

## **CHAPTER 3: MARKER FOR UT DESIGN CHANGES**

The following designations have been supplemented to reflect requirements by UT. Changes are noted in Owner Information Section of this Manual unless noted otherwise.

1. Article 3.01 General
2. Article 3.02 Regulatory
3. Article 3.07 Schematic Design Phase

## CHAPTER 3: DESIGN

### 3.01 GENERAL

- A. Design the project to meet the authorized scope, budget, and schedule.
- B. Upon initiation of the project, arrange to review with the Owner the service and administrative requirements as shown in the A31 Pre-Design Meeting Agenda provided in Appendix 1.
- C. Utilize meeting agenda forms for each design phase as listed below.
  - A32 Program Verification Phase Meeting Agenda
  - A34 Schematic Design Phase Meeting Agenda
  - A36 Design Development Phase Meeting Agenda
  - A38 Construction Document Phase Meeting Agenda
- D. Refer to design phase document checklists as listed below for guidance regarding the required documents. Review the checklists with the Owner for confirmation or revision of document requirements.
  - C32 Schematic Design Phase Document Checklist
  - C34 Design Development Phase Document Checklist
  - C36 Construction Document Phase Document Checklist
- E. The Designer's Basic Services requirements are generally defined by the Agreement but will vary in specifics by project. Specific requirements may include, but are not limited to, the services listed for each design phase in later sections.
- F. Design the project to not exceed the authorized project Bid Target. The Designer's construction cost estimate shall include any Designer-determined estimating contingency. This is not the same as the Owner's contingency which is added to the Bid Target to calculate the MACC. The Owner's contingency is solely designated for the Owner's exclusive control and use for unanticipated project costs.
- G. The exact title of the project and SBC Number shall be used on all documents including invoices and correspondence. Subject lines of email correspondence shall include the exact title of the project. Abbreviations of words or names in project titles may be used on correspondence if the complete title is readily understood.
- H. Design document submittals to the Owner shall be labeled to identify the design phase for which they are provided and shall indicate the date of issue.
- I. When providing services for multiple design phases, obtain written approval of the Owner before proceeding with the next phase.
- J. Prepare meeting notes from each meeting with the Owner and transmit them to the Owner within seven calendar days of the meeting. This includes meetings with user groups or occupants, regardless of the attendance of Owner representatives.
- K. Verify with the Owner the quantity and size of documents required for each review. Lettering on drawings shall be legible at the size provided. Ensure that all drawings are clearly labeled with an accurate drawing scale and include a graphic scale. On plan drawings, regardless of design discipline or building system represented, include a north arrow.
- L. Refer to the Schematic Design Phase section regarding the selection and payment of testing laboratory services.

## CHAPTER 3: DESIGN

- M. Comply with design criteria and standards in the Institution Specific Documents provided on the Owner's web page.

### 3.02 REGULATORY

- A. The Designer is responsible for designing in accordance with the codes and regulations applicable to the project. Section 01 41 15 Basic Regulatory Requirements provided in Appendix 2 lists major codes that may govern the project. Other codes or regulations may also apply.
- B. The State Fire Marshal Office (SFMO) is responsible for reviewing construction documents to approve the fire, building, life safety, and accessibility code compliance of state owned facilities. The Rules of the Tennessee Department of Commerce and Insurance defines "construction" and requires plans and specifications to be submitted to the SFMO prior to commencing construction of a state building. (SFMO review is not required for state leased facilities in exempt jurisdictions, i.e., those jurisdictions that are approved by the SFMO to run their own codes enforcement program). The Owner will cooperate with the Designer and the SFMO to meet the codes requirements and user requirements for the project. Additional guidance is as follows:
  - 1. Upon project initiation, discuss with the Owner the process for communication and review with the SFMO. The Owner may request, as a component of Basic Services, that the Designer initiate communication and technical coordination with the SFMO in design phases prior to the Construction Document phase to allow for early identification of issues.
  - 2. For SFMO reviews, the Designer shall utilize the SFMO's required submittal process after obtaining Owner approval to proceed with the SFMO submittal.
  - 3. The Designer does not pay the SFMO review fee. The Owner pays the review fee through internal State administrative processes. In estimating the review fee, the Designer must give careful attention to the fee table and exemption provisions.
  - 4. The SFMO's approval letter must be obtained before a bid date will be assigned by the Owner.
- C. Storm water permits are regulated by the Tennessee Department of Environment and Conservation (TDEC). Submit projects that involve a project work site of one acre or more to TDEC for an initial review as soon as a preliminary site plan is available for evaluation of permitting applicability. A full submittal shall be concurrent with the SFMO review. The Designer shall comply with the requirements in "TDEC's General NPDES Permit for Discharges of Stormwater Associated with Construction Activities" (CGP) and the accompanying TDEC Erosion and Sediment Control Handbook and the following requirements. The Designer is responsible for determining and/or verifying if the project requires a NPDES stormwater permit and/or is a MS4 regulated site. The Designer shall coordinate with TDEC as necessary to clarify specific requirements. If submittal is required comply with the following:
  - 1. The Tennessee NPDES Construction General Permit (CGP) states that the following persons may complete the Stormwater Pollution Prevention Plan (SWPPP): professional engineer, registered landscape architect, certified professional in erosion and sediment control, or TDEC Level II certified staff.

