Commonwealth of Virginia

Construction and Professional Services Manual

Department of General Services
Division of Engineering & Buildings
Bureau of Capital Outlay Management

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CHAPTER 1 - INTRODUCTION

1.0 GENERAL

The Commonwealth of Virginia Construction and Professional Services Manual – 2014 is written for those who have a basic knowledge and understanding of the building design and construction process and its terminology. State policies, standards and procedures for procurement of services, procurement of construction and contract management and administration differ from those used in the private sector and those used by agencies of the Federal Government. The policies stated herein are those of the Commonwealth of Virginia and are to be used by state agencies for construction on property owned by the Commonwealth subject to any delegations and/or authorizations which may be in effect for a particular agency.

The Commonwealth of Virginia **Construction and Professional Services Manual – 2014** (hereafter referred to as the **Manual**) consists of 8 Chapters and Appendices A through Z and contains policies, procedures and guidance that state agencies shall follow in the planning, design, and execution of both capital outlay and non-capital outlay projects.

The **Construction and Professional Services Manual – 2014 for Architects and Engineers** (hereafter referred to as the **A/E Manual**) consists of Chapters 1, 2, 3, Chapter 4 (Sections 4.0 through 4.18 only), Chapter 5 (Sections 5.0 through 5.16 only), Chapter 6, Chapter 7 (Sections 7.0 through 7.29 only) and Appendices A through Z.

The **A/E Manual** and all revisions thereto, shall be incorporated into the "Contract Between the Owner and the Architect/Engineer" in their entirety, except as amended or superseded in the Contract or an addendum thereto. Architects and Engineers shall follow the policies, procedures and guidance in the A/E Manual in providing services to state agencies in the planning, design, and execution of both capital outlay and non-capital outlay projects unless otherwise exempt in writing by the Contract or its MOU.

1.1 MANUAL DESCRIPTION

The contents of the Manual are directive in nature. Deviations from the policy and procedures outlined within shall be requested by the agency and approved of the Director of the Division of Engineering and Buildings, Department of General Services or his Designee.

1.1.1 Capital Outlay Process

The Manual is designed to present the project acquisition process from advertisement for A/E services to project completion (occupied building). The Manual is arranged in a sequence that parallels this project acquisition process. The 2014 Edition of the Manual including errata corrections will be posted on the BCOM website and may be downloaded and printed by the users. DEB Directives concerning construction and professional services and DEB Directives concerning the application of the USBC to buildings on state property will be posted on the BCOM website when issued.

1.1.2 Revisions to Manual

Revisions to the Manual will be issued electronically by posting on the BCOM website. The revisions may initially be posted as dated DEB Notices. DEB Notices pertaining to revisions in the CPSM will periodically be incorporated into the Manual. Paper copies of the revisions will not be issued but may be printed by the user from the website.

1.1.3 Maintenance of Manual

The Bureau of Capital Outlay Management is responsible for maintenance of the Manual and the A/E Manual. Suggestions for changes or clarifications, questions, and requests for printed copies should be addressed to:

Bureau of Capital Outlay Management
Division of Engineering and Buildings
1100 Bank Street, 6th Floor
Richmond, Virginia 23219

Or preferably emailed to: manuals@dgs.virginia.gov

1.2 MANUAL ORGANIZATION

The Manual is organized as follows:

Chapter 1 provides an introduction to and overview of the Manual and establishes the design and life cycle cost philosophy of the Commonwealth for its Capital Outlay Program.

Chapter 2 acquaints users of the Manual with the Capital Outlay, contractual and procurement terminology used in the Manual and its forms.

Chapter 3 contains guidance for state Agencies on the topic of A/E services, including the procedures to be used by agencies for procuring professional services, and guidance for calculating and determining fees for A/E services.

Chapter 4 contains applications and clarifications of the Uniform Statewide Building Code which apply to the design of building construction on state property, along with technical design criteria, and DEB policy affecting the design and construction of state facilities. Chapter 4 also contains information on Building Official reviews, permits, certificates and approvals applicable to both Capital Outlay and Non-Capital Projects.

Chapter 5 establishes the format for the preparation of design documents and other professional studies by A/Es for Agencies of the Commonwealth. It also contains submittal requirements and approval milestones in the design stages of Capital Outlay projects. This chapter also provides contact information for submittals of Land Use Plans, Master Plans and Master Site and Utility Plans.

Chapter 6 describes DEB design, operation, maintenance and procurement guidelines for use in developing plans and specifications for construction and renovation of state facilities. It is recognized that some Agencies may have established guidelines and methods which differ from those in this chapter. The standards in this chapter shall be followed unless a waiver in writing is granted by the Director of the Division of Engineering and Buildings.

Chapter 7 contains procedures for advertising projects, receiving and opening bids, awarding contracts, addressing informalities in bids, and handling bid protests. Chapter 7 also contains the procedures for construction administration, construction change orders, project completion, final inspection, facility occupancy and project close-out. Chapter 7 provides guidance for special procedures such as design build, construction management at risk, prequalification of contractors and delegation of review. Chapter 7 provides guidance for selecting the Building Committee and describes the duties to be performed by the Committee.

Chapter 8 contains guidance and procedures for agency planning of Capital Outlay projects and the approval process, contains guidance and procedures for utilization requirements, completion and submittal of the various 'CO' forms applicable to construction for both Capital and Non-Capital projects, and contains requirements for reports to be submitted by the Agency to BCOM.

The following **Manual** chapters and sections are not a part of the **A/E Manual** and are not a part of the A/E Contract: Section 4.19, Section 5.17, Sections 7.30 through 7.36, and Chapter 8.

1.3 CAPITAL OUTLAY VS. NON-CAPITAL OUTLAY PROJECTS

1.3.1 Capital Outlay Projects

Capital Outlay Projects, as defined by the Department of Planning and Budget Instructions, must be authorized by the General Assembly or by the Governor as provided for in the Acts of Assembly (also called the Appropriations Act). Capital Outlay Projects use an established authorization and approval sequence for the "Design Phase" of Project to include:

- Project Initiation (using the CO-2 or HECO-2),
- Schematic Design Approval Phase (using the CO-4 or HECO-4),
- Preliminary Design Approval Phase (using the CO-5 or HECO-5) and
- Working Drawing or Construction Documents Approval Phase (using the CO-6 or HECO-6).
- After receiving Bids, Construction Contract Award approval is made using a CO-8 or HECO-8.

These forms are also used to track the cost of the project, the commitment of funds and the infusion or transfer of funds for the project. The approval authority for the forms is described in Chapter 5 of the Manual. Refer also to Chapter 8. These forms are found on the Forms Center or in BITS (Building Information Tracking System).

1.3.2 Non-Capital Outlay Projects

Non-Capital Outlay Projects, as defined by the Department of Planning and Budget Instructions, are usually small construction, renovation, repair or replacement projects which are funded by Agency resources and do not require authorization by the Legislature and the Governor. Non-Capital Outlay Projects in most cases do, however, involve work regulated by the Uniform Statewide Building Code and typically require a Building Permit from the Building Official or his designee. The design phases and approval process for the Non-Capital Outlay Projects is left to the Agency's discretion depending on the project scope. However, the "construction documents" are required to be approved. The intended completion date and the Contractor's name or "work to be performed by agency forces" must be submitted along with the application for Building Permit (CO-17.) See Chapter 8 and Appendix H.

1.3.3 Construction

The Construction Phase is similar for both Capital Outlay and Non-Capital Outlay Projects (depending on the project scope) for Building Permits, Change Orders, Project Substantial Completion, and Certificate of Occupancy. The exception is usually that Capital Outlay Projects require submission of revised capital outlay authorization forms during construction for approval to adjust certain budget line items and to revise project funding. See Chapter 8 for more specific guidance on form submission requirements.

1.4 DESIGN PHILOSOPHY

The design goal is to create a capital investment that meets the user's functional requirements, provides the most economical life cycle cost, and promotes energy efficiency and environmental conservation. The Commonwealth's design philosophy envisions a long and useful life for state buildings. These buildings will often be used for periods exceeding 50 years and, consequently, should be designed for durability, economy of operation and ease of maintenance. Further, the Appropriations Act states that "Projects shall be developed to meet Agency functional and space requirements within a cost range comparable to similar public and private sector projects." Note that this does not say the "best" or "most expensive," nor the "cheapest."

Building 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 Commonwealth, particularly for operating and personnel costs, then the design should incorporate the more expensive first cost feature or system, provided that it does not cause the project cost to exceed its "design-not-to-exceed" budget.

Agencies shall ensure their architects and engineers 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. Acceptance of a particular design does not imply that other, more cost-effective designs are not acceptable.

1.5 FORMS

FORM		WHERE TO FIND
CO-2	Authority to Initiate Capital Project	BITS
CO-3	A/E Contract Log	Forms Center
CO-4	Application for Approval of Schematic Design	BITS
CO-5	Application for Approval of Preliminary Design	BITS
CO-6	Application for Approval of Working Drawings	BITS
CO-8	Approval to Award Construction Contract	BITS
CO-11	Construction Change Order Log	Forms Center
CO-14	Project Completion Report	BITS
CO-17	Building Permit for Construction	BITS
CO-17 IND	Building Permit for an Industrialized Building	BITS
CO-17 MAN	Building Permit for a Manufactured Home	BITS
CO-17 TWR	Building Permit for a Tower	BITS
CO-17 TMP	Building Permit for a Temporary Structure	BITS
CO-17 SPC	Special Use Permit	BITS
CO-13.3	Certificate of Use and Occupancy	BITS
CO-13.3 IND	Certificate of Use and Occupancy for an Industrialized Building	BITS
CO-13.3 MAN	Certificate of Use and Occupancy for a Manufactured Home	BITS
CO-13.3 TWR	Certificate of Use for a Tower	BITS
CO-13.4	Building Permit Close Out	BITS
CO-13.5	Beneficial Occupancy	BITS

For a complete listing of the forms available for download at the DGS Forms Center, refer to Form DGS-30-000 "Capital Outlay Management Forms Master List" located on the BCOM webpage.

CHAPTER 2 - DEFINITIONS

2.1 GENERAL

This chapter is intended to acquaint Agencies 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 Commonwealth of Virginia's Capital Outlay Program. Definitions are taken from the *Code of Virginia*, the General Conditions of the Construction Contract (DGS-30-054, Form CO-7) and general customs and practices associated with state construction industry and professional service contracts.

2.2 DEFINITIONS AND ABBREVIATIONS

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

AARB: Art and Architectural Review Board

ADA: The Americans with Disabilities Act of 1990

ADAAG: Americans with Disabilities Act Architectural Guidelines

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

Advertisement: The term commonly used to describe the public announcement or "Notice" of the availability of the Invitation For Bids (i.e. bid documents or IFB) or Request For Proposal (RFP) made by publishing a notice in the public procurement Web site designated by the Department of General Services, www.eva.virginia.gov , and by "Posting the Notice" (*Code of Virginia*, §2.2-4300 et seq).

A/E Contract: The Form of Agreement (CO-3, CO-3.1, CO-3.2) and any documents expressly incorporated therein. Such incorporated documents customarily include the Terms and Conditions of the A/E Contract, various sections of this Manual (see definition of A/E Manual), the Memorandum of Understanding and all modifications, including subsequent Change Orders.

A/E Manual: The **A/E Manual** shall consist of the following Chapters and Sections of the Construction & Professional Services Manual – 2014 (called the **Manual**):
Chapters 1, 2, 3, and 6 and Sections 4.0 through 4.18, Sections 5.0 through 5.16, Sections 7.0 through 7.29, and Appendices A thru Z, including all revisions thereto. The Manual and all revisions shall be incorporated into the Contract in their entirety except as amended or superseded in the Contract or an addendum thereto.

Agency: Any of the departments, agencies and institutions of the Commonwealth of Virginia, including state-supported institutions of higher education; also referred to as the "Owner" in the Contract Documents.

Agency Contracting 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 a capital outlay project for the Agency. May also be called the Chief Facilities Officer.

Agency Head: The Director, Commissioner, President, or other highest ranking public official of a state agency or institution.

Agency Manual: The short term used for the Construction & Professional Services Manual – 2014 (called the Manual), Chapters 1 thru 8 including Appendices A thru Z, and all revisions thereto. Also called the **Manual**.

Agency Representative: The person designated by the Agency Head to be responsible for administering the agency's Annual Permit program.

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 (CO-11a/e) issued on or after the effective date of the Contract (CO-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.

ADA Standards: 2010 ADA Standards for Accessible Design (September 15, 2010). Sometimes referred to as "ASAD".

ASHRAE: American Society of Heating, Refrigerating and Air-Conditioning Engineers

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.

BCOM: Bureau of Capital Outlay Management. BCOM is a bureau within the Division of Engineering and Buildings, a division of the Virginia Department of General Services.

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 Owner 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 Owner 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.

Building Committee: The group constituted by the Agency in accordance with the requirements of Chapter 7 of the Manual and with the authority and purpose as set forth in Chapter 7 including

interviewing and selecting A/E's for the planning and design of construction projects and other professional services required by the Agency.

Building Official: The Building Official for all buildings on state property (i.e. all buildings on state property, including occupiable buildings and other structures located in the VDOT right-of-way) is the Director of the Division of Engineering and Buildings, Department of General Services. The Building Official's duties, responsibilities and authority generally conform to those described in the Uniform Statewide Building Code (Code of Virginia, § 36-98.1).

Capital Project: For purposes of this Manual, "Capital Project" means (1) Acquisition of real property; (2) New construction projects with a total project cost exceeding $1,000,000 for state agencies, or $2,000,000 for institutions of higher education; (3) Improvements, renovations, repairs, replacement, maintenance, or combination projects for a single building with a total project cost exceeding $1,000,000, or $2,000,000 for institutions of higher education; and (4) Umbrella projects.

Change Order: A document (CO-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, CO-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 a capital outlay project for the Agency. May also be called the Contracting Officer.

CM: Construction Management, or Construction Manager at Risk

***Code of Virginia*:** 1950 *Code of Virginia* as amended, Virginia's codified statutes. Sections of the *Code of Virginia* are referred to herein as § xx-xx.

Commissioning: A quality assurance process to verify and document that building systems and components operate in accordance to the owner's project requirements and the project design documents.

Commissioning Authority (CxA): The party responsible for the commissioning process.

Competitive Negotiations: A method of Contractor selection that includes the following two elements (*Code of Virginia*, § 2.2-4301):

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 publication on the eVA Web site (i.e., Virginia Business Opportunities (VBO) and in a newspaper of general circulation in the area in which the contract is to be performed.

Competitive Sealed Bidding: A method of Contractor selection that includes the following elements (*Code of Virginia*, § 2.2-4301):

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 publication of the public announcement or "Notice" of the availability of the Invitation For Bids (i.e. bid documents or IFB) on the eVA Web site www.eva.virginia.gov. Agencies may also publish the

Notice in a newspaper of general circulation. Bids may be solicited solely from Contractors who have prequalified. (Code of Virginia, § 2.2-4317.). 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.

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**.

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 non-professional services provided under a contract with the Owner which generally includes inspection of the Work, coordinating testing services contracts procured by the Owner, reviewing change orders and schedule submittals from the Contractor, and providing other construction period services for the benefit of the Owner. The Construction Administrator is the entity responsible to the Owner for providing these services to assure compliance with the Contract Documents but is not responsible under the CA Contract for providing the Work. The Owner may use an employee to perform construction administration services. This differs from the Construction Administration services required under the A/E Contract.

Construction Management (CM): As used in this **Manual**, this term means services provided under contract with the Owner, which generally include coordinating and administering construction contracts for the benefit of the Owner, but may also include, if provided in the contract, furnishing construction services to the Owner. Agencies shall obtain approval from the Director of the Division of Engineering and Buildings to utilize Construction Management procedures for construction. See Section 7.31 of the **Manual** for further descriptions. The Construction Manager has direct responsibility and liability to the Owner for performing the Work as described by the Contract Documents. Also called the CM/GC, or the 'Contractor' for the CM 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 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 (CO-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: As used in the **Manuals** and the Standard Forms, "Contractor" means the specific person or firm with whom the Owner has contracted to do the Work described in the Contract Documents for that undertaking. On a Design Build project, the Design Builder is the 'Contractor'. On a Construction Management project, the CM or CM/GC is the 'Contractor'. Can also be used as a generic term used to indicate a person, firm or corporation with who has entered into a contract agreement to perform work or provide a professional or nonprofessional service.

CPSM: Construction and Professional Services Manual

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.

D/B: Design-Build

DCJS: Virginia Department of Criminal Justice Services

DEB: Division of Engineering and Buildings, division of the Virginia Department of General Services.

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 Owner at Substantial Completion or Beneficial Occupancy).

DEQ: Virginia Department of Environmental Quality

Design-Build (DB): A contract between a public body (the Owner) and another party in which the other party agrees to both design and build the structure, roadway or other item specified in the Contract. Agencies must obtain approval from the Director of the Division of Engineering and Buildings to utilize Design-Build procedures for construction, except as provided for under *Code of Virginia*, § 2.2-4306 and Section 7.30.

"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.

DGS: Virginia Department of General Services

DHCD: Virginia Department of Housing and Community Development

DMBE: Virginia Department of Minority Business Enterprise

DPB: Virginia Department of Planning and Budget

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.

DSBSD: Department of Small Business and Supplier Diversity

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

Engineer: A person who is qualified and licensed to practice engineering in Virginia as a Professional Engineer by 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 Owner.

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

ESCO: Energy Service Company, or Energy Service Contract

eVA: Electronic procurement in VA. The eVA home page address is www.eva.virginia.gov .

Extra service: A service which the Owner/Agency 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, CO-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.

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 CO-13.1 and the Contractor by a CO-13.2 that the Project is totally completed in accordance with the Contract Documents. Procedures for determining Final Completion are set forth in Section 44 of the General Conditions of the Construction Contract (CO-7).

Float: The excess time included in a construction schedule to accommodate such items as inclement weather and associated delays, equipment failures, and other such unscheduled events. It is the contingency time associated with a path or chain of activities and represents the amount of time by which the early finish date of an activity may be delayed without impacting the critical path and delaying the overall completion of the project. Any difference in time between the Contractor'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 that 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, DGS-30-54, Form CO-7, latest edition. Also the General Conditions of the Design-Build Contract, DGS-30-056, Form CO-7DB for use with Design-Build contracts; and the General Conditions of the Construction Manager "At Risk" Construction Contract, DGS-30-057, Form CO-7CM for Construction Manager at Risk contracts. All documents can be found on the Forms Center.

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

HVAC: Heating, Ventilating and Air Conditioning

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. (*Code of Virginia*, § 2.2-4301)

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 *Code of Virginia*, § 2.2-4301.

Landscape Architect: An individual licensed by the Commonwealth of Virginia as a 'Landscape Architect' by the APELSCIDLA Board of the Department of Professional and Occupational Regulation.

The Landscape Architect may function as a project manager and may be the prime A/E 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.

LEED: Leadership in Energy and Environmental Design

Liquidated Damages: See Section 43 of the General Conditions of the Construction Contract (CO-7). As used in this Manual, the term "Liquidated Damages" generally means a predetermined and fixed amount of money per period of time as stated in the Contract Documents and which will be charged to the Contractor as a measure of damages for delay suffered by the Owner due to failure of the Contractor to substantially complete, or finally complete, the Project/Work by the date or time established in the Contract Documents.

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

Maintenance Reserve Project: A single effort undertaking which involves major repair or replacement to plant, property or equipment, normally costing from $25,000 to $1,000,000. Examples of such projects include:

a. repair or replacement of damaged or inoperable equipment such as elevators, furnaces, plumbing fixtures, air conditioning and ventilation equipment.
b. 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;
c. repair or replacement of existing utility systems, such as electrical, water and sewer, heating & cooling. When replacement of components of utility systems is required (e.g. transformers, distribution panels, cables, etc.), new components should be sized to account for future growth if the existing components are operating at or near capacity.
d. 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.
e. correction of problems resulting from erosion and drainage.

Memorandum of Understanding (MOU): A document signed by both the A/E and the Owner 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 **A/E Manual** unless such change has been approved in writing by the Director of the Division of Engineering and Buildings or his designee and such written approval is attached to the MOU.

Micro Business: A business enterprise certified by the Virginia Department of Small Business and Supplier Diversity (DSBSD) that has no more than 25 employees and has no more than $3 million in average annual revenue over the three-year period prior to certification.

Minority-owned/controlled Business: 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 include,

but are not limited to, Blacks, Hispanic Americans, Asian Americans, American Indians, Eskimos, and Aleuts.

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:

a. construction of a new plant including the erection, installation, assembly of a new facility or structure, utility system, or site work:
b. addition, expansion, or extension to a structure which adds to the overall exterior dimension of the plant; structure
c. 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. (*Code of Virginia*, § 2.2-4301)

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 Owner 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 Owner announcing the apparent successful bidder and notifying the bidder and all other bidders that the Owner intents 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: A written notice by the Owner to the Contractor (with a copy to A/E) fixing the date on which the Contract time will commence for the Contractor to begin the prosecution of the Work in accordance with the requirements of the Contract Documents. The Notice to Proceed will customarily identify a Contract Completion Date.

NFPA: National Fire Protection Association

Owner: For purposes of the **Manuals**, "Owner" shall mean the public body, i.e., agency, institution, or department, 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 "Agency."

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 a 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 Owner, 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 (*Code of Virginia*, § 2.2-4316). Any response shall be in writing and distributed to all who requested and 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 (*Code of Virginia* § 2.2-4317).

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 Owner to inspect the Work for the Owner and to document and maintain records of activities at the worksite to the extent required by the Owner. The Owner shall notify the Contractor in writing of the appointment of such Project Inspectors.

Project Manager: As used in the **Manuals**, the "Project Manager" shall be the Owner's designated representative for the Project. The scope of the Project Manager's authority is limited to that authorized by the Owner, who shall provide written information to the Contractor at the Preconstruction meeting defining those limits. This authorization by the Owner of Project Manager authority shall not impinge upon or supersede the professional responsibility and liability of the A/E of Record. Changes to any aspect of the design, including: interior layout, exterior appearance, materials of construction, and technical details shall only be made in consultation with the A/E of Record. Also used as a generic designation of the representative of an Owner, an A/E or a Contractor or others through whom written decisions and notices are generally conveyed.

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

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 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 Owner soliciting proposals for professional, nonprofessional, or contractor services. The RFP generally describes the services sought, the unique capabilities or qualifications needed to perform the work, factors to be used to evaluate proposals and the conditions for negotiating prices and terms with the Offerors (*Code of Virginia*, § 2.2-4301).

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 (*Code of Virginia*, § 2.2-4301).

Responsive Bidder: A person or firm who has submitted a bid which conforms in all material respects to the Invitation to Bid (*Code of Virginia*, § 2.2-4301).

SCHEV: State Council on Higher Education in Virginia

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.

Service: A service that the Owner/Agency 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.

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 (*Code of Virginia*, § 2.2-4301).

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: For the purpose of this **Manual**, a "small business" is one of 250 or fewer employees, or gross receipts of $10 million or less averaged over the previous three years. This shall include, but not be limited to, DSBSD-certified minority-owned and women-owned businesses that meet the small business definition.

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 5 of the **Manual** to be submitted by the A/E to the Owner 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 Owner for the purpose for which it is intended. The Owner, at its sole discretion, may request approval from the Building Official for state buildings to 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 Owner, incorporated into the Contract by Change Order.

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

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

SWaM: Small, Women-Owned, and Minority-Owned

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

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 Owner based on the Time for Completion.

UFAS: Uniform Federal Accessibility Standards

Unit Price Work: Work to be paid for on the basis of established unit prices for the quantity of material provided or work done.

Unsealed Bid: An unsealed written offer conveyed by U.S. Postal Service, commercial courier service, facsimile, email, 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).

USGBC: U.S. Green Building Council

VAC: Virginia Administrative Code

VCC: The Virginia Construction Code

VCCO: The acronym used to refer to a state employee who has completed the necessary training and testing and recertification 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 Officer (VCCO). Where used in this **Manual**, the VCCO functions are related to the following: procurement of professional services contracts; receipt, opening and review of bids; and signing the CO-8 recommending award of the contract to the successful bidder.

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

VEES: The Virginia Energy Conservation and Environmental Standards

VPPA: The Virginia Public Procurement Act, §2.2-4300 thru 2.2-4377, *Code of Virginia* as amended

VUSBC: Virginia Uniform Statewide Building Code (Also referred to as the USBC). Refer to Chapter 4 for detailed descriptions of the various VUSBC parts.

Woman-owned/controlled Business: Business enterprise at least 50 percent of which is owned by females or, in the case of a publicly-owned business, at least 51 percent of the stock of which is owned by females.

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

CHAPTER 3 - ARCHITECTURAL AND ENGINEERING SERVICES

3.1 PROCUREMENT PROCEDURES FOR PROFESSIONAL SERVICES

3.1.1 General Policy on Procuring A/E Services

The Virginia Public Procurement Act (*Code of Virginia*, §2.2-4300 through 2.2-4377) sets forth the general parameters for the procurement of professional services. The sections in this chapter provide further clarification of the requirements for procurement of professional services.

3.1.1.1 Professional Disciplines

The policy of the Commonwealth is to contract with a single entity in acquiring the full range of disciplines necessary to provide the services identified for the project. The entity may be an Architectural & Engineering firm with in-house capabilities in all disciplines, or it may be an Architectural, Engineering or Land Surveying 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 which demonstrates it has the ability to meet the criteria in the RFP and is best suited to provide the services for the project. In any case the proposer will be referred to as the Architect/Engineer (A/E) and will be required to provide the services indicated in the contract.

3.1.1.2 Professional Responsibility

The person having overall responsibility for the project management and coordination of disciplines may be either a licensed Architect or Professional Engineer. 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 Architect or Engineer shall be registered and licensed by the Virginia Department of Professional and Occupational Regulation (DPOR) in accordance with requirements of the *Code of Virginia*.

3.1.1.3 Agency Responsibility

The Agency head will designate, in writing, a person, called in this Manual the Agency Contracting Officer or Chief Facilities Officer, who shall be responsible for the administration and supervision of the agency's capital outlay and construction program. This designee shall be responsible for assuring that the Agency conforms to the policies and procedures in the Manual for the procurement and administration of professional and nonprofessional service contracts and for the procurement and administration of construction contracts.

3.1.2 Procurement of Related Services

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

3.1.2.1 Professional Services

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

3.1.2.2 Nonprofessional Services

Cost consultants, interior design and landscape design services, soils 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 architects, engineers or others are considered to be Nonprofessional Services and shall be procured using procedures contained in the DGS, Division of Purchases and Supply, *Agency Procurement and Surplus Property Manual*.

3.1.3 Project Scope of Work

Once the Agency 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 the Manual, the State Budgeting Instructions, the Building Code and/or other standards for the specific related requirements.

3.1.4 Requests for Proposal (RFP)

The Request for Proposal (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 ARCHITECTURAL/ENGINEERING FIRM DATA (Forms AE-1 through AE-6) in response to the RFP and include the data and qualifications of any A/Es to be associated with it on the Project. Responses which do not include the Forms AE-1 through AE-6 and/or do not include the requested information and data may be considered as Not Responsive to the RFP.

Sample RFP Formats for A/E services are located on the DGS Forms Center website.

Proprietary information from respondents will not be disclosed to the public or to the competitors provided such proprietary information is appropriately properly identified, as required by *Code of Virginia*, § 2.2-4342, F., in the RFP response.

A/E's who submitted proposals but were not selected may contact the agency for a de-briefing. The agency shall provide an explanation as to why the firm was not selected.

3.1.5 Advertisements for Professional Services

3.1.5.1 Public Notice

Public notice of the Request for Proposals shall be given a minimum of 10 days prior to the date set for receipt of proposals. Public Notice of RFP's for A/E services for Capital Projects and for Term A/E Contracts shall be posted for at least 21 days unless a shorter time but not less than 10 days is justified and approved in writing by the Director, Bureau of Capital Outlay Management or, where delegated, the Agency's Chief Facilities Officer / Contracting Officer. The written justification and approval shall be a part of the official procurement transaction record.

3.1.5.2 Methods of Notice

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

1. Publication of a notice on the On-Line Bids page of eVA, Virginia's central electronic procurement website. The URL is: http://eva.virginia.gov; and
2. Publication of the Notice in a newspaper of general circulation statewide and/or in the general area of the project.

3.1.5.3 Contact Information

The public notice shall show the name, address, e-mail address, phone and fax number to be used to obtain a copy of the RFP.

3.1.6 Small Businesses and Businesses Owned by Women and Minorities

3.1.6.1 Fees Exceeding $100,000

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. See the DGS-30-360 format on the Forms Center website for format and data requirements.

3.1.6.2 Required Data

The following data is required on each small business, women-owned business and minority-owned business. The format for submission of this data is included at the DGS Forms Center website.

1. Type of ownership and DSBSD (or DMBE) Certification Number, if certified
2. Utilization in the most recent twelve (12) months of DSBSD (or DMBE) certified firms, and
3. Planned involvement or services to be performed by DSBSD (or DMBE) certified firms on the proposed project.

3.1.6.3 Reporting

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 Agency Contracting Officer for agency specific requirements.

3.1.7 Standard Formats for Responses to RFPs

Standard formats for responding to Requests for Proposals (RFPs) provide a uniform forum for the A/E to present both the historical data on A/E firm and the project specific qualifications and help streamline the agency's review and evaluation process. Using standard formats also reduces the effort and expense of responding to RFPs and provides uniformity in the type information requested. Capital Outlay Forms AE-1 through AE-6, ARCHITECTURAL/ENGINEERING FIRM DATA, have been structured to obtain information on the responding A/E that is pertinent to the RFP. Agencies shall require that A/Es responding to Professional Service RFPs use these forms for their responses. Required additional or supplemental information shall be provided as requested in the individual RFP.

Blank copies of the AE-1 through AE-6 forms are downloadable from the DGS Forms Center.

Social Security numbers for Sole Proprietors are not required until an Agency awards a contract to that firm.

Form AE-1 provides historical data on the firm to include firm name, location, type of ownership, size, previous name(s), principals, type of personnel, consultants proposed, Professional Liability

Insurance coverage, disadvantaged business utilization proposed, and variety of past project experience data.

Form AE-2 provides information on the proposed consultants for the particular project.

Form AE-3 provides information on the personnel proposed to be assigned to the project and a narrative of the methodology to be used for providing the services and for quality assurance.

Form AE-4 provides information on the individual qualifications, experience and expertise of the key personnel proposed to be assigned to the project.

Form AE-5 provides specific data on similar projects or projects with similar features on which the A/E and/or its consultants have provided services.

Form AE-6 offers the A/E a forum for a narrative to describe particular capabilities, expertise, project approach, current workload, and other information supporting the firm's qualifications for the project.

A/Es interested in being considered by an agency for Emergency Procurements and Small Purchase Procurements should file with each marketed agency a generic copy of Forms AE-1 through AE-6 indicating consultants often used, current staff with qualifications, typical or representative projects, and a narrative summary of the firm's capabilities. Such forms should be updated at least annually.

3.1.8 Procedures for Qualifications-Based Selection of A/E

3.1.8.1 General Overview

In the event of a bonafide emergency, the Agency may use Category A, Emergency Selection Procedures, to select a qualified and suitable A/E, negotiate a fee, and award a contract to provide the emergency services. See 3.1.8.2 below.

Each Agency using Category B - Small Purchase Procurement procedures for services with a total fee, including reimbursables, less than $50,000 shall receive and maintain statements of interest and qualification statements on Forms AE-1 thru AE-6 from A/Es interested in serving the agency on such small service contracts. Selections of A/E's will be made from those firms having their qualification statements on file with the agency. Qualification statements should be less than one year old and reflect the current status and qualifications of the A/E. See 3.1.8.3 below.

If the total A/E fee, including reimbursables, is expected to exceed $50,000, the Agency shall advertise and utilize the Standard Category C RFP procedures to select an A/E. The Agency Building Committee, either as a whole or through an appointed screening subcommittee, will review and evaluate the responses to the RFP in relation to the criteria listed in the RFP. This screening process will identify the three to five (or more) A/E's which appear best suited by experience, qualifications, project approach and other factors and those A/E's will be recommended for telephonic or personal interviews. See 3.1.8.4.

The Building Committee will conduct interviews with three to five of the top-ranked firms. The interviews should be scheduled to allow sufficient time for a presentation by the firm, a question / answer period permitting the Committee to query the A/E on specific factors to be evaluated, and time for a brief closing summary to permit the A/E to highlight why it should be selected.

After the interviews, the Committee will rank the firms interviewed and conduct competitive fee negotiations with the top-ranked firm, as authorized or directed by the Agency head. If a satisfactory fee, schedule and terms can be negotiated with the top-ranked firm, a contract will be awarded. If not, negotiations with the top-ranked firm will be terminated in writing and negotiations begun with the firm ranked number two and so on.

Notice of Intent to Award: Once the fee negotiations are complete, the Agency shall "Post" a Notice of Intent to Award at the place the agency uses for "posting" notices. Proposers not selected have 10 days from the date of 'posting' in which to file a written 'protest' of the award of the Contract. In addition the Agency must post notice on the DGS central electronic procurement Website, and may post notice on their Electronic Website. The Agency shall post a Notice of Award in like manner when the contract is successfully awarded.

For Term A/E Contracts, the Building Committee should determine the disciplines or categories of contracts to be solicited and issue an RFP for each discipline or category. Even though a proposer may qualify and be interviewed for a contract in more than one discipline or category, the A/E can be awarded only one term A/E Contract with the Agency for that period.

3.1.8.2 Procedures for Category A - Emergency Procurement

(*Code of Virginia*, § 2.2-4303, F.)
In the event of a bona fide emergency, the selection may be made without regard to use of the usual Professional Services Procurement procedures:

3.1.8.2.1 Written Determination

A written determination shall be made in advance and signed by the Agency head documenting the nature and basis of the emergency and authorizing procurement of A/E services (and related corrective work, if applicable) on an emergency basis. The written determination shall be made part of the project file.

3.1.8.2.2 Contact A/E Firm(s)

The Agency should telephonically contact one or more A/E firms who have demonstrated a capability to do the necessary work in a timely manner (either through previous contracts or on their Forms AE-1 through AE-6). The Agency should describe to the A/E the nature of the work and the necessary time frame for accomplishing the work. A commitment should be requested from the firm(s) that if it is selected for the work, it will provide the services within the required time frame.

3.1.8.2.3 Negotiation

The Agency shall negotiate with the selected firm to establish a fee for the work on a LUMP SUM basis or on a UNIT COST (hourly rate) basis with a NOT TO EXCEED AMOUNT.

3.1.8.2.4 Award

The Agency shall award a contract using Form CO-3 or CO-3.2 for the work and shall issue and post a written notice stating that the contract is being awarded on an emergency basis, identify the work being procured, identify the firm selected and the date of award of the contract. Typically, use of the CO-3 is recommended unless the scope of the A/E services will be extremely limited. (An example of extremely limited scope of A/E services would be preparation of construction documents for repairs to an exterior wall after an automobile runs into it.) Post the notice on the On-Line Bids page of eVA, Virginia's central electronic procurement website. The URL is http://eva.virginia.gov .

3.1.8.2.5 Notification

The Agency VCCO shall forward a copy of the signed Form CO-3 or CO-3.2, a copy of the Emergency declaration, and an explanation of the circumstances to DEB.

3.1.8.2.6 Purchase Order

Issue a Purchase Order in eVA referencing to the Contract CO-3 or CO-3.2

3.1.8.3 Procedures for Category B - Small Purchase Professional Service Procurements with Total Fee of $50,000 or Less

(*Code of Virginia*, §2.2-4303, H.)
If the total fee including reimbursable expenses will be $50,000 or less, the Agency may use the following "Small Purchase Professional Service Procurement Procedures".

(Note: Agencies are encouraged to utilize the services of qualified Virginia-based small businesses and businesses owned by women or minorities for Category B procurements.)

3.1.8.3.1 Procedure

If the total fee including reimbursable expenses will be $50,000 or less, the following procedure may be used to procure the A/E services:

1. Advertise and post a notice at least once a year requesting qualifications from A/E's interested in providing services to the agency on small projects where the fee will be $50,000 or less.

2. The Request for Qualifications (RFQ) should be similar to an RFP which lists the information desired and the general types of work to be procured using these procedures.

3. Require the A/E response to RFQ to include Forms AE-1 through AE-6, emphasizing their qualifications for the type of small projects for which they seek consideration.

4. Statements of qualifications (Forms AE-1 through AE-6) and RFQ responses shall be accepted at any time to allow new firms to be considered for work and to allow A/E's to update their qualification forms to show current information.

5. Agencies using this Category B procedure shall sort RFQ responses/interest packages, establish a listing of responding A/E's by qualification or discipline/capability, and file RFQ responses by category for use in selecting A/E's for interview.

6. When the Agency desires to select an A/E by Category B procedures, the Agency shall:
   a. Identify not less than three (3) A/Es for interviews, from a list of firms that have expressed an interest in doing work for the Agency, have Form AE-1 through AE-6 on file with the Agency and appear to be qualified and suitable to render the required services.
   b. Conduct telephone or personal interviews with representatives of the three A/E's to determine current personnel qualifications, location relative to the work, expertise, workload, capability to meet the proposed schedule, past performance on similar projects and ability to provide the service within budgeted costs.
   c. Consideration should be given to number and value of previous agency and state contracts awarded to each firm. (One method would be to assess negative points for each previous Category B contract awarded to the A/E during the last 12 months.) Agencies shall consider the opportunity to maximize the participation of qualified Virginia firms interested in doing such work for the Commonwealth and to avoid favoritism or the appearance of favoritism.

d. Rank order A/Es and negotiate fee for service using competitive negotiation procedures. Repeated selection of the same A/E firm for these 'small purchases' violates the intent of these procedures.
e. Award a contract and post notice of same. Post / publish the notice on the On-Line Bids page of eVA, Virginia's central electronic procurement website at http://eva.virginia.gov .
f. Use Contract Form CO-3.2 or Form CO-3 and forward a copy of the signed contract to BCOM. The CO-3.2 could be used most effectively for projects with fees of $5,000 or less. This applies to Capital Outlay Projects only, not Maintenance Reserve.
g. Issue a Purchase Order in eVA referencing to the Contract CO-3.2.

3.1.8.3.2 Small Purchase Process

If the total fee including reimbursable expenses will be less than $5,000, this 'small purchase' process will allow the VCCO to select and call only one qualified A/E from the list of firms that have expressed interest. Repeated selection of the same A/E firm for these 'small purchases' violates the intent of these procedures.

a. Consideration should be given to number and value of previous agency and state contracts awarded to each firm. Agencies should consider the opportunity to maximize the participation of qualified Virginia firms interested in doing such work for the Commonwealth including Small Businesses, Minority Owned Businesses, and Women Owned Businesses. Agencies should avoid favoritism or the appearance of favoritism.
b. Negotiate fee for service using competitive negotiation procedures.
c. Award a contract and post notice of same. Post the notice on the On-Line Bids page of eVA, Virginia's central electronic procurement website at http://eva.virginia.gov .
d. Use Contract Form CO-3.2, and forward a copy of the signed contract to BCOM. This applies only to Capital Outlay Projects, not Maintenance Reserve.
e. Issue a Purchase Order in eVA referencing to the Contract CO-3.2

3.1.8.4 Procedures for Category C - Standard Professional Services Procurement Procedures

(*Code of Virginia*, § 2.2-4301, Competitive Negotiation, 3.a and § 2.2-4303, B.)

For a project with a fee amount expected to be greater than $50,000, the Committee shall use a qualifications, suitability, and capability based selection process followed by competitive fee versus scope of work negotiations with the selected offeror. These procedures may also be used for smaller fee contracts.

3.1.8.4.1 RFP

Prepare a Request for Proposal (RFP). The standard format RFP for Professional Service is form DGS-30-300 and is available on the DGS Forms Center.

3.1.8.4.2 Advertisement

Post a notice on the On-Line Bids page of eVA, Virginia's central electronic procurement website. The URL is: http://eva.virginia.gov. Publish the Notice in a newspaper of general circulation statewide and in the general area of the project. For advertisements in newspapers, use the abbreviated format provided in Appendix O.

3.1.8.4.3 Evaluation

Receive, evaluate, and rank the respondents based on the data contained in the Forms AE-1 through AE-6, submittals of each respondent with respect to the criteria listed in the RFP. If the total contract amount is expected to exceed $100,000, the evaluation criteria shall include factors for past and proposed use of Small Businesses and Businesses owned by Women and by Minorities.

3.1.8.4.4 Verification

Verify that the top ranked A/Es proposed for interview are, in fact, properly registered with the APELSCIDLA Board and licensed to provide A/E services in Virginia. Any respondent not properly registered and licensed shall be disqualified. Additionally, verify that the A/Es are not debarred or enjoined. Debarment and enjoinment status of A/Es and other vendors can be determined by registered eVA users at the eVA website.

3.1.8.4.4.1 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:

1. Whether the Association is a registered or licensed entity authorized to offer the necessary services in Virginia;
2. The nature of each party's responsibilities to the other and to the Owner;
3. The professional liability insurance coverage of the Association;
4. The Association's organization and management structure;
5. Each firm's financial condition and stability with respect to fulfilling its obligations under the Contract; and
6. Whether the parties to the Association are jointly and severally liable for the Work.

Prior to selecting an Association for fee negotiation for possible contract award, the Owner shall request a review of the Association's legal documents. It is preferable that the Office of the Attorney General perform this review; as a minimum the review will be accomplished by the Owner's staff 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".

3.1.8.4.5 Interviews

Interview a minimum of the top three ranked respondents who are deemed to be fully qualified, responsible, and suitable on the basis of their initial responses. Discussions of fees, rates, design costs, etc., shall not be included in these evaluations or the interviews. Allow the A/E to present more detailed information on the RFP criteria; on specific qualifications and expertise of the personnel proposed to be assigned to the project; on the concepts, methods and approaches proposed for the design; and other pertinent information. Evaluate responses of each interviewed firm along with other material and data submitted, the A/E's past performance, and responses from references, and rank order the firms 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 in the RFP response is appropriately noted as proprietary information exempted from public disclosure as required by the *Code of Virginia*, § 2.2-4342, F.

3.1.8.4.6 Negotiation

Negotiate with the A/E ranked first as to overall suitability and qualifications. If the Owner cannot reach agreement on a fee amount based on compliance with all of the Manual requirements, the negotiations shall be formally terminated in writing. The Owner must then proceed to negotiate with the A/E ranked second. If not successful, the negotiations with the second ranked are terminated in writing and the Owner proceeds to the third ranked. It is understood that at any time, negotiations may be terminated and the project re-advertised.

It is anticipated that the fee amount negotiated will cover all the services required. However, it is recognized that unforeseen circumstances may arise, requiring resolution.

Accordingly, at the time of negotiation, the hourly rates for the various technical personnel classifications must be set forth in the MOU for use in determining a reasonable fee for additional services.

3.1.8.4.7 Award Process

1. Recommend the selected A/E to the Agency Head or his Designee for approval.
2. The terms of the agreement shall be recorded in a written and signed MOU and attached to the Form CO-3 signed by the Agency Contracting Officer and the A/E.
3. Post a Notice of Award. Post the notice on the On-Line Bids page of eVA, Virginia's central electronic procurement website at http://eva.virginia.gov .
4. Issue a Purchase Order in eVA referencing to the Contract CO-3.2. Forward a copy of the Contract, Form CO-3, and the MOU to DEB.

3.1.8.5 A/E Term Contracts

(*Code of Virginia*, §2.2-4301, Competitive Negotiation, 3.a)
A/E Term Contracts are a useful and effective tool for the Agency in effectively managing their planning, maintenance, and renovation programs and effectively handling emergency situations. The following policy governs the use of these contracts.

3.1.8.5.1 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 multiple small projects over a one-year period of time subject to the limitations below.

Some advantages for the agency include a reduction in the cost and time of advertising for services, a shorter response time from the A/E, and an improved efficiency and clarity in the production of the Contract Documents for the Agency. For the A/E, it is usually more cost effective to provide the services on multiple small projects for the same agency. Examples of Term A/E Contracts include: feasibility studies, cost studies, designs of small capital and construction projects (with project costs less than $2,000,000) and maintenance reserve project designs.

A/E design services for all construction and renovation projects with an estimated total project cost of $2,000,000 or more shall be advertised and procured individually.

3.1.8.5.2 Advertisement

Since there is a potential for the maximum total of fees to exceed $200,000, the procedures for Category C in Section 3.1.8.4 apply for the advertisement, SWaM business utilization, selection and posting of notices. The publication of the notice/advertisement of the RFP shall be made on the On-Line Bids page of eVA, Virginia's central electronic procurement website at http://eva.virginia.gov . The Notice shall also be published in a newspaper of general circulation statewide or in the general area of the project, or both. For advertisements in newspapers, use the abbreviated format provided in Appendix O.

3.1.8.5.3 RFP (Request for Proposal)

The RFP shall include a description of the nature and types of the potential projects, the disciplines or expertise required by this Term A/E Contract, and the nature of services expected to be required. The RFP shall also describe factors pertinent to the evaluation and selection process.

3.1.8.5.4 Rights to Issue RFPs and Project Orders

The Agency reserves the right, at its sole discretion, to issue separate RFPs for similar work and other projects as the need may occur. Under the provisions of this contract, the Agency reserves the right to issue a Project Order for the A/E provide the type of services

described to any branch or subsidiary of the Agency, or to another state agency in the same general area.

3.1.8.5.5 Multiple Contract Awards from a Solicitation

An Agency may issue Term A/E Contracts to not more than four (4) of the fully qualified and best suited firms interviewed from a particular A/E Term Contract RFP advertisement and selection process.

3.1.8.5.6 Contract Award Period

The Agency shall complete the selection process and award a Term A/E Contract after the A/E has been selected. The first Project Order may be issued at any time during the term of the contract. If multiple A/Es are selected for award of multiple Term A/E Contracts from a single advertisement, the Term A/E Contracts do not need to be issued concurrently, but the first Project Order for each of the Term A/E Contracts shall be issued at any time during the term of each contract. See also 3.1.8.5.10.

3.1.8.5.7 Contract Limit

No A/E, including any subdivisions or branches thereof, may at any time have in effect more than one (1) A/E Term Contract with any one (1) Agency including any subdivisions or branches thereof.

3.1.8.5.8 Fees

The fee for the services on each Project Order shall be negotiated individually on a lump sum basis considering the Scope of Services required, the estimated man-hours required for each skill level/discipline and the labor rates agreed upon and listed in the MOU. If an estimate of the time required to perform the Work cannot be reasonably estimated, the A/E may be directed to proceed with the work on an hourly basis with a maximum or not-to-exceed amount. The compensation shall be determined by the A/E's certified record of man-hours expended by classification, skill level and discipline, and the hourly rates for each as listed in the MOU.

Any individual Project Order fee shall not exceed $200,000 and the aggregate total of fees for all Project Orders issued during the term of the Term A/E Contract shall not exceed $1,000,000. Agencies may specify lesser fees in the RFP than above if desired.

The Memorandum of Understanding prepared by the Agency will document the negotiated acceptable labor rates for the various A/E classifications, skill levels and disciplines. These rates will be used by the Agency for arriving at lump sum fees and for any hourly rate work authorized by the Agency for Project Orders issued under the Term Contract resulting from this solicitation.

If a Project Order is to be performed on a lump sum basis, the Agency shall determine a lump sum based on the Scope of Service required, the estimated man-hours required for each classification, skill level and discipline, and the labor rates agreed upon during the contract negotiations.

3.1.8.5.9 Contract Term

The term of the A/E Term Contract as relates to the issuance of new Project Orders shall be the earlier of:

1. one year from the date of the A/E Term Contract, or
2. when the cumulative total of fees for Project Orders issued reaches the maximum fee total, or
3. if the Contract is terminated in writing by either party.

This one-year period shall be referred to as the Term.

When the aggregate total of all Project Orders, including Change Orders to those Project Orders, reaches the term dollar limit, no further Project Orders may be issued during that Term.

It is understood that the A/E's Work under the Project Orders issued may not be completed during the Contract Term; however, all terms and conditions of this Contract, including all rights and obligations, shall survive until the Work is completed, except the owners right to issue, and the A/E's right to accept, additional Project Orders. The Owner and the A/E are obligated to fulfill the requirements of all Project Orders issued, including Change Orders, even though the term for issuing new Project orders has concluded.

The Owner may, at its sole discretion, renew the Contract for an additional one-year Contract Term, provided the option to renew was indicated in the RFP. If the Owner exercises its option to renew, the next Contract Term shall begin one year from the date of the execution of the first Contract, or previous renewal, or the date that the Owner notifies the A/E that the option to renew is being exercised, whichever occurs first. A new aggregate limit of $1,000,000 shall apply to the second Contract Term, without regard to the dollar amounts of Project Orders issued during the first year of the Contract. Any unused amounts from the first Contract Term are forfeited and shall not carry forward to the next Contract Term. Subsequent renewals up to a maximum of four (4) one year renewals shall follow the same procedures. The maximum number of renewals is stated in §2.2-4301, Competitive Negotiations.

3.1.8.5.10 Project Orders

The first Project Order shall be issued prior to the expiration of the A/E Term Contract. It authorizes the A/E to perform Work for a lump sum amount or at the marked up hourly rates, as agreed to and set forth in the MOU attached to the A/E Term Contract. A Form CO-3.1a shall be used to award each Project Order.

It is understood that more than one Project Order may, at the owner's sole discretion, be offered to the A/E during the Contract Term. Although the potential exists for multiple project orders during the Contract Term with aggregate fees up to $1,000,000, the Agency does not represent or guarantee that the A/E will receive more than one Project Order.

The Project Order offered to the Term A/E Contractor should include a scope of work, a definition of the product required and a request for a fee proposal. If the A/E and the Owner cannot agree on the scope of work and/or the fee for a Project Order offered to the A/E, the Owner shall terminate negotiations with the A/E on that Project Order and pursue obtaining the services from other A/E's using proper procurement procedures. The Agency shall not offer the Project Order, nor request a fee proposal from a second A/E, until negotiations have been terminated in writing with the Term A/E Contractor first offered that Project Order.

3.1.8.5.11 Procedures for Selection of the Architect or Engineer for a Term A/E Contract:

1. Draft a Request For Proposal (RFP).
2. Advertise: Same as Category C procurements.
3. Receive, evaluate, and rank the respondents.
4. License: Verify that all A/E's are properly licensed to offer services in Virginia.
5. Interview: The Building Committee will conduct interviews with a minimum of the top three ranked A/Es. If Term A/E Contracts are advertised to be awarded to more than one (1) A/E under this solicitation, the Agency shall, in addition to the three (3)

minimum, include two (2) more interviewees for each Term A/E Contract the Agency intends to award. (e.g. 1 contract = 3 interviewees, 2 contracts = 3+2=5 interviewees, 3 contracts = 3+2+2= 7 interviewees.)

6. Selection: Rank order the interviewees and select the A/E to be awarded a contract.
7. Negotiation: Negotiate and agree upon the special terms and conditions, if any, and the hourly rates which pertain to the Contract and document same in the MOU. The Agency shall then offer a Project Order to the selected A/E and request a fee proposal for the work. Negotiate the fee for the services on the project.
8. Award: If the negotiations are successful, the Agency will award a Contract to the selected firm. If negotiations, including hourly rates and other terms and conditions set forth in the MOU to the Term A/E Contract, are not successful, the negotiations shall be formally terminated (in writing) and the contract and the project offered the next firm for negotiation and possible Award of the Contract as described in §2.2-4301, Competitive Negotiation of the *Code of Virginia*, as amended. The Agency shall issue one Project Order as the basis for execution of the Term A/E Contract. The Agency shall not award a Term A/E Contract to the A/E until such contract can be accompanied by the first Project Order.
9. Documentation: Issue a Purchase Order in eVA referencing to the Contract CO-3.1. Send a copy of the Contract Form CO-3.1, the MOU and the initial Project Order Form CO-3.1A to DEB. Also post a Notice of Award.
10. Subsequent Project Orders: The Agency may offer additional project orders of a similar nature to the A/E in accordance with the Contract and the MOU and, upon successful negotiation of a fee for the services, include the project order services in the A/E's Contract.
11. Notice: Post the notice on the On-Line Bids page of eVA, Virginia's central electronic procurement website at http://eva.virginia.gov .

3.1.8.6 Contract Forms To Be Used

The Standard Forms of Contract for Architect and Engineer Services, Forms CO-3, 3.1, 3.1A, and 3.2 shall be used for A/E Contracts as well as the Terms and Conditions of the A/E Contract, Form CO-3a. Copies of these forms are available at the Forms Center website.

These Contract forms shall not be modified, other than filling in the appropriate data and information, without the recommendation of the agency's legal counsel and the approval of the Director of the Division of Engineering and Buildings.

3.1.8.7 Terms and Conditions for Professional Services

The terms and conditions for professional services contracts are provided in Form CO-3a. The CO-3a shall be made a part of all contracts for professional services and shall not be modified without approval of the Agency legal counsel and the DEB Director.

3.1.9 eVA Business-to-Government Vendor Registration

When procuring construction, professional services and non-professional services, attach the applicable vendor registration statement (either DGS-30-384 or DGS-30-385) to the following documents: Request for Proposals, Invitation for Bids, Notice of Intent to Award, Notice of Award, A/E Contracts, and Construction Contracts.

Use **DGS-30-384** when the quantity of orders that will be issued is known, and insert that number in the blank provided (e.g., one, twelve, monthly, etc.)

Use **DGS-30-385** when the quantity of orders that will be issued is unknown.

These statements may be downloaded from the DGS Forms Center.

3.1.10 SWaM Procurement Plan
(Small, Women-Owned, and Minority-Owned Businesses)

3.1.10.1 Agency Plan
In accord with Executive Order 20 (2014) an annual SWaM Procurement Plan that specifies the Agency's plans and goals for SWaM procurement is required. Certification of SWaM businesses by the Department of Small Business and Supplier Diversity (DSBSD) is required. This was formerly handled by Department of Minority Business Enterprises (DMBE). Plan guidelines are available from DSBSD/DMBE. The plan shall be updated each September 1st.

3.1.10.2 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.

3.2 FEES AND PAYMENTS FOR A/E SERVICES

3.2.1 Architectural and Engineering Fees
The Commonwealth'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 Section 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.

3.2.2 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 Agency, and the taxpayers of the Commonwealth of Virginia.

3.2.2.1 Plans and Specifications
The A/E should be aware and keep in mind that there are differences between private work and Commonwealth of Virginia work. 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 Virginia Public Procurement Act as clarified and expanded upon in the Manual.

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

A/E Project Technical Personnel:

Technical personnel shall be construed to mean the A/E's Project Manager, architects (licensed), engineers (licensed) by discipline, designers including non-licensed architects and engineers, project inspector, surveyor, survey team, interior designer, landscape architect, drafters or CADD operators, estimator, specifications writer, typist/clerical staff, and field inspectors.

"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, not at a higher "Principal" rate. See the descriptions of Personnel Classifications below.

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.

General 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 Owner shall have the right to require the A/E to 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 Owner 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 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.

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 / Coordinator - An experienced and licensed architect or engineer who has overall responsibility for the planning, design, coordination of all disciplines, quality assurance, and delivery of the A/E services to the Agency.

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 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 / Drafters - The skills required of this level position include 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), Drafters, 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, calculations, 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 licensed 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 Service 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 3.2.2.3 of this Manual.

Specification/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 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.

3.2.2.3 Additional Services

The Terms and Conditions of the A/E Contract, Form CO-3a, describes the Basic Services required of the A/E as well as the responsibilities of the Agency and typical Additional Services that the Agency requests the A/E to perform.

The A/E and Agency 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 extra services required will be a change in scope and shall be authorized in writing by Change Order using Form CO-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 Agency and/or the State Auditor for a period of three (3) years following conclusion of the Contract.

3.2.2.4 Computer Services

Computer use is commonplace in the A/E profession for analyses, designs, drafting (drawings), 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 Agency.

Specialized outside computer analysis services required by the Agency for the project may be treated as an additional service. The compensation for such specialized computer analyses may be a 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.

3.2.2.5 Special Consultants

Consultants engaged by the A/E to augment the A/E's staff to provide the required A/E services are considered by the Commonwealth to be part of the A/E's staffing for the project.

The Agency 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 Agency'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 Agency approved direct cost to the A/E of such special consultant by 10% for the A/E's overhead and profit.

3.2.2.6 Reimbursable Expenses

1. The costs of fax transmissions, long distance phone calls, postage and similar expenses incurred by the A/E in the performance of the Contract are considered by the Commonwealth to be a part of the A/E's overhead expenses and are not normally reimbursable.
2. The Agency 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 5 at the actual costs plus 10% markup for handling. If re-submittals are required to correct deficiencies and/or complete the documents for submittal, the cost of reproduction for these submittals shall be borne by the A/E unless waived by the Agency.
3. Where the A/E is engaged by the Agency to secure the reproduction of the Bid Documents, the A/E may be reimbursed for the actual direct cost of reproduction plus a markup of 10% to account for the A/E's overhead and handling cost in securing this service for the Agency. The cost of reproduction and sending addenda to address BCOM review comments, clarify or supplement the Bid Documents 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 Agency 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 Agency. The Agency 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 Agency. The travel rates and the per diem rates for lodging and subsistence shall not exceed the maximum amounts allowable for such expenses in the Commonwealth's Travel Regulations. Records supporting such requests for reimbursement shall be subject to audit by the Agency and/or the State Auditor.
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 or downward by Change Order, as appropriate, based on the actual amounts approved for reimbursement.
8. "The Agency will normally pay BCOM for the first schematic submittal review, the first preliminary submittal review, the first working drawing review and the review of the one corrected and highlighted bid set of documents. If additional submittals and reviews are required, the agency may require the A/E to reimburse the agency (by change order to the A/E contract or otherwise) for the actual costs of such additional review unless the A/E can submit justification satisfactory to the agency demonstrating why the A/E should not be held accountable / responsible for such costs."

3.2.2.7 Interior Design

The A/E's basic architectural services includes sizing of spaces for the intended function, providing diagrammatic furniture layouts to the client to confirm functional layouts, and the

selection and specification of building fixtures and finishes which are necessary to provide a complete and useable facility and/or which are included in the construction contract.

Note: Agencies must pay particular attention to the Commonwealth's definition of "Basic Services" and what is included versus the definition of Interior design used in the private sector and the AIA standard contracts. Do not use standard AIA Contracts or AIA definitions of Basic/Additional Services.

"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 Division of Purchases and Supply for the furniture, furnishings and accessories.

Examples of the scope of work for interior design services for furniture, furnishings and decorations when procured as an A/E additional service or as a separate contract are listed below. The person providing these services is referred to herein as the Interior Designer.

Selection of furniture, furnishings, and accessories including but not limited to sofas, chairs, tables, screens, planters, art work, carpets, draperies, etc. Most items are available on and should, if possible, be selected through DPS from state contracts.

- If the items are available on state contract, the interior designer will recommend the proper item and color, fabric, finish, etc. for the Agency to procure.

- If the items available on state contract are considered not acceptable for the particular application, the interior designer will prepare written justifications for the Agency stating why items available on state contracts are not suitable. If procurement of the items off state contract is approved, the interior designer will prepare adequate specifications and other data necessary for Agency procurement.

- If the items are not available on state contract, the interior designer will prepare adequate specifications and other data necessary for Agency procurement.

The interior designer shall select and coordinate all colors, fabrics, etc., with the colors of the building finishes. Although building finishes are selected by the A/E during design and finalized during the review of Contractor submittals, the interior designer shall verify actual Contractor applied finishes through on-site verification and/or coordination with the Agency Project Manager.

The interior designer shall prepare presentation boards of a minimum size of 15 x 20 inches to show furniture placement plans, catalog cutouts of furniture, furnishings and accessories, color samples, material swatches of draperies, carpets and fabrics.

The interior designer shall prepare a minimum of three interior design 8-1/2 x 11 inch binders/packages with accompanying floor plan sheets and deliver to the Agency Project Manager. These binders/packages shall include but are not limited to:

(1) Floor plans at 1/4" = 1'- 0" or larger scale indicating locations of all furniture, furnishings and accessories. These items should be identified with an item number keyed to the presentation boards and the furniture procurement list.

(2) Procurement lists identifying all items to be purchased by model number, contract number (for state contracts), identification number and description (for non-state contract items), quantity, price, etc. Care shall be taken in the selection of all items to ensure that delivery times are reasonably within the agency's schedule and state contracts, if applicable, will not be expired at the time of purchase.

(3) Photographic color reproduction or color copies of the presentation boards reduced to fit 8-1/2 x 11 inch binder or package.

(4) Specifications, drawings and other supporting data for standard procurement and special order items (draperies, custom-built screens or dividers, art work, etc.)

The interior designer shall advise, as needed, when changes must be made as a result of changes in requirements, non-availability of items or materials previously selected, etc.

The interior designer shall provide placement sheets for each room/area, listing each item of furniture or equipment that will go into the area.

3.2.3 A/E Fee Proposal Worksheet (Form CO-2.3)

The Architect/Engineer shall prepare a detailed fee proposal using the Form 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. Supplemental 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 fewer 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 Pre-Bid Conference, assist in opening Bids, and evaluate the bids / bidders for responsiveness and responsibility. It also includes the clerical level effort to receive document deposits, issue bid documents, receive/review returned bid documents and return deposits / issue refunds.

- 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" reproducibles. This work also includes the Professional / Technical Level effort to compare the "As Builts" to the "Record Copy" for correctness.

- Construction Observation and Administration includes the Professional / Technical level effort to perform the onsite inspections / observations, job meetings, payment request evaluations and administrative functions required by the contract and the Clerical level effort to type minutes of meetings and similar functions.

- 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.

3.2.4 Proportioning of the A/E Fee and Payments

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:

- Pre-design services (Additional Services such as studies and similar activities.)

- Design Phase services include
  - Schematic phase
  - Preliminary phase
  - Working drawing phase

- Bidding phase 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 negotiations, 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 schematics 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 CO-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 CO-6.

Note: The Agency 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.

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 Agency, as set forth in Chapter 7.

3.2.4.1 Payments to the A/E

Payments to the A/E shall conform to the requirements in Section 21 of the Terms and Conditions of the A/E Contract, Form CO-3a.

3.2.4.1.1 GCPay

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

The monthly fee for using this system is paid by the project General Contractor. Payment requests for General Contractors and A/Es, and all project costs (equipment, testing, moving, move coordination, etc.), shall be accounted for in this system.

Training on the use of the system is available from GCPay at www.gcpay.com.

Access to and instructions for the use of the GCPay statewide contract are available at the Department of General Services website.

3.2.4.2 Payments by the A/E

Payments by the A/E to its consultants, subcontractors and suppliers shall conform to the requirements in Section 22 of the Terms and Conditions of the A/E Contract, Form CO-3a.

3.2.5 Determining Charges for Changes in the Scope of Work

3.2.5.1 Changes to the Scope of Services

The Agency shall notify the A/E in writing when a change in scope or “extra services” is required. The Agency 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 (CO-11a/e) issued before the extra work is performed (i.e., changes in the plans or specifications, models, studies, etc.). In such cases, the fee negotiations will be based on the defined scope change or work to be done, the estimated technical personnel time to accomplish the work times the rates listed in the Memorandum of Understanding, and any reimbursable expenses authorized.

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

Note: Many of the revisions or requirements included in a Revision to the Manual are made to reflect changes in the *Code of Virginia* or other requirements which must have immediate compliance.

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

Prior to approval of Preliminaries and issuance of the CO-5, Revisions to the Manual can generally be incorporated in the A/E's work with little or no additional effort. If the A/E claims that incorporating the Revision into its services requires extra work, the A/E must notify the Agency of this claim and submit documentation to the Agency to clearly support such claim within 60 days of the distribution date of the Revision.

If, after the CO-5 is issued and before the CO-6 is issued, the A/E determines that including changes resulting from the revision will require additional work on his part, the A/E shall, within 60 days of the distribution date of the revision, provide to the Agency an itemized list of the additional work required by the revision. The Agency may obtain direction, guidance, and/or waivers from the Division of Engineering and Buildings as to which proposed additional A/E work items may be waived and which work items are valid extra work items. The Agency shall then provide direction to the A/E and, if necessary, issue a change order for the work.

Agencies and their 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.

3.2.5.2 Hourly Rates for Changes in Work

The Agency 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 3.2.2.2.

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.

3.2.5.3 Overtime for Changes in Work

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

3.2.5.4 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 Agency 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 Agency.

The A/E's disbursement and job records shall be subject to audit by the State for work done on a reimbursable and/or hourly or unit cost basis. The Agency 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.

3.2.5.5 Audit of A/E's Records

Any Change Order authorizing work to be performed which does not stipulate a fixed sum amount for the work shall be subject to audit by the Agency and/or the State Auditor 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 Agency and/or the State Auditor for a period of three (3) years following conclusion of the Contract.

3.2.6 Changes to A/E Contract

Changes in the Scope of Work and/or Cost of the A/E Contract (Form CO-3 and CO-3.2) will be documented through the execution of a Form CO-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 Governor 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 Governor or his designee. Submit the CO-11a/e in two copies to the Bureau of Capital Outlay Management for approval.

3.2.7 Informal Alternative Dispute Resolution (§2.2-4366, *Code of Virginia*)

Pursuant to § 2.2-4366, Alternative Dispute Resolution, of the *Code of Virginia*, the Owner may enter into an agreement with the A/E to submit disputes arising from the performance of this Contract to arbitration and utilize mediation and other alternative dispute resolution procedures. However, such procedures entered into by the Owner, the Commonwealth, or any department, institution, division, commission, board or bureau thereof, shall be non-binding and subject to § 2.2-514, *Code of Virginia,* as applicable.

In the interest of successful completion of the project, disagreements and disputes should be resolved as soon as possible. To assist in resolving these disputes, the Director, Division of Engineering and Buildings offers agencies and A/E's an impartial Dispute Hearing Panel of 1 or more persons to perform an "Informal Alternative Dispute Resolution". The Agency and the Architect/Engineer may choose to resolve their claims against one another by Appeal to the Director, Division of Engineering and Buildings under the provisions of this "Informal Alternative Dispute Resolution" procedure in lieu of instituting legal action. If the Agency and the A/E both choose to avail themselves of this service, the following stipulations shall apply:

- The Agency and the A/E must both agree to pursue this process and each submit their "Application for Informal Alternative Dispute Resolution"
- The Director of DEB will review the Applications and advise both parties of dates available for a hearing or deny the Application for a Hearing
- The Director of DEB will assemble a Dispute Hearing Panel comprised of persons with expertise in the topics being disputed
- Each party will be represented by its personnel with knowledge of the facts related to the dispute. Neither party will be allowed Legal Counsel at the hearing.
- The Panel will review the Application and facts presented by each party prior to the Hearing.
- Each party will be given the opportunity to present its position and factual data on each item in dispute. Information shall be concise.

- The Hearing Panel will ask questions as appropriate and facilitate discussions toward an agreeable solution.
- If the parties do not agree on a solution during the hearing, the Hearing Panel thru the Director of DEB will render an opinion on the proper resolution of the dispute.
- It is intended that the hearing be efficient and last no more than one day.
- The cost of this service will be based on the time charged to the Dispute Resolution multiplied by the hourly rates for the panel. The cost will be divided and charged equally to the Agency and to the A/E, unless both parties agree to other arrangements and notify the Director of DEB prior to the hearing.

The "Application for Informal Alternative Dispute Resolution Procedure" shall contain the following information:

- A/E Name
- Agency Name
- Project Name and Project Code Number
- List of Items in Dispute (The A/E and the Agency shall each submit a list of the items in dispute with its summary of the pertinent facts in the dispute.)
- Value of the items or Work disputed (in dollars): $_____
- Documents and narrative presenting facts as the Applicant sees them for each disputed item
- Proposed Solution or Relief Sought - Signature of the Chief Facilities Officer for the Agency or the Contract Signature Authority for the A/E

3.3 RESTRICTION ON PROMOTIONAL MATERIALS BY A/E AND CONTRACTOR

The design and contract documents for construction on state-owned property are owned by the Commonwealth of Virginia. Therefore, use of these work products in advertising or promotional literature, or a statement that an agency or institution endorses the work product of an A/E or Contractor is prohibited without the express written permission of the Agency Director. Identifying designs or construction as the work product of an A/E or Contractor in client lists, responses to RFPs and in promotional literature through the use of photographs, renderings, drawings (not contract documents) and descriptions of project is permitted after construction is substantially complete.

CHAPTER 4 - CODE AND TECHNICAL REQUIREMENTS FOR ALL BUILDINGS ON STATE PROPERTY

This chapter contains Division of Engineering and Buildings (DEB) standards which clarify the applications of Virginia Uniform Statewide Building Code (VUSBC) requirements as they pertain to buildings on state property, DEB standards as they pertain to buildings on state property, and technical requirements for all state-owned buildings and structures. The requirements in Chapter 4 prescribe standards and requirements for buildings on state property which may be higher than the minimum requirements for the private sector owner but are necessary to meet the energy, performance, maintenance, safety, and accessibility standards for public buildings. The agency and A/E shall design facilities to the standards and requirements stated in this chapter, regardless of project funding source or project delivery method.

4.0 ADMINISTRATION

The *Code of Virginia* delegates authority for Building Code enforcement in state buildings to the Department of General Services (DGS) acting through the Division of Engineering and Buildings (DEB), and to the Virginia Department of Fire Programs (VDFP) acting through the State Fire Marshal's Office (SFMO). The Department of Housing and Community Development (DHCD) is charged with adopting a Uniform Statewide Building Code and the State Fire Marshal's Office is charged with providing assistance to DEB in enforcing the Building Code and inspecting state-owned buildings (*Code of Virginia* § 36-98). The Memorandum of Agreement that outlines their respective responsibilities is contained in Appendix L.

4.1 BUILDING CODE

The Building Code for all state-owned buildings is the current edition of the Virginia Uniform Statewide Building Code (VUSBC) with supplemental requirements, clarifications and modifications as indicated in this Manual. Refer to Section 4.2 for accessibility standards for state-owned facilities and associated clarifications. The provisions of the VUSBC are based on nationally-recognized model building codes and fire codes published by the International Code Council, Inc. The model codes are adopted by reference into the VUSBC with Virginia amendments. The VUSBC is published in three parts:

Part I - The Virginia Construction Code (VCC)

The VCC contains regulations applicable to the construction of new buildings and additions. Change of occupancy in existing buildings in occupancies of Group I-2 or I-3 shall comply with the VCC.

Part II – The Virginia Rehabilitation Code (VRC)

Reconstruction, alteration and repair in occupancies other than Group R-5 shall comply with the VRC. For additions, the VRC is an alternative to compliance with the VCC. The VRC is applicable to changes of occupancy in existing buildings in occupancies other than Group I-2 or I-3.

Part III – The Virginia Maintenance Code

This part contains the regulations for the maintenance of existing structures which is enforced at the option of the State Building Official or his designee(s).

4.1.1 Applicable Code

A/Es should project when working drawings will be completed and determine what code(s) will be in effect at that time. In cases where working drawing completion is projected to take place after the effective date of a new edition of VUSBC, A/Es should obtain copies of the proposed ICC codes and design the project to conform to the latest requirements to the extent possible. Mixing of code requirements between two editions of the code is not permitted.

1. The applicable code for Capital Outlay projects will be the VUSBC edition in effect at the time outstanding issues have been resolved, preliminary drawings are approved (usually on the CO-5), and authorization is given to proceed with development of the working drawings.
2. If preliminary drawings for Capital Outlay projects are approved during the 12 months before the effective date of a new edition of VUSBC, the applicable code will be designated by BCOM at the time of the preliminary approval.
3. If construction of the project does not begin within one year of the approval of the CO-6, the agency shall request confirmation from BCOM as to what code applies. Prior to reactivating a project that has been inactive for a period during which the effective code has changed, the Agency shall contact the Bureau of Capital Outlay Management for a determination of what code applies. BCOM will confirm any change of code in writing. The plans and specifications shall be revised as necessary to comply.
4. The application of code for non-Capital Outlay projects is as prescribed in the VCC.

4.1.2 Code Clarifications

Code clarification requests should be made in writing to the BCOM Director. The following are code clarifications that shall be applied to state-owned buildings and structures.

4.1.2.1 Buildings at Colleges and Universities

1. Buildings for business and vocational training shall be classified and designed for the (Use) Group corresponding to the training taught.
2. Academic / educational buildings having classroom-type education functions (including associated professor / teacher office spaces), shall include the following additional requirements:
   a. Provide a Fire 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 VCC Chapter 10 and the type of occupancy (not Group) of the space.
3. Buildings housing research, testing and science laboratories shall include a Fire Protection Signaling System.
4. Dormitories, Fraternity and Sorority Houses and similar dwelling units with sleeping accommodations – provide one of the following:
   a. Written University Policy which prohibits the use of these residences as housing for persons / groups / occupants for periods of less than 30 days, or
   b. Design that complies with the most stringent requirements of both Group R-1 (Hotels) and Group R-2 (Dormitory)

4.1.2.2 Residences for Rent

Cabins, Beach Houses, Lodges, and similar dwelling units with sleeping accommodations rented to family groups:

1. Residences for Rent for less than 30 days with a Maximum Occupant Load of 16 or less shall comply with the requirements for Group R-3 or Group R-5.
2. Residences for Rent for less than 30 days with a Maximum Occupant Load of more than 16 shall comply with the requirements for Group R-1.

4.1.2.3 Temporary Change of Use and Occupancy

Temporary change of use and occupancy requires a Temporary Certificate of Occupancy or issuance of a Special Use Permit. (Examples include dormitories rented for less than 30 days, armories used as sleeping quarters, storage spaces used for business or assembly, etc.) The application for Temporary Certificate of Occupancy must be complete, and include an Operational Policy that provides safety measures to address the life safety, health, and welfare of the occupants.

4.1.2.4 Maximum Occupant Load

In determining the means of egress requirements, the number of occupants for whom means of egress facilities shall be provided shall be established by the largest number computed in accordance with the VUSBC. All spaces are assumed to be simultaneously occupied unless certain spaces are approved in advance by the building official as occupied non-simultaneously.

4.1.2.5 Safety Equipment Not Required by Code

Safety equipment, 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 installed in accord with the code and shall operate as designed. Work that is planned as a complete system, but requires phased construction to provide a complete system is acceptable. It is also acceptable to provide non-required, fully functional "partial systems" to certain areas (storage spaces, for example) which will improve safety. However, incomplete systems which are not designed in accord with the code, non-functional systems and abandoned life safety systems are not acceptable because such systems may be perceived as code-compliant systems and may result in life safety or fire hazards to adjacent areas.

4.1.2.6 Stairways

The leading edge (intersection of the tread and riser) of stairways shall be perpendicular to the direction of travel. Stairways with the direction of travel at an angle to the leading edge of the stairway are not acceptable.

4.1.2.7 Reroofing – Secondary (Emergency) Roof Drains in Re-Roofing Projects

If secondary (emergency) roof drains are not a part of the existing construction, then secondary roof drains shall be provided as part of reroofing work. Structural calculations shall be submitted that demonstrate that the structure is adequate to sustain the accumulated water up to the elevation of the secondary roof drains in accord with ASCE 7, Section 8.5.

4.1.2.8 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 verified 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.

4.1.2.9 Fire Walls: Abutting New Construction to Existing Structures

When an addition is needed adjacent to an existing state-owned building, and the existing building cannot accommodate the additional height and area limitations due to its construction type and use group, as an alternative to a traditional fire wall Chapter 7 of the VCC now recognizes that two exterior building walls may be designed to function as a "double fire wall," as defined in NFPA 221. Consideration shall be given to the structural stability and fire resistance of the exterior walls and door openings. Where door openings are provided, portals or vestibules designed to comply with NFPA 221 are acceptable.

4.1.2.10 Carbon Monoxide Alarms

Section 908.7 of the 2012 edition of the Virginia Construction Code supersedes the requirements of the 2012 IBC noted in previous editions of the CPSM. VCC Section 908.7 is applicable to Groups R, I and E.

