

## CHAPTER ONE – GENERAL REQUIREMENTS

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### 1. PROFESSIONAL SERVICES:

**1.1. A/E Services:** The Architect/Engineer (A/E) assigned by contract to a given project shall provide, complete and adequate in every detail, the professional services described in the Standard Form of Agreement with Architects/Engineers. A/E services may include some or all of the following services:

**a. Programming Study and Interior Design Services:**

- (1) Capital Project Program - Part I
- (2) Capital Project Program - Part II
- (3) Feasibility Study
- (4) Space Planning
- (5) Engineering Report
- (6) Interior Design

**b. Design Phase Services:**

- (1) Concept Design Phase
- (2) Schematic Design Phase
- (3) Design Development Phase
- (4) Construction Documents Phase

**c. Bidding and Construction Services:**

- (1) Bidding Support
- (2) Construction Administration Services
- (3) Post Construction Survey

### 2. UNIVERSITY PROJECT NUMBER:

**2.1. Assignment:** At the Project Initiation Conference the A/E will be provided with the University project number. This number shall be used on all correspondence, drawings, specifications, estimates, shop drawings, and all other matters relative to the project.

### 3. PROGRAM AND DESIGN CRITERIA:

**3.1. Program:** The program as delivered to the A/E shall be considered firm as to the scope of the project. Only the University has authority to alter the program. All changes to the Program shall be in writing.

**3.2. Design Criteria:** All University improvements shall be planned, designed and constructed to be attractive, functional, and cost effective with an efficient utilization of space and energy. The design must be economical to construct, operate and maintain. Specific design considerations shall include, but are not limited to the following:

- a. Objective:** It is the objective of the University to achieve effective life cycle costs by application of sound economic and technical analysis by the A/E.
- b. Building Design:** Buildings shall be designed as sound structures of conventional shapes which avoid extraneous features and excessive perimeter walls. Special

## CHAPTER ONE – GENERAL REQUIREMENTS

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attention shall be given to the economics and interrelationship of architectural, structural, mechanical and electrical systems.

- c. **University Design Standards:** The design shall be performed in conformance with the latest editions of all University Architectural and Engineering Design Standards and Master Planning Documents in effect for the applicable University campus.
- d. The A/E shall incorporate the Campus Green Building Policies in the development of the project design. The A/E shall refer to the A/E Design Standards for the applicable campus.

### 4. GREEN BUILDING POLICY:

- 4.1. The primary design A/E consultant shall designate an individual to serve as the Green Building Coordinator (GBC) for the project. The GBC may be a member of the primary firm, a consulting individual, or a firm licensed to practice architecture or engineering in the State of Maryland. The GBC shall be responsible for facilitating and coordinating all related high performance green building activities and shall have either performed previous LEED™ System certifications or shall adequately demonstrate the knowledge necessary to perform the work necessary to obtain a LEED™ Certification. The GBC must be approved by the State during the Architectural and Engineering (A/E) services selection process.
- 4.2. The design of all projects required to be LEED™ Silver or higher certified shall employ an integrated design approach. The design consultant's GBC shall conduct a green building pre-design meeting with all consultant team members, the University project manager, and members of the using Agency team to establish the direction and scope of green building principles, including construction and maintenance procedures, to be employed in this project to attain the LEED™ certification. These principles shall be recorded in writing as the "Green Building Plan" (GBP). The GBP shall be updated and submitted for review at each design phase to track any changes, modifications, or additions. The A/E shall provide four copies of the GBP at the conclusion of the project. The GBP shall follow the format of the LEED™ Green Building Rating System and the plan may be used as the framework for the official submission to the USGBC for certification. All official LEED™ interpretations shall be included in this section.
- 4.3. The A/E shall develop and provide a "Green Building Operations and Maintenance Manual" outlining operation and maintenance procedures and schedules for all materials and systems that contribute to the LEED™ Silver rating. This manual shall be provided in addition to the usual submission of operating and maintenance manuals and shall focus on system maintenance required to keep green features operating as intended. The intent is to provide system maintenance guidelines as opposed to procedures for maintaining individual pieces of equipment as provided in the equipment operating and maintenance manuals. The manual shall be submitted at 50% Construction Documents (CD) phase for review, at the 100% CD submission, and after project completion. The design consultant shall identify and provide the University project manager with a written account of any conflicts between program requirements and other requirements of the State or the project program. Schedule items shall be organized in a one-year calendar format. This information can be collected as the project progresses with the hope of simplifying the effort at the end of the project. The manual shall be prepared in a three-ring binder format to allow for convenient reproduction. Examples of the types of information to be provided include, but are not limited to, the following:

## CHAPTER ONE – GENERAL REQUIREMENTS

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- a. Recommendations on periodic duct inspection or cleaning as well as HVAC filter changes to maintain indoor air quality (IAQ).
  - b. Recommended “green” cleaning products and materials and cleaning schedules for finishes (especially for “green materials”) considering IAQ and extending the life of the material.
  - c. Information on minimum paint reflectance for repainting interior area using reflected day lighting.
  - d. A list of the low VOC paint, sealant and other products and the colors used including specific manufacturer’s name and product description.
  - e. Schedule recommendations for cleaning of glass and light shelves to maintain reflectance and light transmission for daily lighting systems.
  - f. Operation recommendations for HVAC systems as described in the construction documents, approved ATC submittal, and confirmed in the commissioning report.
  - g. A schedule for inspecting and cleaning walk-off mat recesses to maintain IAQ.
  - h. Recommendations for eco-friendly pest control.
  - i. Maintenance recommendations for green roof vegetation.
  
