DIVISION II

PROCEDURES

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Latest Update 6-11-15, See underlined text.

1. PRE-DESIGN CONFERENCE:

1.1. Purpose: As soon as practicable after the Design/Build Contractor's (DBC's) contract with the University has been fully executed the University Project Manager will call a conference to initiate the project. This meeting will include the DBC, A/E and its consultants, a representative(s) of the client, the University Design Review Team, and the University Project Manager.

1.2. Topics: At this meeting, the following will be furnished, made available, and/or reviewed with the DBC A/E:

a. **University Procedure Manual for Professional Services for Design/Build Contracts**

b. **University DBC A/E Design Standards**

c. **University CAD Standards included in the University A/E Design Standards**

d. **University Project Number**

e. **Program:** The approved Project Program

f. **Hazardous Materials:** Review the statements in the approved Project Program and/or other information addressing the presence or absence of lead-based paint, asbestos, PCB, and/or other materials that necessitate restricted handling.

g. **Project Budget:** Review the design-to budget for the project.

h. **Project Drawings:** Review project drawing distribution.

i. **Project Forms:** Project Forms for Summary of Areas-Volume-Efficiency, Tabulation of Gross Area, Summary of Net Assignable Areas, Building Code Study Data, Project Description Sheets with Instructions, Request for Change Order Proposal Form, Engineer's and Developer's Certification Form, for all

types and phases of the project are included in Volume V of this Procedure Manual.

j. **University Personnel:** The names and titles of the University personnel involved with the project.

k. **Available Information:** All site, utility, topographic and master plan information as may be available (if additional information is required, it must be requested in writing by the DBC).

l. **Site Visit:** Date and authorization for site visit.

m. **Permits or other Regulatory/Municipal Requirements:** Where required, applicable Federal, State, or Local permits and/or requirements for MDE, BGE, Trigen, State Fire Marshall, NIH, or Baltimore City and local jurisdictions or other utilities, shall be included in the CD's.

n. **Project Service Schedule:** The project service schedule for all applicable DBC A/E services shall be developed, and shall include the following as a minimum:

(1) Programming , Study and Interior Design

a) Capital Project Program - Part I:

1) Meetings with the clients representatives

2) DBC A/E Submission

3) University Review

4) Meetings with the DBC A/E

5) Final Submission

b) Capital Project Program - Part II:

1) Meetings with the clients representatives

2) DBC A/E Submission

3) University Review

4) Meetings with the DBC A/E

5) Final Submission

c) Feasibility Study:

1) Meetings with the clients representatives

2) DBC A/E Submission

3) University Review

4) Meetings with the DBC A/E

5) Final Submission

d) Space Planning:

1) Meetings with the clients representatives

2) DBC A/E Submission

3) University Review

4) Meetings with the DBC A/E

5) Final Submission

e) Engineering Study:

1) Meetings with the clients representatives

2) DBC A/E Submission

3) University Review

4) Meetings with the DBC A/E

5) Final Submission

f) Interior Design:

1) Meetings with the clients representatives

2) DBC A/E Submission

3) University Review

4) Meetings with the DBC A/E

5) Final Submission

(2) Design Phase Services:

a) Concept Design Phase: Included when required by the Request for Proposal (RFP).

1) Program Verification Phase and Meetings

2) A/E Submission

3) University Review

4) Design Meetings with the DBC A/E

5) Meetings with the DBC A/E and other parties to review cost estimate, and conduct Value Engineering sessions as needed.

b) Schematic Design Phase:

1) Program Verification Phase and Meetings. When the RFP requires a Concept Design Phase, the Program Verification shall be included in that phase.

2) DBC A/E Submission

3) University Review

4) Design Review Meetings with the DBC A/E

5) Meetings with the DBC A/E and other parties to review cost estimate, and conduct Value Engineering sessions as needed.

c) Design Development Phase:

1) DBC A/E Submission

2) University Review

3) Design Review Meetings with the DBC A/E

4) Meetings with DBC A/E and other parties to review cost estimate, and conduct Value Engineering sessions as needed.

d) Construction Documents Phase: 50% CD, 95% CD, & 100% CD:

1) DBC A/E Submission

2) University Review

3) Design Review Meetings with the DBC A/E

4) Meetings with the DBC A/E and other parties to review cost estimate, and conduct Value Engineering sessions as needed.

(3) Bid Support and Construction Administration Services:

a) Bidding Support

b) Construction Administration Services

c) Post Construction Survey

o. Additional Information: Determine any additional information which the DBC A/E may need to complete the project.

p. Special Policies: Any special University policies applicable to each phase of the project.

q. University Design Standards: See the Design Standards for the applicable University.

r. Available Data: In new construction and renovation, alteration and addition projects, such data as may be available on the existing facilities will be identified to the DBC A/E. The DBC A/E will be given access to the University Archives for the purpose of identifying and reviewing available documentation. The University will make arrangements to have the identified documents printed (1 set) for the A/E's use. The DBC A/E must visit the site of the project and familiarize themselves fully with the use, operational conditions, and limitations of said site and perform sufficient field survey or obtain measurements and other information relative to existing conditions and improvements as provided in the project program.

s. **Project Design Review Meetings:** During the preparation of each Design Phase a series of design review meetings will be held with the University Project Manager, University Design Review Team, and the designated person(s) representing the users. At the completion of each Design Phase a Review Conference for each Design Phase will be coordinated by the University Project Manager to review the progress of the project and provide comments to the DBC A/E Design Team. Meetings will be scheduled at the conclusion of each design phase and as needed. The DBC A/E shall prepare and distribute minutes of these meetings to the University Project Manager.

t. **Cost Estimates:**

(1) **Budget Cost Estimates:** Provide a budget cost estimate for all programs, studies, and space planning reports as required by the DBC scope of work.

(2) **Construction Cost Estimates:** A construction cost estimate shall be fully developed for each design phase. Total project cost figures shall include the costs escalated up to the anticipated midpoint of construction, including contingencies. The DBC A/E shall not design for, or contemplate, funds being available in excess of those identified as the design-to budget by the University.

u. **UM Web Site:** UM Master Specifications, A/E Design Standards Manual, A/E Procedures Manual for Design/Build Contracts, CAD Standard Drawing Templates, CAD Detail Files and Project Forms can be accessed at the following site:
http://www.umbfm.umaryland.edu/

2. GENERAL DESIGN DOCUMENT REQUIREMENTS:

2.1. **Design/Build Prime Consultant (PC):** The prime consultant shall be responsible for all aspects of the designs produced by the prime consultant and sub-consultants including but not limited to the verification and accuracy of all floor plans either created by the PC or supplied by the University. When electronic files of existing buildings are supplied by the University for use by the design team, the PC shall be responsible for verifying, and when necessary correcting, the plans to ensure they are correct. Plans that are inaccurate will not be acceptable to the University. The prime consultant shall be responsible for coordination between disciplines during all phases of the design process. Coordination issues documented as part of a review shall be addressed by the affected disciplines and the appropriate corrections shall be documented on the next submission. The PC shall also be responsible for the preparation of the Division 1 specification sections.

2.2. Sign and Seal Drawings: Each consultant shall sign and seal a complete set of 100% bid documents for their discipline. The signed and sealed drawings shall be transmitted electronically, as pdf files, to the University unless otherwise directed by the University Project Manager.

2.3. Number of Submission Sets: The following requirements apply to all design documents for all projects unless waived by the University in writing.

a. The complete set of design documents that are submitted to the University for the SD, DD, 50%, 95% and 100% CD review's shall include twelve (12) sets of bound specifications, eight (8) full size sets of drawings and four (4) mini (half size) sets of drawings to the University for their use and distribution. For additional documentation submission requirements see paragraph 3.1.

b. Some projects may require additional sets for review. The DBC A/E shall verify the required number of sets with the University Project Manager, prior to submission of the above stated minimum.

c. CAD Drawings and Files: Provide one (1) complete set of electronic files (CAD) for the 50% submission, the 100% bid document submission, conformance sets as necessary during bidding and construction for incorporation of all addenda and drawing changes, and the "Record Drawing" submission. See University Architectural and Engineering Design Standards for the applicable campus latest edition, for the University's Guidelines for CAD electronic file requirements.

d. General Electronic Files: General electronic files include scopes of work, project specifications, cost estimates, studies, A/E calculations, building and/or system analysis, VE documentation, produced by the DBC A/E team. Provide one (1) complete set of general electronic files along with the "Record Drawing" submission. See University Architectural and Engineering Design Standards for the applicable campus latest edition for the University's Guidelines for CAD electronic file requirements.

2.4. General Drawing Organization Requirements:

a. CAD Drawings: The DBC A/E's shall produce contract documents on CAD (Computer-Aided Design).

b. Drawing Material: The signed and sealed 100% bid documents will be accepted electronically as pdf files. The "Record Drawings" will be accepted electronically in dwg and BIM formats. For all interim contract drawing submissions, for review, paper media will be acceptable.

c. **Drawing Templates (Sheet Sizes):** Some University Campuses require the DBC A/E to use Standard Drawing Templates for all projects. Standard Drawing Templates include 8 1/2 x 11, 11 x 17, 24 x 18, 24 x 36, 30 x 42, and 30 x 48 Drawing Templates. The 8 1/2 x 11 and the 11 x 17 sheet templates shall only be used by the DBC A/E to document revisions and/or additions to the bid documents when full size revision sheets are not required to document the changes otherwise full size sheets shall be used to document all revisions to the bid documents.

d. **Dates/Project No.:** Dates must be shown on all drawings, with revision dates when applicable. University Project number, building number, and title shall be shown in the bottom right hand corner and scale shall be noted.

e. **Drawing Scales:** Floor Plans and Elevations and Sections should be developed using a Scale of 1/8 inch = 1 foot -0 inches. Use a Scale of 1/4 inch = 1 foot-0 inches for partial floor plans such as toilet rooms, class rooms, mechanical equipment rooms, electrical equipment rooms, and other partial floor plans used for selected projects, etc.

f. **Graphic Scales:** Each drawing containing plans, details, sections, and elevations shall include a graphic scale(s) located in the lower right hand area of the drawing. Where drawings include details and or sections at various scales, provide a graphic scale for each scale used.

g. **Key Plan:** Each drawing containing partial plans of floor or roof areas shall include a key plan which indicates the relationship of the partial plan to the complete floor plan.

h. **Architectural and Engineering Data:** The following architectural and engineering data shall be included on the appropriate drawing for each architectural, structural, mechanical and electrical set as defined in the UM Standard Drawing Numbers and Sheet Titles in Division V: Attachments of this Procedure Manual.