4.2 ACCESSIBILITY STANDARDS FOR STATE-OWNED FACILITIES

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

4.2.1 Conflicting Standards / Modifications

The 2010 ADA Standards for Accessible Design incorporates by reference editions of the International Building Code. The applicable code for the project shall be that which is adopted by the Commonwealth at the time of building design and permit, as described in Section 4.1.1.

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

4.2.2 Clarifications for State-Owned Buildings and Buildings on State-Owned Property

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

4.2.2.1 Elevator Access

2010 ADA Standards for Accessible Design, Section 206.2.3, Accessible Routes: Where Required: Multi-Story Buildings and Facilities: Clarification: All passenger elevators shall be accessible to the disabled.

4.2.2.2 Elevator Access

2010 ADA Standards for Accessible Design, Section 206.2.3, Accessible Routes: Where Required: Multi-Story Buildings and Facilities: Exception 4 does not apply. Residential facilities shall include at least one accessible route to connect each story and each mezzanine in multi-story buildings and facilities.

4.2.2.3 Stairways

2010 ADA Standards for Accessible Design, Section 210.1, Stairways: General: Clarification: All stairways shall be accessible to the disabled.

4.2.2.4 Stairways

2010 ADA Standards for Accessible Design, Section 210.1, Stairways: General: Exception 3 does not apply. Aisle stairways for assembly areas shall comply with *2010 ADA Standards for Accessible Design, Section 504*.

4.2.2.5 Handrails

2010 ADA Standards for Accessible Design, Section 505.10 Handrails: *Handrail Extensions:* Clarification: Handrail extensions shall not be turned to the side or back. Handrail extensions shall continue straight and parallel to the stair run.

4.2.2.6 Dormitories

2010 ADA Standards for Accessible Design, Section 233.3.1.1 Residential Dwelling Units with Mobility Features: Scope of fully-accessible dormitory rooms shall comply with this section; however, all dormitory rooms shall be located on an accessible route and doors to all rooms shall be accessible.

4.2.2.7 Accessible versus Adaptable

Accessible facilities shall be provided at the completion of construction. Adaptable facilities do not meet the requirements of this section.

4.2.2.8 Site Elements

2010 ADA Standards for Accessible Design, *Section 201.1, Scope:* Addition: *Proposed Accessibility Guidelines for Pedestrian Facilities in the Public Right-of Way (PROWAG) dated July 26, 2011* shall apply to the design of site elements provided on state-owned property that are not regulated by the 2010 ADA Standards and are not in the Virginia Department of Transportation Right-of-Way. The PROWAG guidelines are available for free download from the Access Board. These site elements are defined in PROWAG and are generally provided as part of an agency outdoor program.

4.2.2.9 Walk-in Coolers and Freezers

2010 ADA Standards for Accessible Design, Section 203.9, Employee Work Areas: Clarification: Walk-in coolers and freezers are considered employee work areas and shall comply with those requirements.

4.2.2.10 Unisex Toilets and Bathing Rooms

2010 ADA Standards for Accessible Design, Section 213.2.1: Comply with VCC Chapter 11 Section for *Family or assisted-use toilet and bathing rooms*.

4.2.2.11 Signs

2010 ADA Standards for Accessible Design, Section 216, Signs: Clarification: Use the language from VCC Chapter 11 Section *Signage* as guidance for scope compliance.

4.2.2.12 Cabinets

2010 ADA Standards for Accessible Design, Section 225.2, Storage: Clarification: Under counter and over counter cabinets may be defined as the same “type” if the same arrangement of shelves is provided to comply with the reach ranges specified in *Section 308*.

4.2.2.13 Lavatories

2010 ADA Standards for Accessible Design, Section 606, Lavatories and Sinks: Clarification: Comply with VCC Chapter 11 Sections *Lavatories* and *Sinks*.

4.2.2.14 HUD Housing

2010 ADA Standards for Accessible Design, Section 233.2, Residential Dwelling Units Provided by Entities Subject to HUD Section 504 Regulations: Clarification: Use the VCC Chapter 11 Section *Dwelling Units and Sleeping Units* as guidance for scope compliance.

4.3 LIFE SAFETY CODE

Life Safety Code (NFPA 101) applies to state hospital and health care facilities accredited by the Joint Commission on Accreditation of Healthcare Organizations (JCAHO) and accepting federal Medicare/Medicaid funds. In case of conflict with VUSBC provisions, the most stringent requirements apply. BCOM generally does not review for NFPA 101 compliance, except instances where it is referenced in the VUSBC.

4.4 OTHER FEDERAL OR STATE REGULATIONS

Certain projects may be required to comply with other federal or state regulations. Those requirements may take precedence, equal, or exceed construction, health, safety, and welfare standards regulated by the aforementioned standards, and are approved after DEB review. All such codes shall be clearly stated in the Schematic Documents and displayed on title sheets of Preliminary and Working Drawings. The following codes and regulations may apply to state projects:

Title II, Americans with Disabilities Act of 1990
Virginia Statewide Fire Prevention Code (SFPC)
Virginia Industrialized Building Safety Regulations (IBSR)
Virginia Manufactured Home Safety Regulations (MHSR)
Virginia Amusement Device Regulations (VADR)
Virginia Public Building Safety Regulations
Virginia Fire Safety Regulations
Virginia Department of Environmental Quality - Erosion and Sediment Control Regulations
Virginia Department of Environmental Quality - Stormwater Management Regulations
Virginia Department of Environmental Quality – Water Division Regulations
Virginia Department of Health Regulations
Section 504 of the Rehabilitation Act of 1973 (HUD) (See CPSM Section 4.2.2.14)
Fair Housing Act Accessibility Guidelines (HUD)
VUSBC Chapter 11 – Accessibility (See CPSM Sections 4.2.2.10, 4.2.2.11, 4.2.2.13, 4.2.2.14)

4.4.1 Art and Architecture Review Board (AARB)

The Art and Architectural Review Board (AARB) consists of five members appointed by the Governor. It was established 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”. All new buildings, additions to existing buildings and any other new elements on state property, regardless of the funding source, must be reviewed and approved by the AARB. Presentation(s) of the design shall be made to the AARB for comment and recommendation for approval after the project design has been submitted to BCOM for review and comment at the schematic and/or preliminary submittals. The initial AARB presentation should be scheduled as soon as the exterior appearance of the building is no longer likely to change. The location of the building onsite, overall massing, materials selection, colors and landscaping should be defined prior to making a presentation. See AARB Guidelines for Submittals and Presentations for more information.

4.5 FIRE PROTECTION INFORMATION PLAN AND FIRE SAFETY SYSTEMS

This section references requirements for a project-specific fire protection information plan and calculations to be prepared by the A/E and included in the schematic, preliminary design and working drawing submittals. This section also references specific mandatory requirements for various fire safety systems, for which the submittal requirements are detailed in Chapter 5.

4.5.1 Fire Protection Information Plan

Provide the information outlined in Section 5.6.2.4.1 for schematic design submittals, Section 5.7.2.9.7 for preliminary design submittals and Section 5.8.6.9.1 for working drawing submittals. The requirements are included in this chapter by reference, as the requirements pertain to ALL projects which are constructed on state property, regardless of funding source.

4.5.2 Fire Safety Systems

The design of fire suppression systems (sprinkler systems/standpipes, alternate automatic suppression systems, fire pumps), fire detection and fire alarm systems, smoke control systems, access control systems and applied fire resistant materials shall comply with the submittal requirements outlined in Section 5.8.6.9.2 through Section 5.8.6.9.10. The requirements are included in this chapter by reference, as the requirements pertain to ALL projects which are constructed on state property, regardless of funding source.

4.6 FIRE SAFETY REVIEW OF SHOP DRAWINGS

Shop drawings for the following building systems shall be reviewed and approved prior to the work being installed:

- Fire suppression systems (sprinklers/standpipes, alternate automatic suppression systems, fire pumps)
- Fire detection and fire alarm systems
- Smoke control systems
- Access control (security)
- Applied fire resistant materials

The level of completeness and code compliance indicated in the working drawings shall determine whether final approval authority of the shop drawings will rest with BCOM or with the project A/E.

4.6.1 BCOM Shop Drawing Final Approval

When the design of fire suppression, fire detection and fire alarm, smoke control, access control systems or applied fire resistant materials provided in the initial working drawings submittal is determined to be incomplete or not code compliant by the BCOM reviewer, then shop drawings and submittal data shall be submitted to BCOM.

The data shall be reviewed and approved by the A/E of record prior to submittal to BCOM. If 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 BCOM for final review and approval.

4.6.2 A/E Shop Drawing Final Approval

When the design of fire suppression, fire detection and fire alarm, smoke control, access control systems or applied fire resistant materials provided in the initial working drawings submittal is determined to be complete and code compliant by the BCOM reviewer, then shop drawings and submittal data shall be reviewed and approved by the A/E of record.

The A/E shall include a stipulation on the working drawings and in the technical specification that the “Contractor shall bid and install the fire protection system as shown in the documents. Deviations in materials, locations, configurations or sizes proposed by the Contractor will be reviewed under the provisions of Section 26 of the General Conditions as a ‘Substitution’.” “Substituted” designs, i.e., designs modified from the BCOM-approved Working Drawings, shall be submitted to BCOM for review and approval as described in Section 4.6.1.

4.7 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 Director, Division of Engineering and Buildings, acting in his capacity as Building Official for state-owned buildings, and after consultation with the State Coordinator for the National Flood Insurance Program [the Department of Conservation and Recreation (DCR)]. A copy of Executive Memorandum 2-97 has been included in Appendix J for information.

4.8 ENERGY CONSERVATION AND ENVIRONMENTAL PERFORMANCE

State agencies and A/Es shall assure that new construction, renovation, and maintenance of buildings are performed in accord with the following minimum standards for energy conservation and environmental performance.

Individuals who perform the compliance modeling must have obtained a Building Energy Modeling Professional Certification such as ASHRAE Certification. Similar qualifications will be considered individually.

4.8.1 Virginia High Performance Buildings Act

Refer to Sections 6.1.3 through 6.1.3.2.

4.9 DEB ROOFING POLICY AND TECHNICAL STANDARDS FOR STATE BUILDINGS

The Appropriations Act requires that all agencies requesting general funds shall assign first priority to the roofs of its facilities. The DEB Roofing Policy and Technical Standards for State Buildings are located in Appendix A of the Manual and are incorporated into Chapter 4 of the Manual by reference. The policy and technical standards are applicable to all state owned buildings, regardless of funding source or project delivery method used.

4.10 WATERPROOFING AND DRAINAGE FOR SUBSURFACE STRUCTURES

No state buildings for human or equipment occupancy shall be designed with basement floor levels below the water table.

4.11 PREMISES IDENTIFICATION - ADDRESS NUMBERS

New and existing state-owned buildings shall have approved address numbers, building numbers or approved building identification placed on a position that is plainly legible and visible from the street or road fronting the property. These numbers shall contrast with their background. Address numbers shall be Arabic numerals or alphabet letters. Numbers shall be a minimum of 4 inches high with a minimum stroke width of 0.5 inch.

4.12 SPECIAL PROCEDURES FOR ASBESTOS ABATEMENT

Asbestos materials (building materials that contain greater than 1% asbestos) which can be disturbed by demolition or renovation work shall be abated in state owned buildings. Asbestos containing materials shall not be included in any new construction.

4.12.1 General Asbestos Requirements

All state-owned buildings, for which construction was started before January 1, 1985, are presumed to have asbestos-containing materials (ACM) present in building materials including, but not limited to, asphalt and vinyl flooring, resilient floor covering, mastics, fibrous pipe insulations, caulking, window glazing, roofing, flashings, bonding agents, coatings, and binders until such materials have been tested and found not to contain asbestos.

4.12.1.1 Renovation / Demolition / Addition Projects

Owner shall have existing structures(s), constructed before January 1, 1985, inspected by a Virginia-licensed or properly certified asbestos inspector for ACM prior to submittal of the preliminary design for capital outlay projects, and prior to submittal of the working drawings for non-capital outlay projects. All suspect materials must be physically sampled and analyzed. The asbestos inspector shall provide the Owner with a report of the inspection which indicates those places where samples were taken, the results of the analyses, and drawings which indicate those areas, if any, where asbestos was found and where asbestos-containing materials must be abated. (Note: The Agency should have the asbestos inspection performed prior to submitting its funding request. An estimated cost for asbestos abatement, if required, must be included in the cost estimate supporting the funding request.) The asbestos

inspection report must be made available to the project A/E for information and use in preparing the project documents.

4.12.1.2 Asbestos Management Plan / Asbestos Project Design

If asbestos-containing materials (ACM) are found, the Owner shall have a Virginia licensed or properly certified asbestos project designer in concert with the A/E prepare asbestos abatement project design specifications. The asbestos abatement contractor shall be required to mark up the record drawings 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 asbestos inspection report, the construction drawings for renovation or addition projects shall indicate all locations where ACM is to be removed. The asbestos inspection report is to be included as an appendix to the project specifications.

The Owner shall have a Virginia licensed asbestos management planner prepare or update the agency Asbestos Management Plan as required by the *Code of Virginia* § 2.2-1164.

ACM is to be removed by a Virginia licensed asbestos abatement contractor.

4.12.1.2.1 Asbestos Abatement Procedures – Interior Projects

The removal of all ACM found within a structure shall be within a negative pressure enclosure and employee decontamination system unless it can be shown that the internal integrity of the asbestos materials will not be compromised and that the material will be removed in an intact state. All interior asbestos removal projects shall be conducted in a manner to minimize the release of asbestos fibers into the environment, to preclude the potential for measurable exposure of the building occupants to asbestos fibers and to protect the asbestos workers from any unnecessary exposure to asbestos fibers.

4.12.1.2.2 Asbestos Abatement Procedures – Exterior and Roofing Projects

Roof shingles, built-up roofing, flashings, mastics, cementitious siding, window glazing and caulking and any other exterior building materials which contain greater than 1% asbestos shall be disposed of in an approved and licensed disposal site in conformance with existing USEPA and Virginia Regulations. All exterior asbestos removal operations shall conform to the requirements found in 29 CFR 1926.1101 (g) (7) and (g) (8) without regard to personal exposure. Appropriate High Efficiency Particulate Air (HEPA) filtered respiratory protection shall be worn at all times asbestos-containing or asbestos contaminated materials are being removed. All exterior asbestos removal projects shall be conducted in a manner to minimize the release of asbestos fibers into the environment, to preclude the potential for measurable exposure of the building occupants to asbestos fibers and to protect the asbestos workers from any unnecessary exposure to asbestos fibers.

4.12.2 Asbestos Disclosure Statement

The A/E shall note on the Title Page of the drawings and in the specifications for all projects that no asbestos containing materials shall be used on the project. The Title Page of the drawings shall also have an Asbestos Disclosure Statement indicating one of the following:

1. *An asbestos inspection was performed and no ACM was found. The asbestos inspection report is included as an appendix to the project specifications.*

2. *An asbestos inspection was performed and ACM was found generally in the areas indicated. However, the work in this project is not intended to disturb the existing ACM. The asbestos inspection report is included as an appendix to the project specifications.*

3. *An asbestos inspection was performed and ACM was found generally in the area indicated. The asbestos inspection report is included as an appendix to the project specifications. Asbestos-containing building materials shall not be disturbed in this work except where specifically indicated and required. Where such actions are required, the contractor shall have the ACM removed by a licensed asbestos contractor using approved procedures as specified. The ACM that is to remain and the new non asbestos-containing material shall be labeled accordingly. The asbestos abatement contractor shall mark up the record drawings resulting from its work to include areas where asbestos was abated, areas where asbestos was encapsulated, and areas where ACM exist but were left in place. The General Contractor shall review and certify the locations where ACM was abated, areas where ACM was encapsulated and areas where ACM was left in place as marked on the record drawings and will provide the drawings to the Architect.*

4. *An asbestos inspection was not performed because all portions of the existing building that may be affected by the work were originally constructed after January 1, 1985.*

4.12.3 Asbestos Removal Drawings and Specifications

All ACM that will or may be disturbed as a result of a renovation, demolition, or addition work must be removed. The Owner shall have asbestos project specifications written by a Virginia licensed or properly certified asbestos project designer. The designer's license or certification 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 and these guidelines.

The specifications shall include a copy of the project specific asbestos inspection report 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 Virginia Department of Labor and Industry at least 20 calendar days prior to the actual start of the asbestos project, if required.

4.12.3.1 Asbestos Documents Submittal

Project drawings and specifications shall be submitted to the Bureau of Capital Outlay Management with the working drawings submittal for all projects if abatement is to be performed.

4.12.4 Asbestos Contracting

The Agency 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.

4.12.5 Asbestos Abatement Contractor

The Asbestos Abatement Contractor shall be required to mark up the record drawings 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.

4.12.6 Removal and Replacement of Sprayed-on Fireproofing

The A/E shall contact 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 to BCOM

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 BCOM, indicate the construction date, original and present uses, height of floors in feet, whether sprinkled, and any other information that may assist BCOM in its determination. If sprayed-on ACM is to be replaced, the Agency or its A/E shall also submit copies of the specifications for the intended replacement material and the encapsulant specified by the asbestos project designer for review. The encapsulant 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.

4.12.7 Use of Asbestos or Asbestos Containing Materials

The use of any materials which contain asbestos in concentrations greater than 1% shall be prohibited in any new construction or renovations.

4.12.8 Asbestos Related Work - Insurance Requirements

Licensed 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. The Commonwealth 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 Commonwealth of Virginia General Conditions of the Construction Contract 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 (e) to name the A/E as an insured party is waived. The A/E will include such waiver in a supplemental general condition to the project General Conditions.

4.12.9 Conflict of Interest Policies

The asbestos inspector, the asbestos project designer, the asbestos project monitor, the Owner's asbestos management plan author and any other person or firm hired by the Owner 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 inspectors, asbestos project designers or asbestos management plan authors shall not contract with the asbestos abatement contractor to provide services on the project.

Asbestos project monitors are not eligible to contract for project monitoring 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 agencies, and the monitoring personnel shall be accountable only to Agency officials.

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

4.12.10 Asbestos Project Monitor

Each Agency shall ensure that asbestos abatement project specifications are followed by using a Virginia licensed or properly certified asbestos project monitor to monitor the project and perform

air quality testing throughout the duration and at final completion of the project. **No asbestos materials are to be removed without the asbestos project monitor being on-site.**

4.12.11 Demolition / Renovation Notification Requirements

Any proposed demolition of a building which contains asbestos must be reported 10 working days in advance of any demolition and 20 working days in advance of any abatement activity to the Virginia Department of Labor and Industry. The United States Environmental Protection Agency (USEPA) and the Virginia Department of Labor and Industry (DLI) interpret these regulations to include non-friable materials which may be disturbed and rendered friable by the demolition (or renovation) activity. Questions about whether a particular project or product type is covered by these regulations may be directed to the Region 3 Asbestos Coordinator, USEPA, 841 Chestnut Street, Philadelphia, Pennsylvania 19107 or to the Director, Occupational Health Compliance, Virginia Department of Labor and Industry, 13 South 13th Street, Richmond, Virginia 23219; (804) 786-0574 . Renovation projects require special attention because all buildings are suspected to contain some form of asbestos and because renovations usually require disturbance of existing surfaces. Renovation projects are subject to the same EPA regulations as demolition projects with respect to notification and removal of asbestos (CFR Title 40 Sections 61.146-147).

4.12.12 Procurement of Asbestos Consulting Services

Persons licensed by the Virginia Department of Professional and Occupational Regulation as asbestos inspectors, asbestos project monitors, asbestos project designers, asbestos management planners and asbestos analytical laboratories are considered as asbestos consultants and shall be procured according to the guidelines established for non-professional services in the Agency Procurement and Surplus Property Manual.

Asbestos project designers provide services which may necessitate competitive negotiation where qualification factors as well as price should be used to determine the most suitable provider of the services.

A sample RFP for Asbestos Project Design Services is available from the Division of Purchases and Supply for use as a reference in drafting the procurement documents.

4.13 SPECIAL PROCEDURES FOR LEAD-CONTAINING BUILDING MATERIALS

4.13.1 OSHA Regulations

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 Occupational Safety and Health (VOSH) regulations have subsequently adopted the federal regulations in total. (See DLI Website) 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 (CO-7).

4.13.2 Lead Survey

When planning a renovation, demolition or addition project, the agency shall have the facility inspected for the presence of lead containing building materials by a Virginia licensed lead inspector or risk assessor and document all quantities and locations found. If the structure is to be demolished, the lead inspector or risk assessor shall determine whether a Total Concentrate Leachate Procedure (TCLP) test is warranted. Budget estimates and requests shall include the cost of Contractor compliance with the DLI requirements for the protection of construction workers for the specific project.

4.13.3 Lead Testing

Owners with multiple facilities with pending renovation projects should procure an indefinite delivery unit price contract with a qualified, licensed lead testing firm to provide test reports as required for its facilities at the start of each planning process. This non-professional service procurement shall be in compliance with DPS procurement procedures.

4.13.3.1 Housing and Urban Development (HUD) Lead Testing

All facilities which may house children six (6) years of age and younger that were constructed prior to 1978, must have a lead materials and lead paint inspection and risk assessment conducted by a Virginia-licensed lead inspector and/or risk assessor prior to their being occupied by children 6 years and younger. Where abatement or renovation is to be conducted in these facilities, a Virginia-licensed lead project designer shall develop lead project specifications which comply with all EPA and VOSH regulations. A Virginia-licensed risk assessor or lead project designer shall insure that the requirements of the project specifications are followed, including the collection and documentation of all clearance samples.

4.13.4 Lead Removal

In areas to be renovated, the agency shall include a copy of the lead inspection report as an appendix to the project specifications. Where lead materials are found in structures to be demolished, the agency shall determine if the structure has the potential to be considered a hazardous waste when demolished and shall have a TCLP test conducted, if recommended, by the lead inspector or risk assessor.

4.13.5 Lead Materials Disclosure

The Title Page of the construction drawings for renovation or addition projects shall include the lead materials disclosure statement that follows:

An inspection to identify lead containing or coated building components has been conducted and can be found in the project specifications. This report is provided for the contractor's use and may not be all inclusive. It is the contractor's responsibility to comply with all Virginia Occupational Safety and Health (VOSH) regulations as they pertain to employee exposures to lead. ***All lead and lead-coated building components shall be recycled to the extent possible.***

4.13.6 Lead Notification

In facilities where children 6 years and under may be located and if lead-containing materials will be encountered 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 all EPA requirements for lead control/abatement in target housing and all VOSH requirements for worker safety. It shall be the contractor's responsibility to comply with all EPA and VOSH requirements.

4.13.7 Disposal Testing

Following the demolition of lead containing or coated building components which are designated as waste products, additional TCLP tests in accordance with EPA guidelines shall be done on these materials, which include the total waste stream, to determine disposal requirements. TCLP tests of waste materials shall identify whether the material will be required to be disposed of as hazardous waste or as ordinary construction debris. It shall be unlawful for materials identified as hazardous waste to be disposed of with ordinary construction debris.

4.14 CONSTRUCTION INSPECTION

In addition to the required Structural and Special Inspections, A/E Inspections, and Substantial Completion Inspection by the Building Official, the Owner shall cause construction inspections to be made to assure that the work performed is in accord with the approved building permit documents. See Chapter 7 for information on the scope of Structural and Special Inspections and the A/E inspections.

4.14.1 Required Inspections

Inspections shall be performed in accord with the code, including the following:

1. Footing, excavations, and reinforcement materials for concrete footings prior to placement of concrete.
2. Foundation systems during periods of construction necessary to assure code compliance.
3. Preparatory work prior to the placement of concrete.
4. Structural members and fasteners prior to concealment.
5. Electrical, mechanical, and plumbing materials, equipment, and systems prior to concealment. This also includes fire suppression sprinkler systems, clean agent systems and fire detection and alarm systems.
6. Energy conservation material prior to concealment.
7. Final inspection.

(Note: Part of required inspections may be included in the Structural and Special Inspections and the A/E inspections. Despite this, construction inspections shall be made of the work as it is being performed to assure that conditions inspected by the Structural and Special Inspections and the A/E inspections are preserved.)

4.14.2 Inspector Qualifications

Inspectors shall be approved by the Agency's director of facilities. Inspections shall be made by an individual familiar with the project, with the knowledge, skill, and experience necessary to read and understand the documents, and meeting the following minimum criteria:

1. An individual certified by the Department of Housing and Community Development (DHCD) or by the International Code Council (ICC) in the specialty being inspected, or
2. A Virginia-licensed Architect or Engineer, or
3. An individual approved by the Building Official upon recommendation of the agency facilities officer based on the knowledge, skill and experience of the proposed inspector.

4.14.3 Inspection Reports

Inspection reports shall be made on all inspection work. Final Report shall be made at the completion of the work. Reports shall meet the following:

1. Submitted within 30 days of completion of the work item being inspected and prior to the substantial completion inspection.
2. Indicated deficiencies in the work shall be followed by reports that indicate the action taken to correct the work and acceptance of the work.
3. Formatted at the discretion of the agency, but shall include a number and title (as indicated in Required Inspection), date, and signature of the Inspector. Final Report shall be so entitled, and indicate that the work was complete in accord with the approved construction documents (indicate the date of the approved construction documents and include a list of addenda and change orders), or enumerate the deficiencies and corrective actions taken (do not include addenda and change orders previously listed) to comply with the code.

4.14.4 Non-Compliance

If the Owner is unable or unwilling to perform the required inspection and reporting, then the Building Official will cause the inspections to be performed at the Owner's expense.

4.14.5 Procurement of Project Inspection Services

If the Agency does not have adequate staff or does not wish to procure inspection services directly, there is another option available. The Department of General Services offers state-wide term contracts for Project Inspector services. Agencies may take advantage of these contracts. Follow the "Engineering and Building Contracts" link on the DGS website. The specific contract is: "Non-Professional Construction Related Services."

4.14.6 Building Official Inspections

The following inspection types will be conducted by the Building Official staff if the inspections are noted as applicable on the Building Permit's official action wording:

1. Under-slab inspection prior to the installation of concrete that will conceal mechanical, electrical, and plumbing systems.
2. Open-wall inspection prior to the installation of exterior and interior wall surfaces that will conceal mechanical, electrical, plumbing, fire protection systems, and exterior weather resistive systems.
3. Above-ceiling inspection prior to the installation of ceiling surfaces that will conceal mechanical, electrical, plumbing, and fire protection systems.
4. Inspection to verify or determine substantial completion at the end of construction.

The Agency shall notify the Building Official to schedule inspections by sending a request to capout@dgs.virginia.gov. The request shall contain the following:

- Project Number
- Project Name
- Type of inspection required
- Agency contact information to schedule the inspections
- Agency e-mail address to send the Building Official Inspection Reports

The Agency is to be contacted to verify that the project is ready prior to scheduling the inspection.
The Building Official shall provide an Inspection Report to the Agency.
The Agency shall provide e-mail verification that comments in the Building Official Inspection Report have been resolved.

4.15 UNDERGROUND AND ABOVE GROUND STORAGE TANK SYSTEMS

4.15.1 Technical Standards

Technical standards related to USTS and AST are contained in the Department of Environmental Quality, Water Division Regulations: 9VAC 25-580, *Underground Storage Tanks: Technical Standards and Corrective Action Requirements;* 9VAC 25-91-100, *Facility and Aboveground Storage Tank Registration Requirements*; and 9VAC 25-91-130, *Aboveground Storage Tank Pollution Prevention Requirements*.

4.15.2 Delegated Authority

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 9VAC 25-580; 9VAC 91-100; and 9VAC 25-91-130

4.15.3 Local Building Official Authority

State agencies shall request the services above from the nearest local building department on all USTS and AST projects/actions. For capital outlay projects the agency will provide the local building department copies of the appropriate sections/sheets of the specifications/ drawings. The

agency shall pay to the local building department the same fees as would be paid by a private citizen for the services rendered.

4.16 CHESAPEAKE BAY PROGRAM

State agencies 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 sitings and designs. This publication is available from the Chesapeake Bay Local Assistance group within the Department of Environmental Quality.

4.17 EROSION AND SEDIMENT CONTROL REQUIREMENTS

Refer to the Department of Environmental Quality (DEQ) for current requirements. Compliance with the erosion, sediment control and stormwater management requirements is mandatory for all state projects.

4.17.1 Reserved

4.17.2 Reserved

4.17.3 Reserved

4.17.4 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 owner's property) of borrowing, wasting or stockpiling of soil products. A statement similar to the following shall be used:

The Contractor shall be responsible for satisfying any and all erosion 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 including providing a designated, certified "Responsible Land Disturber" before continuing with the concerned activity.

4.18 ENVIRONMENTAL IMPACT REPORT (EIR)

4.18.1 When EIR is Required

Agency shall procure and submit an Environmental Impact Report (EIR) for each major state project (*Code of Virginia* §10.1-1188). Regulatory authority is assigned to the Virginia Department of Environmental Quality (DEQ) in *Code of Virginia* §10.1-1191. A 'major state project' is defined as any project or real property acquisition which cost $500,000 or more. Submission requirements can be found at the Virginia DEQ website. An EIR may not be required by DEQ for some interior renovations and work covered by a previous EIR. However, the Agency must submit its request to DEQ citing the nature of the work and justification for excluding the project from the requirements for an EIR. DEQ will make a determination on the validity of the request and provide a written response on its findings.

4.18.2 Virginia Law

Excerpts from the *Code of Virginia*:

§ 10.1-1188. State agencies to submit environmental impact reports on major projects.
A. All state agencies, boards, authorities and commissions or any branch of the state government shall prepare and submit an environmental impact report to the Department on each major state project.
"Major state project" means the acquisition of an interest in land for any state facility construction, or the construction of any facility or expansion of an existing facility which is hereafter undertaken by any state agency, board, commission, authority or any branch of state government, including state-supported institutions of higher learning, which costs $500,000 or more. For the purposes of this chapter, authority shall not include any industrial development authority created pursuant to the provisions of Chapter 49 (§ 15.2-4900 et seq.) of Title 15.2 or Chapter 643, as amended, of the 1964 Acts of Assembly. Nor shall authority include any housing development or redevelopment authority established pursuant to state law. For the purposes of this chapter, branch of state government shall not include any county, city or town of the Commonwealth.
Such environmental impact report shall include, but not be limited to, the following:
1. The environmental impact of the major state project, including the impact on wildlife habitat;
2. Any adverse environmental effects which cannot be avoided if the major state project is undertaken;
3. Measures proposed to minimize the impact of the major state project;
4. Any alternatives to the proposed construction; and
5. Any irreversible environmental changes which would be involved in the major state project. For the purposes of subdivision 4 of this subsection, the report shall contain all alternatives considered and the reasons why the alternatives were rejected. If a report does not set forth alternatives, it shall state why alternatives were not considered.

§ 10.1-1190. Approval of Governor required for construction of facility.
The State Comptroller shall not authorize payments of funds from the state treasury for a major state project unless the request is accompanied by the written approval of the Governor after his consideration of the comments of the Department on the environmental impact of the facility. This section shall not apply to funds appropriated by the General Assembly prior to June 1, 1973, or any re-appropriation of such funds.

§ 10.1-1191. Development of procedures, etc. for administration of chapter.
The Department shall, in conjunction with other state agencies, coordinate the development of objectives, criteria and procedures to ensure the orderly preparation and evaluation of environmental impact reports required by this article. These procedures shall provide for submission of impact statements in sufficient time to permit any modification of the major state project which may be necessitated because of environmental impact.

4.19 BUILDING OFFICIAL REVIEWS, PERMITS AND APPROVALS

4.19.1 State Building Official

The *Code of Virginia* §36-98.1 delegates authority for building code enforcement of buildings on State property to the Department of General Services acting through the Division of Engineering and Buildings. This includes buildings on state property (existing and under construction) not otherwise exempt.

The Director of the Division of Engineering and Buildings is the Building Official for buildings and structures on State owned property and is called the State Building Official in this Manual. DEB is charged with reviewing plans and specifications, granting modifications, issuing Building Permits, inspecting construction, issuing Certificates of Occupancy, and establishing rules and regulations as may be necessary to carry out its function as building official (*Code of Virginia* §36-98.1). The Director of DEB has delegated the performance of State Building Official functions to the Director and staff of the Bureau of Capital Outlay Management (BCOM).

The Virginia Department of Transportation has authority over structures (bridges, toll booths, etc.) in the Right of Way that are not regulated by the Virginia Uniform Statewide Building Code. Occupiable buildings located within the Right of Way (rest area buildings, welcome centers, etc.) are regulated by the VUSBC and are under the jurisdiction of the State Building Official.

State agencies that are designated as authorities (i.e.: Virginia Port Authority, VCU Health System, University of Virginia Health System, and Fort Monroe Authority) or have special authority granted by the *Code of Virginia* may either exercise Building Official authority, or contract for Building Official services with a locality or the State Building Official. See Section 7.0.1.

4.19.2 Building Maintenance Official

As provided in The Virginia Maintenance Code (Part III of the VUSBC), the Department of General Services acts through the Division of Engineering and Buildings as the Building Maintenance Official. The Director of the Division of Engineering and Buildings is the Building Maintenance Official for buildings and structures on state-owned property and is called the State Building Maintenance Official in this Manual.

The Building Maintenance Official hereby requires and directs that each and every state agency which has real property (land and buildings) shall comply with maintenance provisions of the Virginia Maintenance Code.

The VUSBC prescribes that building maintenance regulations are to be complied with in the repair and maintenance of existing structures and equipment. The purpose is to ensure public safety, health, and welfare through proper building maintenance, repair, and use and continued compliance such as accessibility and energy conservation.

The chief administrative official of each state agency which has real property shall be responsible and accountable to the State Building Maintenance Official for compliance with the maintenance provisions of Part III, Chapter 1, (13VAC5-62-420 et seq.) of the VUSBC. To facilitate the administration and operations of the Agency's compliance with the Maintenance Regulations, each agency head shall assign an Agency Building Maintenance Representative to respond to complaints of non-compliance and to assure that the Agency complies with the Maintenance Regulations. The Agency Building Maintenance Representative shall be the on-site representative of the State Building Maintenance Official for compliance at that Agency. The Agency Building Maintenance Representative shall receive complaints, resolve the issues and otherwise assure compliance with the Maintenance Regulations for that Agency. The Agency Building Maintenance Representative shall submit a report to the Building Official by January 31 each year for previous calendar year's activity. The report shall itemize all complaints received, the action taken and any other noteworthy activities that may have been performed under VUSBC.

4.19.3 Building Permit Policy for Construction - State Owned Buildings & Structures

The policy supplements the Virginia Uniform Statewide Building Code by further defining scope of work and submittal requirements to the Building Official for state-owned buildings and structures. See Appendix P.

4.19.3.1 Closure of DEB-Issued Building Permits

All permits issued by DEB shall be closed upon completion of the work permitted. The work is not to be deemed complete until all work included within the contract has been completed and accepted, all deficiencies identified during inspections of the work by the agency, the A/E, the State Fire Marshal and BCOM have been corrected and accepted, and all work which was determined to be incomplete by inspection has been completed and accepted. Depending on the scope and type of project, the permit shall be closed by one, or a combination, of the following methods:

4.19.3.1.1 New Buildings, Additions & Change of Use Renovations

For new buildings, additions to existing buildings and renovations or alterations to existing buildings which result in a change of use or occupancy classification for the building or a portion thereof, the agency shall prepare and submit Form CO-13.3 (Certificate of Use and Occupancy) within the BITS application software. In addition to authorizing occupancy or re-occupancy, issuance by DEB of an approved CO-13.3 closes the permit for the new building, the additions (only) and/or the renovated areas which underwent a change in use or occupancy. If the work has been determined to be substantially complete, but still has work remaining that must be completed, corrected or otherwise resolved under the open permit, a temporary Certificate of Use and Occupancy may be requested and issued with stipulations and an expiration date by which all work shall be complete. The permanent CO-13.3 shall be issued when all work is completed after submittal of the form by the agency within BITS.

4.19.3.1.2 Renovations in Existing Buildings With No Change of Use

For renovations or alterations to existing buildings or portions of buildings which do not constitute a change of use or occupancy classification for the whole building or any part of the building, the agency shall prepare and submit Form CO-13.4 (Building Permit Closeout) within the BITS application software. Issuance by DEB of an approved Form CO-13.4 closes the permit and authorizes re-occupancy of renovated spaces for projects that required the renovation areas to be vacated during construction. If the work has been determined to be substantially complete, but still has work remaining which must be completed under the open permit, the agency shall request re-occupancy of the building or specific spaces by submitting Form CO-13.5 (Beneficial Occupancy). Form CO-13.5 permits temporary re-occupancy while the remaining work is completed under the open permit between substantial completion and final completion, at which point the agency shall submit Form CO-13.4 to close the permit.

4.19.3.2 Annual Permit

Annual Permits are issued by the Building Official at the Building Official's sole discretion to Agency Representatives in accord with the Virginia Uniform Statewide Building Code. The Agency Representatives are not the Building Official, and their authority is limited, as defined by the Building Permit Policy for Construction – State Owned Buildings & Structures (See Appendix P). Work performed under the Annual Permit is subject to inspection by the Building Official at the Building Official's sole discretion. Deficiencies noted during the Building Official's inspection shall be corrected to the Building Official's satisfaction.

Agency Representatives are limited to one principle Agency Representative (Alternate Agency Representatives report to the principle) per agency at the central agency location. Application may be made by completing the Annual Permits - Agency Representative Application which can be found on the Forms Center. In order for an Agency Representative to be granted full Annual Permit authority the representative must be a registered architect or professional engineer in Virginia with experience in building design and a current knowledge of the Uniform Statewide Building Code. Agency Representative applicants that are not registered architects or professional engineers in Virginia may apply, but must demonstrate knowledge of building construction, building design, experience in building design and a current knowledge of the Uniform Statewide Building Code. If given Annual Permit authority, they may have their authority limited.

4.19.3.3 Temporary Structures (Tent, Stage, Platform, Bleachers, Amusement Devices & Other Structures)

Application for Permit to erect and use temporary structures must be submitted to the Building Official at least 10 days prior to the proposed use. See the Virginia Uniform Statewide Building Code and the Building Permit Policy for Construction – State Owned Buildings & Structures (Appendix P) for the scope of work that requires a permit. Also see Chapter 8.

Tent Permits allow both the erection and the Use and Occupancy of the tent subject to the stipulations shown on the permit. Tent permits are normally issued to allow the tent to be erected the day before the event and to be taken down the day after the event. Exceptions to this Policy may be requested in writing where very large tents with structural frames are required to be erected for the tent. In such cases, the tent supplier and agency shall acknowledge responsibility for safety and security of the tent and area. Tent Permits require that the tent be struck in the event that winds exceeding 40 mph are predicted in the vicinity of the tent location.

4.19.3.3.1 Seasonal / Multiple Function Permit

If a temporary structure is to be repeatedly erected at the same location and for the same type of function AND if the tent is located the proper distances away from existing buildings, the agency may submit an application for a Seasonal Permit to erect the structure for several specified dates. The conditions of the Seasonal Permit require that identical structure be erected, furnished, equipped, used for the identical purpose in the identical location AND that the tent to be erected the day before the event and to be taken down the day after the event. Any variation from a seasonal permit requires a separate permit.

4.19.3.3.2 AARB

“Temporary Structures” are not temporary if proposed for more than 180 days. Any ‘non-permanent structure’ placed on state property for more than 180 days requires approval of the AARB.

4.19.3.3.3 Tent

Site Plan

Indicate property lines, roads, sidewalks, grades greater than 5%, distance to adjacent buildings or structures, and handicapped accessible route to the public way.

Location

Show the location of the tent on the Site Plan and indicate the distances to the nearest buildings on the Permit Application. Tents proposed to be located closer to existing buildings than allowed by the USBC will require special evaluation and may require special conditions if allowed to be erected. Erection of a tent in proximity to a building shall be done in a manner which will not decrease the safety of the building occupants while providing required safety for the occupants of the Tent.

Floor Plan

Indicate means of egress, aisles, exits, furnishings, and equipment. Provide a description of the function or activity to take place. Indicate the proposed Maximum Occupant Load.

Other Construction

Indicate the method of tie-down / anchorage for tents including the proposed wind and live loads. (See Special Conditions below.) Indicate means of egress lighting and power for tents that are proposed to be used at night. Indicate the method of ventilation and when tents are proposed to be conditioned.

Certificate of Flame Resistance
Provide Certificate of Flame Resistance to include tent serial numbers and descriptions (size, color, etc.) so that the tent certificates and tents can be clearly matched up on a one to one correspondence. Open flames, space heaters, or food cooking / heating devices (except with approved electrical appliances and approved power supply) are NOT permitted under and within 20 feet of a tent.

Inspection
Responsible User or the Agency Representative shall inspect the installation for compliance with the approved documents. The State Fire Marshal shall inspect the installation for means of egress and code compliance.

Special Conditions
Tents that are proposed to be occupied during wind speeds that exceed 40 MPH require a tie-down or other anchorage design that is signed and sealed by a Virginia-licensed architect or engineer.

4.19.3.3.4 Stage / Platform / Bleachers

Site Plan
Outside installations: indicate property lines, roads, sidewalks, grades greater than 5%, distances to adjacent buildings or structures, and handicapped accessible route to the public way. Inside installations: indicate the buildings and room location and name.

Floor Plan
Indicate means of egress, aisles, exits, guards, handrails, furnishings, and equipment. Provide a description of the function or activity to take place. Indicate the proposed Maximum Occupant Load.

Other Construction
Indicate the means of egress lighting and power for structures that are proposed to be used at night. Indicate the method of tie-down or other anchorage for structures including the proposed wind loads and live loads. Provide details of anchorage and calculations to show proper anchorage against overturning.

Closed v. Open Engineered Systems
Provide manufacturer data for stage, platform, and bleachers along with a certificate of insurance from the equipment rental / erection company. If the structures are fabricated on site and/or erected by other than the equipment rental company, provide construction / erection documents signed by a Virginia licensed architect or engineer.

Inspection
Responsible User or the Agency Representative shall inspect the installation for compliance with the approved construction / erection documents.

Exceptions:
1. Platform (Dance Floors)
   Dance floors that are no more than 4 inches above the grade plane at any point do not require a permit (a 2 x 4 on edge with a plywood floor is nominally 4 inches; therefore, does not require a permit).
2. Stage (Performance Sets)
   Performance sets that are owned and erected (not rented locally) by contract performance groups (e.g. Private Bands and Theater Groups), that are exclusively for the use of the contract performance group and from which the public are excluded, are

considered equipment of the performing group; therefore, such stages / equipment do not require a permit from BCOM.

Seasonal / Multiple Function Stage Permit
If a temporary stage is to be repeatedly erected at the same location and for the same type of function AND if the stage is to be installed by an experienced, trained and supervised crew, then the agency may submit an application for a Seasonal Permit to erect the stage / structure at a given location for several specified dates. The conditions of the Seasonal Permit require that identical structure be erected, furnished, equipped, used for the identical purpose in the identical location AND that the stage to be erected and inspected by the Agency Safety Officer. Any variation from a seasonal permit requires a separate permit.

4.19.3.3.5 Amusement Devices

"Amusement devices" are regulated by the Virginia Amusement Device Regulations (VADR). Amusement device permit application submittals are reviewed for compliance with the requirements for the various devices that are detailed in the VADR .

a. Agency is to complete all of the required fields on Form CO-17 TMP in BITS. A separate CO-17 TMP is to be completed for each different amusement device.

b. Agency is to download the "CO-17TMP Attachment One" (DGS-30-190) from the DGS Forms Center. All information on Attachment One is to be completed. A separate Attachment One is to be completed for each different amusement device.

c. In addition to Attachment One, additional information must be submitted to support the permit application. That additional information is itemized on the Attachment One form and includes: (1) proof of liability insurance; (2) a simple site plan indicating the location(s) of the amusement device(s) and indicating an accessible route to the device(s) from an accessible building or parking area; (3) certificate(s) of inspection by an inspector who is certified as an amusement device inspector by the Virginia Board of Housing and Community Development; (4) any other information necessary in order to permit the device, such as details to assure a safe adaptation to the site.

d. Agency shall advance the CO-17 TMP to the BCOM BO Admin and shall email the completed CO-17TMP Attachment One to boforms@dgs.virginia.gov along with the other required information listed above.

4.19.3.3.6 Other Temporary Structures

Contact the Bureau of Capital Outlay Management.

4.19.3.4 Industrialized Buildings

An Application for Permit is required to install, make utility connections, and/or occupy an Industrialized Building. See the Virginia Uniform Statewide Building Code and the Building Permit Policy for Construction – State Owned Buildings & Structures (Appendix P) for the scope of work that requires a permit. Industrialized Buildings used as construction trailers on a project construction site are exempt.

4.19.3.4.1 AARB

Industrialized Building shall obtain AARB approval. Industrialized Building used as construction trailers on a project construction do not require AARB approval.

4.19.3.4.2 Site Plan

Indicate property lines, easements, roads, sidewalks, grading, parking (including handicapped spaces), site utilities (size and location: water, sewer, electric, and gas), distances to adjacent buildings or structures, and handicapped accessible route to the public way.

4.19.3.4.3 Foundation

Indicate soils bearing capacity, number and location of piers, and number and location of tie down anchors.

4.19.3.4.4 Other Construction

Indicate stairways, ramps, porches, hallways, sidewalks, paving, roofs, lighting, and other items that are not a part of the industrialized building delivered to the site.

4.19.3.4.5 Inspection

Inspection by the A/E Record and the Regional Fire Marshal Office are required. Submit inspection reports indicating compliance with approved documents.

4.19.3.4.6 Additions, Renovations, and Alterations

Changes to Industrialized Building are regulated in the same manner as changes to all existing structures. Do not make changes to any component of the building, or occupy any portion of a building without approval of the Building Official.

4.19.3.4.7 Industrialized Buildings without a Virginia Registration Seal

If the proposed building does not have a Virginia Registration Seal, the Owner must demonstrate that the building complies with the code. The following are required:

1. Signed and sealed documents shall be provided by a Virginia licensed architect or engineer showing the construction including structural, mechanical, electrical, and plumbing systems,
2. Fire Protection Information Plan shall be provided in accord with the CPSM.
3. Building shall be inspected by a Virginia licensed architect or engineer for compliance with the VUSBC, CPSM and applicable accessibility standards, and a statement with seal, signature, and date, stating that the building conforms to these requirements.

4.19.3.4.8 Procurement Guidance

Define the use and occupancy of the building prior to procurement. Procure the building in accord with CPSM requirements, VPPA requirements, or by a standard lease. Require Virginia seals and registration numbers on the industrialized building in accord with the Virginia Industrialized Building Safety Regulations, 13VAC5-91 et seq.

4.19.3.5 Towers

An Application for Permit is required to install a Tower and must be submitted to the Building Official. See the Virginia Uniform Statewide Building Code and the Building Permit Policy for Construction – State Owned Buildings & Structures (Appendix P) for the scope of work that requires a permit. For towers located on leased property, applicant shall indicate the date when lease was approved by the Division of Real Estate Services (DRES).

4.19.3.5.1 AARB

Towers require AARB approval. Adding antennae to existing buildings require AARB approval. Adding antennae to existing towers are exempt.

4.19.3.5.2 Site Plan

Indicate property lines, easements, roads, sidewalks, grading, site utilities, and distances to adjacent buildings or structures.

4.19.3.5.3 Foundation
Indicate soils bearing capacity and foundation design (size and reinforcement of footings, number and location of piers, and number and location of tie down anchors).

4.19.3.5.4 Other Construction
Indicate fences, storage structures, electrical service, lighting, sidewalks and paving.

4.19.3.5.5 Closed v. Open Engineered Systems
Provide manufacturer data for manufactured tower construction that are constructed in the factory. If the structures are fabricated on site, provide construction documents signed and sealed by a Virginia licensed architect or engineer.

4.19.3.5.6 Inspection / Certificate of Occupancy
Inspection by the A/E Record and submission of the Statement of Structural & Special Inspections is required. For an antenna addition to an existing tower, provide a statement from the A/E with a signed, dated professional seal assuring that the tower will accommodate added loads. Submit inspection reports indicating compliance with approved documents.

4.19.3.5.7 Additions, Renovations, and Alterations
Changes to a tower and the addition of antennae are regulated in the same manner as tower installations. Do not make changes to any component of the tower without approval of the Building Official.

4.19.3.5.8 Permit Fees
Contact the Bureau of Capital Outlay Management. A fee is required with application. Checks shall be made payable to the Treasurer of Virginia.

4.19.3.6 Other Structures (Flagpoles, Antennae, Fences, Miscellaneous)

4.19.3.6.1 Flagpole / Antennae
An Application for Permit to install a flagpole / antenna more than 30 feet in height, and flagpoles / antennae to be attached to existing buildings shall be submitted to the Building Official. See the Virginia Uniform Statewide Building Code and the Building Permit Policy for Construction – State Owned Buildings & Structures (Appendix P) for the scope of work that requires a permit. Flagpole / antennae with a height of 30 feet or less may be permitted under the Annual Permit authority.

4.19.3.6.1.1 AARB
Flagpoles shall be approved by the AARB prior to permitting / erection.

4.19.3.6.1.2 Site Plan
Indicate property lines, roads, sidewalks, and distances to adjacent buildings or structures, or the location of the building to which the flagpole / antennae is to be attached.

4.19.3.6.1.3 Foundation
Indicate soil bearing capacity and foundation design including: connection details, foundation details, based on manufacturer's standard data and details, or calculations signed by a Virginia licensed architect or engineer.

4.19.3.6.1.4 Other Construction

Indicate paving, sidewalks, electrical service and lighting.

4.19.3.5.1.5 Closed v. Open Engineered Systems
Provide manufacturer data. If the structures are fabricated on site, provide construction documents.

4.19.3.6.1.6 Inspection
Inspection by the Applicant or a Virginia-licensed architect or engineer is required. For an antenna addition to an existing structure, provide a statement from the A/E with a signed, dated professional seal assuring that the structure will accommodate added loads. Submit inspection reports indicating compliance with approved documents.

4.19.3.6.2 Fences
An Application for Permit to install a fence that is required for (i) pedestrian safety or (ii) a barrier for a swimming pool shall be submitted to the Building Official. See the Virginia Uniform Statewide Building Code and the Building Permit Policy for Construction – State Owned Buildings & Structures (Appendix P) for the scope of work that requires a permit.

4.19.3.6.2.1 AARB
Fences shall be approved by the AARB prior to permitting / erection.

4.19.3.6.2.2 Site Plan
Indicate property lines, roads, sidewalks, and distances to adjacent buildings or structures, Fire Department access, Exit discharge, Public Way.

4.19.3.6.2.3 Foundation
Indicate VDOT standard details for the erection and stability of fences, manufacturer's details, or calculations signed by a Virginia licensed architect or engineer.

4.19.3.6.2.4 Other Construction
Indicate paving, sidewalks, electrical service, lighting, storage structures.

4.19.3.6.3 Miscellaneous Structures
Contact the Bureau of Capital Outlay Management.

4.19.4 Codes & Standards Compliance Disputes
The Director of the Bureau of Capital Outlay Management, acting under the delegation by the Director of the Division of Engineering and Buildings, functions as the Building Official for providing the Building Official duties in accord with the Virginia Uniform Statewide Building Code.

Appeal of the application of the Building Code or refusal to grant a modification to the provisions of the Building Code by the Building Official or his staff may be made by the affected state agency to the Director of the Division of Engineering and Buildings. Appeals shall be made in writing within 21 calendar days of the application of this code or refusal to grant a modification to the provisions of this code. The appeal shall contain the following information:

Agency Name:
Project Name:
Project Code Number:
Applicable Code / Edition / Section(s):
Disputed Application:
(Documents and narrative that describe in detail, with code references, the disputed application and the alternative proposed application.)

Proposed Modification:

(Documents and narrative that describe in detail, with code references, the proposed modification and systems that provides equivalent features to insure that the spirit and intent of the law is observed and that the public health, safety and welfare are assured.)

Justification:

Signature of the Chief Facilities Officer:

The Director shall issue a written decision on the appeal within fourteen (14) calendar days of receipt by the Division of Engineering and Buildings of the appeal application.

State agencies shall exhaust this appeal process prior to application for appeal to the State Review Board.

CHAPTER 5 - PROJECT SUBMITTAL STANDARDS AND REQUIREMENTS

5.0 GENERAL

There are differences between work prepared for clients in the private sector and work prepared for agencies of the Commonwealth of Virginia. 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 7.34, 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 be clear, concise, and provide thorough detailing of existing and proposed construction.

Design is the sole responsibility of the A/E. Specifications which 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 Director, Division of Engineering and Buildings.

In order to encourage competition required in the expenditure of 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. (*Code of Virginia* § 2.2-4300 et al).

5.0.1 Project Identification on Documents

The Agency and the A/E shall include the 11 digit Project Identification Code (PC No. = Agency Code + Project Code + Subproject Code) on all plans, specifications, contracts, correspondence, sketches, invoices, memoranda, addenda and other documents related to the project. Where the overall project is not subdivided, show the three-digit subproject identification code number as 000. Example format: 999-99999-001. Capital Project Documents without the required identification are not complete.

Each page/sheet/sketch/drawing of any addenda shall include the A/E seal, the project title, the project code, the addendum number, the addendum date, and the 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 provide the Project Identification Code (PC No.) on all submittals including invoices, schedules, shop drawings, change order proposals, correspondence and other project documentation.

5.0.2 Capital Project Initiation

The Agency will be authorized to initiate the design of a Capital construction project upon receipt of an approved GS Form E&B CO-2. Depending on the project documentation previously submitted and the action wording on the CO-2, one or more of the following design progress phases for review by the Division of Engineering and Buildings may be required.

- Schematic Design
- Preliminary Design
- Working Drawings, including Addenda

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.

5.1 NON-CAPITAL OUTLAY CONSTRUCTION PROJECTS

5.1.1 General

Construction or improvement projects undertaken on state property which are not classified as Capital Outlay projects are not required to follow the capital outlay (CO-2, CO-4, CO-5, CO-6 and CO-8) submittal and approval process. However, the Non-Capital Construction Projects are subject to review and permitting by the State Building Official (Director, Division of Engineering and Buildings) for conformance to the Virginia Uniform Statewide Building Code including its referenced standards and for the technical standards and policy requirements of the Manual. "Changes in Group Classification" of existing state-owned buildings also require the submittal of information for the review and approval of the State Building Official and issuance of a new Certificate of Use and Occupancy.

5.1.2 Issuance of Building Permit

Projects/Work on state property shall be designed by and the documents sealed, signed and dated by Virginia-licensed Architect(s) and/or Engineer(s) in accord with the Building Permit Policy for Construction, State-Owned Buildings and Structures (Appendix P). Working drawings ready for bidding and the appropriate information for the Building Permit (CO-17) shall be submitted to the Building Official (DEB/BCOM) for review and issuance of a Building Permit. Refer to the Building Permit Policy in Appendix P for further information.

Some interior renovation or modification projects which do not involve a Change in Group Classification or projects to alter systems regulated by the USBC may be permitted under the Building Official's Annual Permit to the Agency. (See Appendix P) The Agency shall follow the procedures and keep records of such work as set forth in the Annual Permit issued to the Agency.

5.1.3 Issuance of Certificate of Use and Occupancy

The Non-Capital Construction Project 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 Agency shall submit the forms CO-13.1a, CO-13.1b, CO-13.2a, CO-13.3b, the Fire Marshal's report and recommendation, and other applicable certificates or reports along with the Form CO-13.3, Certificate of Use and Occupancy, to DEB/BCOM when requesting that a Certificate of Use and Occupancy be issued.

Renovation-only projects (not involving an addition to an existing building) or which do not involve a change in use or occupancy for the existing building will not be issued a Certificate of Use and Occupancy upon completion. The agency shall submit Form CO-13.4 (Building Permit Closeout) along with Forms CO-13.1, CO-13.2, CO-13.3b, CO-13.1b and a final inspection report from the State Fire Marshal in order to close the permit when the construction is completed. The project is not complete as long as any deficiencies identified by BCOM, the State Fire Marshal, or the A/E have not been completed, corrected or otherwise resolved.

5.1.4 Change in Use or Occupancy

If the Agency proposes to change the Group classification of an existing building or a portion thereof, the VUSBC requires that a new Certificate of Use and Occupancy be obtained. The building shall comply with the Virginia Rehabilitation Code (VRC) unless it a Group I-2 or I-3 occupancy. If the building is a Group I-2 or I-3 occupancy, the Virginia Construction Code (VCC) is applicable instead.

5.2 GENERAL REQUIREMENTS FOR DRAWINGS

5.2.1 Professional Seals
All drawings and specifications submitted in support of application for a building permit shall bear the Virginia professional seal(s) of the individual(s) responsible for its design.

5.2.2 Units of Measurement for Dimensions
All dimensions on drawings shall be expressed in feet, inches and fractions of inches. Metric dimensions are not acceptable.

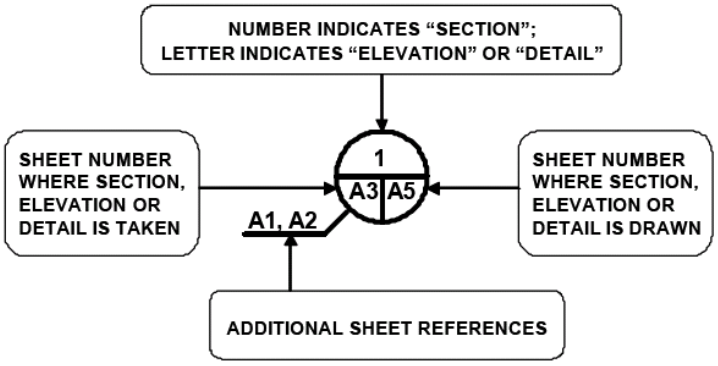
5.2.3 Size of Drawings
Drawing sheet size, except in special cases approved by the Director of BCOM, shall be 24" by 36" (preferred) or, alternatively, 30" by 42". Drawings shall be prepared so as to be suitable for microfilming or optical scanning and for making clear, legible half-size reproductions.

5.2.3.1 Weight of Drawings
Large sets of drawings shall be organized in volumes such that the weight of any volume does not exceed approximately 30 lbs.

5.2.4 Size of Lettering
Mechanical (CADD, BIM) lettering shall be 1/10" minimum and in all caps. The minimum height for hand lettering on all projects shall be 1/8". Spacing between lines shall be equal to one-half the letter height.

5.2.5 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 plans shall have a North Arrow for orientation. All discipline building plans shall be consistent in orientation insofar as practicable.

5.2.6 Section and Detail Designation
The standard section symbol below is representative of the information required for section and detail "tags". The symbol used on the drawing sheet(s) shall indicate where the section or detail is taken and the drawing sheet where the section or detail is drawn.



STANDARD SECTION, ELEVATION OR DETAIL SYMBOL

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

5.2.7 Limits of the Work
The drawings shall describe/show the Work to be provided by the Contractor. Existing features, structures, 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 Agency will perform or have performed by separate contract shall be identified as "Not in Contract" or "NIC" if the abbreviation has been defined.

5.2.8 Date of Construction Documents
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 and ready for bid. Documents printed for bidding shall bear the date described above with no revision numbers or dates.

5.2.9 Record Drawings
Record Drawings showing the As-Built conditions shall be provided to the Agency/Owner on reproducible media. The Agency may further require that they be provided with the Record Drawings as CADD files on removable media.

5.2.10 CADD and BIM Drawings on Disk
The Agency may require the A/E to prepare the drawings on CADD and to provide the Agency with one copy of the completed drawings on removable media. The A/E shall provide the Agency with any special fonts, symbol libraries, special line types or line drawing software, or any other unique software required for the Agency to maintain the CADD drawings as current “As Built” documents.

5.2.11 Reserved

5.2.12 Tabulation of Units
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.

5.2.13 Abbreviations
Provide a master listing of all applicable abbreviations and symbols used in the set of drawings or provide a listing of the discipline-specific abbreviations and symbols at the beginning of each discipline.

5.2.14 Scale of Drawings
Foundation and floor plans shall be drawn to a scale not less than 1/8" = 1'-0" with all necessary dimensions shown. Roof plans are preferred at 1/8" = 1'-0" scale; however, roofs without mechanical equipment and metal / shingled pitched roofs may be drawn at a 1/16" = 1'-0" scale. Elevations shall be drawn to scale at not less than 1/8" to 1'-0". Typical wall sections shall be drawn at not less than 3/4" = 1'-0" scale. Typical window, door and special opening details shall be drawn at 1 1/2" = 1'-0" scale or larger. Provide all necessary interior and exterior details, including special doors, windows, woodwork, paneling or other decorative work, toilets and washrooms, etc., with plans and elevations at a minimum scale of 1/4" = 1'-0” and with construction details at a minimum of 3/4" = 1'-0”. Mechanical equipment room plans shall be drawn at 1/4" = 1'-0" scale minimum.

5.2.14.1 Graphic Scales
Each drawing shall, as a minimum, have a graphic scale shown for the predominant scale used on that sheet.

5.2.15 Asbestos Project Design
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.

5.2.16 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 or scanning.

5.3 SPECIFICATION STANDARDS

Specifications shall be in sufficient detail to describe without ambiguity, all materials, equipment, supplies, and other pertinent information. Required tests and guarantees shall be indicated in the specifications.

5.3.1 Federal Specifications

Federal Specifications, MILSPECS, Corps of Engineers Specifications, and the like shall not be utilized or referenced unless specific prior written approval is obtained from the Director, Bureau of Capital Outlay Management.

5.3.2 Use of Current Forms

The specifications shall include the latest published edition / revision of the General Conditions CO-7, Instructions to Bidders CO-7a, the Standard Bid Form format and wording, the Standard format and wording for the Notice of Invitation to Bid, and all other applicable CO Forms. The latest editions are published on the DGS Forms Center at the "DGS Forms Center" webpage and may be downloaded / printed for use and inclusion in the documents.

5.3.3 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. Font size shall be suitable for microfilming or scanning and shall not be smaller than 10-point font 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:

- Table of Contents
- Notice of Invitation to Bid (Refer to Sample Format in DGS-30-256)
- Instructions to Bidders (GS Form E&B CO-7a)
- Prebid Question Form (DGS-30-272)
- Bid Form (Refer to Format in DGS-30-220)
- Standard Bid Bond Form (GS Form E&B CO-10.2)
- Commonwealth of Va. General Conditions of the Construction Contract (GS Form E&B CO-7)
- Supplemental General Conditions, if applicable (Refer to Samples in DGS-30-376)
- 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 (GS Form E&B CO-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)
- Certificate of Completion by Architect/Engineer (GS Form E&B CO-13.1)
- Certificate of Partial or Substantial Completion by A/E (GS Form E&B CO-13.1a)
- Final Report of Structural Special Inspections (GS Form E&B CO-13.1b)
- Certificate of Completion by Contractor (GS Form E&B CO-13.2)
- Certificate of Partial or Substantial Completion by Contractor (GS Form E&B CO-13.2a).
- List of Drawings
- Submittal Register Format (refer to Sample in DGS-30-364)
- Structural and Special Inspections List (GS Form E&B CO-6b)
- Division 1 - General Requirements, Special Conditions, etc.

- Technical Specifications
  (a) Technical Specification Sections shall be numbered with appropriate section numbers corresponding to an industry-standard specifications format, such as the CSI Masterformat 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 Inspection Survey Report, Lead Inspection Survey 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.

5.3.4 General Conditions of the Construction Contract

The General Conditions of the Construction Contract, Form CO-7, is a standard document 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. The term "Form CO-7", as used herein, also means the Form CO-7DB (applicable to Design-Build contracts) and the Form CO-7CM (applicable to Construction Management contracts).

No item of the General Conditions shall be amended or deleted or its intent changed without prior written approval of the Director, Bureau of Capital Outlay Management.

The latest published edition of the General Conditions, CO-7, shall be bound in the specifications or referenced. If incorporated in the bid sets by reference, a complete copy of the General Conditions shall be provided to any requestor at no charge. The Notice of Invitation to Bid and the Instructions to Bidders (CO-7A) must state where the General Conditions (CO-7) are available for inspection and from whom the prospective bidders may request and receive a copy of the General Conditions. The entity tasked with issuing the documents for bidding shall be listed as the source for obtaining a copy of the General Conditions if not included in the bid documents. A complete copy of these General Conditions shall be included in the Documents attached to/referenced by the Contract Between the Owner and the Contractor (CO-9).

The A/E shall be familiar with the requirements and provisions of the General Conditions (CO-7) and the Instructions to Bidders (CO-7a) and shall coordinate the requirements in the Specifications with those in the CO-7 and CO-7a.

5.3.5 Supplemental General Conditions

Supplemental General Conditions modify, amend or delete specific portions of the General Conditions. The sample Supplemental General Conditions are fixed and shall not be modified (other than, if used, the amount of Liquidated Damages of Section 43). The changes to the General Conditions shall be set forth and labeled "Supplemental General Conditions", and shall be submitted to the Division of Engineering and Buildings for approval. See the sample (for use of Liquidated Damages) in the "DGS Forms Center" (DGS-30-376).

5.3.6 Liquidated Damages

The use of "Liquidated Damages" can be effective when properly implemented and administered. However, Liquidated Damages is not a penalty clause and does not guarantee that the project will be finished on time. Specifying Liquidated Damages, if approved, shall be incorporated by a Supplemental General Condition and has significant legal implications and risks for the agency. If the agency wishes to specify Liquidated Damages, the agency shall prepare a justification for doing so and attach documentation on how the proposed amount per day was determined. The justification shall document costs that can be clearly identified and defended in court such as project management costs, rental costs, transportation costs associated with the work and the like. It shall NOT include speculative costs, such as loss of future revenue. Submit this information to

the Director of the Bureau of Capital Outlay Management for review and approval before incorporating Liquidated Damages in the construction documents.

5.3.7 Special Conditions

The "Special Conditions" establish specific requirements which 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, security procedures for construction personnel, and so forth. The Special Conditions shall be included in Division 1 of the Technical Specifications.

5.3.8 Instructions to Bidders

The Instructions to Bidders, G.S. Form E&B CO-7a, is a standard document which has been written to conform to the requirements and procedures of the Virginia Public Procurement Act, §2.2-4300 through 2.2-4377, *Code of Virginia*. The Instructions to Bidders shall be reproduced and included in the Documents without modification. 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 Director of the Bureau of Capital Outlay Management.

The persons at the Agency and the Architect/Engineer who are responsible for advertising, receiving, and opening bids for the project shall be familiar with and conform to the requirements of the Instructions to Bidders, Form CO-7a.

5.3.9 Types of Specifications

There are three types of specifications used on state projects:

5.3.9.1 Non-Proprietary and 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 non-proprietary manufacturer/model number type specification must list at least 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 pre-packages 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 product's 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 Director, Division

of Engineering and Buildings, to list only those two manufacturers but consider equals if proposed by the Contractor.

5.3.9.2 Proprietary Specifications

A specification is proprietary if it specifies a product / requirements which only one manufacturer can meet but the product is available from multiple vendors or sources. 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 agency requests and receives, in writing, authority from the Director of the DEB to use a proprietary specification. The agency 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. The request shall explain why the proprietary specification is necessary. If approved to use a proprietary specification, the specification shall state that that "the product specified shall be used to the exclusion of all others and no other product will be considered to be equal."

5.3.9.3 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, piece of equipment or service which is available only thru an area franchised vendor is also considered to be a Sole Source item.

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

The agency shall obtain approval from the Director, Division of Engineering & Buildings to use a sole source specification / procurement for any and all items of material, equipment or services proposed to be included in the construction contract procurement. Submit the request to DEB using a completed GS Form E&B CO-18 with back-up justification.

Prior to advertising the project for bids, the Agency shall either procure the sole source item and specify it as Owner furnished/Contractor installed or the Agency 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 the "Sample Bid Form Format" at the DGS Forms Center website for required wording.

5.3.10 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, manufactured products, and/or contractors, those known Virginia-based vendors, products or contractors shall be listed prior to listing non-Virginia based firms.

To further focus on the Commonwealth's "BUY VIRGINIA" emphasis, the IFB (or Project Manual) Cover shall be printed on the "BUY VIRGINIA" watermark/graphic shown on the 'IFB COVER FORMAT SAMPLE' located in the Forms Center.

5.3.11 Use of Standard or Guide Specifications

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 word processing applications.

The A/E shall edit the guide specifications to include only the materials, requirements, and procedures applicable to the project. Specifications which are submitted without editing will be rejected as an incomplete submittal.

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

5.3.12 Restrictive Specifications and Performance Requirements

5.3.12.1 Submittals Prior to Bid Receipt

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.

5.3.12.2 Bidder Experience

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

5.3.12.3 Prequalification of Special Systems

Complex and/or sensitive systems such as locking systems, detention equipment and security control systems for prisons often require manufacturers with a proven history of reliable, operable equipment in special situations with minimal malfunctions, as well as subcontractors who are experienced installers of that manufacturer's products. In such instances, the Agency and A/E should develop the necessary documents to prequalify the manufacturers and/or subcontractors prior to bidding. The names of those prequalified shall be listed in the bid documents for use by all general contract bidders.

5.3.12.4 Unproven Technology

Projects for the Commonwealth shall not be 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 DEB Director may, where justified, authorize use of a new material, equipment or system for a particular project on a trial basis for observation/evaluation. The Agency will be required to closely monitor the installation for compliance with manufacturer's instructions, conduct periodic inspections and report inspection results to DEB.

5.3.13 Phraseology

Specifications must clearly indicate the requirements for the project. The following instructions are intended to reduce common errors and conflicts that may result in change orders evolving from interpretations of the specifications.

1. Under “Requirements”, do not say “the Work consists of …”. Drawings should show the entire scope of the Work. If necessary to list certain parts, say “Generally, the Work includes...”
2. In lieu of reference to the accompanying drawings, use the words “as shown”, “as indicated”, “as detailed” or “as approved by ...,” “as directed by .....,” “as permitted by.....”.
3. There are two parties to the Construction Contract: (1) the Agency or Owner for whom the Work will be performed and (2) the Contractor who has the responsibility to the Owner 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.
4. Do not use “etc.” This term is too indefinite for bidding and inspection purposes.
5. Minimize the use of cross references and in no case use paragraph numbers for this purpose. If necessary to refer to a particular paragraph, do so by its section number and title (e.g. Section 03300, Cast-in-Place Concrete).
6. Do not set up a paragraph in the various sections entitled “Work not Included.” Describe the work that is included under the respective sections.
7. Specifications should clearly delineate air conditioning ducts, heating ducts and piping systems which 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.
8. Do not confuse any and all; “Correct any defects” should read “correct all defects”
9. 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.
10. 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.
11. 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.
12. Use statements that are definite and contain no ambiguous words and phrases.
13. “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”.
14. “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.
15. “Replace” implies removal of old material and furnish and install new material. The preferred wording would be to “remove”..... and “provide”.....
16. “Provide” is defined as “furnish and install”. When material or equipment is “furnished” by the Agency 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 Agency will “furnish” the materials in question.

5.3.14 Specifications on Removable Digital Media

The Agency may require the A/E to provide the Agency with one copy of the final completed technical specifications including addenda on removable digital media.

5.3.15 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.

5.4 COST ESTIMATES 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. In addition to a printed copy of the Building Cost summary form and estimate backup/details, provide an electronic copy of the completed Building Cost Summary with each estimate. 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. **An independent cost estimate is required with the preliminary submittal. If the preliminary submittal is waived or not required, the independent cost estimate shall be included in the working drawings submittal.** On large projects, where construction cost versus budget is in doubt, the Owner may elect to obtain an independent cost estimate based on the final plans and specifications prior to bidding. All cost estimates shall be submitted using ASTM Uniformat II cost breakdown structure in form DGS-30-224 (Building Cost Summary form). ASTM Uniformat II Classification Standard has been extracted, with permission, from ASTM E1557-09 Standard Classification for Building Elements and Related Sitework-UNIFORMAT II, copyright ASTM International, 100 Barr Harbor Drive, West Conshohocken, PA 19428. A copy of the complete standard may be obtained from ASTM International, www.astm.org.

5.4.1 Estimator Qualifications

Capital project estimate submissions must be prepared by professional cost estimators. Certification as a cost engineer by the Association for the Advancement of Cost Engineering (AACE), or as a certified professional estimator by the American Society of Professional Estimators (ASPE), is supporting evidence of an estimator's qualifications, although it is not required.

5.4.2 Ethics

The standards of practice described in the Canons of Ethics published by the AACE and the ASPE, and available on both their Web sites, apply to all estimating services.

5.5 DESIGN INITIATIONS / PRE-DESIGN CONFERENCE

The Agency shall arrange for a pre-design conference at BCOM for all Capital Projects. Participants should include the Agency's Capital Outlay/Construction Representative, the Agency Project Manager, the BCOM Review Team and the A/E's Project Manager and responsible designer in each discipline (architect, civil, structural, mechanical, electrical and others if needed). Where the A/E and the Agency Project Manager are both experienced in the CPSM process and the Agency determines that a pre-design conference is not needed for the project, the Agency shall notify the BCOM Director, in writing, of the decision.

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

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

- Introduction of Attendees
- Role of BCOM
- Authorized Communications
- Design not to exceed Construction Budget
- Proposed Design Schedule
- Requirements of the Manual related to the Public Procurement Act, Chapters 4-7 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 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 Criteria
- Special HVAC or environmental requirements
- Fuel Analyses & Selection
- Special electrical power or lighting requirements
- Schedule requirements for design and for occupancy
- Geotechnical data
- Site particulars and requirements
- A/E's questions and clarifications

5.6 SCHEMATIC DESIGN/PROJECT CRITERIA

5.6.1 General Requirements for Capital Projects

Unless waived by the CO-2 Action Wording, a schematic design/project criteria submittal shall be made to DEB 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 Agency and the A/E and as approved by DEB/DGS/DPB, 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 project scope profile, or a listing of the assignable rooms and spaces, which was used as the basis for development of the schematic design.

A schematic review meeting with BCOM reviewers may be requested by the Agency after the review is completed 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.

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

5.6.2 Schematic Submittal Requirements

Submit the following:

1. Basis of Design Narrative
2. CR-2 Form
3. A/E Project Cost Estimate
4. Schematic Drawings

5.6.2.1 Basis of Design Narrative

The schematic design shall include a Basis of Design Narrative in accord with Appendix D.

5.6.2.2 CR-2 Form

A completed CR-2 form shall be submitted as part of the Schematic submittal indicating, in sufficient detail, construction costs (detail provided in A/E estimate), soft costs, delivery method, anticipated bid date, anticipated construction duration, project square footage, and all anticipated project funding sources.

5.6.2.3 Schematic Cost Estimate

The A/E shall prepare a schematic design estimate in accordance with Section 5.4.

5.6.2.4 Schematic Drawings

The following drawings shall be included as a minimum:

1. Floor plans consisting of single line drawings of each floor layout showing space names, nominal room sizes, and circulation paths
2. Roof plan
3. Longitudinal building section with floor to floor and floor to ceiling dimensions
4. Transverse building section
5. Exterior elevation views
6. Structural plan of a typical supported floor framing scheme and a typical section showing the proposed components of the floor system
7. Orientation and approximate location of proposed roads, walks and parking on a site plan
8. The rooms and spaces to be protected by any proposed fire suppression system (clean agent) and the proposed locations of the major fire suppression system components.
9. The spaces to be protected by any proposed fire sprinkler system. The drawings shall identify and show the locations of the proposed locations of the fire pump, fire pump controller and system alarm valves.
10. Any other information that would be of value to the Agency and the Architect/ Engineer reviewing the project.

5.6.2.4.1 Fire Protection Information Plan – Schematic Design

Provide the following as a minimum:

1. Applicable edition of VUSBC and other applicable codes, including accessibility standards.
2. (Use) Group(s) per VUSBC. For mixed-use occupancies, indicate which Groups are separated and non-separated.
3. Construction Type per VUSBC.