  - j. Provide a list of local sources for recycling used material such as carpet, ceiling panels, and drywall.
  - k. Provide a list of the recyclable materials used in the building.
  - l. Provide a list of the manufacturers and suppliers of all “green” materials used in the building.
  - m. Provide a list of sources of recycled paper products (toilet paper and paper towels) and eco-friendly cleaning products.
  - n. Provide a simple list of instructions for building occupants emphasizing the use of the building’s green features such as the purpose of walk-off mats and how to use composting toilets, as well as simple instructions for turning out lights, locations of recycling stations, use of individual HVAC controls, water use reduction methods and other green practices.
- 4.4.** The design consultant’s GBC shall develop and submit all documentation necessary to the U.S. Green Building Council’s LEED™ Program for certification of the project for the LEED™ Silver or higher rating. Typically, the project shall be registered with LEED™ at the start of the design. The final LEED™ certification shall be submitted after completion of construction. The cost of registering the project with LEED™ as well as a reasonable cost for LEED™ interpretations and consultation shall be included in the consultant’s price proposal. All projects shall be registered under the University of Maryland’s U.S. Green Building Council membership. A copy of the complete LEED™ submission package shall be submitted to the University. In addition, a complete copy of the energy modeling software program shall be submitted to the University, with all data used to model the final building design and systems, for the Universities use. The data shall be submitted in electronic format on a CD that will allow UMB to run simulations on the building and to conduct what-if scenarios with the building systems.
- 4.5.** The design consultant shall provide a separate specification section, which calls attention to special construction issues related to high performance green buildings and the LEED™ rating such as construction materials, construction recycling, special demolition considerations, and potential special construction sequencing issues. This section is in addition to the standard specification sections and is intended to clearly call these special issues to the attention of the contractor during the bidding phase.

## CHAPTER ONE – GENERAL REQUIREMENTS

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- 4.6. For projects that are required to be LEED™ certified, the A/E shall submit three (3) final copies of the LEED™ Certification Submission, stamped and signed with A/E's license stamp, the official LEED™ Certificate, the final Green Building Plan and three (3) copies of the Green Building Operations and Maintenance Manual. For projects that are not required to be LEED™ Silver Certified, when requested by the University, the A/E shall submit a narrative report describing the high performance green elements of the projects. Using the LEED™ score sheet, the A/E shall provide a brief description for each available credit describing how that credit was addressed or an explanation of why it was not addressed. The narrative shall be submitted to the University Project Manager.

### 5. AVAILABLE FUNDS:

- 5.1. **Design-to Budget:** The project design-to budget, when established, is provided to the A/E during fee negotiations. This design-to budget is typically based on the available or expected construction funds for the program construction costs. It includes the anticipated base construction costs and current market inflation. A/E fees, construction contingencies, construction inspection and testing expenses, and other incidental costs are excluded from the design-to budget. The estimated construction cost of the A/E's design must not exceed the design-to budget throughout the design phases.
- 5.2. **Exceeding the Design-to Budget:** At any phase of design, if the A/E and/or CM determines that the program cannot be achieved within the design-to budget, the A/E and/or CM shall notify the University Project Manager in writing identifying the reasons for the additional cost, estimates of the additional cost and proposed alternatives that could be considered to bring the cost down to the design-to budget. Submissions of cost estimates that exceed the design-to budget, without proposed alternatives, will not be accepted by the University.

### 6. COORDINATION, NOTIFICATION AND CORRESPONDENCE:

- 6.1. **Coordination:** The University Project Manager assigned to the project will act as coordinator between the University representatives and the A/E.
- 6.2. **Notification:** The A/E shall coordinate with the University Project Manager well in advance to schedule all necessary meetings. The University Project Manager will be responsible for notifying and scheduling all University representatives as needed. The University Project Manager will determine the location of all meetings.
- 6.3. **Correspondence:** Throughout the project, all correspondence should be transmitted directly to the University Project Manager. Such information will be distributed as necessary by the University Project Manager within the University. The A/E is responsible for distributing drawings and specifications for review to the University Project Manager for distribution to all University representatives. The University Project Number must appear on all drawings, specifications, contracts, shop drawings, transmittals and other such correspondence pertaining to the project.
- 6.4. **Site Visit:** The University Project Manager shall arrange site visits as requested.

## CHAPTER ONE – GENERAL REQUIREMENTS

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**6.5. A/E Team:** The professional A/E team for the project shall be the same design team as stated in the A/E Technical Proposal unless a change is requested and approved in writing by the University in advance of any substitutions via the issuance of a contract amendment by University's Office of Strategic Sourcing and Acquisition Services (Procurement).

### 7. MEETING MINUTES:

**7.1. Responsibility:** The A/E shall prepare agendas, chair the meetings, and prepare minutes of any and all conferences held relative to the project during the Schematic Design, Design Development and Construction Document Phases of the project. These minutes shall state all decisions reached and who made them. The original shall be addressed to the University Project Manager, with copies as required for all attendees and any other persons identified on the distributions list. Minutes shall be distributed within five (5) working days after the meeting.

**7.2. Format of Minutes:** The meeting minutes are to contain the following information. Items (a) through (e) shall be on the first page of the minutes.

- a. Project name
- b. UMB project number
- c. Design progress meeting number or other pertinent meeting description
- d. Time and date of meeting
- e. Project synopsis, including project start date and percent completion to date.
- f. Statement of any items delaying the project
- g. Old business
- h. New business
- i. Participants
- j. Distribution list
- k. Time and date of next meeting

### 8. CHANGES TO THE A/E DESIGN TEAM:

**8.1. A/E Design Team:** Once approved by the University, changes are not permitted on the design team unless written authorization is granted by the UMB Office of Strategic Sourcing and Acquisition Services.