(1) Architectural:

a) Under the heading of code analysis list data for all applicable codes, federal accessibility standards, building use/ construction classifications, fire resistance ratings for major building components, all protected vertical openings, all unprotected vertical openings, fire protection systems, maximum travel distances and dead end corridors with automatic sprinklers, exit and exit access widths for

sprinklered buildings, special locking arrangements (if applicable), roof access, elevators, smoke detection, and means of egress. Include with each major heading all applicable code references and COMAR References. Also include the project gross area in square feet and the net assignable area in net square feet.

(2) Structural:

a) Design dead load, partition load and live load for each and every area of the building, including the roof, and snow loads for the roof areas. Allowances shall be included, wherever applicable, for additional loads due to mechanical equipment, piping, ceilings, etc.

b) Design bearing value for all spread footings and caissons, and bearing load for all piles.

c) Concrete strength required for each part of the building.

d) Steel yield point strength for all reinforcing and structural steel.

(3) Mechanical:

a) **Heating:** Total heat loss for the building in BTUs and steam pounds per hour for steam heating source, ventilation load in BTUs, domestic hot water load in BTUs, heating design temperatures inside and outside, and building gas consumption in cubic feet per hour.

b) **Cooling:** Total heat gain for building in BTUs per hour, ventilation load for building in BTUs per hour, indoor/outdoor temperature and humidity design conditions.

c) **Plumbing:** Total plumbing fixture unit counts for sanitary, domestic cold water, domestic hot water and domestic hot water consumption maximum demand in gph, maximum gas consumption in cubic feet per hour for laboratory use.

(4) Electrical:

a) **Electrical:** Estimated load summary of the demand and connected electrical load for the normal power distribution

system, including breakdown of the lighting system, receptacles, HVAC systems, etc. Estimated load summary of the demand and connected electrical load for the emergency power distribution system, including breakdown of the loads for the emergency system, legally required standby system, and optional standby system, as well as the type and size of stand-by power unit(s) and its source.

b) **Special Systems:** (as appropriate) System description and features for all special systems, including telecommunications, security, fire alarm, metering, audio visual, and CCTV.

2.5. **Cover Sheets:** The DBC A/E shall use the University standard cover sheet provided by the University for all Projects for the UM campus. When preparing documents for other campuses the DBC A/E shall follow the Drawing Standards for that campus or create a cover sheet. The following items shall be included on the cover sheet:

a. **University Logo**

b. **Name of Project**

c. **University Project Number**

d. **A/E Project Numbers**

e. **Location (full address as directed by the University)**

f. **Board of Public Works - Governor, Comptroller, Treasurer**

g. **Maryland General Assembly-Senate President, House Speaker**

h. **Names, addresses and phone numbers of all consulting firms**

i. **Sheet Index:** The A/E shall use the University Standard Sheet Numbers and Sheet Titles for all projects See Division V: Attachments of this Procedure Manual for further information.

2.6. **Title Block Information and Format:** The DBC A/E shall use the UM standard sheet template files, provided by the University, for all Projects for the UM Campus. When preparing documents for other campuses the DBC A/E shall follow the drawing standards for that campus or use their own drawing standards. The following items shall be included in the UM Title Block:

a. **DBC A/E Consultant Block:** List each consultant, including title, address, telephone, and fax numbers.

b. **Registration/Stamp Block:** Architects' and engineers' names, seals, etc. shall be placed in this location on each drawing.

c. **Project Title Block:** Include the University project number, A/E project number, the University CAD file number, and date in the appropriate locations in this block. The University will furnish the required CAD File Number to the A/E.

d. **Sheet Title Block:** Such as "FIRST FLOOR PLAN", "FINISH SCHEDULE," etc.

e. **Revision Block:** List each revision for each drawing indicating revision number, date of revision and brief description.

f. **Sheet Number Block:** Sheet numbers shall be comprised of a discipline specific letter prefix followed by a three digit number without being separated by spaces, periods, or dashes. The three digit numbers shall start at 001 for each discipline. Divide the sheets into groups according to disciplines and use the following letter prefix for each: **A** for architectural; **C** for civil/site; **L** for landscaping; **S** for structural; **M** for mechanical; and **E** for electrical. When demolition drawings are required divide the sheets into groups according to disciplines and use the following letter prefix for each: **AD** for architectural demolition; **CD** for civil/site demolition; **LD** for landscaping demolition; **SD** for structural demolition; **MD** for mechanical demolition; and **ED** for electrical demolition. If a project requires drawings of specialty areas e.g data/communication, security, audio/visual, or food service, a prefix for sheet numbering shall be recommended to the University Project Manager for approval. For a complete list of standard project sheet titles and sheet numbers, for UM campus projects, see Division V: Attachments of this Procedure Manual.

g. **Location of the Project:** As for example: “University of Maryland Baltimore”, “Coppin State University”, “Towson University”, “University of Baltimore”, “University of Maryland, Baltimore County”.

h. **Drawing Scale:** e.g. As noted, 1/8 inches = 1foot - 0 inch etc.

2.7. **Site Plans:** Use 1 inch = 40 feet, unless due to unusual circumstances another scale is specifically authorized in writing by the University Project Manager. The limit of the work must be accurately identified and located. Architectural scales may not be used.

a. Plans shall include locations of all new and existing buildings and structures, roads, walks, utilities, flood plains, wetlands and critical areas, etc. It shall indicate existing and proposed contours. Where a master plan exists, the plan shall show the future buildings adjacent to the proposed project.

b. A complete sediment control and stormwater management plan(s) as required by MDE, including Engineer's Certification and University of Maryland Certification shall be prepared and submitted to the University as required in Division I of this Procedure Manual.

c. Plans and specifications for excavation, retaining structures, dewatering, etc., where required, shall be included in the contract documents.

2.8. AutoCAD Protocol and Standards: The AutoCAD protocols and standards required by the University are defined in the campus Architectural and Engineering Design Standards, latest edition. In addition, the current trend in construction documentation is to model projects using Building Information Modeling (BIM) systems. All future projects shall be modeled using BIM processes, including the use of Revit software for architectural and structural disciplines and auto cad MEP for MEP disciplines. Each campus will develop standards and protocols for using BIM and will amend the appropriate University campus design standards to include those requirements as they are finalized and adopted.

2.9. Floor Plans: Floor plans shall be double line. Overall dimensions shall be shown. Major rooms, areas or space shall be appropriately identified by name, actual net square footage, and programmatic, net square footage. Each floor plan shall contain a note below the plan, indicating the approximate gross square feet and the net assignable square feet for each floor, including basements, mechanical floors, penthouses, etc. The first floor plan in the case of multiple story buildings shall contain a summary for the entire building.

a. Demolition Plans: Where demolition work is required, the floor plans and/ or site plan shall clearly show what work is to be removed and a reference provided to identify the proposed work for the same area. If lead is identified, the demolition plan and related notes shall describe the location and refer to the specification section which shall specifically describe or give the necessary regulation for the removal and disposal of potential lead hazards.

b. Lettering Size: Shall be a minimum one eighth (1/8) inch high.

c. **Line Work:** All line work shall be of sufficient density to provide uniform reproduction and photographic quality. See the CAD standards in the University Design Standards for additional information.

d. **Column Grids:** Provide column lines and numbers, and use north arrow indications on floor plans, part plans, sections, elevations, details, mechanical /electrical system riser diagrams etc.

e. **Section and Detail Symbols**: Note the sheet location of the section or detail involved.

f. **Key Plan:** Where a portion of a plan appears on a sheet, provide a key plan that shows the location of that portion with respect to the other portions.

g. **Room Title and Number:** Show room title and number on all plans. Coordinate with the University; for the final room number and name assignments.

h. **Delineation of Work:** Carefully delineate all drawings to distinguish between new work, existing work to remain, and demolition work.

i. **Partial Plans:** Provide larger scale partial plan(s) for project areas such as assembly halls, toilet rooms, mechanical equipment rooms, electrical equipment rooms etc.

2.10. **Elevations:** The design of the elevations shall define materials, coordination between materials and systems, and their placement. There shall be an elevation drawn for each building facade. The scale of the elevations shall not be less than one eighth (1/8) inches = 1 foot- 0 inch.

2.11. **Sections:**

a. Provide appropriate building sections necessary to show all sectional profiles of the building. There shall be at least two (2) building sections taken perpendicular to each other through the main body of the building.

b. Provide detailed sections through all major architectural elements including walls, stairs, elevators, atria, skylights, auditoria etc.

2.12. **Details:** Details shall be at a large enough scale to illustrate all structural elements, construction materials, dimensions etc.

2.13. **Reflected Ceiling Plans:** Reflected ceiling plans are intended to coordinate the design intention of the various trades involved, and should clearly indicate the

locations of all types of ceiling materials, bulkheads, full height partitions, access doors, diffusers, grilles, sprinkler heads, lights, speakers and all other work.

2.14. Future Expansion: Indicate proposed future expansions (both vertical and horizontal) and planned future equipment shown as dotted lines on site plans, architectural floor plans, engineering floor plans, roof plans and in elevations and sections.

2.15. Specifications:

a. UM Master Specifications: Some University Campus's require the A/E to use their Master Specifications for their projects. UM has developed a complete set of Master Specifications for Divisions 1, 14, 15, 26, 27 and 28. These sections shall be used for all UM Projects. The A/E shall review the University's Master Specification Table of Contents, provided by the University, and request from the University Project Manager all appropriate specification sections necessary to suit the current project scope. The A/E shall edit the University Master Specification Sections as indicated in the Design Standards. All project specification sections for each discipline shall include the standard UM header and footer and the body and footer shall use Times New Roman, size 12 text.

b. A/E Specifications: The DBC A/E shall utilize their own specifications and/or other resources only in those cases where the University Master Specification does not include the required equipment, materials, or construction procedures to suit the current project.

c. Specification Cover Sheet: See Division V: Attachments of this Procedure Manual for the University's standard cover sheet. The color of the cover page shall be selected by the University.

d. Table of Contents: All pages shall be complete, listing all division numbers and division titles as shown by CSI. After each division number and title, indicate the page numbers where the specification is to be found. If the project does not include any work in a specific division show "none" in the column of page numbers.

e. Assembly of Specifications: All specification pages must be firmly and permanently bound together with binding tape to prevent the removal of a page without the possibility of detection. Specifications must be printed on both sides of paper.

f. A/E shall follow the University Master Specification numbering and three part section format.

g. Where trade names or proprietary items are identified reference shall be made to "or approved equal".

h. Whenever brand name products are included at least three acceptable brands shall be named, if possible.

i. Hardware schedules are required in the specification. Hardware schedules shall be open to full competition except where proprietary cylinders or other hardware elements are required by the University. The DBC A/E shall determine the requirements of the University for the master key system and special hardware requirements.

j. Generalized all-inclusive ("grandfather") clauses must be avoided. Be specific with all written directions, instructions, and requirements. Specifications should follow CSI recommended practice and be clear, complete, correct, concise and coordinated.

k. Reference shall be made to the General Conditions in the appropriate divisions of the specifications.

l. **Instructions to Bidders:** Intentionally omitted. This is the responsibility of either the University or the Construction Manager.