4. Indicate whether or not the building will be equipped with fire protection sprinkler system and/or fire detection/fire alarm systems.
5. Tabulation of square footage per floor and total building area including new SF, existing SF to be renovated, other existing SF and total building volume (cubic feet).
6. Tabulation of units: Number of auditorium seats, bedrooms, etc.
7. Design occupant load(s), including the number of occupants to be accommodated in each space.
8. Indicate paths for means of egress, paths of exit access, travel distances to exits and common paths of travel. Indicate specific locations where access controls or security locking systems will be provided within means of egress paths.
9. For projects that will have partial, phased-in occupancy, indicate locations and construction of temporary barriers, fire resistance ratings of temporary barriers, locations of temporary exit signage, locations of temporary means of egress emergency lighting and the temporary exit access patterns at each floor for each substantially completed phase.
10. Indicate rating of all fire resistance-rated assemblies, including smoke barriers.
11. Provide a matrix that defines the "Fire-resistance Rating Requirements for Building Elements" (VCC Table 601) including exterior walls, fire walls, fire barriers, shaft enclosures, fire partitions, smoke barriers and horizontal assemblies. Matrix shall indicate the listed design assemblies proposed to achieve the required fire resistance ratings. Include copies of each listed assembly.
12. With reference symbols, completely show routes of all fire walls, fire barriers (including exit access corridor walls), and smoke partitions to illustrate continuity of fire-resistance ratings.
13. Define the UL through penetration firestop assemblies for all utilities penetrating fire rated construction.

5.6.2.4.2 Verification of Existing Conditions

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

5.7 PRELIMINARY DESIGN (DESIGN DEVELOPMENT PHASE)

5.7.1 General Requirements for Capital Projects

Based on the previous approvals and direction, the A/E shall prepare the preliminary design consisting of drawings 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, the agency shall submit new information in the format of an updated/current project scope profile, or a listing of the assignable rooms and spaces which was used as the basis for development of the preliminary design.

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.

5.7.2 Preliminary Submittal Requirements

Submit the following:

1. Basis of Design Narrative
2. Building Systems and Equipment Checklist
3. CR-2 Form
4. A/E Project Cost Estimate.
5. Independent Cost Estimate
6. VE Study and recommendations, if applicable
7. Geotechnical Report
8. Calculations
9. Preliminary Drawings

5.7.2.1 Basis of Design Narrative

The narrative shall describe 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 the Manual. See Appendix D.

5.7.2.2 Building Systems and Equipment Checklist

Complete the Building Systems and Equipment Checklist found on the Forms Center (DGS-30-232).

5.7.2.3 CR-2 Form

A completed CR-2 form shall be submitted as part of the preliminary submittal indicating, in sufficient detail, construction costs (detail provided in A/E and independent cost estimates), soft costs, delivery method, anticipated bid date, construction duration, project square footage, and all project funding sources.

5.7.2.4 A/E Preliminary Cost Estimate

The A/E shall prepare a preliminary design estimate in accordance with Section 5.4.

5.7.2.5 Independent Preliminary Cost Estimate

The Agency shall submit an independent preliminary design estimate in accordance with Section 5.4.

5.7.2.6 VE Study

Submit a value engineering study and agency recommendations in accord with Section 5.14.

5.7.2.7 Geotechnical Report

Submit a geotechnical report that includes boring logs, geotechnical analysis and foundation design recommendations.

5.7.2.8 Calculations

Submit one copy of calculations for each discipline. Indicate design criteria, loadings, assumptions, evaluations and comparisons of alternative systems, cost factors and other considerations which support the systems selected and shown on the drawings.

5.7.2.9 General Requirements for Preliminary Drawings

Preliminary drawings shall include the following information unless such information is not applicable to the project:

5.7.2.9.1 Title Sheets

1. Project Identification: Agency, Project Code Number, Appropriation Act Number.

2. Activity or function(s) to be performed in the facility
3. Edition (year) of the VUSBC on which the design is based.
4. Applicable accessibility standards.
5. VUSBC Construction Type.
6. (Use) Group(s) per VUSBC.
7. Other major code(s) used as a basis for design.
8. Maximum VUSBC occupancy for each level and total for the building.
9. Location and vicinity maps noted to show project location.
10. Tabulation of GSF per floor (new and renovated), total GSF (all floors - new and renovated), total building volume.
11. Tabulation of "Building Area" per VUSBC definition (per story).
12. Tabulation of units: Number of parking spaces, auditorium seats, bedrooms etc.
13. Building purpose / occupancy.
14. Design occupant load for each level and total for the building.
15. Index of drawings.
16. Professional seal(s) of the architect(s) and engineer(s) responsible for the design.
17. The uniform date of the completed preliminary design documents.

5.7.2.9.2 Site Drawings

Submit a site/improvement plan & composite utility plan for new construction and additions. The site plan shall be based upon an approved comprehensive Master Plan.

1. Plan scale and north arrow.
2. New and existing elevation contours affected by the work.
3. Floor and contour elevations.
4. Applicable boundaries with survey computations.
5. Dimensioned relationship of new work to boundaries and existing structures.
6. Location of test borings.
7. Location and quantities of general and accessible parking spaces.
8. Accessible routes.
9. Pedestrian traffic routes.
10. Items to be demolished: structures, walks, utilities, trees, etc.
11. Proposed landscaping (planting materials).
12. Existing and new utilities: storm drainage, sanitary sewers, water distribution, fuel gas distribution, building utility distribution pipes and tunnels, electric and telephone poles and lines, hydrant locations, and data on fire flow test, etc.
13. Site improvements such as fencing, lighting, etc.
14. Typical paving section for proposed types/thicknesses.
15. Identify/show special earthwork recommended and construction considerations noted in geotechnical report.

5.7.2.9.3 Demolition Drawings

For interior demolition:

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

For total building demolition:

1. Floor plans showing building size;
2. Description of existing material /construction to be removed;
3. Elevation (drawn or photographic) of building;
4. Asbestos Disclosure Statement;
5. Lead Disclosure Statement.

5.7.2.9.4 Architectural Drawings

1. Floor Plans (for each floor)
   a. Plans of each floor at 1/8" = 1'-0" scale, minimum
   b. Overall dimensions
   c. Space names and numbers
   d. Relationship of new work to existing spaces
   e. Identification of new work versus existing construction
   f. Locations of asbestos regardless of who removes it or how it is removed
   g. Identification of openings, entrances, delivery areas
   h. Identification of accessible routes and Areas of Refuge
   i. Plan scale and north arrow
2. Roof Plan
   a. Proposed and existing primary and emergency roof drains
   b. Roof slope: 1/4" per 1'-0" to drain minimum for all low-slope roof areas
   c. Slope (high to low) with direction arrows
   d. New and existing equipment
   e. Roof penetrations and structures
   f. Identification of materials on existing roofs
   g. Typical roofing section identifying materials
   h. Access to roof and roof mounted equipment
3. Exterior Elevations (Scale 1/8" = 1'-0" minimum)
   a. Openings: windows (including operable notation), doors, louvers, vents
   b. Percentage of glass vs. gross wall area (per elevation and/or exposure)
   c. Floor elevations
   d. Identification of all major finishes
   e. Stairs, ramps, and railings
   f. Rooftop equipment and structures
   g. Expansion and control joints
   h. Grade at the face of the building wall
   i. Subsurface construction (dotted in)
   j. Identification of new work versus existing construction
4. Small Scale Sections (Scale: 1/16"=1'-0"minimum)
   a. One longitudinal and one transverse section, minimum
   b. Floor elevations
   c. Indication of ceilings in relation to floors
   d. Method and extent of insulation of exterior envelope
5. Wall Sections (Scale: 3/4" = 1'-0" minimum)
   a. One section for each type of wall construction
   b. Identification of materials and components
   c. Identification of insulation type including “R” value
   d. Identification of air barrier and vapor barrier
6. Finish Schedule
   a. May be included in the Basis of Design narrative or on drawing. Indicate proposed finishes for all spaces. Note those existing finishes to remain.
   b. Give ceiling heights of interior spaces.

5.7.2.9.5 Furnishing/Equipment Drawings

1. Show equipment to approximate scale.
2. Show built-in furnishings to scale.

5.7.2.9.6 Structural Drawings

1. Provide Live Loads, Snow Loads, Wind Loads, and Seismic Criteria used for structural design. Refer to VCC Chapter 16.

2. Show design bearing / support capacity (soil bearing, pile capacity, caisson capacity) for foundation system.
3. Provide the design lateral active and at-rest earth pressures, where applicable.
4. Provide Foundation Plan indicating type & tentative sizes.
5. Provide Foundation details of improved bearing strata and other special requirements.
6. Provide Floor Framing` Plans of each level indicating type of system and tentative member sizes/depths and column spacing.
7. Provide Roof Framing Plan.
8. Provide Typical Section(s) of framing identifying materials, thicknesses, and depths.
9. Provide Typical Section of floor system
10. Provide Details of connections to existing buildings, if applicable.
11. Identify elements of proposed lateral force resisting system.

5.7.2.9.7 Fire Protection Information Plan and Calculations – Preliminary

Provide the following as a minimum to demonstrate compliance with the code:

1. Applicable edition of VUSBC and other applicable codes, including accessibility standards.
2. (Use) Group(s) per VUSBC. For mixed-use occupancies, indicate which Groups are separated and non-separated.
3. Construction Type per VUSBC.
4. Indicate extent of fire protection sprinkler system and fire detection/fire alarm systems.
5. Tabulation of square footage per floor and total building area including new SF, existing SF to be renovated, other existing SF and total building volume (cubic feet).
6. Tabulation of units: Number of auditorium seats, bedrooms, etc.
7. Design occupant load(s), including the number of occupants to be accommodated in each space.
8. Indicate paths of means of egress, paths of exit access, travel distances and common paths of travel. Indicate specific locations where access controls or security locking systems will be provided within means of egress paths.
9. For projects that will have partial, phased-in occupancy, indicate locations and construction of temporary barriers, fire resistance ratings of temporary barriers, locations of temporary exit signage, locations of temporary means of egress emergency lighting and the temporary exit access patterns at each floor for each substantially completed phase.
10. Indicate rating of all fire resistance-rated assemblies, including smoke barriers.
11. With reference symbols, completely show routes of all fire walls, fire barriers (including exit access corridor walls), and smoke partitions to illustrate continuity of fire-resistance ratings.
12. With reference symbols, identify the extent of all fire-rated floor/ceiling and roof/ceiling assemblies. Distinguish new walls from existing walls and new construction from existing construction.
13. Indicate locations of all portable fire extinguisher cabinets.
14. Provide drawings including typical that clearly define the locations and extent of the application of applied fire resistant materials.
15. Define the UL design assemblies specific to the respective locations and application of applied fire resistant materials.
16. Define the validation tests required for Special Inspections of applied fire resistant materials in the project. See Section 5.8.6.9.10.
17. Indicate whether the building is designated as an “essential facility” for purposes of compliance with seismic and snow provisions in VUSBC Chapter 16.
18. Indicate the seismic design category.
19. Calculations in support of the indicated Construction Type, based on Group, allowable height and allowable area, and permitted or required height and area modifications.

20. Calculations to support the indicated design occupant load on a space by space and floor by floor basis.
21. Calculations to demonstrate and support the indicated capacity of the egress components throughout the building.
22. Provide a matrix that defines the “fire-resistance rating requirements” for building elements (VCC Table 601) including exterior walls, fire walls, fire barriers, shaft enclosures, fire partitions, smoke barriers and horizontal assemblies. Matrix shall indicate the listed design assemblies proposed to achieve the required fire resistance ratings.

5.7.2.9.8 Fire Suppression Systems - Sprinklers / Standpipes

Refer to the requirements for working drawings submittals in Section 5.8.6.9.2. The more that the design is defined in the preliminary design stage, the fewer the remaining issues that must be resolved during the working drawings stages. If the project delivery method is one that will require early release packages for phased permitting, refer to specific requirements outlined in Appendix C.

5.7.2.9.9 Fire Suppression Systems – Alternate Automatic Systems

Refer to the requirements for working drawings submittals in Section 5.8.6.9.3. The more that the design is defined in the preliminary design stage, the fewer the remaining issues that must be resolved during the working drawings stages. If the project delivery method is one that will require early release packages for phased permitting, refer to specific requirements outlined in Appendix C.

5.7.2.9.10 Reserved

5.7.2.9.11 Fire Pumps

Refer to the requirements for working drawings submittals in Section 5.8.6.9.5. The more that the design is defined in the preliminary design stage, the fewer the remaining issues that must be resolved during the working drawings stages. If the project delivery method is one that will require early release packages for phased permitting, refer to specific requirements outlined in Appendix C.

5.7.2.9.12 Reserved

5.7.2.9.13 Fire Detection and Fire Alarm Systems

Refer to the requirements for working drawings submittals in Section 5.8.6.9.7. The more that the design is defined in the preliminary design stage, the fewer the remaining issues that must be resolved during the working drawings stages. If the project delivery method is one that will require early release packages for phased permitting, refer to specific requirements outlined in Appendix C.

5.7.2.9.14 Smoke Control Systems

Refer to the requirements for working drawings submittals in Section 5.8.6.9.8. The more that the design is defined in the preliminary design stage, the fewer the remaining issues that must be resolved during the working drawings stages. If the project delivery method is one that will require early release packages for phased permitting, refer to specific requirements outlined in Appendix C.

Note: Prior to the submission of preliminary design documents, the Agency and the A/E shall develop and submit a preliminary “Rational Analysis” (a detailed design report) to BCOM for review and approval. Refer to Section 5.8.6.9.8 for detailed requirements.

5.7.2.9.15 Access Control (Security)

Refer to the requirements for working drawings submittals in Section 5.8.6.9.9. The more that the design is defined in the preliminary design stage, the fewer the remaining issues that must be resolved during the working drawings stages. If the project delivery method is one that will require early release packages for phased permitting, refer to specific requirements outlined in Appendix C.

5.7.2.9.16 Applied Fire Resistant Materials

Refer to the requirements for working drawings submittals in Section 5.8.6.9.10. The more that the design is defined in the preliminary design stage, the fewer the remaining issues that must be resolved during the working drawings stages. If the project delivery method is one that will require early release packages for phased permitting, refer to specific requirements outlined in Appendix C.

5.7.2.9.17 Plumbing Drawings

1. Provide plans of each floor noting fixture locations and types. Indicate routing of main distribution lines with tentative sizes.
2. Provide riser diagrams for all piping systems.
3. Provide location of water supply and distribution, sanitary drainage, storm drainage, and sprinkler services to the building.
4. Provide plumbing fixture schedule.
5. Provide location, sizes and types of water heaters/ heat exchangers, Storage Tanks, flues, etc.
6. Provide fuel gas piping layout and connected load, if applicable.

5.7.2.9.18 Mechanical (HVAC) Drawings

1. Provide 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.
2. Provide equipment schedules with tentative sizes, capacities, ID #, features, etc.
3. Indicate locations and sizes of fans, pumps, compressors, air handling equipment, dampers, etc.
4. Provide preliminary layout and elevation of equipment room and/or central system showing configuration, tie-ins, etc. as necessary to describe system.
5. Provide central heating or cooling plants, distribution piping, equipment.

5.7.2.9.19 Electrical Drawings

(Power and lighting plans may be combined if submittal clearly conveys required information.)

1. Lighting plans for each floor showing approximate fixture location, type, and lighting level required (in foot-candles).
2. Power distribution plans showing location of incoming service, generators, and panelboards.
3. Show interface points for communications, fire alarm, EMCS and other pertinent systems.
4. Floor proposed locations for receptacles, telephone outlets and switches.
5. It is the A/E's responsibility to contact the utility company during development of the project design in order to determine the available fault current at the project site.
6. Provide the following for fire alarm systems:
    a. Indicate locations of the fire alarm system alarm-initiating and notification appliances
    b. Indicate locations of the fire alarm control and trouble signaling equipment

5.8 WORKING DRAWINGS PHASE (CONSTRUCTION DOCUMENTS PHASE)

5.8.1 General Requirements for Capital Projects

The A/E shall visit the site as necessary to ascertain pertinent local and site conditions. Based on the preliminary plans (Design Development 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 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.

Specifications and drawings for any type of built-in equipment must be submitted with the working drawings 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 Agency shall submit new information in accordance with the format shown on the sample form entitled Project Space Profile.

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.

5.8.2 Cost Estimate

The A/E shall submit a detailed Cost Estimate in conformance with the requirements of Section 5.4 and Appendix E - Cost Estimate, and advise the Agency 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 Agency 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.

5.8.3 Permits and Utilities

The A/E shall assist the Agency 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.

5.8.4 Calculations

Calculations must be organized, indexed, numbered and submitted for each discipline involved. Design calculations shall identify 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 BCOM and provide one copy to the Owner's facilities office.

5.8.4.1 Structural Calculations

Calculations for every structural member are not required. Structural calculations for members representative of the various types of structural elements should be submitted If submitted, computer printouts shall clearly indicate the individual member being analyzed or shall be

accompanied by diagrams labeled with member numbers corresponding with the printout. The A/E shall be responsible for storing the complete set of calculations.

5.8.4.2 Plumbing Calculations

Include calculations for the following:

- Plumbing fixture counts
- Domestic cold water demand
- Domestic water heater and hot water storage sizing
- Primary and secondary roof drainage system sizing
- Sanitary demand

5.8.4.3 Fuel Gas Calculations

Include calculations for the following:

- Gas piping
- Flue vent sizing

5.8.4.4 HVAC Calculations

Include calculations for the following:

- HVAC building heat gain/loss
- Ventilation (outside) air per space
- Air distribution duct sizing and static pressure
- Equipment selections including but not limited to: fans, coils, chillers, boilers, pumps, cooling towers
- Hydronic and steam piping expansion and anchoring
- Refrigerant system capacity and volume
- Fuel oil supply and storage sizing

5.8.4.5 Energy Conservation Calculations

Include calculations for the following:

- ASHRAE 90.1 compliance check
- Building envelope thermal resistance and U-values

5.8.4.6 Electrical Calculations

Include calculations for the following:

- COMCheck verification
- Demand load for all switchboard, panelboards and feeders to multiple loads in a tabular form with 25% spare capacity
- Voltage drop calculations showing no more than 2% for feeders, 3% for branch circuits and 2% for exterior branch circuits that feed lighting or equipment not mounted to the building
- Photometrics of emergency lighting along the entire path of egress, at the same scale as the floor plan provided in the working drawings. NOTE: If egress paths are not indicated on the plan, it will be assumed that the lighting levels for the entire room or area will need to meet the required illumination levels required by the VCC.

5.8.5 Submittal Requirements

Working drawings shall be complete, coordinated, and ready for approval to bid. The working drawings including the specifications shall bear a uniform date as described in this Manual. The drawings shall consist of Architectural and Engineering drawings in such detail as to show clearly the work to be performed. These drawings shall be planned to produce a set of plans with all disciplines coordinated to describe the work required. 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 which do not apply to the particular project.

Submit the following:
1. Working Drawings
2. Specifications (Project Manual)
3. Updated A/E Project Cost Estimate
4. Calculations

5.8.6 Requirements for Working Drawings

Working drawings shall show or provide the following information:

5.8.6.1 General Requirements

Each drawing to be reproduced shall include:
1. Name of the A/E,
2. Project Title,
3. Project location
4. The 11 digit state Project Code,
5. Drawing / Sheet Title,
6. Drawing / Sheet number,
7. Signed, dated professional seal(s) of the responsible licensed professional(s),
8. The uniform date of the completed documents

5.8.6.2 Title Sheet(s)

1. Project Identification: Agency, Project Code, Appropriation Act Number
2. Activity or function(s) to be performed in the facility
3. Edition (year) of the VUSBC on which the design is based
4. Applicable accessibility standards
5. VUSBC Construction Type
6. (Use) Group(s) per VUSBC
7. Other major code(s) used as a basis for design
8. Maximum VUSBC occupancy for each level and total for the building
9. Location and vicinity maps noted to show project location
10. Tabulation of GSF per floor (new and renovated), total GSF (all floors - new and renovated), total building volume.
11. Tabulation of “Building Area” per VUSBC definition (per story)
12. Tabulation of units: Number of parking spaces, auditorium seats, bedrooms etc.
13. Building Purpose/Occupancy.
14. Design occupant load for each level and total for the building
15. Design Live Loads for all floors
16. Index of drawings
17. Professional seal(s) and signature(s) of the architect(s) and engineer(s) responsible for the design. Seals shall be signed and dated. This applies to the first page of every addendum as well.
18. The uniform date of the completed construction documents

5.8.6.3 Site Drawings

Site/improvement plan & composite utility plan minimum for new construction and additions; shall be based on an approved comprehensive Master Plan.
1. Provide scale and north arrow.
2. Provide new and existing contours affected by work.
3. Provide floor and contour elevations.
4. Provide applicable boundaries with survey computations.
5. Provide dimensioned relationship of new work to boundaries and existing structures.
6. Indicate location of test borings.
7. Indicate general parking and handicap parking.
8. Indicate handicap accessible routes

9. Indicate pedestrian traffic routes.
10. Indicate demolitions: structures, walks, utilities, trees, etc.
11. Indicate proposed landscaping (planting materials)
12. Indicate 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.
13. Indicate site improvements such as fencing, lighting, etc.
14. Provide typical paving section of each type and thickness required.
15. Indicate special earthwork recommended and construction considerations noted in soils report.

5.8.6.4 Demolition Drawings

For total building demolition:

1. Provide plan of building with length & width dimensions,
2. Provide elevations (drawn or photographic) and cross section of building to be demolished,
3. Provide details of termination of demolition, underpinning, etc.
4. Asbestos and Lead Disclosure Statements

For interior / selective demolition:

1. Provide floor plans showing existing partition, etc., and showing or describing existing material and construction to be removed
2. Provide information or estimates for bidding for work to be removed.
3. Asbestos and Lead Disclosure Statements

5.8.6.5 Architectural Drawings

1. Floor Plans (for each floor)
   - Provide plans of each floor at 1/8" = 1'-0" minimum
   - Provide room/space numbers.
   - Provide overall dimensions.
   - If the work is an addition, indicate the relationship of new to existing spaces.
   - Distinguish new from existing construction.
   - Indicate 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 accessible building entrances and exits.
   - Provide scale and north arrow.
2. Reflected Ceiling Plans
   - Provide ceiling tile / grid layout
   - Indicate lighting fixture locations
   - Indicate sprinkler head locations
   - Indicate HVAC diffuser and grille locations
   - Indicate coffers, drop soffits, changes in height or materials
3. Roof Plan
   - Indicate proposed and existing drains.
   - Indicate roof slope: 1/4" per 1'-0" to drains minimum (unless waived for reroofing).
   - Indicate means of secondary (emergency) roof drainage.
   - Indicate new and existing equipment.
   - Indicate roof penetrations and structures.
   - Indicate materials of existing roofs.
   - Provide typical roofing section identifying materials.
   - Indicate access to roof.
   - Indicate direction of slope (high to low) with arrows
4. Exterior Elevations
   - Indicate scale (1/8" = 1'-0" minimum).

- Indicate openings: windows, doors, louvers, vents.
- Indicate percentage of glass vs. gross wall area.
- Indicate floor elevations (above sea level).
- Indicate finishes.
- Indicate stairs, ramps, and railings.
- Indicate rooftop equipment and structures.
- Indicate expansion and control joints.
- Indicate grade at the face of the building wall.
- Indicate subsurface construction.
- Existing and new work shall be clearly distinguished.

5. Building Cross Sections (Scale: 1/16"=1'-0" minimum)
   - Provide one longitudinal and one transverse section minimum.
   - Indicate floor levels / elevations on sections.
   - Indicate ceilings in proper relation to floors.
   - Indicate method and extent of insulating exterior envelope.
6. Details and Wall Sections (Scale: 3/4" = 1'-0" minimum)
   - Provide one section minimum for each type of wall construction.
   - Indicate major materials and components.
   - Indicate insulation and note R-value.
   - Provide one section with dimensions and details for each stair configuration, minimum.
7. Finish Schedule
   - Indicate proposed finishes for all spaces. Note those existing finishes to remain.
   - Indicate ceiling heights of interior spaces.
   - Indicate finishes, textures, colors, etc., required to be provided by the Contractor
8. Door Schedule
   - Indicate size and material for each door and door frame
   - Indicate glazing size and material for each door and frame
   - Indicate fire resistance rating for each door and frame
   - Cross reference a specified hardware set for each door assembly

5.8.6.6 Furnishing/Equipment Plans

1. Provide outline of equipment to scale.
2. Provide outline of built-in furnishings to scale.
3. Provide elevations, sections and details as necessary to describe built-in equipment, casework and furnishings included in the Work of the contractor.

5.8.6.7 Structural Drawings

1. 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.
2. Indicate design live loads, snow loads, wind loads, and seismic criteria used for design of structural systems per VCC Chapter 16.
3. Indicate design bearing / support capacity (soil bearing, pile capacity, caisson capacity) for foundation system.
4. Engineered design and details of 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 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.
5. Structural drawings shall include plans at the same scale as the architectural plans. Details and sections shall be at a scale of not less than 3/4" = 1'-0".

6. The plans, details and specifications shall completely define the structural system and special conditions for the project.
7. Provide foundation plans indicating type & sizes.
8. Provide foundation details of improved bearing strata and other special requirements.
9. Provide floor framing plans of each level indicating type of system and member sizes/depths and column spacing.
10. Provide roof framing plans.
11. Provide typical section(s) of floor and roof systems identifying materials, thicknesses, and depths.
12. Provide details of connections to existing buildings, if applicable.

5.8.6.8 Special Structural Requirements

See Appendix Q for special drawing and specification checklists for:

1. Cast-in-place reinforced concrete
2 Cast-in-place post-tensioned concrete
3. Precast concrete components
4. Structural steel
5. Steel joists
6. Pre-Engineered metal structures
7. Prefabricated wood components systems.

5.8.6.9 Fire Protection and Fire Safety Systems – Working Drawings

5.8.6.9.1 Fire Protection Information Plan and Calculations

Provide the following as a minimum to demonstrate compliance with the code:

1. Applicable edition of VUSBC and other applicable codes, including accessibility standards.
2. (Use) Group(s) per VUSBC. For mixed-use occupancies, indicate which Groups are separated and non-separated.
3. Construction Type per VUSBC.
4. Indicate extent of fire protection sprinkler system and fire detection/fire alarm systems.
5. Tabulation of square footage per floor and total building area including new SF, existing SF to be renovated, other existing SF and total building volume (cubic feet).
6. Tabulation of units: Number of auditorium seats, bedrooms, etc.
7. Design occupant load(s), including the number of occupants to be accommodated in each space.
8. Indicate paths of means of egress, paths of exit access, travel distances and common paths of travel. Indicate specific locations where access controls or security locking systems will be provided within means of egress paths.
9. For projects that will have partial, phased-in occupancy, indicate locations and construction of temporary barriers, fire resistance ratings of temporary barriers, locations of temporary exit signage, locations of temporary means of egress emergency lighting and the temporary exit access patterns at each floor for each substantially completed phase.
10. Indicate rating of all fire resistance-rated assemblies, including smoke barriers.
11. With reference symbols, completely show routes of all fire walls, fire barriers (including exit access corridor walls), and smoke partitions to illustrate continuity of fire-resistance ratings.
12. With reference symbols, identify the extent of all fire-rated floor/ceiling and roof/ceiling assemblies. Distinguish new walls from existing walls and new construction from existing construction.
13. Indicate locations of all portable fire extinguisher cabinets.
14. Provide drawings including typical and special details that clearly define the locations and extent of the application of applied fire resistant materials.

15. Define the UL design assemblies specific to the respective locations and application of applied fire resistant materials.
16. Define the validation tests required for Special Inspections of applied fire resistant materials in the project. See Section 5.8.6.9.10.
17. Indicate whether the building is designated as an “essential facility” for purposes of compliance with seismic and snow provisions in VUSBC Chapter 16.
18. Indicate the seismic design category.
19. Calculations in support of the indicated Construction Type, based on Group, allowable height and allowable area, and permitted or required height and area modifications.
20. Calculations to support the indicated design occupant load on a space by space and floor by floor basis.
21. Calculations to demonstrate and support the indicated capacity of the egress components throughout the building.
22. Provide a matrix that defines the “fire-resistance rating requirements” for building elements (VCC Table 601) including exterior walls, fire walls, fire barriers, shaft enclosures, fire partitions, smoke barriers and horizontal assemblies. Matrix shall indicate the listed design assemblies proposed to achieve the required fire resistance ratings. Include copies of each listed assembly.
23. With reference symbols, completely show routes of all fire walls, fire barriers (including exit access corridor walls), and smoke partitions to illustrate continuity of fire-resistance ratings.
24. Define the UL through penetration firestop assemblies for all utilities penetrating fire rated construction.

5.8.6.9.2 Fire Suppression Systems - Sprinklers / Standpipes

Changes to the design during the construction phase of the project shall be considered substitutions in accord with the General Conditions. Changes shall be documented by change order and shall be submitted to the Building Official for review. It is the responsibility of the A/E to provide a project specific design. Performance criteria do not meet the intent of this section.

Working Drawing Submission

Provide the following as a minimum to demonstrate code compliance:

1. Identify the occupancy hazard classification and show the location of sprinklers for each of the spaces on each floor within the buildings. The location of sprinklers are to be based on the VUSBC, NFPA 13 and the user’s programmatic requirements with the understanding that the quantity, coverage, location and type of sprinkler are not to be altered by the Contractor, without prior written approval by the A/E and the Building Official. The resulting changes are to be documented by change order.
2. Show the location of fire department valves and risers within the building. Indicate that the fire department valves are attached to either a standpipe riser, combined standpipe and sprinkler riser, or wet pipe sprinkler system risers. The locations of fire department valves are to be based on the VUSBC, NFPA 13, NFPA 14 and the user’s programmatic requirements.
3. Show proposed sprinkler piping and standpipe layout including the sprinkler mains (including cross mains) within the building and layout of branch lines for the most hydraulically demanding zone(s) on each floor of each sprinkler system. Indicate the size of pipes that are shown.
4. Provide a table summarizing the characteristics of each of the sprinkler systems. Define the type of sprinkler system(s), areas of coverage, hazard, minimum rate of water coverage (density) per area, water required for each area of coverage, hose stream allowances for each area, total water requirements for each area of coverage, hydraulically calculated pressure requirements at a common reference point at design

flow for each area of coverage, and water supply (flow & pressure) available at the common reference point.
5. Provide a small scale drawing showing locations of water hydrants, test and flow hydrants (for waterflow tests), and routing of underground pipe. Indicate the waterflow Test results, the date and time taken and who conducted the test. Indicate the water supply (flow & pressure) at a reference point common with the sprinkler/standpipe system design.
6. Show and identify all existing sprinkler systems and standpipe systems.
7. Show and indicate all new connections to existing systems.
8. Provide sprinkler riser diagram with appropriate fittings, accessories, sizes, alarms, valves, etc., noted.
9. Show all system drains.
10. Show all inspector's test station locations and associated discharge/ drainage piping.
11. Show the location of the fire department connection(s) with all interconnecting piping to the sprinkler and standpipe systems.
12. Show the location and details of the fire pump, driver, fire pump controller, piping, components and piping specialties.
13. Show the location of the fire pump test header and all interconnecting piping.
14. Show sprinkler head type, K-factor and temperature ratings.

Specifications

Provide the following as a minimum to demonstrate code compliance:
1. Provide complete specifications to reflect the systems that are defined on the drawings.
2. Provide wording in the specifications that indicate that the type of systems, the location of major components, the quantity, type, coverage, location of sprinklers, and modifications to the distribution system are not to be altered by the Contractor, without prior written approval by the A/E and the Building Official. Changes to the design depicted within the construction documents shall be considered substitutions in accord with the General Conditions and are to be documented by change order.
3. Provide a description of the acceptance testing requirements. Indicate which of the acceptance tests are to be witnessed by the regional office of the State Fire Marshal.

Calculations

Provide the following as a minimum to demonstrate code compliance:
1. Provide final hydraulic calculations for each sprinkler system and standpipe system.
2. The calculations shall demonstrate the performance of the system with an automatic water supply for the most hydraulically demanding zone on each floor of the building for each of the fire sprinkler systems compliant with NFPA 13 and NFPA 14.
3. The calculations shall also demonstrate the performance of the sprinkler and standpipe systems as connected to the manual water supply (fire department pumper truck – validate pumper truck performance with local fire department) by the fire department connection and interconnecting piping compliant with VUSBC, NFPA 13 & NFPA 14.

Shop Drawings Review

Shop drawings (working plans, product data and calculations) are to be reviewed by the A/E of record for compliance to the project contract documents and the code. At the conclusion of the shop drawing review, the A/E of record shall:
1. Verify the Underwriters Laboratories (UL) listings and classifications for the materials, components, and equipment provided for this project result in a code compliant fire suppression system.

2. Provide a "sealed" statement, attached to the reviewed shop drawings indicating that the fire suppression shop drawings (working plans, product data and calculations) satisfy the requirements of the project contract documents and the code (cite the applicable NFPA Sections).
3. Provide the regional office of the State Fire Marshal a copy(s) of the approved complete fire suppression shop drawings.
4. Provide DEB/BCOM a copy of the "sealed" statement and a copy of the transmittal to the regional office of the State Fire Marshal.
5. Refer to Section 4.6 for additional requirements.

Validation of the Fire Suppression Systems

Fire suppression systems are to be acceptance tested in accord with the requirements of the code. The regional State Fire Marshal's office shall observe the installed fire suppression system and witness the fire suppression system performance tests. The A/E and Contractor shall certify that the fire suppression system is complete.

5.8.6.9.3 Fire Suppression Systems – Alternate Automatic Systems

Changes to the design during the construction phase of the project shall be considered substitutions in accord with the General Conditions. Changes shall be documented by change order and shall be submitted to the Building Official for review. It is the responsibility of the A/E to provide a project specific design. Performance criteria do not meet the intent of this section.

Alternate automatic systems include wet-chemical systems (NFPA 17A), dry-chemical systems (NFPA 17), foam systems (NFPA 11 and NFPA 16), carbon dioxide systems (NFPA 12A) and clean agent systems (NFPA 2001). Halon systems shall not be used in the design of new fire extinguishing systems in state owned buildings.

Commercial cooking suppression systems shall either be: a pre-engineered automatic dry and wet chemical extinguishing systems tested in accordance with UL 300, and labeled and listed for the intended applications, or; developed in accordance with one of the above-referenced NFPA standards.

Working Drawing Submission

Provide the following as a minimum to demonstrate code compliance:
1. Show and identify rooms / spaces / components to be protected by the proposed fire suppression system.
2. Show the enclosure partitions (full and partial height) of the protected area.
3. Identify the locations of the major fire suppression system components.
4. Show the routing of the fire suppression system lines between the stored agent and the dispersion nozzles within each of the protected spaces. Indicate sizes of pipes that are shown.
5. Provide a table defining the type of fire suppression system(s), areas of coverage, hazard, minimum required concentration of fire suppression agent, volume of agent required for each area of coverage, total volume of agent for the areas protected by this system.
6. Show and identify all existing fire suppression systems.
7. Show the location of all dispersion nozzles for all spaces/areas protected.
8. Show the locations and components of the automatic detection system and agent releasing system. Define the specific locations for actuation devices.
9. Show the location of and define the interface requirements to connect to the building's fire alarm system.

10. Show the location of components for means of manually releasing of agent.
11. Location of controlled devices such as dampers and shutters
12. Provide fire suppression system riser diagram with appropriate fittings, fire suppression agent storage tanks, accessories, sizes, alarms, valves, etc…
13. Show and indicate all new connections to existing systems.
14. Show the location of instructional signage.

Specifications

Provide the following as a minimum to demonstrate code compliance:
1. Provide complete specifications to reflect the systems that are defined on the drawings.
2. Provide wording in the Specifications that indicate that the type of system, concentration requirements, quantity of agent required, location and type of dispersion nozzles, location of major components and modifications to the distribution system are not to be altered by the Contractor, without prior written approval by the A/E and the Building Official. Changes to the design depicted within the construction documents shall be considered substitutions in accord with the General Conditions and are to be documented by change order.
3. Provide complete step-by-step description of the system sequence of operations including functioning of abort and maintenance switches, delay timers, and emergency power shutdown.
4. Provide a description of the acceptance testing requirements. Indicate which of the acceptance tests are to be witnessed by the regional office of the State Fire Marshal.

Calculations

Provide the following as a minimum to demonstrate code compliance:
1. Complete calculations to determine enclosure volume and quantity of agent required.
2. Calculations to define the size of backup batteries
3. The method used to determine number and location of audible and visual indicating devices.
4. The method used to determine number and location of detectors.

Shop Drawings Review

Shop Drawings (working plans, product data and calculations) are to be reviewed by the A/E of record for compliance to the project contract documents and the code. At the conclusion of the shop drawing review, the A/E of record shall:
1. Verify the Underwriters Laboratories (UL) listings and classifications for the materials, components, and equipment provided for this project result in a code compliant fire suppression system.
2. Provide a “sealed” statement, attached to the reviewed shop drawings indicating that the fire suppression shop drawings (working plans, product data and calculations) satisfy the requirements of the project contract documents and the code (cite the applicable NFPA Sections).
3. Provide the regional office of the State Fire Marshal a copy(s) of the approved complete fire suppression shop drawings.
4. Provide DEB/BCOM a copy of the “sealed” statement and a copy of the transmittal to the regional office of the State Fire Marshal.
5. See Section 4.6 for additional requirements.

Validation of the Fire Suppression Systems

Fire suppression systems are to be acceptance tested in accord with the requirements of the code. The regional State Fire Marshal's office shall observe the installed fire suppression system and witness the fire suppression system performance tests. The A/E and Contractor shall certify that the fire suppression system is complete.

5.8.6.9.4 Reserved

5.8.6.9.5 Fire Pumps

Changes to the design during the construction phase of the project shall be considered substitutions in accord with the General Conditions. Changes shall be documented by change order and shall be submitted to the Building Official for review. It is the responsibility of the A/E to provide a project specific design. Performance criteria do not meet the intent of this section.

Application of Fire Pumps in Fire Suppression Systems

A fire sprinkler/standpipe suppression System is to provide a reasonable degree of protection for life and property from fire based on sound engineering principles, test data, and field experience. One key component of the system is a reliable water supply of acceptable volume and pressure. The connection of the fire suppression system to a public water supply that is of acceptable volume and pressure is considered to be the most "reliable water supply". Where the building characteristics are such that the water supply requirements of the designed fire suppression system cannot be provided by the available water supply then the incorporation of an automatically controlled fire pump into the fire suppression system, compliant with NFPA 20 *Standard for the Installation of Stationary Pumps for Fire Protection*, shall result in an "acceptable water supply." Sound engineering principles are to be incorporated into the design of the fire suppression system to result in the most reliable and acceptable water supply for the project.

Electrical Requirements

Fire pump electrical components and systems shall comply with the *National Electric Code* (NFPA 70) section(s) on fire pumps. The power for fire pumps shall be from a service which is both electrically and mechanically separate from the remainder of a building's power supply.

Emergency Electrical Systems

Fire pumps are considered to be an emergency system and shall comply with the additional electrical requirements of the *National Electric Code* (NFPA 70) section on emergency power, where any of the following condition(s) occurs:

1. The building is more than 75 feet in height.
2. The building has a total assembly design occupant load that exceeds 1,000 people.
3. The building is designated as an Emergency Shelter (VUSBC Section 1604.5).
4. Electric motor driven fire pumps are used and the height of the structure is beyond the capacity of the fire department apparatus.

Working Drawing Submission

Provide the following as a minimum to demonstrate code compliance:

1. Show the location of the fire pump, pressure maintenance pump, pump controllers, piping, components and piping specialties.
2. Provide details of the fire pump, pressure maintenance pumps, pump controllers, suction piping, discharge piping, components and piping specialties.

3. Provide a table summarizing the water supply characteristics for the most demanding area of each of the sprinkler systems supplied by the fire pump. Define the type of sprinkler system(s), water flow and pressure requirements for each area of coverage, hose stream allowances for each area, resulting total water flow and pressure Requirements for each area of coverage, water supply (flow & pressure) available, fire pump, resulting available water supply, resulting safety factor in psig for each sprinkler system.
4. Provide a small scale drawing showing locations of water hydrants, test and flow hydrants (for waterflow tests), and routing of underground pipe. Indicate the waterflow test results, the date and time taken and who conducted the test. Indicate the water supply (flow & pressure) at a reference point common with the sprinkler/standpipe system design.
5. Show and identify all existing sprinkler systems and standpipe systems in the vicinity of the fire pump(s).
6. Show and indicate all new connections to existing systems.
7. Show the location of the fire department connection(s) with all interconnecting piping back to the fire pump.
8. Show the location of the fire pump test header and all interconnecting piping.
9. Show the location of the electrical components of the fire pump, driver, fire pump controller and ancillary electrical components.
10. Show the location, size and routing of the conduits and conductors serving the fire pump, driver, fire pump controller, and ancillary electrical components.
11. Provide details of the electrical components serving the fire pump, driver, fire pump controller, piping, components and piping specialties.
12. Where multiple fire pumps or multiple sources of power are required, provide a diagram on the drawings that defines all of the applicable components and defines the sequence of operation.

Specifications

Provide the following as a minimum to demonstrate code compliance:
1. Provide complete specifications to reflect the systems that are defined on the drawings.
2. Provide wording in the specifications that indicate that the modifications to the fire pump and ancillary components are not to be altered by the Contractor, without prior written approval by the A/E and the Building Official. Changes to the design depicted within the construction documents shall be considered substitutions in accord with the General Conditions and are to be documented by change order.
3. Provide a description of the acceptance testing requirements. Indicate which of the acceptance tests are to be witnessed by the regional office of the State Fire Marshal.

Calculations

Provide the following as a minimum to demonstrate code compliance:
1. Provide hydraulic calculations that demonstrate that the most hydraulically demanding zone(s) of the fire sprinkler system(s) is satisfied by the automatic water supply (water supply plus fire pump) compliant with the requirements of NFPA 13, NFPA 14 and NFPA 20.
2. Where the height of the structure is beyond the capacity of the fire department apparatus, provide hydraulic calculations that demonstrate the performance of the standpipe system(s) as connected to the automatic water supply (water supply plus fire pump) compliant with the VUSBC, NFPA 13 & NFPA 14.

Existing Fire Pumps

Where an existing fire pump is to be used in the project, its performance and condition is to be established and validated. This is to be accomplished by submitting a copy of the recent report of the fire pump inspection, testing, and maintenance, compliant with the *Virginia Statewide Fire Prevention Code: Fire Pumps - Testing and Maintenance.* This section requires that fire pumps be inspected, tested, and maintained in accordance with NFPA 25. The current edition of NFPA 25 defines the parameters for the report. The performance and condition of the fire pump is to be validated on an annual basis.

Shop Drawings Review

Shop drawings (product data, sketches and certified shop test pump curves) are to be reviewed by the A/E of record for compliance to the project contract documents and the code. At the conclusion of the shop drawing review, the A/E of record shall:

1. Verify the Underwriters Laboratories (UL) listings and classifications for the materials, components, and equipment provided for this project result in a code compliant fire pump system.
2. Provide a "sealed" statement, attached to the reviewed shop drawings indicating that the fire pump shop drawings (product data, sketches and certified shop test pump curves) satisfy the requirements of the project contract documents, the VUSBC and NFPA 20.
3 Provide the regional office of the State Fire Marshal a copy(s) of the approved fire pump shop drawings.
4. Provide DEB/BCOM a copy of the "sealed" statement and a copy of the transmittal to the regional office of the State Fire Marshal.
5. See Section 4.6 for additional information.

Validation of the Fire Pump

The fire pump(s) is to be acceptance tested in accord with the requirements of the code. The regional State Fire Marshal's Office shall observe the installed fire pump and ancillary components. The regional State Fire Marshal's office shall witness the fire pump performance tests. The A/E and Contractor shall certify that the fire pump installation is complete.

5.8.6.9.6 Reserved

5.8.6.9.7 Fire Detection and Fire Alarm Systems

The A/E shall provide complete project specific drawings and specifications that define a code compliant fire alarm system. User's programmatic requirements which may supplement or provide additional levels of protection above the minimum requirements of the code shall be included in the design. Changes to the design during the construction phase of the project shall be considered substitutions in accord with the General Conditions. Changes shall be documented by change order and shall be submitted to the Building Official for review. The A/E shall assure that code compliant fire alarm Systems(s) are provided through the review of the fire alarm shop drawings and the observation of the progress and quality of the work. The A/E shall confirm that the fire alarm system(s) is complete and code compliant. It is the responsibility of the A/E to provide a project specific design. Performance criteria do not meet the intent of this section.

Provide the following as a minimum to demonstrate code compliance:

1. Locate and identify all fire alarm system alarm-initiating and notification appliances.
2. Locate and identify where protective covers are utilized with fire alarm system alarm initiating and notification appliances.
3. Locate and identify all fire alarm control and trouble signaling equipment.

4. Locate and identify all existing alarm system alarm-initiating and notification appliances.
5. Locate and identify all existing fire alarm control and trouble signaling equipment.
6. Locate and identify the interface requirements for all fire alarm system alarm initiating devices provided by other trades such as HVAC duct smoke detectors, kitchen hood fire suppression systems, fire sprinkler flow and tamper switches.
7. Locate and identify the interface requirements for all devices whose operation is initiated by the fire alarm system such as door hold open devices, fire shutters, elevator recall, electronic door hardware and smoke control systems.
8. Identify the primary and secondary power supplies and connections.
9. Identify the candela output levels for all visual alarm notification appliances. Candela ratings such as “15/75” are not compliant.
10. Provide a matrix that defines the interface of the fire safety control functions. Define the action that will initiate an alarm or trouble condition. Define the alarm-initiating device activated, the action of the control and trouble signaling equipment, and the resulting alarm notification appliance actions and resulting operation of interfaced equipment.
11. Provide fire alarm system riser diagram showing all system components. Define the “zones” to be protected. Diagrammatically define the location of the constantly attended location from which the fire alarm system will be supervised. Define the interface between the fire alarm system and the constantly attended location.
12. Provide wording in the Specifications that indicate that the location and type of fire alarm system alarm-initiating appliances and the type of fire alarm system alarm notification appliances and control and trouble signaling equipment, the location of major components are not to be altered by the Contractor, without prior written approval by the A/E and the Building Official. Changes to the design depicted within the construction documents shall be considered substitutions in accord with the General Conditions and are to be documented by change order.
13. Provide a description of the acceptance testing requirements. Indicate which of the acceptance tests are to be witnessed by the regional office of the State Fire Marshal.
14. Demonstrate that the quantity and location of the audible alarms as indicated on the drawings attain the required sound pressure levels in each of the respective spaces.
15. Demonstrate that the required capacity of the secondary power supply is attained.
16. Demonstrate that the indicated candela performance is attained for alarm notification devices where protective covers are utilized.

Shop Drawings Review

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

1. Verify the Underwriters Laboratories (UL) listings and classifications for the materials, components, and equipment provided for this project result 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 project contract documents and the code (cite the applicable NFPA).
3. Provide the regional office of the State Fire Marshal a copy(s) of the approved complete fire alarm shop drawings.
4. Provide DEB/BCOM a copy of the “sealed” statement and a copy of the transmittal to the regional office of the State Fire Marshal.
5. See Section 4.6 for additional requirements.

Validation of the Fire Alarm Systems

Fire alarm systems are to be acceptance tested in accord with the requirements of the code. The regional State Fire Marshal's 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.

5.8.6.9.8 Smoke Control Systems

Changes to the design during the construction phase of the project shall be considered substitutions in accord with the General Conditions. Changes shall be documented by change order and shall be submitted to the Building Official for review. The A/E shall assure that code compliant smoke control system is provided through the review of shop drawings and the observation of the progress and quality of the work. The A/E shall confirm that the smoke control system is complete and code compliant.

The VUSBC defines 3 methods of smoke control. These are 1) Pressurization Method, 2) Airflow Design Method and 3) Exhaust Method. Large enclosed volumes, such as atriums, shall be permitted to utilize the Exhaust Methods. Smoke control systems using the Exhaust Method shall be designed in accordance with one of the five design approaches defined in NFPA 92B. The Building Official's approval is required for the use of any of these methods within a project.

Prior to the submission of preliminary design documents, the Agency and the A/E shall develop and submit a preliminary "Rational Analysis" (a detailed design report) to BCOM for review and approval. The Rational Analysis shall define the type of smoke control system proposed, design fundamentals of the system, calculation procedures to be followed, the method of operation, supporting systems and design fires consistent with the VUSBC section on "Smoke Control Systems – Analysis". When the preliminary "Rational Analysis" is accepted by BCOM, complete and submit the final Rational Analysis documents with the preliminary design documents to BCOM for review and approval.

Provide conceptual floor plans which identify the locations of the major components, pertinent calculations, sequence of operation and any other information that may assist in the evaluation of the methods are to be included in the documents submitted to the Building Official. It is the responsibility of the A/E to provide a project specific design. Performance criteria do not meet the intent of this section.

Provide the following as a minimum to demonstrate code compliance:

1. Locate and identify all of the walls, floors and ceilings that define the perimeter of the space(s) to be protected by the smoke control system.
2. Locate and identify the HVAC system components respective to the smoke control system.
3. Locate and identify all smoke dampers respective to the smoke control system.
4. Locate and identify all motorized dampers respective to the smoke control system
5. Locate and identify the interface requirements with the fire alarm system.
6. Locate and identify the interface requirements for all devices whose operation is required by the smoke control system such as door hold open devices, smoke dampers, fire shutters, motorized ventilation dampers, fans, air handlers and smoke detectors.
7. Identify the primary and secondary power supplies and connections.
8. Provide wording in the specifications that indicate that the components of and their locations which make up the smoke control system are not to be altered by the Contractor, without prior written approval by the A/E and the Building Official. Changes to the design depicted within the construction documents shall be considered

substitutions in accord with the General Conditions and are to be documented by change order.
9. Provide a description of the acceptance testing requirements. Indicate which of the acceptance tests are to be witnessed by the regional office of the State Fire Marshal.
10. Provide calculations as defined by the VUSBC and NFPA 92B that establish the performance requirements for the method of smoke control for this project.

Shop Drawing Review

The shop drawings (working plans, product data and calculations) of the components that result in the smoke control system are to be reviewed by the A/E of record for compliance to the project contract documents and the code. At the conclusion of the shop drawing review, the A/E of record shall:
1. Verify the Underwriters Laboratories (UL) listings and classifications for the materials, components, and equipment provided for this project result in a code compliant smoke control system.
2. Provide a "sealed" statement, indicating that the shop drawings submitted for the smoke control system (working plans, product data and calculations) satisfy the requirements of the project contract documents, the VUSBC, and the applicable NFPA Standard (cite the applicable NFPA Standard as referenced by the CPSM).
3. Provide the regional office of the State Fire Marshal a copy(s) of the complete approved smoke control shop drawings with a copy of the "sealed statement".
4. Provide DEB/BCOM a copy of the "sealed" statement and a copy of the transmittal to the regional office of the State Fire Marshal.
5. See Section 4.6 for additional requirements.

Validation of the Smoke Control System(s)

The smoke control system(s) are to be acceptance tested in accord with the requirements of the code. The regional State Fire Marshal's office shall observe the installed components of the smoke control system(s) and witness the smoke control system performance tests. The A/E and Contractor shall certify that the smoke control system is complete prior to acceptance testing by the Building Official.

5.8.6.9.9 Access Control Systems (Security)

Shop drawings shall be submitted to BCOM for work elements including: electric strikes, electric latches, electric locks, magnetic locks and other electronic controls (card keys, access buttons, proximity sensors etc.), even if used as an overlay on mechanical door hardware.

Provide the following as a minimum to demonstrate code compliance:
1. Building floor plans defining the locations and components of the access control hardware proposed.
2. Door hardware details and elevations defining the locations of all associated access control hardware.
3. A copy of the door hardware (mechanical hardware) shop drawings for the doors where the access controls are to be provided;
4. A sequence of operations demonstrating compliance with the requirements of the *Virginia Construction Code*, Section 1008 Doors, Gates and Turnstiles;
5. Documentation demonstrating that each of the access control components are listed for the intended use and that per the manufacturer's documentation the specific components are compatible with each other;
6. A description of how the elements interface with the building's fire alarm system.

Other security measures including cameras, contact switches or other security items which do not affect means of egress are not required to be included.

5.8.6.9.10 Applied Fire Resistant Materials

The A/E shall provide complete project specific drawings and specifications that result in code compliant fire resistive construction through the use of applied fire resistant materials. Applied fire resistant materials include spray-applied fire resistant materials, fire resistant mastics and intumescent coatings. The A/E shall determine which members are required to be fireproofed and indicate the minimum thickness of the applied fire resistant materials to be applied. Changes to the design during the construction phase of the project shall be considered substitutions in accord with the General Conditions. Changes shall be documented by change order and shall be submitted to the Building Official for review. The A/E shall assure that code compliant fire resistive construction is provided through the review of the applied fire resistant material shop drawings and the observation of the progress and quality of the work. The A/E shall confirm that the fire resistive construction is complete and code compliant.

Provide the following as a minimum to demonstrate code compliance:

1. Provide drawings (small scale structural framing plans) including typical and special details that clearly define the locations and extent of applied fire resistant materials. Drawings should be structural steel plans without irrelevant walls, doors and other features that would obscure a clear representation of the extent of fireproofing.
2. Define the UL design assemblies specific to the respective locations and application of the applied fire resistant materials.
3. Provide complete Specifications to reflect the applied fire resistant materials assemblies that are defined on the drawings.
4. The specifications shall clearly state that no asbestos-containing material will be permitted. Contractor shall be required to certify that the material being used contains no asbestos.
5. **Where structural steel members having different thicknesses of applied fire resistant materials 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.**
6. 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 applied fire resistant materials as the structural member.
7. All applied fire resistant materials shall be tested after installation according to ASTM E-605, ASTM E-736, ANSI/UL 263 and ANSI/UL 1709, latest editions. Include the specific validation testing requirements as defined below. These tests shall be made by an independent testing laboratory. The Owner shall arrange and pay for laboratory services for field and laboratory tests and reports. The Contractor shall schedule the tests while the material is accessible. If additional tests are required as a result of non-compliance with the specifications; the additional tests and reports shall be paid for by the Contractor.
8. The independent testing laboratory reports shall clearly show the location of the tests and test results. Copies of the reports shall be sent through the A/E to the Owner, State Fire Marshal and Bureau of Capital Outlay Management.

<u>Removal and Replacement of Sprayed-on Material</u>

Agencies and/or their A/E shall contact the Building Official 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 resistance characteristics. Submit plans and specifications to the Building Official which will include any bidding documents, addenda or

change orders which may relate to the fire resistance characteristics of the existing structure. Include the date(s) of construction, original and present uses, height in floors and feet, whether sprinkled and any other information that may assist the Building Official in his determination.

Shop Drawings Review

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

1. Verify the Underwriters Laboratories (UL) design assemblies and for the materials, and components provided for this project result in code compliant fire resistive construction.
2. Provide a "sealed" statement, attached to the reviewed shop drawings indicating that the sprayed-on fireproofing shop drawings (working plans, product data and calculations) satisfy the requirements of the project contract documents and the code.
3. Provide the regional office of the State Fire Marshal a copy(s) of the approved complete shop drawings.
4. Provide DEB/BCOM a copy of the "sealed" statement and a copy of the transmittal to the regional office of the State Fire Marshal.
5. See Section 4.6 for additional requirements.

Validation of Sprayed-on Fireproofing Assemblies

Applied fire resistant material assemblies are to be acceptance tested in accord with the requirements of the code and the requirements defined herein. The regional State Fire Marshal's office shall observe the installed fireproofing assemblies. The independent testing laboratory reports shall clearly show the location of the tests and test results. The A/E and Contractor shall certify that the sprayed-on fireproofing assemblies are complete. Copies of the reports shall be sent through the A/E to the Owner, State Fire Marshal and Bureau of Capital Outlay Management.

Validation Testing Requirements

All applied fireproofing shall be tested after installation according to ASTM E-605, ASTM E-736, ANSI/UL 263 and ANSI/UL 1709, latest editions. The minimum location and number of tests of the applied fireproofing shall conform to the requirements below:

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

5.8.6.10 Plumbing Drawings

1. Indicate items to be demolished as part of renovation projects.
2. Provide plans for each floor noting locations and types of fixtures, water supply and distribution, sanitary drainage and special piping.
3. Provide plumbing fixture schedules showing designations, connection sizes, and mounting heights of accessible fixtures. Flush valve handles shall be located on the wide side of the accessible stall.
4. Provide plans indicating roof drains and areas served by each in square feet, piping and sizes.
5. Provide riser diagrams indicating fixtures, water supply and distribution, sanitary drainage and special piping
6. Provide details of connections at water heaters, air compressors and roof drain installation.
7. Provide equipment schedules for water heaters, air compressors, air dryers and drains.

5.8.6.11 Mechanical (HVAC) Drawings

1. Indicate items to be demolished as part of renovation projects.
2. Provide plans of each floor and roof indicating double line-duct layouts and mechanical equipment. Plans shall indicate ceiling-mounted lighting fixtures.
3. Provide plans for each floor indicating chilled water, heating hot water, steam and condensate piping and piping sizes. Show provisions for expansion. (This may be shown on ductwork plans when legible.)
4. Provide layouts of mechanical equipment and fan rooms to a scale not less than twice that of the floor plans. Show equipment, ducts and piping to coordinate the installation in tight areas. Show access and service space requirements such as that required for tube, coil, and fan removal.
5. Provide schedules for all mechanical equipment, steam traps, and air devices, showing sizes, capacities, HP, CFM, electrical characteristics, locations and features.
6. Provide drawings showing control schematics and automation points.
7. Provide diagrams of chilled and heating water, steam, and condensate piping.
8. Indicate central heating and cooling plants, distribution piping, equipment, anchors and expansion joints.
9. Provide sections as required to clearly show the work in 3 dimensions.
10. Indicate the building heating loads (in BTU or pounds of steam per hour) to include transmission plus infiltration, outside air, domestic hot water, and kitchen, laundry, hospital hot water and outside air loads.
11. Indicate the sensible and total air conditioning cooling load of the building in tons. Also show the outside air portion of the cooling load in tons.
12. Indicate fitting types for ducts.

5.8.6.12 Electrical Drawings

Power and lighting plans may be combined if the combined drawing clearly conveys required information.

1. Provide lighting plans for each floor indicating fixture location, type and lighting level required (in foot-candles).
2. Provide power distribution plans indicating incoming service, generators and panelboards.
3. Indicate interface points for communications, fire alarm, and EMCS.
4. Provide floor plans indicating receptacles, telephone outlets, switches, audio visual and data.
5. Indicate, in kilowatts or KVA, electrical load total, three-phase load, motor load and size of largest motor in horsepower.
6. Provide control diagrams, panel board schedules and riser diagrams.
7. Provide lighting fixture schedule on the drawings.

5.8.6.13 Control Systems

1. Provide a written sequence of operation on the plans for each mechanical and electrical control system stating explicitly how systems are intended to function.
2. Provide data regarding safety, alarms, indicators and control parameters.
3. Provide control system input/output summaries.
4. Indicate point(s) of connection of new to existing system.
5. Indicate location of operator interface.

5.8.7 Project-Specific Specifications

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. Specifications shall conform to the requirements and standards listed in Section 5.3.

5.8.8 Rock Excavation

See Chapter 6 for requirements. Provide estimated quantities of rock excavation on the Bid Form.

5.8.9 Submission

The A/E shall prepare and submit working drawings and specifications for the Agency to submit to the various review agencies for approval as pertinent to the project. (See Section 5.11.)

5.8.10 Time for Completion

With this submission, the A/E shall furnish the Agency with an estimate of the time for constructing the project and include such in the appropriate paragraph of the bid form.

5.9 BID FORMS AND PROCEDURES

5.9.1 Instructions to Bidders

Use the standard Instructions to Bidders, GS Form E&B CO-7a. Do not retype or modify the Instructions to Bidders, CO-7a, without permission from the Director of the Bureau of Capital Outlay Management. 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.

5.9.2 Unit Price Bids

Unit price bids without estimated quantities shall not be requested on the bid form. Unit prices may be used only where the required quantity cannot be reasonably determined by the bidders from the documents. (e.g. total length of piles required, total length of caissons, amount of rock excavation, etc.) See Section 6.0.7 for guidance on unit price bids.

In such case, an estimated quantity of the unit of construction is provided by the Agency (and its A/E) on the bid form; the quantity as provided on the bid form and the unit price inserted by the bidder are multiplied together to give a lump sum amount; and the lump sum amount is added with the other base bid amounts to determine the total base bid amount. Use the wording and format shown on the Sample Bid Form Format, DGS-30-220 in the DGS Forms Center to allow an adjustment to the Contract Price based on the actual quantities provided and approved in the Work. It is not appropriate to list small or insignificant estimated quantities for unit prices on the bid form.

5.9.3 Bid Form Preparation

Bid Forms shall be prepared using the format and wording shown on the Sample Bid Form Format, DGS-30-220 in the Forms Center. The Bid Form shall state the basis for determining the low bidder for award of the contract as shown on the Sample Bid Form. The contractor's Disqualification Statement and the Immigration Reform and Control Act of 1986 statement shall be

included on each bid form. See Section 5.10 of this Chapter for requirements and procedures concerning Additive Bid Items.

Inclusion or use of "Allowances" in the Bidding is not permitted. Options are to specify the work in the documents and bid competitively with the rest of the project OR procure the work separately and include the subcontractor's name and price on the Bid Form similar to the method used for "HVAC monitoring" on Standard Bid Form Format DGS-30-220 .

5.9.4 Prequalification of Contractors or Subcontractors

As provided in §2.2-4306 of the *Code of Virginia*, prospective bidders may be prequalified for bidding on projects. (Prequalification criteria, procedures, and appeal process requirements are provided in Chapter 7 of the Manual.)

5.9.5 Advertising

The Agency shall notify the A/E in writing when final working drawings and specifications have been approved. The Agency shall establish a time and place for receiving bids. Bid receipt dates shall be coordinated through BCOM. The A/E shall use this information in completing the Advertisement, the 'Posting' and the Notice of Invitation for Bids.

For all work in excess of $100,000, a minimum period of 30 days shall be allowed from date of the original advertisement / Posting of Notice to the date of bid receipt unless otherwise approved by the BCOM Director. Projects estimated to cost less than $100,000 may be advertised for shorter periods of time such as 21 or 14 days (depending on whether more than one trade is involved) but no less than the 10 days required by the *Code of Virginia*.

§2.2-4301 of the *Code of Virginia*, "Competitive Negotiation", requires that Requests for Proposals (RFP) be 'posted' and advertised in the newspaper of general circulation in the area. If the agency determines that the work can be procured by competitive negotiation, it must advertise the RFP in the newspaper as well as public posting and posting on the eVA website.

§2.2-4301 of the *Code of Virginia*, "Competitive Sealed Bidding", requires that Invitations for Bid (IFB) be 'posted' on the Department of General Services' central electronic procurement website http://www.eva.virginia.gov/. In addition to posting electronically, the IFB may also be advertised in a newspaper. When advertising in the newspaper, the Agency may post the full Notice of Invitation for Bid (such as DGS-30-256) or it may use the 'short form' Notice posting the minimum information as shown in DGS-30-252. As a minimum, include the information indicated on the sample "Notice of Invitation for Bids" provided as form DGS-30-252 on the DGS Forms Center.

Newspapers which are considered to have daily statewide circulation in Virginia are the Richmond Times-Dispatch, the Norfolk Virginian-Pilot, the Roanoke Times & World News and the Washington Post. The project may also be advertised in a newspaper which serves the area where the project is located if different from the above. A Notice of the Invitation for Bids shall 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 advantageous for large projects.

The Agency may authorize the A/E to advertise in the newspaper in the name of, and at the expense of the Agency, for construction bids in accordance with provisions of §2.2-4301 the *Code of Virginia*.

5.9.6 eVA Vendor Registration

When procuring construction, professional services and non-professional services, attach the applicable vendor registration statement (either DGS-30-384 or DGS-30-385) to the following

documents: Request for Proposals, Invitation for Bids, Notice of Intent to Award, Notice of Award, A/E Contracts, and Construction contracts.

Use **DGS-30-384** when the quantity of orders that will be issued is known, and insert that number on the blank provided (e.g., one, twelve, monthly, etc.)

Use **DGS-30-385** when the quantity of orders that will be issued is unknown.

These statements may be downloaded from the DGS Forms Center.

5.10 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 Agency 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 Agency and A/E have incorporated reasonable cost containment measures in the design, Additive Bids Items may, with the approval of the BCOM Director, be used for budget control subject to the following limitations:

- 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.
- The total cost estimate of the Total Base Bid plus all Additive Bid Items shall not exceed 110% of the 'Construction Cost' on the CO-6 for Capital Outlay Projects or 110% of the Budget for Non-Capital Projects
- Additive Bid Items shall be structured to minimize additional effort necessary to prepare the bid.
- 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.
- 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.
- Only the term Additive Bid Item shall be used. **Use of the term 'Alternate' is not permitted.**
- The Work included in each Additive Bid Item shall produce a complete component which may be incorporated into the work in the Base Bid.
- Each Additive Bid Item shall be independent of other Additive Bid Items.
- 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.
- Additive Bid Items shall be sequenced so the most essential Additive is listed first.
- When the project bids are received and opened, the low bidder shall be determined based on the lowest bid which combines the Total Base Bid Amount plus the total amount of the Additive Bid Items, taken in sequence, which the Owner in its sole discretion decides to accept/award.
- Out-of-sequence selection of Additive Bid Items is prohibited, even if such manipulation would fit within the available funding.
- Negotiation of Additive Bid Item amounts is 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. Permission to negotiate with the low bidder must be obtained from the Director, Bureau of Capital Outlay Management.

5.11 PROJECT SUBMISSION REQUIREMENTS

5.11.1 Capital Project Submittals

The A/E shall provide adequate copies of plans, specifications, cost estimates, and other applicable data for the Agency'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:

Agency	No. of copies to be submitted to Agency					
	SD	PD	WD	RWD	BID	PBM/CO
BCOM / State Building Official	5	5	5	5	3	3
Regional State Fire Marshal's Office			1	1	1	1
DEQ – Div of Soil & Water Conservation						
DEQ Erosion & Sediment Control	Coordinate with the agency					
DEQ Stormwater Management	Coordinate with the agency					
Art & Architecture Review Board	Presentations to Board at SD, PD					
Dept. of Historic Resources	Coordinate with the agency					
Dept. of Health (Food Service)	Coordinate with the agency					
Dept. of Environmental Quality (DEQ)						
DEQ Air Division	Coordinate with the agency					
DEQ Water Division	Coordinate with the agency					
DEQ Waste Division	Coordinate with the agency					
County or City Manager	Provide 1 copy at completion of PD					

Legend:

SD: **Schematic Design**
PD: **Preliminary Design**
WD: **Working Drawings**
RWD: **Revised Working Drawings**
BID: **Bid Documents, including Addenda**
PBM/CO: **Post Bid Modifications or Change Orders**

The A/E shall coordinate with and obtain approval of the utility designs from the local utilities agencies for connection and service. The A/E shall coordinate with local Fire Service entity for locations of on-site hydrants and Fire Department Connections.

The A/E shall coordinate with and shall obtain approval of the entrance design and 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.

5.11.2 Non-Capital Project Submittals

The A/E shall provide adequate copies of plans, specifications, cost estimates, and other applicable data for the Agency'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:

Agency	No. of copies to be submitted to Agency					
	SD	PD	WD	RWD	BID	PBM/CO
BCOM / State Building Official	5	5	5	5	3	3
Regional State Fire Marshal's Office			1	1	1	1
DEQ – Div of Soil & Water Conservation						
DEQ Erosion & Sediment Control	Coordinate with the agency					
DEQ Stormwater Management	Coordinate with the agency					
Art & Architecture Review Board	Presentations to Board at SD, PD					
Dept. of Historic Resources	Coordinate with the agency					
Dept. of Health (Food Service)	Coordinate with the agency					
Dept. of Environmental Quality (DEQ)						
DEQ Air Division	Coordinate with the agency					
DEQ Water Division	Coordinate with the agency					
DEQ Waste Division	Coordinate with the agency					
County or City Manager	Provide 1 copy at completion of PD					

Legend:

SD:	**Schematic Design**
PD:	**Preliminary Design**
WD:	**Working Drawings**
RWD:	**Revised Working Drawings**
BID:	**Bid Documents, including Addenda**
PBM/CO:	**Post Bid Modifications or Change Orders**

5.11.3 Electronic Documents Submittal

For projects with a construction budget greater than $10 million, the A/E shall provide two copies of the Building Permit documents in PDF format on removable digital storage media for Agency and BCOM use. The file structure shall be one file for drawings and one file for specifications. The drawing file shall include a Table of Contents and bookmarks identifying each sheet by number and name. The specification file shall include a Table of Contents and bookmarks identifying each section by CSI number and name.

5.12 REVIEWS AND APPROVALS

5.12.1 General

Reviews are performed as a service to the Agency and do not relieve the Agency, 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.

5.12.2 Building Official Review

The Director, Division of Engineering and Buildings (DEB), as Building Official for all buildings on state property is responsible for the review of the working drawings / bid documents to assure conformance with the requirements of the VUSBC, the ADA, and other DEB Standards established for construction and/or modification of state-owned buildings. The Bureau of Capital Outlay Management (BCOM) is the DEB Director's staff tasked with performing these reviews. When the Building Official is satisfied that the documents are in conformance with all applicable VUSBC and CPSM Chapter 4 requirements, the Agency shall submit an application for Building Permit, CO-17.

5.12.3 Annual Permit Work

See Appendix P, "Building Permit Policy for Construction – State Owned Buildings & Structures" for guidance on the types of Work which may be performed by the Agency under the Annual Permit. The Agency Representative designated on the permit shall be responsible to the Building Official for review & approval of documents, issue of a Project Permit, and inspection of the Work for conformance with VUSBC requirements. See Chapter 4 for information on the Annual Permit Representative.

5.12.4 BCOM Review Comments

BCOM will transmit written review comments to the Agency electronically via email or fax transmission. The comments may be transmitted directly to the A/E at that time as well, upon request by the agency.

5.12.4.1 Responses to BCOM Review Comments

Within 2 weeks after receipt of written comments from all applicable disciplines, the Agency, with input from the A/E, shall provide a written response to each BCOM comment, preferably on the comment sheet in the space provided or on a separate page if additional space is needed. All issues in dispute shall be resolved before the authorization is given to proceed to the next phase.

5.12.5 Re-submittals

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 Agency may require that the A/E make such re-submittals without compensation or reimbursement.

5.12.6 Revised Submittals

All changes, revisions, and additions shall be highlighted in yellow on at least two revised submittal sets of preliminaries or working drawings. If an Agency asks for a review to be expedited, all changes shall be highlighted in yellow on all sets of the revised submittal unless otherwise agreed to by BCOM.

5.12.7 Final Approval

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.

5.12.8 Print and Release of Bid Documents:

When authorized to advertise for bid by the approved CO-6, other CO forms, or by the BCOM Director, contact the BCOM Program Management Section at (804) 225-3769 to establish a bid receipt date.

5.12.8.1 Advance Advertisement / Notice

In some cases it may be advantageous to the Agency to advertise a project before bid documents are fully revised. In such case the procedures below shall be followed:

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.

5.12.9 Average Review Periods for Complete Submittals

Division of Engineering and Buildings – less than 3 weeks
(Internal goal is 85% reviewed within 14 days and 95% within 21 days)

5.12.10 Approvals

Approval of the submittal at any stage is dependent on the Agency and the A/E satisfactorily resolving the issues raised during the reviews by DEB/BCOM 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 DEB/BCOM review comments.

5.13 QUALITY CONTROL / QUALITY ASSURANCE

The A/E shall be responsible for the professional and technical accuracy and coordination of all designs, drawings, specifications, cost estimates, and other work or materials furnished. The A/E shall perform a Quality Assurance review of the working drawings prior to submitting the working drawings to DEB/BCOM. See Appendix Q for Checklists and guidance for QC/QA reviews and coordination of plans and specifications.

5.14 VALUE ENGINEERING (VE)

Capital Projects with a project cost greater than $5,000,000 shall have a 40-hour Value Engineering (VE) Study conducted on the design. (See §2.2-1133, *Code of Virginia*.) The study shall be conducted by a qualified VE Team concurrent with the preliminary (40%) 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 Agency.

For projects that (i) are designed utilizing either the Design-Build or Construction Manager at Risk construction delivery method, (ii) have the value engineering process as an integral component, and (iii) have been granted an appropriate waiver by the Director of the Department of General Services, BCOM shall participate in all cost savings decisions before modifications to the design may be finalized. Prior to the issuance of any permits, BCOM shall be provided a summary of cost savings that have been incorporated into the design as well as potential cost savings that were considered but not incorporated. The summary shall be reviewed and recommendations made to the Director of BCOM.

5.14.1 Scope of VE Study

The VE Study shall be made by a multi-discipline team of five VE qualified 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 indicated otherwise by Agency) shall encompass the recommendations of the VE study group and include detailed cost estimates, life cycle analysis and sketches, as necessary.

The VE Team shall be assembled and isolated away from their normal work station in order to avoid the normal daily interruption. The Agency will provide a suitable room with tables and chairs. VE services shall be performed in a timely manner concurrently with the normal preliminary design review to minimize any delay in the schedule.

5.14.2 Procurement of the VE Study

The agency shall procure the services of a Value Engineering consultant using non-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 proposers 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. Changes to or substitutions to the approved VE team configuration shall be submitted in writing to the Agency for approval.

The typical VE Team will be composed of:

1. VE Team Leader (CVS) **
2. Architect
3. Structural Engineer
4. Mechanical Engineer
5. Electrical (or Civil) Engineer
6. Typing, Clerical and Estimating support staff as necessary

** The principal person responsible for pre-study work, assembling, editing and reproducing the recommendations generated by the Value Engineering Team Study. C.V.S. must edit and sign the final report.

5.14.3 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 for 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.

5.14.4 Information Supplied to the VE Team

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

1. Two sets of 35% drawings (full size)
2. Four sets half size drawings
3. Outline Specifications & Systems Checklists (2 copies)
4. Detailed Cost Estimate (6 copies)
5. Basis of design (6 copies)
6. Design Calculations (Structural, Mechanical, Electrical)
7. Boring logs and soil reports
8. Scope of Project/Program requirements (6 copies)

5.14.5 Certified Value Specialist (CVS) Responsibilities

The CVS shall have the following responsibilities for the VE Study:

Pre-Study
1. Review complete design package & identify high cost areas.
2. Prepare cost model (actual vs. historical)
3. Prepare bar graphs of all subsystems.
4. Prepare preliminary cost worth ratios.

40 Hour Study
1. Team Leader and coordinator.
2. Team recorder.
3. Presentation of recommendations.

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.

5.14.6 VE Report Requirements

The results of the VE study performed on the project shall be documented as follows:
1. Contents page.
2. Brief description of total project and project requirements with a copy of the Owner's program requirements.
3. Brief summary of VE recommendations.
4. One site plan, floor plan and elevation on 8-1/2"x 11" or fold out.
5. Summary sheet (only) of 35% cost estimate.
6. VE cost model of project.
7. Each VE recommendation shall be described Before and After VE and shall be accompanied with a detailed cost estimate of savings, life cycle cost analysis and sketches as necessary.
8. Complete Six Step Job Plan (workshops) of all work shall be submitted as appendices for reference.

All reports shall 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.

5.14.7 Oral Presentation

At the completion of the Value Engineering Study, the VE team leader and members as appropriate shall make an oral presentation of the items recommended to be implemented on the project. Audience for the presentation shall include representatives of the following: the A/E, the Agency, and the DGS .

5.14.8 A/E Participation

The design A/E's involvement in the VE Study with anticipated man-hours by discipline for routine general construction is summarized as follows:

	PM	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					
MANHOUR TOTALS	24	16	12	12	12	12

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 Agency within 14 days of receipt of the report.
- Participate in joint 35% review/VE resolution meeting at the Agency and at BCOM if required.
- Submit a final report within 14 calendar days of the resolution meeting to the Agency and BCOM.
- Implement all finally accepted VE recommendations into the project design.