## CHAPTER 3: DESIGN

2. The Designer shall prepare a site-specific Stormwater Pollution Prevention Plan (SWPPP) to be submitted to TDEC. In collaboration with the Owner, the Designer shall prepare a Notice of Intent (NOI) for construction activity with stormwater discharge and submit to TDEC. The preparer's qualifications shall be as required by the CGP. The approved NOI and SWPPP shall be included in the Project Manual.
  3. The Designer shall coordinate and perform site assessments at each outfall, as required. The Contractor will be required to perform twice weekly inspections.
  4. The Designer shall engage the Campus MS4 Permit contact to review plans for completeness and overall Best Management Practices effectiveness. The C44 Stormwater Plan Review Checklist provided in Appendix 1 shall be completed and submitted to the Owner prior to bidding. The Designer shall collect, review and maintain copies of the C62 Stormwater Site Audit Checklist, as provided in Appendix 1, completed monthly by the Owner or its qualified agent.
  5. The Designer shall provide a written statement that the Construction General Permit is ready for termination of coverage and coordinate the Notice of Termination with the owner and TDEC.
  6. The Designer shall provide as built certification that the installation is in substantial compliance and provide a stormwater operation and maintenance plan.
- D. Local Authorities having jurisdiction to provide permits and inspections on similar local and private projects are to also be engaged in the Owner's projects, regardless of the State's sovereign immunity. Submit complete signed, sealed, final sets to all local authorities at the earliest appropriate opportunity and before assignment of a bid date. The cost for the plan review fee is paid by the Designer and reimbursed by the Owner.
- E. Federal Construction Regulations may apply to projects that are partially or fully funded by Federal agencies. When federal funds are included in the project, the Designer shall coordinate with the Owner to incorporate the construction requirements, including but not limited to, the Davis-Bacon Wage Act and the Buy American Act for construction materials.

### 3.03 OWNER CONSULTANT REVIEWS

- A. Drawings and specifications (for applicable projects) may require a review by the Owner's third party consultant for ADA, building envelope, stormwater and commissioning. Written Designer responses to all consultant comments are required for each third party review. Submit responses to the consultant and Owner. Any drawing revisions required as a result of the reviews must be made prior to bid.
- B. Prior to contacting the consultants, verify with the Owner which consultant reviews are applicable.
- C. The cost for the services provided by the specialty consultants is paid by the Owner unless the project includes a specialty consultant as basic services in the Owner - Designer Agreement.

## CHAPTER 3: DESIGN

### 3.04 HIGH PERFORMANCE BUILDING REQUIREMENTS

The State of Tennessee High Performance Building Requirements (HPBr) is a program of the Office of the State Architect (OSA). The Designer shall conform to the OSA's guidance for HPBr provided on the OSA website.

### 3.05 SPACE EFFICIENCY AND COST ANALYSIS

- A. Guidelines for space efficiency and cost analysis are detailed in the applicable Design Phase sections below. Application of these guidelines will vary in specifics by project. In conducting these analyses, refer to the Postsecondary Education Facilities Inventory and Classification Manual (FICM): 2006 Edition, Chapter 3, for building area measurement guidance.
- B. Review with the Owner the application of the terms in the FICM.