3. SPECIFIC PROGRAMMING AND STUDY SERVICE REQUIREMENTS (If required):

3.1. **General:** All documentation shall utilize the University Standard Cover Sheets and Drawing Templates for drawings and bound reports.

3.2. **Capital Project Program - Part I:** The DBC A/E shall complete the Capital Project Program - Part I consistent with the terms of the A/E contract and shall include, as a minimum, the information indicated in the following paragraphs:

a. **Preface:** Include a campus map identifying the project site.

b. **Introduction:** Include description of the vision for the project.

c. **Project Overview:** Include a description of the University Campus. A summary of the project and a table which indicates the existing campus NASF by room code.

d. **Project Justification:** Include a description of the existing conditions. Identify projected figures for student enrollment, faculty and staff for both fulltime and part time populations over six (6) to sixteen (16) year time span. Provide a summary of problems to be addressed by the project and their consequences potential alternatives and a preferred solution for the project.

e. **Project Scope**: Include a description of the project site and the proposed construction.

f. **Meetings:** The consultants shall attend meetings with University personnel representing the client, facilities management, public safety, etc. to review the requirements for the project and the project documents submitted in this phase**.**

g. **Responses:** Consultants shall respond to review comments made by UM representatives.

h. **Submission:** The DBC A/E shall provide at least two (2) bound documents to the University.

3.3. **Capital Project Program - Part II:** The DBC A/E shall complete the Capital Project Program - Part II consistent with the terms of the DBC A/E contract and shall include, as a minimum, the information indicated in the following paragraphs:

a. **Instruction to the A/E:** Include a summary of the project, A/E qualifications, and a hazardous material statement.

b. **Design Services:** Include a general scope of work, identify basic design services, describe supplemental design services and supporting expert studies applicable to the project, summarize the drawing and document formats, and identify the information provided by the University.

c. **Design Criteria:** Summarize the requirements for codes, design standards, site development, architectural and structural designs, mechanical and electrical designs, and identify the building operation and maintenance requirements.

d. **Room Specifications:** Summarize the building service requirements, and room specification sheets. Also include a stacking diagram and a proposed program summary. Also include space layouts for typical laboratory module and/or other specialized rooms, complete with all appropriate dimensions, locations of furniture, case work, and equipment.

e. **Appendix:** Include a Building Code List, Project Consistency Report and an Environmental Assessment Form.

f. **Meetings:** The consultants shall attend meetings with University personnel representing the client, facilities management, public safety, etc. to review the requirements for the project and the project documents submitted in this phase

g. **Responses:** Consultants shall respond to review comments made by UM representatives.

h. **Submission:** The DBC A/E shall provide at least two (2) bound documents to the University.

3.4. **Feasibility Study:** The DBC A/E shall complete the Feasibility Study consistent with the terms of the DBC A/E contract and shall include, as a minimum, the information indicated in the following paragraphs:

a. **Introduction:** Include an introduction to the project and what the university expects to accomplish.

b. **Executive Summary:** Include a summary of the requirements for a new project, a renovation project, an addition to an existing building or a replacement of an existing building.

c. **Existing Conditions:** For new construction summarize the location and condition of the project site including the utilities. For renovation projects, addition to a building, or a replacement building summarize the conditions of the building including the architectural, structural, mechanical, electrical, plumbing, and safety elements.

d. **Analysis:** For new construction include a detailed analysis for each discipline. For renovation projects or an addition to a building include a detailed analysis of the existing systems and the anticipated modifications to each system.

e. **Recommendations:** When more than one design option is included in the study include the consultant's recommendation for each design option.

f. **Cost Estimate:** Include a summary of the cost estimate for the base design and any alternate designs.

g. **Appendix:** Include a detailed cost estimate spread sheet identifying the material and labor cost by units. Also include any drawings on 11x17 sheets to support the study.

h. **Meetings:** The consultants shall attend meetings with University personnel representing the client, facilities management, public safety, etc. to review the requirements for the project and the project documents submitted in this phase.

i. **Responses:** Consultants shall respond to review comments made by UM representatives.

j. **Submission:** The DBC A/E shall provide at least two (2) bound documents to the University.

3.5. **Space Planning:** The DBC A/E shall complete the Space Planning consistent with the terms of the DBC A/E contract and shall include, as a minimum, the information indicated in the following paragraphs:

a. **Introduction:** Include an introduction to the project and what the university expects to accomplish.

b. **Executive Summary:**

c. **Existing Conditions:** Identify existing conditions and how they may affect the project.

d. **Analysis:** Include the following:

(1) **Program Verification:** This service shall include a program verification element. The consultants shall attend meetings with University personnel representing the client, facilities management, public safety, etc. to review the requirements for the project.

e. **Recommendations:** Include the following:

(1) **Planning Concepts:** The consultants shall provide at least three (3) space planning concepts for the area, complete with all appropriate dimensions, locations of case work, furniture, and equipment.

f. **Cost Estimate:** Include a budget cost estimate for each space planning concept.

g. **Appendix:** Include the following:

h. **Responses:** Consultants shall respond to review comments made by UM representatives.

i. **Submission:** The DBC A/E shall provide at least two (2) bound documents to the University.

3.6. **Engineering Study:** The DBC A/E shall complete the Engineering Study consistent with the terms of the DBC A/E contract and shall include, as a minimum, the information indicated in the following paragraphs:

a. **Introduction:** Include an introduction to the study and what the university expects to accomplish.

b. **Executive Summary:** Include a summary of the requirements for a new project, a renovation project, an addition to an existing building or a replacement of an existing building.

c. **Existing Conditions:** For new construction summarize the location and condition of the project site including the utilities. For renovation projects, addition to a building, or a replacement building summarize the conditions of the building including the architectural, structural, mechanical, electrical, plumbing, and safety elements.

d. **Analysis:** For new construction include a detailed analysis for each discipline. For renovation projects or an addition to a building include a detailed analysis of the existing systems and the anticipated modifications to each system.

e. **Recommendations:** Include a summary of the proposed new systems and/or equipment in a base design and any recommended alternate designs.

f. **Cost Estimate:** The consultants shall submit a Budget Cost Estimate for this study.

g. **Appendix:** Include Life Cycle Cost Analysis Calculations supporting the systems and or equipment recommendations.

j. **Meetings:** The consultants shall attend meetings with University personnel representing the client, facilities management, public safety, etc. to review the requirements for the project and the project documents submitted in this phase.

k. **Responses:** Consultants shall respond to review comments made by UM representatives.

3.7. **Interior Design:** The Architect/Interior Designer shall complete the Interior Design consistent with the terms of the A/E contract and shall include, as a minimum, the information indicated in the following paragraphs:

a. **Finished Materials:** Include at least two (2) material samples for finishes such as carpet, ceiling tile, wall tile, floor tile, window blinds, fabric for furniture, window drapes and wood panels.

b. **Color Boards:** Include a color board with at least two (2) color samples for each finish.

c. **Cost Estimate:** The consultants shall submit a Budget Cost Estimate for the interior design.

d. **Meetings:** The consultants shall attend meetings with University personnel representing the client, facilities management, public safety, etc. to review the requirements for the project and the project documents submitted in this phase.

e. **Responses:** Consultants shall respond to review comments made by UM representatives.

4. DESIGN PHASE:

4.1. **General:** The submission requirements identified below and in the following paragraphs represent the minimum requirements the University expects from each discipline for each specific submission unless waived by the University Project Manager in writing.

a. **Transmittal:** Transmittal letter with each submission package.

b. **MDE Transmittal:** Copy of transmittal letter to MDE indicating that the project has been submitted for MDE review where required for projects.

c. **Cost Estimate:** Provide a complete cost estimate identifying the anticipated cost, for each discipline, for each submission phase as required by the DBC A/E Contract.

d. **Tabulations:** Update and submit Tabulations of Areas-Volume-Efficiency in triplicate at each submission phase.

e. **Design Data Form:** Building Code Design Data form.

f. **Geotechnical Report:** Complete Geotechnical Report.

g. **Response to Comments:** Provide a written response to the University review comments from the previous design submission, addressing each review comment individually.

h. Completed LEED™ check list.

4.2. Concept Design Phase: When required by the University, the DBC A/E shall complete the Concept Design Phase of the project consistent with the terms of the DBC contract and shall include the submissions indicated in the following paragraphs:

a. Documentation: All documentation shall utilize the University Standard Cover Sheets and Drawing Templates for drawings and bound reports.

b. Architectural Submission: The architectural submission shall include the following drawings and/or bound reports:

(1) Program Verification Phase: Include a Program Verification Phase. See Schematic Design Phase for requirements.

(2) Drawings: The drawings shall include the following:

a) Site Development Plan: A site plan at a scale of 1 inch = 50 feet-0 inches shall include the major proposed features such as sidewalks, roadways, parking areas, loading docks, site amenities such as benches, planting beds, trash receptacles, stairs in outdoor spaces, existing and new grading, contractor's staging area, and the limits of contract line. Provide elevations to show the relationship of major elements in the vertical plane as necessary with appropriate drawing notations. Also include a key plan identifying the site's relationship to the campus.

b) Building Plans, Elevations and Section's: Building plans, elevations and sections at a scale of 1/8 inch = 1 foot-0 inches shall include the following:

1) Floor Plans shall indicate the functional relationship of major spaces with appropriate drawing notations.

2) Elevations shall indicate massing of materials and fenestration with appropriate drawing notations.

3) Sections shall indicate the vertical relationship to grade and adjacent buildings, the floor to floor heights and major elements in the building or located on the roof with appropriate drawing notations.

4) The plans, elevations, and sections can be developed as a model, a perspective, or a computer generated slide presentation to walk through the building.