5.14.9 Criteria Challenge

In the package of documentation which the design A/E prepares for the Value Engineering Consultant, the design A/E may include a Criteria Challenge Package to question specific project design criteria, instructions and/or user requirements and to identify alternate items or procedures that might satisfy the required functions at a lower life cycle cost.

Examples of criteria which might be challenged are the exterior appearance or materials which may have resulted from a visit to the AARB, the Energy Budget required by the Manual, a user requirement for every office to have a window, or 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 BCOM. 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.

5.14.10 A/E Action on VE Study

The following clarifies the specific submittals and approval procedures required for the VE Study responses and proposed action:

- Both the Agency and the Architect/Engineer (A/E) shall review and evaluate the Value Engineering recommendations. Not all VE recommendations are automatically appropriate for inclusion in state projects.
- The A/E shall provide a written comment and/or evaluation of each VE recommendation to the Agency along with the A/E's recommendation to accept, to reject, or to accept with modifications each VE recommendation. The A/E shall also provide its responses to the Bureau of Capital Outlay Management (BCOM) preliminary review comments so that the VE recommendations and the BCOM comments may be resolved at the same time.
- 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 using the Format VE-1 (electronic version downloadable from the DGS Forms Center) and indicate its

recommended disposition of each item. The A/E's completed electronic VE-1 Summary sheet shall accompany the detailed responses / explanations sent to the Agency.

- The Agency shall review the A/E's evaluation and recommendations on the VE Study and the A/E's responses to the BCOM review comments. The Agency shall indicate its proposed action (acceptance, rejection, or acceptance as modified) on the electronic VE-1 Summary sheet and forward electronic copies of the VE-1 to DEB along with printed copies of the VE Study.
- If any proposed action deviates from the requirements of the Virginia Uniform Statewide Building Code (VUSBC) or the Manual, the Agency shall also submit a request for code modification or waiver of Manual requirements for each item along with appropriate justification.
- The Bureau of Capital Outlay Management will review the responses to the BCOM review comments and the proposed action on the VE recommendations. A meeting of BCOM and Agency representatives will be required where the agency has rejected a VE recommendation for a design change that was also identified in the BCOM review or is judged by BCOM to meet the criteria of the project and save money. Upon resolution of the issue and agreement on a specific design direction, the CO-5 will be approved and authorization given to prepare working drawings.

5.15 STRUCTURAL AND SPECIAL INSPECTIONS

Chapter 1 of the VUSBC prescribes the minimum inspections to be performed on a project. VUSBC Chapter 17, *Structural Tests and Special 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 Project Inspection, the A/E and the Owner's Independent Testing Lab.

5.15.1 Application to State-Owned Buildings

The Director, Division of Engineering and Buildings, in his capacity as Building Official for all state-owned buildings, establishes the following procedure for the application of the Structural and Special Inspections for capital outlay projects:

5.15.1.1 A/E Responsibilities

The A/E, as part of its Basic Service of preparing bid documents, shall include in the project specification the requirements for the materials, for the submittals, and for the tests and inspections to be performed. Identify those tests and inspections to be performed by the Owner'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. The A/E, as part of its construction period Basic Services, shall review and approve the shop drawings, material submittals and other data required to assure compliance with the requirements of the bid documents. The A/E in accord with their contract shall visit the site with representatives of each discipline having work in progress to assure conformance with the design shown in the documents. Where an Agency has received permission to exclude this service from the A/E contract, qualified Architects and Engineers of the Agency shall perform this function.

5.15.1.2 Project Inspector Responsibilities

Each project shall have an on-site Project Inspector/Clerk of the Works who shall, as part of his/her responsibilities, check all materials delivered 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. The Owner's Project Inspector shall furnish copies of all reports to the A/E.

5.15.1.3 Owner's Independent Test Lab
The Owner's Independent Test Lab shall inspect foundations, log and inspect pile and caisson installations, inspect and test concrete, and inspect and test bolted and welded connections as required by the specifications. The Owner's Test Service shall furnish copies of all reports to the A/E.

5.15.1.4 Statement
The Agency shall submit with the CO-6 (or prior to submitting for the CO-17) two (2) copies of the completed and signed G.S. Form E&B CO-6a Statement of Structural and Special Inspections, with copies of the edited schedule for Special Inspections - State-owned Buildings (G.S. Form E&B Form CO-6b).

5.15.1.5 Final Report
The Agency shall submit a copy of the completed and signed Final Report of Structural and Special Inspections, G. S. Form E&B CO-13.1b with its request for a Certificate of Occupancy or other documentation supporting its request to occupy a facility and close the building permit.

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

5.15.3 Additional Information
See Chapter 7 and Appendix N for additional information on other Project Inspector functions.

5.16 COMMISSIONING OF HVAC SYSTEMS
"Commissioning" for HVAC systems, as described in ASHRAE Guidelines 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 pre-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 is 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.

5.17 MASTER PLANS: SITE AND UTILITY PLANS
Agency Land Use Plans or Master Plans should be submitted to the Division of Real Estate Services. The Division may be contacted at the following:

Division of Real Estate Services
1100 Bank St., 3rd Floor
Richmond, VA 23219
Telephone: (804) 225-3874

Fax: (804) 225-4673
Email: dres-info@dgs.virginia.gov

CHAPTER 6 - DESIGN & PROCUREMENT CRITERIA, POLICIES & GUIDELINES

Chapter 6 sets forth the DEB design and procurement guidelines for use in developing plans and specifications for construction and renovation of state facilities.

These guidelines shall be followed unless a waiver in writing is granted by the Director of the Division of Engineering and Buildings.

6.0 DESIGN CRITERIA AND GUIDELINES

The DEB design criteria and guidelines for the design of buildings constructed on state-owned property which are to be used and maintained by state agencies shall be followed by the Agency and A/E with respect to the design and procurement of the project. If the A/E determines that there is a valid reason for not meeting or using the criteria or guides, the A/E must present their findings and justification to use differing criteria to the Agency for their concurrence. The Agency may then forward the request in writing to DEB for approval to use the different criteria.

Should a conflict arise between the standards and criteria in the Manual and the criteria stipulated by the Agency, those shown in the Manual shall govern.

6.0.1 Agency Design Standards

Design criteria for a particular campus may be stipulated by the Agency as a supplement to this Chapter.

A/E shall obtain from the agency with which it has a contract for services the Design Criteria and Standards which the Agency has for its site or campus. Such Criteria and Standards shall not conflict with nor supersede the standards stated in this Manual unless approved in writing by the Director of the Division of Engineering and Buildings.

6.0.2 Plans, Sections and Details of Equipment or Systems

6.0.2.1 Design Intent

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 5.3.9 for requirements concerning the use of brand names and models.

6.0.2.2 Basis of Design

Where a particular manufacturer's product is indicated as the basis for design and detail, the following statement shall be placed on the drawing with appropriate noting/references:

"The design [detail] [section] shown is based on [manufacturer and model] equipment and is intended only to show the general size, configuration, location, connections and support for equipment or systems specified with relation to the other building systems. See specification Section [xxx] for technical requirements pertaining to the equipment."

6.0.3 Proprietary and Sole Source Procurement Procedures

6.0.3.1 Proprietary Specifications

In general, the Commonwealth's policy is to allow competitive bidding to the greatest extent practicable and to limit the proprietary procurement to only that material and/or work which has been justified and approved. From time to time, a situation arises in which only a single product will perform the required function. In such cases, the A/E should forward a request through the Agency to the Director of the Division of Engineering and Buildings fully justifying the use of the proprietary product.

Proprietary or Sole Source requirements shall not be used unless it is conclusively established that no substitute will serve the purpose. Timely submittal of the request is required to avoid delays in the work. Use of proprietary items/specifications is prohibited unless formal written approval is obtained.

6.0.3.2 Proprietary Specification Language

If proprietary specification authorization is granted, specify the item by manufacturer's name and catalog number, followed by "notwithstanding any other provision of this contract, no other product will be acceptable" or language of similar import. When the approved proprietary product is available from the manufacturer to two or more vendors or approved installers who regularly work in the area of the project, the product may be included in the project specifications for competitive bidding.

6.0.3.3 Sole Source or Franchised Vendors

When the proprietary product is available only through a sole source provider or installer and the Director of the Division of Engineering and Buildings, acting upon request of the Agency, determines that it is in the best interests of the Commonwealth (by approval of the CO-18 *Sole Source Procurement Request*), the Agency shall procure the proprietary product, including installation where applicable, in accordance with the provisions of *Code of Virginia*, Chapter 43, § 2.2-4303, E.

The subcontract price for the sole source procurement (and the subcontractor selected by the Owner, if applicable) shall be indicated on the bid form and included in the Total Base Bid Amount by all bidders. Refer to DGS-30-220 *Standard Bid Form Format* in the DGS Forms Center for an example of incorporation of an approved sole source product into the bid form.

6.0.4 Separate Contracts for Material and Equipment

As an alternative to Proprietary and Sole Source Procurement Procedures, the proprietary procurement shall be deleted from the scope of the Work being bid (the project plans and specifications) and a separate contract procured by the Agency for such work.

6.0.5 Work that is "Not in Contract"

Work outside of the general contract, that is Not In Contract (NIC) for bidding but is to be included in the construction, shall be coordinated with the contract documents in one of the following ways.

6.0.5.1 Contractor-Purchased / Contractor-Installed (subcontractor designated/price set by Owner)

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

negotiated price of the subcontract to be included in the Bid. An example of this is a pre-selected Building Automation Systems subcontractor.

6.0.5.2 Contractor-Purchased / Contractor-Installed (materials contract assigned by the Owner)

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 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.

6.0.5.3 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 Owner pays the supplier directly for the materials.

6.0.5.4 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.

6.0.6 Approvals, Equals, and Substitutes

6.0.6.1 Approvals and / or Submittals Prior to Bidding

The Bid Documents shall not require samples, shop drawings, or similar materials to be submitted for approval prior to receipt of bids.

6.0.6.2 Approvals of Submittals

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.

6.0.6.3 Brand Names

Unless otherwise stated in the specifications, the name of a certain brand, make or manufacturer denotes the characteristics, quality, workmanship, economy of operation and suitability for the intended purpose of the article desired, but does not restrict bidders to the specific brand, make, or manufacturer. The brand names are shown to convey to the Contractor the general style, type, character and quality of article specified. When brand names are listed in the specifications, specify a minimum of three (3) brands with model numbers.

6.0.6.4 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 Owner as not being equal.

6.0.6.5 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 Owner 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 Owner, 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 Owner will have the right to limit or reject substitutions at its sole discretion.

6.0.7 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 Owner, 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 provided in the DGS Forms Center.

6.0.7.1 Implementation of Unit Prices

Where unit prices are used to competitively bid work which 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.

Examples 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 up or down based on actual quantity authorized)

Estimated quantity of 150 cubic yards @ $ _____ per cubic yard = $_____
(A/E fills 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 (Example 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 $_____

If rock excavation is required, use the following:

Part ___ - Excavation of Rock Material: (Example)

Excavation of rock material, where authorized or directed, and proper disposal off-site of excess material, complete per specifications. (Price per cubic yard; final price shall be adjusted up or down based on actual quantity authorized):

Estimated quantity of ____ cubic yards @ $_____/ cubic yard = $_____

Part ____ = _____ Dollars $_____

If rock excavation with backfill is required, use the following:

Part ____ - Excavation of Rock Material at Trenches: (Example)

Excavation of rock material, where authorized or directed, and proper disposal off-site of excess material and backfill with compacted trench fill material per specifications. (Price per cubic yard; final price shall be adjusted up or down based on actual quantity authorized):

Estimated quantity of ____ cubic yards @ $_____/ cubic yard = $_____

Part ____ = _____ Dollars $_____

6.0.8 Procurement of Furnishings and Loose Equipment

Loose equipment and furnishings are generally items moveable or portable versus permanently installed. It includes such items as fire extinguishers, but not FE cabinets; residential refrigerators; unattached residential stoves; unattached furniture; and other similar furnishings or loose equipment.

The Agency shall purchase loose equipment using the procedures described in the Agency Procurement and Surplus Property Manual published by the Division of Purchases and Supply and the eVA procurement process.

6.0.9 Built-In Equipment

Built-in equipment comprises special purpose equipment or furnishings which 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* (VPPA):

1. Bid the Built-in equipment as part of the Construction Contract.
2. Bid prior to receipt of bids on the Construction Contract where the successful bidder agrees to be assigned as a subcontractor to the Construction Contractor. That price and vendor's name are then listed on the Bid Form using wording as shown on the sample "Bid Form (Standard Format)" on the DGS Forms Center for inclusion in the Construction Contract bids.
3. Bid the Built-In Equipment to be furnished and installed as a separate contract for both procurement and installation.

6.1 GENERAL DESIGN STANDARDS

6.1.1 Guidelines for Space Planning

These guidelines are used for evaluating areas of common types of spaces. The guidelines are intended to help in planning space sizes and for calculating and justifying Capital Budget Requests space and area requirements. In the actual design of the project the agency may choose to make some spaces larger than the indicated guideline area and compensate by reducing the area allocated to other spaces. The use of areas greater than those indicated are not considered to be a valid justification for an increase in the authorized project square footage. Spaces which exceed the guidelines, any special space needs or special features required may need further explanation or justification in the Basis of Design.

Space Category &Type of Room or Space	Area Guideline	Remarks
Private Offices		
Agency Head or Department Director (Position requires confirmation by General Assembly)	196 sf	14' x 14'
Agency Head or Department Director	150 sf	10' x 15'
Assistant Director & Confidential Staff (Confidential Staff: describe position & why private office space is needed)	120 sf	10' X 12'
Open Offices		
Professional Staff Supervisor	96 sf	8' x 12'
Professional Staff & Support Admin. Supervisor	64 sf	8' x 8'
Contractors/Auditors	48 sf	6' x 8'
Field Staff, Floating Staff, Recep. & Support Admin.	48 sf	6' x 8'

Special Space Requirements		
Examining/Medical Rooms	100 sf	10’ x 10’
Testing, Training, Hearing Rooms: Seminar Seating	15 sf	per person
Testing, Training, Hearing Rooms: Auditorium	10 sf	per person
Interview Areas	80 sf	8’ x 10’
Reception Room, 1-5 visitors	144 sf	12’ x 12’
Over 5 visitors, add:	10 sf	per person
Conference Room, 1st 10 chairs	25 sf	per person
Over 10 chairs, add:	15 sf	per person
Assembly / Auditorium, Meeting, Theater, Lecture Hall/Room		
Fixed Seats (incl. aisle space)	10 sf	per seat
Chairs, not fixed	10 sf	per person
Tables and Chairs	15 sf	per person
Standing/Observation Space	3 sf	per person
Educational Spaces		
Classroom, 10 - 49 stations	20 sf	per station
Classroom, 50 - 99 stations	15 sf	per station
Lecture, over 100 stations	10 sf	per station
Laboratory, Biology & Chemistry	45 sf	per station
Laboratory, Engineering	60 sf	per station
Laboratory, Physics or Geology	40 sf	per station
Laboratory, Art & Architecture	60 sf	per station
Lab Storage, Biology & Chemistry	10 sf	per station
Lab Storage, Engineering	10 sf	per station
Lab Storage, Physics or Geology	8 sf	per station
Lab Storage, Art & Architecture	10 sf	per station
Dormitory		
Bedroom	115 sf	per bed
Lounge & Recreation Space	25 sf	per bed
Storage Space	10 sf	per bed
Library		
Stack Space	0.08 sf	per book
Reading Space	10 sf	per user
Library Services	2.5 sf	per user
Food Service, Food Courts, Dining Halls		
Dining Areas	15 sf	per seat
Serving Line and Counters	1.5 sf	per seat
Kitchen and Food Preparation	2.5 sf	per seat
Food Storage	1.5 sf	per seat
Dishwashing Area	0.7 sf	per seat
Receiving Area	0.4 sf	per seat
Waste or Garbage Area	0.3 sf	per seat
Recreation Buildings	5 sf	per person
Bleacher Seats	20 sf	per locker

Locker Area	50 sf	per station
Weight Room	20 sf	per person
Exercise and Aerobics Area	20 sf	per person

6.1.1.1 Additional Clarifications

- Field Office Personnel who are routinely out of the office 50% or more of the normal work week shall be restricted to open office space.
- When evaluating conference or reception space, consider the "peak" or highest number of users at any one time on a frequent basis during a weekly period (4-5 times per week.)
- Conference Rooms are not typically sized for full staff meetings.
- File Storage is an area where Agencies may be able to save money by evaluating file storage practices. High density storage options or purging files on a regular basis may significantly reduce the amount of real estate needed over time.
- If the total number of private offices is greater than the total number of open office workstations, add 30 % to the total of all Personnel, Support and Special spaces for circulation.
- If the total number of private offices is less than the total number of open office workstations, add 35% to the total of all Personnel, Support and Special spaces for circulation.

6.1.2 Building Efficiency Ratios

6.1.2.1 General

Building efficiency is the ratio of Assignable Area to Gross Building Area expressed as a percentage and is determined based on the definitions and calculation procedures shown below. The minimum building efficiency ratios are a composite of the ratios or factors taken from recognized standards and are based on the definitions and procedures shown below. The minimum building efficiency ratios are intended to provide achievable minimum standards for design of an efficient, functional layout.

The definitions and procedures described below shall be used to determine the "Building Efficiency Ratio". Use the VUSBC definition of Building Area for determining the allowable area for the building for code compliance.

(Higher Education Agencies should note that the SCHEV guidelines for determining space needs or justification considers not only the assignable space (classroom, laboratory, etc.) but also all spaces which directly serve that space as being part of the "program space". Likewise, the SCHEV area and use factors for "program space" are based on their definitions without regard to actual layout.)

6.1.2.2 Definitions

Gross Area (GSF): The total area of all floors of a building measured to the exterior face of the exterior walls, or to the horizontal projection of the roof or floor above for areas that are not provided with exterior walls. This is not to be confused with the definition of "Area, Building" in the Virginia Construction Code which is used for building code limitations on building area.

Assignable Area (ASF): The area or the sum of all areas on all floors of a building assigned to, or available for assignment to, an occupant, including every type of space functionally usable by an occupant except "Non-assignable Areas" defined below. The area of a closet or private toilet within an office or suite space shall be included in the calculation of the assignable area of that space. Assignable square footage shall include only program-related spaces; however, not all program related spaces are necessarily considered assignable.

Non-assignable Area: The area or the sum of all areas on all floors of a building not available for assignment to building occupants but which are necessary for the general operation of the building. Non-assignable space areas include corridors, stairs, lobbies, foyers, atria, entry vestibules, walls, columns, elevators, mechanical shafts, toilets (common and public), janitors closets, custodial, circulation, mechanical, HVAC and utility spaces, structural areas and open (shaft and atrium) spaces.

Custodial Area: That portion of the non-assignable area which is the sum of all areas of the building used for its protection, care, and maintenance. These include janitor's closets, storage areas for custodial supplies and equipment, trash rooms, and custodial locker rooms.

Circulation Area: That portion of the non-assignable area which is required for physical access to other spaces, whether directly bounded by partitions or not. Circulation space includes corridors, elevator shafts, stairs, loading platforms, entry vestibules, foyers, atria, lobbies, tunnels and bridges. When determining circulation area, only spaces required for general access should be included. Aisles which are used for circulation within open office suites, auditoriums and other work areas are included in the calculation of the assignable area.

Mechanical Area: That portion of the non-assignable area designed to house mechanical/HVAC equipment, mechanical shafts, plumbing and sprinkler risers, electrical equipment rooms / closets, telephone and communications equipment rooms / closets, other utility services, and common or public (non-private) toilet facilities.

Structural Area: That portion of the non-assignable area which cannot be occupied or put to use because of the presence of structural features of the building. Included are columns, exterior walls, fire walls, and permanent partitions.

6.1.2.3 Calculations

The areas shall be determined from the actual floor plans for the facility.

Assignable square feet (ASF) as a percentage of gross square feet (GSF) shall be no less than the ratios listed below. Exceptions to these building efficiency factors must be approved by the Director of the Division of Engineering and Buildings. Requests must be supported by written justification submitted by the agency stating why these ratios cannot be obtained.

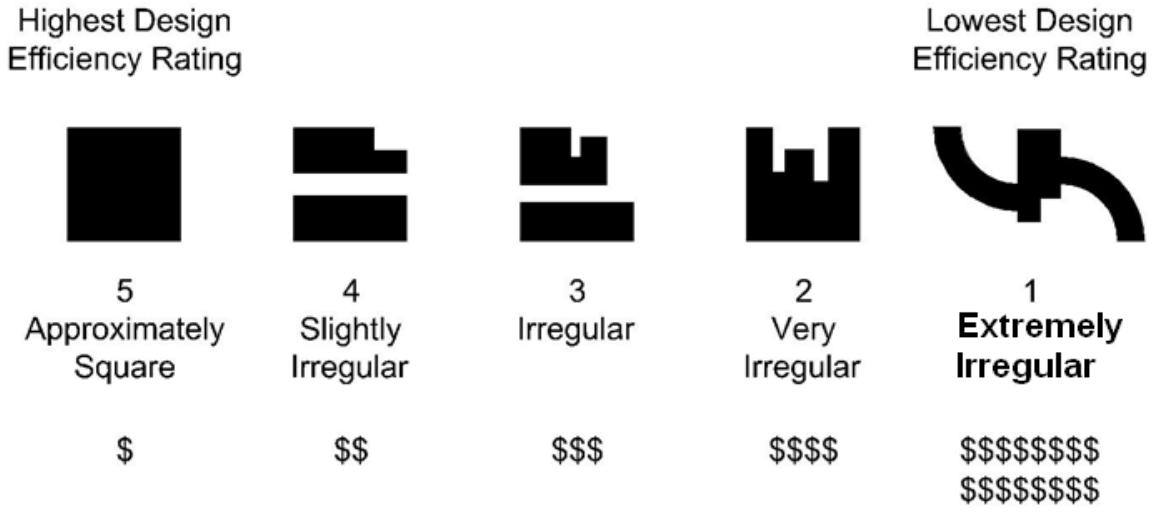
6.1.2.4 Building Efficiency Ratios

Building Type	Ratio: ASF to GSF
Office Building w/partitioned offices	70%
Office/Classroom Building (where classrooms are 29% or less of the assignable area)	70%
Office Building w/open office layout	90%
Classroom Building	66%
Classroom & Office Building (where classrooms are 70% or more of the assignable area)	66%
Health/Fitness Building with gymnasium & classrooms	85%
Health/Fitness Building (gyms, classrooms, pool, handball courts)	80%
Hospital or Infirmary	60%
Engineering/Laboratory Building	72%
Instructional Shop Building	90%

Library Building	75%
Fine Arts Building	72%
Science Building w/Laboratories	65%
Physical Plant Service Building	85%
Student Union	75%
Dormitory Housing w/ common use toilets	65%
Apartment or Townhouse Style Housing	90%
Suite Style Housing w/ private toilets	80%
Auditorium / Theater	70%
Dining Facility	72%
Warehouse	93%
Maintenance Garage	85%

6.1.2.5 Design Efficiency Rating:

Design Efficiency Rating is a rating of the design efficiency as it relates to construction cost for the proposed design. The A/E shall design the project to achieve the highest Design Efficiency Rating as practical for the intended purpose.



6.1.3 High Performance Buildings Act - Design

State Agencies and Architects / Engineers shall ensure that new construction and renovation of buildings is performed in accord with the following minimum standards for energy conservation and environmental performance. Individuals who perform the compliance modeling must have obtained a Building Energy Modeling Professional Certification such as ASHRAE Certification. Similar qualifications will be considered individually.

All executive branch agencies and institutions entering the design phase for: 1) construction of a new building greater than 5,000 gross square feet in size, or 2) renovation of greater than 5,000 square feet of a building where the cost of renovation exceeds 50 percent of the value of the building, the new construction and/or renovation shall be designed and constructed consistent with either method A, B or C of the following energy conservation and environmental performance standards.

A. **Leadership in Energy and Environmental Design (LEED for New Construction & Major Renovations)**
Obtain a minimum of 50 points. (LEED Silver 50/100)
Demonstrate compliance by the following method:
Submit copy of USGBC LEED certification to DEB.

B. **Green Globes**
Obtain a minimum of 2 Globes.
Demonstrate compliance by the following method:
Submit copy of Green Globes certification to DEB.

C. **Virginia Energy Conservation and Environmental Standards**
Comply with the ICC International Green Construction Code, Public Version 1.0, dated March 2010 as modified herein. Public Version 1.0 of ICC International Green Construction Code will remain in effect unless modified by a DEB Notice even if updated versions of the code are released. The minimum requirements to comply with the Virginia Energy Conservation and Environmental Standards determined by the Division of Engineering and Buildings are identified in the attached Compliance Matrix. Incorporate the following modifications into the ICC International Green Construction Code:

1. Chapters 1 and 3 are not used.
2. Chapters 2 and 12 are for reference only.
3. Appendices A,B,C, and D are not used
4. Required code sections in Chapters 4 through 11 are listed in the Compliance Matrix.
5. When a Code Section is listed in the Compliance Matrix, and associated Code sub-sections are not listed, compliance with all sub-sections is required.
6. Where Code sub-sections are listed, only those Code sub-sections listed are required.
7. Disregard references to Table 302.1.
8. Modifications to required code sections are described in “Remarks” column of Compliance Matrix.
9. Project Electives determined by the Agency.
10. Documentation requirements listed in the ICC International Green Construction Code are only required to be submitted to Agency at Agency’s request.
11. Change “Code Official” to “Agency.”
12. Change “AHJ” to “Agency.”
13. Demonstrate compliance by the following method:
    Submit copy of completed Virginia Energy Conservation and Environmental Standards Compliance Matrix, provided in the DGS Forms Center, to DEB.

6.1.3.1 High Performance Buildings Act - Operations

(*Code of Virginia*, § 2.2-1182 and 2.2-1183)
Any executive branch agency or institution entering the design phase for the construction of a new building greater than 5,000 gross square feet in size or the renovation of a building where the cost of the renovation exceeds 50 percent of the value of the building, shall conform to VEES and the building shall be designed, constructed, verified, and operated to comply a public building design, construction and renovation program that meets the requirements of VEES.

The Director of the Department of General Services may grant an exemption from the design and construction standards required above upon finding that special circumstances make the construction or renovation to the standards impracticable.

6.1.3.2 Guidelines for Operation

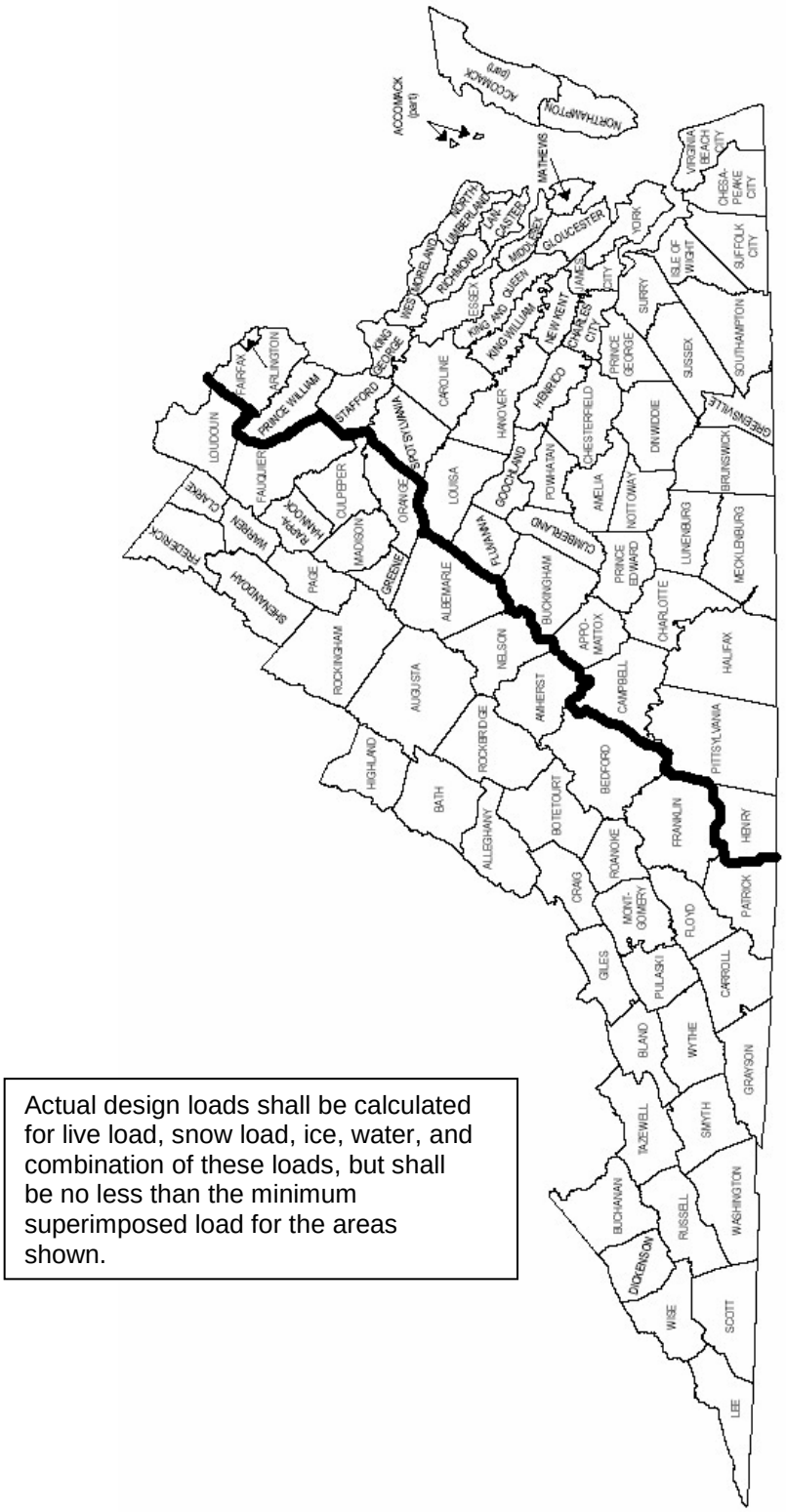
Refer to Virginia Executive Order No. 19 (2010).

6.1.4 Structural Design Guidelines

6.1.4.1 Roof Load

The minimum design superimposed load for flat roofs and roofs with a slope of less than four (4) inches per foot shall be as indicated on the following Figure 6.1.4.1,

Minimum Superimposed Loads for Design of Low-Sloped Roofs. Generally, roofs in areas in and west of the Blue Ridge Mountains and the indicated areas of Northern Virginia shall be designed for a minimum design superimposed load of 30 pounds per square foot. Indicated areas east of the Blue Ridge Mountains shall have a minimum design roof superimposed load of 20 pounds per square foot for roof design. Greater live, snow and/or combination loads shall be used where local experience, calculations, drifting or other conditions dictate.



Actual design loads shall be calculated for live load, snow load, ice, water, and combination of these loads, but shall be no less than the minimum superimposed load for the areas shown.

Figure 6.1.4.1

6.2 CIVIL & SITEWORK DESIGN STANDARDS

6.2.1 Earthwork

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

6.2.2 Drawings

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 notes shall state that earthwork is 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.

6.2.3 Earthwork Specifications

Specifications shall be definite, not general.

1. Coordinate Specifications with the Drawings.
2. Include a geotechnical/soils report in the 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 6.2.5.
5. 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. All A/E standard specifications shall be edited to conform to the following requirements.

6.2.4 Structural Fill and 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.

6.2.4.1 General Fill and Backfill

Includes all classifications of materials noted above.

6.2.4.2 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.

6.2.4.3 Aggregates

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

6.2.4.4 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.

6.2.4.5 Quality Assurance and 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.

6.2.5 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 in Section 6.0.7.1.) 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 bed rock, 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 which 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 which cannot be removed by a 3/4 CY track mounted back hoe 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 which 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.

All rock quantities shall be based on in-place volumes and shall be obtained by means of the method of average end areas or other method acceptable to the engineer. Truck counts will not be accepted as a method of determining earthwork quantities.

6.2.6 Erosion and Sediment Control Requirements

The Department of Environmental Quality requires submittals for Erosion and Sediment Control, Stormwater Management and a Virginia General Discharge Permit.

6.2.6.1 Plans and Specifications

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

A statement similar to the following shall be used:

"The Contractor shall be responsible for satisfying any and all erosion 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. The Contractor shall provide on-site, a person certified as a 'Responsible Land Disturber' in accordance with Code of Virginia §10.1-563, as revised. "

(Note: This instruction may be added to one appropriate specification 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.)

6.2.7 Minimum Standards for Parking

The following minimum parking space dimensions and minimum numbers of spaces are standards for use in the design of state parking decks, parking garages and parking lots. Parking configurations and aisles widths shall be designed to provide adequate maneuvering and safe circulation for all vehicles. Consideration shall be given to increasing the sizes of spaces and aisles for short duration parking and/or high turnover rates. Protection of columns, walls and posts with parking signage shall be considered by the use of wheel stops, bollards or guard rails.

6.2.7.1 Stalls in Parking Decks and Garages Utilizing Self-Parking

Type of Vehicle	Minimum Width	Minimum Length	Minimum Area
Standard Cars	8'-6" (9'-0" preferred)	18'-0"	153 SF
Compact Cars *	8'-0"	15'-0"	120 SF
Handicapped Spaces **	Refer to 2010 ADA Standards for Accessible Design		

* Compact car spaces may be incorporated and designated where restrictions by walls, columns, piers or other restraints impede the use of standard size spaces.

** Locate the accessible parking spaces to minimize handicapped users' distance to accessible exits, routes to accessible buildings and exposure to crossing traffic.

6.2.7.2 Stalls in Parking Lots Utilizing Self-Parking

Type of Vehicle	Minimum Width	Minimum Length	Minimum Area
Standard Cars	8'-6" (9'-0" preferred)	18'-0"	153 SF
Compact Cars *	8'-6"	15'-0"	128 SF
Handicapped Spaces **	Refer to 2010 ADA Standards for Accessible Design		

* Compact car spaces may be incorporated and designated where restrictions by walls, columns, piers or other restraints impede the use of standard size spaces.

** Locate the accessible parking spaces to minimize handicapped users' distance to accessible exits, routes to accessible buildings and exposure to crossing traffic.

6.2.7.3 Parking Space Planning and Minimum Number of Spaces

This policy applies to all new buildings, additions and changes in use or occupancy. Buildings which undergo major renovations shall comply to the greatest extent possible.

All projects that renovate or alter accessible facilities shall provide an adequate number of parking spaces for physically disabled people. An adequate number of parking spaces means a number of accessible spaces that complies with the 2010 ADA Standards for Accessible Design.

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 Group	Minimum Total Number of 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.
F, H, 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).
I-3	One parking space for every two employees, plus one parking space for every 20 beds.
M	One parking space for every 200 gross square feet.
R-2	One parking space for every two employees, plus one parking space for every five beds.
R-3, R-4	One parking space for every individual housing unit.

NOTES:

1. The Commonwealth of Virginia typically does not construct buildings of Groups A-4 (churches), I-1 (group homes) or R-1 (hotels). If an agency proposes to build a project in one of these Groups, it shall submit a parking proposal to the Director, Bureau of Capital Outlay Management for review and approval.
2. Parking spaces for the disabled shall be based on Table 208.2 Parking Spaces in the 2010 ADA Standards for Accessible Design. These parking spaces shall be located closest to the nearest accessible entrance on an accessible route and no more than 250 feet from the accessible entrance.
3. For purposes of calculating employees/students, their number is equal to the number of workstations or the maximum number of employees/students in a shift.
4. If it is not possible to comply with the requirements, the agency shall request a waiver from the Director, Bureau of Capital Outlay Management. The request shall explain in detail why compliance is not possible and shall provide an alternative proposal for parking.
5. Parking plans may be developed for an entire campus, facility or complex which addresses 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 offsite parking for the occupants and guests to the building or facility.

6. For mixed use occupancies, the total number of parking spaces shall be allocated proportionally to the individual Groups which the parking lot or structure is intended to serve.

6.3 CONCRETE DESIGN STANDARDS

Include the following special requirements in the specifications for Cast-in-Place Concrete:

1. ACI 301, Specification for Structural Concrete for Buildings (current edition) shall be incorporated by reference 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 C173 or ASTM 231, and Unit Weight - ASTM C138.
3. The Owner 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. This certification requires the successful completion of a written and performance examination on the applicable ASTM test methods of this section. ICC certification is also acceptable.

6.4 MASONRY DESIGN STANDARDS (RESERVED)

6.5 STEEL DESIGN STANDARDS (RESERVED)

6.6 WOOD & PLASTICS DESIGN STANDARDS (RESERVED)

6.7 THERMAL & MOISTURE PROTECTION DESIGN STANDARDS

6.7.1 Waterproofing & Drainage for Subsurface Structures

No state buildings for human or equipment occupancy shall be designed with building systems (such as ductwork) or basement floor levels below the water table. Varying degrees of subsurface water content require the following minimum waterproofing and drainage techniques.

6.7.1.1 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.

6.7.1.2 Damp to Wet Soils with No Obvious Water Source:

1. Waterproof walls and provide protection board. Note: If geotechnical type drainage board 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.

6.7.1.3 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, and follow the waterproofing techniques listed above.

6.8 DOORS & WINDOWS DESIGN STANDARDS

6.8.1 Operable Sash

Unless impractical, it is recommended that operable windows be provided in areas that can create effective cross ventilation in the building if required due to failure of HVAC system. Operable sashes shall be provided with lockable operators.

6.9 FINISHES DESIGN STANDARDS (RESERVED)

6.10 SPECIALTIES DESIGN STANDARDS

6.10.1 Nuisance Bird Control

When dealing with nuisance birds, it is important to minimize the risk of affecting non-target species. The use of an integrated wildlife damage management plan, where multiple methods are implemented to reduce or eliminate damage is recommended. These methods can include harassment (loud noise, distress calls, visual frightening devices), chemical deterrents (repellents, roost inhibitors), physical barriers (netting, anti-perching devices, structural repairs), and habitat modification (vegetation management, eliminating sources of food and water). Control methods should be chosen as appropriate for the treatment area and to selectively control the target species. Some methods may be impractical, illegal, or aesthetically undesirable in some locations, so alternatives should be considered in these circumstances. If considering any methods of nuisance bird control, please contact your local office of the United States Department of Agriculture or the Virginia Department of Game and Inland Fisheries for advice. When using sticky, polybutene-based roost inhibitors to deter pigeons from roosting, the designer should be aware of the product's effect on the target species and if there are any residual effects to other species or the environment. The designer should be aware of nearby sources of food and cover that may attract migratory birds to the treatment area. The designer may reconsider the use of the product or take additional steps to ensure that smaller, non-target birds do not become entangled in or harmed by the product. The product should be used in such a manner as to target the intended species only and applied in areas where the risk of affecting non-target species is minimal. Physical exclusion devices such as netting or porcupine wires may be used instead of or in addition to chemical repellents in these areas.

6.11 BUILT-IN EQUIPMENT DESIGN STANDARDS (RESERVED)

6.12 FURNISHINGS DESIGN STANDARDS (RESERVED)

6.13 SPECIAL CONSTRUCTION DESIGN STANDARDS (RESERVED)

6.14 VERTICAL TRANSPORTATION DESIGN STANDARDS

6.14.1 Final Acceptance for Elevators

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."

6.14.2 Elevator Microprocessors

If microprocessor control systems are provided for elevators, include the following:

1. In the general portion of the elevator specification include the following:

   Repair Requirements: "For elevator microprocessor control system, provide maintenance diagnostic tools, electrical schematic wiring diagrams, and any access codes and passwords required for all maintenance functions, including diagnostics, adjustments, and parameter reprogramming. Tools may be hand held or built into the control system and shall function for the life of the equipment. Tools provided shall be usable throughout the life of the equipment without the requirement to return to the manufacturer. Provide complete operations and maintenance manuals including diagnostics instructions for troubleshooting the microprocessor system."

2. In the products portion of the elevator specification include the following under the Control Equipment description:

   Solid-State Control: "Elevator controller shall be solid-state microprocessor based for dispatch and motor control."

6.15 MECHANICAL AND PLUMBING DESIGN STANDARDS

6.15.1 Rainwater Harvesting

Requirements for rainwater harvesting that were provided in the previous editions of the CPSM are superseded by the provisions of Chapter 13 (Nonpotable Water Systems) of the Virginia Plumbing Code, 2012 edition.

6.15.2 Building Automation Systems Design And Procurement

Current Building Automation Systems (BAS) and Energy Monitoring and Control Systems (EMCS) have proprietary protocol and programs which limit their ability to tie-in or interface with the systems of other manufacturers or vendors. It is essential that agencies give careful consideration and attention to the planning, procurement, pricing, and implementation of their BAS and EMCS requirements and expansions.

6.15.2.1 Planning

The planning for a BAS or EMCS shall include consideration and evaluation of the following:

- Will the BAS/EMCS serve a single or multiple buildings?
- What functions, control and data gathering activities will the BAS/EMCS provide?
- Will the BAS/EMCS be tied-in to a Central Station?
- Will the Central Station provide only monitoring and data gathering functions?
- Will the Central Station Operator be able to control the BAS/EMCS functions at the separate or remote building?
- Does the Agency have a BAS/EMCS currently installed at this location, campus, etc.?
- How many vendors have a BAS or EMCS at this location?
- Which vendors actively serve systems in this general area?
- Has the Agency obtained cost data for comparison for installation costs and for service/maintenance costs on similar systems? (This is necessary if the Agency intends to procure the BAS/EMCS as a sole source or competitively procured system.)

6.15.2.2 Policy on BAS / EMCS Competition

The Virginia Public Procurement Act (VPPA), § 2.2-4300 through 2.2-4377, *Code of Virginia* as amended, contains the statutory procurement methods, requirements and restrictions. Simply put, the VPPA requires that the BAS/EMCS be competitively procured unless specific approval has been obtained to use Sole Source procurement. Unless otherwise approved, Building Automation Systems (BAS) or Energy Management Control Systems (EMCS) shall be specified using performance or non-proprietary specifications. This should result in maximum competition and best cost for the state.

Where an Agency has, or will have, multiple buildings with a BAS/EMCS and where the Agency has, or intends to have, a central monitoring or central control station for the multiple building systems, consideration should be given to having the systems/ central stations of 2 vendors so that the vendors can compete with each other for future systems and/or tie-ins.

6.15.2.3 Building Automation System Evaluation

To expedite the review of the BAS/EMCS system for a project, the A/E, with input from the Agency, shall provide the information required by the Building Automation Systems Questionnaire form (Form DGS-30-222) to describe the currently existing BAS's and shall submit to BCOM not later than with the preliminary drawing submittal. The information provided by this questionnaire is essential in considering the Agency request for approval of proprietary or sole source procurements and in the BCOM review of the proposed system at working drawings design stage.

6.15.2.4 BAS/EMCS Procurement

One of the following methods shall be used to procure the BAS/EMCS for the project:

6.15.2.4.1 Method 1: Non-Proprietary / General Contract Bidding

All vendors may bid on the work. No special approvals are required. A Non-proprietary BAS/EMCS performance specification is included in the bid documents for competitive bidding along with all other work.

6.15.2.4.2 Method 2: Proprietary / General Contract Bidding

Where two vendors each have a BAS/EMCS currently in operation at the site and/or where the Agency has made a determination in writing that only 2 or 3 vendors will be acceptable and all others are excluded, the Agency may obtain approval from the Director, Division of Engineering and Buildings, to proprietarily specify that the BAS/EMCS bidders be restricted to those vendors listed in the specifications. The successful subcontract bidder would be required to perform the work required by the documents just as any other subcontractor.

6.15.2.4.3 Method 3: Sole Source Separate Procurement

Prior to completing the Working Drawings , the Agency must make a determination in writing that only one vendor can meet the Agency's requirements for the BAS/EMCS and obtain approval for a Sole Source procurement of the BAS/EMCS work. Once the use of sole source procurement is approved, the Agency must decide if the Agency will supervise and manage the vendor or if the Agency will assign the BAS/EMCS vendor's contract to the project (General) Contractor to supervise and manage.

The Agency shall then negotiate a price with the sole source vendor for the specified BAS/EMCS work and/or tie-in on the basis of the specifications and the contract management procedures selected and commit the agreement to writing.

If the (General) Contractor will be tasked with coordinating and supervising the BAS/EMCS vendor/subcontractor, the price and the name of the vendor for this automation work shall be placed on the Bid Form using the wording shown on the Sample Bid Form Format provided in the DGS Forms Center. The (General) Contractor Bidder is required to include this subcontract price plus any markups for supervision, coordination and profit in its bid and to be responsible for this work just as if the bidder had selected this subcontractor itself.

When using this Method 3, any part of the HVAC control system, fire alarm system, valves, dampers, etc., which do not have to be Sole Source shall be competitively bid.

If the Agency/Owner elects Method 3, measures must be taken to ensure the cost and configuration of the system are reasonable such as using cost data for installation and for service/maintenance on similar systems for comparison.

6.15.2.5 Design and Specification of BAS / EMCS:

6.15.2.5.1 Schematic Submittal
Indicate if a BAS/EMCS will be required for the project. If required, the submittal shall indicate which method the Agency intends to use to procure the system.

6.15.2.5.2 Preliminary Submittal
Include a copy of the Sole Source procurement request approval from the Chief of Staff or the Proprietary procurement request approval from the Director, Division of Engineering and Buildings if Method 2 or Method 3 are proposed for use.

6.15.2.5.3 Working Drawings
If either Method 1 or Method 2 above are selected for use, the A/E shall include the following BAS/EMCS information in the documents at the working drawing submittal:

- Performance specifications
- Sequence of operation
- Input / Output Summaries
- Control schematics
- Equipment (front-end computer, etc.) locations
- Control legend

If Method 3 above is selected for use, the Engineer shall require the BAS/EMCS vendor to provide the following to BCOM at the working drawing stage (and prior to the Owner's final agreement to the scope of work and the price):

- A breakdown of the vendor's proposed cost including materials, markups, subcontractors, labor, and training.
- A completed input/output summary similar to the one shown as Form DGS-30-223, including a cost per point broken out into major types. (i.e., A.I., A.O., D.I, D.O., etc.)
- Control schematics and sequence of operation including interface with any other control system, and software functions that will be incorporated into the system.
- Details of any major additions to the system front-end/operator interface hardware and software.

6.15.3 Pressure Vessel Design Standards
All fired or unfired pressure vessels whether a part of an equipment package or an entire piece of equipment shall be specified to comply with the ASME Code. The specifications shall require that

the pressure vessel be so stamped in an easily identifiable location and that the manufacturer's data indicating ASME compliance be submitted.

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

6.16 ELECTRICAL DESIGN STANDARDS

6.16.1 Lightning Protection Systems

6.16.1.1 Determining if a Lightning Protection System is Required

The most recent edition of NFPA 780 shall be used to evaluate lightning protection systems, and to determine if a system is required. For new facilities, roof replacements, and solar array installations the A/E shall evaluate the building to determine if a lightning protection system is required. A lightning protection system is not required where either:

A. The Annual Threat of Occurrence (Nd) is less than the Tolerable Lightning Frequency (Nc), as calculated in the Simplified Risk Assessment (L.5).
B. The Total Risk (R) is less than the maximum Tolerable Risk (RT), as calculated in the Detailed Risk Assessment, for each type of loss relevant to the structure (L.6).

Provide a note on the project cover sheet or electrical cover sheet specifying the risk factors and specify if a lightning protection system is required. Risk evaluation documentation shall be made available upon request.

Photovoltaic array installations shall be provided with a lightning arrestor either at the array or at the output of the inverter to protect downstream equipment regardless of the risk factor.

6.16.1.2 Lightning Protection System Labeling and Certification

Initial certification or re-certification by inspection is required for all lightning protection systems which are installed or modified as part of a construction project. The inspection shall be performed by either:

A. Underwriters Laboratories under the most recent edition of UL 96A: Standard for Installation Requirements for Lightning Protection Systems.
B. A Lightning Protection Institute certified inspector under the appropriate Lightning Protection Institute master certificate inspection.

The inspection shall certify the final installation to obtain a master label for all elements to include the facility and services entering the facility.

The installation contractor shall provide a third party master label inspection to the agency prior to project close out. Should the contractor not be able to obtain a complete master label, the agency shall provide the remaining certification at their expense prior to issuance of a final Certificate of Use and Occupancy or Building Permit Close Out. These are typically part of UL 96A, Chapter 13. Planning and coordination of inspections shall be conducted during the design phase, and shall be coordinated with the agency.

6.16.2 Busway Installation

Include the following paragraph in specifications for busway systems:

"The busway 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 busway system.

6.16.3 Electrical Room drawings

All electrical rooms shall be drawn at a minimum of ¼" scale. All required clearances with text or faded dashed lines. All required door swing, and door hardware shall be noted and cross referenced to architectural drawings if submitted as a set.

6.16.4 Elevator Machine Rooms

Elevator machine rooms shall be drawn at a minimum of ¼" scale. Show all equipment to be provided by others. All required clearances with text or faded dashed lines. Provide all power and lighting as required by the latest adopted codes. Provide lighting with either a battery backup or from a generator.

6.16.5 Electrical Details

The following items require details to include all dimensions, materials, and location of construction to include distance above or below floor/finished grade:

- Duct bank
- Under/through footing penetrations
- Housekeeping/equipment pads
- Lighting switching – by tick marks, switch notation, or drawing notes. Lighting circuits are always required regardless of how the switching is indicated.
- Grounding detail for service entrance and individual transformers. Provide grounding conductors and electrodes: Sizes, materials, and associated conduits. Use of "per NEC" is not acceptable.
- Grounding riser diagram where generators, transfer switches, main-tie-main switchboards, or separately derived systems (aside from individual transformers) exist.
- ARC flash warning labels as required by NEC 110.16.

6.16.6 Emergency Systems (NEC 700)

All equipment, conductors, and conduits associated with emergency systems shall be clearly identified with drawing notation and physical labels. Emergency systems will be kept separate from all other systems as described in the NEC. All loads associated with emergency systems shall be required to be life safety.

6.16.7 Legally Required Standby Systems (NEC 701)

All equipment, conductors, and conduits associated with legally required standby systems shall be clearly identified with drawing notation and physical labels.

6.16.8 Optional Standby Systems (NEC 702)

All equipment, conductors, and conduits associated with optional standby systems shall be clearly identified with drawing notation and physical labels. Optional standby systems may share conduit and enclosures as permitted in the NEC.

6.16.9 Electrical Calculations

Provide the following calculations during the design process prior to submittal of working drawings:

- COMCheck verification
- Demand load for all switchboard, panelboards, and feeders to multiple loads in tabular form with 25% spare capacity.

- Voltage drop calculations showing no more than 2% for feeders, 3% for branch circuits, and 2% for exterior branch circuits that feed lighting or equipment not mounted to the building.
- Photometrics of emergency lighting along the entire path of egress at same scale as floor plan included in working drawing submittal. NOTE: If egress paths are not indicated on the plan, it will be assumed that the lighting levels for the entire room or area will need to meet the required illumination levels required by the VCC.
- All lighting and lighting calculations shall be provided in accordance with the 10th edition of the Illuminating Engineering Society of North America (IESNA) Handbook, and applicable energy codes.

6.16.10 Use of MC Cable

Metal-clad (MC) cable may be used if the following conditions are met:

New Construction

1. MC cable is used for branch wiring only.
2. A separate neutral conductor must be provided for each phase conductor in the cable assembly.
3. When running into a panel where the ceiling spaces are inaccessible, conduit (3/4" minimum) shall be run from the panel to a junction box in the nearest accessible ceiling.
4. Conduit shall be run neatly in straight, parallel runs, with proper support, and limited sag.

Renovation

1. Per NEC
2. A separate neutral conductor must be provided for each phase conductor in the cable assembly.

6.16.11 Conduit as Ground is Not Permitted

Conduit shall not be used as ground. Where conduit has been used as ground in existing facilities, ground conductors, bonding jumpers and clamps shall be provided for all affected work to provide a separate grounding conductor in conduit back to the source of the branch circuit or feeder. Complete details shall be included on working drawings.

6.16.12 Fire-Rated Walls

All fire rated walls shall be noted on power and lighting sheets. Fire rating shall match ratings indicated on architectural sheets.

6.16.13 Door Hardware Requirements

All door swing and door hardware requirements for transformer/electrical vaults, electrical rooms, generator rooms, or elevator machine rooms shall be noted on the electrical drawings as well as on the architectural sheets.

6.16.14 Clearance Markings

A 2" wide yellow line shall be painted on all concrete floors in electrical rooms and closets indicating the electrical working space as defined by the NEC. The space dimensions shall be provided by the design professional on the contract drawings. Stencil "NO STORAGE – ELECTRICAL WORKING SPACE" in 2" high, yellow letters centered in the space outlined area.

6.16.15 Mechanical Equipment

Provide coordination between mechanical and electrical drawings for means of disconnect for all mechanical equipment. Where a means of disconnect must be provided by the electrical contractor, provided coordinated drawings specifying the location, means of support, and means of connection to the equipment. Group disconnects to reduce mounting hardware requirements, supports, and roof penetrations.

Dashed or faded outlines shall be provided for all mechanical equipment on drawings. Provide notes as required to indicate clearances for maintenance, installation, or provisions for servicing. Coordinate with mechanical drawings where possible.

All mechanical equipment used to evacuate smoke, fumes, or provide heating in support of life safety equipment such as sprinkler pipes, shall be provided a circuit breaker locking device in the associated panelboard. Verify that such equipment qualifies for NEC 700, 701, or 702 systems.

6.16.16 4-Wire Delta Systems

No 4-Wire Delta systems are permitted to be used in new construction. Where 4-wire delta systems exist, they may be reused, but all elements of the system must be brought up to NEC standards when modified. Modification includes disconnection, connections, and reconfiguring of any part of the system. Provide labels, grounding, color coded conductors, etc. as required by the latest edition of the NEC.

6.16.17 Circuit and Equipment Designations

All circuit designations shall be provided in such a manner that any drawing sheet may stand on their own for purpose of circuit designation. Circuits shall be provided with circuit numbers, conductor and conduit sizes as a minimum.

All equipment designations shall be provided in such a manner that any drawing sheet may stand on its own for purpose of equipment designation.

No references to index sheets shall be used for the purpose of identification of circuits or equipment.

6.16.18 Incandescent Lights

As part of the preliminary design submittal, the agency shall submit the rationale for selecting incandescent and contact information for the person(s) requiring the use of incandescent fixtures.

6.16.19 Environmental Initiative Documentation

All design aspects to include existing conditions, material use and disposal, and commissioning shall be documented on the drawings and identified as being mandatory for the evaluation of the project with respect to the certification being sought.

6.16.20 Points of Contact

All pertinent points of contact for construction efforts shall be documented in the drawings to include Owner representatives, construction managers, utilities, and communications contractors where known.

6.16.21 Dig Notice

Where digging is required as part of the construction effort, include “Contact Miss Utility at 811, 1-800-552-7001, or http://www.missutilityofvirginia.com no less than 72 hours prior to excavation and do not disturb the soil until dig ticket has been processed.” on the working drawings.

6.16.22 Marinas, Boat Yards, Docks and Floating Buildings

All electrical installations subject to NEC Article 553 and 555, shall be provided the following additional safeguards, as approved by the agency:

1. Shore power circuits shall be provided one of the following:
    a. Ground fault monitoring: Notification of ground fault conditions shall be provided by indicator lights and sounders, or a beacon. The notification device(s) may be located at the branch circuit source, or at the marine power outlet, or both.

Notification devices shall be visible to the general public. Notification devices will require a reset that is not accessible by the general public. Fault current threshold may be adjusted to no more than 10mA. Supplemental notification to remote panel is permitted, but indicators must be visible to the general public.

b. Shore power GFCI: A ground fault shall open all poles of any shore power circuit where a ground fault is detected at the circuit breaker in the distribution panel. Class A or Class B GFCI protection is acceptable.

c. Distribution power GFCI: A ground fault shall open the main circuit breaker of any panel providing shore power when a ground fault is detected at the distribution panel. Fault current threshold shall be adjusted to a maximum of 80mA.

d. An emergency power off button shall be located at the head of each pier, dock, gangway and on the dock such that there is no more than a 100 foot travel path to a button from any place on the floating structure to include finger piers or other such extensions to the dock. Each button shall:

   i. Be a red latching plunger.
   ii. Have a minimum diameter of 2".
   iii. Be provided in a clear weatherproof cover.
   iv. Be accessible to the general public without locks or latches.
   v. Mounted between 36 and 48" above the dock surface.
   vi. Labeled "EMERGENCY ELECTRICAL SHUT OFF" in 1" high reflective white letters on a red background.
   vii. Shunt-trip the circuit breakers to feeders providing electrical service to the dock where button is located.
   viii. Activate a siren, >75dB, at the button and at the head of the dock when depressed.

2. All 15 and 20 amp, 120V power circuits present on docks, floating building, or buildings within 50 feet of the 100 year minimum shore line. Class B GFCI is permitted for locations over water, Class A shall be required in all other locations.

3. A ground fault shall open the main circuit breaker of any panel on docks, floating buildings, or buildings within 50 feet of the 100 year minimum shore line when a ground fault is detected at the distribution panel. Fault current threshold shall be adjustable to a maximum of 300mA.

4. Docks shall be configured such that power connections between the marine power outlet and vessels shall be unobstructed. Cords shall not be required to be routed over surfaces, under water, or through a conduit to be connected to a vessel.

5. Commissioning: All commissioning shall be third party, accomplished as a condition of BCOM, and be conducted according to Chapter 4 of "Commissioning Building Electrical Systems", NECA 90-2004. Commissioning shall be accomplished for all service ground, groundings system elements, Ground-fault protection Systems, relays, and breakers.

6. The engineer shall provide a third party stray voltage study as a condition of BCOM. A stray voltage measured at more than 2 volts will require documented corrective measures. The study shall:

   a. Be accomplished with all power connections complete and power applied to all marina power outlets.
   b. Use a voltmeter with greater than 20MΩ input resistance and 50mV accuracy.

i. Voltage samples shall be accomplished by driving a metal probe 6” into the earth, or a 1’ long metal probe or wire submerged below the water surface where samples are to be in the water.
ii. Voltage samples shall be accomplished with and without a 5KΩ load resistor across the meter input.
iii. Provide voltage samples relative to the neutral bus and ground bus for each voltage sample, and be recorded with 3 significant digits.

c. Provide voltage samples at each panelboard and transformer at the equipment location and 1’, 5’, and 10’ from the equipment.
d. Provide voltage samples at each shore power connection at connection location and in the water 5’ from the connection.

6.16.23 Aluminum Conductors

Aluminum conductors smaller than no. 4 shall not be used on state electrical work.

CHAPTER 7 - CONSTRUCTION PROCUREMENT AND ADMINISTRATION

7.0 GENERAL

Section 2.2-4301, *Code of Virginia* defines "construction" as meaning building, altering, repairing, improving or demolishing any structure, building or highway, and any draining, dredging, excavation, grading or similar work upon real property.

§ 2.2-1132, *Code of Virginia*, provides that the Division of Engineering and Buildings shall provide assistance in the administration of capital outlay construction projects set forth in the appropriation act, other than highway construction undertaken by the Department of Transportation and the acquisition or improvement of specialized cargo-handling equipment and related port infrastructure by the Virginia Port Authority.

Further, the Division of Engineering and Buildings may establish standards, as needed, for construction by the Commonwealth and may, with the advice of the Attorney General, establish standard contract provisions and procedures for the procurement and administration of construction and for the procurement and administration of architectural and engineering services relating to construction, which shall be used by all departments, agencies and institutions of the Commonwealth except in such cases where additional authority has been given to that agency (see Section 7.0.1).

For purposes of § 2.2-1132, "construction" shall include 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 with the exceptions stated above.

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.

7.0.1 Additional Authority Classifications

Certain agencies have been given additional authority under the Code of Virginia in managing capital outlay.

Tier 1 (Higher Education Management Act): University of Virginia (207, 246), College of William and Mary (204, 241, 268), Virginia Tech (208, 229), and Virginia Commonwealth University (236).

Tier 1 Agencies have control over all capital outlay procedures regardless of the source (General Fund or other). For Pool Funded Projects, this control begins once the project has been funded by the Governor's Designee (6-PAC). The Agency must comply with the Virginia Public Procurement Act. Tier 1 Agencies have the option of selecting their Building Official.

Tier 2 (Higher Education Capital Outlay): James Madison University (216), Old Dominion University (221), Virginia Military Institute (211), Radford University (217), Christopher Newport University (242), George Mason University (247), Virginia Community College System (260).

Tier 2 Agencies have control over all capital outlay and procurement procedures for projects that do not involve any funding from the General Fund. The Agency must comply with the Virginia Public Procurement Act. DGS/DEB remains the Building Official.

Agencies that have been granted additional authority as described above shall notify DGS/DEB, the A/E, Contractor, and other entities that are regulating, proposing, or contracting with the Agency for the project of that additional authority and how the requirements and procedures differ from those in this manual.

7.1 GENERAL REQUIREMENTS FOR PROCUREMENT OF CONSTRUCTION

7.1.1 Capital Outlay Construction Projects

The default standard for procurement of construction services is competitive sealed bidding in accordance with Title 2.2, Chapter 43 of the *Code of Virginia* (Virginia Public Procurement Act) and the procedures described in this chapter. (§ 2.2-4301 and 2.2-4303, *Code of Virginia*) See Section 7.3. Alternative methods of construction procurement are Design-Build (see Section 7.30) and Construction Management (see Section 7.31).

The Invitation For Bids for capital outlay construction projects shall include the General Conditions of the Construction Contract, Form CO-7; the Instructions to Bidders, Form CO-7a; the Notice of Invitation to Bid; a Bid Form; and other documents described in Chapter 5. Use the wording shown in the Form DGS-30-376, Supplemental General Conditions for Renovation Projects and Liquidated Damages. See the Forms Center for a description and links to required forms.

7.1.1.1 Emergency Procurement of Construction

In case of an emergency, a contract may be awarded without competitive sealed bidding. However, such procurement shall be made with such competition as is practicable under the circumstances. A written determination of the basis for the emergency and for the selection of the particular contractor shall be included in the contract file. As a minimum, the Agency shall post a written notice on eVA stating that the contract is being awarded on an emergency basis and identifying that which is being procured, the contractor selected, and the date on which the contract was or will be awarded. Refer to the Code of Virginia (§ 2.2-4303, F.) for the complete statutory requirements.

7.1.2 Non-Capital Outlay Construction & Maintenance Reserve-Funded Projects

Non-capital outlay construction, or repair or replacement in kind, or remodeling or renovation and Maintenance Reserve projects which are not classified as 'capital' projects but which cost $100,000 or more shall follow the same bidding procurement procedures as described for capital projects. Projects shall be posted and advertised for competitively sealed bids as described in this chapter. See Appendix H for further guidance on Non-Capital Outlay projects.

7.1.3 Small Non-Capital Outlay Construction Projects

Non-capital outlay construction, or repair or replacement in kind, or remodeling or renovation Work which is valued at less than $100,000 may be procured using the standard CPSM Competitive Sealed Bid procedures or by using the Small Project Procurement Procedures described in Section 7.2 below

7.1.4 Special Construction Procedures

Competitive negotiations may be used by an Agency on projects using a fixed price design-build or construction management contract conforming to the procedures in Section 7.30 or 7.31 of the **Manual** (§ 2.2-4306, *Code of Virginia*).

7.1.5 Virginia Construction Contracting Officer

Agencies having a Virginia Construction Contracting Officer (VCCO) shall use the services of the VCCO in bidding and awarding capital outlay construction contracts as described in Sections 7.3 through 7.8 of this Manual. Procedures stipulated in this Manual for advertisement, Invitation to Bid, Receipt of Bids, Opening of Bids and Award of Contracts shall be used. If an agency does not have a VCCO, each construction or professional service procurement shall be reviewed and approved by DEB/BCOM.

7.1.6 Authorization to Advertise for Bids

Authorization to advertise for bids is given on completion of technical review(s) of the project documents by the BCOM or the Agency Review Unit (for those so delegated) and approval of the Project CO-6 for Capital Projects. For Non-capital projects it is recommended that the documents be reviewed by BCOM before advertising for bid. Failure to do so puts the agency at risk for change orders if bids are based on documents which do not conform to the requirements of the VUSBC or Chapters 4 and 6 of the Manual. Call the BCOM Program Management Section at (804) 225-3769 to establish or change a date for receipt of bids.

7.1.7 Work Performed by Other than Public Contract

Unless waived by the action wording on the approved CO-2, Agencies authorized to perform construction using Agency work force personnel shall submit their plans and specifications bearing the seal of the responsible architect and/or engineer for State Building Official review, approval, and Building Permit prior to beginning work. The format and instructions for submittals are outlined in Chapter 5 of this Manual.

The wording to "proceed" waives the requirement to make submittals of the forms CO-4, CO-5 and CO-6 and of the design phase documents for Capital Outlay procedure review. However, this does not relieve the Agency (or their A/E or Contractor) from compliance with all applicable building codes and standards nor does it relieve the Agency from submitting the plans/sketches and the specifications/work description as necessary to obtain a Building Permit for the Work.

7.1.8 SWaM Procurement Plan

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

7.1.8.1 Agency Plan

In accord with Executive Order 20 (2014) an annual SWaM Procurement Plan that specifies the Agency's plans and goals for SWaM procurement is required. Certification of SWaM businesses by the Department of Small Business and Supplier Diversity (DSBSD) is required. This was formerly handled by Department of Minority Business Enterprises (DMBE). Plan guidelines are available from DSBSD/DMBE. The plan shall be updated each September 1st.

7.1.8.2 Prequalification

SWaM Procurement Plans with identified goals for minority and women-owned business procurement, may include those goals as conditions or pre-qualification requirements in the terms and conditions for the award of any prime contract in excess of $100,000 and, if so included, may reflect those goals in the requirement for a subcontracting plan prepared and submitted within 30 days of award for construction. See Section 7.34, Prequalification Procedures.

7.1.8.3 Contract Size

If the size of vertical or horizontal construction contracts appears to limit SWaM vendors from bidding or winning such contracts, then the contracting agency may seek to reduce the size of the contracts to increase the pool of potential SWaM bidders. If the effect of reducing the size of such contracts is to cause a meaningful increase in price, a significant degradation in terms and conditions, a significant decrease in administrative efficiency or non-compliance with applicable federal contracting requirements or funding conditions, then the contracting agency or institution shall not be obligated to so reduce the contract size. In the case of construction contracts awarded to non-SWaM primes, the prime contractor shall seek to size the subcontracts so as to enable qualified SWaM subcontractors to bid effectively for such work so long as the effect of reducing the size of such subcontracts does not cause a meaningful increase in price or a significant degradation in terms, conditions or other applicable contract factors. In the case of non-highway construction, where appropriate for the construction job in question, the Commonwealth shall consider using a Construction Manager at Risk instead of a

prime contractor in order to afford opportunities for SWaM contractors to bid effectively for the work in question. Nothing contained in this paragraph shall require the contracting agency to accept contractors who do not meet applicable quality, safety and performance standards.

7.1.8.4 SWaM Identification / Certification

The contractor shall provide DSBSD certification for all work provided by SWaM contractors under the Agency SWaM Procurement Plan as soon as practicable after signing of the contract.

7.1.8.5 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.

7.1.9 Bonds / Commonwealth Self-Bonding Program

7.1.9.1 Bid Bond

For contracts with a value of $100,000 or less, when Bid Bonds are not required by the Invitation for Bid or Request for Proposal, the Owner may require prospective contractors to be prequalified. For contracts with a value of more than $100,000 but less than $500,000, when Bid Bonds are not required by the Invitation for Bid or Request for Proposal, prospective contractors shall be prequalified. In no case shall bonding requirements be waived for projects with a value of $500,000 or more.

7.1.9.2 Performance Bond and Labor and Materials Payment Bond

For contracts with a value of less than $500,000, agencies should consider waiving the Performance Bonds and Labor and Materials Payment Bonds when the agency determines that the risk is acceptable. For contracts with a value of less than $500,000, when Performance Bonds and Labor and Materials Payment Bonds are required by the Invitation for Bid or Request for Proposal, there are two methods to obtain these bonds - Commonwealth Self-Bonding Program or Standard Bonds. For bidders who have been prequalified in accord with the Commonwealth Self-Bonding Program, the Owner may at their sole discretion obtain the bonds through this program. All other contractors shall provide the Owner with Standard Bonds or Alterative Forms of Security in accord with §2.2-4338. In no case shall bonding requirements be waived for projects with a value of $500,000 or more.

7.1.9.3 Commonwealth Self-Bonding Program

The Commonwealth's Self-Bonding Risk Management Program for Small Construction Projects (aka, Self-Bonding Program) was developed by the Department of the Treasury's Division of Risk Management in conjunction with the Department of General Services' Division of Engineering & Buildings. This program was developed to address the mandates of the following sections of the *Code of Virginia*: § 2.2-1839, § 2.2-4336, § 2.2-4337, and § 33.1-12. The current procedures describing the Self-Bonding Program are available for view and download from the DEB website. Form, CO-16, Attachment Two (DGS-30-174), requests additional financial and insurance data from contractors seeking to prequalify for self-bonded projects.

7.1.10 Political Contributions Prohibited During Procurement Process

Per *Code of Virginia* §§ 2.2-4376.1 and 2.2-3104.01, no bidder or offeror, including any individual who is an officer or director of such, who has submitted a bid or proposal to a state agency for the award of a public contract pursuant to the Virginia Public Procurement Act (*Code of Virginia* § 2.2-4300 et seq.) shall knowingly provide, or make an express or implied promise to

make, a contribution, gift, or other item valued over $50 to the Governor, his political action committee, or the Governor's Secretaries, if the Secretary is responsible to the Governor for any agency with jurisdiction over matters at issue ("Governor's Associates"), during the period between the submission of the bid and the award of the public contract. Likewise, the Governor's Associates shall not knowingly accept such a contribution, gift, or other item under these circumstances. Any person who violates this shall be subject to a civil penalty of $500 or up to two times the amount of the contribution or gift, whichever is greater. The provisions of this paragraph shall not apply to contracts with a stated or expected value of under $5 million or contracts awarded as the result of competitive sealed bidding (as defined in *Code of Virginia* §2.2-4301).

7.1.11 Debarment and Enjoinment

Code of Virginia § 2.2-4321 allows for contractors to be debarred from construction contracts with the Commonwealth. A contractor may be debarred or enjoined only under the circumstances and by the procedures outlined in the DGS Debarment and Enjoinment Procedures for Construction. Debarment and enjoinment status of contractors and other vendors can be determined by registered eVA users at the eVA website.

7.2 PROCEDURES FOR SMALL CONSTRUCTION PROJECTS

7.2.1 Small Non-Capital Outlay, and Maintenance Reserve-Funded Projects

Construction shall be procured by competitive sealed bidding in accordance with Title 2.2, Chapter 43 of the *Code of Virginia* (Virginia Public Procurement Act) and the procedures of this chapter. (§ 2.2-4301 and 2.2-4303, *Code of Virginia*) Also see Section 7.3.

Building Permits are required for construction projects as delineated in the Building Official's "Building Permit Policy for Construction – State Owned Buildings & Structures" including all revisions thereto. See Appendix P.

The following procedures shall be used for the procurement of small construction projects:

7.2.2 Non-Capital Outlay Minor Construction Costing $50,000 or More but Less Than $100,000

- Develop Scope of Work including plans & specifications (bid documents)
- Use CO-7 General Conditions
- Post Notice of IFB in eVA (and at the Agency's public posting area, if applicable)
- Receive Sealed Bids
- Open Bids next day at specified time
- Post Notice of Award.
- Bonds are not required but may be specified

7.2.3 Non-Capital Outlay Minor Construction Costing $5,000 or More but Less Than $50,000

- Develop Scope of Work including plans & specifications (bid documents)
- Use CO-7 General Conditions
- Post Notice of IFB in eVA (and at the Agency's public posting area, if applicable)
- Solicit Bids from at least 8 licensed DSBSD-certified Small Businesses, 4 of which shall be Women Owned Businesses and/or Minority Owned Businesses (SWaM)
- Receive Faxed or emailed Bids by specified deadline
- Open / announce Bids next day at specified time
- Post Notice of Award

7.2.4 Non-Capital Outlay Minor Construction Costing Less Than $5,000

- Develop Scope of Work (bid documents)

- Use CO-7 General Conditions
- Solicit Bids from at least 4 licensed DSBSD-certified Small Businesses, 2 of which shall be Women Owned Businesses and/or Minority Owned Businesses (SWaM)
- Receive Faxed or emailed Bids by specified deadline
- Open / announce Bids next day at specified time
- Post Notice of Award

7.2.5 DEB Contracts

DEB has developed a list of contracts for use by all state agencies. The list of contracts can be reviewed at the DEB Contracts web page.

- Develop Scope of Work including plans & specifications (bid documents)
- Use CO-7 General Conditions
- Post Notice of IFB in the Agency's public posting area and through eVA
- Receive Sealed Bids
- Open Bids next day at specified time
- Post Notice of Award

7.2.6 Non-Capital Outlay Minor Construction

All work that is classified as construction as defined by COV §2.2-1132 shall be procured in accord with Construction and Professional Services Manual (CPSM). The Agency Procurement and Surplus Property Manual (APSPM) shall not be used to procure construction. The only work that may be procured under the guidance of the APSPM is that for which no building permit or demolition permit is required to be issued. If there is doubt, either contact BCOM for guidance or use the CPSM procedures for procurement of construction.

Code of Virginia §2.2-1132

For purposes of this section, "construction" shall include 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. It shall not include buildings or other facilities ancillary to the use of state highways that are located within the right-of-way of any state highway, or assets for use by the Virginia Port Authority within the boundaries of property owned or leased by the Virginia Port Authority.

7.3 BID PERIOD ACTIVITIES

Preparations for bidding including the preparation of Bid Documents, the Invitation for Bids, the Instructions to Bidders (Form CO-7a), the Bid Form, and Advertising are described in Chapter 5. Prequalification procedures are described in Section 7.34 of the **Manual**.

§2.2-4301 of the *Code of Virginia*, "Competitive Sealed Bidding", requires that Invitations For Bid (IFB) be 'posted' or advertised in a newspaper or both. When advertising in the newspaper, the Agency may post the full Notice of Invitation For Bid (see DGS-30-256) or it may use the 'short form' Notice posting the minimum information as shown in DGS-30-252. Notice shall also be posted on the DGS Internet procurement website at www.eva.virginia.gov.

§2.2-4301 of the *Code of Virginia*, "Competitive Negotiation", requires that Requests For Proposals (RFP) be 'posted' and advertised in the newspaper of general circulation in the area. If the agency determines that the work can be procured by competitive negotiation, it must advertise the RFP in the newspaper as well as public posting and posting on the DGS Internet procurement website at www.eva.virginia.gov .

7.3.1 Prebid Conference

If a Prebid Conference or project showing is held (whether optional or mandatory), representatives of the Agency and the A/E shall attend. The Agency shall make the Project location or building available to the attendees (prospective bidders) for their observation or inspection.

The A/E shall conduct such conference or showing. The agenda for the Prebid Conference 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 Bidder
   - Prebid Question Form
   - Bid Form
   - Supplemental General Conditions
   - Special Conditions
   - General Requirements
   - Site constraints, phasing requirements, or other requirements that affect the sequence or staging of the work.
   - 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 shall 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.

7.3.2 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. All addenda shall be approved by the Owner prior to issuance.

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 prior to the receipt of bids.

Addenda shall show the Agency Name, the Project Title, the 11 digit Project Code, and the specific items to be modified. Addenda shall be written in a clear and concise manner. Each item shall identify the location in the documents of the item to be changed (e.g. plan sheet number and view or specification section and paragraph number) and describe the change to be made (e.g. change dimension in Section from x'-xx" to y'-yy" or delete wording in Section 09999, paragraph 3 (b) as written and replace with the following words ".....")