### 3.06 PROGRAM VERIFICATION PHASE

- A. As described in the Agreement, the Owner will normally have program information to provide to the Designer that will establish the Owner's functional objectives including space requirements and relationships, time and budget constraints, and other special criteria.
- B. Specific requirements for Program Verification Phase Basic Services may include, but are not limited to, the following.
  - 1. Project initiation by a pre-design meeting with the Owner
  - 2. Verification of program requirements and advisement as specified in the Agreement
  - 3. Validation or development of a project problem statement based on the program requirements
  - 4. Definition of allocations and constraints regarding project scope, budget, and time
  - 5. Program Verification Phase HPBr implementation
  - 6. Program Verification Phase space efficiency and cost analysis as described below
  - 7. Consultation on site selection, site relationships, and site issues as follows
    - a. Risk assessment of Owner-provided information on existing conditions
    - b. Identification of real property considerations
    - c. Existing and project-required utility easements
    - d. Restrictions regarding project site usage, staging, work hours, and continued occupancy
  - 8. Identification of code and regulatory compliance requirements
  - 9. Consultation on functional aspects of the program and preliminary concepts for developing functional design solutions

## CHAPTER 3: DESIGN

### C. Program Verification Phase Space Efficiency and Cost Analysis:

1. Based on the project's SBC project budget information (SBC1) form, calculate the project's Efficiency Ratio (ER) by dividing the form's listed Net Square Feet (NSF) by the form's listed Gross Square Feet (GSF).
2. Research and document a minimum of three other similarly designed and constructed university projects in the United States in regards to project budget and ER. Comparative project cost data from the other projects shall be escalated to the midpoint of the planned project construction period.
3. Evaluate the program's Net Assignable Square Feet (NASF) and the program's descriptions of design feature quality levels for consistency with (1) the SBC form's Bid Target, GSF, NSF, and calculated ER and (2) the Designer's comparative research. Report the evaluation by either of the following actions:
  - a. If the Designer concludes that there is consistency and the SBC form's Bid Target is adequate, report this conclusion in writing to the Owner along with the other documents required for completion of Program Verification Phase services.
  - b. If the Designer concludes that there is inconsistency and the SBC form's Bid Target is inadequate this conclusion shall immediately be reported in writing to the Owner along with the Designers' recommendations to reconcile inconsistencies by (1) reconsideration of the Bid Target, (2) an adjustment to the program's NASF, (3) alteration of the target ER, (4) adjustments to design feature quality levels, or (5) a combination of the above.

### 3.07 SCHEMATIC DESIGN PHASE

- A. Verify existing conditions as practicable and discuss with the Owner the types of additional investigations that are needed to adequately design the project.
- B. Early in the Schematic Design Phase, prepare and submit to the Owner a written proposal for land, environmental, archaeological and other surveys, geotechnical and hazardous materials investigations, and such other special services as needed to design the project. The proposal may recommend preliminary studies and detailed follow-up studies. Discuss service and receive qualifications with at least three qualified firms before making a service provider written recommendation. Request and submit each firm's cost proposal with their qualifications except for those of professional services that are prohibited from cost-based selection. Professional services cost proposal requests occur after the Owner and Designer reach a consensus on the best qualified provider and the cost proposal may be negotiated. The Designer will be given written authorization to hire the selected firm. Recommendations should meet the following requirements in the proposal.
  1. Identify firms that submitted proposals, their qualifications, and the recommended firm for providing services.
  2. Identify a timetable for obtaining services that provides adequate time for the Owner to review and approve the qualifications.
  3. In accordance with the timing for requests for cost proposals described above, the firm will be asked to submit an hourly not to exceed cost proposal which includes an itemization of direct cost along with a total fee. With each cost

## CHAPTER 3: DESIGN

proposal, identify the projected maximum Owner's cost including applicable Designer multiplier.