(3) Bound Reports: Bound Reports shall include the following:

a) A brief description of the proposed design concepts.

b) A brief description of energy conservation features.

c) An Area Analysis identifying the total net area and total gross area for the Program, the Design, and the Deviation between the program and the design for the Net Gross Area.

c. Structural Submission:

(1) Bound Reports: Bound Reports shall include the following:

a) A brief description of the proposed design concept.

b) A brief description of the structural system including the foundation. Provide a minimum of two (2) design approaches.

d. Mechanical Submission:

(1) Drawings: A site plan at a scale of 1 inch = 50 feet-0 inches shall include the locations of existing major mechanical utility systems, and locations of new connections.

(2) Bound Reports: Bound Reports shall include the following:

a) A brief description of the each engineered system, such as HVAC, Plumbing, Fire Protection, and or other systems as required by the program. Provide a minimum of two (2) design approaches for HVAC and Fire Protection Systems and include Green Design Features where applicable.

b) A brief description of energy conservation features.

e. Electrical Submission:

(1) Drawings: A site plan at a scale of 1 inch = 50 feet-0 inches shall include the locations of existing major electric and communication utility systems, and locations of new connections.

(2) **Bound Reports:** Bound Reports shall include the following:

a) A brief description of the each engineered system such as Lighting, Power Distribution, Security, Fire Alarm, Audio/Visual, Telecommunication and or other systems as required by the program.

b) A brief description of energy conservation features.

f. Consultants shall respond to review comments made by UM representatives.

4.3. **Schematic Design Phase:** The DBC A/E shall complete the Schematic Design Phase of the Project consistent with the terms of the DBC contract and shall include the submissions indicated in the following paragraphs.

a. **Program Verification Phase:** The DBC A/E, and appropriate consultants, will attend program verification meetings with University Representatives to review the program requirements. The University representatives will include the University Project Manager, the University design team, and the client representatives. When the University requires a Concept Design Phase, the Program Verification shall be included in that phase.

(1) The A/E shall provide a tabulation document which represents the Tabulations of Areas - Volume - Efficiency. This document shall be submitted as an electronic file in either a “doc” file format or in an “xls” spread sheet file format.

(2) Provide appropriate bubble diagrams and stacking diagrams to represent the intended horizontal and vertical adjacencies.

(3) The design process shall not proceed to the next design phase until the Program Verification Phase has been reconciled and approved by UM.

b. **Civil SD Submission:**

(1) Site Plan shall show locations of existing buildings and structures, roads, walks, utilities, flood plains, wetlands and critical areas within two hundred (200) feet of the proposed structure and/or within the limits of the contract. It shall indicate proposed site improvements, grading, access, parking areas, utilities, etc. Where a master plan exists, the site plan shall show the future buildings adjacent to the proposed project, proposed structures, and/or within the limit of contract, grading, drainage, planting, lighting, access, sediment and erosion control and storm water management conceptual drawings.

(2) Site Plan shall also include the building orientation, locations of existing and new utilities and a north arrow.

c. Landscape SD Submission:

(1) Site Plan shall show locations of existing buildings and structures, roads, walks, utilities, flood plains, wetlands and critical areas within two hundred (200) feet of the proposed structure and/or within the limits of the contract. It shall indicate proposed site improvements, grading, access, parking areas, utilities, etc. Where a master plan exists, the site plan shall show the future buildings adjacent to the proposed project, proposed structures, and/or within the limit of contract, grading, drainage, planting, lighting, access, sediment and erosion control and storm water management conceptual drawings.

d. Architectural SD Submission:

(1) **General:** Materials and methods of illustrating the schematic design phase are left to the A/E. However, all drawings for presentation to the Architectural Review Board shall be mounted on a firm backing for each display for review.

(2) The following drawings should be in the Schematic Design Phase submission for review. Some may be only partially complete. - demolition plans, landscape plans, site plan, civil plans, life safety floor plans, floor plans, labeled "floor plan as per program", building elevations including mechanical louvers, building sections, and roof plans.

(3) In narrative form provide a complete building and Life Safety Code review for the project, identifying each code section reference.

(4) Provide a complete set of architectural drawings incorporating all review comments from the Program Verification Phase.

(5) Provide a narrative description of architectural and site improvements.

(6) Provide outline specification sections for major architectural elements such as exterior materials, window types, wall and roof construction and thermal insulation values.

(7) Provide one copy of exterior elevations in color indicating the materials and shadow lines for reveals.

(8) Provide interior elevations.

(9) All plans, elevations, and sections shall show adjoining buildings and their relationship to the new project.

(10) Include photographs of the project site, adjacent structures and surrounding area to record the nature and character of the environment.

(11) Include a construction cost estimate as required by the DBC A/E Contract.

(12) **For Conveying System Design:** Clearly indicate numerical designation of each elevator on floor plans (i.e.: elevator number 1, 2, 3, 4, etc., reading numerically from left to right facing the elevator bank from hallway or lobby. Where elevators with double entrances are used, numbering shall be sequenced as viewed from the entrance lobby. Remote elevators, such as service or special lifts, shall continue the sequence. Indicate the finished floor elevation of each landing served, elevator pit, machine room, and overhead clearances. Submit a complete analysis of the elevator design and compliance for the project as required in the Architectural and Engineering Design Standards for the applicable campus.

e. Structural SD Submission:

(1) Provide a written narrative describing the proposed foundation and framing system based on program needs, geotechnical investigation and site utilization study. If multiple foundation systems and/or framing systems are appropriate, the DBC A/E shall present these alternatives with the Schematic Phase submittal, including documentation; which details the desirable and undesirable aspects of each proposed system, along with budget estimates for each system. A typical floor plan indicating the columns and beams forming the buildings structural grid system shall be included in the submission.

(2) Provide a foundation plan indicating the locations of footings, foundation walls, and other supports such as caissons as necessary to support the new building.

(3) Provide a floor plan indicating the proposed column grid spacing for the new building.

f. Mechanical SD Submission:

(1) Coordinate with civil to ensure that all anticipated utility work is included on site plan.

(2) Mechanical floor plans shall indicate major pipe and duct systems. Major pipe systems shall be indicated by single line representation. Major duct systems, new and existing, including risers, twenty four (24) inches in width and larger shall be indicated double line with appropriate sizes indicated. Duct systems less than twenty four (24) inches in width shall be indicated as single line with appropriate sizes indicated. Duct systems indicated for removal shall be indicated as single line with appropriate sizes indicated.

(3) Provide narrative description and engineering analysis of existing and proposed mechanical systems reflecting results of coordination with the University. Engineering analysis shall address preliminary load calculations, design criteria used, e.g. indoor/outdoor conditions, etc., domestic water demand, impact on existing site utilities, fuel analysis, justification for selection of specific HVAC systems including alternative system comparisons, investigation of need for specific life-safety provisions, such as smoke exhaust systems, and investigation of fire protection requirements. In addition, provide:

a) Design data for fire suppression systems: design criteria, type of system, hazard classification, water density, size of hydraulic remote area, inside/outside hose stream allowance, maximum coverage area per sprinkler head, etc.

b) Municipal or Private water supply flow test data.

c) Calculations conducted to determine if a fire pump, storage tank, etc., would be required to meet fire suppression demand.

d) Calculations conducted to determine if domestic booster pumps will be required or pressure reducing valves.

e) Preliminary equipment capacity and utility requirements.

f) **Alternative Energy Sources:** A narrative description and engineering analysis of alternative HVAC system concepts and energy sources shall be submitted. It shall focus on the variety of systems that may be needed to meet the program's requirements and for securing a comfortable space environment. It shall also address considerations for

implementation of energy conservation, individual space temperature control and the major equipment selection.

(4) **HVAC/Plumbing Narrative:** A narrative description of HVAC and plumbing systems equipment and controls as per Life Cycle Cost Analysis for all spaces in the building, including provisions for implementation of energy conservation and incorporating review comments from previous submissions and reflecting further refinements. See Division IV: Life Cycle Cost Analysis of this Procedure Manual for additional requirements.

g. Electrical SD Submission:

(1) Coordinate with civil to ensure that all anticipated utility work is included on site plan.

(2) Electrical floor plan indicating single line representation of major systems.

(3) Provide narrative description and engineering analysis of existing and proposed electrical systems, including audio visual systems, reflecting results of coordination with the University. Engineering analysis shall address preliminary load calculations, and design criteria used.

(4) The following items shall be shown on drawings or in a narrative format which accompanies the drawings to indicate the intended systems, or alternatives, for the project:

a) Source of power.

b) Source and interconnection of telephone, data, fiber optics, fire alarm, security, audio visual, and CCTV systems.

c) Locations of buildings from which underground cabling will be required for power, telephone, data, fire alarm, building management, security, etc.

d) The approximate size, preferred location and number of stacks of electrical/telephone/data distribution rooms.

e) Probable location for entrance into the building of underground feeds for power, telephone, data, fiber optics, fire alarm, and security cabling.

f) Base one-line diagram of power, fire alarm, telephone, and data cabling risers.

g) Emergency generator and fuel tank location.

(5) Provide a set of preliminary electrical calculations identifying the estimated power requirements based on squire feet.

h. Consultants shall respond to review comments made by UM representatives.

4.4. Design Development Phase: The DBC A/E shall complete the Design Development Phase of the project consistent with the terms of the DBC contract and shall represent 35% completion of the project design and shall include the submissions indicated in the following paragraphs. The DBC shall provide a tabulation document which represents the Tabulations of Areas - Volume - Efficiency. This document shall be submitted as an electronic file in either a "doc" file format or in an "xls" spread sheet file format.

a. Civil DD Submission:

(1) Provide a complete set of civil drawings, outline specifications, narratives, etc incorporating all review comments from the SD Phase.

(2) Provide a site plan indicating the new building orientation, demolition of existing structures, walkways, utilities, trees etc, new utilities, and site improvements such as fencing, lighting etc. scale and north arrow.

(3) Preliminary Storm Water Management: Plans shall be submitted at the DD Phase.

b. Landscape DD Submission:

c.

(1) Provide a complete set of landscape drawings, outline specifications, narratives, etc incorporating all review comments from the SD Phase.

d. Architectural DD Submission:

(1) Provide a complete set of architectural drawings, outline specifications, narratives, etc., incorporating all review comments from the SD Phase.

(2) The following drawings should be in the Design Development Phase submission for review. Some may be only partially complete. Demolition plans should be complete. Landscape plans, site plan, civil plans, foundation plans, life safety floor plans, floor plans, reflected ceiling plans, building elevations, building sections, detail sections (wall sections etc.) window schedule, door schedule, finish schedule, details (ie: window details, roof details, millwork details to have started) roof plan, typical lab plans and elevations to have started (if in project). Interior room elevations to have begun, (toilet rooms, etc.).

(3) In narrative form provide a complete building and Life Safety Code review for the project, identifying each code section reference.