7.3.2.1 Major Clarifications or Corrections

Addenda to clarify or correct significant information in the Bid Documents shall 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 10 days from addendum issue to bid date.

7.3.2.2 Minor Clarifications

Addenda which serve primarily to provide clarifications or corrections that do not require significant changes to the Bid documents and can be covered in a one page Addendum may be issued up to 6 days prior to bid 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.

7.3.2.3 Distribution of Addenda

One copy of all Addenda shall be submitted to BCOM and the appropriate regional State Fire Marshal's office at the same time and by the same means as the Addenda are issued to the Bidders.

7.4 BID RECEIPT, OPENING AND EVALUATION

The Receipt, Opening and Evaluation of Bids are very important activities and agencies must follow the established rules, procedures and processes. The person receiving the bids shall be thoroughly trained and knowledgeable of the proper procedure for receiving and documenting bids. This person will usually be the Agency VCCO or a person acting under the supervision of the Agency VCCO. The person must be focused on receiving the bids, documenting the receipt, opening the bids properly and evaluating the bid information. Failure to follow the procedures may result in bid protests, voiding the bid receipt and inviting possible legal action.

See Appendix F for further information and a Checklist for Receiving and Opening Bids.

7.4.1 Notice of Intent to Award

Once the bid evaluation is complete, the successful low bidder has been determined, and the Agency has approval to award a contract, the Agency shall "Post" a Notice of Intent to Award, CO-9.1, (DGS-30-067) for a minimum of 10 days prior to award of the Contract. A copy of the Bid Tabulation annotated to indicate the bidder to which the award is intended to be made and the intended amount of the award may satisfy this requirement. The Notice shall be posted at the place the agency uses for "posting" notices. In addition the agency shall also post such notices on their electronic website and on eVA.

7.5 PROVISIONS FOR NEGOTIATION WITH A LOW BIDDER

When the bid exceeds the approved construction budget and the conditions and right to negotiate were included in the Bid Documents (§ 2.2-4318, *Code of Virginia*), state agencies may request authority to negotiate with the lowest responsive and responsible bidder as outlined below.

In general, bids which are less than 10 percent over budget can reasonably be negotiated. If the bids are more than 10 percent over budget, the changes required would be significant and involve design and/or scope changes. Therefore, the Project should be re-bid after these changes are made. See Section 5.10 for bid/budget management techniques and Section 7.6.1 for available alternatives.

7.5.1 Authority to Negotiate

The Director of the Bureau of Capital Outlay Management may grant the Agency the authority to negotiate with the apparent low bidder after review of the Bid Tabulation, the specifics of the request and the justification submitted by the Agency.

The Agency's request for authority to negotiate may be made telephonically to the BCOM Director at (804) 786-4398 and shall include the following information followed within 24 hours by the written documentation:

a. Pre-bid estimate of construction cost from the approved CO-6 or other documentation
b. Tabulation of bids and bidders
c. Name of recommended Agency negotiator
d. Name of Architect/Engineer Firm's advisor(s)
e. A list of the items or work that the Agency proposes to consider in the negotiation. (VE recommendations previously rejected shall be considered.)

The Director of the Bureau of Capital Outlay Management will approve or disapprove the request normally within 24 hours after receipt of the written documentation. The Director may give verbal approval followed by written authorization to begin negotiations.

Negotiation shall be limited to the Work included in the Total Base Bid on the bid form only. Additive bid items, if any, cannot be considered in the negotiations nor can they be incorporated in the final negotiated contract.

7.5.2 Role of the A/E

The A/E, as part of his Basic Services, shall advise the Owner as to the functional, operational, safety and code aspects of all proposed changes in the Work. The A/E shall also advise the Owner of the appropriateness of the dollar value of each change. Once the negotiations are complete, the A/E shall assist the Agency in preparing the documentation of the negotiations and prepare any sketches, details or other modifications to the plans and specification to clarify the Work to be performed by the Contractor.

7.5.3 Documentation of Revisions

Documentation of the negotiations shall clearly identify the Work changed or deleted and the value of each change or deleted item of Work.

The Work changed or deleted is subject to approval of the DEB Director since this represents a change from the documents previously approved. The Agency shall complete a Form CO-9b, Post Bid Modification, which shall become part of the contract.

7.6 AUTHORITY TO AWARD A CAPITAL OUTLAY PROJECT CONTRACT

When the apparent low responsive and responsible bidder is determined for a Capital Project, the Agency shall prepare a tabulation of bids and a Form CO-8, Approval to Award Contract (DGS-30-056). The Director of the Division of Engineering and Buildings or an Agency Designee who is a Virginia Construction Contracting Officer (VCCO) shall have authority to approve the award of a contract to the lowest responsive and responsible bidder for capital outlay projects.

7.6.1 Low Bid Equal to or Less Than Agency Estimate

If the low bid is equal to or less than the Agency construction estimate on the approved CO-6 or authorizing advertising document, the GS Form E&B CO-8 may be approved by the designated Agency VCCO. No commitment, verbal or written, shall be made until bids have been reviewed and approval received from the Agency VCCO to award the Contract. When the CO-8 is approved, a Contract can be awarded. The Agency shall enter the Project Budget on the CO-8 to reflect the proposed construction amount (low and additives taken), A/E fees, project inspection, equipment, other and a maximum of 5% of the contract amount as a construction contingency. Remaining funds will be de-allotted and held by DPB pending project completion. Copies of the approved CO-8, the bid tabulation and a copy of the Bid Form submitted by the successful low bidder shall be forwarded to BCOM within 10 days after the bid opening.

7.6.2 Low Bid Exceeds Agency Estimate by 10% or Less

If the low bid exceeds the Agency estimate of construction costs shown on the approved CO-6 or authorizing advertising document by 10% or less, the Agency may

Accept the bid if funds are available within the approved total project budget; or
Request authority to negotiate; or
Reject all bids.

The designated Agency VCCO shall sign the CO-8 which shall show the revised project budget breakdown. A copy of the approved CO-8, the bid tabulation and a copy of the Bid Form submitted by the successful low bidder shall be forwarded to BCOM within 10 days after bid opening.

7.6.3 Low Bid Exceeds Agency Estimate by More Than 10%

If the low bid exceeds the Agency estimate of construction costs shown on the approved CO-6 or authorizing advertising document by more than 10%, the Agency may

Request authority to infuse additional funds and award a contract; or
Request authority to negotiate with the low bidder; or
Reject all bids.

In all cases where the low bid exceeds the Agency construction estimate by more than 10%, the approval to award a contract, even after negotiations with the low bidder, rests with the Director of the Division of Engineering and Buildings.

7.6.3.1 Infusion of Funds

If the Agency elects to infuse additional funds and accept the low bid, submit the following to DEB for approval within 10 days after bid opening: a revised CO-2, the CO-8, a copy of the bid tabulation, a copy of the Bid Form submitted by the successful low bidder, a copy of the CO-9b, Post-Bid Modification, if appropriate, and a request for DPB to approve the addition of funds and request for DEB approval to award the Contract. The Agency shall adjust the Project Budget on the CO-8 to reflect the proposed construction contract amount, A/E fees, project inspections, equipment (DO NOT change this amount) and a maximum of 5% of the construction contract amount as construction contingency. No commitment, verbal or written, shall be made until bids have been reviewed and approval received from DPB and DEB to award the Contract. When the CO-8 is approved by DEB, a contract may be awarded.

7.6.3.2 Negotiation

State agencies may, when authorized, negotiate with the lowest responsible bidder as outlined in Section 7.5 when the low bids exceed available funds. The final negotiated price shall be entered on E&B Form CO-8 and, with the completed EB Form CO-9b, Post-Bid Modification, be submitted to DEB for approval to award the contract. The Project Budget on the CO-8 shall show the proposed construction contract amount (negotiated contract amount), A/E fees, project inspections, equipment and a maximum of 5% of the negotiated contract amount as construction contingency if funds are available for such contingency. No commitment, verbal or written, shall be made until bids have been reviewed and approval received from DPB and DEB to award the Contract. When the CO-8 is approved by DEB, a contract may be awarded.

7.6.3.3 Rejection of All Bids

If the Agency does not wish to accept the bids, it shall contact BCOM to describe and coordinate the proposed rejection. The Agency VCCO shall reject all bids.

7.7 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 Agency, no later than ten days after the award or the announcement posting of the intent to award, whichever occurs first. No protest shall lie (i.e. be sustained or have a basis) for a claim in which 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 Agency shall issue a decision in writing within ten days of the receipt of the protest stating the reasons for the action taken. This decision shall be final unless the bidder or offeror appeals within ten days of the written decision by instituting legal action as provided for in § 2.2-4364, *Code of Virginia*. (§ 2.2-4360, *Code of Virginia*).

Stay of award during protest (§ 2.2-4362, *Code of Virginia*). 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 by the Agency Head that proceeding without delay is necessary to protect the public interest or unless the bid or offer would expire.

7.8 AWARD OF THE CONSTRUCTION CONTRACT

After receipt of authorization from DEB or the Agency VCCO, the Agency may enter into a written contract with the Contractor using the Form CO-9. One copy of this form and the Form CO-9b (Post-Bid Modification), if used, shall be filed with the BCOM Director. A copy of the Notice of Award, Form CO-9.1a, shall be **publicly posted** concurrent with the Notice to the Contractor that his bid has been accepted.

When the apparent low responsive and responsible bidder is determined for a Non-Capital Project, the Agency shall 'post notice' of the intent to award the contract.

7.9 REFUND OF DEPOSITS FOR DRAWINGS AND SPECIFICATIONS

The A/E's Basic "Bid Phase" Service includes having the bid documents printed, issuing bid documents to bidders, receiving and holding deposits on the bid documents, maintaining the listing of bid document holders, receiving and inspecting the bid documents returned after bidding, and returning deposit checks/ issuing refunds when the documents are returned in a condition usable for construction. Agencies may choose to perform these functions "in-house" or contract to have this function performed by a Project Manager. If not required of the A/E, the A/E Contract shall be modified, either in the description of services in the initial MOU or by a Change Order, to reflect the deletion of this basic service. See Chapter 3. If bid documents are distributed electronically by file transfer, there should be no deposit charged. If distributed via removable electronic media (DVDs, flash drives and the like), the deposit should be minimized to cover direct costs only. It is the A/E's responsibility to provide electronic bid documents in a read-only format which is readily usable by the agency and by all bidders.

All checks used as a deposit for the purpose of securing plans and specifications shall be made payable to the A/E (or entity tasked with distribution of the Bid Documents). If the documents are returned in good condition, within 10 days after bid opening, checks will be returned or a refund issued to the Contractor. In case any of the deposits are forfeited, either in part or in their entirety, the A/E shall make an accounting to the Agency showing the number of sets of blueprints provided, the number of sets returned, and also the amount of money forfeited for payments of plans and specifications by the Contractors. Any forfeiture, as mentioned above, should then be subtracted from the A/E's statement for reimbursement of printing costs.

The A/E may require separate payment of a nominal shipping charge where the Contractor requests shipment rather than pickup of bid document sets. Shipping charges are intended to reflect only the cost of packaging and shipping the documents and are not refundable to the plans holders.

7.10 CONSTRUCTION CONTRACT ADMINISTRATION

The A/E's Basic Services requires the A/E to assist in the solicitation of bids, assist in bid opening, review submittals, inspect the Work, review and certify Contractor payment requests, issue clarifications of the Documents, issue Field Orders, process change orders and perform other functions associated with contract administration.

7.10.1 Alternate Construction Contract Administration

Agencies that have the resources and capabilities may request authority to administer the Construction Contract. The request will be submitted to the Director, Division of Engineering and Buildings, with the CO-5 or prior to the submission of the CO-6 for the project. The request must document the advantage to the Agency and the Commonwealth of using some entity other than the A/E to administer the Construction Contract and give a synopsis of how the Construction Contract is proposed to be administered.

Alternatively, the Agency may use the RFP process for Non-Professional Services to secure a consultant to perform Project Management and/or Project Inspection services. The selected Project Management / Project Inspection contract must clearly identify the services to be provided by the consultant and the limits of its authority. The Project Manager services which relate to the

construction may impact the Contractor. Required interface or interaction between the Contractor and the Project Manager must be conveyed to the Contractor in the Special Conditions Section of the specifications.

The A/E Contract must be modified to reflect the reduction in the A/E Basic Services.

7.10.2 A/E Construction Period Services: Required

The following services, described in the General Conditions of the Construction Contract, CO-7, shall be provided by the A/E of record and shall not be delegated to others unless specifically approved by the Director, DEB:

- Attend preconstruction meeting
- Make design changes required by uncovered hidden conditions
- Interpret plans & specifications
- Where the documents specify or show a means, method, sequence, technique or procedure, determine acceptability of substitute means, methods, sequence, techniques or procedures proposed by the Contractor
- Provide additional details as necessary to clearly describe what is required to be constructed
- Prepare and issue or validate all Field Orders and all Agency directed and/or authorized Change Orders involving any matters or items of 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.
- Clarify discrepancies in documents
- Review and approve submittals
- Reject non-conforming submittals including Sprinkler Shop Drawings & Submittals.
- Furnish approved copies of Sprinkler submittals to the Regional Fire Marshal's Office.
- Verify conformance of submittals with Plans and Specifications
- Approve or reject alternate or substitute materials proposed by Contractor
- Approve or reject equipment and materials proposed by Contractor
- Resolve conflicts between manufacturer installation instructions vs. Plans and Specifications
- Advise on acceptable procedures where installation instructions are not provided
- Approve or reject Contractor's proposed modifications to structural and other building systems
- Advise Owner on technical matters related to the project

Note: If the A/E's contract has been appropriately modified, Agency directed and/or authorized Change Orders and 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 or electrical system integrity may be handled by a qualified licensed professional on the Agency or separate Consultant's staff.

7.10.3 A/E Construction Period Services: Optional

The following construction period services shall also be provided by the A/E as part of his periodic site visit Basic Services unless specifically deleted by the A/E Contract in its Memorandum of Understanding (MOU):

- Conduct preconstruction meeting
- Confirm in writing, all verbal orders given by the A/E to the Contractor and/or Project Inspector
- Transmit Owner's Orders to Contractor
- Review Contractor's CO-12 Schedule of Values, continuation sheets, and approve for acceptable level of breakdown, acceptable allocation of costs, proper listing of 'Unit Price' work shown on the Bid Form, and separate listing of Change Order costs.
- Verify quantities of unit price work and prepare Change Orders as appropriate for quantities actually performed or incorporated in the Work. See Appendix K for Change Order procedures.

- Review proposed work plan & schedule
- Review schedule for adequate time to review submittals
- Review/recommend approval of project CPM schedule per Section 19 of the CO-7, General Conditions of the Construction Contract
- Report on Contractor adherence to schedule
- Review/approve progress graph
- Approve Contractor's proposed type of temporary heat as it may affect protection of construction
- Advise Owner on construction matters related to the project
- Make site visits and provide written report
- Determine progress and quality of the Work
- Recommend suspension of Work
- Inspect/spot check Work for conformance with the Contract Documents and the codes and installation / workmanship standards therein. (e.g. reinforcing clearances and laps per ACI; ductwork conforming to SMACNA; wiring conforming to NEC; etc.)
- Note and report defects and deviations in the Work
- Identify to Project Inspector any specific checks or inspections to be made as the Work progresses including what to look for
- Require defective Work to be removed and redone
- Reject inferior or poor workmanship
- Reject Work which does not conform to Contract Documents requirements
- Require Contractor to make repairs or changes deemed necessary
- With Owner's approval, suspend Work which depends on non-conforming Work until an acceptable correction or replacement is provided by the Contractor
- Approve repair/restoration of damaged work
- Inspect roof and advise when ready for roof survey
- Approve CO-12 and Schedule of Values format, content and breakdown
- Schedule and conduct monthly pay meeting
- Review CO-12 pay request vs. work done & materials stored & certify amount
- Certify monthly pay requests
- Receive Contractor's affidavit of payment of claims
- Review Contractor requests/claims for extension of time
- Review Contractor claims for extras
- Verify Project is ready for substantial completion inspection prior to actual inspection
- Conduct Substantial Completion Inspection and prepare punchlist
- Complete and sign Certificate of Substantial Completion, CO-13.1a
- Conduct Final Completion Inspection
- Complete and sign Certificate of Completion, CO-13.1
- Coordinate Operation & Maintenance Manuals and other project closeout documents & submit to Owner
- Prepare Record Drawings

7.10.4 Construction Project Management by Agency or Consultant

All Construction Project Management / Contract Administration activities not specifically required above to be performed by the A/E may be performed by the Agency or by the Agency's Project Management / Project Inspection Consultant. The Agency or its consultant may then perform the functions listed in 7.10.3 above.

7.10.4.1 Alternate Construction Contract Administrator

If the Owner relieves the A/E of responsibility for issuing Field Orders and/or Change Orders or rejecting Work, the person designated by the Owner to issue the Field Orders or Change Orders or reject the work or have authority to render decisions on the project shall be a Virginia licensed Architect or Professional Engineer who is experienced, knowledgeable and qualified to make the judgment on the matter.

A copy of all Change Orders related to technical matters or conformance to the applicable Codes and standards along with a copy of the justification and the recommendation of the "Delegated Review Authority" shall be forwarded to the Building Official (Director, Division of Engineering and Buildings) for approval as to code compliance.

For an Agency with "Delegated Review Authority", the person designated as responsible for such reviews shall review and recommend approval or disapproval on all proposed change orders related to technical matters to assure continued conformance to the Code and adherence to requirements.

7.10.4.2 Owner's Designated Representative

The Owner may designate an on-site Project Manager to be the Owner's designated representative on the project. In such case, the Project Manager shall be the person through whom the Owner and the A/E generally convey written decisions and notices to the Contractor and receive information and notices from the Contractor.

The Owner may also delegate from the Architect/Engineer to the Project Manager certain inspection, verification, acceptance, rejection, and administrative duties and authority. The scope of the Project Manager's authority is limited to that authorized by the Owner. The Owner shall provide the Contractor and the A/E information in writing defining the limits of the Project Manager's authority.

7.11 PRECONSTRUCTION MEETING

The General Conditions of the Construction Contract (Form CO-7) requires that prior to the start of construction, and no later than 15 calendar days after the Notice to Proceed, a Preconstruction meeting shall be held. Attendees should include the Owner's Project Manager and Project Inspector, the A/E's Representative including representatives of each design discipline involved in the project, Fire Marshal's Office representative, the Contractor's Project Manager and Superintendent (and Scheduler, if Contractor desires), and representatives of the Contractor's major Subcontractors. A Safety Representative from Department of Labor and Industry may also be invited.

The purpose of the preconstruction meeting is to clarify and discuss the specifics related to, but not limited to, the following:

1. Persons involved from each entity and their chain of authority.
2. Names, addresses, telephone numbers, fax numbers, procedures and formats to be used for Requests for Information (RFI), Requests for Clarification (RFC), Requests for Proposals (RFP), shop drawing and sample submittals, and notices.
3. Contractor's proposed construction schedule.
4. Owner's sequencing requirements, if any.
5. Schedule of Values and Certificate for Payment (Form C0-12) requirements and procedures.
6. Procedures for shop drawing, product data and samples submittals.
7. Procedures for handling Field Orders and Change Order Form CO-11.
8. Procedures for Contractor's request for time extension, if any.
9. Construction site requirements, procedures and clarifications to include:
   - Manner of conducting the Work
   - Work site specialties such as dust and erosion control, stormwater management, project signs, clean up and housekeeping, temporary facilities, utilities, security, and traffic
   - Safety
   - Layout of the Work
   - Quality control, testing, inspections and notices required
   - Site Visits by the A/E
   - Owner's Project Inspector duties

- Running Punch List
- As-Built Drawings

10. Monthly Pay Meeting
11. Requirement for the Contractor to furnish the Owner a list of hazardous materials that may be brought onto the job site. If additional material, not on the initial list, is to be brought to the job site, the Owner shall be given 48-hour prior notification.
12. Project Close-Out requirements and procedures.

7.12 MONTHLY PAY MEETING

The intention is that the Contractor, the Owner and the A/E have timely exchange of information and cooperate to accomplish the Work as required by the Contract Documents. The Contractor is responsible for managing the Work, obtaining approvals and requesting clarifications on a timely basis. The Owner and its A/E are responsible for making a reasonable effort to provide timely responses to the Contractor.

Section 36 of the General Conditions of the Construction Contract establishes the requirement for a monthly pay meeting which will usually be held at or near the Work site. In addition to Owner, A/E and Contractor representatives, the following representatives, at a minimum, should be available to attend portions of the meeting, as applicable or necessary:

- Owner's Project Inspector
- Contractor's Project Superintendent
- A/E representative of each discipline where construction work was performed for the current pay request or where work is projected to be performed in the coming month.
- Representatives for each subcontractor who performed work included in the current pay request or who is projected to perform work in the coming month.

The following additional topics should be included, as a minimum, in the monthly pay meeting agenda:

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

7.13 OTHER MEETINGS

The A/E and/or the Owner may include requirements for other meetings, such as progress meetings, coordination meetings, subcontractor pre-construction meetings and/or partnering meetings, in the Contract Documents, in the Special Conditions or in Division 1 of the Specifications.

7.14 ACCESS TO WORK

Refer to the General Conditions of the Construction Contract.

7.15 AUTHORITY OF THE A/E DURING CONSTRUCTION

Unless the Agency specifically designates an on-site Project Manager to act as the Owner representative, the A/E shall act as the representative, but not the agent, of the Owner during the construction phase. The A/E shall have authority to endeavor to secure the faithful performance by Owner and Contractor of the Work under the Contract to include the following:

- Review the Contractor's submittals for conformance to the requirements of the contract documents and return copies to the Contractor with appropriate notations.
- Interpret the requirements of the drawings and specifications and issue Field Orders to the Contractor as may be required.
- Recommend to the Owner suspension of the Work (in whole or in part) whenever such suspension may be necessary to ensure the proper execution of the Contract.
- Reject, in writing, Work, including material, installation or workmanship, which does not conform to the requirements of the drawings and specifications.
- Determine the progress and quality of the Work, subject to the right of the Owner to make an overriding decision to the contrary.
- Upon request by the Contractor, the A/E shall confirm, in writing within ten (10) days, any verbal order or determination made by the A/E.

7.15.1 Changes in the Work

The A/E shall have no authority to approve or order changes in the Work which alter the design concept or which call for an extension of time or a change in the contract price. Where such changes are in order, the A/E shall prepare the appropriate documents for the Owner's approval and issue same to the Contractor.

7.15.2 Owner's Decisions

The Owner shall have the right, but not the duty, to countermand any decision of the A/E and to follow or reject the advice of the A/E, including but not limited to acceptance of the Work, as it deems best. In those instances where the A/E has been given authority to act, the A/E shall promptly do so, but in the case of disagreement between A/E and the Owner, the decision of the Owner shall be final.

7.15.3 Orders to the Contractor

All orders from the Owner to the Contractor shall normally be transmitted through the A/E but may be communicated directly to the Contractor and the A/E by the Owner. The Owner must be aware that any order issued directly to the Contractor without first consulting with the A/E may put the Owner at risk.

7.15.4 Construction Methods

The A/E shall not be responsible for construction means, methods, techniques, sequences or procedures (other than those expressly specified in Contract Documents), or for safety precautions and programs in connection with the Work, and the A/E shall not be responsible for the Contractor's failure to carry out the Contractor's own responsibilities.

7.15.5 Project Management Consultant

Should the Owner choose to employ a different A/E or a Project Management Consultant to perform any portion of the services listed in Section 7.10 above, the status, authority and responsibilities of the A/E or Project Management Consultant so employed shall be the same as that of the former A/E with regard to that service.

7.16 SCHEDULE OF VALUES AND CERTIFICATE FOR PAYMENT

The General Conditions of the Construction Contract, Form CO-7, describe in Sections 20 and 36 the requirements for completing the Schedule of Values and Certificate for Payment, Form 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. As previously described in this Chapter, the Owner may delete this service from the A/E Contract and assign the function and responsibility to

the designated Project Manager when approved by the Director, Division of Engineering and Buildings.

The procedures and requirements in Sections 20 and 36 of the General Conditions are incorporated herein by reference. The following clarifies and amplifies the specified procedures associated with the CO-12.

7.16.1 Schedule of Values

The A/E shall require the Contractor to provide the Schedule of Values using the ASTM Uniformat II cost breakdown structure totaling the amount of the Contract broken down into a sufficient level of detail (commensurate with the size of the project) to allow the A/E to verify the work completed. Where the total project has multiple floors, parts, or phases, the Contractor shall prepare appropriate schedules of values to facilitate review of and justification for payments.

Unless waived by the Director, Bureau of Capital Outlay Management, the Owner and A/E shall require the Contractor to use the CO-12 spreadsheet template. This spreadsheet is available for download from the Forms Center or on GCPay.

The Owner shall submit a copy of the final approved CO-12 to the Director of the Bureau of Capital Outlay Management at project closeout. Unless its use was waived by the Director, Bureau of Capital Outlay Management, the Owner shall submit the CO-12 in the electronic format described in the preceding paragraph. The electronic copy of the CO-12 spreadsheets may be submitted on electronic media, or as an e-mail attachment.

7.16.2 Payment for Stored Materials

If the Contractor requests, or intends to request, payment for materials stored in an approved and secure manner, the Schedule of Values must indicate the amount for labor and the amount for materials, and in a supplement thereto must include an itemized list of materials for that trade or work section. The material breakdown shall be in sufficient detail to allow verification of the quantities required for the project, the quantities delivered, the Work completed, and the quantities stored on or off the site.

All off-site stored materials for which payment is being sought shall be scheduled for installation within 6 months. Off-site stored materials shall be stored within the Commonwealth of Virginia. If the Contractor requests payment for materials stored out of state, contact BCOM for assistance.

Go to the Forms Center for sample formats and Supplemental Agreements for off-site stored materials away from the general location of the Project.

7.16.3 Required Pay Request Forms

All requests for payment shall use page 1 of the Schedule of Values and Certificate for Payment (Form CO-12), and page 1 shall be completed, signed and submitted by the Contractor with each payment request. If the requirement to use the Bureau of Capital Outlay Management's CO-12 spreadsheet template was waived, the succeeding pages of the Schedule of Values may be prepared using alternate computer programs, provided the data is reported in the same format and contains the same information.

7.16.4 GCPay

Use of the web-based service, GCPay, for all pool-funded projects that include funds provided by the Six-Year Capital Outlay Plan Advisory Committee (i.e., Chapter 1 and other Pooled Projects) is mandatory. At this time, the use of GCPay is optional for other state projects. The monthly fee for using this system is paid by the project General Contractor. Payment requests for General Contractors and A/Es, and all project costs (equipment, testing, moving, move coordination, etc.), shall be accounted for in this system. Training on the use of the system is available from

GCPay at www.gcpay.com. Access to and instructions for the use of the GCPay statewide contract are available at the Department of General Services website.

7.16.5 Completed Work

The "Value of Work Completed" portion of the Form CO-12 shall be completed, the Contractor's certification completed and signed and the appropriate substantiating material attached to each request for payment.

The CO-12, Schedule of Values and Certificate for Payment, shall be completed, signed and submitted by the Contractor with each payment request.

7.16.6 Payment for Labor Progress

The labor progress for any item may be calculated based upon the estimated percentage of Work complete up through 50 percent. Thereafter, the evaluation of labor progress shall be based upon the effort required to complete that item or task. The material progress shall be calculated as the dollar cost of materials used in relationship to the amount estimated as necessary to complete a particular element of Work. When calculating material progress, credit shall be given for installed material as well as that stored on the site and any material stored off site which has been certified by the A/E in accordance with the General Conditions.

7.16.7 A/E's Certification of Payment Request

Based on the periodic observations at the site and on the Contractor's Schedule of Values and Certificate for Payment (CO-12), the A/E shall determine the amount owed the Contractor, shall mark the application as necessary, and shall issue the Certificate for Payment to the Owner with recommended amounts for payment shown.

Where the amount recommended for payment differs from the amount requested on the Contractor's Application, a copy of the marked Schedule of Values and Certificate of Payment shall be furnished to the Contractor. The issuance of a Certificate of Payment shall constitute a representation by the Architect/Engineer to the Owner that the Contractor is entitled to payment in the amount indicated. By issuing a Certificate of Payment (Form CO-12), the A/E shall not be responsible for making any examination to ascertain how and for what purpose the Contractor has used the monies paid on account of the contract sum.

7.17 INSPECTION OF WORK

Section 16 of The General Conditions of the Construction Contract, Form CO-7, describes the requirements, responsibilities and authorities for inspection of the construction Work and for correction of deficiencies and/or defects found. The A/E as part of Basic Services is required to visit the site, observe the Work in place, observe the Work in progress and evaluate the Contractor's conformance to the requirements of the Contract Documents. As previously described in this Chapter, the Owner may delete this service from the A/E Contract and assign the function and responsibility to the designated Project Manager when approved by the Director, Division of Engineering and Buildings.

The procedures and requirements in Section 16 of the General Conditions are incorporated herein by reference. The following clarifies and amplifies the specified procedures associated with the inspection of the Work.

7.17.1 Inspection by A/E

A representative of the A/E firm (or the Agency's professional/technical staff when design is accomplished in-house) shall be available to answer questions from the Project Inspector or in-house craftsmen and shall make visits as necessary to clarify plans and specifications.

Appropriate representatives of the A/E or Agency professional technical staff shall visit the site at least twice each month to observe the progress and quality of work, to determine if the work is

proceeding in accordance with the Contract documents and to review the Contractor's Application for Payment (Form CO-12). A qualified person in each design discipline of the project which had work performed during the pay period being verified or which will have work to perform during the upcoming pay period shall attend the monthly pay meeting. The Memorandum of Understanding shall indicate the minimum number and/or frequency of site visits by the A/E.

The A/E shall provide to the Owner and the Contractor after each visit to the site, a written report indicating the date, time of day, weather conditions and the names of the persons representing the A/E who participated in the visit. The A/E shall inspect and spot check Work for compliance with the Contract Documents and the codes, installation and workmanship standards therein. Identify to the Project Inspector any specific checks or inspections to be made as he inspects the Work as it progresses. The report shall advise the Owner of any problems that were noted and shall compare the A/E's observations of the actual progress of the Work with that reported by the Contractor.

On the basis of his on-site observations, the A/E shall make every reasonable effort to guard the Owner against defects and deficiencies in the Work of the Contractor. He shall have the authority to inspect the Work, to note and report defective Work and deviations from the Contract Documents to the Owner, to reject same, and to recommend to the Owner the suspension of the Work when necessary to prevent defective Work from proceeding or being covered.

It is essential that the A/E and the Project Inspector work together, observe and inspect the Work, and regularly communicate to assure that work being performed conforms to the Contract Documents.

7.17.2 Owner's Project Inspector / Clerk of the Works

Except as provided in Section 7.17.2.1, the Owner shall designate a specific individual to serve as inspector on every project whenever work on the project is in progress. Waiver of this requirement must be approved by the Director of BCOM. The name of the inspector shall be shown on the Form CO-8. Where completion of a Form CO-8 is not required, the name of the project inspector will be entered in the project file on a locally developed form. The Project Inspector shall be knowledgeable of and have reasonably convenient access to the codes and standards referenced in the Contract Documents which stipulate the requirements for installation and workmanship on the trades involved in the Work. (e.g. ACI, SMACNA, NFPA, NEC, ICC, ASHRAE, etc.)

Persons designated to inspect work regulated by the VUSBC must be licensed Architects or Professional Engineers, persons certified in their respective areas of competence by DHCD, persons certified in their respective trade by DPOR or persons otherwise approved by the Chief Facilities Officer as having the necessary knowledge and competence by education and experience to inspect the assigned work. (See CPSM Section 4.14.2.)

7.17.2.1 Small Projects

For small or simple trade contract projects, a Building and Grounds employee or a member of the administrative staff may serve as the Project Inspector. The agency, at its discretion, may designate an inspector for projects accomplished using in-house forces. The duties of the inspector will be consistent with the size and complexity of the job and similar to those listed in the following paragraphs.

7.17.2.2 Inspector's Use of Facilities

The firm, individual or Agency staff providing these inspection services (hereinafter called the Inspector) shall furnish all labor, materials, and resources for full-time Project Inspector/Clerk of the Works services during the construction of the project. The Inspector shall be a duly authorized and qualified person who shall be available during the entire time Work is in progress on the site.

On new construction and larger renovation projects, the Inspector should be provided with a separate jobsite office or trailer containing approximately 120 square feet, light, HVAC, a desk, a 36" x 72" work table, chair, plan rack, and telephone line. If the contractor is to provide this office/trailer, have the A/E include this requirement in the Special Conditions of the Specifications. Depending on the project, the Inspector should provide, or have access to, other office furnishings and/or equipment such as fax machine, camera, computer, copier, etc., necessary for performing these services.

The A/E shall provide the Project Inspector with a copy of all approved shop drawings, submittals, samples, schedules, change orders, clarifications, supplemental information, and other pertinent correspondence and material for the Inspectors use at the jobsite.

7.17.2.3 Inspector's Responsibilities

The duties and functions of the Project Inspector including those listed in the General Conditions of the Construction Contract, Form CO-7, are described in Appendix N.

7.17.3 Commissioning Inspection of HVAC Systems

The Project Inspector shall observe the Contractor's pre-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 his periodic inspections of the HVAC systems to be present for such testing, balancing, adjusting and start-up of HVAC equipment and the testing of automatic controls to assure that these systems function properly.

Some sophisticated HVAC systems for facilities such as laboratories, medical science facilities, and archival storage facilities have minimal tolerances for deviations in temperature, humidity and/or air changes and, therefore, may require special commissioning or test/inspection services to assure the precise conditions required.

There may be additional, specific commissioning requirements implemented into a project as part of Agency compliance with the Virginia Energy Conservation and Environmental Standards (VEES). Additional criteria could also be needed if an Agency is pursuing LEED Certification. The criteria will be described in the project specifications.

The Owner 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 or commissioning agent depending on the services required and the capabilities of the possible vendors or consultants. These additional commissioning services may include, but are not limited to:

- Calibrate every instrument (sensor, switch, controller, etc.) in the system. (Note that Basic Service commissioning will utilize factory calibration.)
- Test three points for each analog instrument for linearity and accuracy.
- Calibrate all flow transmitters for 0%-100% of flow values with 3 point calibration along its span.
- Calibrate all pressure transmitters at three points along its span.
- Calibrate all temperature sensors and include any offsets required.
- Operate all control valves and dampers throughout their entire range. Verify that each actuator will close/open with specified air pressure.

7.17.4 Other Inspectors

All other inspectors and testing personnel called for in the specifications as well as inspectors from the Department of Labor and Industry shall be provided access to the project as their duties

require. The Agency shall procure the services of independent laboratories or firms to provide the Owner's inspection and testing services for all Structural and Special Inspections.

7.17.5 State Fire Marshal Inspections

The Regional Office of the State Fire Marshal's office shall be responsible for the Fire Marshal inspection of new and renovated state building construction in accordance with the agreement between the Department of General Services and the Department of Housing and Community Development.

7.17.6 Hazardous Materials

Prior to the start of construction, the Contractor shall furnish the Owner a list of hazardous materials that may be brought onto the job site. If additional material, not on the initial list, is to be brought to the job site, the Owner shall be given 48-hour prior notification. When requested by the Owner, the Contractor shall furnish the Owner with material safety data sheets for any materials to be brought onto the job site.

7.18 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.

7.19 CONSTRUCTION CHANGE ORDERS

Construction change orders may be necessary during the course of construction. No change order shall be issued, regardless of cost, that increases the approved scope of the project as shown on the approved CO-2 or as set forth in the Capital Project Request or Preplanning Study without prior approval of the Director of the Department of General Services.

Change orders are most commonly necessitated by unforeseen site or building conditions; errors or omissions in the contract documents; an opportunity to reduce the operating cost of the facility under construction; technology changes occurring since contract award which must be incorporated in the project; or a change in the Agency requirement.

All changes involving the contract price, whether decrease or increase or performance time shall be documented in an approved contract change order (Forms CO-11 and CO-11a) to the construction contract. See Appendix K for Capital Projects and Non-Capital Projects Change Order instructions.

7.19.1 Governor's Approval

The Owner may authorize changes in the construction contract. However, in accordance with §2.2-4309, *Code of Virginia*, Change Orders involving an increase in contract price of more than 25% or $50,000, whichever is greater, shall have the prior written approval of the Governor or his designee. When a change order increases the contract price and the cumulative total of change orders exceeds the original contract amount by more than 25% and $50,000, that change order and any subsequent change order that increases the contract amount shall have the prior approval of the Governor or his designee. Agency representative shall sign Forms CO-11 and CO-11a prior to submitting to BCOM for approval of the contract change with supporting documentation outlined below.

7.19.2 Justification

The Agency justification section of the CO-11a on all change orders shall:

1. Include a written statement by the Agency outlining the proposed cost sharing by the responsible design professional when the change results from an error or omission.
2. Or, answer the following questions when the change is generated by a change in the Agency requirement:
   (a) When was the change in Agency requirement known?
   (b) If before bidding, why were the changes excluded from the bid package?
   (c) Why can the Work not be packaged and bid separately?
   (d) What quantitative impact will the lack of this change have on Agency service delivery?

7.19.3 Copy to BCOM

An information copy of all CO-11 and CO-11a forms approved locally shall be sent to BCOM (without the cost back-up documentation) when the approved change order is issued to the Contractor.

7.19.4 Cumulative Amount

The total cumulative amount for all change orders for a single contract shall not exceed the construction contingency provided on the approved CO-8. The Agency may request approval through BCOM to DEB, DGS and DPB to infuse additional funds or to transfer funds to the contingency line item from another line item of the Total Project Budget or another Appropriation. All requests shall be submitted on a revised CO-2 and a revised CO-8 with appropriate written justification for an increase in construction contingency.

7.20 BUILDING OFFICIAL INSPECTIONS

Based upon the size and complexity of the project, one or more of the following inspection may be required and will be noted on the Building Permit issued for the Project:

1. Underslab Inspection
2. Open Wall Inspection (prior to concealment)
3. Open Ceiling Inspection (prior to concealment)
4. Any other Inspections the Building Official deems necessary to ensure compliance with Code.

A Substantial Completion Inspection is required for all projects. 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 CO-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 CO-13.2a to the Owner 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 representatives of the General Contractor, including those of the mechanical, electrical, and major equipment subcontractors, the A/E, the Owner, the Director of the Division of Engineering and Buildings or his designee and the State Fire Marshal's 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 Division of Engineering and Buildings representatives agree that this project, or this portion of the project being inspected, is substantially complete in accordance with the contract documents, the A/E shall execute the appropriate Certificate of Partial or Substantial Completion (CO-13.1a), and submit them to the Owner. Attach copies of the punch list, the Contractor's CO-13.2a, the Certificate of Use and Occupancy CO-13.3, and other documents as appropriate.

The Owner may forward this material to the DEB Director and request that a Certificate of Occupancy be issued, or the Owner may wait to request the Certificate of Use and Occupancy when final completion is achieved. If one or more re-inspections of the Work that the Contractor declared to be Substantially Complete are required because the Work was not substantially complete as stated, the Contractor shall reimburse the Owner for the costs of the re-inspections. Do not accept the project as Substantially Complete unless the facility (part or whole) is ready for occupancy.

7.21 BENEFICIAL OCCUPANCY

Once the Owner, 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 Owner may submit a CO-13.3, Certificate of Occupancy, and a CO-13.3b, Checklist for Beneficial Occupancy, along with copies of the CO-13.1a, CO-13.1b (if applicable), CO-13.2a, Fire Marshal's final acceptance report and other required operations permits to the DEB Director.

The Director of the Division of Engineering and Buildings when satisfied that the project and/or portion of the project is in fact substantially complete in accordance with the contract documents, may issue written authorization (CO-13.3) to the Owner to occupy the project, or applicable portion thereof, subject to any conditions or stipulations stated.

The Owner shall not occupy the facility until the certification from the State Fire Marshal that the project complies with the fire safety requirements and applicable codes and the Certificate of Use and Occupancy (CO-13.3) issued by the Director, Division of Engineering and Buildings 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:

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. CO-13.1a with punchlist from A/E;
4. CO-13.2a with any attachment from Contractor;
5. CO-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. CO-13.3 Certificate of Occupancy with data on entire project and separate sheet showing data on area requested to be occupied;

The Owner 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 DEB Director, the State Building Official.

7.22 FINAL COMPLETION INSPECTION

When the Contractor determines that the items listed in the "punch list" have been completed and that the Work is complete and ready for final testing and inspection, he shall complete Form CO-13.2 and send it to the A/E at least five (5) days prior to the date the Contractor has set for the Work to be ready for Final Inspection. The A/E will forward the CO-13.2 to the Owner and attach a written endorsement, based on his periodic inspections, as to whether or not he concurs with the date set by the Contractor.

The A/E shall receive the Certificate of Completion (CO-13.2), the Affidavit of Payment of Claims (CO-13), written guarantees, equipment and operating Manuals and related documents assembled by the Contractor, review same and turn them over to the Owner at the final inspection. The A/E shall record any items noted for completion or correction. He shall promptly follow up on the items and notify the Owner, in writing, when they are completed.

The A/E shall conduct the final inspection. A representative of the State Fire Marshal's office either will be present at the inspection or otherwise inspect the completed work and advise the Owner

whether the work meets the fire safety requirements of the applicable building code. The Owner may have other persons participate in the inspection.

If one or more re-inspections are required because the Work purported to be complete is not complete, the Contractor shall reimburse the Owner for all re-inspection costs.

If the A/E and the Fire Marshal's representative agree that the building is complete in accordance with the contract documents, and safe to occupy, the A/E shall execute the "Certificate of Completion by the Architect/Engineer" (CO 13.1) and deliver it, along with the Record Drawings and all other required material, to the Owner for final acceptance of the project.

7.23 PROJECT CLOSE-OUT

The A/E shall file with the Owner and the Owner with the Division of Engineering and Buildings, the Certificate of Completion by A/E, Form CO-13.1. The Architect/Engineer shall not be required to file this Certificate of Completion before he, in his professional opinion, believes all construction requirements have been met.

7.24 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.

7.24.1 CADD Drawings

Where the drawings were plotted by CADD drafting onto paper or vellum, the original sealed masters shall be delivered to the Owner as described in Section 7.25 below. The CADD information shall be modified to show the "As Built" conditions, dimensions, locations, etc. and appropriately noted. Sections, details and/or sketches produced as part of addenda and those prepared during construction to clarify the documents or for Change Order work shall be transferred to and composed on additional drawing sheets for inclusion in the Record Drawing set. Once the CADD data is completed, the drawings shall be printed (on a transparent, reproducible medium) and stamped "Record Drawings". The Record Drawings are then ready for microfilming and/or delivery to the Owner. Providing the original masters of the bid documents and the original Record Drawings is a basic service.

7.24.2 Manually Prepared Drawings

Where the drawings were prepared by manual drafting on paper or mylar, the originals shall be modified to show the "As Built" conditions, dimensions, locations, etc. with appropriate notations made on the originals. Sections, details and sketches produced as part of addenda and those prepared during construction to clarify the documents or for Change Order work shall be transferred to and composed on additional drawing sheets for inclusion in the Record Drawing set. Once completed, the drawings shall be stamped "Record Drawings". The Record Drawings are then ready for microfilming and/or delivery to the Owner. Providing the Record Drawings (the original drawings and specifications) is a Basic Service of the A/E.

7.24.3 A/E Statement of Preparation on Record Drawings and Specifications

The statement of preparation as shown below shall be affixed to each and every drawing sheet and on the cover and title page of the project manual of a completed set of "Record Documents". The drawings are not required to be sealed and signed. This criterion applies to documents created manually and in electronic formats. It is the expectation of the Owner that during the preparation of the Record Drawings and Specifications that the A/E is responsible to ensure that all information from Change Orders, RFIs, CNRs and other forms of document modifications used during the

construction of the project are properly incorporated into the final Record Documents

Statement of Preparation of Record Documents
These Record Documents have been prepared in part based on information provided by the Contractor in accordance with Section 23, *Plans and Specifications* of the General Conditions of the Construction Contract. The A/E is not responsible for either errors in information provided by Contractor or others, or for information omitted by Contractor from its As-Built Drawings. Neither As-Built Drawings nor Record Drawings change or modify the duties and obligations of the A/E of Record to perform inspections in accord with Section 16, *Inspection* and Section 44, *Inspection for Substantial Completion & Final Inspection* or other requirements of the contract.

_____
A/E of Record Date

7.24.4 Document Retention Requirements
The Owner (Agency) is responsible for assembling, maintaining and retaining the Record construction documents for all buildings constructed on state owned property. This includes documentation of all renovations, remodels and additions.

These documents shall be provided to the Owner electronically in PDF format. The Owner may also request additional copies of the record documents in other formats at its discretion.

The Record Documents include the Record Drawings of the As-Built Plans, Specifications, Maps and other pertinent documents. These documents shall be retained until the Building is removed from the state inventory. At that time the Agency shall contact the State Archivist at the Library of Virginia to determine the disposition of the documents.

The building-owning Agency is responsible for records retention in accord with the applicable Library of Virginia Records Retention Policy. BCOM documents are working papers used for Building Official and Capital Outlay review purposes only.

7.25 OWNERSHIP OF DOCUMENTS
Original drawings and specifications as prepared by the A/E for the project shall be the property of the Commonwealth of Virginia, whether the work for which they are made is executed or not. The A/E shall provide to the Owner at the completion of the job, the original drawings and original copy of the specifications at the time the Record documents are provided to the Owner.

7.25.1 Restriction on Promotional Materials by A/E and Contractor
The design and contract documents for construction on state-owned property are owned by the Commonwealth of Virginia. Therefore, use of these work products in advertising or promotional literature, or a statement that an agency or institution endorses the work product of an A/E or Contractor is prohibited without the express written permission of the Agency Director. Identifying designs or construction as the work product of an A/E or Contractor in client lists, responses to RFPs and in promotional literature through the use of photographs, renderings, drawings (not contract documents) and descriptions of project is permitted after construction is substantially complete.

7.26 MAINTENANCE AND OPERATING MANUALS
A specific set of operating and maintenance instructions written for the specific project shall be provided to the Agency at the final inspection. This shall consist of a compiled document prepared by the A/E team for the project. These documents 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 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 do not provide specific data but simply reference the drawings, specifications and manufacturers are not acceptable. The compiled documents, along with the Record drawings and specifications, shall be provided to the head of the Buildings and Grounds operation of the Agency at the time of final acceptance of the project.

7.27 GUARANTEE PERIOD INSPECTION

Prior to the expiration date of the Contractor's one-year guarantee period, but not before 9 months of this period has elapsed, the Owner shall make an inspection of the building, equipment, and/or any other work included in the original Contract to determine whether any defects in materials or workmanship have developed. The Owner shall provide the Contractor with written notice of such defects and shall notify the A/E for advice in the correction of the defects.

7.28 START-UP/ACCEPTANCE OF MECHANICAL AND ELECTRICAL SYSTEMS

It shall be the A/E's responsibility to verify that the Contractor has all systems functioning properly per design intent; that equipment has been received per Shop Drawings 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 Owner that the system is ready for final start-up and acceptance testing.

It is the intent that when the startup inspection team is called together to conduct final inspections and acceptance test that the work be started as scheduled and completed without exceptional delay.

Major or time consuming adjustments or modifications during final inspection shall be avoided. Final inspections requested when the systems are obviously not ready for such testing and inspections may result in a back-charge to the A/E or Contractor for the costs of inspection team visits and related costs. Applicable portions of the above requirements shall be included in the project specifications.

7.29 SPECIAL CONSTRUCTION PROCEDURES

The following sections address procurement of alternate construction delivery methods. Currently, the most widely used methods are: Design-Build; Construction Management at Risk; and the Public-Private Education Act. Other delivery methods are described as well. Also included in this section are the procedures for Prequalification; requirements for Partial Building Permits, referencing Code Compliance Documents.

When special construction procedures are used, the opportunity may exist for construction to start before the complete building design has been finalized. This results in an overlap of the design and construction time frames. The overlap compresses the overall time schedule for the project slightly. Partial Building Permits (using Code Compliance Documents) can be issued for early construction. If partial permitting is used, a separate building permit submittal shall be made for each portion of the work. Subsequent building permits shall supersede any previously issued partial permits with the full building permit governing the project once that permit is issued. The manner in which the project is separated into partial permits shall be subject to the approval of the building official.

7.29.1 OVERVIEW

"Design-Build" is a single-source procurement method for a construction project. The Agency holds one contract with a Design-Build Contractor, for both professional design services (A/E services) and building construction. See Section 7.30.

"Construction Management at Risk" is a procurement method for project construction only. The Construction Manager provides a Guaranteed Maximum Price (GMP) for the Construction and all

related services and is “At Risk” for constructing the project within the agreed-upon GMP. The Agency holds a separate contract for professional design services (A/E services.) See Section 7.31.

“Public-Private Education Facilities and Infrastructure Act of 2002” (PPEA) includes provisions that allow an Agency to work with private developers to design and construct a facility. The Agency holds a single contract with the successful proposer for both the design and construction of the specific project. See Section 7.32.

ESCO; Purchases & Installation of Facility-Related Equipment: See Section 7.33.

Prequalification: See Section 7.34.

Building Official Submittal Requirements for Partial Building Permits: See Section 7.35.

Code Compliance Documents: See Section 7.35.1.1.

7.30 DESIGN-BUILD (D/B) PROCUREMENT PROCEDURES

An Agency holds one contract for Design-Build work with the D/B Contractor. The D/B Contractor includes the A/E professional design services within his contract. This results in a single source of responsibility. Refer to the DGS Forms Center for required forms and click on the link below for Design-Build procedures approved by the Secretary of Administration.

DESIGN-BUILD PROCEDURES

7.30.1 Guidelines For Design-Build Procurement – Basic Procedure

Note: For Design-Build procedures for a Prototype project: see Section 7.30.2.

1. Design-Build is best suited to project types that have two or more of the following characteristics:
   a. Relatively simple and straightforward.
   b. Incorporate integral engineering/engineered shop drawing components as primary systems in the project. (example – metal buildings, precast parking structures)
   c. Are new construction.
2. The Agency’s A/E consultant (sometimes under a term contract), or a licensed professional on the Owner’s staff, prepares Pre-Design scope and criteria. Standard VPPA procedures are used to select the Owner’s A/E.
3. The Agency’s A/E prepares Schematics, including Outline Technical specifications, for the Agency’s approval, with an opportunity for the Agency to make changes. The completed Schematic drawings and Outline specifications are sometimes referred to as “Bridging Documents.” The documents establish the minimum level of quality required for the project.

Minimum Requirements for Bridging Documents:

1. Survey of Site
2. Soil Borings/Geotechnical Reports
3. Program Describing Building Use and Functional Requirements
   a. Various user groups/spaces
   b. Specific operational requirements
   c. Specific equipment demands
   d. Square footage
   e. Architectural restrictions
4. Schematic Floor Plans Showing Building Dimensions
5. Site Restrictions (access, staging area, traffic control, work hours, etc.)
6. Schedule Constraints

7. Master Planning Documents (if available)
8. Any Additional Data that is Pertinent to the Project.

STEP I Guidelines:

1. NOTE: See Section 7.34 for procedures for Prequalification.
2. Reference use of the CO-7 DB as the General Conditions of the Design Build Contract and the CO-9 DB as the Contract between the Owner and Design Builder.
3. The Agency receives responses and qualifications from Design Build Proposers and selects between three to five proposers to submit technical and cost proposals. The basis of selection shall be based upon the Owner's evaluation of which RFQ responses demonstrate the greatest conformance with the requirements set forth in the RFQ.

STEP II Guidelines:

1. The Agency makes a presentation to the AARB for approval of each proposed Design. Alternatively, the Agency may wait until the Cost Proposals are opened and then submit the winning design; Agency's choice. The Agency is strongly cautioned that waiting to present the design to the AARB creates significantly greater risk to the Agency. If the Agency selects a design-build contractor and then the AARB requires significant modifications to or rejects the design, the Agency will bear the cost of redesign and the related costs of construction in order to comply with the AARB's ruling.
2. The Agency may request a one-time revision to the technical proposals to conform with the Agency's desires for the project as well as any AARB comments. Along with these technical revisions, the Proposers may also submit adjustments to their cost proposals.
3. The Agency shall adhere to one of the following methods for award:

Method #1 (Cost Basis):

The Agency reviews the revised Technical Proposals for compliance with the requirements of the RFP and all clarifications issued. Assuming that the required changes were made, all proposals, though they may have different features, would now meet the requirements of the RFP. All proposals are considered to be equally acceptable, with respect to the RFP criteria.

The Agency publicly opens the Cost Proposals from each Proposer, along with any cost modifications submitted. Since all proposals meet the RFP requirements, the contract is awarded based on the lowest price.

Method #2 (Cost + Technical Basis):

Where Design-Build Contractor selection includes a technical scoring component in addition to the low cost scoring component, the Agency shall use the following method to award:

a. Each selection committee member shall review the revised Technical Proposals for compliance with the requirements of the RFP (and clarifications issued) ranking them in order of preference from 1 to 5. (1 being the best)

b. Points shall be credited to the technical proposals based upon a 100 point baseline as follows:

Rank #1 = 100 points
Rank #2 = 80 points
Rank #3 = 60 points
Rank #4 = 40 points
Rank #5 = 20 points

If there are fewer than five proposals, the highest rankings are used. (Example 1=100, 2=80, 3=60)

c. After the technical proposals have been evaluated, the Agency shall open the cost proposal from each proposer along with cost modifications submitted. The cost proposals shall be scored based upon a 100 point baseline plus an additional 20 points for every 3% below the stated project budget. If a proposal is 12% or more below the median of the values of the proposals the cost score shall be 180 points.

d. Each committee member shall sum the cost points and technical points to obtain a total score for each proposal.

e. The scores from each of the committee members shall be summed for each proposal.

The contract shall be awarded based upon the highest total score. In the event of a tie, the project shall be awarded to the lowest price of the proposals included in the tie. Worksheet DGS-30-390 is available on Forms Center for use with this scoring method. The Agency and the D/B Contractor sign the contract (CO-9 DB.)

7.30.1.1 General Notes

- Builder must be licensed as a Class A Contractor in Virginia by DPOR.
- Responsible design professionals must be licensed in Virginia by DPOR as Architects and Professional Engineers.
- Design must conform to the scope as authorized by the CO-2.
- Design must conform to CPSM Chapter 4 - Technical Requirements.
- Design must conform to current VUSBC and handicapped accessibility standards.
- Must use all applicable CO-Forms, Contracts, etc. for the project, including the CO-7 DB and CO-9 DB.
- If the Agency does not contract for a Value Engineering Study, the Agency must submit a written request to waive the VE Study requirement to the Director, Engineering and Buildings, if the project value exceeds $5,000,000.
- The Agency arranges a “Pre-Design” meeting with BCOM to coordinate the documents that will be required for the building permit. Determine whether partial building permits will be issued.
- The Agency submits documents to BCOM for review and building permit. See Section 7.35.
- The Agency is required to contract for independent Structural and Special Inspections, paid for by the Agency separately from the D/B contract. See Appendix M for more information.
- The Work shall be inspected by other than the D/B Contractor, to assure conformance with the plans and specs – usually by the Agency’s project inspector.
- Inspections by the State Fire Marshal are required.
- Inspections by BCOM are required.
- A Certificate of Use and Occupancy is required.

7.30.2 Design-Build Procurement – Prototype Building

The procedures for utilizing Design-Build procurement for a Prototype building are similar to the basic procedures above, except as follows:

Select a Prototype design to use (Plans and Specifications). Make the changes required for adapting to the specific site.

The Agency makes a presentation to the AARB for approval of the Prototype at the specific location.

7.31 CONSTRUCTION MANAGEMENT AT RISK (CM) PROCUREMENT PROCEDURES

Construction Management at Risk is another alternate construction delivery method. The Agency holds two contracts: a contract for professional A/E design services, and also a two-phase contract with the CM at Risk Contractor. See Sections 7.35 and 7.35.1.1. Refer to the DGS Forms Center for required forms and click on the link below for Construction Management procedures approved by the Secretary of Administration.

CONSTRUCTION MANAGER AT RISK PROCEDURE

7.31.1 Guidelines for Construction Manager "At Risk" Procurement – Basic Procedure

"CM at Risk" is Construction Management where the CM provides a Guaranteed Maximum Price (GMP) for the Construction and all related services and is "At Risk" for constructing the entire project within the GMP.

1. Construction Manager Selection: Selection and is structured into 2 phases: Pre-Qualification and Selection.
    a. Pre-Qualification Criteria: The evaluation committee shall develop a list of qualification criteria for inclusion in the Request for Qualification (RFQ). At a minimum, the qualification criteria shall include the following:

        1. Appropriately licensed and in good standing as a Class A General Contractor in the Commonwealth of Virginia.
        2. Ability to demonstrate the ability to obtain appropriate insurance coverage for the project.
        3. Appropriate bonding capacity.
        4. A listing of experience of at least three projects of similar scope, complexity, and delivery method including construction cost, schedule, and Owner or Architect representative's contact information.
        5. A list of at least three professional references including contact information.

    b. Request for Qualifications: The evaluation committee shall issue a Request for Qualifications in accordance with the procedure adopted by the Secretary of Administration and evaluate the responses to establish a pre-qualified list of proposers. The basis of selection shall be the Owner's evaluation of which Qualification Statements demonstrate the greatest conformance with the requirements set forth in the RFQ.

    c. The evaluation committee will send Request for Proposals (RFP) to the pre-qualified firms and request submission of formal proposals from them. All RFP's shall request the following information:

        1. A lump sum fee for Pre-construction Services in accordance with the scope of services included in the RFP.
        2. A General Conditions Fee based upon an anticipated duration set by the Agency detailed in a specific listing of General Conditions items and their associated cost. (See worksheet DGS-30-468).
        3. An Insurance and Taxes Fee expressed as a rate (percentage) to include all insurance costs such as general liability insurance, builder's risk insurance, payment and performance bonds, and any other insurance costs that are required by the contract and any taxes such as local business licenses or other taxes that are required for the completion of the work expressed as a percentage. The Insurance and Taxes Fee is to be inclusive of all items, other than design or CM contingencies, CM Fee, or General Conditions Fee, that will be included in addition

to the cost of the work in establishing the Guaranteed Maximum Price and the final contract value.

4. A CM/GC Fee to include all home office expenses, overhead and profit during the construction phase of the Contract.

d. The agency shall NOT request budget estimates as a part of the RFP response.

e. Selection of the Construction Manager based upon the RFP responses' conformance with the criteria contained within the RFP and shall be made in accordance with the procedures adopted by the Secretary of Administration.

f. The CM Fee and the Preconstruction Services Fee shall be evaluated based upon the sum of those fees and not individually.

2. Construction Manager at Risk Contracts: The CM at Risk contracts are structured into two phases:

a. Phase 1: Pre-Construction Phase Services: These services are subject to the *Terms and Conditions for Non-Professional Services* and will be performed for a stipulated or fixed amount.

- Use form CO-9 – CM (1)
- The Phase 1 contract is associated with the work of the CM at Risk prior to the start of construction activities.

b. Phase 2: Construction Phase Services: These services are contingent upon the CM at Risk providing an agreeable GMP to the Owner.

- Use form CO-9 – CM (2)
- The Part 2 contract is associated with the work of the CM at Risk during the construction portion of the project.

c. In the event of phased permitting where the drawings and specifications are not complete for portions of the project, but where early release packages have been bid and permitted, the agency shall use form CO-9CM (ER) for the release of the work for those packages. Early release packages shall be established based upon approved working drawings for the work of that package and the value of the early release shall serve as an interim GMP for the work pending the full GMP for the project. The intermediate packages shall correspond with the partial permits being issued (example: clearing & grubbing, grading, or site utilities) or shall be for long lead items that need to proceed in order to maintain the project schedule (example: mill orders for structural steel). The early release packages are allowed provided permission has been granted by the Director, Division of Engineering and Buildings and that the agency acknowledges that if the Final GMP exceeds the approved budget (See Form DGS-30-299 on the Forms Center), the agency shall find alternate agency funds to supplement the allotted funding or identify scope of work that can be eliminated to reduce the project cost without impacting the program function or code compliance of the building. See Appendix C for guidance in complying with this requirement.

3. If a GMP cannot be agreed upon, the Contract for Phase 1 is concluded and the Agency would not enter into a Phase 2 contract with the CM at Risk. At this point in the process, the documents are substantially complete; and after review and approval by the Director, Division of Engineering and Buildings, the project may be bid using standard competitive sealed bidding to the pre-qualified CM at Risk proposers (including the CM at Risk

proposer with whom a GMP was not agreed upon). If the project is bid using standard competitive sealed bid procedures, then the construction contingency of the CM process would no longer be applicable. Allowances and contingencies are not permitted using the standard Design-Bid-Build process.

Alternatively, if factors remain that sustain the benefit of the CM at Risk process, the Agency may request a GMP from the other pre-qualified CM at Risk proposers. After unsuccessfully negotiating a GMP with the Phase 1 CM, modifications to that CM's GMP shall no longer be considered. The GMP from the second highest ranked CM at Risk proposer is then negotiated. If an acceptable GMP is not reached with that proposer, then a GMP from the third ranked CM proposer shall be negotiated, and so on. Each unsuccessful negotiation from the successive CM proposers removes that CM proposer from further consideration.

7.31.1.1 General Notes

- The CM firm must be licensed in Virginia by DPOR as a Class A Contractor.
- If the Agency does not contract for a Value Engineering Study, the Agency shall submit a written request (to waive the VE Study requirement) to the Director, Engineering and Buildings.
- Have "Pre-Construction" meeting with BCOM to coordinate the documents that will be required for the Building Permit and whether partial permits will be issued for early phases of the work.
- Submit documents to BCOM for Review and Building Permit.
- The Agency is required to contract for independent Structural and Special Inspections, paid for by the Agency separately from the CM contract. See Appendix M for further information.
- The work must be inspected by other than the CM "AT RISK" Contractor to assure conformance with the plans and specs – usually by the Agency's Project Inspector.
- Inspections by BCOM and State Fire Marshal's Office Representatives are required.
- A Certificate of Occupancy is required.
- Must use all applicable CO- Forms and Contracts for the project.
- Must use an MOU Template (DGS-30-465) but made project specific.

7.31.2 Pre-Construction Phase

The Preconstruction Period shall include the following meetings and deliverables along with any other items indicated in the CM Contract for Pre-Construction Phase Services (CO-9CM(1)):

Project Kick-off Meeting

Meeting including the Agency Project Manager, A/E, CM at Risk, and other personnel as required. The following items shall be addressed as part of the meeting:

- Status of project drawings/specifications.
- Schedule constraints.
- Key building components.
- Key site limitations or work rules related to the project.
- Project budget.
- Each team member's roles and responsibilities.

Project Schedule

With input from the Owner and A/E, the CM shall produce a CPM (Critical Path Method) project schedule for use by the project team during the pre-construction phase of the project. The CM shall update this schedule on a monthly basis (at a minimum) or as the project requires. The project schedule shall include:

- Key milestones.
- A construction schedule projecting the major construction activities' sequence and durations

- o Activities indicating the production of design documents for the various stages of design and phases of permitting.
- o The various activities related to the CM at Risk's preconstruction effort such as completion of the cost studies, solicitation of bids, and development of the GMP.
- o Activities and major decisions that are the responsibility of the Owner.

Progress Meetings

Meetings shall be held on a monthly basis (at minimum) or as the project requires. The following items shall be addressed as part of the meeting:

- o Status of project drawings/specifications
- o Schedule status
- o Outstanding issues related to key building components or systems.
- o Any changes in site limitations or work rules related to the project.
- o Project budget status
- o Project savings opportunities.

7.31.3 Construction Phase

The Construction Phase shall include the following meetings and deliverables along with any other items indicated in the CM Contract for Construction Period Services (CO-9CM(2)):

The CM shall coordinate and manage the Work to be performed by all of the subcontractors through to project completion and final acceptance, including punch-list work. The CM shall be responsible for keeping the project on schedule, and ensuring that the subcontractors furnish materials and perform the work according to the construction documents.

The following is a partial list of contract administration activities that the CM shall perform in cooperation with the A/E and commissioning agent for all subcontracts:

- Keeping records
- Reporting progress
- Controlling schedules
- Conducting meetings
- Processing submittals
- Processing progress payments
- Coordinating/scheduling/monitoring safety
- Inspecting
- Monitoring testing
- Responding to requests for information (RFI's)
- Processing contract change orders
- Maintaining as-built drawings
- Performing photographic services
- Performing other services
- Coordination of construction sequences and phases
- Generation and presentation to the Owner of construction phasing
- Confirm existing conditions
- Coordination and scheduling of owner provided inspection forms

7.31.3.1 Record Keeping

Examples of documents and files to be maintained (but not limited to) are:

- Correspondence
- Annotated submittals, including approved shop drawings, product data, and samples
- Formal and pending contract change orders and directives with documentation
- Value engineering change proposals
- Claims and supporting documentation
- Minutes from progress meetings

- Budget records to include invoices and supporting documentation
- Documentation of all clarifications and decisions
- Documentation of all dust, noise, fumes or vibrations complaints and their resolution
- Inspection and progress reports
- CM's monthly status reports
- Construction Trade, material, and equipment contracts/purchase orders
- Construction drawings and specifications updated on a current basis to record changes and selections made
- Addenda
- Permits, certificates, and governmental approvals
- Phone logs and memos
- Expense records
- Warranties and guarantees
- Project photographs
- Commissioning paperwork and certifications
- Record Drawings

7.31.3.2 Progress Reporting

The CM will submit bi-weekly reports to the Owner's Project Manager and A/E on the status of construction, including updated copies of all logs maintained at the site for change orders, claims, submittals, etc. The CM will submit monthly reports by the 5th working day of each month in 8 1/2" x 11" format including the following information:

- Update of the master Project schedule with analysis
- Inspection report, list of inspections that the Contract Documents require, and deficiencies, delays, and omissions
- Summary of outstanding and potential problems and issues, including notices of intent to file claims
- Summary of issues resolved, decisions reached, clarifications, instruction, commissioning etc.
- Submittal log
- Progress photos
- Minutes from meetings held during the month
- CM Contingency log
- Change Order Proposal(COP) log
- Request for Information(RFI) log

7.31.3.3 Schedule Control

The CM shall generate, at Project's beginning, a master Project schedule chart. This schedule shall break down all CM and subcontractor Project activities through substantial completion in accordance with the requirements of the General Conditions (CO-7CM). It shall also include Owner activities which impact the schedule and the Owner's occupancy requirements. It shall be kept up to date to reflect construction phasing and commissioning activities.

The CM shall continuously monitor actual progress against the schedule and identify any delays or potential delays. If the CM encounters or anticipates delays, it will recommend recovery actions to the Owner's Project Manager to mitigate the delays and implement approved, remedial measures.

7.31.3.4 Progress Meetings

Progress Meetings shall be held a minimum of two times per month, or more often as the Owner's Project Manager deems necessary to facilitate the efficient completion of the project. Normally the following will attend the progress meetings:

- Owner's Project Manager
- Owner's Inspector

- CM Project Manager and CM Superintendent
- A/E representative(s)
- Subcontractor superintendent(s) - As needed
- Facilities Operations and Maintenance representative(s) - As needed
- Parking Services representative (parking permitting) – As needed
- Campus Police representative (security/traffic control) – As needed

A typical agenda for the progress meetings is as follows:
- Progress update
- Commissioning status
- Schedule update w/ upcoming activities (next 30 days/critical dates)
- Submittal status
- RFI status
- Change Order Proposal (COP) log
- Change Order Log
- CM contingency status
- Payment request review
- Issues / old and new
- New Business

The CM shall prepare and promptly distribute minutes from each meeting to the Owner, A/E, and Subcontractors

7.31.3.5 Inspection
The CM shall have the overall responsibility for scheduling, coordinating, and inspecting all of the subcontractors' workmanship, materials, and equipment to ensure conformity with requirements of the contract documents (including the contract drawings and specifications, subsequent contract change orders, and approved submittals).

The CM will make quality determinations based on the records and inspections to ensure complete contract compliance, to protect the Owner against defects, deficiencies, omissions, and delays. Throughout construction the CM will maintain an up-to-date “rolling punch list” of defects, deficiencies, delays, and omissions as well as corrective actions taken. The CM will prepare and maintain inspection reports according to the CPSM’s inspection and acceptance requirements.

7.31.3.6 Coordinate / Monitor Testing
Under direct contract to the Owner the independent certified testing company(s) will be responsible for conducting the required verification tests, retaining all samples, and for submitting test results to the Owner, A/E, and CM. The CM will review the Subcontracts, identify all tests required by the Contract Documents to be performed by the testing company(s), and prepare a complete testing schedule. The Commissioning Agent will be integral to the generation of this schedule. The CM's responsibilities with regard to testing shall include:
- Coordination with testing agency for scheduling of test
- Verifying that tests are conducted as scheduled
- Witnessing tests selected by the CM, A/E, Commissioning Agent and Owner’s Project Manager
- Reviewing test and retesting results and documenting with Contract Documents
- Retaining test and retesting records
- Summarizing significant test results in progress reports
- Notifying immediately the Owner of test failures and, with A/E, planning corrective actions
- Overseeing corrective actions and retesting until issue resolution

7.31.3.7 Requests for Information.

The CM shall coordinate responses from the CM, A/E, and Owner to the Subcontractors' requests for information. The CM will consult with the A/E on technical matters, including requests for interpretations of the meaning and intent of the drawings and specifications, or with the Owner on administrative matters. The CM is responsible for facilitating information requests to keep response times to a minimum. The CM will maintain copies of the final answers to information requests as part of the Project records.

7.31.3.8 Photography

The CM is responsible for procuring at its expense; construction photographs of items that may be the subject of Subcontractor claims, or that require documentation. The photographer will label each photograph with at least the following:

- Project, Building, City, State
- Name of Construction Trade Contractor
- Date and time taken
- Description of weather conditions
- Subject matter and view point
- Name of CM, photographer, and observer, if any

7.31.3.9 Project Commissioning

The Owner shall engage a third-party commissioning agent to conduct an enhanced commissioning of building systems. Prior to this, the CM shall coordinate a systematic process to ensure that the mechanical, electrical and plumbing (MEP), audio-visual and all other systems are fully functional in accordance with the design intent generated by the Project documents and the Owner's operational needs, and the personnel charged with maintaining and operating them are trained (not merely familiarized) to perform operation and maintenance. The CM shall work with the A/E to coordinate and implement a systematic process to ensure that the mechanical, electrical and plumbing (MEP), audio-visual and all other designated systems are fully operational and compliant with the contract documents. The personnel charged with maintaining and operating them shall be trained to the point that they are fully capable of operating and maintaining the building systems to perform in accordance with the Project's design intent and the Owner's operational needs.

The CM will ensure that the Subcontractors have a complete understanding of the systems testing and commissioning requirements placed on them by the contract through the A/E. This includes, but is not limited to, providing single-line diagrams and sequences of operations as required.

7.31.3.10 Project Close-Out

The CM shall secure and transmit to the A/E all warranties, operations and maintenance manuals, and similar submittals required by the Contract Documents, for approval by the A/E, before delivery to the Owner. The CM shall also deliver all keys, record documents, and maintenance stocks to the Owner.

7.32 PUBLIC PRIVATE EDUCATION FACILITES AND INFRASTRUCTURE ACT OF 2002 (PPEA) PROCUREMENT PROCEDURES

Procedures for the PPEA procurement methods can be found on the DGS Website. Projects utilizing PPEA still require inspection by BCOM and must comply with the VUSBC. The agency is strongly encouraged to include CPSM technical or procurement standards in the Comprehensive Agreement to ensure the overall quality and lifecycle costs are in accordance with the agency's goals and procurement is in accordance with the standards set by the agency are maintained.

7.33 OTHER SPECIAL CONSTRUCTION DELIVERY METHODS

7.33.1 Energy Performance-Based Contract (ESCO)

Procedures for the ESCO procurement methods can be found on the DGS Website. Projects utilizing ESCO still require inspection by BCOM and must comply with the VUSBC.

7.33.2 Purchases & Installation of Facility-Related Equipment

One of the Capital Project/Non-Capital Project classifications listed in Section 7.2 must be used based upon the size of the project and the funding source. Comply with definition of construction vs. non-construction procurement and associated requirements of the CPSM and APSPM as they apply. (Section 7.2.6) Refer to Chapter 4 and Appendix P for permitting requirements. No construction work is to be procured under the APSPM procedures.

7.34 PREQUALIFICATION PROCEDURES

An agency may prequalify contractors for a particular construction project and limit consideration of bids or proposals to prequalified contractors (*Code of Virginia*, §2.2-4317). The procedures contained in this Section shall be used for prequalification of contractors for a particular construction project. The agency may prequalify general contractors or selected subcontractors or both. Any prequalification of contractors and/or subcontractors shall be conducted in accordance with the procedures stipulated in this Section and *Code of Virginia*, §2.2-4317, and sufficiently in advance of the bid receipt date to allow potential contractors a fair opportunity to complete the process.

7.34.1 Objective

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.

The bar chart in Figure 7.34.1 depicts reasonable timeframes for elements of the prequalification process. Shorter times may be used, provided they are consistent with the intent of the minimum time specified in §2.2-4317. The agency shall advertise for the prequalification (Request for Qualifications) in a newspaper of daily statewide circulation and on the On-Line Bids page of eVA, Virginia's central electronic procurement website [URL is http://www.eva.virginia.gov], and shall post the advertisement in the public area where Invitations to Bid and Requests for Proposals are generally posted. The date set for receipt of the Standard Form for Contractor's Statement of Qualifications shall be at least thirty (30) calendar days from the date of the initial newspaper advertisement.

7.34.2 Forms

The Standard Form for Contractor's Statement of Qualifications, DGS-30-168, *Contractor's Statement of Qualifications* (CO-16) and the DGS-30-172, *CO-16 – Attachment 1, Qualifications Criteria*, 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.

7.34.3 Building Committee

The agency shall establish a committee (the Building Committee) of five (5) state employees 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 an accredited Virginia Construction Contracting Officer (VCCO) of the agency, one shall be a registered architect or engineer and one shall be the project manager for the proposed project. A licensed architect or engineer from the Bureau of Capital Outlay Management may be a member of the committee. The remaining person(s) should be state employees 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.

Use of "Design/Build" and "Construction Management at Risk" procedures requires that the agency include a licensed architect or engineer from BCOM in the selection process. See 7.30 and 7.31.

7.34.4 Denial of Prequalification

Code of Virginia, §2.2-4317, permits a state agency to deny prequalification to any contractor only if the agency 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 nongovernmental 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. A state agency 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 nongovernmental 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.

The state agency shall deny prequalification to any contractor who does not have the requisite Virginia license issued by the Virginia Board of Contractors to perform work in Virginia pursuant to *Code of Virginia*, §54.1-1100 et seq.

7.34.5 Written Notification

In accordance with the *Code of Virginia*, §2.2-4357, any contractor refused permission to participate, or disqualified from participation, in public contracts shall be notified in writing. Prior to the issuance of a written determination of disqualification or ineligibility, the agency shall (a) notify in writing each contractor that submitted the CO-16 of the results of the evaluation (b) disclose the factual support for the determination, and (c) allow the contractor an opportunity to inspect any documents that relate to the determination, if so requested by the contractor within five (5) business days after receipt of the notice. The written notice to each contractor shall be delivered by U. S. mail.

Within ten (10) business days after receipt of the notice, the contractor may submit rebuttal information challenging the evaluation. The agency shall issue its written determination of disqualification or ineligibility based on all information in possession of the agency, including any rebuttal information, within five (5) business days of the date the agency received such rebuttal information.