- C. Specific requirements for Schematic Design Phase Basic Services may include, but are not limited to, the following.
  - 1. A schematic design communicated as specified in the Agreement.
  - 2. An analysis of the site including the following:
    - a. Analysis and descriptions as specified in the Agreement
    - b. Flood zone designations
    - c. Local zoning
    - d. Applicable permits
  - 3. Fire and life safety requirements and design concepts
  - 4. Conceptual diagrams of alternate approaches to program requirements
  - 5. Visual studies in diagrammatic or model form
  - 6. Dimensioned schematic floor plan drawings of the approved design concept
  - 7. A narrative description of building systems
  - 8. Schematic Design Phase HPBr implementation.
  - 9. Schematic Design Phase space efficiency and cost analysis as described below
  - 10. Review of applicability and criteria for building commissioning
  - 11. Schematic Design Phase coordination with the SFMO
  - 12. Determination of TDEC Storm Water Permit applicability
  - 13. Communication of the results of site studies, surveys, and other services
- D. Schematic Design Phase Space Efficiency and Cost Analysis:
  - 1. Calculate the GSF, NASF, and ER of the schematic design. Compare the calculated ER with the target ER and Bid Target established in the Program Verification Phase.
  - 2. Develop a Cost/GSF estimate and utilize such to estimate the construction cost as required by the Agreement. The Designer's Cost/GSF estimate shall be based on comparisons to other similar and recently completed projects. Comparative project cost data from other projects shall be escalated to the midpoint of the planned project construction period based on an escalation factor developed after researching a minimum of three industry sources' current escalation projections.
  - 3. Resolve any inconsistencies between the Bid Target, the estimate of cost of construction, ER, and quality levels requirements.
  - 4. Provide this analysis to the Owner in writing.

### 3.08 DESIGN DEVELOPMENT PHASE

- A. Specific requirements for Design Development Phase Basic Services may include, but are not limited to, the following services.

## CHAPTER 3: DESIGN

1. A fully developed and communicated design concept as specified in the Agreement.
  2. A site plan with contours, applicable cross sections, and definition of extent of site disturbance and demolition.
  3. Design Development Phase space efficiency and cost analysis as described below.
  4. Significant typical design details.
  5. Summary descriptions for materials, equipment, and building system with preliminary construction specifications.
  6. Design Development Phase HPBr implementation.
  7. Design Development Phase coordination for SFMO review and TDEC Storm Water Permit.
  8. Design presentation to the SBC (Early Design Phase or EDP), if applicable.
- B. Design Development Phase Space Efficiency and Cost Analysis:
1. Precisely calculate the GSF, NASF, and ER of the developed design. Develop a summary of changes from the Schematic Design Phase design with a brief description of the influences causing the change.
  2. Use an experienced and qualified cost estimator to prepare the construction cost estimate as required by the Agreement which shall be based on material quantity take-offs and current industry pricing for the midpoint of the planned project construction period with application of escalation factors as appropriate. Additionally, apply the developed design's GSF to the previously developed Cost/GSF estimate and compare the resultant amount to the construction cost estimate.
  3. Resolve any inconsistencies between the Bid Target, the construction cost estimate, ER, and quality levels requirements.
  4. Provide this analysis to the Owner in writing along with a summary of the construction cost estimate as shown on F32 Designer's Cost Estimate Summary provided in Appendix 1.
- C. The Owner will inform the Designer of the specific requirements for the Designer to make a design presentation (Early Design Phase or EDP) to the State Architect and to the SBC in Nashville. The Owner may request that a rehearsal presentation be made to the Owner prior to the SBC presentation. Presentation requirements are specific to each project but may include the following.
1. Digital presentations (PowerPoint or PDF) for projection in the SBC meeting.
  2. Brief oral comments on any project aspect in response to questions from SBC members.
  3. Preliminary drawings as listed below communicating design concepts accurately but not so detailed as to detract from understanding the form and function of structures.
    - a. A vicinity plan showing the relationship of the project to the surrounding campus or community