(4) Provide exterior wall sections indicating all materials, the locations of structural components and ceilings.

(5) Provide typical interior wall/partition sections at mechanical rooms and shafts indicating the locations of lights, ceilings, and beams and space for pipes, ducts, cable trays etc.

(6) The outline specification shall include the major architectural finishes identified in the previous phase.

(7) Provide a bound manual identifying the basis of design stating the proposed materials, methods, and systems including structural, mechanical and electrical, to be incorporated in the facility.

(8) Room numbering shall be consistent with the University space inventory system. All room numbering shall be coordinated and finalized with the University at this Design Phase.

(9) After the DD Submission but prior to the 50% CD Phase submit an Interiors Presentation Package indicating the proposed materials and color schemes etc.

(10) After the DD Submission but prior to the 50% CD Phase submit an Exterior Presentation Package indicating the proposed materials and color schemes etc.

(11) As required by the program and/or the DBC A/E contract submit color perspective renderings to the University by the completion of the 50% CD Phase.

(12) As required by the program and/or the DBC A/E contract submit a professionally prepared computer model, for use as a public relations tool, to the University by the completion of the 50% CD Phase.

(13) **For Concrete Design:** Submit the criteria, materials and system intended to be used in the design of the concrete structural frame, floors, decks, stairs and roofing system. The design shall address the durability of the structure relative to the intended use and environmental exposure, as well as requirements to sustain impact, fatigue, and vibration stresses. As requested by UM the A/E team shall also include a comparative cost estimate of the construction and the potential impact on the construction schedule may be required to justify the use of a concrete frame.

(14) **For Conveying System Design:** Include the following:

a) Indicate each hoistway entrance and dimensions, clear shaft sizes, general construction details required for development of construction documents and for accurate budget estimating, points of structural support for elevator work, and clearances in pits and overhead. Plans and a section at 1/4 inch = 1 foot-0 inches must be provided in the documents.

b) Include the transfer reaction loads to the graphic column schedule in the structural design submission. Indicate the intended support and anchorage system for structural guide rails and sills, noting which part of the work is the responsibility of the elevator subcontractor.

c) Indicate the general layout of equipment in machine rooms, showing crucial space limitations. Do not design to accommodate only minimum equipment sizes and clearance requirements of a given manufacturer, since equipment and clearances may vary between manufacturers, and open bidding of equipment must be possible. Since actual field conditions often vary from "ideal" layouts and dimensions shown in manufacturers' literature, provide for reasonable clearances and working room.

d) Include necessary HVAC equipment to provide correct controlled environment for the Machine Room and computerized equipment. Coordinate this equipment with mechanical drawings and indicate that controls are to be interconnected with campus central.

e) Provide information required for coordination with other design disciplines, including but not limited to: preliminary power and control wiring requirements, ventilation louvers clearly indicated on architectural elevations, penthouse roof elevation, etc.

f) Provide an outline specification of the equipment which supports the approved elevator traffic analysis, including speed, car capacity, hoistway opening configuration, etc. Provide a completed checklist of drawing-specification coordination of elevator work with all affected trades, including structural, electrical, etc.

e. Structural DD Submission:

(1) Provide a complete set of structural drawings, outline specifications, narratives, etc incorporating all review comments from the SD Phase.

(2) Provide structural plans with columns and framing including sizes of components.

(3) The Design Development Phase submittal shall indicate the steel to be used in the building frame, associating specific steels with specific members, including connections. As requested, the A/E shall explain the use of the particular steels and show reason why each is the most appropriate for the use. If the justification is financial, the A/E must include the appropriate comparative

f. Mechanical DD Submission:

(1) Provide a complete set of mechanical drawings, outline specifications, narratives, etc incorporating all review comments from the SD Phase.

(2) Coordinate with civil to ensure that all anticipated utility work is included on site plan.

(3) Mechanical floor plans shall indicate major pipe and duct systems. Major pipe systems shall be indicated by single line representation. Major duct systems, new and existing, including risers, twenty four (24) inches in width and larger shall be indicated double line with appropriate sizes indicated. Duct systems less than twenty four (24) inches in width shall be indicated as single line with appropriate sizes indicated. Duct systems indicated for removal shall be indicated as single line with appropriate sizes indicated. Locations and service

access shall be shown for all mechanical equipment. Where utility cores are used, indicate planned arrangements of piping and ductwork within cores and provisions for accessibility. Provide the following specific drawing information:

a) Provide a legend on the first sheet of each discipline including abbreviations and symbols used.

b) Orientation of building should be the same for each discipline.

(4) Fire Protection Plans:

a) Define each classification of occupancy and hazard of contents.

b) Define and identify the area of each construction type.

c) Indicate the use of all building spaces (offices, auditorium, etc.).

d) Define and identify means of egress.

e) Provide capacity of means of egress, including travel distances.

f) Identify special hazard protection.

g) Show the number of occupants to be accommodated in each space.

h) Distinguish new walls from existing walls.

i) Show location of fire walls, fire separation walls (including exit access corridor walls) and smoke partitions.

j) Identify all fire-rated floor/ceiling and roof/ceiling assemblies.

k) Identify each type of automatic fire suppression system and where it is used.

l) Identify design data for fire suppression systems: design criteria, type of system, hazard classification, water density, size of hydraulic remote area, inside/outside hose stream allowance, maximum coverage area per sprinkler head, etc.

m) Location of fire extinguishers.

n) Show and identify location and type of existing and new standpipes.

o) Identify type of fire detection, alarm and communications systems.

(5) Plumbing Plans:

a) Plans for each floor noting fixture locations and types. Indicate routing of main distribution lines with tentative sizes.

b) Show general or schematic arrangement of all piping systems.

c) Show location of water, sanitary sewer, storm sewer and sprinkler services to the building.

d) Show tentative fixture connection schedule.

e) Show location, sizes and types of water heaters/heat exchangers and flues if required.

f) Show location of backflow preventers, booster pumps or other mechanical equipment with proper maintenance clearance. Location of equipment should be coordinated with other disciplines.

g) Provide preliminary fixture unit counts and anticipated flow rates for sanitary, storm water, domestic hot and cold water systems.

(6) HVAC Plans:

a) Plans for each floor noting HVAC Equipment locations and types. Indicate routing of main pipe and duct distribution lines with tentative sizes.

b) Show general or schematic arrangement of all piping and duct systems.

c) Identify areas on the floor plans where close coordination between structural and other disciplines is required to assure

all work will fit in the available space. Provide sections indicating elevations of structural elements, ceiling, floor slabs, mechanical components, sprinkler pipes, cable trays, conduit and lighting fixtures.

d) Identify all equipment with equipment numbers.

e) Schedule equipment with preliminary capacities.

(7) The outline specification shall include individual University master specification sections planned for, and list of equipment and materials to be included in each section.

(8) Provide a set of block load HVAC Calculations to support the proposed heating and cooling central plant size and major equipment selections such as chillers, cooling towers, AHU's, etc. Include all appropriate input data.

(9) Provide a narrative description of proposed Mechanical Systems incorporating review comments from previous submission and reflecting further refinements. Provide energy code worksheet calculations.

(10) Provide a cost estimate for the mechanical systems in accordance with University Requirements.

(11) **Life Cycle Cost Analysis:** A study of not less than three alternative HVAC systems shall be submitted substantiating the selection of HVAC systems and energy sources, according to the Procedure for the Implementation of Life Cycle Cost Analysis and Energy Conservation. See Division IV: Attachments Life Cycle Cost Analysis of this Procedure Manual for additional Requirements.

f. Electrical DD Submission:

(1) Provide a complete set of electrical drawings, outline specifications, narratives, etc incorporating all review comments from the SD Phase.

(2) The following items shall indicate the selected systems and/or equipment which will be documented for construction:

a) Fixed locations and descriptions for:

1) Electrical/telephone/data room stacks and building entrance.

2) Emergency generator and fuel tank

3) Single line of the proposed location for the cable tray/ladder system for distribution of telephone/data/security systems.

4) Electrical devices.

5) Audio visual system equipment.

b) Preliminary coordination, short circuit study and arc flash hazard analysis-calculations, and impedance diagram. Studies shall be revised as required during CD phase. Final report shall be submitted by contractor with proposed switchgear.

c) One-line diagram of power systems showing sizes of feeders, transformers, distribution panels, switchboards, motor control centers and protection schemes.

d) Description of the sequence of operation, approved by the User, University's review engineer, University's Operations And Maintenance Department, University Fire Marshal, Public Safety Police Department and Environmental Health and Safety; for card access, building security, and fire alarm systems.

e) Layout of substation, emergency generator rooms and electrical/telephone/data rooms.

f) Calculations to support the number and spacing of lighting fixtures to achieve IES lighting recommendations and compliance with energy conservation requirements. (watts per square foot for corridors, offices, labs, etc.)

g) Description of sequence of operation, approved by the University's electrical review engineer and operations and maintenance representative, for substation automatic transfer for emergency power systems.

h) Provide written evidence of complying with BGE Electric Company requirements for protection where synchronizing and parallel operation of the University generators with normal power occurs.

i) Audio visual equipment list.

(3) One copy of the following preliminary calculations shall be submitted with the DD presentation in either a doc. file format or a spread sheet format:

a) Load and demand analysis

b) Load analysis for stand-by power systems

c) Lighting power density compliance per latest revisions of ASHRAE/IES 90.1

d) Lightning risk assessment per NFPA 780, Appendix H

e) Voltage drops for all feeders

(4) All literature used in the determination of the calculations shall be referenced.

g. Consultants shall respond to review comments made by UM representatives.

4.5. 50 % Construction Document Phase: The DBC A/E shall complete the 50% CD Phase of the project consistent with the terms of the DBC contract and shall represent 50% completion of the project design and shall include the submissions indicated in the following paragraphs. The DBC A/E shall provide a tabulation document which represents the Tabulations of Areas - Volume - Efficiency. This document shall be submitted as an electronic file in either a “doc” file format or in an “xls” spread sheet file format.

a. General: The DBC A/E shall proceed with the preparation of construction documents (CD's) only upon receipt of written authorization by the University. Upon receipt of the notice to proceed the DBC A/E shall commence with the 50 % Construction Document Phase.

(1) Drawings: At this phase of design, the DBC A/E will mark review sets with "FOR REVIEW ONLY, NOT FOR CONSTRUCTION" or equivalent wording.

(2) Specifications: or architectural and engineering specifications, the 50% CD Submission is considered by the University to be a draft copy of the Final CD Specifications.