If the evaluation reveals that the contractor should be allowed permission to participate in the public contract, the agency shall cancel the proposed disqualification action. If the evaluation reveals that the contractor should be refused permission to participate, or disqualified from participation, in the public contract, the agency shall so notify the contractor. The notice shall state the basis for the determination, which shall be final unless the contractor appeals the decision within ten (10) days after receipt of the notice by invoking administrative procedures meeting the standards of *Code of Virginia*, §2.2-4365, if available, or alternatively by instituting legal action as provided in *Code of Virginia*, §2.2-4364. If, upon appeal, it is determined that the action taken was improper, the sole relief shall be restoration of eligibility.

7.34.6 Establishing Contractor Qualification Criteria

Contractor experience qualification criteria shall be sufficiently general so that contractors with the qualifications and experience to satisfactorily complete the proposed project will not be arbitrarily excluded. For example, requiring a contractor to have constructed a two-story college dormitory is too restrictive. Therefore, experience criteria shall be expressed in terms related to the building's construction:

1. functional type (classroom, dining facility, maximum security prison, etc.);
2. job site access (dense urban location surrounded by multiple story buildings, open rural area, etc.);
3. height and physical size (14 stories with 4 below grade floors; 250,000 gross square feet);
4. foundation system (piles, spread footings, mat foundation, etc.);
5. structural system (reinforced cast in place concrete; structural steel; precast concrete members, etc.);
6. exterior wall system (granite panels; glass store front; brick with CMU back-up, etc.):
7. electrical service and distribution;
8. mechanical system (gas-fired package boilers; four pipe hot water/chilled water; centrifugal chiller, VAV box, etc.);
9. number of subcontractors used on a typical job;
10. roofing system (four-ply built-up; single-ply EPDM, etc.); and other similar criteria.

Qualification Criteria I, III, V and VI in the standard CO-16 qualification criteria package (DGS-30-168 and DGS-30-172), found on the DGS Forms Center, shall not be changed without the prior written approval of the Director of the Division of Engineering and Buildings. Qualification criteria for Experience (II) shall be customized to fit the particular project for which prequalification is intended.

7.34.7 References

Verification of References supplied by the contractor in Sections VI: 1, 2, 3 & 5 of the CO-16 shall be accomplished using the Contractor Reference Sheet found on the DGS Forms Center.

7.34.8 Advertisement for Bids

The Notice of Invitation for Bids for the project shall be posted in a public place normally used for posting Notices or published in a newspaper of statewide circulation or both, and on the On-Line Bids page of eVA, Virginia's central electronic procurement website. The URL is http://www.eva.virginia.gov. The advertisement shall appear no less than 30 days prior to the date of bid receipt, unless otherwise approved by the Director of the Bureau of Capital Outlay Management. The advertisement shall state that bids will be accepted only from those contractors prequalified to bid on the project. Further, contractor shall be a registered vendor with the eVA electronic procurement system.

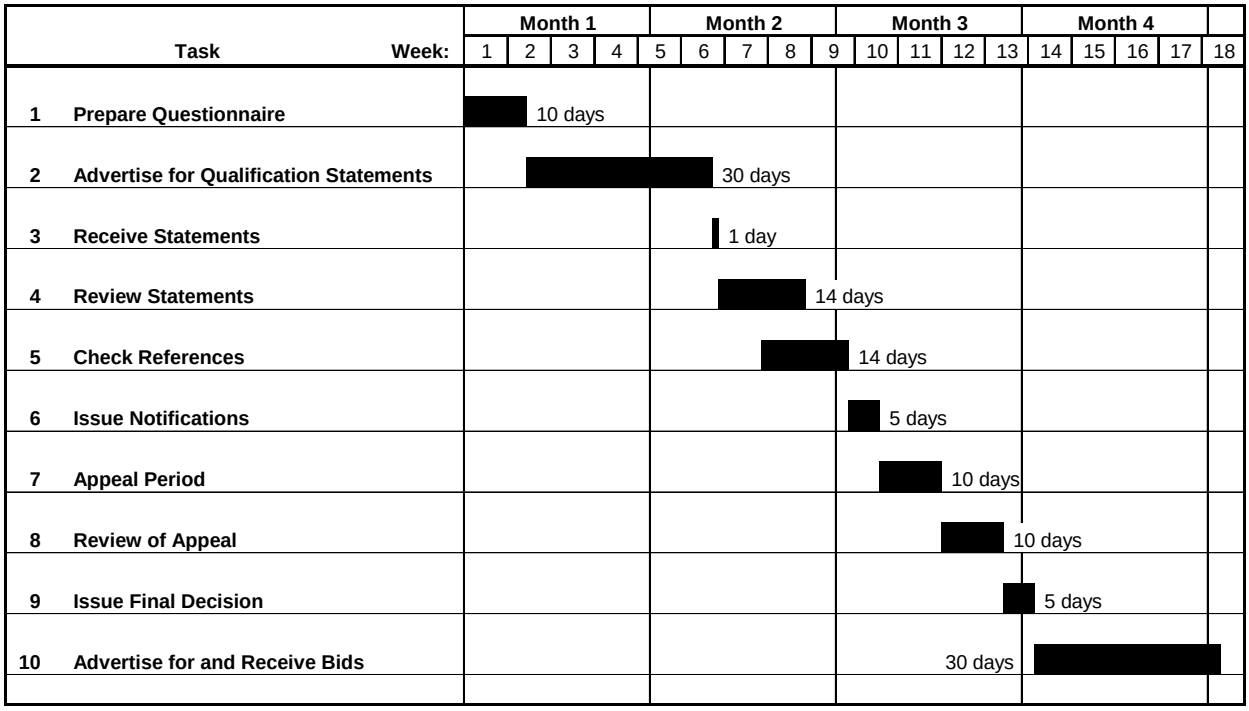


Figure 7.34.1 PREQUALIFICATION PROCESS TIMELINE CHART

7.35 REQUIREMENTS FOR PARTIAL BUILDING PERMITS

The minimum required submittal for Design-Build, Construction Management at Risk and PPEA project documents is the complete Working Drawing submittal as described in CPSM Chapter 5.

One of the advantages of using an alternate construction delivery method is the ability to start construction before the complete building design has been finished. Partial Building Permits are issued to the Agency upon request and compliance with the following procedure.

Partial Building Permits may include a combination of the following:

- Sitework and below grade utilities;
- Foundation;
- Superstructure;
- Shell (exterior walls and roof) and building core.

A Full Building Permit supersedes the Partial Building Permits, and incorporates all previously-issued Partial Building Permits.

In order to issue Partial Permits, the State Building Official must agree that the building's design is code compliant. Before the Agency submits completed Working Drawings for early permits, such as sitework, the Agency must submit interim documents (Code Compliance Drawings and Code Compliance Summary & Calculations) that include enough information for BCOM to ascertain code compliance. This interim submittal is termed "Code Compliance Documents".

7.35.1 Submittal Requirements For Partial Building Permits

The prerequisite for receiving a Partial Building Permit is approval of Code Compliance Documents and submittal of specific Working Drawings. See Section 7.35.1.1 for information on Code Compliance Documents.

Once approval of Code Compliance Documents has been received, an Agency shall submit two to five sets of Working Drawings and technical specification sections for Partial Building Permits.

The number of sets will relate to the design disciplines for which review is required. For example, sitework and below grade utilities may require three sets; superstructure may require two sets. The drawings and technical specifications shall consist of the specific drawing sheets and specification sections relevant to the work for which a Partial Building Permit is requested. The scope of the work shall be clearly defined on the drawings. The work shall be a discrete portion of work. The documents shall display the signed, dated seals of the responsible design professionals.

For example, a Partial Building Permit submittal for Sitework, Below Grade Utilities and Foundations (including waterproofing) could include Civil, Architectural and Structural Working Drawings; and technical specifications for Earthwork, Utilities, Concrete, and Thermal & Moisture Protection. A Partial Building Permit issued for Superstructure (including fireproofing) could include Architectural and Structural Working Drawings; and technical specifications for Concrete, Masonry, Metals, Wood and Thermal & Moisture Protection.

The Partial Building Permit will reference the specific documents submitted for the work of that Permit.

7.35.1.1 Code Compliance Documents

Code Compliance Documents consist of Code Compliance Drawings and Code Compliance Summary & Calculations. These documents, once approved, pave the way for the Agency to submit Working Drawings for Partial Building Permits. Code Compliance Documents are not necessarily the same as standard "Preliminary Phase" submittal documents or "Early Trade Packages". Early Trade or Bid Packages are sets of Working Drawings and technical specifications that are assembled by the A/E for the Contractor's use in bidding specific trade portions of the work.

The following information, data and drawings comprise the minimum acceptable information for a Code Compliance Document Submittal if Partial Building Permits will be sought. Refer to Appendix C for written/narrative requirements.

The central focus of the Code Compliance Documents is to establish all essential building design elements which make up the systems proposed for the building. All professional design disciplines have the responsibility to coordinate their work with the information shown on the Code Compliance Drawings and written in the Code Compliance Summary & Calculations.

7.36 THE BUILDING COMMITTEE

Every Agency having a capital project (regardless of funds source) shall establish a Building Committee. This requirement may be satisfied by one or more committees, dependent upon the needs and the project volume of the Agency. The committee shall be appointed by the Agency head or his or her designee.

7.36.1 Authority and Purpose

The Building Committee assists the Agency head in interviewing and selecting Architects and Engineers to carry out planning, design or other professional services for the Agency and recommends to the Agency head the best qualified A/E firm to provide those professional services. The Committee will be guided in accomplishing these tasks by the requirements and policies contained in Chapter 3, "A/E Services". A Building Committee shall be used by the Agency head to interview and recommend a Design-Build Team or Construction Manager for a Capital Project approved for accomplishment using such procedures.

7.36.2 Composition of Building Committees

The Building Committee shall be composed of 5 members with representation from the following areas as needed for the project:

a) Required: Accredited Virginia Construction Contracting Officer (VCCO)
b) Architect or Engineer from Agency's facilities planning department (permanent member)
c) Technical person responsible from Agency's facilities operation/maintenance department (permanent member)
d) The representative of the end-users department for the proposed new/renovated facility
e) Other representative as deemed appropriate by the Agency head
f) Office of the Attorney General of Virginia or Agency legal counsel (ex-officio, advisor)
g) Bureau of Capital Outlay Management (ex-officio, advisor)

The members specified in f) and g) above are not essential as active members to every Building Committee, unless the Committee is selecting a Design-Build or Construction Management Contractor. For D/B and CM at risk, the BCOM member shall be an active member.

Committees appointed for the purpose of reviewing A/E firm qualifications and recommending an A/E for an A/E Term Contract shall include:

a) The project management persons responsible for administering the Agency's construction/renovation projects
b) The technical persons responsible for operation and maintenance of Agency facilities.

7.36.3 Qualifications of Members

At least two members of the committee must be knowledgeable of:

a) The functional and operational requirements of the proposed building project
b) The project technical requirements
c) The administrative procedures for selecting design professionals, the development of a project design scope, the techniques for negotiating an A/E fee and the content and preparation of MOUs (an accredited VCCO).

7.36.4 Building Committee for Small Purchase Procurements

Committees appointed for the purpose of reviewing A/E firm qualifications and recommending an A/E for a single Category B contract, where the fee is expected to be $50,000 or less, may have as few as three members, one of whom is a VCCO.

Where total fees will not exceed $5,000, the Committee may be one person who is an accredited VCCO.

CHAPTER 8 - CAPITAL OUTLAY PLANNING AND PROJECT APPROVAL

8.0 GENERAL

This chapter describes the capital outlay process. It provides instructions on documentation required for approvals at various milestones in the Capital Outlay process. ALL capital outlay projects shall follow the approval procedures in Section 8.4.4 unless specifically waived by the Director of the Bureau of Capital Outlay Management or the document authorizing initiation of the project or deviation is authorized by an entity delegated authority to do so by the Acts of Assembly, or by Agency MOU's with and approved by the Secretary of Administration.

On projects authorized under delegated authority to the agency, the HECO-2, HECO-4, HECO-5, HECO-6 and HECO-8 (HECO Forms) shall be submitted to and approved by the Agency Designee in conformance with the Agency MOU. Building Official activities remain under the purview of the Director, Division of Engineering and Buildings (the Building Official for Buildings on State Property).

8.1 CAPITAL PROJECT PLANNING / BUDGETING PROCESS:

This section generally describes the budget process directly related to the Capital Outlay Program.

- The Agency develops its Six (6) year plan for Capital Projects.
- DPB issues its Budget Instructions (usually in February) See the DPB website.
- Agencies submit their Capital Budget Requests (CBR) in the Performance Budgeting (PB) system, with project priorities indicated.
- Capital Project submissions are reviewed by DPB and DGS for possible inclusion in the Governor's budget based on program guidance established by the Governor.
- Capital Project submissions are reviewed and considered by the six-pack committee for possible inclusion in the Governor's budget based upon program guidance established by the Governor and input from DPB and DGS
- The Governor presents his Budget to the money committees in December
- "Part 2, Capital Project Expenses" of The Budget Bill contains those Capital Projects the Governor has selected for construction or planning in the coming biennium.
- The General Assembly considers and passes the Acts of Assembly (the Appropriations Act).
- The Governor signs the Acts of Assembly (the Appropriations Act).
- Authorization to proceed with the projects must be granted by the Governor (or his designee) before any planning for or construction can begin.
- Funds are not available to be spent until July 1 of the even numbered years or until action on the Acts of Assembly (the Appropriations Act) is completed.

8.2 CAPITAL OUTLAY PROJECT IMPLEMENTATION PROCESS

The following generally summarizes the capital outlay project implementation process.

- Agency procures an Environmental Impact Report (or obtains letter from DEQ that EIR is not required for the project). Preparation and submission of an environmental impact report is required for each major state project (Code of Virginia §10.1-1188). Regulatory authority is assigned to the Virginia Department of Environmental Quality (Va. DEQ) in the *Code of Virginia* §10.1-1191. Submission requirements are described in the "Procedure for Environmental Impact Review of Major State Facilities", prepared by the Va. DEQ - current issue 2003.
  [NOTE: *Code of Virginia* §10.1-1190 provides that the State Comptroller shall not authorize payments of funds for major state projects unless the request is accompanied by written approval of the Governor after his consideration of the comments by DEQ on the environmental impact of the facility.]
- Agency obtains authority to initiate a Capital Outlay Project by submitting Form CO-2 for approval.
- Issue Notification of Initiation of Environmental Impact Report Process (CO-2a)
- Agency issues RFP for A/E services, interviews and selects A/E, negotiates fee, awards A/E Contract (Form CO-3 and MOU) (See Chapter 3)
- Agency and A/E attend Pre-design Conference.

- A/E develops and submits Schematic design for approval. Approve Schematic design and receive approval to proceed to Preliminaries. (Form CO-4)
- A/E develops and submits Preliminary design for approval.
- Conduct VE Study if value of the project authorized construction cost exceeds $5,000,000
- Issue notice of availability of Preliminary design to local jurisdiction (Form CO-5a)
- Obtain approval of design from AARB
- Approve Preliminary design and receive approval to proceed to Working Drawings. (Form CO-5)
- A/E develops and submits Working Drawing submittal for approval. Review Working Drawings design. Receive approval of Working Drawings using Form CO-6 and receive approval to advertise for bids.
- Contact BCOM to establish a Bid Date
- Advertise / Post Notice of IFB
- Receive Bids with Bid Bond, Form CO-10.2. Open Bids and evaluate.
- If within Budget, submit CO-8 for approval, e-mail/fax Bid Form and Bid Tab to BCOM, Post Notice of Intent to Award Contract
- If over budget but within range for negotiation, request approval to negotiate. If negotiations successful, prepare CO-9b, Post Bid Modifications to Bid.
- Use Form CO-9 to Award Contract for Construction
- Contractor submits Performance Bond using CO-10 and Labor and Material Payment Bond using CO-10.1
- Submit Information for Building Permit, CO-17. (See Section 8.7).
- For Change Orders to A/E Contract use CO-11AE
- For Change Orders to Construction Contract, use Form CO-11 and CO-11a
- Submit Certificate of Use and Occupancy, Form CO-13.3, or Beneficial Occupancy, Form CO-13.5 followed by Permit Closeout, Form CO-13.4 (See Section 8.7)
- Submit Project Completion Report using Form CO-14

8.3 CAPITAL OUTLAY PROJECT AUTHORIZATION:

Appropriated funds will be allotted and authority given to initiate a project, subject to interim approvals, reviews, and progress reporting, upon application from the agency but not before July 1 following General Assembly approval of the Biennial Budget which includes the project. In odd numbered years if a capital outlay project is added to the Budget during the short session, DPB may authorize the project after the Governor and veto session action on the amended Budget.

Architectural or engineering planning for or construction of, or acquisition of any capital project shall not commence or a revision be initiated without prior written approval of the Governor (§4-4.01 of the Appropriation Act (the Acts of Assembly).

Under certain circumstances the Governor may authorize the initiation of Capital Projects under the conditions set forth in §4-4.01 of the General Provisions of the Acts of Assembly. A project authorized under §4-4.01 is subject to the Capital Outlay Process, including the submission of E&B Form CO-2 to request authorization to initiate the project.

8.4 PROJECT EXECUTION

8.4.1 Acquisitions of Real Property

Acquisition of real estate shall be handled as a Capital Outlay Project and is governed by DGS/DEB Real Property Management Manual Chapter 2, Fee Acquisition.

To initiate an acquisition, submit an E&B Form CO-2 to the BCOM. For projects which consist of acquisition and construction, the request to acquire the property must be submitted on a separate E&B Form CO-2 to the Bureau of Capital Outlay Management.

8.4.2 Demolition

Demolition of any building, regardless of size and type, shall be authorized by the Governor prior to proceeding. (§ 2.2-2402, B, *Code of Virginia*.) The Division of Engineering and Buildings' Directive Number One provides specific instructions on the approval process. The DEB Directive Number One requirements are provided as Form DGS-30-550 on the DGS Forms Center. Demolitions which are required to permit construction shall be approved before preliminary drawings are prepared.

8.4.3 Temporary Facilities

Though funding for the modular or industrialized building or prefabricated building may be proposed from maintenance and operating funds, such projects are essentially Capital in nature. Prior to submitting a requisition to the Division of Purchases and Supply (where purchase is involved) or before finalizing any contractual arrangements for lease of a temporary facility, submit plans of the structure to BCOM for issuance of a building permit. The plans shall show that the structure meets the requirements of the Virginia Uniform Statewide Building Code or the Virginia Industrialized Building Unit and Mobile Home Safety Regulations and is accessible to the disabled. The plans shall include site location plan, proper anchorage, tie down and utilities for the structure. See Chapters 4 and 8.

Include a site plan indicating the proposed location of the facility. The location of the facility, as well as the aesthetics of the proposed structure, shall be presented to the Art and Architectural Review Board. Prior to occupancy, the Agency shall apply to the State Building Official (Division of Engineering and Buildings) for a Certificate of Occupancy for the facility. Form CO-13.3 TMP shall be completed and be accompanied by a letter report of inspection recommending occupancy of the facility from the Regional State Fire Marshal's Office.

8.4.4 Construction Projects

Capital construction projects are generally executed as described above. [Also see Figure 8.5]. The 3-digit agency code and the five digit project code assigned to the project in the Appropriation Act shall be the basic project identifier for the life of the project. Agencies with a blanket or umbrella appropriation; a project that will be accomplished by separate contracts at multiple locations or acquisitions at multiple locations; or a single project to be accomplished through two or more construction contracts, shall assign a 3-digit sub-project code for each undertaking. Several examples are given below. The agency code, project code and sub-code shall be used on all capital outlay forms and correspondence.

EXAMPLE BLANKET APPROPRIATION

Improvement: Blanket Authorization - Auxiliary (14666)

Project Number: Title

234-14666-001 Replace Clipper - Dining Hall

234-14666-002 Renovate Pool Room, Student Activity Building

234-14666-003 Upgrade HVAC System Intramural Gym.

EXAMPLE MULTIPLE PROJECT LOCATION APPROPRIATION

Improvement: Upgrade Central Heating Plants (15111)

869-15111-001 Install Gas Boilers - Roanoke Shop

869-15111-002 Replace Traveling Grates - Tazewell Facility

869-15111-003 Install Industrial Water Treatment Equipment, Warrenton Heating Plant

EXAMPLE MULTIPLE CONTRACTS - SINGLE PROJECT

Construction: Freestone Recreation Area (19213)

707-19213-001 Construct Grand Pavilion

707-19213-002 Construct Beach Area Facilities, Phase I

707-19213-003 Construct Beach Area Facilities, Phase II

8.4.5 Project Initiation

Agencies shall submit a "Request for Authority to Initiate Capital Project, G.S. Form E&B CO-2" via BITS (Building Information Tracking System) .

CO-2: REQUEST FOR AUTHORITY TO INITIATE CAPITAL OUTLAY PROJECT

Purpose: To request authority to initiate a project.

Submit: Subsequent to release of the Appropriation Act.

Other Uses:
1. Change in "Movable Equipment & Furnishings" amount,
2. Transfer money into or out of project, and
3. Infuse additional funds.
4. Scope increase or decrease by more than 5%.

When the approved CO-2 authorizes an agency to "proceed", subsequent submission of the Capital Outlay G.S. Forms E&B CO-4, CO-5, CO-6, CO-13, CO-13.1 and CO-13.2 are waived unless specific submittals are noted on the CO-2. However, the Agency shall obtain a Building Permit prior to the start of the construction if the authorized Work requires such a permit. (See Chapter 4)

The Director, Department of General Services, may authorize minor increases in square footage of a project where the increase is justified (§4-4.01 of the Appropriation Act). The Agency head shall submit a written request for such an increase to the Director of Department of General Services stating the necessity and justification for the increase. Any request which would increase the cost of the project beyond the amount appropriated will not be considered.

The Total Project Budget breakout on the CO-2 will reflect the results of DPB and DEB review during the budget development process. List sub-projects with sub-project numbers and fund proportioning for each on page 2 and page 3, if needed, on the CO-2. Appropriate comments and instructions relative to changes from the figures submitted by the Agency with the Capital Budget Request will be provided to the Agency during or after budget development. The amount of funding shown in the equipment line on the CO-2 will remain fixed for the life of the project unless a revised CO-2 is submitted and approved by the DPB to adjust the equipment amount. Equipment purchases must be coordinated with and, where appropriate, procured through the Division of Purchases and Supply.
The Agency shall notify (using the Form E&B, CO-2a), the chief administrative officer of the county, city or town in which the Agency intends to undertake the capital project.

CO-2a Notification of Initiation of Environmental Impact Report Process

Purpose: To notify the administrative officer of the local political subdivision of the initiation of the environmental impact report process.
Submit: To the appropriate administrative officer concurrent with submission of a CO-2.

Other Uses: Not Applicable.

Special Conditions: None.

The purpose of the notification is to enable the locality to comment on the Environmental Impact Report.

8.4.6 Pre-Design Conference

The Agency may engage an A/E firm to prepare drawings and specifications upon receipt of the approved CO-2. Prior to preparation of schematics or the continuation of design beyond the concept presented in the Capital Budget Request, the agency shall schedule a pre-design meeting with BCOM. The meeting may be held at BCOM. Participants shall include the BCOM lead reviewer for the agency, the A/E, the agency project manager, the user of the facility and, at DPB's discretion, the DPB budget analyst for the agency. The agenda for the meeting shall include:

- Introductions
- Role of BCOM
- Authorized Communications
- Project Scope
- Project Budget
- Proposed Design Schedule
- Required Reviews
- Manual Design Requirements
- Public Procurement Act
- Chapters 4 - 7 of the Manual
- Fire Safety Reviews
- Fire Protection System Design
- Clarification/Resolution of Budget Development Comments
- Waivers/Code Modifications
- Content of Review Submission
- Intent of Review Comments
- Design Approach
- Sole Source / Proprietary Specifications
- Use of Standard Procurement / Specification Forms
- Value Engineering
- Prequalification
- Other Regulatory Reviews
- Fuel Selection

The Agency shall prepare and distribute minutes of the meeting to all participants within 14 days of the meeting. Participants shall have 10 days to note any corrections to the minutes that may be necessary.

The Agency may proceed with the project design at the conclusion of the 10-day review period for the pre-design meeting minutes. Agreements on design direction, scope, budget, review comment agreement, etc., reached during the pre-design meeting shall be incorporated in the first review submission.

8.4.7 Schematics

Schematic submittals are usually required for Capital Outlay Projects which have not had a Preplanning Study prepared. CPSM Section 5.6 outlines the requirements for the Schematic submittal. Generally, the Schematic translates the Agency's written project functional, spatial and adjacency requirements into a graphic presentation of floor plans, space sizes and relationships, and exterior building elevations. The Agency shall make a schematic presentation to the Art and Architectural Review Board as soon as the A/E completes and DEB approves the schematic submittal. Additional reviews may be required by the Art and Architectural Review Board.

CO-4 Application for Approval of Schematics

Purpose: To submit and receive approval of the Schematic submittal and obtain authority to prepare Preliminaries. Use a separate CO-4 for each sub-project submitted.

Submit: With Schematic submittal when Schematic drawings and data are complete and ready for review.

Other Uses: None

8.4.8 Preliminary Submittal

The next project approval milestone is the submittal of preliminary drawings with the basis of design narrative, building systems and equipment checklist, cost estimates, and CO-5 submission (in BITS) to BCOM and other Agencies for review. Section 5.7 of the Manual outlines preliminary submittal requirements. The Agency shall arrange for a Value Engineering Study of each project with a total project cost greater than $5,000,000. The study and Agency action on the study recommendations are a required part of a preliminary submittal. The Agency is responsible for making submittals to and obtaining approvals from the other review agencies listed in Section 5.11. BCOM is not involved in these reviews and approvals.

After BCOM review and resolution of any differences between agency action on the VE recommendations and the BCOM preliminary review comments, an approved CO-5 will be issued to authorize preparation of working drawings. Any changes required by the BCOM review comments shall be incorporated in the next project submission.

CO-5: Application for Approval of Preliminary Drawings and Specifications

Purpose: To submit and receive approval of the preliminary drawings and obtain authority to prepare working drawings. Use a separate CO-5 for each sub-project submitted.

Submit: With the preliminary submittal when preliminary drawings and data are complete and ready for review.

Other Uses: To make adjustments to construction, A/E, Project Inspection and Other Budget Lines as project design develops.

Agencies with an authorized Higher Education Capital Outlay (HECO) approval authority may perform its own schematic, preliminary and working drawings reviews of Capital Outlay Projects and approve its HECO Forms HECO-4, HECO-5 and HECO-6. **A copy of these Agency-approved HECO forms shall be sent to the Bureau of Capital Outlay Management in conformance with the Agency's Memorandum of Understanding with the Secretary of Administration.**

The Agency shall notify (using the Form E&B, CO-5a), the chief administrative officer of the county, city or town in which the Agency intends to undertake the capital project that preliminary plans are available upon the request of the locality.

CO-5a Notification of Availability of Preliminary Drawings

Purpose: To notify the administrative officer of the local political subdivision of the availability of preliminary drawings.

Submit: To the appropriate administrative officer concurrent with submission of preliminaries to BCOM.

Other Uses: Not Applicable.

The purpose of the notification is to enable the locality to evaluate the project and to submit their comments to the agency. Upon receipt of a request from the locality, the Agency shall transmit a copy of the preliminary plans to the locality for comment (§15.2-2202, C).

8.4.9 Working Drawing Submittal

The next project approval milestone is the submittal of completed working drawings and specifications by the Agency to the BCOM and other reviewing Agencies. See Section 5.11 for a listing of other agencies whose review and approvals may be required. A completed E&B Form CO-6 and the final cost estimate shall accompany the submittal to BCOM. BCOM will review the working drawings and specifications and, if appropriate, approve the working drawings and authorize the Agency to advertise the project for bids.

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 Agency in concert with its A/E shall be responsible for determining when these reviews are necessary and ensuring that the appropriate review Agencies receive the plans and specifications. Changes required by the BCOM review comments shall be incorporated in the bid package before the construction documents are released to prospective bidders.

The Agency shall submit the number of copies of the revised documents as requested by the BCOM lead reviewer before release of the documents to prospective bidders unless otherwise instructed. The Agency shall ensure comments of the State Fire Marshal, Division of Soil and Water Conservation, and other reviewing Agencies are received and incorporated in the bid package prior to advertising. Addenda to a bid package shall not be issued later than 10 days prior to bid opening. Confirmation that all comments have been incorporated must be submitted to BCOM at least 10 days prior to the bid receipt date.

CO-6: Application for Approval of Working Drawings and Specifications

Purpose: To submit and receive approval of working drawings and to receive approval to advertise a project for bids. Use a separate CO-6 for each sub-project submitted.

Submit: With the working drawings and when the working drawings are complete and ready for review.

Other Uses: To make adjustments to the Construction, A/E, Project Inspection, and Other budget lines based on final project design.

Even though some agencies may have “HECO” authority to approve the HECO-2, HECO-5 and HECO-6 for their Capital Outlay projects, BCOM review or the Working Drawings / Construction Documents is required before a Building Permit is issued. It is strongly recommended that the Working Drawing plans and specifications be submitted to BCOM review prior to release to bidders so that any Codes and Standards deficiencies noted can be corrected prior to bidding. This is a more cost effective process that making corrections by Change Order to the Construction Contract.

Bid dates for Capital Outlay projects (both BCOM- and HECO-approved) shall be established with the BCOM. The purpose is to assure that state capital projects do not compete with each other or other significant projects for bidders on bid day. Call the Program Management Section at (804) 225-3769 to establish the bid date. Contractors shall be allowed 30 days from the date of first public notice to prepare and submit bids unless otherwise approved. Refer to Section 5.9.5.

8.4.10 Bid Opening and Contract Award

On the date prescribed, Bids shall be publicly opened and announced as specified in Chapter 7. When the apparent low responsive and responsible bidder is determined, the Agency shall prepare a tabulation of bids and a G.S. Form E&B CO-8, Approval to Award Contract (CO-8). If the low bid is equal to or less than the Agency's construction estimate on the CO Form authorizing advertising (e.g., CO-6), the E&B Form CO-8 may be approved locally by the Agency’s designated Virginia Construction Contracting Officer (VCCO). Submit the approved CO-8 and the bid tabulation and bid form to BCOM within two (2) business days after bid opening.

CO-8: Approval to Award Contract

Purpose: Authorize the award of a construction contract to the apparent low bidder.

Submit: The approved/signed CO-8 with the bid tabulation to the BCOM within two business days after signature by the designated Virginia Construction Contracting Officer (VCCO).

Other Uses: To make changes in the project budget after contract award for all budget lines except "Movable Equipment & Furnishings"

Special Conditions: None

If the low bid exceeds the Agency construction estimate by less than 10%, and if funds are available within the approved total project budget shown on the approved CO-6, the agency may accept the bid. The designated VCCO shall sign the CO-8 which shall show the revised project budget breakdown. Submit the approved CO-8 and the bid tabulation and bid form to BCOM as stipulated above.

If the low bid exceeds the agency construction estimate by 10% or more, the agency may:
1) request authority to infuse additional funds,
2) request authority to negotiate with the low bidder, or
3) reject all bids.

To infuse additional funds the Agency shall submit a revised CO-2, a CO-8 and the bid tabulation and bid form Faxed to the BCOM for approval of the funding action by DPB and approval of the contract award by BCOM.

Authority to negotiate with the low bidder shall be requested from the Director of the BCOM. Follow the procedures detailed in Section 7.5 of Chapter 7 to request authority to negotiate.

In all cases where the low bid exceeds the agency construction estimate by more than 10%, approval to award a contract (even after negotiations with the low bidder) shall be required from the Director of the BCOM.

Prior to rejecting bids, the agency shall contact the Director of BCOM at (804) 786-4398 and coordinate their proposed rejection with BCOM.

When the CO-8 has been approved the agency may award a contract to the low bidder.

The project budget on the CO-8 shall reflect the contract award amount, A/E fees, supervision, equipment and a maximum of 5% of the low bid amount, or negotiated amount where negotiation with the low bidder was authorized, for the construction contingency. Remaining funds shall be de-allotted and held by DPB pending project completion. If during the course of construction the contingency is exhausted and additional contingency is required, the agency shall submit a revised CO-2 and a revised CO-8 to BCOM/DPB requesting approval of the additional contingency amount. The request shall identify the source of funds for the contingency increase and include an explanation as to why the additional contingency is needed.

8.4.11 Building Permits and Demolition Permits

Working Drawings and Specifications / Construction Documents must be reviewed and approved by BCOM prior to issuance of a Building Permit, Simultaneous with the submission of the CO-8 to the Director, DEB, the following shall be submitted to obtain a Building Permit and/or Demolition Permit:

CO-17: Information for Building Permits Refer to Chapter 4 and Section 8.7.6.

CO-17.1: Demolition Permit (for demolition of Existing Buildings)

Purpose: To authorize demolition of existing structures on State property. (Interior demolition associated with renovations and repairs is usually covered by the Building Permit.)

Submit: One copy to the Bureau of Capital Outlay Management completed with all information and dates and copies of approval by other relevant State Agencies. One copy will be returned to the Agency when signed and approved by the Building Official and the Governor's Designee.

Other Uses: None

Special Conditions: Request must show dates of approval by the AARB and by Historic Resources (DHR) to demolish the structure. Also show dates of Asbestos Survey and Lead Based Paint Survey. Contract Documents must require proper disposal of Hazardous and Non-Hazardous materials including the proper handling and disposal permits. Authorization is contingent upon approval of the CO-8 for award of the Demolition Contract (or Construction Contract if demolition will be done as part of that contract).

The following attachments are required with the submission of the CO-17.1:

- AARB Demolition Approval – Copies of front page of the Meeting Minutes with date of the meeting and relevant page(s) in Minutes addressing demolition.
- DHR Demolition Approval – Copy of approval letter / memo from DHR.
- Photographs of exterior and interior of building.
- Other information as deemed appropriate by the Agency to support the application.
- Clarifications of information for CO-17.1

- Always use the current edition of the CO-17.1 – available from the DGS Forms Center.
- Surveys of hazardous materials – asbestos and lead paint - shall be complete. If hazardous materials were found and not previously abated, Abatement Designs must be complete and incorporated as part of the Demolition Contract.
- Date of Release by Utilities shall be complete when the CO-17.1 is submitted with Release dates noted (No future dates accepted). The only exception allowed is when the Releases are required as part of Contractor's work in the Demolition Contract, which shall be noted on the CO-17.1.

8.4.12 Change Orders to the Construction Contract

Refer to Section 8.7.7.1 for information.

8.4.13 Change Orders to the A/E Contract

Refer to Section 8.7.7.2 for information.

8.4.14 Building Occupancy

Refer to Chapter 4 and Section 8.7.8 for information.

8.4.15 Project Close Out

Every capital project which has an approved CO-2 authorizing the project to be initiated shall be closed out by the completion and submission of a Project Completion Report, GS Form E&B CO-14. This includes projects which may have been cancelled by the agency and never constructed, projects where funds were reverted, projects which were combined with another project and the funds transferred, and projects where the funding was never allotted.

A project may be reported as 100% complete in the semiannual capital outlay status report when a Certificate of Occupancy, CO-13.3, has been issued by the State Building Official, or, in the case of renovation projects where there is no change in use or occupancy classification, when the permit has been closed by issuance of Permit Closeout, CO-13.4, by the State Building Official.

The Project Completion Report, GS Form E&B CO-14, shall be submitted to BCOM as soon as practical after the project is physically complete and the associated administrative steps have been concluded, but no later than 12 months after the owner occupies the building or the work has been accepted as substantially complete. Included in this generalized statement are such things as the contractors submission of warranty, operating manuals, maintenance procedures and other user required documentation; submission of the record drawings by the A/E; release of retainage to the contractor and final payment for any outstanding invoices and other ancillary or associated work/equipment provided by vendors and contractors not associated with the general construction; etc.

8.5 CAPITAL OUTLAY ORDER OF PROCEDURE

DOCUMENT	USE / ACTION
CO-2	Authority to Initiate a Capital Outlay Project
CO-2a	Notice of Initiation of Environmental Impact Report Process
CO-3	Contract for A/E Services to design a Project
CO-3a	Terms and Conditions of the Professional Services Contract
CO-4	Approval of Schematics (when Schematics are required)
CO-5	Approval of Preliminary Design
CO-5a	Notice to Public Body of Availability of Preliminaries
CO-6	Approval of Working Drawings (Plans and Specifications) (and Authorization to Advertise for Bids)
CO-8	Authority to Award a Construction Contract
CO-9	Contract for Construction
CO-17 (CO-17IND, CO-17MAN, CO-17TWR CO-17TMP, CO-17SPC)	Building Permit (for industrialized building, manufactured home, tower, temporary structure, special use permit)
CO-17.1	Application for Permit to Demolish a Building
CO-11AE	Change Order to the A/E Contract
CO-11, CO-11a	Change Order to the Construction Contract, Justification for Change Order
CO-13.3(CO-13.3IND, CO-13.3MAN, CO-13.3TWR)	Certificate of Use and Occupancy (for industrialized building, manufactured home, tower)
CO-13.4	Building Permit Closeout (for projects that will not result in a CO-13.3)
CO-13.5	Beneficial Occupancy (for projects that will not result in a CO-13.3)
CO-14	Project Completion Report

8.6 CO FORMS CAPITAL OUTLAY SUBMISSION SUMMARY

FORM #	DESCRIPTION	WHEN TO SUBMIT	FORMAT	CPSM CHAP
CO-2	Initiate Project	As Required to Initiate any project, or for approval of a scope or dollar change to approved project	BITS	8
CO-2a	Notice to Locality	Initiation of the EIR	Paper to Chief Administrative Officer of the Locality	8
CO-2.3	A/E Fee Proposal	A/E submits to Agency	Electronic file	3
CO-3, CO-3.1, CO-3.1a, or CO-3.2	Owner – A/E Contracts	10 days after contract executed (w/ copy of MOU)	Paper	3, 8
CO-4	Schematic Approval	With Schematics	BITS	8
CO-5	Preliminary Approval	With Preliminaries	BITS	8
CO-5a	Notice to Locality	Completion of Preliminary Documents	Paper- Send to Chief Administrative Officer, Local Political Subdivision	8
CO-6	Working Drawing Approval	With Working Drawings	BITS	8
CO-6a	Inspection Statement	With Working Drawings w/CO-6b attached	Paper	5
CO-6b	Special Inspection List	Attached to CO-6a	Paper	5
CO-8	Approval to Award Contract	Within 10 working days of bid opening	BITS (Send Bid Form, Bid Tab, & CO-9b)	7
CO-8b	A/E Performance Evaluation	Upon receipt of Approved CO-6	FAX, pdf (copy to A/E)	3, 5
CO-9	Owner - Contractor Contract	No submittal to BCOM	To Agency File	7
CO-9b	Post Bid Modification (also FAX w/CO-8)	Attached to CO-9	Paper	7, 8

FORM #	DESCRIPTION	WHEN TO SUBMIT	FORMAT	CPSM CHAP
CO-9.1	Notice of Intent	No submittal to BCOM	To Agency File	7
CO-9.1a	Notice of Award	No submittal to BCOM	To Agency File	7
CO-10	Performance Bond	No submittal to BCOM	To Agency File w/CO-9	7
CO-10.1	Payment Bond	No submittal to BCOM	To Agency File w/CO-9	7
CO-11	Change Order to Construction Contract	When Change Order requires Governor's approval (2 originals)	Paper w/ CO-11a justification & backup	7, 8
CO-11	Change Order to Construction Contract	When Change Order DOES NOT require Governor's approval	Paper w/ CO-11a (or Electronic)	7, 8
CO-11a	Change Justification	With CO-11	Paper	7, 8
CO-11a/e	Change Order to A/E Contract	When Change Order requires Governor's approval (2 originals)	Paper w/ CO-11a justification & backup	7, 8
CO-12	Schedule of Values, Request for Payment	At project close-out	GC-Pay, or Electronic	7
CO-13	Affidavit - Payment of Claims	With Contractor's Final payment request	Paper, pdf	7
CO-13.1	A/E Certificate of Completion	After completion of Final Inspection	Paper, pdf	7
CO-13.1a	A/E Certificate of Substantial Completion	After Substantial Completion Inspection	Paper, pdf or FAX with CO-13.3a	7, 8
CO-13.1b	Final Report of Structural Inspections	After Substantial Completion Inspection	Paper, pdf or FAX with CO-13.3a	7, 8
CO-13.1c	PM or PI Certificate of Substantial Completion	After Substantial Completion inspection	Paper, pdf or FAX with CO-13.3a	8
CO-13.2	Contractor Certificate of Completion	After completion of Final Inspection	Paper, pdf	7

FORM #	DESCRIPTION	WHEN TO SUBMIT	FORMAT	CPSM CHAP
CO-13.2a	Contractor Certificate Substantial Completion	Before Substantial Completion inspection	Paper, pdf or FAX with CO-13.3a	7, 8
CO-13.3	Certificate of Use & Occupancy	After Substantial Completion Inspection – Prior to Occupancy	BITS	7, 8
CO-13.3 IND	Industrialized Building Certificate of Use & Occupancy	After Substantial Completion Inspection - Prior to Occupancy	BITS along w/ CO-13.1a,CO-13.2a, CO-13.3b & other reports	7, 8
CO-13.3 MAN	Manufactured Home Certificate of Use & Occupancy	After Substantial Completion Inspection - Prior to Occupancy	BITS along w/ CO-13.1a,CO-13.2a, CO-13.3b & other reports	7, 8
CO-13.3 TWR	Tower Certificate of Use & Occupancy	After Substantial Completion Inspection - Prior to Occupancy	BITS along w/ CO-13.1a,CO-13.2a, CO-13.3b & other reports	7, 8
CO-13.3b	Checklist for Beneficial Occupancy	With CO-13.3a	Paper, pdf or FAX	8
CO-13.4	Building Permit Close	After Final Completion	BITS along w/ CO-13.1a,CO-13.2a, CO-13.3b & other reports	4, 5
CO-13.5	Beneficial Occupancy	After Substantial Completion Inspection - Prior to Re-Occupancy	BITS along w/ CO-13.1a,CO-13.2a, CO-13.3b & other reports	4
CO-14	Completion Report	Within 12 months of Building Occupancy	BITS	7, 8
CO-15	Application for Review Delegation	As required	Paper	7
CO-16	Prequalification	As required by RFQ	None	7
CO-17	Building Permit	After CO-8 approval for Capital Project; After contract award for non-capital	BITS	7, 8
CO-17 IND	Building Permit - Industrialized Building	After CO-8 approval for Capital Project; After contract award for non-capital	BITS	7, 8
CO-17 MAN	Building Permit - Manufactured Home	After CO-8 approval for Capital Project; After contract award for non-capital	BITS	7, 8

FORM #	DESCRIPTION	WHEN TO SUBMIT	FORMAT	CPSM CHAP
CO-17 TWR	Building Permit - Tower	After CO-8 approval for Capital Project; After contract award for non-capital	BITS	7, 8
CO-17 TMP	Building Permit - Temporary Structure	After CO-8 approval for Capital Project; After contract award for non-capital	BITS	7, 8
CO-17 SPC	Special Use Permit	After CO-8 approval for Capital Project; After contract award for non-capital	BITS	7, 8
CO-17.1	Demolition Permit	After DHR & AARB Approvals, before demolition	Paper to BCOM w/attachments	8
CO-18	Sole Source Procurement Approval	Before Working Drawings	Paper	5

FORMAT TO BCOM explanations

Electronic	=	E-mail or other electronic transmission to a specified electronic address
FAX		Paper copies transmitted electronically from one FAX machine to BCOM FAX number OR a 'scanned' document in 'pdf' format sent electronically to BCOM E-mail address
Paper	=	Paper copy or original w/signatures sent by US Postal Service or by courier service
pdf	=	Indicates that 'scanned' document in 'pdf' format sent electronically to BCOM E-mail address may substitute for 'Paper' or FAX copy
BITS	=	Forms shall be prepared and submitted by agency within BITS application software

FIGURE 8.6

8.7 CO FORM INSTRUCTIONS AND REQUIREMENTS

This section describes the CO- Forms used for Construction Projects - both Capital and Non-Capital and regardless of the source of funds. Any work which meets the definition of "construction" as defined in Section 2.2-4301 of the *Code of Virginia* and which is regulated by the Uniform Statewide Building Code must be authorized by a Building Permit which is a Form CO-17. This Chapter provides instructions on the forms, documentation, and approvals required at various milestones in the process. Agencies are reminded that preparation and submission of an environmental impact report is required for each major state project which costs more than $500,000. (*Virginia Code* §10.1-1188). See Section 4.18 of the Manual

8.7.1 Capital Outlay Project 'CO' Forms for Construction:

In addition to these construction related 'CO' forms, all capital outlay projects must also follow the approval procedures in Section 8.4 unless specifically waived by the Director of the Bureau of Capital Outlay Management (or other delegated authority) or unless otherwise indicated in the project authorization wording on the CO-2. Approval and notification forms are listed in the table at the end of this chapter.

8.7.2 Annual Permit Designation

The Building Official has determined that certain repair, remodeling and improvement projects can be performed at the agency level by agency forces or by contracting with minimal risk to public safety. Appendix P, Building Permit Policy, identifies those types of projects. To facilitate the process, the Building Official, at his sole discretion, has established an Annual Permit Procedure where agencies may request authority to review, approve, permit and inspect these types of projects locally by submitting the name of an Architect or Engineer on staff who will be the agency designee responsible to the Building Official for assuring that work done under the Annual Permit Authority is recorded and meets the requirements of the Building Code. After approval of the qualifications of the proposed person, the Building Official will issue a letter to the Agency designation the person named in the letter as the designee for review and approval of documents for proposed projects under the Annual Permit and for inspecting such projects to assure compliance with the VUSBC and applicable standards. See Section 4.19.3.1 of the Manual

8.7.3 Demolition of Buildings

Demolition of any building (plant) regardless of size and type shall be authorized by the Governor prior to proceeding. (§ 2.2-2402, B, *Code of Virginia*.) This includes obtaining recommendations for approval to demolish the building / structure for the Art & Architecture Review Board and the Department of Historic Resources. The Division of Engineering and Buildings' Directive Number One provides specific instructions on the approval process. Requests for demolitions of existing buildings which must be done to allow for the new construction should be requested and approved before preliminary drawings for the new construction are prepared. The Agency is required to complete and submit E&B Form CO-17.1 with attachments to request authorization to demolish any building or structure on state property.

8.7.4 Temporary Facilities (Other than Tents and Stages)

Though funding for a modular or industrialized building or prefabricated building may be proposed from maintenance and operating funds, such projects are essentially Capital in nature. Prior to submitting a requisition to the Division of Purchases and Supply or the Agency Procurement Office (where purchase is involved) or before finalizing any contractual arrangements for lease of a temporary facility, the Agency must assure that the item being leased or purchased will meet the requirements of the VUSBC (Building Code). See Chapter 4 for guidance. Before the item is delivered to the site, the Agency should submit plans of the structure to BCOM for issuance of a building / foundation permit. The plans shall show that the structure meets the requirements of the Virginia Uniform Statewide Building Code or the Virginia Industrialized Building Unit and Mobile Home Safety Regulations and is accessible to the disabled. The plans shall include site location plan, proper anchorage, tie down and utilities for the structure. See Chapter 4.

Include a site plan indicating the proposed location of the facility. The location of the facility, as well as the aesthetics of the proposed structure, shall be presented to the Art and Architectural Review Board. Prior to occupancy, the Agency shall apply to the State Building Official (Division of Engineering and Buildings) for a Certificate of Occupancy for the facility. Application shall be made in accordance with the building permit guidelines in Section 8.7.6 and be accompanied by a letter report of inspection recommending occupancy of the facility from the Regional State Fire Marshal's Office.

8.7.5 Construction Projects

Capital construction projects are generally executed as shown in Chapter 8 and outlined in Figure 8.5. The 3-digit agency code and the five digit project code assigned to the project in the Appropriation Act shall be the basic project identifier for the life of the project. Agencies with a blanket or umbrella appropriation; a project that will be accomplished by separate contracts at multiple locations or acquisitions at multiple locations; or a single project to be accomplished through two or more construction contracts, shall assign a 3-digit sub-project code for each undertaking.

Non-Capital Construction projects also must have an identifier for tracking purposes. The identifier is the three digit agency code followed by a five digit code composed on the last two digits of the year in which the project is first submitted to BCOM for review followed by the three digit agency code. (e.g. 194-A4194-xxx for DGS) The last three subproject digits are sequential numbers assigned by BCOM when the submittal or application is first received. (e.g. 194-A4194-012 for the twelfth DGS non-capital submittal received)

8.7.6 Building Permits

The construction documents submitted for Building Permit shall have sufficient information, sizes, dimensions, details, material descriptions, loads and load capacities, plans, sections, elevations and details for the Building Official to determine that the proposed work conforms to the requirements of the Building Code and applicable standards and policies. For most projects, this submittal will be plans and specifications. For repairs, remodels and minor improvements, it may be plans and specs or sketches with dimensions or even a narrative of the work to be done. In any case, the documentation must describe what is to be done and show that the work will conform to the requirements of the building code and applicable standards and policies.

The submittal of completed working drawings and specifications (or other materials) by the Agency to BCOM shall be followed, after award of the contract, by the completed project information on Form CO-17, Building Permit, in BITS. For work to be permitted under the Annual Permit by the Agency Designee, the documentation must satisfy the designee.

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 before a Building Permit will be issued. The Agency in concert with its A/E shall be responsible for determining when these reviews are necessary and ensuring that the appropriate review Agencies receive the plans and specifications. Changes required by the BCOM review comments shall be incorporated in the documents and the Work as a condition of the Building Permit.

CO-17: Building Permit - for Capital Projects

Purpose: To request approval of Plans & Specifications including addenda and any post–bid modifications for construction upon approval of the CO-8 authorizing award of the Construction Contract. A separate Building Permit, CO-17, may be issued at the discretion of the Building Official for each phase of phased projects or to allow sitework to begin pending resolution of deficiencies in the documents.

Submit: CO-17 in BITS with all data including date of documents, number of addenda and dates, name and license number of Contractor, etc. Submit after the CO-8 and any other material required to be submitted with the CO-8 have been approved.

Other Uses: For projects reviewed by a Delegated Review Unit, also submit one (1) complete set of the Plans, Specifications, Addenda and any Post Bid Modification modifying the requirements of the Bid Documents along with the CO-17.

If negotiations were conducted with the Low Bidder to obtain a Contract, also include three (3) copies of the Post Bid Modification, CO-9b, and supporting documentation which describe the proposed changes to the Contract Documents.

CO-17: Building Permit - for Non-Capital Projects

Purpose: To submit and receive approval of construction documents and to receive approval to begin construction

Submit: After completion of the working drawings / construction documents and after award of the contract. Submit completed CO-17 in BITS with all applicable information filled in to describe the Work

Other Uses: To request extension of the Building Permit expiration date.

CO-17 MAN: Building Permit - for Manufactured Home

Purpose: To request approval of Plans and Specifications to construct foundations and anchorage systems for Manufactured Homes and to install and connect "labeled" Manufactured Homes for temporary or permanent use.

Submit: CO-17 MAN along with three (3) copies (minimum) of the Floor Plan(s) & Specifications or manufacturer's data with serial #'s and seals, Site Plan, Foundation Plan & details, Anchorage Plan & details, and Entrance / Egress / Access Plan & details which show / describe the work to be performed.

Other Uses: None

Special Conditions: Units proposed to be acquired and/or placed on state property shall conform to the requirements of the Virginia Manufactured Home Safety Regulations (MHSR), shall have the appropriate labels of an Inspection service affixed, and shall have a Virginia Registration Number. See Chapter 4 for guidance for procuring an industrialized building to assure that it will be acceptable for use when delivered to the site.

CO-17 IND: Building Permit - Industrialized Building

Purpose: To request approval of Plans and Specifications to construct foundations and anchorage systems for Modular or Industrialized Buildings and to install and connect "labeled" Industrialized Buildings for temporary or permanent use.

Submit: CO-17 IND along with three (3) copies (minimum) of the Floor Plan(s) & Specifications or manufacturer's data with serial #'s and seals, Site Plan, Foundation Plan & details, Anchorage Plan & details, and Entrance / Egress / Access Plan & details which show / describe the work to be performed.

Other Uses: None

Special Conditions: Units proposed to be acquired and/or placed on state property shall conform to the requirements of the Virginia Industrialized Building Safety Regulations (IBSR), shall have the appropriate labels of an Inspection service affixed, and shall have a Virginia Registration Number. See Chapter 4 for guidance for procuring an industrialized building to assure that it will be acceptable for use when delivered to the site.

CO-17 TMP: Permit / Certificate for Temporary Facility

Purpose: To request authority to erect and use a temporary facility or tent for a relatively short period of time to accommodate specified functions. The application shall specify the use group, the type of construction, the occupancy load in the facility,

the period of time the facility may be used, and any stipulations, conditions and modifications.

Submit: Submit a CO-17 TMP in BITS with the appropriate data completed. Also include a Site Plan showing the tent location and distances to adjacent building and property lines; a Floor Plan showing EXITS and furnishing layouts; and Tent Material Certificates of Conformance which document indicate Flame Resistance required by NFPA 701. Also submit data on stages, platforms, etc. to be erected. Submit to BCOM at least 10 work days prior to the requested occupancy date.

Other Uses: Stages, Platforms, Amusement Devices, etc.

Special Conditions: Request shall indicate date proposed for erection, dates facility to be used, type of use / activity, and date to be taken down. Use of the facility will be subject to planned and unannounced inspections by the Fire Marshal and Building Official representatives.

CO-17 TWR: Building Permit – Communication Tower
See Division of Real Estate Services (DRES) for instructions. Copy of application is on the DGS Forms Center website.

Purpose: To request approval of Plans and Specifications to construct foundations and tower structures for Communications Towers. Required for all towers on state property except those in the VDOT Right-or-Way (over which VDOT has jurisdiction) regardless of whether the towers are for state agency use or for use by lessee.

Submit: Submit a CO-17 TWR in BITS along with five (5) copies (minimum) of the Tower Plan(s) & Specifications or manufacturer's data with load design data, Site Plan, Foundation Plan & details, and Anchorage Plan & details, Professional Engineer's Seals that are signed and dated.

Other Uses: None

Special Conditions: Communications Towers to be constructed / erected by a private sector entity on land leased from a state agency must have approval of the lease from the Division of Real Estate Services (DRES) before a Building Permit will be issued. See Chapter 4 for guidance for Communications Towers.

CO-17 SPC: Special Use Permit

Purpose: To request approval to temporarily use a structure for a use other than the use other than under which it was occupied

Submit: Submit a CO-17 SPC in BITS. Contact BCOM for further instructions.

Other Uses: None

Special Conditions: Will vary based upon project characteristics.

8.7.7 Change Orders

Change orders to the contract may be necessary during the course of construction. Change orders are most commonly necessitated by unforeseen site or building conditions; errors or omissions in the contract documents; an opportunity to reduce the operating cost of the facility under construction; technology changes occurring since contract award which must be

incorporated in the project; or a change in the agency requirement. All changes to the requirements shown on the Contract Documents MUST be documented by a Change Order to the Contract, regardless of whether the project is 'capital' or 'non-capital'. Changes to the contract amount and/or performance time shall be included in an approved contract change order G.S. Form E&B CO-11. Change Orders to 'capital' contracts shall be justified or explained on the CO-11a . Change Orders to 'non-capital' contracts which require the approval of the Governor's Designee shall be justified or explained on the CO-11a . The Agency may require that the CO-11a also be used as a management tool for other 'non-capital' project change orders.

8.7.7.1 Construction Change Orders

CO-11 / CO-11a: CONTRACT CHANGE ORDER / JUSTIFICATION

Purpose: To request and receive approval of a change in the construction contract time, amount, or both.

Submit: For all locally approved capital outlay project change orders, submit one copy of the CO-11 and CO-11a with the contractor back-up cost materials to the BCOM within 5 days after the change order is approved and signed.

For all change orders requiring the prior approval of the Governor or his designee, submit two copies of the CO-11 and CO-11a with one copy of the contractor back-up cost material.

Other Uses: Must be used to document any and all changes to a construction contract (CO-9) using CPSM procedures. Must also be used to document change orders to maintenance reserve and other non-capital outlay construction contracts.

Special Conditions: Any Change Order which changes work regulated by the Building Code, its referenced Standards, or DEB Standards must be submitted to BCOM with copies of the document showing the changes to the regulated systems. BCOM review of these Change Orders is to assure compliance with the applicable codes and standards.

Changes involving an increase in construction contract price of more than 25% of the original contract amount or $50,000, whichever is greater, shall have the prior written approval of the Governor or his designee. When the cumulative total of change orders exceeds the original contract amount by more than 25% and $50,000, any subsequent change order that increases the contract amount, regardless of the amount, shall have the prior approval of the Governor or his designee. Prior to starting any work, submit the CO-11 and CO-11a to BCOM for approval of the contract change with supporting documentation outlined in Chapter 7.

The Agency justification section of the CO-11a on all change orders shall:

1. include a written statement by the Agency outlining the proposed cost sharing by the responsible design professional when the change results from an error or omission or
2. answer the following questions when the change is generated by a change in agency requirement:
   a. When was the change in agency requirement known?
   b. If before bidding, why were the changes excluded from the bid package?
   c. Why can the work not be packaged and bid separately?
   d. What quantitative impact will the lack of this change have on the service delivery of the Agency?

An informational copy of all CO-11's and CO-11a's approved locally shall be sent to BCOM without the supporting documentation.

8.7.7.2 A/E Change Orders

A/E Contract change orders may be necessary during the course of design and/or construction. Change orders are most commonly necessitated by unforeseen site or building conditions; changes in agency requirements; extra services required by the agency; technology changes occurring since contract award which must be incorporated in certain types of projects; or delays in construction which are not attributable to the A/E. All changes involving the contract amount or performance time shall be included in an approved contract change order G.S. Form E&B CO-11a/e and CO-11a

CO-11a/e / CO-11a: ARCHITECT/ENGINEER CONTRACT CHANGE ORDER / JUSTIFICATION

Purpose: To request and receive approval of a change in the contract time, amount or both.

Submit: For all change orders requiring the prior approval of the Governor or his designee, submit two copies of the CO-11a/e and CO-11a with one copy of the A/E back-up cost material. The CO-11a shall specifically address points identified in Section 8.4.12.

Other Uses: Used to document all changes to the A/E contract and/or MOU.

Special Conditions: None.

Changes involving an increase in the A/E contract price of more than 25% of the original contract amount or $50,000, whichever is greater, shall have the prior written approval of the Governor or his designee. When the cumulative total of change orders exceeds the original contract amount by more than 25% and $50,000, any subsequent change order that increases the contract amount, regardless of the amount, shall have the prior approval of the Governor or his designee. Submit the CO-11a/e and CO-11a to BCOM for approval of the contract change with supporting documentation indicating how the change in contract amount was determined.

The Agency justification section of the CO-11a on all change orders shall:

1. include a written statement by the Agency outlining the proposed cost sharing by the Contractor when the change results from a substitution proposed by the Contractor, or
2. answer the following questions when the change is generated by a change in agency requirement:
   a. When was the change in agency requirement known?
   b. If before bidding, why were the changes excluded from the bid package?
   c. Why can the work not be procured separately?
   d. What quantitative impact will the lack of this change have on the service delivery of the Agency?

8.7.8 Building Occupancy

The Building Official may approve a building or facility being occupied when it is substantially complete. A new building, addition to a building, or a renovated building with a new use group classification shall not be occupied until the State Building Official issues a Certificate of Use and Occupancy, Form CO-13.3. The Agency shall apply to the BCOM for a Certificate of Occupancy by submitting a Form CO-13.3 in BITS and a CO-13.3b Checklist for Beneficial Occupancy with

the required reports and Certificates of Substantial or Final Completion attached. Requests for Partial or Temporary Occupancy shall also include a small scale floor plan with the subject areas for occupancy noted.

The application shall include a CO-13.1 or CO-13.1a (Certificate of Completion or Certificate of Partial/ Substantial Completion by A/E); a CO-13.1b (Final Report of Structural and Special Inspections); a CO-13.2 or CO-13.2a (Certificate of Completion or Certificate of Partial/ Substantial Completion by Contractor); a copy of the Contractor and A/E's punch lists; and a letter or report from the Regional Fire Marshal's Office stating there are no objections to the building being occupied or stating conditions for occupancy of the building; and a CO-13.3b (Checklist for Beneficial Occupancy). If the A/E's construction visits / inspections were limited, also include a CO-13.1c (Certificate…by Construction Inspector …). Projects which have elevators, food service / kitchen facilities, and/or water or waste water treatment facilities are required to be inspected separately and have a certificate of compliance issued by the inspecting entity. Include copies of certificates with the Application for Certificate of Use and Occupancy. The Building Official (Director, Division of Engineering and Buildings) may issue a Certificate of Use and Occupancy when, in his judgment, the building is substantially complete and all life and fire safety elements of the project design are functioning properly.

CO-13.3 Certificate of Use and Occupancy

Purpose: To authorize the use of a building for its intended function. The certificate shall specify the use group, the type of construction, the occupancy load in the building and all parts thereof, the edition of the Uniform Statewide Building Code under which the building was constructed and any stipulations, conditions and modifications.

Submit: Submit Form CO-13.3, Certificate of Use and Occupancy, in BITS with a completed and signed CO-13.1a Certificate of Partial or Substantial Completion by A/E or CO-13.1, Certificate of Completion by A/E; a completed and signed CO-13.2a, Certificate of Partial or Substantial Completion by Contractor, or CO-13.2, Certificate of Completion by Contractor; a CO-13.3b, Checklist for Beneficial Occupancy; and the Fire Marshal's Inspection / Acceptance Report to BCOM at least 5 work days prior to the requested occupancy date.

Other Uses: None.

Special Conditions: Include copies of certificates for elevators, food service / kitchen facilities, and/or water or waste water treatment facilities as may be applicable for the project.

CO-13.3 Application - Temporary or Partial Certificate of Use and Occupancy

Purpose: To authorize the use of a building or portion thereof for its intended function. The certificate shall specify the use group, the type of construction, the occupancy load in the building and all parts thereof, the edition of the Uniform Statewide Building Code under which the building was constructed and any stipulations, conditions and modifications concerning the building's use or occupancy.

Submit: Submit Form CO-13.3, Certificate of Use and Occupancy, in BITS with a completed and signed CO-13.1a Certificate of Partial or Substantial Completion by A/E with current punch list; a completed and signed CO-13.2a, Certificate of Partial or Substantial Completion by Contractor including Contractor's list of incomplete work; a CO-13.3b, Checklist for Beneficial Occupancy; the Fire Marshal's Acceptance

Report; and copies of any applicable specialty certificates; to BCOM at least 5 work days prior to the requested occupancy date.

Other Uses: None.

Special Conditions: Include a small scale floor plan showing areas proposed to be occupied with requests for Temporary or Partial Occupancy.

CO-13.3 IND: Certificate of Use and Occupancy – Industrialized Building

Purpose: To authorize the use of a modular or industrialized building for its intended function. The certificate shall specify the use group, the type of construction, the occupancy load in the building, the edition of the Uniform Statewide Building Code under which the building was constructed, the labels and Virginia Registration Number of the units, and any stipulations, conditions and modifications.

Submit: A completed and signed CO-13.3 IND, Certificate of Use and Occupancy – Industrialized Building with applicable attachments and the Fire Marshal's Inspection / Acceptance Report to BCOM at least 5 work days prior to the requested occupancy date.

Other Uses: None.

Special Conditions: Include a site plan showing the location of this building on the site with distances to adjacent buildings and property lines if not submitted with the CO-17 IND Building Permit – Industrialized Building.

CO-13.3 MAN: Certificate of Use and Occupancy – Manufactured Home

Purpose: To authorize the use of a manufactured home for its intended function. The certificate shall specify the use group, the type of construction, the occupancy load in the building, the edition of the Uniform Statewide Building Code under which the building was constructed, the labels and Virginia Registration Number of the units, and any stipulations, conditions and modifications.

Submit: A completed and signed CO-13.3 MAN, Certificate of Use and Occupancy – Manufactured Home with applicable attachments and the Fire Marshal's Inspection / Acceptance Report to BCOM at least 5 work days prior to the requested occupancy date.

Other Uses: None.

Special Conditions: Include a site plan showing the location of this building on the site with distances to adjacent buildings and property lines if not submitted with the CO-17 MAN Building Permit – Manufactured Home.

CO-13.3 TWR: Certificate of Use and Occupancy – Tower

Purpose: To authorize the use of foundations and tower structure for Communications Tower for its intended function. Required for all towers on state property except those in the VDOT Right-or-Way (over which VDOT has jurisdiction) regardless of whether the towers are for state agency use or for use by lessee.

Submit: A completed and signed CO-13.3 TWR, Certificate of Use and Occupancy – Tower with applicable attachments and the Fire Marshal's Inspection / Acceptance Report to BCOM at least 5 work days prior to the requested occupancy date.

Other Uses: None.

Special Conditions: Communications Towers to be constructed / erected by a private sector entity on land leased from a state agency must have approval of the lease from the Division of Real Estate Services (DRES) before a Building Permit will be issued. See Chapter 4 for guidance for Communications Towers.

8.7.9 Project Close Out

Refer to Section 8.4.15 for information.

NON-CAPITAL CONSTRUCTION CO-FORMS SUMMARY

FORM #	DESCRIPTION	WHEN TO SUBMIT	FORMAT	CPSM CH
Optional	Initiate Project	None to BCOM	Agency discretion	7
CO-2a	Notice to Locality	Initiation of the EIR	Paper to Chief Administrative Officer of the Locality	8
CO-2.3 Optional	A/E Fee Proposal	A/E submits to Agency	Agency discretion	3
CO-3, CO-3.1, CO-3.1a, OR CO-3.2	Owner – A/E Contracts	None to BCOM	Use appropriate CO-form	3
CO-5a	Notice to Locality	Completion of Preliminary Documents	See Chapter 8	8
Transmittal Form	Working Drawings / Construction Documents	With documents	Paper	4
CO-6a	Inspection Statement	With Working Drawings w/CO-6b attached	Paper	5
CO-6b	Special Inspection List	Attached to CO-6a	Paper	5
CO-8 Optional	Approval to Award Contract	Agency discretion	To Agency File	7
CO-9	Owner - Contractor Contract	None to BCOM	To Agency File	7
CO-9b	Post Bid Modification	Attached to CO-9	To Agency File	7
CO-9.1	Notice of Award	No submittal to BCOM	"POST" copy	7

FORM #	DESCRIPTION	WHEN TO SUBMIT	FORMAT	CPSM CH
CO-10	Performance Bond	No submittal to BCOM	To Agency File w/CO-9	7
CO-10.1	Payment Bond	No Submittal to BCOM	To Agency File w/CO-9	7
CO-11	Change Order to Construction Contract	When Change Order requires Governor's approval (2 originals)	Paper w/ CO-11a justification & backup	7, 8
CO-11	Change Order to Construction Contract	When Change Order DOES NOT require Governor's approval	No submittal to BCOM	7, 8
CO-11a	Change Justification	With CO-11	See CO-11	7, 8
CO-11a/e	Change Order to A/E Contract	When Change Order requires Governor's approval (2 originals)	Paper w/ CO-11a justification & backup	3, 8
CO-11a/e	Change Order to A/E Contract	When Change Order DOES NOT require Governor's approval	No submittal to BCOM	3, 8
CO-12	Schedule of Values, Request for Payment	No submittal to BCOM	To Agency File	7
CO-13	Affidavit - Payment of Claims	With Contractor's Final payment request	To Agency File	7
CO-13.1a	A/E Certificate of Substantial Completion	After Substantial Completion Inspection	Paper, pdf or FAX with CO-13.3	7, 8
CO-13.1	A/E Certificate of Completion	After Final Completion Inspection	To Agency File	7, 8
CO-13.1b	Final Report of Structural Inspections	After Substantial Completion Inspection	Paper, pdf or FAX with CO-13.3	7, 8
CO-13.1c	PM or PI Certificate of Substantial Completion	After Substantial Completion inspection	Paper, pdf or FAX with CO-13.3	8
CO-13.2	Contractor Certificate of Completion	After completion of Final Inspection	To Agency File	7
CO-13.2a	Contractor Certificate Substantial Completion	Before Substantial Completion inspection	Paper, pdf or FAX with CO-13.3	7, 8
CO-13.3	Certificate of Use & Occupancy	After Substantial Completion Inspection - Prior to Occupancy	BITS w/ CO-13.1a,CO-13.2a, CO-13.3b & other reports	7, 8

FORM #	DESCRIPTION	WHEN TO SUBMIT	FORMAT	CPSM CH
CO-13.3b	Checklist for Beneficial Occupancy	With CO-13.3	Paper, pdf or FAX	8
CO-13.4	To Close Permit	When completed	BITS	4, 5
CO-13.5	Beneficial Occupancy	After Substantial Completion & Prior to Re-Occupancy	BITS	4
CO-17	Building Permit -	After contract award for Non-capital projects	BITS	8
CO-17.1	Demolition Permit For a Building	After DHR & AARB Approvals, before demolition	Paper to BRPM w/attachments	8
CO-18	Sole Source Procurement Approval	Before Working Drawings	Paper	5

FORMAT explanations

Electronic	=	E-mail or other electronic transmission to a specified electronic address
FAX	=	Paper copies transmitted electronically from one FAX machine to BCOM FAX number OR a 'scanned' document in 'pdf' format sent electronically to BCOM E-mail address
Paper	=	Paper copy or original w/signatures sent by US Postal Service or by courier service
pdf	=	Indicates that 'scanned' document in 'pdf' format sent electronically to BCOM E-mail address may substitute for 'Paper' or FAX copy
BITS	=	Form must be completed and submitted by agency within the BITS application software

8.8 REPORTS

DGS is responsible for coordinating with, and collecting data from, other state agencies to compile two legislatively-mandated reports. These reports are the Capital Outlay Progress Report and the Value Engineering Utilization Report.

8.8.1 Capital Outlay Progress Report

8.8.1.1 Reporting Requirement

Section 4-8.01 of the *2003 Acts of Assembly* requires the Department of General Services to submit an annual report to the Senate Finance and House Appropriations Committees on the status of capital outlay projects. Every Agency having a capital outlay project is required to submit a report listing all active capital outlay projects. Active projects are defined as those for which an approved CO-2 form has been issued. Projects are removed from the report the first reporting cycle following the submittal of the CO-14 form.

8.8.1.2 Reporting Frequency

The report is required to be submitted annually. The Agency's report is due to BCOM by July 30 reporting data thru June 30 of the previous fiscal year.

8.8.1.3 General Instructions

Following are the general reporting instructions:

1. At least three weeks prior to the due date for the report, each agency will be provided via e-mail with an Excel spreadsheet of its portion of the most recent report submitted to the State Legislature.
2. The Agency shall edit this spreadsheet to show additions, deletions or changes in status as of the June 30th as noted above.
3. If a project shows no progress since the last report, an explanation must be given in the remarks column or on an attached sheet. Indicate the reason for lack of progress and what steps are being taken to get the project back on schedule.
4. E-mail the completed report to BCOM at coforms@dgs.virginia.gov by July 30th.

8.8.1.4 Specific Instructions

Following is an explanation of the data required in each column of the report. The data fields below are listed in the order in which they appear on the report.

Project Identification: 3-digit Agency or Sub-Agency Code, plus 5-digit Project Code under which the Appropriation is listed. Add the 3-digit Sub-Project code. Give abbreviated project title.

Biennium: Biennium in which the initial Appropriation was made. For even numbered years, use the double designation such as 2014-2016. For Appropriations made during the odd numbered years or mini-session, use 2015. Subsequent yearly or biennial additions or deletions to the Appropriation will be noted in remarks.

Appropriated Amount: Total of all funds appropriated for the project, including all funds added to or deleted from the project.

Obligated To Date: Value of all expenditures to date of all funds that are obligated by signed contract or purchase order.

CO-2 Approved: Denotes date of approval of the initial CO-2 by the Governor. Dates of revised forms are not required.

Design Percent Complete: Show percentages as follows:

A/E hired (CO-3)……	5%
Design Criteria (Schematics) Approved……	20%
Preliminary Plan & Specifications Approved……	40%
Working Drawings & Specifications Approved……	100%

Interpolate percentages to indicate status between points denoted. If plans are not required to be prepared either by Consultant or In-House personnel, then mark Column 6 as 'N/A'.

Contract Amount: Figure denotes accepted low bid amount, plus or minus increases or decreases as generated by approved change orders. When a Contractor is not utilized (i.e., when the work is performed by owner forces), then use the budgeted amount for construction.

Construction Percent Complete: Show percentages as follows:

Contract Awarded……..	1%
Work Begun……	10%
Estimated Progress-Interpolate……..	Between 10% and 95%
Substantial Completion……..	95%

Estimated Completion Date: As shown on the DGS-30-058 (CO-8) and as revised by change orders or Owner estimate of substantial completion when work is done by owner

forces. Include in the listing the planned or estimated Construction Completion Dates for all Projects under design.

Remarks: Identify any variation to normal procedures in addition to those uses as described in the explanation above; e.g., Project on hold, Contractor walked off site, Project under litigation, etc.

8.8.2 Value Engineering Utilization Report

8.8.2.1 Reporting Requirement

The Director of the Department of General Services is required by the *Code of Virginia* § 2.2-1133 to report to the Governor and the General Assembly on or before September 15 of each year, the following:

- the number and value of the state capital projects where Value Engineering (VE) was employed
- the identity of the capital projects for which a waiver of the requirements of § 2.2-1133, B was granted, including a statement of the compelling reasons for granting the waiver.

8.8.2.2 Reporting Frequency

The report is required to be submitted annually. Individual agency reports are due to BCOM by August 1. This data reported shall encompass the period from July 1 through June 30.

8.8.2.3 General Instructions

At least three weeks prior to the due date for the report, each agency will be provided via e-mail with a data input form to complete.
The Agency shall edit this form to list all VE studies completed during the reporting period. The Agency shall also list all projects which qualified for a VE study, but for which a VE study was not prepared. The reason for not having a VE study prepared shall be provided (i.e., a waiver granted because the project was …)
E-mail the completed report to BCOM at capout@dgs.virginia.gov by the specified due date.

8.8.2.4 Specific Instructions

Refer to the data input form provided for further instructions.

APPENDIX A - DEB ROOFING POLICY & TECHNICAL STANDARDS FOR STATE-OWNED BUILDINGS

A.0 GENERAL

The Appropriations Act requires that all agencies requesting general funds shall assign first priority to the roofs of their facilities. The provisions of this Appendix shall govern the design of low-slope, flexible membrane (built-up and single-ply) roofs. This Appendix also governs the design of metal roofing systems to be used on state-owned buildings.

This Appendix provides criteria and qualifications for selecting full- time Roof Inspectors (Section A.21) and Roof Consultants/Inspection Services Providers (Section A.22). It also provides criteria for non-destructive evaluation (NDE) roofing surveys and criteria for drawings to accompany NDE surveys (Section A.23).

New or reroofing project working drawings and specifications shall be prepared by a licensed Virginia Architect or Engineer. Procurement of these professional services is covered in Chapter 3 of the 2014 Construction and Professional Services Manual.

Assuming roofs are equal in other respects, low-slope roofs that shed water are more desirable than flat roofs that do not; and steep roofs are more desirable than low-slope roofs. Economy, aesthetics, constructability and compatibility are valid considerations in evaluation and design of roof systems.

This Appendix provides not only mandatory provisions but sound advice on improving the survival rate of low-slope roofs.

A/E shall include DGS Form DGS-30-326 “Special Requirements for Low Slope Roofing Membranes” in the front end of the specifications and reference it in the low slope roofing membrane specifications. The A/E is responsible for selection and specification of the roofing membrane.