**8.2. A/E Design Team Release or Addition:** If it becomes necessary for a prime A/E firm to either release a consultant firm, or add a consultant firm, on an approved design team, a written request and justification for this action shall be submitted to the University Project Manager. The request to release a consultant firm from the design team shall include the reason(s) why the firm is being released. The request to add a consultant firm shall include information about the qualifications and experience of the proposed substitute firm.

**8.3. Approval:** When either a substitution or addition of a consultant firm is approved by the UMB Office of Strategic Sourcing and Acquisition Services, the prime A/E firm will be notified in writing, authorizing the substitution or addition of a consultant firm.

## CHAPTER ONE – GENERAL REQUIREMENTS

---

- 8.4. Contract Modification:** When a consultant firm is added to the approved A/E team, the UMB Office of Strategic Sourcing and Acquisition Services shall issue a contract modification to the prime A/E firm incorporating changes to the base contract.
- 8.5. Specialty Consultants:** Specialty Consultants, such as for telecommunications, building envelope, security, audio visual, and closed circuit television (CCTV), if required for a project, shall be independent and not employed as a representative of a system or equipment manufacturer intended for inclusion in the construction documents.
- 8.6. Consultant Requirements:** The A/E with whom the University has a direct contract shall negotiate the agreements with proposed sub-consultants so that the said sub-consultants are bound by the requirements of the A/E contract with the University and this manual.
- 9. PRESS RELEASES POLICY:**
- 9.1.** No A/E under contract with the University shall issue any press release or respond to any inquiries by any publication, including newspapers, concerning any University projects, without first clearing the text with the University Project Manager and obtaining written approval from the University.
- 10. COST ESTIMATES:**
- 10.1. Cost Estimates:** Cost estimates are defined as budget cost estimates and/or construction cost estimates.
- 10.2. Budget Cost Estimate:** Budget cost estimates shall be furnished by the A/E as required by the A/E scope of work.
- 10.3. Construction Cost Estimate Submissions:** Unless otherwise required by the project program construction cost estimates shall be furnished by the A/E at each of the following phases of work:
- a. Concept Design Phase**
  - b. Schematic Design Phase**
  - c. Design Development Phase**
- 10.4. Construction Cost Estimate Revisions:** The University may require revision or restudy of any of the above estimates as may be necessary to keep the project within the budget, in response to and in coordination with value engineering efforts, or to require more realistic figures, at no additional charge to the University. As it is essential that accurate estimates be provided, it is recommended that the A/E obtain professional detailed take-off estimates as soon as the drawings are sufficiently developed to realistically obtain such an estimate.
- 10.5. CM Construction Cost Estimate Review:** The A/E shall review the 50% Construction Document estimates and other estimates prepared and submitted by the construction manager.
- 10.6. Construction Cost Estimate Coordination:** If the University employs the construction manager (CM) method, the A/E will be required to

## CHAPTER ONE – GENERAL REQUIREMENTS

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- a. Confer with the CM at start of design to determine and agree upon the cost estimate format to be used by both parties and;
- b. Reconcile each estimate with the CM.

### 11. VALUE ENGINEERING:

- 11.1. **Definition:** Value Engineering (VE) is an organized, systematic, and structured evaluation process used by a multidisciplinary team directed at analyzing the functions of systems, equipment, materials, and components of the building project for the purpose of achieving the essential functions at the lowest lifecycle cost consistent with required performance, quality, and safety. The focus is on improving value by identifying alternate design approaches to reliably accomplish each function in the least cost manner without sacrifice to performance, quality, and safety.
- 11.2. **Implementation:** Value Engineering shall be performed at the completion of the Schematic Design and Design Development Phases for every project. In addition, the VE process may be utilized as part of an effort to reduce the reconciled estimated construction cost to within the identified design-to budget. At the completion of each subsequent Design Phase the CM shall compare the reconciled construction cost to the identified design-to budget. When the reconciled construction cost exceeds the identified design to budget by more than 5 percent, the University Project Manager will schedule a meeting with the A/E and all other parties to continue the VE Procedure.
- 11.3. **Value Engineering Procedure:** The VE Procedure shall be a collaborative effort by representatives of the University, the A/E Team, and the construction manager. The procedure shall include identification of all potential alternative design solutions, systems, and/or materials to increase value and reduce construction cost. Each potential alternative shall be analyzed by the design team for applicability to the project.
- 11.4. **A/E Responsibility:** Each member of the design team shall review the estimated cost of each line item in their respective disciplines and recommend alternative design solutions, systems, and/or materials to the University for consideration as potential cost reduction opportunities.

### 12. LIFE CYCLE COST ACCOUNTING AND ENERGY CONSERVATION:

- 12.1. **Life Cycle Cost Analysis:** A life cycle cost analysis (LCCA) shall be utilized for the evaluation and comparison of design alternatives identified during the Schematic Design Phase and shall be performed concurrent with the Design Development Phase. See Division IV: Life Cycle Cost Analysis of this Procedure Manual for additional LCCA Requirements.
- 12.2. **Energy Conservation and Green Building Design:** The A/E design shall be in accordance with the requirements of the University Architectural & Engineering Design Standards and good architectural and engineering practice to analyze and include all economically feasible or mandated energy conservation, sustainable, and green building design features, including those required for LEED Certification.