(3) As a minimum include floor plans, elevations, sections, 1/4 scale floor plans of mechanical spaces, toilet rooms, stairs and elevators

and building sections where required due to tight conditions or a high density of mechanical equipment. Also include details, schedules, and a list of symbols and abbreviations. Building performance criteria as outlined in the University requirements shall be completed and included on the drawings at this phase.

(4) **Construction Contract Packages:** Construction Contract "Packages" for a fast track schedule may be submitted after approval of the Design Development documents. All Construction Contract "Bid Packages" shall be 100% complete for the scope of work to be bid. Submittals of each system and/or each construction contract package shall be submitted to the University for review as required, including:

a) 50%-complete construction documents by each contract "package" including all requirements of the Design Development Phase reviews and draft technical specifications for all (or applicable) trades;

b) 95%-complete construction documents for each contract "package" and draft Project Manual including final technical specifications sections, Division 1 and contract bidding documents, and an updated project schedule and project cost estimate by trade; and,

c) 100%-complete construction and bidding documents in accordance with the requirements of DBC contract.

(5) **Alternates: Purpose:** When authorized by the University, the DBC A/E shall specify add alternates to be included in bids as may be considered necessary. Alternates shall be used to affect a change in the scope of the project or in the materials or methods specified. The following practices shall be followed by the DBC A/E when specifying alternates.

a) **Priorities:** The DBC A/E shall review all alternates with the University and establish the priority in which alternates will be listed. Add alternates, if accepted with the Base Bid, will be in the order listed on the bid form. Alternates shall normally be all add in a given bid.

b. Civil 50% Submission:

(1) Provide a complete set of civil drawings, specifications, narratives, etc. incorporating all review comments from the DD Phase.

(2) Provide site plan indicating all required utility work, including existing conditions, proposed systems, structures, equipment in sufficient detail to establish location, alignment, grade, inverts and impact on existing structures, systems or utilities.

(3) Indicate exterior electrical work on a plot plan, which shall be complete and clearly delineate the extent of the contractor's responsibility. Plans also shall show all other underground utilities.

(4) **Storm-Water-Management:** Include plan(s), specifications and computations.

c. Landscape 50% Submission:

(1) Provide a complete set of landscape drawings, specifications, narratives, etc. incorporating all review comments from the DD Phase.

d. Architectural 50% Submission:

(1) Provide a complete set of architectural drawings, specifications, narratives, etc. incorporating all review comments from the DD Phase.

(2) All drawings should have been started and well underway at this time.

(3) Room numbers shall be as per the University space inventory.

(4) Provide a narrative describing intended materials and finishes.

(5) Reflected ceiling plans should be developed at this time.

(6) Provide all pertinent technical specification sections which comply with the University's Design Standards, and this Procedure Manual.

(7) **For Conveying System Design:** Provide all information on equipment to be provided by the elevator subcontractor as required for coordination with other design disciplines for review and acceptance by the University as follows:

a) Coordinate with the electrical engineer to insure the wiring design for the operation of standard devices, including telephone, as well as special systems such as CCTV cameras, intercoms, annunciation and/or music systems (not commonly provided in University projects), are included in this submission. All special devices shall be clearly noted in the construction documents with specific notations indicating the need for special wiring, including conduit with pull line and appropriate pull boxes between any remote monitoring panels (life safety, lobby, fireman) to the controller. This wiring should be in a continuous run from the machine room.

b) Indicate all items provided by the elevator subcontractor which impact other trades and scope of work specified in other divisions such as access doors and panels to hoistways, pits, machine rooms, as well as access ladder(s) to elevator pits, and machine rooms. Show buffer inspection platforms and ladders, which are necessary in extra deep pits. Show pit water proofing, water stopping and sumps.

c) Cab interiors shall indicate elevations of all four (4) walls, including handrails and other special details, location for signal equipment, lighting/ceiling layout, emergency access panels and similar requirements. Submit colors and finishes, along with the building finishes to the University for review and approval.

(8) The design and construction documents, including outline specifications at the Design Development phase and materials specifications at the 50%-complete Construction Documents phase shall clearly indicate the following:

a) Dimensions for principal elements and placement of woodwork as necessary for further development of the project and for definitive cost estimating.

b) Extent, location and type of fire-retardant-treated material.

c) Extent, location and type of pressure-treated decay-resistant material, including specification of materials and fastenings for grounds, sills, etc. abutting masonry materials and/or in damp conditions.

e. Structural 50% Submission:

(1) Provide a complete set of structural drawings, specifications, narratives, etc. incorporating all review comments from the DD Phase.

(2) Provide a structural column schedule indicating floors, column marks, base plates, kip loads, total loads, floor elevations etc.

(3) Provide a structural beam schedule indicating floors, beam marks, base, kip loads, total loads, floor and beam elevations, reinforcing stirrups, spacing, etc.

(4) Provide a footing schedule with footing, type, size, reinforcing etc.

f. Mechanical 50% Submission:

(1) Provide a complete set of mechanical drawings, specifications, narratives, etc. incorporating all review comments from the DD Phase.

(2) Provide a set of drawings representing a minimum of 50% completion of the final set of construction drawings. As a minimum include floor plans, sections, 1/4 scale floor plans of mechanical spaces, toilet rooms, and sections through the building where tight conditions and/or a high density of mechanical equipment, materials, etc are located. Also include details, schedules, symbols and abbreviations. Building performance criteria as outlined in the University's Design Standards shall be completed and included at this Phase. All duct systems, new and existing, including risers, shall be indicated double line with appropriate sizes indicated. Duct systems indicated for removal shall be indicated as single line with appropriate sizes indicated. All piping systems on floor plans shall be indicated single line with appropriate sizes indicated. On large scale mechanical equipment room plans, sections and elevations piping eight (8) inches and larger, including fittings and valves shall be indicated double line with appropriate sizes indicated. Hangers and supports for large piping shall be indicated using the actual size and profile of the hanger method.

(3) Identify areas on the floor plans where close coordination between structural and other disciplines is required to assure all work will fit

in the available space. Provide sections indicating elevations of structural elements, ceiling, floor slabs, mechanical components, sprinkler pipes, cable trays, conduit and lighting fixtures.

(4) Provide one (1) bound mechanical design manual containing room heating and cooling load calculations for every conditioned space, revised block load calculations, all input data for block loads and individual room load calculations, ductwork static pressure calculations, building/zone air balance diagrams, pipe sizing/pump head calculations, and plumbing equipment sizing calculations.

(5) Provide a printed copy of each complete University master specification section indicating the DBC A/E's editing marks. Editing shall not be limited to the instructions included in each section but shall also include any additional material, and/or equipment specifications that may be required for the project.

g. Electrical 50% Submission:

(1) Provide a complete set of electrical drawings, specifications, narratives, etc. incorporating all review comments from the DD Phase

(2) Provide site plan indicating all required utility work, including existing conditions, proposed systems, structures, equipment in sufficient detail to establish location, alignment, grade, inverts and impact on existing structures, systems or utilities.

(3) Provide a set of drawings representing a minimum of 50% completion indicating the locations of the mechanical and electrical equipment. Also include details, schedules, symbols and abbreviations. Building performance criteria as outlined in the University's Design Standards shall be completed and included at this phase. Architectural or other drawings may be used to show exact locations of electrical or lighting work, but on electrical drawings show complete requirements.

(4) Provide a minimum of three plans for each floor. Normally, the first plan should show the lighting system: the second plan should show the power and fire alarm systems; and the third plan should show the telephone, data, security, fire alarm, audio visual, and cctv systems.

(5) 50% Construction documents should be accurate and coordinated with other disciplines, showing sizes, locations, connections and detailing materials, equipment and methods so the contractors understand what is intended and can select and install equipment to satisfy the intended purpose.

(6) Provide a printed copy of each applicable University master specification section, indicating the A/E's editing marks. Editing shall not be limited to the instructions included in each section but shall also include any additional sections for material and/or equipment specifications that may be required for the project.

a) When electrical high voltage work (over 600 volts) is required in construction of a project, the services of an independent high voltage electrical testing agency shall be utilized unless waved by the University Project Manager. The project specifications shall read as follows where appropriate: "The contractor shall coordinate and cooperate with an independent high voltage electrical testing and inspection agency under contract by the contractor for testing and inspection of all electrical high voltage components of the system prior to being energized." The costs of the testing and inspection services shall be paid direct by the contractor. Repeat testing costs caused by unacceptable test results and/or inspection findings shall be back charged to the contractor.

b) The following statement shall be included in the appropriate sections of the electrical specifications: "The contractor shall file for an independent inspection agency, and pay all fees associated with such filing, at the start of construction so that adequate rough-in inspections can be made during the course of work. An electrical inspection report from an independent (non-governmental) electrical inspection agency approved by the State of Maryland Fire Marshall must be submitted to the University prior to or with the final payment invoice. The inspection certificate shall be submitted in lieu of a city or municipal permit for electrical work performed on property belonging to the State of Maryland.

(7) **Electrical Calculations:** One copy of the following calculations are to be submitted with the 50% CD presentations. Those calculations

previously submitted at the DD phase shall be updated for this submission:

a) Load and demand analysis for normal systems

b) Load analysis for emergency power systems, including sizing calculations for emergency power equipment

c) Lighting power budget per latest revision of ASHRAE 90.1 and in compliance with the recommendations of IEEE.

d) Short circuit analysis using ohmic or per-unit method depending on complexity of the system (Reference IEEE Transactions on Industry and General Applications, Vol. 3, Number 2, March/April 1967)

e) Voltage drop analysis for all feeders

f) Power factor correction

g) Lighting calculations (interior and exterior)

h) Pole classifications, guy vector diagrams and guy strength when overhead transmission systems are involved.

(8) All calculations are to be presented on an applicable form; all literature used in the determination of the calculations shall be referenced.

(9) **Electrical Layouts:** Indicate layouts on drawings to define specific requirements for each raceway, conductor, cable, outlet, wiring device, lighting fixture, switching arrangement, equipment item, etc.

(10) **Symbols and Legends:** Electrical symbols identifying the system components shall conform to IEEE standards; they may be supplemented by additional symbols, which shall be indicated on project drawings.

(11) **Raceway Layouts:** Indicate raceways required for each electrical system in their entirety on each floor plan; include specific identification of associated conductors or cables. Indicate branch circuits from outlet to outlet. Include switch legs, but associated home runs may be symbolically designated. Indicate feeders in their entirety from points of origin to termination; include all intermediate

takeoffs, pull boxes, etc. Arrange raceways so they are not installed in elevator hoistways, duct spaces, stairwells, etc.