A.1 ROOFING ABBREVIATIONS

AIA: American Institute of Architects
BUR: Built-up Roofing
BURSI: The Better Understanding of Roofing Systems Institute
CSI: Construction Specifications Institute
CSPE: Chlorosulfonated Polyethylene
EPDM: Ethylene Propylene Diene Monomer
FM: Factory Mutual
FSM: Flexible Sheet Membrane
KEE: Ketone Ethylene Ester
MB: Modified Bitumen
NDE: Non-Destructive Evaluation
NBP: Acrylonitrile Butadiene Polymer
NRCA: National Roofing Contractors Association
NRCA Manual: The NRCA Roofing and Waterproofing Manual (latest edition)
PVC: Polyvinyl Chloride
RCI, Inc.: RCI, Incorporated (formerly Roof Consultants Institute)
RIEI: Roofing Industry Educational Institute (Now part of NRCA)
SPM: Single-ply Membrane
SPRI: Single-ply Roofing Institute
TPO: Thermoplastic Polyolefin
UL: Underwriters Laboratories

A.2 ACCEPTABLE LOW SLOPE ROOFING MEMBRANES

The following types of membrane are acceptable on low-slope roofs for state-owned facilities:

1. EPDM, single-ply, 45 mil minimum thickness; 60 mil preferred.
2. KEE, single-ply, 45 mil min. thickness
3. NBP, single-ply, 45 mil min. thickness
4. PVC, single-ply, ASTM D 4434 Type III and Type IV, 45 mil minimum thickness
5. TPO, single-ply, 60 mil minimum thickness
6. Built-up roofing, applied with hot bitumen, 4-ply minimum.
7. Hybrid 4-ply system (3-ply BUR with reinforced modified bitumen cap sheet)
8. The Director of BCOM will consider the use of membranes other than those listed above only if the Owner requests and the A/E supports, in writing, the use of the alternative system. The request must be received and approved before working drawings are submitted for review and shall provide the following:
    a. The reasons for using other membranes
    b. A description of the system(s) and membrane(s)
    c. A summary of evaluated design criteria (See Section A.16 System Evaluation)
    d. ICC-ES Evaluation Report if system is not listed in the VUSBC
    e. Confirmation from the A/E in writing that the roofing membranes and systems have been investigated and are suitable for use on the proposed project roof(s).
    f. Additional information as requested

A.3 OTHER LOW SLOPE ROOFING MEMBRANES

These include vegetative roofs and plaza decks.

A.3.1 Vegetative Roofs

The roofing membranes shall be as indicated in Section A.2 ACCEPTABLE LOW SLOPE ROOFING MEMBRANES. Design of the vegetative roof shall use FM Data Sheet 1-35 Criteria (Wind load design criteria shall be in accordance with ASCE 7 instead of 1-35 criteria). The 1-35 Criteria Data Sheet is available for download at http://www.roofnav.com and includes information concerning:

1. Non-vegetated border zones
    a. Shall be per FM 1-35 requirements at Perimeters and corners
    b. Shall be a minimum 1.5’ wide at penetrations
    c. Shall be a minimum 3’ wide at machine rooms, penthouses, and walls
    d. Shall be a minimum 3’ wide to partition the roof area, not exceeding 15,625 square feet and 125’ in length
2. Parapet walls.
    a. Shall be a minimum of 6” above ballast or pavers for roofs below 150’ in height.
    b. Shall be a minimum of 30” in height for roofs 150’ or above in height and shall have a 3’ wide non-vegetative zone.
3. Grade level roofs
    a. Shall have special load requirements
    b. Shall have a 3’ vegetation free break

A.3.2 Plaza Decks

Plaza decks, when constructed over occupied spaces, are considered to be roofs and shall use roofing membranes as indicated in Section A.2 ACCEPTABLE LOW SLOPE ROOFING MEMBRANES.

A.4 METAL ROOFING

The following types of metal roofs are acceptable on state-owned facilities:

1. Double lock seam or flat seam terne metal, copper, zinc or stainless steel roofs are acceptable when they comply with the latest editions of SMACNA Architectural Sheet Metal Manual, or

the NCRA Metal Roofing Manual. Copper roofs shall also comply with the latest edition of the Copper & Common Sense Manual.

2. Lapped rib panels with exposed fasteners are acceptable only for utility structures such as sheds or pre-engineered buildings where the manufacturer is responsible for water tightness.
3. Architectural systems installed over a solid deck are acceptable for roof slopes 4:12 or greater, if they use clip-on caps or single lock ribs.
4. Structural systems, which can span between widely spaced purlins, may be used for low-slope roofs and must have machine-locked ribs a minimum of 2" high, with tape or gaskets between ribs.
5. Systems other than those described above must be approved by BCOM for use at the preliminary review stage. A/E shall submit product data on the system used as the basis of design and show that at least 2 other manufacturers make comparable systems. If panels are longer than 10', details and specifications must show where the system is anchored (ridge, center, or eave) and how expansion is accommodated. Gaskets or tape shall be used to make seams watertight. Metal closures shall be provided at ends of ribbed panels.

A.5 ROOF SURVEY FOR REROOFING

Before reroofing a facility or making major repairs, the Owner shall procure a roof survey performed by an experienced and qualified inspection service. See qualifications for a roof consultant/inspection services provider in Section A.22. The roof survey shall use nondestructive evaluation (NDE) moisture detection methods indicated in Section A.23. For roof repairs or replacement where asbestos materials may be present, an asbestos survey shall be performed and the findings reported in writing.

A.5.1 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 request a waiver of the roof condition survey after determining the conditions by visual inspection. 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.

A.6 REROOFING REQUIREMENTS

If complete reroofing is required for over 25% of the roof area in a calendar year:

1. Provide secondary (emergency) roof drains in accord with the requirements for new construction.
2. Provide guarantees for new construction
3. Provide insulation in the roof covering assembly in accord with the requirements for new construction.

A.7 OWNER'S ROOFING INSPECTION

The Owner shall have a full-time inspector on site while the roof is being applied. The inspector may be the project inspector or someone qualified to inspect a roof installation. See qualifications for a roof inspector and roof consultant in Sections A.21 and A.22.

A.7.1 Daily Report

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, A/E, and the owner. The inspector shall not permit installation of roofing materials without having first obtained from the design architect a copy of the approved shop drawings showing the ASTM's or other standards.

A.7.2 Semi-Annual Owner Inspections

The Owner shall inspect the roof(s) semi-annually, as a condition of the roofing guarantee. The Owner shall also inspect the roof(s) before the two-year guarantee expires. See additional requirements later in Appendix A.

A.8 PREBID CONFERENCE

If specified, the roofing 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 by addendum if bid documents need to be changed.

A.9 PREROOFING CONFERENCE

A pre-roofing conference is required and shall be included in the Specifications as part of DGS -30-326 “Special Requirements for Low Slope Roofing Membranes”. The conference shall be held before ordering roofing materials.

1. Representatives of the owner (including the roofing inspector), architect, general contractor, roofing contractor, deck contractor, mechanical contractor, and roofing manufacturer shall attend.
2. Review of plans, specifications, flashing details, work scheduling, and workmanship standards is required. Problems and discrepancies shall be resolved.
3. A written record of proceedings shall be prepared and made part of the job record.

A.10 GUARANTEES

Guarantees and warranties for new construction or reroofing are included in the Specifications as part of DGS -30-326 “Special Requirements for Low Slope Roofing Membranes”. Additional requirements, warranty period length, or BCOM approved waivers/exceptions may be specified by the A/E in the roofing specifications. Identify the DGS Form section being modified in the roofing specification.

A.10.1 Roofing Contractor’s Guarantee

Provide the following roofing contractor’s guarantee on the General Contractor Guarantee form:

“*The roofing contractor shall guarantee 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 final completion of the entire project. 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 in accordance with the roofing contractor’s limited guarantee.****”***

A.10.2 Owner’s Agreement

Provide the following Owners Agreement on the Contractor Guarantee form:

“*The undersigned named Owner for the Commonwealth, agrees, from the date of final completion of the entire project, to maintain the roof in accordance with the manufacturer’s written requirements and also agrees to avoid damage to the roof surface by any parties under his control working or walking on the roof. The Owner recognizes his responsibility to inspect the roof semiannually.****”***

A.10.3 Contractor’s Guarantee for New Construction

The (General) Contractor shall furnish, as a minimum, a manufacturer’s 20-year total system material and labor warranty / guarantee with no monetary limitations (NDL no dollar limit) from the date of Final Completion of the entire project. The contractor shall provide a workmanship warranty agreeing 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 completion of the entire project. Sheet metal flashing incidental to the roofing shall be covered under the manufacturer’s warranty. Exception: Roofs less than 5,000 SF in area and roofs on utility or unoccupied structures shall have a minimum 10-year total system warranty.

A.10.4 Contractor's Guarantee for Reroofing

The (General) Contractor shall furnish, as a minimum, a manufacturer's 20-year total system material and labor warranty / guarantee with no monetary limitations (NDL no dollar limit). The contractor shall provide a workmanship warranty agreeing 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. Sheet metal flashing incidental to the roofing shall be covered under the manufacturer's warranty.

Exception: Roofs less than 5,000 SF in area and roofs on utility or unoccupied structures shall have a minimum 10-year total system warranty.

A.11 PROCUREMENT OF ROOFING CONSULTANTS

If the Agency does not wish to procure roofing consultants under a separate contract, the Division of Engineering and Buildings has developed contracts for roofing project inspectors and roofing consultants offering testing services. Agencies can locate this information on the DEB website.
The specific contract is: "Non-Professional Construction Related Services."

A.12 ROOFING CONFERENCES

A pre-bid conference is not required but is strongly recommended for reroofing or roofing repair projects. A pre-roofing conference is required and shall be specified.

A.13 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 NCRA Manual conflicts with provisions of this document, or
2. The A/E obtains approval from BCOM to use different details and provisions.

A.14 BIDDING ROOFING SYSTEMS

Specifications shall include bids for only one type of roofing system. For the purpose of bidding KEE, NPB, PVC and TPO shall be considered one roofing system. Single ply and multi ply roofing systems shall not be bid as alternates.

A.15 MATERIALS CERTIFICATION

1. Materials Certifications shall be included in the Specifications as part of DGS -30-326 "Special Requirements for Low Slope Roofing Membranes" that the materials shall be labeled with ASTM certification numbers or other specified product certifications or 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.
2. The owner's full-time roof inspector shall verify the materials received are as specified and in accordance with A/E approved shop drawings before roofing materials may be installed.

A.16 SYSTEM EVALUATION

The A/E responsible for roofing design shall evaluate and specify the roofing system(s) for:

1. Fire resistance rating
2. Wind uplift resistance (including roof system and sheet metal flashing components)
3. Warranty
4. Tear resistance
5. Attachment
6. Resistance to harmful local chemicals
7. Membrane compatibility with insulation
8. Type of membrane seams and joints

A.17 SINGLE-PLY MEMBRANE (SPM) SPECIFICATIONS

1. Specify SPM completely with latest listed ASTM and performance criteria.

2. SPM, if specified with either manufacturer or brand-name products, shall be specified with three manufacturers and three equivalent products.
3. The single-ply membrane manufacturer's representative shall check installation procedures at start-up and inspect the completed membrane installation..

A.18 BUILT-UP ROOFING (BUR) MEMBRANE SPECIFICATIONS

1. Specify BUR and each BUR system component with latest available ASTM standards.
2. Specify, minimally, a built-up four-ply hot bitumen system.
3. Hybrid four ply systems shall have a reinforced Modified Bitumen cap sheet at least 120 mils thick with a mineral granule surface applied with hot asphalt over a three ply (minimum) hot bitumen system.
4. If manufacturers are specified, specify three different manufacturers and three systems.
5. Specify equiviscous temperature (EVT) range for bitumen application.

A.19 GENERAL REQUIREMENTS

The following requirements are generally applicable to all low-slope roofs. Contractor specific requirements for the items listed below are included in the Specifications as part of DGS -30-326 "Special Requirements for Low Slope Roofing Membranes". Additional requirements or BCOM approved waivers/exceptions may be specified by the A/E in the roofing specifications. Identify the DGS Form section being modified in the roofing specification.

A19.1 Roof Slope

1. 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 Owner may request authority to use a lesser slope from the Director of BCOM.
3. Dead level valleys are unacceptable. Roof Cricket Valleys shall slope a minimum of 1/8" per foot unless impractical. In such case a waiver may be requested by the Agency to allow a slope of 1/16" per foot.

A.19.2 Wind Uplift

Roof assemblies shall be designed to resist the uplift loads as calculated using the current VUSBC edition of ASCE 7 for field, perimeter and corner conditions. Low slope membrane roofs, except gutters, shall be designed and installed for wind resistance in accordance with ANSI/SPRI ES-1. For additional information on wind design see the following:

1. Factory Mutual (FM) P7825
2. Factory Mutual (FM) Technical Advisory Bulletin 1-29.
3. Factory Mutual (FM) Loss Prevention Data Sheets 1-7 and 1-28S
4. Single-Ply Roofing Institute (SPRI) SPRI RP-4 Wind Design Guide

A.19.3 Insulation

Unless otherwise required to comply with a Manufacturers roofing system or by BCOM approved waiver, insulation shall be as follows, except as noted:

1. C or R (per inch) factor
2. 2 layers, if thickness permits
3. Staggered joints
4. Roof insulation securement shall be specified in the roofing specifications. Mechanically fasten the first layer to metal deck. Cold applied adhesives and/or low rise foam products are acceptable for the attachment of the first layer to concrete decks, and for attachment of the individual insulation layers to each other contingent upon meeting FM I-90 wind uplift rating and the specified roofing material manufacturer's warranty.
5. Compatible Insulation: The A/E shall assure the Owner that the specified type of insulation has been investigated and is entirely compatible with contiguous, specified roofing materials.

A.19.4 Rooftop Equipment

1. Avoid if possible.

2. Comply with NRCA Manual recommendations including minimum height of equipment above the roof membrane when equipment is supported above the roof surface..
3. Design clearances and details for easy re-roofing.
4. Provide prefabricated walks to and around equipment that requires servicing; walks must not block roof drainage.

A.19.5 Approved Applicator

The roofing and base flashing applicator shall be approved by the materials manufacturer.

A.19.6 Roof Protection

1. Before moving equipment or materials over a roof, the Owner, General Contractor, roofing contractor, and any of their agents must protect the roof from damage during and following roofing work.
2. Movement of equipment and materials without roof protection shall be cause for the Owner, General Contractor, roofing contractor or A/E to stop work until protection is provided and any damage is corrected.
3. The Owner's roofing inspector shall record all such violations.

A.19.7 Pre-Final Inspection Survey

Unless the Owner requests in writing a waiver of the survey for justifiable reasons and the Director of the BCOM approves the waiver, comply with the following survey provisions:

1. The A/E shall notify the Owner, 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 Owner shall engage the services of an experienced, independent roof survey inspection service or laboratory to survey the roof(s). The service shall use infrared, nuclear moisture detection, or electronic leak detection methods. Roof probes or cuts shall not void the Contractor’s two year guarantee and the manufacturer’s 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 BCOM no later than ten days before the substantial completion inspection. Also, copies of all survey reports shall be delivered to the Owner, A/E, Contractor, and roofing contractor.
5. The Owner shall pay for the service unless the survey shows roofing deficiencies caused by improper materials, poor workmanship, or Contractor negligence. In that case 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.. Insulation or roofing materials determined in the roof survey to have detrimental amounts of moisture by the Consultant and any materials covering the insulation shall be replaced by the Contractor at no cost to the Owner.
7. In any case where the roofing survey reports insulation that has lost more than 20% of its dry thermal resistance (R-value) the (wet) insulation and any materials covering the insulation shall be replaced by the Contractor at no cost to the Owner.

A.19.8 Final Inspection

The following items must be given to the Owner's representative at the Final Inspection:

1. A copy of the (general) contractor’s and roofing contractor’s two-year guarantee.
2. A copy of the roofing manufacturer’s standard warranty/guarantee.

3. The Contractor shall assist the A/E in preparing the appropriate 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 DGS Forms Webpage and complete all applicable items.

A.19.8.1 One Year Inspection
Representatives of the Owner (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.

A.19.8.2 Two Year Inspection
The Owner 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 Owner shall require that any defects be corrected at least 30 days prior to expiration of the guarantee.

A.20 METAL ROOFING POLICY

These provisions shall govern the design of all metal roofs (low slope or steep slope). See Section A.4 for Metal Roofing Systems.

A.20.1 Document prepared by A/E, Metal Roofing

New or reroofing project working drawings and specifications shall be prepared by an architect or engineer appropriately registered by the DPOR, Commonwealth of Virginia.

A.20.2 Roofing Conferences, Metal Roofing

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.

A.20.3 Guarantees, Metal Roofing

Specify guarantees and warranties for new construction or reroofing in the Special Conditions or General Requirements as follows:

A.20.3.1 Roofing Contractor's Guarantee, Metal Roofing

Provide the following roofing contractor's guarantee on the General Contractor Guarantee:
The roofing contractor shall guarantee 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 final completion of the entire project. 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 in accordance with the roofing contractor's limited guarantee.

A.20.3.2 Owner's Agreement, Metal Roofing

Provide the following Owners Agreement on the Contractor Guarantee:
The undersigned named Owner for the Commonwealth, agrees, from the date of final completion of the entire project, to maintain the roof in accordance with the manufacturer's written requirements and agrees to avoid damage to the roof surface by any parties under his control working or walking on the roof. The Owner recognizes his responsibility to inspect the roof semi-annually.

A.20.3.3 Contractor's & Manufacturer's Guarantee for New Construction and Reroofing, Metal Roofing

The (General) Contractor shall furnish as a minimum, for all pre-engineered buildings and other standing seam roofing systems on buildings for uses other than utility or storage, a manufacturer's twenty (20) year non-prorated watertightness warranty / guarantee from the

date of final completion of the entire project. A manufacturer's twenty (20) year finish warranty against fading, chalking and film integrity is recommended when an applied finish is specified. The contractor shall provide a workmanship warranty agreeing 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 completion of the entire project*.

A.20.3.4 Wind Uplift, Metal Roofing

A wind uplift performance rating equivalent to UL Class 90 (U.L. Test 580) is recommended on all buildings for uses other than utility or storage. The roofing system shall meet the wind loads required by the VUSBC Chapter 16.

A.20.4 NRCA Roofing and Waterproofing Manual, Metal Roofing

Comply with additional recommendations of manufacturer and NRCA Handbook.

A.20.5 Approved Applicator, Metal Roofing

Specify that the roofing applicator shall be approved by the materials manufacturer.

A.20.6 Roof Protection, Metal Roofing

All specifications must state that before moving equipment or materials over a roof, the Owner, 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 Owner, General Contractor, roofing contractor or A/E to stop work until protection is provided and any damage is corrected.

A.20.7 Final Inspection, Metal Roofing

The following items must be given to the Owner's representative at the final inspection:

1. A copy of the (general) contractor's and roofing contractor's two-year guarantee.
2. A copy of the roofing manufacturer's warranty/guarantee.
3. Copies of the History of Roofing Installation, Sample Form A; and Roof Information Worksheet– Sheet Metal Roofing, Sample Form C. The A/E shall obtain forms from the Owner and complete all applicable items.

A.20.8 Warranty Inspections, Metal Roofing

1. Representatives of the Owner (and the A/E), the Contractor, the roofing subcontractor, and the roofing manufacturer shall inspect the roof(s) between nine months and one year before the closing of the General Contractors one year guarantee.
2. The Owner 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 Owner shall require that any defects be corrected at least 30 days prior to expiration of the guarantee.

A.21 THE ROOF INSPECTOR

The minimum qualifications below serve as criteria for Owners who must select an outside, full-time roofing inspector.

1. The Inspector should have a thorough knowledge of roofing details, flashing, and systems employing single-ply, built-up, metal, shingle, slate, or other membranes as the main weatherproof barrier.
2. The Inspector shall have attended roofing related education in formal schools or seminars sponsored by agencies such as AIA; BURSI; RCI, Inc.; CSI; NRCA; or roofing manufactures' training courses and shall obtain a minimum of twelve continuing education units annually in such courses, or shall have a current Registered Roof Observer Registration from RCI, Inc. Inspectors with other training must submit qualifications and be approved by BCOM in advance.
3. The Inspector shall be thoroughly familiar with the latest edition of the NRCA Roofing and Waterproofing Manual and specialized manuals prepared by NRCA.

4. The Inspector shall have a minimum of five years of full-time, practical roofing experience or approved equivalent experience.
5. The Inspector shall 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.
6. The Inspector shall be trained and competent in the services he is providing
7. Roof Inspector's Scope of Work:
    a. The Inspector shall monitor the work for compliance with the contract documents
    b. The Inspector shall continuously monitor and observe the work at the point of application during installation of the roof.
    c. The Inspector shall immediately report any deficiencies or deviations to the Architect and Owner. A written report shall follow an oral report within two business days.
    d. The Inspector may recommend suspension of work or rejection of non-complying work to the A/E and Owner.
    e. The Inspector shall not:
        i. Authorize deviations from the contract documents.
        ii. Enter the area of responsibility of the Contractor's superintendent.
        iii. Issue orders on any aspect of construction means, methods, techniques, sequences, procedures, or safety in connection with the work.
    f. The Inspector shall:
        i. Keep a daily log for each project.
        ii. Provide a copy of the log to the roofing contractor, the A/E, and the Owner. (Refer to the Daily Log form provided in the DGS Forms Center as Form DGS-30-352.)
        iii. 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.

A.22 THE ROOF CONSULTANT / INSPECTION SERVICES PROVIDER

The Consultant should have the following qualifications:

1. Roof consulting and testing services should be the Consultant's full-time occupation.
2. The Consultant shall have a minimum of five years of field experience in providing the service
3. The Consultant shall have completed at least three service contracts in the recent past. Work for each of the completed contracts should be roughly equivalent in size and complexity to the proposed work.
4. The Consultant shall be required to submit three complete surveys of roofs that were repaired, recovered or replaced. The survey shall include names, addresses and telephone numbers of roof owners and Architects or Engineers responsible for preparing the drawings and specifications.
5. The Consultant shall have attended roofing related education in formal schools or seminars sponsored by agencies such as AIA; BURSI; RCI, Inc.; CSI; NRCA; or roofing manufactures' training courses and shall obtain a minimum of twelve continuing education units annually, or shall have a current Registered Roof Consultant Registration from RCI, Inc. Consultants with other training must submit qualifications and be approved by BCOM in advance.
6. The Consultant should be trained, experienced, and competent in performing required services.
7. If testing is required, The Consultant shall be appropriately trained, certified, and licensed in the testing procedures (infrared, nuclear, electronic leak detection, core sampling, ASTM procedures, gravimetric analysis; and so forth) required for the service.
8. The Consultant should submit documented experience of the firm and resumes of all participating employees.
9. The Consultant's resume should describe other related services and contributions, such as writing, lecturing, and serving as an expert witness. The Consultant should list a professional qualifications or licenses.
10. The completed resume form must be submitted with the roof Consultant's response to the Owner's request for proposal. It will be used with other required items to evaluate the applicant.

A.23 NON-DESTRUCTIVE (NDE) ROOFING SURVEYS

A non-destructive (NDE) Survey uses infrared, nuclear, impedance moisture, electronic field vector mapping or electronic leak detection to locate unacceptable moisture within a roofing system. 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:

1. Equipment, subject to the Owner's approval, shall be equal to the following:
   a. Infrared: A camera designed for the intended application and capable of taking thermograms. Instrument sensitivity shall permit recognition of areas of wet insulation as small as 6 inches on a side.
   b. Nuclear: A nuclear hydrogen detection (NHD) meter used for the measurements of reflected neutrons that can be linked to the presence of water in the roofing system
   c. Impedance Moisture Survey: Scanner designed to detect and evaluate non-destructively comparative moisture conditions within roofing and waterproofing.
   d. Electronic Field Vector Mapping (EFVM) or Electronic Leak Detection: Generator and receiver designed for the intended membrane leak detection used for roofing and waterproofing.

2. Operators of equipment shall be certified in the equipment used and licensed as required for by the survey protocol.

3. Surveys
   a. Infrared: Provide a complete survey of the roof or roofs. Outline all anomalies on the roof. Provide a thermogram showing the outlines and daylight photographs of all anomalies. Survey inspection procedures, reports, etc. shall be conducted in accordance with the requirements and procedures in ASTM C1153, "Standard Practice for Location of Wet Insulation in Roofing Systems Using Infrared Imaging," except as otherwise noted in this Appendix.
   b. Nuclear: Provide a grid, comprising 5' x 5' 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 area of anomalies. Survey inspection procedure, reports, etc. shall be conducted in accordance with the requirements and procedures of ANSI/SPRI/RCI NT-1, "Detection and Location of Latent Moisture in Building Systems by Nuclear Radioisotopic Thermalization" except as otherwise noted in this Appendix.
   c. Impedance Moisture Survey: Provide a complete survey of all roof or waterproofing areas. Mark, number, and photograph all anomalies on the membrane surface. After field testing is complete submit a report with all anomalies located on a roof plan. Photographs of each anomaly shall be included in the report. Mapping shall be done in accordance with standard practices over the entire roof surface. Survey inspection procedures, reports, etc. shall be conducted in accordance with the requirements and procedures of ASTM D7954, "Practice for Moisture Surveying of Roofing and Waterproofing Systems using Non-destructive, Electrical Impedance Scan" except as otherwise noted in this Appendix.
   d. Special Surveys using electrical conductance measurement methods to locate leaks in roofing systems - Electronic Leak Detection or Electronic Field Vector Mapping (EFVM): This system may be used on roof areas where full time roof inspector has noted that there is no detrimental moisture observed in the roof system during the daily observations. Provide a complete survey of roof or waterproofing areas as directed. Mark, number, and photograph all anomalies on the membrane surface. After field testing is complete submit a report with all anomalies located on a roof plan. Photographs of each anomaly shall be included in the report. Survey inspection procedures, reports, etc. shall be conducted in accordance with the requirements and procedures of ASTM D7877 "Standard Guide for Electronic Leak Detection methods for Detecting and Locating Leaks in Waterproof Membranes" except as otherwise noted in this Appendix. Roof cores shall be taken at all leaks to determine the extent of damage by the leak if roof insulation is below the roof membrane and above the deck. Roof cores may be omitted if the roof inspector is to be present to observe the roof contractor's

repair of the roof leak by opening roof and removing wet insulation. Wet insulation is determined in the field by the roof inspector. Fees for the roof inspector and retesting shall be paid by the contractor by change order to the contract. Note: for Electronic Leak Detection test the roof area on an area by area basis not to exceed 5,000 SF. Readings taken with the receiver shall be done on a 24" x 24" grid pattern.

4. 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 (See Exception below for roofs with no anomalies). The samples shall be taken as follows:
   a. One is required on roofs showing no anomalies.
   b. On all other roofs a minimum of one dry and one wet core shall be taken from each roof surveyed where anomalies are present. 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 Owner.
   c. As many cores as needed should be taken to verify non-destructive testing data results, but no more than five cores shall be taken from any roof area except as noted in the test protocol.
   d. Exception: If no anomalies are shown by the survey equipment and the owner's full time roof inspector was present on the site during all roofing applications and had not noted any roofing applications where moisture was present in the form of rain, dew, mist or entrapped moisture the requirement for a minimum of one roof core into a newly installed assembly may be waived by the owner.

5. Gravimetric Analysis
   As soon as possible after samples are taken, core should be sealed in air tight containers and taken to a laboratory for analysis.
   a. Analyze samples gravimetrically per ASTM D1864 to determine percent of moisture in any required core sample taken from new roofs and, unless waived for justifiable reasons, from existing roofs.
   b. Identify all materials - surfacing, membrane (and number of plies), insulation, vapor barriers, adhesives, etc. - in the cores.

6. 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.

7. Report
   The Consultant shall submit a written report explaining the problems.
   a. Reports for existing roofs 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 estimate for correcting the defects and anomalies.
   b. Reports for new roofs where a design professional is providing construction administration services 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.

8. Drawings

The Consultant shall prepare drawings that include the following as a minimum:

a. Plans shall show all roofs surveyed.
b. State identification, title, date, and use of the building.
c. Name, address and phone number of agency representative.
d. Make, model and serial number of equipment used.
e. Name of operator and data analyst.
f. The survey technique used.
g. Condition of the roof surface at the time of the survey.
h. Date, time and weather conditions at the time of the survey.
i. Description of the roofing and waterproofing assembly.
j. Provide an orientation north arrow and drawing scale
k. Indicate the area of each roof and approximate overall dimensions
l. Indicate 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, and identified..
m. Show and explain all roofing defects and anomalies.
n. Delineate, for an infrared survey, moisture anomalies with contour lines; for a nuclear survey, show all grid point readings and define areas having unacceptable moisture by contour lines. Indicate 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 identify-able features (such as parapets).
o. Provide at least one detail section 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.
p. A statement shall be made of the basis for the unacceptable moisture content levels established for each material present. See survey protocols.
q. Other information as required or listed in the survey protocol.

APPENDIX B (RESERVED)

APPENDIX C - EARLY RELEASE CODE AND BUDGET COMPLIANCE SUMMARY

Projects using the CM at Risk or Design/Build construction delivery methods may be granted permission to start construction before the complete building design has been finished. Partial building permits may be issued to the Agency for early release packages such as grading, site utilities, and foundations. The Agency shall request permission from the Director of BCOM to release early packages for specific work packages. As a part of that request, the Agency shall demonstrate both code and budget conformance for the project (See Form DGS-30-299 on the Forms Center).

C.1 CODE COMPLIANCE DOCUMENTS

C.1.1 Code Compliance Drawings

Code Compliance Drawings are based on CPSM Chapter 5 requirements for preliminary phase submittals, but there are differences in the two types of submittals due, in part, to the type of procurement. See the description below for the minimum acceptable requirements.

Title Sheet and Building Code Data

Agency name
Project name
Project code number
Index of drawings
Applicable building code (Part I or II, and which edition) including referenced documents.
Applicable handicapped accessibility standards.
Design occupant loads in accord with VUSBC for each room and space.
Building (use) groups –separated or non-separated.
Building construction type.
Building height and area;
Number of stories.
Tabulation of number of units (bedrooms, sleeping units, fixed assembly seats, parking spaces including handicapped accessible units by type.)
Tabulation of the minimum required number of plumbing fixtures, itemized by use group and gender.
Type of fire suppression system.
Type of fire alarm system.
Type of smoke control or smoke removal system.
State if building is a designated “Emergency Shelter.”
Seismic design category.

Code Compliance Summary Plans

Provide one summary plan for each floor.

Summary Floor Plans

1. North arrow and drawing scale (min. 1/8” scale preferred for floor plans.)
2. Identify the use of all spaces with names & numbers.
3. Show the VUSBC number of occupants to be accommodated in each room and space, and provide a total number of occupants for each use group. State the calculation method used to determine the number of persons for each room or space. The higher number by calculation or actual shall be used.
4. Graphically distinguish demolition from existing and new construction.
5. Show locations and rating of all fire walls, fire barriers, fire partitions, smoke barriers, smoke partitions and structural elements, including extent of horizontal assemblies.
6. Identify the extent of all fire-rated floor/ceiling and roof/ceiling assemblies.

7. Show locations of all portable fire extinguisher cabinets.
8. Show the location of the water flow test.
9. Identify all required exits.
10. Show locations of fire command center, fire pump room, and generator as applicable.
11. Provide listed design assemblies (UL or other approved testing entity) for all major structural elements requiring fire resistance ratings such as columns, beams, roofs, and floors.
12. Path and length of travel for means of egress from the most remote points in the structure.
13. Capacity of all means of egress elements.
14. Indicate the accessible paths of travel to the public way.
15. Show the handicapped accessible route from parking to the building.

Existing Buildings – Compliance Alternatives

Where change of occupancy is intended for an existing building, full compliance with ONE of the following is required:
VUSBC, Part 1 – New Construction Code, Chapters 2-33;
or VUSBC, Part 1 – Chapter 34, *Compliance Alternatives;*
or VUSBC Part 2 – Rehabilitation Code, referencing the International Existing Building Code.

Demolition Plans

Interior demolition:

1. Provide information on work to be removed;
2. Note results of asbestos survey; and
3. Note results of lead survey.

Total building demolition:

1. Provide a floor plan showing building size;
2. Describe existing material /construction to be removed;
3. Show an elevation (drawn or photographic) of building;
4. Note results of asbestos survey; and
5. Note results of lead survey.

Architectural Plans

1. Plans of each floor at 1/8" = 1'-0" minimum.
2. Show north arrow and scale.
3. Overall building dimensions.
4. Room or space names and numbers.
5. If the work is an addition, show the relationship of new to existing spaces.
6. Graphically distinguish new from existing construction.
7. Indicate all openings, entrances, delivery areas.
8. Identify the construction materials or systems for floors and walls.
9. Dimensions as needed to demonstrate handicapped accessibility.

Roof Plan

1. Roof material; roof slope; location of roof drainage – including primary and secondary drainage
2. Locations of rooftop equipment
3. Significant penetrations and structures
4. Roof access

Exterior Elevations

1. Scale 1/8”=1’-0” minimum
2. Proposed materials for the foundations; walls and roofs
3. Finished floor elevations and floor-to-floor dimensions

4. Overall building height dimensions from finished grade at face of building wall

Transverse and Longitudinal Building Sections

1. Scale 1/16”=1’-0” minimum
2. Finished floor elevations; overall & floor-to-floor dimensions
3. Indicate ceilings in relation to floors.
4. Method and extent of insulating exterior envelope.
5. Identify the continuity of the fire resistive construction – horizontally and vertically, including the hourly rating of supporting structure to the ground.

Civil Plans

1. Provide North arrow and scale.
2. New and existing contours affected by work.
3. Floor and contour elevations – new and existing.
4. Applicable boundaries with survey computations.
5. Dimensioned relationship of new work to boundaries and existing structures.
6. Location of test borings.
7. General parking and handicap parking.
8. Handicapped-accessible and pedestrian traffic routes.
9. Demolitions: Indicate all demolition impacted by the project.
10. 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.
11. Site improvements such as fencing and lighting.
12. Typical paving section for proposed types and thicknesses.
13. Identify and show special earthwork recommended and construction considerations noted in geotechnical report.
14. Show all trees & other landscaping features that may affect underground utilities.
15. Locate the fire department connection and hydrants.
16. Locate proposed stormwater management features.
17. Locate site retaining walls.

Structural Drawings

1. Show occupancy category, live loads, snow loads, wind loads, and seismic criteria used for structural design
2. Show design bearing capacity (soil bearing, pile capacity, caisson capacity) for foundation system
3. Foundation plan indicating type & tentative sizes.
4. Provide north arrow and scale: 1/8”=1’-0” minimum.
5. Foundation details of improved bearing strata and other special requirements.
6. Floor framing plans of each level indicating type of system and tentative member sizes/depths and column spacing.
7. Roof framing plan.
8. Typical sections of framing, identifying materials, thicknesses, depths.
9. Typical section of floor system
10. Details of connections to existing buildings.
11. Identify elements of proposed lateral force resisting system.

Fire Detection and Alarm Systems – Floor Plans

Show the locations of, and identify, the following:

a. Fire alarm system alarm initiating and notification appliances.
b. Fire alarm control and trouble signaling equipment.
a. Existing alarm system alarm initiating and notification appliances.
b. Existing alarm control and trouble signaling equipment.

Fire Suppression Systems – Drawings

1. Identify the occupancy hazard classifications and show the locations of sprinklers for the most hydraulically demanding zones within the building for each fire sprinkler system.
2. Show the location of fire department valves and risers within the building, including connections to standpipe risers, combined standpipe and sprinkler riser, or wet pipe sprinkler system risers.
3. Show proposed sprinkler piping and standpipe layout including the main sprinkler lines.
4. Show layout of branch lines for the most hydraulically demanding zones within the building for each system, and size the pipes.
5. Show the locations of water hydrants, test and flow hydrants for water flow tests, and location of underground pipe.
6. Indicate the water flow tests results, the date and time taken and responsible party.
7. Show the water supply flow and pressure at a reference point common with the sprinkler and standpipe design.
8. Clean agent: Identify the rooms to be protected by this system; show the enclosure partitions of the protected area.
9. Clean agent: Identify the locations of the major components of the system; show the general routing of lines from the stored agent and spaces to be protected.
10. Clean agent: Provide a riser diagram defining the clean agent storage tanks, accessories, automatic detection system, alarm devices, manual means of releasing the agent, controlling devices, other pertinent information.
11. Show and clearly identify all existing fire suppression systems.

Sprayed–on Fire Proofing

1. Show the proposed UL design assemblies specific to the building structural elements.

Fire Pumps

1. Show the location of the fire pump, pressure maintenance pump and pump controllers.
2. Show and identify the sprinkler systems and standpipe systems in the vicinity of the fire pumps.
3. Locate the fire department connections and piping to the pump.
4. Locate the fire pump test header and interconnecting piping.
5. Show the location of the system electrical components.

Mechanical (HVAC) Drawings

1. North arrow and drawing scale: 1/8” scale minimum for Floor Plans.
2. Show equipment layout, ventilation, condensate disposal.
3. Show routes of duct and exhaust systems.
4. Identify combustion air.
5. Show appliance vents.
6. Show locations of fire and smoke dampers.
7. Indicate locations and tentative sizes of fans, pumps, compressors, conveyors, etc.
8. Description of required smoke control systems, including airflow schematic and sequence of operations.
9. Special equipment: Identify pressure vessels, refrigeration equipment. Show piping layouts.
10. Schematic layout and elevation of equipment room and central system, showing configuration, tie-ins and relevant details.
11. Central heating or cooling plant: show distribution piping and equipment.

Plumbing Drawings

1. North arrow and drawing scale: 1/8” scale minimum for Floor Plans.

2. Show fixture locations, types and a tentative schedule.
3. Show routing of main supply and distribution lines, with tentative sizes. Include drainage and venting.
4. Locate water, sanitary sewer, storm sewer and sprinkler services into the building.
5. Show location, sizes and types of hot water heaters, heat exchangers, storage tanks, flues.
6. Show gas piping layout and connected load.
7. Special requirements: Locate special plumbing wastes, traps and interceptors, medical gases.

Electrical Drawings

1. Power and lighting plans may be combined for this submittal if document clearly conveys the required information.
2. Include north arrow and drawing scale: 1/8" scale minimum for floor plans.
3. Lighting plans for each floor showing approximate fixture location, type, and lighting level required in each room or space, in footcandles.
4. Power distribution plans showing location of incoming service, generators, and panelboards. Include generator annunciator panel, smoke control system panel as applicable
5. Exit signs and means of egress lighting, interior and exterior.
6. One line riser diagram for the electric service equipment and major distribution components.

C.1.2 Code Compliance Narrative:

Describe the functions to be housed in the building and the applicable VUSBC use group classifications.

Provide analysis of the Virginia Uniform Statewide Building Code (VUSBC) and referenced standards requirements of all occupancies in the building.

Determine occupancy classifications and compute occupant load, number of exits and other requirements.

Calculate the minimum number of plumbing fixtures of each type required, based on the VUSBC occupancy load. Itemize by use group and gender.

Describe unusual or critical code requirements and describe how such requirements will be met.

State the VUSBC construction type. Describe construction systems and materials proposed to achieve the construction type and fire resistance rating.

Compute gross floor area in accord with CPSM Chapter 4. Show calculations used to derive the building efficiency ratio.

State the types of thermal insulation proposed, where the insulation is required, and the U or R value for the various portions of the structure.

Describe the design features proposed to make the facility accessible to and usable by physically handicapped persons, conforming to the applicable accessibility standard.

C.1.2.1 Asbestos, Lead-Based Paint and Hazardous Materials:

The A/E shall include a statement addressing the presence of, or potential presence of, asbestos, lead-based paint, and other hazardous materials on the project. Indicate if the

Agency has secured hazardous materials investigation of the project for renovation projects. See CPSM Chapter 4 for appropriate statement to be included.

C.1.2.2 Structural:

Describe foundation conditions; type of foundation proposed; maximum allowable bearing capacity for the foundations, and the method by which the allowable bearing values are to be determined.

Indicate type of construction adopted; list of materials selected with design strengths and ASTM, AISC, ACI or other standards to be specified.

Describe special features and considerations that affect the design and may not be evident on the drawings.

List structural floor and roof systems proposed; length, spacing and size of principal members.

Describe the proposed Lateral Force Resisting System.

List live loading data, including floor loads, wind, snow, earthquake; as required by the building code.

C.1.2.3 Civil:

Describe the utilities available at the site.

Characterize existing vegetation, bodies or water, topography and soil conditions; existing site improvements and their disposition, including pedestrian and vehicular access, roads, sidewalks, parking.

Indicate proposed site improvements; contours, bodies of water, landscaping.

Describe existing water supply and sewer lines: existing conditions; type of new construction and materials.

Identify the standards governing the design.

Describe the impact of steam condensate and cooling water discharge on existing sewer lines & treatment plants; include estimated cost of distribution and treatment of the additional loading.

Pavement: state general soil conditions; indicate CBR valve and pavement recommendations, and the criteria on which the recommendations are based.

Dust and erosion control: list the type of treatment selected and the affected areas. Stormwater management: describe the measures to be taken to comply with Stormwater Management Regulations.

C.1.2.4 Plumbing:

Describe systems to be utilized on each part of the project.

Plumbing fixtures: based on the minimum number of fixtures required, as calculated above, estimate the number of fixture units and water demand in GPM for all plumbing fixtures; describe the types and quality of fixtures.

Estimate the maximum and minimum water pressure at each building and indicate if booster pumping will be required.

Domestic water heater and distribution system: types, size and design temperature; indicate if heat recovery will be used.

Specify materials for each piping system.

C.1.2.5 Heating, Ventilation And Air Conditioning:

Design Conditions: Describe the indoor and outdoor design conditions to be used in the design of the systems for this project. Energy sources for heating and cooling systems shall comply with the International Energy Conservation Code.

Heating:

- Describe the source of heat energy to be used, and explain why this source was selected instead of other available sources. Describe the type and routing of the proposed system to convey the heat source.
- State if a condensate return system is to be utilized; if condensate is to be wasted, heat reclaim shall be studied. Indicate maximum hourly production of condensate.
- Describe the type of heating medium and system; describe the HVAC control system.

Ventilation:

- Indicate the quantity of outside air per person in all areas, and the type of filtration.
- State if smoke removal or smoke control systems are to be employed.

Air Conditioning:

- Provide a description and schematics of the air conditioning system. Indicate locations of major components of the system.
- Define the areas to be air conditioned.

Briefly describe the controls for each system and the intended sequence of operation.

Briefly describe testing and balancing requirements that will be specified.

C.1.2.6 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 project. 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.

C.1.2.7 Special Mechanical Systems:

Describe any special mechanical systems, for example, compressed air, hydraulic and nitrogen, including the source of the medium.

C.1.2.8 Central Heating Plants And Heating Plant Additions:

Describe new boilers, including rating, flow, temperature, pressure and type.

Describe control systems.

Describe any new auxiliaries to be added and the source of power for their operation.

C.1.2.9 Refrigeration (Cold Storage):

Identify refrigerated areas, their uses and the temperatures to be maintained.

Describe the type of refrigeration equipment and systems.

Include preliminary cooling profile, equipment and tank sizes.

C.1.2.10 Thermal Storage:

Describe the type (static or dynamic) of storage proposed.
Provide preliminary cooling profile, equipment and tank sizes.

C.1.2.11 Fire Suppression Systems:

Describe the types of automatic sprinkler and gaseous extinguishing systems proposed, and note the locations to be protected.

Identify the Occupancy Hazard Classifications within the building for each fire sprinkler system, based on the VUSBC, NFPA 13 and the user's programmatic requirements.

Provide a table summarizing the characteristics of each of the sprinkler systems to be provided. List types of systems, areas of coverage, hazard. For each area: list the minimum rate of water coverage; water required; hose stream allowances; total water requirements; hydraulically calculated pressure requirements at a common reference point at design flow; and water supply (flow & pressure) available at the common reference point.

Document the water supply available at the 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.

Describe the fire pump operating parameters, components and their operation.

Provide preliminary hydraulic calculations to show that the most hydraulically demanding zones of the fire sprinkler systems will be code compliant using the automatic water supply (water supply plus fire pump.)

Where the height of the structure is beyond the capacity of fire department apparatus, provide hydraulic calculations to show that the performance of the standpipe system, as connected to the automatic water supply (water supply plus fire pump), will be code compliant.

Clean agent system: Identify the types of systems to be used. Provide a preliminary sequence of operations (step-by-step description) for the alarm, notification, control and release of the system. Define the Acceptance Testing requirements.

Clean agent system: Provide preliminary calculations to define the enclosure volume and quantity of agent required.

C.1.2.12 Fire Alarm Systems:

Describe fire detection and alarm systems including location of detectors, manual stations, audible devices, control panels and other components.

Indicate the type and adequacy of signal and fire alarm systems, including spare capacity on fire alarm circuit.

The importance of early resolution of fire protection requirements cannot be overemphasized.

C.1.2.13 Electrical Systems:

Interior distribution systems:

Electrical characteristics: phase, voltage, number of conductors in main distribution circuits.

Provide a breakdown in tabular form of the estimated connected load to show: lighting loads; convenience outlet loads; power load for building equipment such as heating and air conditioning: loading for special operating equipment.

List type of wiring system and where they will be used. NEC prohibits embedding aluminum conduit in concrete without approved supplementary corrosion protection. Design shall ensure that conduit, pipe, bars, anchors or other aluminum parts are not embedded in concrete unless protected.

Describe type of conductors and where they will be used.

Include a statement describing proposed pertinent standards of design, such as voltage drop (include calculations); lighting intensities (include calculations); type of lighting fixtures; use of selective switching or other energy conserving features.

Determination of short-circuit duty required for all service entrance protective devices and switchgear.

Interface provision for multi-use systems, such as telephone, intercom, data. Agency is responsible for design and procurement of telephone and data systems.

Outside distribution systems:

Contact utility companies for location and characteristics of nearest service facility capable of meeting project supply requirements. If primary supply at the point of take-off is inadequate for the project, state the measures proposed to correct the deficiency.

State the electrical characteristics of power supply to the site, including circuit interrupting requirements and voltage regulation.

Estimate the total connected load and resulting kilowatt demand load.

State the basis for selection of primary and secondary distribution voltage.

List the type of conductors, and locations for use.

C.1.2.14 Security And Entry Control Systems:

State security requirements.

Describe access control equipment and intrusion detection systems. Outline when and where the systems will be required; note the locations, functions and areas of control.

C.2 PROJECT BUDGET ANALYSIS:

The Agency shall provide a clear summary of the anticipated project cost and how it conforms to the project budget. This summary shall be based upon the latest available project documents and shall include both anticipated construction costs and soft costs. The intent of this summary is to demonstrate that the project is in conformance with the overall project budget and addresses all potential costs related to the project.

C.2.1 PROJECT COST SUMMARY:

The Agency shall submit a completed Building Cost Summary worksheet(s) to BCOM (Form DGS-30-224) along with an updated CR-2 (Form DGS-30-198) indicating all of the anticipated soft costs for the project.

C.2.2 PROJECT BUDGET MAINTENANCE PLAN:

The Agency shall submit a plan for addressing any potential cost increases that may occur during the finalization of the Guaranteed Maximum Price (GMP) for the full project. The Agency shall demonstrate the ability to address at least a 5% overrun at full GMP. The BCOM Director may require this minimum amount to be higher depending upon the particular project and any uncertainty due to unresolved questions. This plan may contain value engineering options, identification of supplemental funding (from Agency sources), or increased contingency amounts.

APPENDIX D - BASIS OF DESIGN NARRATIVES

INTRODUCTION

The Basis of Design and Code Compliance Summaries are narrative descriptions of the project submitted as a bound presentation of facts sufficiently complete in accord with the following format to expedite BCOM review of the appropriate submittals.

General computations supporting system selection; member depth; floor-to-floor heights; mechanical and electrical loads are expected with the Schematic Basis of Design Narrative. Design computations, sizing of members or conductors, details of connections, for example, are expected to accompany the Preliminary Basis of Design or Code Compliance Summary narrative submittals.

D.0 OVERVIEW

The Schematic Basis of Design narrative presents the basic information, criteria, logic, evaluations and considerations developed in each category to prepare the Schematic submittal. See Section D.1.

The Preliminary Basis of Design Narrative reflects the further analyses, evaluations and decisions made to arrive at a more advanced stage of design. See Section D.2.

The Code Compliance Summary & Calculations requirements are similar to the Preliminary Basis of Design Narrative requirements, but include differences due to the application of alternate delivery methods for facility construction. See Section D.3.

D.1 SCHEMATIC BASIS OF DESIGN INFORMATION

The Schematic submittal shall include a Basis of Design Narrative which, as a minimum, provides the following information in narrative or tabular format:

1. Capacity and type of occupancy
2. Functions to be housed in the building
3. Proposed building location on the site and how this project is located in relation to other nearby facilities
4. Indicate the type of construction proposed: fire resistive, protected or unprotected noncombustible, etc. and VUSBC Type #
5. Outline description of basic materials
6. Future construction or expansion to be accommodated, if any
7. Style and character of building desired
8. Structural Design Live Loads, Wind Loads, and Seismic Criteria used
9. Type of foundation system selected
10. General description of any proposed Fire Suppression Systems (Clean Agent).
11. Provide a general description of any proposed fire sprinkler systems.
12. Identify applicable NFPA Standard (cited by the VUSBC) which provides the minimum requirements for the design, installation, testing, inspection, approval, operation, and maintenance of the proposed fire sprinkler or fire suppression system.- Provide an indication of the water supply to the proposed building and whether or not a fire pump will be required. (Calculations to support this position are desirable at this phase but are not required.)
13. A description of the types of HVAC systems being evaluated, estimated heating and cooling loads, fuels evaluated and fuel selected to be used
14. Total square foot area per floor and per building
15. Total cubic foot volume
16. Number of beds, seats or parking spaces, where applicable
17. Total estimated construction cost based on the schematic documents
18. Total proposed project budget

D.2 PRELIMINARY BASIS OF DESIGN INFORMATION – STANDARD DESIGN-BID BUILD CONSTRUCTION

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. (DPB Form S-1 or equivalent)
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 design 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. Describe construction systems/materials proposed to achieve the construction type/fire resistance rating.
d) Computation of gross floor area in accordance with Form DGS-30-219, Area Calculation Worksheet guidance and of the 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 **5** 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) Describe materials for all major items of construction and all interior and exterior finishes. The description of finishes 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 Agency'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 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) Where high-density file storage systems are proposed, provide data to demonstrate acceptable loading capacity.
k) 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?
l) Design features to make facilities accessible to and usable by the physically handicapped. If not incorporated, appropriate reasons/justification shall be given.
m) 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.

n) Describe special construction features incorporated into the facility such as barred windows, special wall/roof construction, etc.

o) 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 submitted to BCOM 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.

i) Where high density file storage systems are proposed, provide data to demonstrate acceptable structural loading capacity.

j) Details using horizontal HSS tubes as beams: Do not recommend using HSS Tubes as horizontal beams where they are required to be fire rated. There is no UL Listing for this condition. HSS tubes used as columns and X-bracing can be UL Listed.

k) Helical piers: if the engineer wishes to use helical piers, a recommendation must be made by the soils engineer in the soils report or supplemental report for the correct design.

Plumbing:

a) Describe system to be utilized on each part of the project.

b) Determination/calculation of number of each type of fixture based on approved 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.

f) Also, a statement as to whether heat recovery is contemplated for domestic water heating.

g) Design temperature of domestic hot water distribution system and extent of recirculation system within building.

h) Indicate materials to be used for each piping system.

i) 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. 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, interconnecting 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.

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.

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) When the Owner has an Energy Management System, the preliminary submittal shall be prepared to conform to the requirements and procedures in Chapter 6.

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 4, 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 State 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) Provide a description of the Fire Pump Components and the Sequence of Operation specific to this project.
    4) Approximate water demand for sprinkler system.
e) 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, nonmetallic sheathed cable, etc., and where proposed to use. NEC prohibits embedding aluminum conduit in concrete unless protected. Design shall sure that conduit, pipe, bars, anchors or other aluminum parts are not embedded in concrete unless protected.
    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 (usually available from power company). Include cost premiums in cost estimate.
    7) Type and arrangement of Cable Television Systems (CATV), Closed Circuit Television Systems (CCTV), Nurse Call, inter-com, sound, signal, and fire alarm systems. Identify number and location of telecommunication outlets (telephone, computer, word processing, etc.). Obtain information from the using activity.
        a. 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.
        b. 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 Owner.

8) Indicate interior lighting on lighting plans.

b) Outside distribution systems:
   1) Contact the Utility Companies for location and characteristics of nearest service facility capable of meeting project supply requirement and cost-of-service information for economic analysis.
   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, if a group of loads is involved.
   5) Basis for selection of primary and/or secondary distribution voltage.
   6) Type of conductors, such as copper or aluminum, and where proposed to be used.
   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: Owner 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:
Sensitive compartmented information facilities.
Conventional arms, ammunition, and explosives storage sites (AA & E).
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 (EMCS):

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 authorization is required for tie in. See Chapter 6 for additional information.
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)
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.

Roads, Driveways, Parking Areas and Walks:

a) State general soil conditions, with a brief outline of soil exploration and testing performed.
b) Indicate CBR valve and pavement recommendations. (Show typical paving section on the drawings.)
c) 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

The Building Systems & Equipment Checklist form is available for download from the DGS Forms Center. On the Forms Center, search for Form "DGS-30-232" to download the current copy of this form. The form is available in Adobe pdf format. (The data may be typed in the form or printed and completed manually.)

APPENDIX E - COST ESTIMATE REQUIREMENTS AND FORMAT

E.1 GENERAL

All estimates shall be prepared in the **systems format** and shall be summarized on a **Building Cost Summary** form. The Building Cost Summary form utilizes ASTM Uniformat II cost breakdown structure in ASTM Uniformat II Classification Standard which has been extracted, with permission, from ASTM E1557-09 Standard Classification for Building Elements and Related Sitework-UNIFORMAT II, copyright ASTM International, 100 Barr Harbor Drive, West Conshohocken, PA 19428. A copy of the complete standard may be obtained from ASTM International, www.astm.org.. 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. **A printed copy of the Building Cost Summary form and the associated supporting estimate backup shall be provided with each submission. Unless waived by the Director of the Bureau of Capital Outlay Management, the Agency shall require their design and cost consultants to submit an electronic copy of each completed Building Cost Summary form.** The electronic copy of the form (i.e., spreadsheet) may be submitted to BCOM either on removable electronic media, or as an e-mail attachment.

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. 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 budgets, to develop historical data for future estimates, and for verification of the Contractor's initial Schedule of Values (CO-12).

The estimate at each submittal is expected to reflect the A/E's or Agency's Independent Estimator's best information and experience. Pricing must reflect all requirements of the contract plans and specifications. Estimate backup may be prepared manually or by utilizing computerized estimating programs, however, the estimate must be summarized using the Building Cost Summary spreadsheet. A detailed breakdown of the components of each system or assembly shall be calculated, quantified and cost-estimated. The 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 summarized on the Building Cost Summary spreadsheet.

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. Refer to the notes on page 1 of the Building Cost Summary form.

When the estimates exceed the approved or proposed construction budgets, the agency, in consultation with their design and cost consultants, shall describe how they will address this issue.

E.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 practical, the key assumptions made while developing the estimate must be described.

E.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 between the **A/E cost estimate** and the **Independent cost estimate** is **10% or greater,** the Agency shall provide a **reconciliation** of the two consultant's estimates.

E.4 FINAL/WORKING DRAWINGS PHASE ESTIMATE

The A/E shall provide a final estimate based on the working drawings and specifications and shall be prepared using the systems format. A full and accurate description of each system shall be provided in the estimate. Quotations shall 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.

E.5 SUMMARY OF ESTIMATE SUBMISSION REQUIREMENTS

Design Phase	A/E Estimate	Owner's Independent Estimate
Schematic Phase	Required*	Optional (at owner's discretion)
Preliminary Phase	Required*	Required*
Working Drawing Phase	Required*	Optional (at owner's discretion)

* The following are required:

- Submit a hard copy of the Building Cost Summary sheet(s) and supporting estimate backup to BCOM
- Submit an electronic version of the completed Building Cost Summary worksheet(s) to BCOM (the Excel worksheet template, "Form DGS-30-224" is available for download from the DGS Forms Center)

E.6 COST ESTIMATING STANDARD SYSTEMS DESCRIPTIONS

Building Systems Descriptions

ASTM Uniformat II Classification Standard:

Extracted, with permission, from ASTM E1557-09 Standard Classification for Building Elements and Related Sitework-UNIFORMAT II, copyright ASTM International, 100 Barr Harbor Drive, West Conshohocken, PA 19428. A copy of the complete standard may be obtained from ASTM International, www.astm.org.

Level I	Level II	Level III
A Substructure	A10 Foundations	A1010 Standard Foundations
		A1020 Special Foundations
		A1030 Slab on Grade
	A20 Basement Construction	A2010 Basement Excavation
		A2020 Basement Walls
B Shell	B10 Superstructure	B1010 Floor Construction
		B1020 Roof Construction
	B20 Exterior Enclosure	B2010 Exterior Walls
		B2020 Exterior Windows
		B2030 Exterior Doors
	B30 Roofing	B3010 Roof Coverings
		B3020 Roof Openings
C Interiors	C10 Interior Construction	C1010 Partitions
		C1020 Interior Doors
		C1030 Fittings
	C20 Stairs	C2010 Stair Construction
		C2020 Stair Finishes
	C30 Interior Finishes	C3010 Wall Finishes
		C3020 Floor Finishes
		C3030 Ceiling Finishes
D Services	D10 Conveying	D1010 Elevators & Lifts
		D1020 Escalators & Moving Walks
		D1090 Other Conveying Systems
	D20 Plumbing	D2010 Plumbing Fixtures
		D2020 Domestic Water Distribution
		D2030 Sanitary Waste
		D2040 Rain Water Drainage
		D2090 Other Plumbing Systems
	D30 HVAC	D3010 Energy Supply
		D3020 Heat Generating Systems
		D3030 Cooling Generating Systems
		D3040 Distribution Systems
		D3050 Terminal & Package Units
		D3060 Controls & Instrumentation
		D3070 System Testing & Balancing
		D3090 Other HVAC Systems & Equipment
	D40 Fire Protection	D4010 Sprinklers
		D4020 Standpipes
		D4030 Fire Protection Specialties
		D4090 Other Fire Protection Systems
	D50 Electrical	D5010 Electrical Service & Distribution
		D5020 Lighting and Branch Wiring
		D5030 Communications & Security
		D5090 Other Electrical Systems

E Equipment & Furnishings	E10 Equipment	E1010 Commercial Equipment
		E1020 Institutional Equipment
		E1030 Vehicular Equipment
		E1090 Other Equipment
	E20 Furnishings	E2010 Fixed Furnishings
		E2020 Movable Furnishings
F Special Construction & Demolition	F10 Special Construction	F1010 Special Structures
		F1020 Integrated Construction
		F1030 Special Construction Systems
		F1040 Special Facilities
		F1050 Special Controls and Instrumentation
	F20 Selective Building Demolition	F2010 Building Elements Demolition
		F2020 Hazardous Components Abatement
G Sitework & Utilities	G10 Site Preparation	G1010 Site Clearing
		G1020 Site Demolition and Relocations
		G1030 Site Earthwork
		G1040 Hazardous Waste Removal
	G20 Site Improvements	G2010 Roadways
		G2020 Parking Lots
		G2030 Pedestrian Paving
		G2040 Site Development
		G2050 Landscaping
	G30 Site Mechanical Utilities	G3010 Water Supply
		G3020 Sanitary Sewer
		G3030 Storm Sewer
		G3040 Heating Distribution
		G3050 Cooling Distribution
		G3060 Fuel Distribution
		G3090 Other Site Mechanical Utilities
	G40 Site Electrical Utilities	G4010 Electrical Distribution
		G4020 Site Lighting
		G4030 Site Communications & Security
		G4090 Other Site Electrical Utilities
	G90 Other Site Construction	G9010 Services and Pedestrian Tunnels
		G9090 Other Site Systems & Equipment
Z Gen'l. Cond. / OH&P	Z Gen'l. Cond. / OH&P	Z0000 General Conditions / Gen'l Requirements, OH & P

The last entry above is not part of the referenced ASTM Uniformat II classification standard.

Design Contingency:
Estimates are expected to include design contingency not exceeding the percentages shown below:

ESTIMATE CATEGORY	%
Pre-planning	15%
Schematic	10%
Preliminary	5%
Construction Documents	0%

Construction Contingency:
The amount of contingency will depend upon the project size, procurement method, and whether the project is renovation work. Construction contingency is automatically calculated in form DGS-30-198 (Cost Review Questionnaire CR-2).

Building Cost Summary Sheet

Standard DGS forms and formats are available for download from the DGS Forms Center.

To view/download the latest version of the Building Cost Summary Sheet (Form "DGS-30-224"), visit the website listed above and enter "DGS-30-224" 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 F - CHECKLIST FOR OPENING BIDS

F.1 PROCEDURES FOR RECEIVING BIDS

The Agency shall assure that the person receiving bids, called the Bid Officer, is thoroughly trained / knowledgeable in the proper procedure for receiving and documenting 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 that the clock visible to bidders in the bid receipt area shows the correct time.

(2) When bids or modifications are delivered to the bid receiving office, the bids shall be date stamped and the time noted or stamped on the envelope showing the time of receipt.

(3) The bid receipt deadline must strictly comply with the specific time called for in the Invitation for Bids. It is suggested that the Bid Officer give a warning that the Bid Receipt Deadline is near such as **"The time is now 1:55 pm and all bids must be received by 2:00 pm."**

The Bid Officer shall be responsible for deciding when the Bid Receipt Deadline has arrived and shall announce **"The 2:00 pm deadline has arrived. All bids and bid modifications in our possession at this time are deemed to be timely. No further bids or bid modifications will be accepted."**

(4) When multiple bids are delivered just prior to the bid receipt deadline, the Bid Officer shall accept the bids up to the deadline without taking time to note the time on each bid. After announcing that the deadline has arrived, the Bid Officer or assistant should note on those bids which were timely but not stamped that the bids were received prior to the 2:00 pm deadline.

(5) If a bidder wishes to change the amount of his bid, such change must be received by telegram, Facsimile, letter or written on the outside of the bid envelope before the time set for receipt of bids. Methods for modifying the bid 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.

F.2 PROCEDURES FOR OPENING BIDS

(1) Once the Agency Bid Opening Designee determines that the bid opening hour has arrived**, which shall be at least 24 hours after the receipt of bids and as indicated in the Invitation for Bids, a statement should be made as to the number of bids received.** It is prudent to inquire whether any bidder has any question about the pending opening. After receiving either a negative reply or after answering questions, proceed to open the bids in alphabetical order. **Do not open work papers!**

(2) Paragraph 4 of the Instructions to Bidders requires the Contractor to place its Contractor License Class and License Number on the envelope and on the bid documents. Para. 4(c) of the CO-7a gives instructions for action if not shown.

(3) Prior to revealing any of the information in the bid, the Bid Opening Designee must verify that
- 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 allow 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.

F.3 AFTER BID OPENING IS COMPLETE

(1) Keep all bids, work papers, etc. until **2 hours** after bid opening to allow the Bidders to state he made a mistake. **Do not open Work Papers unless low bidder claims an error!**

(2) After two hours, return all Bid Bonds, checks, etc., to all but 3-lowest bidders. Work papers can be returned to all.

(3) Keep bids and bid bonds or checks from 3-lowest bidders until Contract is signed.

(4) Contact Department of Professional and Occupational Regulation, Contractor's Section, and verify Contractor Class and Registration No. of the 3 lowest bidders (and listed subcontractors, if any).

(5) 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 (or 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 Agency Bid Opening Designee.

APPENDIX G (RESERVED)

APPENDIX H - GUIDELINES FOR NON-CAPITAL OUTLAY BUILDING PROJECTS

H.1 GENERAL

In general, the procedures for **non-capital outlay projects** are the same as those for Capital Outlay Projects **with the exception of the requirement to submit Forms CO-2, CO-4, CO-5 and CO-6** to BCOM/DEB for approval. All building construction, additions and renovations must have a Building Permit as described in the Building Permit Policy included in Appendix P. Some work may be permitted by the agency under the Annual Permit Program for those agencies which have received such a permit. The plans and specifications for all other building construction and additions and those renovations which affect the (Use) Group Classification, the type of construction, means of egress, or other "life safety" features must be submitted to the Building Official for review and a Form CO-17, Building Permit shall be submitted in BITS after the contract is awarded. The technical requirements and the procedures for procurement of construction (both Capital Outlay and Non-Capital Outlay) are covered by the **Commonwealth of Virginia Construction and Professional Services Manual for Architects & Engineers** and the **companion Commonwealth of Virginia Construction and Professional Services Manual for State Agencies**.

H.2 ARCHITECT/ENGINEER

- The A/E is responsible for having copies of the **Commonwealth of Virginia Construction and Professional Services Manual for Architects & Engineers (the A/E Manual**), the VUSBC, and the referenced codes and standards.

- Procedures for solicitation, selecting and contracting with the A/E described in Chapter 3 of the **Manual** should be followed by the Agency.

- Form CO-3, CO-3.1 or CO-3.2 should be used for the contract along with a Memorandum of Understanding (MOU) defining the A/E's specific scope of work, schedule, etc.

H.3 CODES AND STANDARDS

- Technical standards in Chapter 4 of the Manual are applicable to the design of all state projects.

- The VUSBC applies to the project.

- Accessibility Standards cited in Chapter 4, Section 4.2, also apply to state projects.

- The standards and guidance in Chapter 5 of the Manual should be followed in the preparation of the plans and specifications; especially Section 5.2 (Drawing Standards), Section 5.3 (Specification Standards), and the Sections describing the content of drawings.

- The GENERAL CONDITIONS OF CONSTRUCTION CONTRACT, Form CO-7 and the INSTRUCTIONS TO BIDDERS, Form CO-7a, shall be used for building projects, whether new, renovations or additions.

- For consistency in working with "Building Contractors" on state building projects, the following CO Forms shall be used for execution of the construction contract:

CO-9	Contract Between Owner and Contractor
CO-9.1	Notice of Award
CO-9.2	Notice to Proceed
CO-10	Commonwealth of Virginia Standard Performance Bond

CO-10.1 Commonwealth of Virginia Standard Labor and Material Payment Bond
CO-11 Contract Change Order
CO-12 Schedule of Values and Certificate for Payment
CO-13 Affidavit of Payment of Claims
CO-13.1a Certificate of Substantial Completion by Architect/Engineer
CO-13.2a Certificate of Substantial Completion by Contractor

H.4 PROCEDURES PRIOR TO BEGINNING CONSTRUCTION

Once plans and specifications have been completed, the Agency shall obtain a Building Permit from the Building Official (thru BCOM) or from the Agency Designee for those projects /work which can be performed under the Annual Permit where applicable.

For those projects which must be submitted to the Building Official for review, submit five (5) sets of Project Plans and Specifications to BCOM for review. (It is suggested that this submittal be made to BCOM prior to bidding so that any deficiencies noted can be corrected prior to receipt of bids.). After the contract has been awarded, submit (in BITS) an electronic copy of Form CO-17, BUILDING PERMIT.

- If the project is for renovation of existing facilities, also send one copy of the Project Plans and Specifications to the Regional Fire Marshal's office for review and comment.

- BCOM will review plans and specifications for compliance with the applicable Building Code, Standards, and Technical Requirements of the Manual. Assuming conformance with these requirements, a signed/approved building permit along with any comments and/or stipulations will be sent to the agency. If significant deficiencies are found or if the plans and specifications (or sketches and scope of work) are deemed insufficient to require code conforming work, a Permit will be denied and a resubmittal of corrected documents will be required.

- Agency shall send one copy of final plans and specifications and any addenda to the Regional Fire Marshal's office.

- Agency shall send copies of documents for approval to other review agencies such as Division of Soil & Water Conservation, State Water Control Board, etc., if required by the scope of the project.

H.5 PROCEDURES PRIOR TO OCCUPANCY

Agency's Project Representative shall assure that all inspections and tests are performed to assure that the work performed conforms to the requirements of the applicable codes and standards and that the building is safe and ready for occupancy.

- Have Contractor complete Form CO-13.2 or 13.2a.

- Have Architect (or Agency Project Manager/Inspector) complete a Form CO-13.1 or 13.1a, a Form CO-13.3, Certificate of Use and Occupancy, and a Form CO-13.3b, Checklist for Beneficial Occupancy.

- If new building, addition to or renovations of existing building, have Regional Fire Marshal inspect and provide report recommending acceptance for occupancy.

- On new buildings, on building additions, or on renovations that involve a change in (Use) Group Classification, the Agency submit above documents to BCOM. BCOM will review and prepare CO-13.3, Certificate of Use and Occupancy, for signature and send signed Certificate to Agency.

APPENDIX I – LIFE CYCLE COSTS AND ENERGY ANALYSIS

I.1 Parameters for Calculation of Life Cycle Costs and Energy Analyses

I.1.1 General Instructions For All Life Cycle Cost 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., indicate how the various costs were calculated and note the basis or source of the cost data.)

I.1.2 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/Cooling 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 in the Manual or other criteria as approved by BCOM.
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 the various fuel/energy rates (i.e., $s/gallon, $s/KWH, etc.) and the data source for each.

I.1.3 Specific Instructions For Completing Worksheets

a. Use a new Worksheet for each alternative.
b. Complete all general information at the top of the Worksheet.
c. Fill in Columns "a" thru "f" for each year. Use escalated costs. On the Worksheet, specify the annual escalation rate used for each cost category. In the supporting documentation, identify the source/basis for the chosen escalation rates.
d. Sum Columns "a" thru "e" for each year; subtract Salvage Value (Column "f") and place results in Column "g".
e. Multiply the Column " g " figures by the corresponding discount factor in Column "h" and place results in Column "i".
f. Sum Column "i" and place results in the box at the bottom of the Worksheet.

I.1.4 Building Life Cycle Cost Summary Worksheet

Standard DGS forms and formats are available for download from the DGS Forms Center.

To view/download the latest version of the Building Life Cycle Cost Summary (Form "DGS-30-228"), visit the website listed above and enter "DGS-30-228" 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 – MISCELLANEOUS POLICIES AND MEMORANDA IMPACTING DESIGN AND CONSTRUCTION

J.1 Executive Memorandum 2-97

"Floodplain Management Program for State Agencies"

J.2 April, 1998 Joint DCR/ DHCD Memorandum "Historic Properties and the USBC"

COMMONWEALTH of VIRGINIA

Department of Historic Resources

James S. Gilmore, III
Governor

John Paul Woodley, Jr.
Secretary of Natural Resources

2801 Kensington Avenue, Richmond, Virginia 23221

H. Alexander Wise, Jr
Director

Tel: (804) 367-2323
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Memorandum

April 2, 1998

Historic Properties and the USBC

Questions have been raised regarding the application of the Virginia Uniform Statewide Building Code (USBC) to historic buildings particularly as it relates to accessibility. This guidance is intended to help clarify the application of the USBC to historic buildings.

Section 3406.0 of the BOCA National Building Code, which is incorporated as part of the USBC, allows special provisions for historic buildings and reads:

> The provisions of this code relating to the construction, repair, alteration, addition, restoration and movement of structures shall not be mandatory for existing buildings or structures identified and classified by the federal, state or local government authority as historic buildings, when such buildings are judged by the code official as safe and in the interest of the public health, safety, and welfare regarding any proposed construction, alteration, repair, addition and relocation.

Simply stated, when a property is listed on or eligible for the Virginia Landmarks Register or is designated a contributing building to a state, county, or city district, the building need not strictly comply with the USBC. The local code official determines the extent of the exemption from USBC requirements.

Because most historic buildings are not exempt from providing accessibility under the Americans with Disabilities Act (ADA) requirements, the ADA should be followed in planning alterations to historic buildings. The ADA offers alternative requirements for properties that cannot be made accessible without "threatening or destroying the historic significance of the property" (4.1.7 of ADAAG). Owners of such properties should contact the Department of Historic Resources (the State Historic Preservation Office) to determine if the special accessibility provisions for historic properties apply. When special provisions are warranted, this office will document justification for the allowance.

Questions pertaining to these issues should be directed to William Mills Crosby of the Department of Historic Resources or the local city, county or town USBC code official. Staff of the Division of Building and Fire Regulation at the Department of Housing and Community development are also available for technical assistance.

H. Alexander Wise, Jr., Director
Department of Historic Resources

Warren C. Smith, Director
Department of Housing and Community Development

Petersburg Office
10 Courthouse Avenue
Petersburg, VA 23803
Tel: (804) 863-1620
Fax: (804) 863-1627

Portsmouth Office
612 Court Street, 3rd Floor
Portsmouth, VA 23704
Tel: (804) 396-6707
Fax: (804) 396-6712

Roanoke Office
1030 Penmar Avenue, SE
Roanoke, VA 24013
Tel: (540) 857-7585
Fax: (540) 857-7588

Winchester Office
107 N. Kent Street, Suite 203
Winchester, VA 22601
Tel: (540) 722-3427
Fax: (540) 722-7595

APPENDIX K - CONSTRUCTION CHANGE ORDER PROCEDURE GUIDELINES

K.1 OVERVIEW

The Agency should require that the Contractor and A/E use the following procedures in the development of change orders to any construction project which uses the Commonwealth of Virginia General Conditions of the Construction Contract. The procedures are based on requirements of the Commonwealth of Virginia Construction and Professional Services Manual and 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 scope, cost, or time for completion must be documented with a Contract Change Order (D.G.S. Form CO-11). Procedures outlined herein will generally begin once a change in the work is identified by the Owner, A/E, or Contractor.

K.2 PROCEDURE

In order to ensure compliance with Paragraph 38 of the General Conditions, the following Change Order procedures are recommended:

1.

A. Where the Owner 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 Owner 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 Owner 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 Owner 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 Owner 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 Owner. To facilitate analysis by the Owner 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.

3. When a mutually agreed price has been determined, the A/E shall make his written recommendation to the Owner 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 owner by the A/E unless the Owner was an active participant in the price negotiations.

4. If the Change Order proposal is acceptable, the Owner shall have a Change Order prepared.

5. The A/E shall prepare the Change Order form (Form CO-11) and the Change Order Justification (CO-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. The A/E will forward Form CO-11 to the Contractor for signature.

6. The Contractor will forward the signed Form CO-11 to the Owner. All backup material must be provided with each copy of the change order.

IMPORTANT: NO CHANGE ORDER WILL BE APPROVED IF THE LABOR, MATERIAL, AND EQUIPMENT ARE NOT ITEMIZED ON THE BREAKDOWN SHEETS (GC 1, SC 1, and SS 1).

7. Change Order approval authorities are described in Chapter 7 of the Construction and Professional Services Manual and Section 38 of the General Conditions.

8. No work on any change order shall be accomplished without the approval of the Owner and, if applicable, the Director, Department of General Services. Any work accomplished prior to the receipt of the fully executed change order is done at the Contractors risk and will be removed at Contractor expense should the change order not be approved. No payment for work covered by a change order shall be invoiced or paid until the fully executed change order has been received.

9. The Owner will distribute approved Change Orders to the A/E and Contractor.

K.3 CONSTRUCTION CHANGE ORDER FORMS

Standard DGS forms and formats are available for download from the DGS Forms Center.

The following Construction Change Order forms are available for download from the Forms Center:

Form Number	Description	File Type
DGS-30-092	CO-11, Change Order (Construction)	Excel
DGS-30-096	CO-11a, Change Order Justification (incl'd w/ CO-11)	Excel
DGS-30-200	GC-1, Change Order Estimate (General Contractor's)	Excel
DGS-30-204	SC-1, Change Order Estimate (Subcontractor's)	Excel
DGS-30-208	SS-1, Change Order Estimate (Sub-subcontractor's)	Excel

To view/download the latest version of these forms, visit the website listed above and enter the Form Number 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 L – MEMORANDUM OF AGREEMENT BETWEEN BCOM AND SFMO

Memorandum of Agreement
Between
Division of Engineering and Buildings
And
State Fire Marshal's Office

July 1, 2008

Introduction

The Code of Virginia (COV) §36-98.1 designates the Department of General Services acting through the Division of Engineering and Buildings (DEB) as the Building Official for state-owned buildings. The Bureau of Capital Outlay Management (BCOM) acts on behalf of DEB as the State Building Official. The State Building Official enforces the *Virginia Uniform Statewide Building Code* (VUSBC). BCOM enforces, in accord with Code of Virginia (COV) §2.2-1132, the *Construction and Professional Services Manual, Building Permit Policy for Construction State Owned Buildings & Structures*, and, in accord with COV §2.2-1159, provisions of the *Americans with Disabilities Accessibility Guidelines for Buildings and Facilities*. DEB has the authority to delegate inspection and building code enforcement duties to the State Fire Marshal's Office (SFMO). This agreement identifies the responsibilities of DEB, SFMO, and owning Agency Representatives; and defines the scope of inspection and building code enforcement duties delegated by DEB to the SFMO for construction, additions, alterations, and renovations of state-owned buildings.