13. **CODES, REGULATIONS AND STANDARDS:** The A/E's documents shall be developed in accordance with the applicable codes, regulations and standards which include, but are not limited to, the following:

## CHAPTER ONE – GENERAL REQUIREMENTS

---

- 13.1. State Model Performance Codes:** Latest adopted edition of Maryland’s State Model Performance Codes for State Buildings, the latest edition of the International Building Code (IBC) with modifications, latest edition of the International Energy Conservation Code (IECC), and latest edition of the Maryland Accessibility Code (MAC).
- 13.2. Fire and Life Safety Codes:** Latest edition adopted of the State Fire Prevention Code (COMAR 29.06.01) which includes NFPA 101 Life Safety Code and references the NFPA National Fire Codes, latest edition. The A/E shall request a meeting early in the design process (no later than the DD Phase) with the Fire Marshall assigned to the University Campus where the work will be performed to discuss all relevant design issues and to obtain the Fire Marshall’s interpretation of the applicable fire codes. (Resident designee for the State Fire Marshall)
- 13.3. Sprinkler Systems:** Sprinkler Systems installed in new construction projects shall be in accordance with Public Safety, Title 9 of the Annotated Code of Maryland.
- 13.4. Accessibility:** Latest adopted edition of the Regulations Governing Construction of Facilities for the Handicapped by the State of Maryland (COMAR 05.02.02), inclusive of the Americans with Disabilities Act (ADA), Public Law 101-336, U.S. Dept. of Justice, 1991, specifications for making buildings accessible to and usable by American National Standard for Buildings and Facilities Providing Accessibility and Usability for Physically Handicapped People ANSI A117.1 - 1986, Fair Housing Amendments Act (1988) or other Federal regulations. Where the federal law is more restrictive than COMAR, federal law shall control.
- 13.5. Sediment Control and Storm Water Management:** Management shall comply with regulations of the Maryland Department of the Environment (MDE), Water Management Administration, Environment Article sections 4-101 through 4-116, Annotated Code of Maryland and COMAR 26.17.01 and 26.17.02.
- a. Chesapeake Bay Critical Area Criteria (COMAR Title 27). Also see Division III: Policies and Procedures of this Procedure Manual.
  - b. Nontidal Wetlands (COMAR 26.17.04 & 26.23)
  - c. Wetlands (COMAR 26.24)
  - d. Reforestation Requirements (Article-Natural Resources; Sections 5-103 & 5-501 through 5-509 & 5-1601 through 5-1612; Annotated Code of Maryland and COMAR 08.19.04.)
- 13.6. Flood Plain:** Management Regulations & Permits, Dept. of Natural Resources (COMAR 26.17.04), latest edition.
- 13.7. Water Resources:** Other water resources rules and regulations of procedure as issued by the Dept. of the Environment (COMAR 26.08), latest edition.
- 13.8. Food Preparation:** Latest edition of Maryland State Department of Health Regulations for Eating and Drinking Establishments (COMAR 10.15.03) applies whenever food preparation or serving areas are included in the project. These regulations shall be interpreted by the Maryland Dept. of Health and Mental Hygiene.



## CHAPTER ONE – GENERAL REQUIREMENTS

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- 13.9. Elevators:** Regulations Governing elevators, dumbwaiters, escalators and moving walks ANSI/ASME A17.1 or the latest edition, and other requirements of the State Department of Licensing and Regulation, Division of Labor and Industry (COMAR 09.12.81 through 09.12.83)
- 13.10. Lead Exposure:** Maryland Occupational Safety and Health Standards for occupational exposure to lead in construction work. These regulations apply to occupational exposure to lead by every employee in construction work.  
(Occupational Safety and Health Standard 29 CFR 1926.62 with Maryland Amendments and COMAR 09.12.31)
- 13.11. Hazardous Waste:** Maryland State Department of the Environment for disposal of controlled hazardous substances. These regulations establish standards for generators of hazardous waste. (COMAR 26.13.04.01)
- 13.12. Mechanical and Electrical Codes:** Latest adopted editions of the National Standard Plumbing Code (NSPC) with modifications and supplements, latest edition of the IMC – International Mechanical Code, latest edition of the National Electrical Code (NEC), and the latest edition of the National Fuel Gas Code (NFGC) ANSI Z223.1, NFPA 54.
- 13.13. Mechanical and Electrical Standards and Regulations:** The following Standards and Regulations shall be referenced or implemented for design considerations not covered by the listed codes. ASHRAE Standards, Procedures for Implementation of Energy Conservation, Maryland Department of Health Food Service Requirements, SMACNA, ASME, Institute of Electrical and Electronics Engineers (IEEE), Edison Electric Institute (EEI), Electronic Industries Application (EIA), Insulated Power Cable Engineers Association (IPCEA), and Certified Ballast Manufacturers Association (CBM), American National Standards Institute (ANSI), American Society of Mechanical Engineers (ASME), American Concrete Institute (ACI), Illuminating Engineering Society of North America (IES), Rules and regulations of the Baltimore Gas and Electric Company, ANSI/ASME Elevators and Escalators Safety Code A17.1 and National Electrical Manufacturers Association (NEMA).
- 13.14. Test Laboratories:** Underwriters Laboratories, Inc. (UL), and/or Canadian Testing Laboratories (CTL). Under certain conditions, with the written permission of the UMB electrical engineer, CTL may be acceptable.
- 13.15.** Compliance with all regulations of local authorities having jurisdiction, and service district utility companies (electric, water, sewage) for work located on and off campus.
- 13.16. Historic Lands and Structures:** When a project includes Historic Lands and Structures, the project shall be in compliance with Article 83B, Sections 5-617 and 5-618 of the Annotated Code of Maryland. The Maryland Historical Trust (MHT) shall review capital projects affecting historic properties.
- a. Notification:** Early in the Design Phase (SD Phase) of the Project the University's Project Manager shall be responsible for notifying the MHT, regarding the project. At that time the University Project Manager shall also schedule the necessary review meetings with MHT and the A/E. Other review groups may be included as indicated below:

## CHAPTER ONE – GENERAL REQUIREMENTS

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**Design Advisory Panel:** For Projects Located in Baltimore City Involving Historic Structures, the Design Advisory Panel (DAP) shall also be invited to review project documents.