## CHAPTER 3: DESIGN

- b. A site plan showing relationships to site features and adjacent structures
- c. Floor plans
- d. Elevations or perspective (preferred)
- 4. Project Summary:
  - a. Purpose of project, brief project description, and general program spaces, along with overall square footage
  - b. The site, its location, and the results of geotechnical investigations and other test reports
  - c. The facility plan, relation to Master Plan, and major functional relationships of the building
  - d. The systems used for foundation, structure, walls, roof, windows, finishes, plumbing, HVAC, and electrical service
  - e. Energy efficiencies and applicability of the HPBr
  - f. Fire protection systems, barrier-free accommodations, and other special features contributing to the solution
  - g. Commissioning scope, if required
  - h. Efficiency analysis of gross, net, and usable square footage
  - i. SBC approved Bid Target versus Designer's construction cost estimate.
  - j. Building cost estimate and cost per square footage
  - k. Site cost estimate
  - l. Anticipated construction start date and completion date and compliance with schedule

### 3.09 CONSTRUCTION DOCUMENT PHASE

- A. Specific requirements for Construction Document Phase Basic Services may include, but are not limited to, the following services.
  - 1. Plan for the Construction Schedule
    - a. Whenever possible, the construction Contract Time shall be planned to run without imposed schedule impacts such as interruptions, sequences, or dependencies.
    - b. If such schedule impacts are unavoidable then accommodations for these impacts shall be made in the Bidding Documents and reviewed with the Owner early in the Construction Document Phase.
    - c. Establishing construction phases is a viable accommodation for a schedule impact. Designer services for phased construction schedules shall include the control of construction commencement and/or acceptance through phase-specific Notices to Proceed, Substantial Completion inspections, and Certifications for Payment.
  - 2. Plan Alternates as Required and Approved
    - a. The use of Alternates requires review and approval by the Owner. When

## CHAPTER 3: DESIGN

necessary, Alternates are used to protect the Bid Target and improve the chance for an awardable bid.

- b. When authorized by the Owner, Alternates shall be established, evaluated, and awarded according to OSA Policy.
  3. The use of Allowances and Unit Prices requires review and approval by the Owner.
  4. Prepare a Project Manual following the guidance in Chapter 4.
  5. Prepare required drawings including, unless otherwise approved, a title sheet, location map, and a list of drawings.
  6. Complete a C38 Bid Documents Submittal Checklist provided in Appendix 1, a Designer's Cost Estimate, required HPBr documents, and when applicable a C44 Stormwater Plan Review Checklist provided in Appendix 1.
  7. Compare the specific documents in the Project Manual with the document requirements in the C42 Standard Document Instructions and Checklist provided in Appendix 1. Check off each document required for the Project manual paying careful attention to the document date and when/if the document is required.
  8. Submit at least one set of preliminary Bidding and Contract Documents to the Owner for review and transmit the following documents in PDF format.
    - a. SFMO approval letter or a no review letter
    - b. Completed Bid Documents Submittal Form
    - c. Completed Standard Document Instructions and Checklist
    - d. Completed Designer's Cost Estimate
    - e. Completed HPBr criteria information.
    - f. Completed Stormwater Plan Review Checklist when applicable
    - g. Preliminary Stormwater O&M plan when applicable
  9. Submit documents to the SFMO as required.
  10. A final revision of the narrative summary descriptions required in the Design Development Phase.
  11. Construction Document Phase Space Efficiency and Cost Analysis as described below.
- B. Construction Document Phase Space Efficiency and Cost Analysis:**
1. Precisely calculate the GSF, NASF, and ER of the final detailed design. Develop a summary of changes from the Design Development Phase design with a brief description of the influences causing the change.
  2. Review the construction cost estimate submitted to the Owner in the Design Development Phase as required by the Agreement. Based on this review, take either of the following actions:
    - a. Provide a written confirmation of the continued validity of the construction cost estimate submitted to the Owner in the Design Development Phase with the Designer's recommendations regarding applicability.