Responsibilities

Plans review is performed by DEB, or by the Annual Permit Agency Representative, in accord with the Building Permit Policy. Fire protection system shop drawing review (sprinkler, fire suppression, fire alarm, and fire detection) is performed by DEB at the Working Drawing review or during construction. A Building Permit (by DEB) or a Project Permit (by the Agency Representative) is issued for work. Inspection is performed by the: Agency Inspector, A/E of Record, Special Inspectors, DEB, and SFMO. The Building Permit is closed out by DEB issuing a Certificate of Occupancy or a letter, and the Project Permit is closed out by the Agency Representative in accord with agency procedures.

DEB shall provide the SFMO a copy of the approved Building Permit, and the owning Agency Representative shall provide the SFMO a copy of the approved Project Permit. The owning Agency Representative shall maintain a copy on the site and provide the SFMO a copy of the approved construction documents including: working drawings, specifications, addendum, change orders, and approved fire protection system shop drawings; and shall provide the SFMO timely notice for inspection of all work regulated by the VUSBC.

If discrepancies in the application of the VUSBC are identified by the SFMO upon review of the approved documents or inspection of work in the field, then the SFMO shall identify these discrepancies to DEB for resolution by sending an e-mail to CapOut@dgs.virginia.gov. The SFMO does not have the authority to order changes to the approved construction documents.

The SFMO has the authority to order changes to the work to comply with the approved construction documents.

If deficiencies in work are identified by the SFMO which are outside of the scope of inspection delegated herein, then these deficiencies should be noted as advisory on the SFMO Inspection Report.

SFMO Scope of Work

Inspect in accord with approved plans as referenced by the approved Building Permit or approved Project Permit.
Perform inspections within 10 calendar days of a request.
During construction - submit SFMO Progress Inspection Reports to the Agency Representative, with a copy to BCOM at CapOut@dgs.virginia.gov, within 10 calendar days of the inspection. Copies of the reports may be provided to the A/E of Record upon request.
At the completion of the work - submit SFMO Substantial Completion Inspection Report to the Agency Representative, with a copy to BCOM at CapOut@dgs.virginia.gov, within 10 calendar days of the inspection. Copies of the reports may be provided to the A/E of Record upon request.
SFMO inspection shall include the life and fire safety aspects of the VUSBC related to:
- Fire-Resistance-Rated Construction
- Fire Protection Systems
- Means of Egress
- Fire Department Access
- Safeguards during Construction

Assist in plans review as requested.
Evaluate and provide advice on the appropriate application of the VUSBC as requested.
Recommend issuing a Stop Work Order for work that is being executed contrary to the VUSBC or any pertinent law, or in a manner endangering the general public.

Period of Agreement

This agreement shall remain in effect until either party gives 60 days written notice of termination to the other party.

State Fire Marshal's Office		Division of Engineering and Buildings	
Charles E. Altizer, PE	Date 7/3/2008	Robert B. Jones, RA	Date 7/3/2008
State Fire Marshal		DEB Director	

APPENDIX M - STRUCTURAL AND SPECIAL INSPECTIONS

M.1 General

The VUSBC "Special Inspections" section requires special inspections to be performed on a project and cites requirements for Special Inspections. These inspections have been, heretofore, provided on state projects by a combination of the Owner's Project Inspection, the A/E and the Owner's independent testing lab. CPSM Section 5.15 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 edition (currently 2009), make appropriate notations on the list and forward the marked-up list with the completed Statement of Structural & Special Inspections, Form CO-6a, to BCOM 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 Owner'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 Owner'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 Owner, 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, the Agency's Project Inspector and the Agency's Project Manager or responsible person shall complete the Final Report of Structural & Special Inspections, Form CO-13.1b, and submit to BCOM as soon as completed but prior to the substantial completion inspection report.

The four page lists of special inspections related to the 2009 (and earlier) VUSBC editions are available on our website and may be used as a guide for the A/E in preparing the documents and in assuring that the inspections are made to obtain substantial completion and a Certificate of Occupancy.

M.2 STRUCTURAL & SPECIAL INSPECTION FORMS

Standard DGS forms and formats are available for download from the DGS Forms Center.

The following current Structural and Special Inspection forms (as well forms for earlier editions) are available for download from the Forms Center:

Form Number	Description	File Type
DGS-30-048 (2009)	CO-6a & CO-6b, Statement of VUSBC Special Inspections	Word
DGS-30-053 (2009)	CO-6c, Contractor's Statement of Responsibility	Word
DGS-30-120	CO-13.1b, Final Report of Structural & Special Inspections	Word
DGS-30-124	CO-13.1b-twr, Final Report of Structural & Special Inspections for a Communication Tower	Word

To view/download the latest version of these forms, visit the website listed above and enter the Form Number 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 N - PROJECT INSPECTION

N.1 MINIMUM QUALIFICATIONS OF THE PROJECT INSPECTOR

The Project Inspector shall meet the CPSM Chapter 4, Section 4.14.2 criteria and 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, NFPA, NEC, ICC, 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.

N.2 DUTIES OF THE PROJECT INSPECTOR / CLERK OF THE WORKS

The following is a detailed listing of the duties, services, functions and responsibilities of the Project Inspector for Capital Outlay Projects. This listing supplements and expands upon the duties, functions and responsibilities generally described in Section 16 of the **General Conditions of the Construction Contract**. The Project Inspector is an employee of the Owner and is responsible to the Owner for performing the duties, observations, and services described. 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**. Administrative duties may be assigned to / performed by a Clerk of the Works in support of the Project Inspector

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, NFPA, 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 Owner ways to alleviate identified problems. Identify all work not done in accord with the Contract Documents and report it to the Owner and A/E.

- Immediately report all discrepancies in the Contractor's work to the Architect/Engineer and the Owner. 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 on the DGS Forms Center.)

- 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 Owner 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 Owner 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 Owner 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 Owner, 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 Owner's Testing & Inspection agents.

- Verify invoices for on-site tests/site visits of independent testing entities, which are to be paid by the Owner.

- Submit to the Owner 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 on the Forms Center.)

- 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 Owner 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 owner'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 Owner 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 jobsite:
  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. Owner'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 Owner on the acceptability of all proposals submitted by the Contractor for changes initiated by the Owner or Architect, and the acceptability of all claims for change orders initiated by the Contractor.

- The Inspector shall confirm to the Owner 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 General Contractor, and executed change orders from the Architect. He shall file copies with the Owner monthly.

- Throughout construction, the Inspector shall review the Contractor's detailed schedule and advise the owner on the Contractor's progress and all other construction scheduling issues. He shall monitor the schedule, notify the owner 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 Owner 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. He shall advise the Architect and Owner whether 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 Owner and Architect to approve or to revise the Certificate and application for payment.

- The Owner 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 Owner occupy the project in whole or in part;

5. Issue a certificate for payment.

Supervisor: The Inspector shall report to the Owner's Project Manager.

N.3 CHECKLIST OF PROJECT INSPECTOR / CLERK OF THE WORKS DUTIES

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 Owner 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, Owner).
___ Safety notification (to GC, A/E, Owner).
___ Understands and maintains clarification requests.

2. MEETINGS (ATTEND, REVIEW MINUTES AND MAINTAIN COPIES)

___ Preconstruction meeting.
___ Monthly pay request.
___ Interim A/E inspection.
___ Pre-roofing conference.
___ Substantial Completion Inspection.
___ Final Inspection.
___ Coordination meetings.
___ Records Owner'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, material men, Owner, 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 Owner of problems.
___ Verifies approved erosion & sediment control plan is on site and is being followed daily. Notifies A/E and Owner of deficiencies.
___ Verifies Contractor's disposal site has been approved.
___ Verifies that offsite storage for Contractor materials is approved.
___ Verifies Contractor records proper disposal of hazardous material.

5. SCHEDULING/PAYMENTS

___ Assists A/E to verify accuracy of CO-12 quantities.
___ Compares work progress to scheduling.
___ Notifies A/E and Owner of Contractor's failure to comply with schedule.
___ Verifies Contractor time and materials for change orders and unit prices.
___ Advises Owner 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 Owner.
___ Provides list of unresolved issues.
___ Reports status of separate contracts at substantial completion inspection.
___ Coordinates Contractor's training of Owner's forces.
___ Receives and keeps track of punch list.

APPENDIX O – FORMAT FOR RFQ & RFP NEWSPAPER ADVERTISEMENTS

In order to provide complete and consistent newspaper advertisements, use the following format:

Commonwealth of Virginia
(Agency Name)
Request for *(Proposals or Qualifications for Professional Services or Work)*
(Title of the services or work)

Documents are located at www.eva.virginia.gov and available from the individual indicated below.

Inquiries should be directed to: *(Agency Contact Name)*
(Agency Contact Telephone Number) or *(Agency Contact Email Address)*

Proposals will be received in accordance with the information posted at www.eva.virginia.gov until *(Time and Date of Receipt)*

APPENDIX P - BUILDING PERMIT POLICY FOR CONSTRUCTION STATE OWNED BUILDINGS & STRUCTURES

A Building Permit issued by the State *Building Official* is required for work in accord with VUSBC Section 108, *Application for Permit.* A Project Permit issued by the Agency is required for work in accord with 2012 VUSBC Section 110.2, *Types of permits.* No Permit is required for work in accord with 2012 VUSBC Section 108.2, *Exemptions from application for permit.*

General Requirements
Applicable Codes: Virginia Uniform Statewide Building Code, 2012 edition (2012 VUSBC) effective July 14, 2014 and the 2010 ADA Standards for Accessible Design published September 15, 2010.

- The requirement for a Building Permit is determined by the type or character of the work. The type of funding (general, non-general, gift) or program area (capital, maintenance reserve, operating) in which the work is authorized have no bearing on the requirement for a Building Permit.

- *Construction documents* for work performed under the Annual Permit are a State *Building Official* requirement, but are not required to be submitted for State *Building Official* review.

- The Agency shall submit to the State *Building Official* by January 31 of each year an Annual Permit Activity Report as of December 31 of work initiated under the Annual Permit. A report of audit conducted by the State *Building Official* or State Auditor during the Annual Permit period may be submitted for the Annual Permit Activity Report.

- HVAC, Electrical, Plumbing, Gas Piping, Fire Sprinkler, Fire Suppression, and Fire Alarm work shall be performed by, or under the supervision of, tradesmen certified by the Department of Professional and Occupational Regulation.

- The Regional Fire Marshal's Office shall be notified prior to performing building demolition and alterations to and relocation of Fire Sprinkler, Fire Suppression, or Fire Alarm systems by submitting a copy of the Project Permit to the Regional Fire Marshal's Office.

- *Construction documents* for Annual Permit Work, Fire Prevention Code inspection reports by the Regional Fire Marshal's Office, Property Maintenance Code inspection reports by the agency, periodic ASME A17.1 required elevator test reports (performed by an ASME QEI-1 certified elevator inspector), and inspection / substantial completion inspection reports by the Division of Engineering and Buildings shall be kept on file at the Physical Plant office of the agency for review by the State *Building Official* and/or Regional Fire Marshal's Office.

- Code Clarifications and Technical Design Standards shall apply as indicated by Chapter 4 of the Construction and Professional Services Manual, 2014 including revisions.

BUILDING PERMIT (Issued by DEB)

Character of work
Projects involving the following:

- Construction of *structure(*s*)* and site improvements, including new structures that contain *occupiable space.*
- *Special Inspection(*s*)*
- Site work, utility work, and foundations for Industrialized Buildings.
- Changing the use of a building either within the same use Group or to a different use Group.
- Removal or cutting a structural beam or bearing support.
- Addition, removal, alteration, or relocation of all, or a part of, a *Means of Egress*, *Exit,* or *Fire Rated Assembly*
- Addition, removal, replacement, alteration, or relocation of Elevators and Conveying Systems.
- Addition of or removal of an HVAC, Electrical, Plumbing, Gas Piping, Fire Sprinkler, Fire Suppression, and/or Fire Alarm System.
- Mechanical: alteration or relocation of the quantity or source of ventilation, exhaust, or combustion air; alteration or relocation of boilers, water heaters, pressure vessels, or refrigeration equipment; change in refrigerant classification for replacement in kind of refrigeration equipment.
- Electrical: alteration or relocation of circuits greater than 1 phase, 240 volt, 50 amp or 1 phase, 277 volt, 30 amp
- Plumbing: alteration or relocation of plumbing fixtures, water supply, water distribution, sanitary waste, special waste, or storm drainage.
- Gas Piping: alteration or relocation of fuel gas or fuel oil piping systems.
- Fire Sprinkler: alteration or relocation of water supply or equipment other than sprinkler heads; relocation of more than 25% of sprinkler heads per story.
- Fire Suppression: alteration or relocation of suppression agent or equipment other than heads; relocation of more than 25% of heads per story.
- Fire Alarm: alteration of system logic; alteration or relocation of equipment other than alarm devices; relocation of more than 25% of alarm devices per story.
- Utility structures including communication towers, water tanks, and water and wastewater treatment.
- Roof replacement projects where the work is the replacement of more than 25 percent of an existing roof covering.
- Temporary structures.
- Demolition of structures (CO-17.1 Demolition Permit w/attachments required).

Requirements: *Construction documents* prepared under the supervision of and signed and sealed by a registered Architect or Engineer and submitted for review to the State Building Official.

PROJECT PERMIT (Issued under Annual Permit Authority)

Character of work

- Projects limited to the addition, removal, alteration, or relocation of any wall or partition that is not a part of a Means of Egress, Exit, or Fire Rated Assembly.
- Site improvements limited to parking lots and roads, fences, and other sitework regulated by the VUSBC.
- Projects limited to alteration or relocation of Mechanical, Electrical, Plumbing, Gas Piping, Fire Sprinkler, Fire Suppression, Fire Alarm not indicated above as requiring a Building Permit to be issued by DEB.
- Interior demolition projects that do not involve removal or cutting of structural beams or structural bearing supports.

Requirements: *Construction documents* prepared under the supervision of and signed by a registered Architect or Engineer. Regional Fire Marshal's Office written acceptance of installed *Means of Egress, Exit, Fire Rated Assembly, or Fire Protection Systems*.

Character of Work

- Asbestos abatement (abatement documents shall be prepared and signed by a licensed asbestos designer).
- Roof replacement projects where the work is limited to the replacement of less than 25 percent of an existing roof covering.
- Replacement in kind of steep-slope (4:12 or greater) asphalt shingle roofing.

Requirements: *Construction documents* describing the work.

Character of Work

- *Hot Work* including cutting, welding, Thermit welding, brazing, soldering, grinding, thermal spraying, thawing pipe, installation of torch applied roof system or any other similar work.

Requirements: Agency shall implement safety measures in accord with the Virginia Statewide Fire Prevention Code.

NO PERMIT

Character of work

- *Ordinary Repairs* and maintenance which are not regulated by the VUSBC.
- Replacement in kind of materials and equipment with that of similar characteristics in the same location.
- Periodic elevator tests and inspections by an ASME QEI-1 certified elevator inspector.

Italicized words are as defined by the VUSBC.

APPENDIX Q – QUALITY ASSURANCE CHECKLISTS

Q.1 DESIGN COORDINATION

- The working drawing 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 work must conform to current criteria, guides, codes and standards established by the Division of Engineering and Buildings, 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 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 BCOM for compliance with requirements and standard criteria. Errors and deficiencies shall be corrected by the A/E at no additional cost to the Agency.**

- The A/E shall be responsible for the professional and technical accuracy and coordination of all designs, drawings, specifications and cost estimates of all disciplines and other work or materials furnished. This includes overlaying the plans either manually or by CADD to coordinate the locations of work in the various disciplines. Intersections of components of various disciplines shall be checked for conflicts and to assure that adequate space exists for the material to be installed where shown on the documents.

- 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.

- 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.

- Required information may be shown on plans, details, sections, notes and/or schedules as may be appropriate.

- The A/E shall determine that all work as indicated on the drawings is fully and consistently specified.

Q.2 QUALITY ASSURANCE

- The following material/checklists in this appendix provide guidance to assist the A/E in reviewing the documents and represent the information the Commonwealth 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.

- Information may be shown or noted on plans, elevations, sections, details, schedules, tables, or notes as applicable to the particular item and the project scope of work. In general, where

more than one type, size, thickness, class, strength, or characteristic is specified, the location and limits for each should be indicated on the drawings.

BIDDING NOTICES AND FORMS

Notice of Invitation to Bid (Advertisement)

- Project name and location shown
- Brief general description of project shown
- Specific location where bids will be received (street address, building room number and any other special information)
- Time and date for receiving bids
- Date, time and location of pre-bid conference
- Is attendance at pre-bid conference mandatory? (Should not be mandatory unless there is specific justification.)
- Where can documents be obtained?
- How much is the deposit (and shipping charge, if any) for the bid documents?

Bid Form

- Does basic wording and format conform to standard bid form?
- Has Part A been properly edited for piles, caissons, and rock material?
- Has paragraph following Part B been included and properly edited?
- Have quantities been shown for Parts C, D, and E?
- Has rock excavation been adequately addressed? Estimated quantity shown?
- Have Additive Bid Items been clearly defined on the Bid Form?
- Have Additive Bid Items been clearly described/shown on the drawings?
- Has the contract award statement from the Standard Bid Form been copied verbatim to the project Bid Form?
- Are there any subcontracts which have been procured separately which will be included in this contract?
- Has wording from Standard Bid Form been used to include this work?
- Has A/E filled in the number of calendar days or the required substantial completion date in the space provided for use by ALL bidders?
- Has the climatological data source to be used been indicated?

Supplemental General Conditions

- Are Supplemental General Conditions required?
- Have Supplemental General Conditions been approved by the DEB Director?
- Does wording of Supplemental General Conditions conform to Sample Format?

Have the following forms been included?

- Notice of Invitation to Bid
- Instructions to Bidders (G.S. Form E&B CO-7A)
- Pre-bid Question Form
- Bid Form
- The current Commonwealth of Virginia General Conditions of the Contract for Construction Projects (G.S. Form E&B CO-7)
- Supplemental General Conditions, if applicable
- Form of Agreement (G.S. Form E&B CO-9)
- Workers Compensation Insurance Certificate (G.S. Form E&B CO-9a)
- Standard Performance Bond (G.S. Form E&B CO-10)
- Standard Labor and Material Payment Bond (G.S. Form E&B CO-10.1)
- Standard Bid Bond (G.S. Form E&B CO-10.2)
- Change Order blank (G.S. Form E&B CO-11)
- Schedule of Values Format (G.S. Form E&B CO-12)

- Affidavit of Payment of Claims (G.S. Form E&B CO-13)
- Certificate of Completion by Architect/Engineer (G.S. Form E&B CO-13.1) and Certificate of Partial or Substantial Completion by Architect/Engineer (G.S. Form E&B CO-13.1a).
- Final Report of Structural & Special Inspections (G.S. Form E&B CO-13.1b)
- Certificate of Completion by Contractor (G.S. Form E&B CO-13.2) and Certificate of Partial or Substantial Completion by Contractor (G.S. Form E&B CO-13.2a).
- Listing of Structural and Special Inspections (G.S. Form E&B CO-6b)
- List of Drawings
- Submittal Register Format

DIVISION 0 AND DIVISION 1

- Do Special Conditions conflict with the General Conditions?
- Have special conditions or requirements affecting the Contractor's Work been described in the Special Conditions?
- Is a list of drawings included?
- Do submittal requirements conflict with Section 24 of the General Conditions?
- Have requirements for temporary facilities been specified?
- Are there any special construction phasing requirements or sequencing of Work? Have these been specified?
- Are there any special limits on Contractor access to the work or site? Have these been specified?
- Are there any special limits on Contractor hours of work?
- Are there any special requirements for giving notices to the Owner?

DIVISION 2

Section 02050 - Demolition and Removal
Show the following information on the project drawings:

- Plan of structures to be demolished
- Elevation of structures to be demolished
- Limits of demolition
- Depth of demolition and detail for termination of foundations / walls
- Locations of any monitoring stations required for vibration, wellpoints, etc.
- Asbestos locations and/or statements
- Lead-based paint locations and/or statement

Section 02110 - Clearing and Grubbing
Show the following information on the project drawings:

- Limits of clearing
- Property lines
- Trees and shrubs to remain in area to be cleared and detail of protection required
- Trees to be removed in areas which are not to be cleared
- Identify area to be totally cleared and grubbed.

Section 02200 - Earthwork (For structures and pavements; includes clearing and grubbing, excavation, fill/backfill, compaction and grading) Show the following information on the project drawings:

- Location and record of soil boring, water level observations and test pits.
- Soil classification(s) per ASTM D 2487 and properties.
- Hydrological data including 100 year floodplain (where available).

- Surface elevations, existing and new.
- Location of underground obstructions and existing utilities.
- Sources of borrow material and soil classification(s) of borrow, if located on state property
- Limits of areas to be cleared of trees, shrubs, and brush.
- Disposal areas for brush and wasted soil, if available on state property.
- Description/details of any special subgrade requirements or use of synthetic fiber filter fabric.
- Details of special construction such as under railroad or highway right-of-way.
- Areas to receive topsoil and to be seeded or sodded identified.
- Erosion/sediment control measures and storm water management facilities
- Typical cross sections of embankments or roadway construction indicating depths and extents of special compaction.
- Details of subsurface drain construction (incl. foundation drains, drains behind retaining walls).
- Have specifications been tailored for this project?
- Has "**suitable soils**" listing been tailored to suit this project?
- Have procedures for filling, backfilling and compaction been specified?
- Have specifications identified the tests to be performed on the fill/backfill and the standards to be met to assure proper compaction?

Section 02220 - General Excavation, Backfilling and Compaction
Show the following information on the project drawings:

- Surface elevations (contours, spot elevations or both), existing and new;
- Location of underground obstructions and existing utilities;
- Location of borings and test pits and logs of soil borings and test pits. Include ground water observations and topsoil thickness encountered in boring, soil classifications.
- Location of borrow and disposal area if located on state property;
- Clearing stripping and grubbing limits, if different from clearing limits;
- Areas to be seeded or sodded identified;
- Hydrological data including 100 year floodplain, where available;
- Shoring and sheeting (if required) and design requirements/criteria to be used by Contractor's shoring and sheeting designer
- Pipe trench excavation details.
- Erosion/sediment control measures and storm water management facilities

Section 02225 - Excavation, Backfill and Compaction for Utilities
Show the following information on the project drawings:

- Location and logs of soil borings, water level observations, and test pits.
- Hydrological data including 100 year flood plain (where available).
- Surface elevations, existing and new.
- Location of underground obstructions and existing utilities.
- Sources of borrow material if on state property or at a prearranged source.
- Limits of areas to be cleared of trees, shrubs, and brush.
- Disposal areas for brush and wasted soil if on state property.
- Location and length of continuous concrete cradles, arches, or sleeves. Details/table of width and depth of trenches and pits for each type of pipe or appurtenance. Details of bedding for each type of pipe in varying earth and rock conditions; backfill details.
- Typical detail of method of stabilizing weak foundation material.
- Details of special construction such as under railroad and highways right-of-way requirements for jacking and boring.
- Details of sewage absorption trenches, absorption pits, and subsurface drains.
- Identify, detail, or note areas to receive topsoil and to be seeded or sodded and thickness of topsoil to be placed.
- Details of pavement repair.

Section 02270 - Erosion and Sediment Control / Stormwater Management
Show the following information on the project drawings:

- Temporary control devices required during construction.
- Permanent control devices to regulate rate of runoff water and to control future erosion .
- Plans shall be submitted by agency to the Department of Environmental Quality, Division of Soil & Water Conservation for approval.
- Plans shall be submitted by agency to the Department of Environmental Quality, Division of Stormwater Management for approval.
- A discharge permit issued by the Department of Environmental Quality may be required prior to advertising for bids.
- Stabilization methods for soil stockpiles.
- Temporary and permanent erosion control and stabilization methods for borrow/waste areas.

Section 02361 - Round Timber Piles
Show the following information on the project drawings:

- Plan layout (singles and clusters, show cluster layout)
- Batter pile angle.
- Design loads
- Location of test pile, unless option to allow direction by the engineer is selected.
- Tip elevation (estimated elevations/depths for bidding).
- Cutoff elevation (top elevation)
- Subsurface soil data logs shall be shown on the drawings. The entire soils report must also be included in an appendix to the specifications.
- Staging area, if other than within the limits of work shown on the site plan.
- Sections, details, dimensions and reinforcement of pile caps.

Section 02363 - Concrete Filled Steel Casing Piles
Show the following information on the project drawings:

- Plan layout (singles and clusters, show cluster layout).
- Batter pile angle.
- Design load capacity.
- Location of test pile, unless option to allow direction by the engineer is selected.
- Tip/base elevation (estimated elevations/depths for bidding).
- Cutoff elevation (top elevation).
- Subsurface soil data logs shall be shown on the drawings. The entire soils report must also be included in an appendix to the specifications.
- Staging area, if other than within the limits of work shown on the site plan.
- Size of casing.
- Concrete strength and details of reinforcing.
- Sections, details, dimensions and reinforcement of pile caps.

Section 02365 - Pressure-Injected Footings or Piles
Show the following information on the project drawings:

- Plan layout (singles and clusters, show cluster layout).
- Batter pile angle.
- Design load capacity.
- Location of test pile, unless option to allow direction by the engineer is selected.
- Bottom elevation (estimated elevations/depths for bidding).
- Cutoff elevation (top elevation).

- Subsurface soil data logs shall be shown on the drawings. The entire soils report must also be included in an appendix to the specifications.
- Staging area, if other than within the limits of work shown on the site plan.
- Size of shaft.
- Concrete strength and details of reinforcing.
- Sections, details, dimensions and reinforcement of pile caps.

Section 02366 - Steel Sheet Piles
Show the following information on the project drawings:

- Plan layout.
- Batter pile angle.
- Tip elevation (estimated elevations/depths for bidding).
- Cutoff elevation (top elevation)
- Subsurface soil data logs shall be shown on the drawings. The entire soils report must also be included in an appendix to the specifications.
- Staging area, if other than within the limits of work shown on the site plan.
- Grade of steel.
- Pile shape and weight.

Section 02367 – Precast / Prestressed Concrete Piles
Show the following information on the project drawings:

- Plan layout (singles and clusters, show cluster layout)
- Batter pile angle.
- Design pile load capacity
- Location of test pile, unless option to allow direction by the engineer is selected.
- Tip elevation (estimated elevations/depths for bidding).
- Cutoff elevation (top elevation)
- Subsurface soil data logs shall be shown on the drawings. The entire soils report must also be included in an appendix to the specifications.
- Size and shape and unit stresses for prestressing strands or wire.
- Detail of splices
- Detail of reinforcing and tendons
- Sections, details, dimensions and reinforcement of pile caps

Section 02368 - Rolled Steel Section Piles
Show the following information on the project drawings:

- Plan layout (singles and clusters, show cluster layout)
- Batter pile angle.
- Design pile load capacity
- Location of test pile, unless option to allow direction by the engineer is selected.
- Tip elevation (estimated elevations/depths for bidding).
- Cutoff elevation (top elevation)
- Subsurface soil data logs shall be shown on the drawings. The entire soils report must also be included in an appendix to the specifications.
- Staging area, if other than within the limits of work shown on the site plan.
- Sections, details, dimensions and reinforcement of pile caps

Section 02371 - Drilled Foundation Caissons (Piers)
Show the following information on the project drawings:

- Subsurface soil data and logs.

- Top and estimated bottom elevation of each caisson.
- Size (diameter in inches), bearing capacity, and total number of each size of caissons.
- Dimensions of the bell, if required.
- Dimensions of the casing.
- Reinforcing steel details, if required.
- Location of caissons to be penetration tested, if required.
- Location of caisson to be proof tested, if required.
- Locations, size, bell dimensions, and installation sequence of load testing caisson, if required.
- Pilot hole size and depth into rock, if required

Section 02500 - Pavement and Associated Work
Show the following information on the project drawings:

- Typical section of each type or thickness of pavement showing dimensions and geometry, slopes, etc.
- Dimensions defining the limits and shape of the paved areas
- Details with dimensions of curbs, curb & gutter, raised islands, medians, curb cuts, ramps, and drainage structures
- Layout of parking spaces, pavement markings, traffic control signage, and painted indicators including handicapped parking spaces meeting requirements of the 2010 ADA Standards for Accessible Design
- Existing and new grading contours or spot elevations
- New contours and spot elevations of paved areas showing drainage swales, slopes and directions of drainage flow
- Drainage structures including manholes, drop inlets, piping, culverts, sizes of piping/culverts and lighting standard locations.

Section 02660 - Exterior Water Distribution System
Show the following information on the project drawings:

- Plan and location of all new pipelines, including size and type of pipe.
- Show or specify maximum working pressure of the system.
- Location, size, and type of service of existing connecting, intersecting, and adjacent pipelines and other utilities.
- Paved areas and railroads which pass over new pipelines.
- Profile, where necessary to show existing parallel or crossing underground piping, conduits, clearances or unusual conditions.
- Note class or thickness of pipe, including material identification if more than one class or thickness is used. Show limits for each where class or thickness will be different for different sections of pipeline.
- Bedding conditions.
- Details and locations of critical flanged joints, joints made with sleeve-type mechanical couplings, grooved and shouldered type joints, and insulating joints.
- Locations of valves, hydrants (showing which are traffic type hydrants), indicator posts and details concerning valves, where necessary).
- Show or specify size and shape of hydrant operating nut and cap nuts if nonstandard nuts are required; dimensions of threads (major diameter, minor diameter, pitch diameter, thread form, and number of threads per inch) on hydrant hose and pumper connections if nonstandard threads are required.
- Connection of service line to water main, if different from that specified.
- Location or size of thrust blocks, including type; or location of and details of metal harness, when necessary (metal harness, when necessary, must be shown for PVC plastic water main pipe).
- Details for fire hydrant installation.

Section 02690 - Site Steam or Hot Water Distribution System
The project drawings should show the following information:

- Plan and location of all new pipelines, including size of pipe.
- Show or specify maximum working pressure of the system.
- Location, size, and type of service of existing connecting, intersecting, and adjacent pipelines and other utilities.
- Paved areas and/or railroads which pass under or over new pipelines.
- Profile, to show elevations, manholes, laterals, crossing utilities, and unusual conditions.
- Note class or thickness of pipe, including material identification if more than one class or thickness is used. Show limits for each where class or thickness will be different for different sections of pipeline (unless clearly described in specs).
- Locations, types and typical and/or special details of above grade and in tunnel pipe supports and pipe guides.
- Locations of expansion loops or expansion joints.
- Locations and details of anchors
- Locations and typical and special details of pipe tunnels and trenches.
- Points of connection.
- Location and details of concrete thrust blocks.
- Location and details of manholes.
- Location and size of main and branch line valves
- Location and size of vents and drains.
- Location and detail of drip legs, trap stations, trap schedule, and method of condensate recovery.
- Diagrams of electronic circuitry for controls and instrumentation shown.

Section 02720 - Storm Drainage System
Show the following information on the project drawings:

- Plan and location of all new pipelines, including type of service and size of pipe.
- Location, size, and type of service of existing connecting, intersecting, or adjacent pipelines and other utilities.
- Paved areas and railroads which pass over new pipelines.
- Profile, where necessary to show existing parallel or crossing underground piping, conduits, clearances or unusual conditions.
- Invert elevations at beginning and end of pipelines and at manholes or similar structures.
- Note class or strength of pipe and limits for each where class or strength will be different for different sections of pipeline. Indicate shape requirements if different shapes available.
- Design details for all stormwater system structures including manholes, catch basins, curb inlets, and head walls.
- Storm drainage lines and culverts required to be watertight.
- Bedding details and location of cradle(s), when cradle is required.
- Location, size, elevation and details, if necessary, for stormwater retention basin or structure.

Section 02730 - Exterior Sanitary Sewer System
Show the following information on the project drawings:

- Plan and location of new pipelines, including type of service and size of pipe
- Location, size, and type of service of existing connecting, intersecting, or adjacent pipelines and other utilities
- Paved areas and railroads which pass over new pipelines
- Profile, where necessary to show existing parallel or crossing underground piping, conduits, clearances or unusual conditions.

- Invert elevations at beginning and end of pipelines and at manholes or similar structures
- Note class or strength of pipe and limits for each where class or strength will be different for different sections of pipeline
- Design details for pertinent manholes, septic tank(s), and sewage absorption trench including Health Department requirements
- Bedding conditions, where different from those specified in the appropriate specification and location of cradle(s), when cradle is required, if not covered
- Sections and details of pump stations.
- Location and size of thrust blocks on pressure lines
- Location of flanged joints on pressure sewers if only used on part of line.
- Location of mechanical joints on ductile iron piping (if used on only part of the system).
- Location, size, and type of service of existing connecting, intersecting, and adjacent pipelines and other utilities.

Section 02831 - Fence, Chain Link
Show the following information on the project drawings:

- Fence alignment.
- Posts: Minimum height to accommodate fabric and clearance, post size for line posts, corner posts, pull posts and gate posts.
- Post setting dimensions: Not less than indicated in chain link manufacturer's installation standards. Assure that embedment length in concrete slabs and walls will be at least 12 inches. Show typical details for each condition to be encountered.
- Chain link fabric: Show height and size or gauge on detail or section.
- As required: Top rail, bottom rail, top and bottom reinforcing wires, and where a higher degree of security is required other than provided by fabric, include barbed wire on supporting arms. Note method of supporting arm attachment to post tops - bolts, screws, tamper-proof fasteners or welding.
- Sleeve type expansion couplings: Specify/note as maximum of 21 feet on centers, if used.
- Gates: location, size, and type. Include framing members size, weight, bracing, locking hasps, hinges, center pins, etc.
- Where special fencing requirements exist, such as wolf-proofing, antiburrowing provisions, crossing drainage ditches, provisions for electrical installations, or special security installations, specifications should be modified and appropriate details included on the drawings. Modifications and details should afford security equal to that of the fence.
- Where special entrance security requirements exist such as electronic locks, motor operated gates, closed circuit video; add details and modify the specification accordingly.
- Other information necessary to indicate layout and general configuration of the fence.

Section 02930 - Turf
Show the following information on the project drawings:

- Clearly indicate all areas to be turfed and if more than one type of turf is specified, delineate areas for each type.
- All turf specifications shall be written to reflect the environmental conditions peculiar to the project area.

Section 02950 - Landscaping, Trees and Shrubs
Show the following information on the project drawings:

- Description, number and size of trees and plants
- Layout/location of various trees and plants including groupings.
- Details of planting requirements including depth and diameter of excavations, mulching, protection, and supports

- Layouts and controls for irrigation systems if included in project
- Are tree and plants located away from existing and new underground utility lines, site improvements and surface drainage patterns?

DIVISION 3

Section 03300 - Cast-in-Place Concrete
The documents shall provide sufficient details with data on the various configurations or conditions of the concrete and reinforcing steel to facilitate bidding and shop drawing preparation. Details shall include, but not be limited to, rebar size, location and spacing, location and lengths of splices, and required embedment lengths and cover. Typical details with tabular information are acceptable with special sections and details shown as needed. Clearly indicate that the design of formwork and shoring required for construction are the responsibility of the contractor. The documents may require that the design of the formwork and shoring be performed by a licensed professional engineer and that the design responsibility shall rest with the contractor and his engineer.

Show the following information on the project drawings:

- Loading assumptions.
- Material strengths used in design, fc.
- Yield strength of reinforcement required.
- Details of reinforcement bars, showing number, sizes, bends, laps and stopping points of bars; location and details of stirrups; and mechanical connections to reinforcement bars.
- Show wire size and weight or wire size and spacing of wire fabric reinforcement and locations where used;
- Details of concrete sections, showing dimensions, reinforcement cover, and required camber.
- Expansion, contraction and construction joint locations with dimensions and details.
- Details and locations of critical construction joints, including waterstop locations and splices, keys and dowels when required.
- Locations where structural lightweight concrete or lightweight insulation or fill concrete will be used.
- Show locations and details for depressed structural slabs where required for static-disseminating and spark-resistant tile, terrazzo or other floor finishes in order to provide finished surfaces at the same elevations.
- When exposed concrete surfaces are specified, the locations in the finished structure shall be indicated. If other than cast finish is required, the type and location shall be indicated.

Section 03366 - Cast-in-Place Post-Tensioned Concrete
The documents may require that the post-tensioning system be engineered by the contractor. Clearly indicate all design, loading and performance criteria as well as all pertinent design assumptions. Require contractor to provide calculations and shop drawings for the post-tensioning system sealed by a licensed professional engineer. The A/E shall review these submittals for conformance with the design requirements.

Section 03410 - Precast Concrete (Non-Prestressed)
The documents may require the contractor to provide these components as an engineered system. Clearly indicate the layout and configuration of the units as well as the complete performance requirements. The contractor shall be required to provide calculations and shop drawings of the units sealed by a licensed professional engineer. The A/E shall review these submittals for conformance with the design requirements.

Show the following information on the project drawings:

- Live and dead (and lateral) loads for design (Note whether the topping is included in the specified dead load).
- Details and locations for fitting, bearing, and connections.
- Location of expansion and control joints.
- Style and area of steel fabric reinforcement in areas where required. Kind and size of reinforcing bars and spacing.
- Strength and type of concrete.
- Detail of placement of sealant or fillers in joints.
- Fire rating.
- Lightweight concrete unit weight.
- Special requirements for concrete cover over reinforcing.
- Areas where toppings are required, indicate areas where the full thickness of the topping is not present.

Section 03412 - Precast, Prestressed Concrete
The documents may require the contractor to provide these components as an engineered system. Clearly indicate the layout and configuration of the units as well as the complete performance requirements. Require contractor to provide calculations and shop drawings of the units sealed by a licensed professional engineer. The A/E shall review these submittals for conformance with the design requirements.

Show the following information on the project drawings:

- Live and dead (and lateral) loads for design and whether topping is included in the dead load.
- Details and locations for fitting, bearing, and connection of units.
- Location of expansion and control joints.
- Camber.
- Style and area of steel fabric reinforcement in areas where required. Kind and size of reinforcing bars and spacing.
- Strength and type of concrete.
- Detail of placement of sealant or fillers in joints.
- Fire rating.
- Lightweight concrete unit weight.
- Tendon types, physical properties, and allowable design stresses.
- Special requirements for concrete cover over tendons and other reinforcing.
- Areas where toppings are required, indicate areas where the full thickness of the topping is not present.

DIVISION 4

Section 04200 - Unit Masonry (Brick and/or CMU)
Show the following information on the project drawings:

- Locations and dimensions of each kind of masonry work.
- Masonry compressive strength fm, Type, and Fire rating, if required
- Mortar types and where used
- Vertical reinforcing bar size and spacing where required
- Horizontal reinforcing and spacing
- Control joint locations
- Expansion joint locations
- Bond pattern if other than running bond.
- Through-wall flashing and weep details.
- Control joint and expansion joint details.
- Special brick shapes if required.

- Bond beam locations, sizes, and reinforcing.
- Lintel locations.
- Lintel schedule with sizes, shapes, components, reinforcing, etc.
- Details of anchorage of masonry to supporting structure.
- Details of Bearings on masonry and of anchorages to masonry.

DIVISION 5

Section 05120 - Structural Steel
The documents shall provide complete details of the configuration of the structural steel and of any non-standard connections. The detailing of standard connections shown in AISC's Manuals of Steel Construction, Allowable Stress Design and Load and Resistance Factor Design may be left to the contractor. If this is done, the documents must clearly indicate all design loads and other criteria required for the development of connection details. The A/E shall review the shop drawings and verify design adequacy of fabricator detailed connections. The contractor shall not be required to provide a licensed professional engineer for the design of these connections.

Show the following information on the project drawings:

- Yield strength of steel used in design;
- The extent and location of structural steel;
- Designations of steel members;
- Centerline dimensional locations of framing members;
- Top of steel elevations above or below a reference elevation.
- Connection details of typical connections
- Details of special and moment resisting connections
- Beam or girder camber, if required
- Shoring information and typical details, if shoring required during construction
- Locations where galvanized steel will be used;
- Size and shape of crane rails;
- Types of connections (welded and bolted), including adjustable runway support connections if overhead, top running cranes are provided;
- Locations where high strength bolts and slip critical connections are required and the loads and stresses required if design is provided by Contractor;
- The location of welds requiring nondestructive testing, along with type of testing required;
- Lateral bracing members / framing
- For composite beams show shear stud number, size and spacing required

Section 05210 - Steel Joists and Joist Girders
Standard open web steel joists and joist girders shall be indicated by size, type and spacing on the drawings. **For non-standard loading conditions,** the documents may require that the components be provided by the contractor as an engineered system. In this case, **clearly indicate all loading and design criteria**. The contractor shall be required to provide calculations and shop drawings for these components prepared by a licensed professional engineer. The A/E shall review these submittals for conformance with the design requirements.

Show the following information on the project drawings:

- Joist series, size and spacing, point loads (if any), and slope
- Joist girder depth, kip load on each panel point, span, and slope.
- Design loads, including uplift and lateral forces in addition to gravity (dead and live) loads.
- Method of anchoring joists to supports
- Stiffeners at point / concentrated loads
- Framing between joists at openings through supported roof or floor

- Framing at equipment being supported by joists/joist girders
- Spacing and type of bridging and bracing.
- Accessory details as applicable
- Bearing details on masonry

Section 05310 - Steel Decks
Indicate which roof areas on the structure are considered by the structural engineer as functioning as diaphragms for the lateral force resisting system. Composite decks and diaphragm acting decks, including connections, should be designed by the structural engineer according to the Steel Deck Institute and details shown on the drawings. Drawings must show wind uplift loads for roof joist design in addition to the items listed below.

In addition to the above, show the following information on the project drawings:

- Structural properties (height, sheet thickness, section moduli, moment of inertia).
- Openings in floor and roof deck and typical detail of framing at opening
- Location, spacing, and size of hanger clips or loops for critical locations.
- Closure plates, where required.
- Location of cellular decking and whether it is to be used as electrical raceway.
- Weld or fastener spacing and size of same
- Whether construction is based on shored construction.
- End and side lap details

Section 05400 - Cold-Formed Metal Framing
Show the following information on the project drawings:

- The extent and location of all cold formed metal framing
- Indicate gage, size, section modulus, and other structural properties required.
- Connections and other installation details.
- Indicate concentrated loads, e.g., pipe supports, that may overstress a flange or connection.
- Slip connection requirements at underside of roof members

Section 05500 - Metal Fabrications
Show the following information on the project drawings:

- Location and configuration of all metalwork.
- All sizes and dimensions.
- Special fastenings, attachments or anchoring.
- Location and size of expansion shields larger than 3/8 inch in diameter.
- Location and identification of products to be galvanized.
- Location and special details of expansion joint covers.
- Connection details (other than manufacturer's standard) of grating.
- Locate and detail removable sections of handrails.
- Location and support detail of ladders.
- Location and details of all structural steel door frames.
- Sections, dimensions, sizes and details of all metal stairs.

DIVISION 6

Section 06100 - Rough Carpentry
Show the following information on the project drawings:

- Location and magnitude of concentrated loads
- Grade and stress rating of structural lumber

- Sizes and spacing of all wood framing members including trusses
- Location, size, type, and thickness of all materials
- Size and spacing of special fasteners
- Details of connections
- Size and spacing of anchor bolts
- Details of all connections and anchorage where special conditions exist such as high wind, hurricane, and earthquake areas
- Locations where treated lumber is required including type of treatment - preservative or fire retardant treatment
- Details of depressed floors to receive ceramic tile

Section 06180 - Prefabricated Wood Components
The documents may require that prefabricated wood components such as glue laminated structural members and trusses, metal plate fabricated wood trusses, and similar shop fabricated wood structural systems be provided by the contractor as engineered systems. All design and performance criteria must be indicated in the documents. The contractor shall be required to provide calculations and shop drawings for these systems prepared by a licensed professional engineer. The A/E shall review these submittals for conformance with the design requirements.

Section 06200 - Finish Carpentry
Show the following information on the project drawings:

- Location, size, type, and thickness of materials;
- Size and spacing of special fasteners or attachments;
- Special details, sections and requirements of millwork;
- Type and/or pattern of prefinished material;
- Profile and size of trim;
- Color and/or pattern of prefinished material
- Profile and size of trim
- Location and species of any wood that is to be stain, natural, or transparent finish

DIVISION 7

Section 07220 - Roof Insulation
Show the following information on the project drawings:

- The extent and locations of the work to be accomplished.
- Dimensions when space limitations or construction features govern thickness of insulation materials.
- Details at cants, edge strips, and nailers.
- Location and spacing of wood nailers.
- Location, type and spacing of special anchorages to substrate
- Extent of tapered insulation and slope

Section 07240 - Exterior Insulation and Finish System
Show the following information on the project drawings:

- Locations of EIFS.
- Thermal resistance value (R-value) for each location if various R-values are used.
- If several levels of Impact Resistance are specified, indicate locations where each level is required.
- Joint layout on elevations.
- Details at edges and at joints and of special profiles

Section 07250 - Spray-Applied Fireproofing
Show the following information on the project drawings:

- Location of all sprayed fire protection.
- Thickness of sprayed on fire protection and rating required
- Drawings should also show fire protection other than sprayed-on for the following items:
  (a) Concrete fire protection of steel bearing members in elevator hoistways.
  (b) Plaster fire protection of structural steel and underside of steel decks in machine rooms.
  (c) Equivalent masonry, concrete or plaster fire protection on outside surfaces of exterior structural peripheral members.
- Bearing for members in certain areas may not require fire protection. Locations and members should be specifically identified on the drawings.

Section 07410 - Preformed Metal Roofing and/or Siding
Show the following information on the project drawings:

- Roof slope.
- Location, sizes, and details of flashing, closure strips, and accessories.
- Depth, thickness/gage, and configuration of roof and wall panels.
- Spacing of girts and purlins.
- Design loads for sizing girts and purlins.
- Method of attachment to supports

Section 07414 - Preformed Steel Standing-Seam Roofing
Show the following information on the project drawings:

- Roof slope
- Supporting structural framework.
- Intermediate support and attachment details, when applicable.
- Attachment clip spacing.
- Flashing support and fastening spacing.
- Roof venting. (Detail to preventing infiltration of wind-driven rain.)
- Sealant and closure locations.
- Locations for dissimilar metal protection.
- Details of all accessories such as ladders, walkways, antenna mounts, guy wire fastening, ventilation equipment, and lightning rods.
- Details of flashing at all roof penetrations. On roof plan add note to offset penetrations such that center of penetrations coincide with mid-point of panel seams.
- Detail how expansion of roofing will be accounted for
- Locations where panels will be anchored / attached / restrained

Section 07511 - Aggregate-Surfaced Bituminous Built-Up Roofing
Show the following design, details and information on the roof drawings:

- Roof penetrating components such as roof drains and vents shall not be located within 18 inches of each other, of the toe of cant strip, or at juncture of roof with wall or other vertical surfaces.
- Roof drains with approved clamping rings and removable large dome strainers are used.
- Equipment mounted on curbs or structural supports are of sufficient height to accommodate roof flashings and installation of roofing under equipment.
- Structural supports are circular (pipe columns) to greatest extent practicable to permit use of circular collars with flashing flanges and umbrella flashing with clamping rings. Avoid use of pitch pockets, if possible.
- Curbs shall not restrict drainage of water from roof.
- Expansion joints in roofing shall be provided at each expansion joint in the structure.

- Details of expansion joints in roofing placed on curbs 8 inches high, minimum, above the membrane. Expansion joints shall not restrict drainage of water from roof.
- Indicate pressure treated wood cants at base of curbs for structural support.
- Area dividers in the roofing shall be provided:
  (1) where the roof deck changes direction and where substrate materials change;
  (2) uniformly spaced not over 200 feet apart on section of roof that exceeds 200 feet in length or width;
  (3) at each intersection where L- or T-shaped roof deck changes direction; and
  (4) where there is a difference in elevation between adjoining decks.
- Area dividers shall be located at high points, where practicable, shall not prevent drainage of water from the roof, and shall be placed on curbs above the water line.
- Flashing details provided at points where items will mount on or penetrate roofing membrane and at points requiring a typical flashing. Use isometric drawings as required to clearly indicate intersections of different types of flashings.
- Slope of substrate/roofing with directional arrows and live load limits.
- When backnailing of felts is required on a non-nailable deck, provide treated wood nailers, as a minimum, as follows:
  (1) Spaced no more than 21 feet apart (clear dimension), same thickness as insulation, and at right angles to roof slope on decks with roof insulation;
  (2) Spaced no more than 21 feet apart, embedded flush with deck top surface, and parallel to roof slope on decks without roof insulation; and
  (3) At right angle to roof slope of barrel roofs and spaced and installed as for decks with or without insulation, as applicable.
- Extent, location, and configuration of roof planks and walkways shown.
- Are treated wood nailers compatible with roofing material specified?

Section 07530 - Elastomeric Sheet Roofing System (EPDM)
Show the following information on the project drawings:

- Flashing and counterflashing at perimeter of roofing, pipe, conduit and other roof penetrations, and curbs. (Do not use sealant filled pitch pans for flashing roofing penetrations unless there is no alternative.)
- Expansion joints in the roofing at each expansion joint in the structure, placed on curbs above the waterline, and not restricting drainage of water from the roof.
- Roof drains not placed within 18 inches of other penetrations, expansion joints, or walls.
- Roof-mounted equipment on curbs or structural supports of sufficient height to accommodate roof flashings and installation of roofing under the equipment. Curbs shall not restrict drainage of water from the roof.
- Roof walkways for traffic areas and access to mechanical equipment. Provide openings in walkways to permit drainage of water from the roof.
- Slope of substrate/roofing with directional arrows.
- Live load limits of roof construction to caution against overload during stockpiling roofing materials.

Section 07600 - Flashing and Sheet Metal
Show the following information on the project drawings:

- Base, counter open valley, and eave flashing
- Roof drain flashing
- Expansion joints - (The contract drawings should contain details of building expansion joints at walls, ceiling, floors, roof, and parapets. Include exterior and interior details. Provide isometric detailing for expansion joints intersections.)
- Sheet metal roofing - show extent, slope, method of attachment and provisions for thermal movement of roofing

- Downspout locations, gauge, size, and method of attachment
- Gutter size, gauge, locations, and method of attachment

DIVISION 8

Include a complete door schedule. The door schedule should assign a separate number for each opening and should indicate:

- the door type and style,
- material,
- design (whether flush panel, full flush, paneled, glazed, or louvered)
- size and thickness,
- glazed or unglazed,
- fire rating class for fire doors,
- hardware set number, (may be here or in specifications)
- threshold material, if any, and
- material for frames, mullions, and transom bars.

It is recommended that standard door-type nomenclature, SDI 106, be used to indicate designs (e.g., F, L, G, GL, etc., in lieu of A, B, C, etc.).

Section 08110 - Steel Doors and Frames
Show the following information on the project drawings:

- Sizes of door openings, direction of swings, and travels of doors.
- The side of wall or partition where door is to be located.
- Details of nonstructural mullions, mullion covers, and removable mullions.
- Type and thickness of glazing required; whether or not insulating glass units are required.
- Method, type, number and spacing of anchors required for anchoring door frames to adjoining construction.
- The type of doors and frames required for various openings, and optional types of materials and construction, if any.
- Indicate locations which require safety glass (on plan or in schedule)
- Indicate the free area for louvers in doors.
- Indicate whether fire doors are required on one or both sides of the fire wall.

Section 08120 - Aluminum Doors and Frames
Show the following information on the project drawings:

- Size of door openings, thickness, swing and travel of doors and design; whether flush, paneled, glazed, or louvered; width of stiles and rails
- Elevations of each door and frame type, at 1/4-inch scale
- Details of head, jamb, sill, mullions, and transom sections; key sections to door frame elevations; type and spacing of anchors
- Type and thickness of glazing required and method of glazing
- Details of weatherstripping for exterior doors
- Amount of free area for louvers
- A separate number for each door opening on door schedule

Section 08210 - Wood Doors
Show the following information on the project drawings:

- Locations and travel of doors
- Sizes, types, and thicknesses,

- Glazing and louver requirements
- Designs
- Fire rating requirements
- Color or finish
- Door swing
- Sound transmission class

Section 08500 - Metal Windows
Show the following information on the project drawings:

- Type of material
- Sizes and types of windows;
- Metal and wood subframes, casings, or stools, if any;
- Hardware required.
- Sizes, location, and swing of ventilators; direction of slide for sliding ventilators;
- Location and details of fixed sash.
- Typical window sections and details.
- Show glass thickness. Show special glazing such as safety glass, if any.
- Method of anchoring windows to adjoining or adjacent construction; note size and types of clips, anchors, screws, or other fasteners in details.
- Details of nonstructural mullions and mullion covers; details of anchoring and reinforcing nonstructural mullions at windows to receive window cleaner anchors.
- Number of window cleaner anchors required and locations.
- Locations of windows requiring special operators, if any. Show method of operation and concealment of operators, cables and rods, as appropriate. Show wiring diagram for motor driven operators, if any.
- Locations of windows designated as forced entry resistant, if any.
- Locations of fire-rated windows, if required.

Section 08710 - Finish Hardware
Show the following information on the project drawings:

- Location, class, and hourly rating of fire doors;
- Location and installation details for blocking behind door stops (wall bumpers) mounted on wallboard partitions; and
- Hardware set numbers (HW-2, etc.) in the door schedule or list doors by number in each hardware set in the specifications.
- Are the following items included in the schedule - thresholds, automatic door bottoms, weatherstripping, acoustic seals, kick plates, panic hardware?

Section 08800 - Glazing
Show the following information on the project drawings:

- Locations of each type of glass, using the same terminology used in the specification.
- Thickness of glass, unless glass of each type is the same thickness.
- Frame and rabbet details, indicating method of glazing.

Section 08900 - Glazed Curtain Wall System
Show the following information on the project drawings:

- Large scale details showing the sizes and configuration of principal wall system framing members, panels, and other components as well as details of flashings, copings, weep, and drainage system.

- Methods of securing system framing to structures and details of fastenings, anchors, and auxiliary shapes.
- Details of expansion joints and each type of typical joint.
- Type and thickness of glass and details showing methods of glazing for all conditions.
- Details for installing each type of panel specified.
- Details of any required field applied thermal insulations, sound insulations, baffles, fillers, fire stops, or other seals at joints between curtain wall and edges of floor slabs.
- A schedule showing the various types and sizes of system units and of all window units.

DIVISION 9

Section 09310 - Ceramic Tile, Quarry Tile and Paver Tile
Show the following information on the project drawings:

- Rooms, areas, or spaces that are to be tiled such as floors, walls, wainscots (give heights), shower rooms and compartments; and, sink, vanity, or work table tops and splash backs, should be shown in the finish schedule.
- Bases, thresholds, and treatment at windows, doors and trimmed openings, including sills and vertical returns back to window or door frames, should be properly detailed.
- Spaces which require cleavage membrane or membrane waterproofing.
- Where a mortar bed is required, and where it is desired that surface of tiled floor be flush with adjacent floor, indicate depressed structural slab or sub-floor.
- A schedule showing tile types, sizes, patterns, trim, and built-in tile accessories required for each room or space. Identify type of trim shape by the designations of ANSI A137.1.
  Do not indicate sizes if specified in this section.
- Slope of floors to drain is 2% or less.
- Details and locations of expansion and control joints in tile walls or floors.
- Treatment at tile recesses for radiators, convectors, drinking fountains, lighting fixtures, and other recessed items.
- Locations where concrete walls or partitions, or masonry walls are to be furred to receive ceramic wall tile.

Section 09500 - Acoustical Treatment
Show the following ceiling information on the project drawings:

- Location of acoustical tile ceiling (ATC) systems. If more than one type of system is used, key each system to locations on the reflected ceiling plan or the Finish Schedule using symbols ATC-1, ATC-2, etc.
- Arrangement of panels, light fixtures, diffusers, other penetrations and exposed suspension grids when used are shown on the Reflected Ceiling Plan. Have these items been coordinated with Mechanical & Electrical?
- Maximum spacing of suspension members for concealed grid suspension systems.
- Location and material of fire stops above suspended ceilings.
- Location of systems required to have ceiling sound transmission class (STC), fire endurance ratings, or both.
- Details of special or patterned panels if necessary to describe adequately.
- Where acoustical ceilings are provided in conjunction with thermal insulation beneath vented attic spaces, under certain types of roof decks, careful attention should be given to furnishing adequate details on the contract drawings. Such features as support of insulation over flush-mounted light fixtures, conduit, acoustical units, and suspension system components and around heating, air conditioning, and other utilities shall be covered by the details. Appropriate specification shall be included in Section: Ceiling, Wall and Floor Insulation, to cover the installation of insulation over the suspension system, light fixtures and other ceiling penetrations.

Section 09660 - Resilient Tile Flooring
Show the following information on the project drawings:

- Type, location and layout pattern of floor tile.
- Type and location of base, stair treads, edge strips, and joints between resilient and other types of flooring.
- Manufacturer's name and number. Note on drawings or in specs: Colors listed are for color identification purposes only. Listing is not intended to limit selection of equivalent textures and colors from other manufacturers.

Section 09900 - Painting
Drawings shall include project documentation such as details, sections, elevations and/or schedules which indicate the type and extent of work. Specific quantities of work shall not be cited in the specification. Work shall be coordinated between the drawings and specifications and include the following:

- Reputtying and reglazing
- Resealing of existing exterior joints
- Removal of existing coatings
- Has potential for lead paint and/or asbestos been investigated and addressed on renovation projects?
- Has finish schedule been coordinated with this specifications section?
- Are types of paint compatible with materials being painted?
- Are number of coats of paint shown in schedule or specified?
- Do specifications establish the level of workmanship required for painting?

DIVISION 10

Section 10800 - Toilet and Bath Accessories
Show the following information on the toilet room plans and elevations:

- Mounting heights required above finished floor
- Locations of all fixtures, partitions and accessories including plan and elevation dimensions.
- Number of accessories required.
- Clearances as required to comply with 2010 ADA Standards for Accessible Design

DIVISION 11

Section 11193 - Detention Hollow Metal Frames, Doors and Door Frames
Show the following information on the project drawings:

- Sizes of door or view window, speaking port, louver, view port and food pass, if any, openings, thicknesses of doors, swings, and travels of doors.
- Indicate detention hollow metal doors as Sec. Holl. Mtl. or SHM and show that the term means Detention Hollow Metal Doors and Frames, in a schedule of abbreviations.
- The size of wall or partition where door is to be located.
- Type and thickness of glazing required.
- Method, type, and spacing required for anchoring frames to adjoining construction.
- Include a complete door schedule. The door schedule should assign a separate number for each opening and should indicate the door type and style, material, design, size, thickness, hardware set number, threshold material, if any.

Section 11400 - Food Service Equipment

Show the following information on the project drawings:

- Equipment location, including all elements located in counters and dishwashing counters and at sinks.
- Size, material and details for custom-fabricated equipment.
- Floor, wall, and ceiling penetrations. Include mounting height and size of pass through window at soiled dish counter.
- Locations for raised bases, retainer curbs, or depressions.
- Locations for recessed, grated floor drains required for equipment.
- Locations for exhaust fan curbs, supply fan curbs, exhaust duct, supply duct, and ductwork material.
- Location for fire suppression system tanks and actuating stations.
- Locations and type of hoods, plumbing enclosure housing and control panel of automatic washdown system.
- Location and detail drawing of insulated floors, including under-floor perforated drains and vent pipes.
- Location of disposer control centers.
- Locations of disconnect switches.
- Location and detail drawings of electrical chases and raceways and plumbing chases. Assure that underfloor electrical chases are provided to and among cash registers.
- Location of remote compressors and refrigeration systems.
- Location of all utility connections to building water, sanitary, gas, electrical, sprinkler, fire alarm, oil, compressed air, steam, and other utility systems. Include convenience outlets at point of use of plug-in equipment.
- Detail drawings should be provided to show water metering devices located to provide one device to serve two kettles where practical.
- Details of the remote pressurized syrup containers and associated supply lines to drink dispenser(s).

Section 11601 - Laboratory Equipment and Fume Hoods
Show the following information on the project drawings:

- Location of equipment, by unit number.
- Location of utility connection.
- Relation to adjacent trades.
- Remotely located blower and ductwork, to create negative pressure at hood. Require appropriate weatherproof caution labels attached to outlet end of exhaust duct systems where warning of dangerous chemical fumes will be necessary for the protection of workmen in the vicinity.
- Optimum face velocity.
- Fans and ductwork needed to create negative pressure. Laboratory fume hoods are ventilated enclosures designed to provide a safe working area for laboratory activities involving hazardous materials, generated fumes, aerosols, gases, and particulate matter. To operate satisfactorily, air is removed from this enclosure at an optimum face velocity. Require velocities measurable at the maximum face area of the hood, with maximum allowances for hood, filter, and appurtenance static pressure losses within the specified limits.

DIVISION 13

Section 13121 - Pre-engineered Metal Buildings
The documents may require that pre-engineered metal structures be provided by the contractor as engineered systems. All design and performance criteria must be indicated in the documents. The supporting structure for the engineered system shall be detailed on the drawings with the assumed reactions from the engineered system indicated. The contractor shall be required to provide

calculations and shop drawings for these systems prepared by a licensed professional engineer. The A/E shall review these submittals for conformance with the design requirements.

Show the following information on the project drawings:

- Floor and eave height dimensions required
- Clear spans, clear heights necessary
- Roof slope required (or minimum and maximum slope)
- Type of roof and wall coverings
- Approximate locations for downspouts, roof ventilators, louvers, and skylights
- Location and required R factor of insulation
- Depth of roof and wall coverings, if necessary
- Location of liner panels
- Minimum design roof dead, live, and snow loads.
- Basic wind speed in miles per hour.
- Collateral loads for special equipment or crane loads, special live loading
- Importance factor for wind and seismic computations.
- Foundation plan with dimensions and details and the allowable design bearing capacity of soil on which this design is based. Require Contractor to include in his price any modifications necessary for his building.
- Where applicable, state the allowable horizontal drift between the pre-engineered metal building and adjacent or adjoining construction.

DIVISION 14

Section 14200 - Elevators
Show the following information on the project drawings:

- Fire-rated hoistway, with vent at top where required by code.
- Waterproofed pit, with ladder, indirect drain or sump, light and (GFCI) receptacle.
- Machine room, with ventilation to maintain temperature, light and outlet, and fire extinguisher. Do not run pipes, ducts, conduits, etc. through or over the machine room or locate other equipment in the machine room. For new machine rooms in existing buildings show how pipes, ducts, conduits, etc. are relocated.
- Hoist beam at top of shaft, removable if necessary for overhead clearance.
- Smoke detectors in each lobby and machine room to initiate firefighter's return.
- Heat detectors in shaft and machine room to activate elevator return.
- Power feeders to machine room with disconnects for elevator machine and cab lighting, phone connection in machine room.

DIVISION 15

Section 15250 - Mechanical Insulation
Show the following information on the project drawings:

- Areas where pipe insulation differs from the typical;
- Areas where ductwork is to be internally insulated;
- Areas where metal jackets are to be used on interior piping;
- Pumps to be insulated and encased in 20 gauge boxes, if required;
- Heat exchanger temperatures.

Section 15320 - Fire Pumps
Show the following information on the project drawings:

- Configuration, slope to drain, and sizes for each piping system;
- Location and type of each pump, including associated equipment and appurtenances;
- Capacity of each item of equipment;
- Locations and details for special supports for piping; and
- For pipe larger than 12 inches, details of anchoring piping including pipe clamps and tie rods.

Section 15330 - Fire Extinguisher Sprinkler Systems
Show the following information on the project drawings: (See NFPA 13):

- Location and detail of each sprinkler system entrance to include:
  supply riser,
  alarm valve,
  water motor alarm,
  fire department inlet connection,
  pressure or flow switch,
  fused disconnect switch,
  and associated electrical connections.
- Location where each sprinkler system begins including connection to water distribution system piping.
- Location of sprinkler system control valves, post indicator valves, wall indicator valves and inspector test stations.
- Area of sprinkler system coverage when system is protecting partial areas.
- Details of sprinkler piping anchors where required.
- On renovation projects, indicate existing sprinkler piping layout and sprinkler heads on project drawings only if existing sprinkler system is being modified and such layout is necessary for clarity or coordination with new work. Show new sprinkler system work.
- Show predominate hazard classification; identify any areas with a different classification
- Show information on water supply to include:
  Water flow available in gpm,
  Static water pressure in psi,
  Residual Water Pressure in psi,
  Hydrant locations.

Section 15400 - Plumbing Systems
Show the following information on the project drawings:

- Configuration and sizes of piping systems
- Locations of hot water and cold water shut-off gate valves for each toilet room
- Dimensioned location and type or schedule # of each plumbing fixture with clearances as required to comply with 2010 ADA Standards for Accessible Design.
- Typical details for attaching wall-hung fixtures to walls
- Whether piping is run above or below ground, floors, and ceilings and whether concealed or exposed
- Capacity and operating characteristics of each item of equipment
- Locations and details for special supports for piping
- Locations, sizes, and types of cleanouts
- Locations, sizes, and typical details for extended rim floor drains
- Detail or sections through each type roof drain, floor sink, and grease interceptor or separator
- Roof drain / roof leader piping location and sizes
- Location of acid-resistant DWV piping, cleanouts, traps, drains and accessories
- Cleanouts in crawl spaces or exterior of buildings shall be not less than 3 feet from building wall
- Exterior buried piping shall not run parallel within 5 feet of exterior building wall
- Location and size of water hammer arresters

- Ranges and accuracies for gages and thermometers
- Capacity, size, bypass valves, and piping for water meters and detail of water meter box (Coordinated with serving utility entity)
- Locations and sizes of access panels for valves
- Details of pipe penetrations in outside walls

Section 15512 - Chilled, Condenser or Dual System Water Systems
Show the following information on the project drawings:

- Single line plan and necessary sections indicating location, sizes, and routing of associated piping. Piping larger than 4" diameter should be shown by double lines.
- Locations of anchors, expansion loops, and fittings
- Details of anchors and guides
- Flow diagrams for system(s).
- Appropriate schedules and details for equipment or components.

Section 15520 - Steam or Hot Water Distribution Systems (Interior)
The project drawings should show the following information:

- Plan and location of all new pipelines, including size of pipe.
- Maximum working pressure of the systems.
- Location, size, and type of service of existing connecting, intersecting, and adjacent pipelines and other utilities.
- Locate and detail the pipe entry through building wall or slab. Include detail of interface between the tunnel or box trench and the building
- Isometrics to show elevations, manholes, laterals, crossing utilities, and unusual conditions.
- Locations, types and typical and/or special details of pipe supports and guides.
- Locations and isometric of expansion loops.
- Locations and details of anchors. Indicate pitch of pipe and direction.
- Points of connection.
- Location and size of main and branch line valves
- Location and size of vents and drains.
- Location and detail of drip legs, trap stations, trap schedule, and method of condensate recovery.

Section 15652 - Central Refrigeration Equipment for Air Conditioning
Show the following information on the project drawings:

- Indicate size and locations of cooling tower supports.
- Locations of water treatment tanks and control panels.
- Indicate size and routing of refrigerant safety relief discharge piping. Consult ANSI/ ASHRAE 15 Safety Code for Mechanical Refrigeration.
- Indicate a cooling tower basin heating system for cooling towers that will be required to operate when outside temperatures are below freezing and the heat generated through the refrigeration process (with head pressures maintained) will be insufficient to preclude freeze-ups. Either electric immersion heaters or steam or hot water coils may be used for supplemental heating.
- Indicate vibration isolation requirements

Section 15850 - Air Handling Equipment
Show the following information on the project drawings:

- Arrangement plan and details for air handling equipment and accessories.
- Equipment schedules with sound ratings (loudness level), electrical characteristics, capacities.

- Equipment pads, foundations, supports, and vibration isolators.

Section 15900 - Temperature Control Systems
Show the following information on the project drawings:

- Sequences of operations and system schematic. (Specification should contain a narrative description detailing how the controls are to operate.).
- Direct Digital Controller architecture schematic: Show general architecture of DDC system including controllers, communication LANs, workstation terminal, etc.
- Dampers: Show type of damper (opposed or parallel blade).
- Control valves: Show control valve nominal size, flow capacities, type of fluid, inlet pressure, maximum and minimum pressure drop at design flow, and calculated Cv. (Select valves for smallest Cv within available pressure constraints, pipe velocities, economy of design, and noise criteria.)
- Indicate pressure and temperature indicator's scale ranges and location. Location of temperature wells and pressure taps.
- Smoke detectors and location of key-operated override switches, when required, along with the zoning arrangements for these systems.
- Indicate location of meters provided in this and other sections.
- Location of room sensors, pressure sensors and outdoor sensors.
- Input / output summary as described in the Manual.
- Location and horsepower of air compressors and refrigerated air dryers when required.
- Elementary wiring diagrams.
- Location and types of automatic dampers, including smoke dampers, e.g., opposed or parallel blade.
- Mechanical flow drawing: Show relative position of all individual HVAC components, input sensors (temperature sensors, pressure sensors, equipment proofs, override buttons, etc.), output components (actuators, valves, dampers, etc.), and hardwired safeties (smoke detectors and freeze stats).

Section 15996 - Testing/Adjusting/Balancing: Heating, Ventilating and Cooling Systems
Show the following information on the project drawings:

- A unique number or mark for each piece of equipment or terminal.
- Air quantities at air terminals in cfm and direction of air flow (2-way, 4-way, etc.).
- Air quantities and temperatures in air handling unit schedules
- Water quantities and temperatures in thermal energy transfer equipment schedules.
- Water quantities and heads in pump schedules.
- Water flow measurement fittings and balancing fittings.
- Ducts for special locations (wet, corrosive, etc.)

DIVISION 16

Section 16100 - Interior Wiring and Circuiting
Show the following information on the project drawings:

- Plans showing locations of all fixtures, receptacles, switches, and outlet sizes.
- Show Branch Circuiting with identification of circuits for all light fixtures and switches. Show wire size, type insulation, Alu or Cu wire, method of running circuit, and number of conductors including ground fault protection, as applicable.
- Provide panelboard schedule for branch circuits.
- Show conduit sizes and runs.
- Show mounting height for outlets and switches on elevation or note on drawings.

- Have equipment rooms and electrical rooms been checked for adequate heat dissipation? (i.e. cooling or ventilation)
- Are wiring and equipment suitable for kitchens, mechanical rooms and other hot locations?
- Are voltages, loads and characteristics of electrical powered equipment compatible with the service provided?
- Have conduit stub-outs and circuiting been shown / located for future planned needs?

Section 16200 - Diesel-Electric Generators
Show the following information on the project drawings:

- Verify that general information and data below has been shown:
  a. Piping plans and elevations.
  b. Fuel Piping and tank details.
  c. Engine setting plan and details.
  d. Civil; architectural; structural; heating, ventilating, and air conditioning; plumbing; and electrical plans and details.
  e. Flow Diagrams indicating the number of engines and other system requirements.
  f. Diagrams indicating sizes of all piping not provided by the engine manufacturer.
  g. Indicate any additional specified water treatment requirements.

- One-Line Diagrams:
  a. Indicate the number of engine-generator units and other system requirements.
  b. Are wiring and raceway requirements shown?.
  c. Are elevations of switchgear arrangements, the secondary unit substation, motor control centers, and the control switchboard shown?.
  d. Are ratings for buses, instrument transformers, relays, instruments, circuit breakers, motors, motor controllers, lighting transformers, and other requirements shown or covered in the specifications?

- Miscellaneous: Provide any limiting dimensions, not covered in the specifications, by codes, or defined on to-scale drawings, which are necessary for proper system operation.

Section 16400 - Service and Distribution
Show the following information on the project drawings:

- On electrical site plan, show location of service to property and overhead or underground routing of service to building. Show transformer location, if applicable, and service entrance location.
- Show service cable size and type (aluminum or copper) wire.
- Show ground service and tie to protective ground.
- Show single line main power riser diagram from service entrance to distribution panelboards. Connection of equipment should be indicated by circuit runs. Indicate type of insulation, wire size, number and type of conductors for feeders including equipment ground and ground fault protection.
- Indicate wiring and raceway requirements. Provide elevations of switchgear arrangements, the motor control centers, and the control switchboard.
- Show ratings for buses, instrument transformers, relays, instruments, circuit breakers, motors, motor controllers, lighting transformers, and other requirements not covered in the specifications.
- On electrical power floor plans, show location and identification number of main panel and of distribution panelboards.
- Show panelboard schedules to include size, rating, circuit breaker ratings, class and number of poles, terminals and equipment ground.
- Verify that sufficient space exists to install panelboards in locations as indicated.
- Verify that panelboards are not improperly recessed in fire rated walls.
- Disconnects shown for motors and electrical powered equipment

- Has spare capacity (25%) been included in all mains and panelboards?
- Have structural supports been designed and shown for electrical equipment, masts, and such?

Section 16510 - Interior Lighting
Show the following information on the project drawings:

- Type, style, mounting, lamp arrangement, ballast type, power factor, and lumens per watt . Use schedule if necessary.
- Location of fixtures on plan. Coordinate with reflected ceiling plan.
- Wattage, voltage, and frequency rating required
- Type of reflector, diffuser required
- Glass/plastic lens
- Accessories required, such as photocell, time switches, and auxiliary lamps
- Mounting height above floor or grade to bottom of fixture
- Indicate type of rods or straps used to suspend fixtures if more than one type of hanger is used.
- Reflecting or non-reflecting surface finish
- Shielding required
- Referenced sketch
- Exit and emergency lighting shown for corridors, stairs and egress routes.

Section 16530 - Exterior Lighting (and accessories)
The following information shall be shown on the drawings or included in the project specifications:

- Luminaire schedule indicating pertinent information (mounting, lamps, ballasts, and voltage).
- Type of luminaire;
- Voltage and wattage rating required;
- Accessories required, such as photocell, time switches, and auxiliary lamps;
- Location of poles or standards;
- Referenced sketch; and
- Extent and location of the work to be accomplished and wiring and equipment necessary for a complete installation.
- Detail of pole base and foundation including anchorage and grounding

Section 16700 - Communication Systems
Show the following information on the project drawings:

- On electrical site plan, show location of service to property and overhead or underground routing to building.
- Show location and size of communications equipment mounting board.
- On electrical power floor plans, show location of control panel
- Show single line **communications riser diagram**. Connection of equipment should be indicated by circuit runs in lieu of conduit runs. Do not indicate number and size of conductors for interconnection of communications components.
- Show mounting height for outlets on elevation or note on drawings.

Section 16722 - Interior Fire Alarm System
Show the following information on the project drawings:

- 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.
- On electrical site plan, show location of master fire alarm box, annunciator, circuit run to the connection to the campus fire alarm circuit, circuit run into the building and connection to control

panel, and circuit run for master box marker light. Circuit runs should show conduit size and numbers and size of conductors.

- Show single line fire alarm riser diagram. Connection of equipment should be indicated by circuit runs in lieu of conduit runs. Do not indicate number and size of conductors for interconnection of fire alarm components.
- Show mounting height for panels on elevation or detail drawings, if critical.
- Location of visual annunciators (strobe lights) adjacent to exits or EXIT signs to meet requirements of 2010 ADA Standards for Accessible Design and current applicable edition of NFPA 72.
- Intercom system for Areas of Refuge.