- b. **Presentations:** The A/E shall be responsible for presenting the required project documents to the MHT for their review and comment.
- c. **MHT Assessment:** Based on an Initial Assessment by the Maryland Historical Trust, a Phase I Archaeological Survey may be required.
  - (1) Findings during a Phase I Investigation may require a Phase II Archaeological Investigation.

### 14. MEASUREMENT OF BUILDING AREAS, VOLUME AND EFFICIENCY FACTORS:

**14.1. Gross Area:** The gross area of buildings shall be measured as follows:

- a. **Measurement:** Measure from outside face of exterior wall to outside face of exterior wall.
- b. **Full Areas:** Include the gross area of each level:
  - (1) All interior floors (including stairs, shafts, etc.)
  - (2) Mezzanine or interior balcony
  - (3) Basement, sub-basement, pipe space, boiler room, etc. (six (6) feet or more high)
  - (4) Enclosed space beneath upper floors (stilt design)
  - (5) Mechanical space (six (6) feet or more high)
  - (6) Penthouse (stair, elevator, equipment, etc. six (6) feet or more high)
  - (7) Elevator machine room floor
  - (8) Fly gallery gridiron
  - (9) Pipe tunnels (six (6) feet or more high) under building and/or within ten (10) feet.
- c. **Half Areas:** Include one-half (0.5) of the gross area of:
  - (1) Paved porch/terrace with roof
  - (2) Exterior covered balcony
  - (3) Entrance canopy over paving
  - (4) Areaways (six feet or more)
  - (5) Unenclosed space beneath building (stilt design)
  - (6) Loading dock with canopy
- d. **Exclusions:** Gross Area
  - (1) Unusable/unfinished attic space under pitched roof
  - (2) Roof and roof parapets
  - (3) Interior court or yard
  - (4) Covered walks (site work)
  - (5) Sun shades
  - (6) Porch/terrace without roof

## CHAPTER ONE – GENERAL REQUIREMENTS

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- (7) Roof overheads (no paved walkway beneath)
- (8) Upper space of gym, pool, auditorium, lecture hall, large entrance exceeding one story, etc.

**14.2. Net Area:** The net area of buildings is defined and measured as follows:

- a. **Net Assignable Area:** This is the sum of all floor areas of a building allotted to an occupant, including types of space functionally usable by an occupant. Measurement is between inner faces of walls and partitions or imaginary dividing lines of open areas.
  - (1) **Examples:** Offices, classrooms, mail rooms, conference rooms, libraries, file rooms, storage pertaining to an occupant or program (not custodial or general storage), seminar rooms, laboratories (including balance, supply and preparation rooms, etc.), lecture rooms, auditoriums (including storage, dressing and preparation rooms, stage, etc.), toilet and locker rooms (including shower rooms) only when they are private and directly supporting a room function (e.g., for a patients room, examination room, gymnasium, kitchen, actor's dressing areas, student bedrooms or houseparent's apartment, etc.), lounges (academic, dormitory, faculty, patient, etc.), kitchen (including food storage areas, dining rooms, etc.), athletic courts, swimming pool, dance and wrestling rooms, rifle range, library reading and stack areas (including processing, study, audio, micro-film and typing rooms, but excluding "phantom" corridors), etc. "Phantom" corridors mean a circulation space not specifically defined by fixed or movable walls.
- b. **Non-assignable (supporting) Area:** This is the total of all areas remaining after net assignable areas have been deducted from the gross area. Non-assignable areas include the following:
  - (1) **Custodial:** For building protection, care, maintenance and operation, e.g., custodial storage, janitor closet, maintenance store room, locker room, toilet and shower room, shop, etc.
  - (2) **Circulation:** Required for physical access to some subdivision or space, whether or not enclosed by partitions, e.g., corridors (access, public, service, including "phantom" corridors for large unpartitioned areas), elevator shaft, escalator, fire tower and stairs, stair hall, loading platform (except when required for a program function), lobby, public vestibule or entryway, tunnel, bridge, stair or elevator penthouse, elevator machine room, covered paved open areas, etc.
  - (3) **Mechanical:** To house mechanical equipment, utility services and non-private toilet facilities, e.g., duct and service shafts, meter and communication closets, boiler room, mechanical and electrical equipment rooms, telephone equipment rooms, fuel room, toilet rooms for public or general use, etc.
  - (4) **Construction:** The areas actually occupied by the structural and other physical features of the building, e.g., exterior walls, fire walls, partitions, etc.

## CHAPTER ONE – GENERAL REQUIREMENTS

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### 14.3. Gross Volume:

- a. **Full Volumes:** (for fully enclosed areas) For each portion of the building, multiply the gross area by the average height of that portion from the underside of its base floor slab (or underside of crawl space floor slab or top or ground if no slab exists) to the top of the finished roof. The height of enclosed space beneath plazas, etc. shall be from the underside of the base floor slab to the finished surface of the plaza.
- b. **Half Volumes (for partially enclosed areas):** For each half area of a building, multiply one-half (1/2) of the gross area by the average height as follows:
  - (1) **Covered Porch/Terrace & Building Dock:** From ground level to the top of the finished roof.
  - (2) **Exterior Covered Balcony:** From the underside of the floor construction system to the top of the finished roof.
  - (3) **Entrance Canopy Over Paving:** From the underside of the slab to the top of the finished roof.
  - (4) **Areaways:** From the underside of the base slab to the top of the enclosure walls or grating.
  - (5) **Unenclosed Space Beneath Building (Stilt Design):** From the top of the slab to underside of the ceiling, if there is any enclosed floor or crawl space beneath the open area. From the underside of the slab to the underside of the ceiling, if there is no enclosed floor or crawl space beneath the open area.