## CHAPTER 3: DESIGN

Or

- b. Use the same cost estimator who prepared the construction cost estimate in the Design Development Phase to update the construction cost estimate for the final detailed design. This update shall include identifying and applying changes in material quantity take-offs, changes in industry pricing and escalation factors, additional detailing, and any other factor causing a change in the construction cost estimate.
3. Apply the final detailed design's GSF to the previously developed Cost/GSF estimate and compare the resultant amount to the construction cost estimate as updated. Provide this analysis in writing to the Owner with the Designer's recommendations regarding applicability.
- C. Transition to Bidding Phase: The following is a typical sequence of events for the transition from the Construction Document Phase to the Bidding Phase.
  1. The Designer incorporates the Owner's comments on the draft Bidding Documents in appropriate revisions.
  2. For projects determined to include "Highway Construction" or that are funded with Federal Funds and subject to the Davis-Bacon Act, the Owner obtains and forwards to the Designer a Wage Rate Determination for incorporation in the Bidding Documents.
  3. The Designer submits to the Owner the final, signed and sealed, Bidding Documents, a copy of the SFMO approval letter, and a copy of the TDEC Storm Water Permit Application.
  4. The Bidding Phase begins with the assignment of the bid date by the Owner and the bidding proceeds in accordance with Chapter 5.

### 3.10 FURNITURE, FIXTURES, AND EQUIPMENT (FF&E) ADDITIONAL SERVICES

- A. The Owner and Designer shall jointly review the project to determine the applicability of additional services for FF&E design. If applicable, submit to the Owner a written proposal for additional services for FF&E design, prepared in accordance with the Agreement and to accommodate the specific requirements of the project. Services may commence only after written approval by the Owner. FF&E design services shall be coordinated with and mutually responsive to other services of the Designer to result in an integrated project delivery. Typical services for FF&E design are described below.
- B. Program Verification Phase FF&E Additional Services
  1. Meet with the Owner's user group representatives to discuss program requirements for FF&E including the following:
    - a. Functional standards and quality levels.
    - b. Personnel space standards and/or workstation systems.
    - c. General requirements related to power and data systems, telecommunications, and reproduction equipment.
  2. Following determination of user needs, prepare FF&E budget estimates and an outline schedule indicating milestone dates for completion of project FF&E work.

## CHAPTER 3: DESIGN

3. Confirm the scope, schedule, and fee for FF&E design services.
  4. Submit a written summary of results for Owner approval.
- C. Schematic Design Phase FF&E Additional Services
1. Prepare schematic design documents including the following:
    - a. Alternative design scaled floor plans indicating FF&E types and quantities
    - b. Illustrations (e.g., drawings, photographs, samples) of proposed types of finishes, materials, and fabrics
    - c. Documentation of the user's specific FF&E requirements related to power and data systems, telecommunications, and reproduction equipment
    - d. Preliminary listing of manufacturer recommendations
  2. Coordinate FF&E design with power and communications design for accurate understanding and compatibility across disciplines.
  3. Schedule necessary meetings with user groups for confirmation of design direction.
  4. Confirm FF&E schedule and budget.
  5. Culminate Schematic Design Phase FF&E services with a presentation to the Owner's project manager and user group representatives for approval.
- D. Design Development Phase FF&E Additional Services
1. Prepare final floor plans for all FF&E features.
  2. Make final written recommendations for approved manufacturers for FF&E specifications including specifications for finishes and fabrics.
  3. Submit a final written recommendation for furniture and fabric selections. Selections shall be based on user input from a minimum of one initial recommendation review meeting and two revised recommendation review meetings. Additional interaction with user representatives shall be conducted as necessary to develop recommendations.
  4. Provide illustrations for recommended locations and types of art.
  5. Develop and communicate with appropriate project design personnel to ensure proper coordination between FF&E and building systems including, but not limited to, electrical, communications, mechanical, and structural designers.
  6. Confirm FF&E schedule and budget.
  7. Culminate Design Development Phase FF&E services with a presentation to the Owner's project manager and user group representatives for approval.
- E. Construction Document Phase FF&E Additional Services
1. Develop FF&E specifications and bid documents.
  2. Make arrangements with Owner for final selection and purchase of approved art.
  3. Confirm FF&E schedule and budget.
  4. Collaborate with the Owner's project manager and purchasing personnel to develop appropriate bidder lists.

## **CHAPTER 3: DESIGN**

5. Submit Construction Documents for Owner approval.

### **3.11 TEAM EVALUATIONS FOR DESIGN PHASE**

In accordance with State requirements as found on the Office of the State Architect website, the Owner will initiate the process of team evaluations.

END OF CHAPTER