(12) **Supplementary Diagrams:** Include in drawings a one-line diagram for each major electrical system, and a riser diagram for each electrical system; these shall include schedules and supplementary information that completely define the several systems. Electrical schedules required shall include each medium-voltage, and low-voltage switchgear assembly, transformer, motor control center, and panelboards that designates system characteristics, sizes and parameters for each protective device and motor controlled, including current limiting fuses, circuit designation, equipment served, and the connected load.

(13) **Equipment Rooms:** Provide enlarged scale drawings for each room required for medium-voltage and low-voltage switchgear assemblies, and for transformers. Show auxiliary systems, equipment arrangement, grounding requirements, and DC and supervisory systems on drawings.

(14) **Cross-References:** Include in drawings suitable notes which cross-reference diagrams, schedules, symbol list, general notes, etc. with associated floor plans.

(15) **Detail Drawings (as needed):** Provide detail drawings, as described in subparagraphs. **a)** through **c)** below:

a) **Service Entrance Profiles for Duct Bank:** Communication duct bank and any others as required.

b) **Front Elevations:** Provide front elevations for each supervisory control panel motor control center and medium-voltage and low-voltage switchgear assembly. Provide front elevations for a typical transformer at each substation with the cabinet containing current transformer and secondary disconnecting switch. Provide front elevations for each type of services entrance, including the associated conduit bank and other significant details. Requirements shall be coordinated with utility companies. This is essential, as some require reinforced conduit bank construction for filled areas and a conduit bank support or saddle that must be cast in the building wall.

c) **Enlarged Plans, Elevations, and Details:** Provide enlarged plans, elevations, and details for each typical and special

electric and telecommunications closets. This includes elevations to show routing in cabinets.

(16) **One Line Diagrams:** Delineate elevator control transfer scheme, control transformer arrangement, potential and current transformer ratings, device numbers indicated by ANSI, etc., on these diagrams or associated one-line diagrams.

(17) **Ground Diagram:** Provide a system grounding diagram with the required layout also indicated on associated floor plans.

(18) **Panel Boards:** all panel boards shall be shown in full, denoting existing and new loads to be served along with associated KVA per breaker and panel. All existing information shall be noted but not limited to manufacturer, A/C ratings, main breaker, and frame size. When there is at least one full sheet of panel schedules, a representative matrix is required in the upper right corner for every reference.

h. Consultants shall respond to review comments made by UM representatives.

4.6. 95 % Construction Document Phase: The DBC A/E shall complete the 95% CD Phase of the project consistent with the terms of the DBC contract and shall represent 95% completion of the project design and shall include the submissions indicated in the following paragraphs. The DBC A/E shall provide a tabulation document which represents the Tabulations of Areas - Volume - Efficiency. This document shall be submitted as an electronic file in either a “doc” file format or in an “xls” spread sheet file format.

a. **General:** Upon receipt of the notice to proceed the A/E shall commence with the 95% Construction Document Phase.

(1) **Drawings:** At this phase of design, the A/E will mark review sets with "FOR REVIEW ONLY, NOT FOR CONSTRUCTION" or equivalent wording.

(2) **Specifications:** For architectural and engineering specifications, 95% CD Submission is defined as a 95% Copy of the Final CD Specifications.

b. **Civil 95% Submission:**

(1) Provide a complete set of civil drawings, specifications, narratives, etc. incorporating all review comments from the 50% CD Phase.

c. **Landscape 95 % Submission:**

(1) Provide a complete set of landscape drawings, specifications, narratives, etc. incorporating all review comments from the 50% CD Phase.

d. Architectural 95% Submission:

(1) Provide a complete set of architectural drawings, specifications, narratives, etc. incorporating all review comments from the 50% CD Phase.

(2) All pertinent information necessary for the construction of the project shall be included at this submittal phase.

(3) Provide an interior signage package including samples and appropriate graphics.

(4) **For Conveying System Design:** Include the following information with this submission:

a) Checklist for drawing - specifications coordination listing all trades supporting or affected by elevator installation and operation.

b) Elevator drawings and specifications shall be complete. Details shall include elevator hoistway, hoistway entrances and frames; details of sills; head, transom and jambs; and cab details all clearly indicating relationship to and requirements of adjacent construction. Every door shall be equipped with a key access hole on each level. Elevation drawings should show hall doors on each level, lobby and upper floor call stations, and the layout and placement of the floor indicator panel located in the elevator lobby on the building entrance floor.

(5) The 95%-complete construction documents shall clearly and completely indicate all profiles of jambs, trim, siding, and moldings (including special joinery), as well as construction details for all millwork and casework as necessary. In addition, they shall clearly indicate, and coordinate with, other relevant materials and structure as necessary for contracting of the work, and for preparation of shop drawings. The drawings shall include:

a) Special veneer matching, wood grain direction and plastic laminate pattern direction and splice locations (where not obvious from specification or detailing).

b) Documents shall coordinate the placement of such devices in the relevant trade drawings and specifications sufficiently for preparation of shop drawings and device rough-in.

c) If more than one grade is required, drawings or specifications must clearly indicate locations and extent of each grade to ensure that the required quality is provided.

d) Finish hardware for cabinets shall be installed at factory.

e) **Samples:** Samples of veneers and finishes, and/or full-sized mock-ups shall be furnished as necessary for review and approval prior to incorporation into the 95%-complete construction documents. Generally, mock-ups shall be installed at the University for review and shall be maintained for quality control of the installed work.

e. Structural 95% Submission:

(1) Provide a complete set of structural drawings, specifications, narratives, etc. incorporating all review comments from the 50% CD Phase.

f. Mechanical 95% Submission:

(1) Provide a complete set of mechanical drawings, specifications, narratives, etc. incorporating all review comments from the 50% CD Phase.

(6) Provide a complete set of drawings including site plan, all floor plans, sections, 1/4 scale plans, details and schedules, incorporating all previous review comments. The drawings shall include a building load summary for HVAC and Plumbing including, but not limited to, the following: ventilation criteria, design conditions, total heating and cooling loads, fixture units, domestic hot and cold water demand and other, utilities and services required in the project. In addition, substantiating data indicating coordination between the mechanical design team and other disciplines shall be submitted. The use of prints of inter-discipline, composite floor plans with appropriate highlighting and annotations is an effective method. All duct systems, new and existing, including risers, shall be indicated double line with appropriate sizes indicated. Duct systems indicated for removal shall be indicated as single line with appropriate sizes indicated. All piping systems on floor plans shall be indicated single line with appropriate

sizes indicated. On large scale mechanical equipment room plans, sections and elevations piping eight (8) inches and larger, including fittings and valves shall be indicated double line with appropriate sizes indicated. Hangers and supports for large piping shall be indicated using the actual size and profile of the hanger method.

(2) Identify areas on the floor plans where close coordination between structural and other disciplines is required to assure all work will fit in the available space. Provide sections indicating elevations of structural elements, ceiling, floor slabs, mechanical components, sprinkler pipes, cable trays, conduit, and lighting fixtures.

(3) Provide a cost estimate for the mechanical systems in accordance with the University's Design Standards.

(4) Identify Areas on the construction document that will require the contractor to prepare and submit coordinated drawings for review by the A/E and the University.

(5) Provide one (1) bound mechanical design manual which includes any additional room heating and cooling load calculations not provided in the 50% CD Phase, additional calculations supporting the selection of all mechanical equipment, and all revised calculations from previous submission.

(6) Provide a printed copy of each specification section incorporating the editing indicated in the previous submission, and including the University's review comments from the previous submission. Include any additional material, and/or equipment specifications that may be required for the project not included in the previous submission.

g. Electrical 95% Submission:

(1) Provide a complete set of electrical drawings, specifications, narratives, etc. incorporating all review comments from the 50% CD Phase.

(2) Provide a printed copy of each specification section incorporating all University's review comments from the previous submissions, and any additional material, and/or equipment specifications that may be required for the project not included in the previous submissions.

(3) **Electrical Calculations:** Provide one updated copy of all calculations, including the load information on the drawings.

(4) **Electrical Coordination Study:** At a minimum, this analysis shall encompass that segment of the distribution system between the origin of utility service and the first level of secondary distribution equipment, or where service is derived from an existing state-owned distribution system, between the existing primary distribution equipment and the first level of secondary distribution equipment. This study shall include set points for all adjustable protective devices.

(5) **Arc Flash Hazard Analysis:** Using the same scope as the Electrical Coordination Study, this analysis shall show, in tabulation form, the pertinent fault levels, trip delays and device opening times, equipment type, conductor gaps, working or approach distances, flash protection boundaries, incident energy, and Personal Protective Equipment (PPE) levels to be used when working on and around each piece of electrical equipment. This Arc Flash Hazard evaluation shall use the IEEE 1584-2002 method.

(6) **Electrical Drawings:** Should be essentially complete and coordinated by the DBC A/E. The drawings shall include all circuiting and wiring, details and schedules.

(7) Electrical and Communications drawings should show proper tie-ins with elevator work, including the following:

a) Power supply (generally 3-phase) of proper rating to and including fused disconnect in elevator machine room (for each elevator). Service should be through the disconnect to the controller.

b) Dedicated 120 volt circuit in machine room for each elevator controller.

c) Lighting and standard (120 volt) GFIC power outlets in each machine room and elevator pit.

d) Fire detection and alarm system connections to elevator controllers.

e) Transfer switch and selector panel for elevator operation on emergency power. Phase monitoring shall be included in all hydraulic and traction equipment.

f) All elevator machine rooms shall have emergency and normal lighting.

i. Consultants shall respond to review comments made by UM representatives.

4.7. 100 % Construction Document Phase: The DBC A/E shall complete the 100% CD Phase of the project consistent with the terms of the DBC contract and shall represent 100% completion of the project design and shall include the submissions indicated in the following paragraphs. The DBC A/E shall provide a tabulation document which represents the Tabulations of Areas - Volume - Efficiency. This document shall be submitted as an electronic file in either a "doc" file format or in an "xls" spread sheet file format.

a. General: Upon receipt of the notice to proceed the DBC A/E shall commence with the 100% Construction Document Phase. When all previous review comments have been incorporated the DBC A/E shall request the University Project Manager to schedule a final review meeting with the appropriate Consultant(s) and the university personnel to review the 100% CDs. If additional corrections are required the DBC A/E shall proceed with the corrections to the CDs as directed by the University. When this submission has been approved by the university the DBC A/E shall submit construction documents as indicated below.

(1) Construction Bid Documents Submission: Submit the following files to the University Project Manager on a CD-R:

(a) Drawings: One (1) Complete Set, Signed/Sealed in "pdf" file format from the bound CAD files.