### 14.4. Tabulation: Tabulation of areas, volume and efficiency shall be prepared and furnished by the A/E as follows:

- a. **Itemize:** Itemize tabulations for the following:
  - (1) **Gross Area:** Floor by floor plus appurtenant areas.
  - (2) **Net Assignable Areas:** Room by room.
  - (3) **Gross Volume:** Includes half volumes of partially enclosed areas as well as full volumes of totally enclosed areas.
  - (4) **Efficiency Factors:** Divide the gross area by the net assignable area.
    - a) **Example:** 49,209 SF gross area divided by 33,705 SF net assignable area = 1.46.
  - (5) **Percent Efficient:** Divide the net assignable area by the gross area and multiply by 100.
    - a) **Example:** 33,705 SF net assignable area divided by 49,209 SF gross area, multiplied by 100 = 68.5% efficient.
- b. **Building Efficiency Factors (Guidelines):** The following criteria; for building efficiency factors has been adopted from the DGS Procedure Manual for Professional Services, July, 2003 Edition:

**CHAPTER ONE – GENERAL REQUIREMENTS**

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<b>Building Type</b>	<b>Efficiency Factor Range</b>	<b>Mid-Point</b>
Administration / Office	1.67 (60%) - 1.82 (55%)	1.74 (57%)
Library	1.52 (66%) - 1.67 (60%)	1.60 (62%)
Classroom	1.65 (61%) - 1.85 (54%)	1.75 (57%)
Science (Undergraduate)	1.65 (61%) - 1.85 (54%)	1.75 (57%)
Science (Research)	1.72 (58%) - 1.92 (52%)	1.82 (55%)
Medical (Teaching)	1.75 (57%) - 1.95 (51%)	1.85 (54%)
Dormitory	1.33 (75%) - 1.54 (65%)	1.43 (70%)
Dining Hall (Kitchen)	1.40 (71%) - 1.60 (62%)	1.50 (67%)
Student Union	1.60 (62%) - 1.75 (57%)	1.67 (60%)
Performing Arts Fine Arts	1.75 (57%) - 1.95 (51%)	1.85 (54%)
Theater, Auditorium, Concert Hall	1.45 (69%) - 1.60 (62%)	1.52 (66%)
Gymnasium	1.40 (71%) - 1.50 (67%)	1.45 (69%)
Patient Health Facility	1.70 (59%) - 1.85 (54%)	1.77 (56%)
Maintenance Shop	1.25 (80%) - 1.35 (75%)	1.30 (77%)

**c. Submission of Areas, Volume and Efficiency:**

- (1) Requirements:** Submissions are required for all new buildings and additions: they may also be required for alterations and renovations.
- (2) Forms:** Use Summary-Areas, Volume & Efficiency Forms in Division V: Attachments of this Procedure Manual.
- (3) Content:** Submissions at each phase shall show not only the tabulations of that phase, but shall also show the tabulations of program and all prior phases, based on approved plans of the prior phases, on the same form.
- (4) Copies:** Submit in triplicate to the University’s Project Manager.

**d. Submission Schedule:** The A/E shall submit current detailed tabulations of areas, volume and efficiency at the time of submission of plans for review, at each phase of submission of plans, initially, and at each submission of revised plans as follows:

- (1) Concept Design Phase:** On each architectural floor plan, the actual net assignable and the programmed net assignable area shall be noted for each programmed space.
- (2) Schematic Design Phase:** On each architectural floor plan, the actual net assignable and the programmed net assignable area shall be noted for each programmed space.
- (3) Design Development Phase:** On each architectural floor plan, the actual net assignable and the programmed net assignable area shall be noted for each programmed space.
- (4) Construction Document Phases (50%, 95% and 100%):** On each architectural floor plan, the actual net assignable and the programmed net assignable area shall be noted for each programmed space.
- (5) Other:** As requested.