(b) Drawings: One (1) Complete Set, in "dwg" file format in ACAD 2012. Each "dwg" file must be a bound file using 'E' transmit feature. Unbound files will not be accepted.

(c) Specifications: One (1) Complete Set, in "doc" file format.

(d) Bound Submission Requirements: See paragraph 2.3 for submission requirements for bound specifications and drawing sets.

b. Civil 100% Submission:

(1) This submission shall include the University's comments for the drawings, specifications, narratives, etc from the 95% Design Review Phase.

c. Landscape 100% Submission:

(1) This submission shall include the University's comments for the drawings, specifications, narratives, etc from the 95% Design Review Phase.

d. Architectural 100% Submission:

(1) This submission shall include the University's comments for the drawings, specifications, narratives, etc from the 95% Design Review Phase.

e. Structural 100% Submission:

(1) This submission shall include the University's comments for the drawings, specifications, narratives, etc from the 95% Design Review Phase.

f. Mechanical 100% Submission:

(1) This submission shall include the University's comments for the drawings, specifications, narratives, etc from the 95% Design Review Phase.

(2) Provide bound sets of engineering analysis addressing any reselection or revisions resulting from the 95% CD Phase review comments.

(3) Identify areas on the floor plans where close coordination between structural and other disciplines is required to assure all work will fit in the available space. Provide sections indicating elevations of structural elements, ceiling, floor slabs, mechanical components, sprinkler pipes, cable trays, conduit, and lighting fixtures.

(4) Provide a printed copy of each Specification Section incorporating all of the University's review comments from the previous submissions, and any additional material, and/or equipment specifications that may be required for the project not included in the previous submissions.

g. Electrical 100% Submission:

(1) This submission shall include the Universities comments for the drawings, specifications, narratives, etc from the 95% Design Review Phase.

(2) Provide a printed copy of each Specification Section incorporating all of the University's review comments from the previous submissions, and any additional material, and / or equipment specifications that

may be required for the project not included in the previous submissions.

h. FINAL APPROVALS: The DBC A/E will secure and submit via the DBC to UMB final approvals and/or permits from all regulatory agencies and public utilities (State Fire Marshal's Office; Department of Health and Mental Hygiene; Maryland Department of the Environment; water, sewer, telephone, gas and electric owner; etc.) affected by the project design.

5. BIDDING:

5.1. Bidding Support Procedures:

a. Exclusions from the DBC A/E Contract: Intentionally Omitted.

b. DBC Contract Obligations: The following items are to be included in the DBC A/E Contract.

(1) Pre Bid Conference:

a) Attendance: A pre-bid conference will be conducted at the start of the bidding period. Representatives of the DBC A/E consultant team familiar with all aspects of the construction documents shall attend the conference. The DBC A/E representatives will be expected to discuss the general scope of work and answer specific technical questions regarding the construction documents.

(2) Addenda:

a) Interpretation: In response to questions from prospective bidders, the DBC A/E and only the A/E, shall interpret the contract documents during the bidding period. Interpretations shall be given by written instruction with sketches or drawings as necessary to the University for distribution to prospective bidders.

b) Preparation: The DBC A/E shall prepare addenda as necessary during the bidding period and deliver the number of copies to the DBC for distribution to prospective bidders not less than seven (7) working days prior to scheduled date of bid opening.

c) Scope Reviews: The DBC A/E shall attend scope review meetings with prospective bidders as requested by the University.

6. CONSTRUCTION ADMINISTRATION SERVICES:

6.1. DBC A/E Contract Exclusions and Obligations:

a. Exclusions from the DBC A/E Contract: Intentionally Omitted.

b. DBC A/E Contract Obligations: The following items are to be included in the DBC Contract:

(1) Project Signs: Project signs are required for all new buildings. The DBC A/E shall design at least one project sign per the University Design Standards.

(2) Meetings and Field Reports:

a) Work Initiation Conference and Progress Meetings: Beginning with the work initiation conference, meetings shall be held a minimum of every two weeks during the construction phase. The DBC A/E shall be required to have in attendance the DBC A/E Project Manager and those members of the design team whose technical expertise is necessary to clarify or reconcile project difficulties. Where additional special meetings or field inspection visits are deemed necessary by the University PM to resolve construction issues, the appropriate DBC A/E team representative shall attend. The DBC A/E shall issue appropriate documentation as needed to address and resolve the issue.

b) Field Reports: The DBC A/E shall prepare and submit written reports summarizing observations, any clarifications, directions, reconciliation or results of field visits. The DBC A/E shall include sufficient man hours of the various disciplines in construction phase services to provide this support on "an on-call basis" as needed. No additional compensation shall be made to the DBC A/E over and above the amounts included in the DBC A/E fee unless the object of these events is outside the original contract scope.

(3) Materials and Colors: At the appropriate time in an early stage of construction, as determined by the University, the DBC A/E shall select and shall coordinate the approval of brick panels, stone samples, concrete colors and textures, paint colors and all other finishes with the University. The University will also approve in writing all such materials, including material substitutions.

(4) Shop Drawings, Product Data, and Coordination Drawing Submittals:

a) The DBC A/E shall provide a master list of submittals based on a numbering system approved by the University.

b) The DBC A/E shall review and mark all submittals, including shop drawings, product data, coordination drawings, samples, operation and maintenance manuals, and testing and balancing reports as appropriate, checking for conformance with information given and the design concept expressed in the Construction Documents. Where the UM Standard Project Submittal Form is used, the DBC A/E shall fill in the appropriate review blocks on the form in lieu of using their own review stamp. The DBC A/E review shall be completed within two (2) weeks of receipt of submittals. The A/E shall transmit all submittals to the University Project Manager for their review and distribution to the CM.

(5) Request for Construction Document Change (CDC): The DBC A/E shall use the UMB Standard CDC Form and provide CDC's in consecutive numbering order with sketches/drawings and/or written description and specifications to document the changes to the construction documents. The DBC shall transmit all CDC's to the University Project Manager for their review.

(6) Requests for Information (RFIs): The DBC A/E shall respond to all RFIs in a timely manner, preferable within five working days or less, and provide clarifications as necessary in the RFI response or as a separate Change Bulletin. The DBC shall transmit all RFI's to the University's Project Manager for their review.

(7) Change Request and Change Orders: The DBC A/E shall review all trade contractor change order proposals as requested by the University Project Manager. The change order request and/or change orders shall be reviewed for the cost value of the proposed work and to determine if the proposed work is not already covered by the current scope of work.

(8) Certificates of Payment: Percentage of Completion: The DBC Project Manager and the University Project Manager will agree in draft form on the percentages of completion of the various segments of work.

(9) Independent Construction Inspection and Testing:

a) When independent construction inspection and testing services are required in connection with the construction of a project, due to the value of the construction contract, such services will be provided by an independent inspection and testing firm under a separate contract with the DBC or the University as determined by the University. The DBC A/E shall monitor the contract with the contracted inspection and testing firm. Contract monitoring shall consist of weekly review of test results and field inspection reports, and liaison with the independent construction inspection and testing representatives.

(10) Completion and Acceptance of Project:

a) **Pre Final Inspection for Substantial Completion:** When the project or designated portion thereof is substantially complete the Contractor will notify the University Project Manager. The A DBC /E shall conduct a walk through to verify that the work is substantially complete. The entire portion of the project shall be inspected. During the inspection, the DBC A/E Team shall prepare a punch list of uncompleted or unsatisfactory work items owed to the project by the contract agreement. If, in the opinion of the DBC A/E and the University Project Manager, the project is ready for acceptance, the date of substantial completion will be established and the warrantee period will begin.

b) **Final Project Completion:** When all the defects and deficiencies have been corrected and verified by the University Project Manager then the DBC A/E shall review the work and report to the University that the punch list work has been completed.

(11) Record Documents:

a) **Record Drawings:**

1) The DBC A/E shall acquire from the DBC the marked up record set of drawings indicating the "red line As-Built" conditions of the project.

2) Using the contractor's "red line As-Built" drawings, the electronic files of the Construction Bid Documents shall be corrected to include all "As-Built" conditions as recorded by the contractor and all changes to the project as a result of ASI's, change bulletins, field conditions, etc The final product of incorporating all "red line As-Built" information and

all changes to the project as a result of ASI's, change bulletins, field conditions, etc. shall be called the Record Drawings.

3) Acceptance of the "Record Drawings" shall be conditional upon University Project Manager's approval of materials, quality, completeness and accuracy. The University reserves the right to verify the "Record Drawings" accuracy prior to final acceptance and payment.

4) Record Drawings shall be turned over to the University Project Manager within four (4) months of substantial completion of the project; final payment of the DBC A/E's Phase V fee shall not be due until the "Record Drawings" electronic files and one complete set of the Contractor's "red line As Built" Drawings are submitted and approved by the University.

b) Record Specifications:

1) The DBC A/E shall submit a record set of specification's that includes revisions to the bid specifications as a result of ASI's, change bulletins, field conditions, etc. and shall be called the Record Specifications.

2) Acceptance of the "Record Specifications" shall be conditional upon University Project Manager's approval of materials, quality, completeness and accuracy. The University reserves the right to verify the "Record Specifications" accuracy prior to final acceptance and payment.

3) "Record Specifications" shall be turned over to the University Project Manager within four (4) months of substantial completion of the project; final payment of the DBC A/E's Phase V fee shall not be due until the "Record Specifications" electronic files are submitted and approved by the University.

c) Record Document Submission Formats:

(1) The DBC A/E shall submit all of the following:

(a) Record Drawings: One (1) Complete Set in "dwg" file format in ACAD 2012. Each "dwg" file must be a bound file, using e-transmit and include contractors red line markups and all changes to the project as a result of ASI's, change bulletins, field conditions, etc.

(b) Record Drawings: One (1) Complete Set, in "pdf" file format created from the record drawing ACAD files.

(c) Record Specifications: One (1) Complete Set in "doc" file format and must include all changes to the specifications as a result of ASI's, change orders, etc.

(d) Contractors "red line As-Built" Prints: One (1) complete set of prints with the contractor's red line markups.

7. POST CONSTRUCTION SURVEY:

7.1. Site Visits:

a. Site Visits: During the two year warranty period the DBC and DBC A/E representatives shall make a minimum of two (2) site visits, one visit before the end of the first year and the second visit before the end of the second year, after acceptance of the project at times determined by the University Project Manager. These visits will be arranged by the University Project Manager and shall be in the presence of the client representative and other University representatives.

7.2. Site Reports:

a. Reports: The DBC A/E shall provide a written report to the University Project Manager within seven (7) days after each site visit. This report is to include all disciplines.

END OF DIVISION II