### 15. SUB-SURFACE EXPLORATION AND EVALUATION:

- 15.1. Requirements:** The A/E shall plan and perform the subsurface exploration and evaluation and procure the information relative to the site and subsurface conditions relevant to the project requirements. The data procured shall be adequate, correct and reasonably complete for the intended purposes of planning, design, quantity, and cost estimating, and determining the construction feasibility of the project.
- 15.2. Subsurface Data:** The A/E shall make available the procured data relating to the site and subsurface information and evaluation to the University Project Manager prior to starting their functions of design, review, bidding, construction and inspection respectively.
- 15.3. Geotechnical Engineer:** The work of subsurface exploration and evaluation shall be performed under the direct guidance, direction, and control of the geotechnical engineer. All submittals to the University relating to and including the results of the subsurface exploration, evaluation and recommendations shall bear the seal of the geotechnical engineer.
- 15.4. Exploratory Program:** During the Schematic Design Phase, the A/E shall submit to the University Project Manager, for review and approval, three (3) copies of the proposed Exploratory Program. The Exploratory Program shall include, but not be limited to the following:
- a. Scope:** Understanding of the project and design considerations.
  - b. Boring Plan:** A layout of test borings/pits with reference to existing physical features and proposed locations of structures. Site plan of the project showing location of structures, grading, storm water management areas, and utilities may preferably be used to show the test locations.
  - c. Description:** Number, type, and estimated depths of test borings/pits or other investigative systems.
  - d. Estimated Quantities:** Estimated linear feet of earth borings and rock coring and types and estimated quantities of laboratory and field tests.
  - e. Estimated Cost:** Estimated cost for the subsurface exploration at the billing unit prices.
- 15.5. Utility Verification:** After approval of the Exploratory Program by the UMB Project Manager, the A/E shall conduct the subsurface investigation and evaluation. Prior to starting field operations, A/E shall verify the presence and location of underground utilities with Miss Utility, Private Utility Locators, or University Utility Locators if applicable.
- 15.6. Geotechnical Report:** Upon completion of subsurface exploration and evaluation, the A/E shall submit to the University Project Manager three (3) copies of the Geotechnical Report and any additional results, reports, supplements, revisions, modifications or clarifications developed subsequent to the original report. As a minimum, the report shall address each of the following:
- a. Geology:** Geology and general nature of soil/rock/drainage/ and groundwater conditions in the project area.
  - b. History:** A history of the project site and relevant information relating to the nearby foundations and structures, underground springs, etc.

## CHAPTER ONE – GENERAL REQUIREMENTS

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- c. **Boring plan:** Boring plan, to scale, indicating boring and test pit locations referenced to existing physical features and proposed locations of structures and other facilities.
- d. **Logs:** Boring and test pit logs, with soil/ rock description, classification, and depth of character of fill, ground water observations made during the exploration.
- e. **Characteristics:** Information relating to rock/soil character, consistency, compressibility, shear strength, safe bearing value, chemical content, corrosiveness, frost penetration depth, permeability, and relevant properties.
- f. **Quantity Estimates:** depths, locations, and quantity estimates of topsoil, unsuitable soils, existing fill, rock excavations, borrow, demolition debris or controlled substances, etc.
- g. **Rock Line:** Rock line elevations with cross-sectional profiles, evidence that rock strata is sound and not underlain by mine cavities or lenses that would affect the stability and support capability. Provide recommendation's for corrections in case of questionable stability.
- h. **Foundation Analyses:** Foundation analyses and recommendations including the presentation of risk and cost effectiveness considerations.
- i. **Foundation Information:** All relevant foundation information including design parameters, elevations of bottom of footings or pile tips, related soil bearing or pile capacity, factors of safety and settlement analysis considerations.
- j. **Recommendations:** Recommendations for design and support of floor slab, retaining or basement walls, water or damp proofing and drainage, underground utilities, pavements or driveways and parking lots, stability of slopes, ground water seepage control, or other stabilization procedures.
- k. **Site Evaluation:** Relating to the excavation and earthwork feasibility. If rock excavation is involved, indicate definition, removal and handling type of equipment, blasting requirements, etc. For earthwork, indicate shrinkage factors, suitability of on/off-site materials, and borrow requirements and source. Include groundwater observations, elevations and recommendations for temporary dewatering during construction and for permanent dewatering during construction. Effects of seasonal variations shall be noted.
- l. **Potential Problems:** Identify problems which may affect the cost of construction and/or cause delays, and furnish construction precautions and recommendations. Identify inspection, testing and quality control requirements during the construction.
- m. **Storm Water Management Recommendations:** Identify the type of storm water management facilities suitable for the site and design parameters to be used by site engineer for systems sizing.

### 16. SEDIMENT AND EROSION CONTROL, AND STORM WATER MANAGEMENT:

- 16.1. **Requirements:** It is required that review and approval be granted by the Maryland Department of the Environment (MDE), Sediment and Storm Water Administration (COMAR 26.17.01 and 26.17.02), for all projects in which existing earth surfaces are disturbed in the execution of the project or which on-site storm water management is required, to current limitations established by MDE. Should a flooding hazard be present, which cannot be alleviated by natural features, retention measures may be required in the design of controls. The A/E shall be responsible for submitting plans, specifications and computations with the Design Development and Construction Document submittals directly to MDE for review. One copy of the transmittal letter with MDE's signature

## CHAPTER ONE – GENERAL REQUIREMENTS

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acknowledging receipt shall be submitted to the University as part of DD submission to the University Project Manager.

- 16.2. Program:** The A/E shall provide sediment and erosion control, and storm water management programs at all design phase submissions. The final storm water management, sediment and erosion control plan(s) shall address all aspects of the construction phase such as stabilization of temporary stockpiles of topsoil, waste material, etc. in addition to the overall requirements of the Sediment and Storm Water Administration.
- 16.3. Contract Documents:** Contract documents and storm water management construction shall be in accordance with the Sediment Control Regulations approved and adopted by the MDE. No changes in these measures as shown in the contract documents may be approved by any person or agency other than MDE. The A/E shall be responsible for revising contract documents for any changes required by MDE.
- 16.4. Reference Manual:** The reference manual controlling specifications for Soil Erosion and Sediment Control, latest edition can be obtained at:
- a. Maryland Department of the Environment  
1800 Washington Boulevard  
Baltimore, Maryland 21230
- 16.5. Certification:** Contract drawings submitted to MDE for approval must contain both Engineer's and Developer's Certifications. See Division V: Attachments of this Procedure Manual for the Engineer's and Developer's Certification Form.

### 17. WATER AND SANITARY SYSTEMS:

- 17.1. Requirements:** The A/E shall comply with all the requirements of COMAR Title 09, Department of Licensing & Regulation, Subtitle 20, Board of Commissioners of Practical Plumbing and COMAR Title 26, Department of the Environment, Subtitle 04, Regulation of Water Supply, Sewage Disposal, and Solid Waste.
- 17.2. State Permits:** When the project requires connections to water or sewer in excess of four hundred (400) linear feet and/or a new storage or treatment facility other than septic systems that discharge underground, the A/E shall obtain a Water & Sewage Construction Permit from the Applications and Permits Section, Water Management Administration, Department of the Environment.
- 17.3. Swimming Pools:** Where the project requires a design for a swimming pool, comply with all requirements of COMAR 10.17.01.
- 17.4. Water Appropriation:** When the project requires the withdrawal of either ground water or surface water, on either a temporary or permanent basis, the A/E shall be responsible for complying with all permitting requirements and shall comply with COMAR 26.17.06, "Water Appropriation or Use".
- 17.5. Water Discharge:** When the project requires the discharge of water, on either a temporary or permanent basis, the A/E shall be responsible for complying with all necessary permits to satisfy the requirements of the National Pollution Discharge Elimination System



## CHAPTER ONE – GENERAL REQUIREMENTS

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(NPDES) established under the Federal Act B in accordance with the provisions and conditions of COMAR 26.08.01 – 26.08.04, "Water Pollution".

**17.6. Utility Connections:** The A/E shall be responsible for making application to and obtaining from any and all local city and State regulatory agencies, those approvals necessary to make utility connections to available public, private or municipal water and sewer facilities to serve the site or to construct the necessary on-site sanitary facilities to support the building project in its entirety.

- a. Owner Approval:** The A/E shall obtain, from the owners of the utilities, the necessary approvals for connection to the same and shall be responsible for coordination of the actual utility connection with the contractor's work schedule.
- b. Trade Permits:** Mechanics and/or trade permits will be obtained by those trades as required by them.
- c. Payment:** Actual payment of any local water and sewer charges or connection fees will be the responsibility of University unless otherwise required. The A/E shall direct the utility owner to invoice the University for said charges unless otherwise required, and shall copy the University Project Manager on all correspondence and telephone conference reports.

### **18. PRESENTATION TO THE ARCHITECTURAL REVIEW BOARD (ARB):**

**18.1. Requirements:** The A/E will be required to make presentations to the Board of Architectural Review at the Schematic/ Design Development Phase in connection with new buildings, building additions, and major renovations that alter the building exterior.

#### **18.2. Schematic Design Presentation:**

- a. The Presentation:** The Board of Architectural Review will consider this presentation as the Schematic Design Phase regardless of the state of development and shall make its comments and recommendations accordingly.
- b. Notification:** The A/E will be notified of date and time of the board meeting. The A/E will be advised of the time limit for the presentation to the board. The University Project Manager will schedule any of the A/E presentations before the Board of Architectural Review. The A/E shall provide an explanation of the program, the schematic design of the building, the site, a simple block model and cost of the project.
- c. Considerations:** The board will consider all factors affecting the project, including program, setting, adaptability of the master plan, and the architectural design. The board, in its comments and recommendations, will evaluate the functional and aesthetic aspects of the project design, and consider whether the project can be built economically, consistent with sound construction and minimum maintenance.
- d. Recommendations:** After considering the submission, the board shall discuss with the A/E the tentative recommendations of the board. The A/E will be given the opportunity to reply to the board's comments. The Board shall develop the final recommendation in the presence of the A/E. The A/E and University will take the ARB comments and recommendations into consideration at the Design Development Phase and respond as necessary. The University will then inform the ARB in writing of the University's intended design direction.

## CHAPTER ONE – GENERAL REQUIREMENTS

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**18.3. Minutes:** The Board supplies written minutes which are sent to University. The University Project Manager will advise the A/E and instruct them as to how they are to proceed.

### 19. APPROVAL OF CONTRACT DOCUMENTS:

**19.1** The approval of contract documents, which includes plans and specifications, by the University in no way relieves the A/E of their responsibility for:

- a. The accuracy and completeness of such documents,
- b. Compliance with required Standards, Codes, Ordinances or other applicable regulations, and
- c. Compliance with standard of care governing the A/E performance.

### 20. CERTIFICATION OF CONTRACT DOCUMENTS:

**20.1. Professional Certification:** Immediately after the contract documents have been reviewed, approved and all necessary signatures placed thereon, the A/E shall place the following certification on each of two prints of the title signature sheet of the plans and forward same to the University Project Manager: "The contract documents for the indicated public improvement were prepared under my supervision and, to the best of my knowledge, information and belief, they comply with the relevant building codes."

**20.2. Seal and Signature:** All contract documents, drawings, specifications, etc., shall bear the seal and signature of the primary A/E and the seal and signature of each consultant to the primary A/E on drawings and specifications within their area of responsibility.

### 21. PAYMENTS FOR PROFESSIONAL SERVICES:

**21.1. Full and/or Partial Contract:** When the A/E has a full and/or partial services contract, payment requests shall be made per the A/E contract documents. When the A/E has extra work on a not to exceed basis, payment requests shall be made in accordance with the A/E contract documents.

**21.2. Payment Request:** Bills may be presented at the beginning of each month covering the costs of service during the previous month. Furnish original and one copy.

**21.3. Required Services:** All services required under the A/E agreement must be provided prior to the University's approval of each phase as well as prior to the University's approval of A/E invoices for payment of applicable fees.

**21.4. Final Payment:** Final payment of the A/E's Construction Administration Phase fee shall only be payable upon submission and University acceptance of the "Record Drawings" and all other remaining outstanding documentation or services. Final payment of the A/E's Post construction Phase fee shall be payable upon submission of the Post Construction report.

**END OF CHAPTER 1**