

## **PROGRAM ANALYSIS AND DESIGN**

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**Project Scope:** The University of Illinois at Urbana-Champaign will provide to the AE, a Project Program Statement with background information. The Program Statement also outlines the project parameters and serves as an initial edition of "Owner's Project Requirements".

Unless specifically stated in the Project Program Statement, all projects shall be designed to meet the *University of Illinois at Urbana-Champaign Facilities Standards*.

**CDB Projects at the U of I:** The U of I and the CDB together will determine the relevant sections of the CDB checklist that are to be completed for the project.

*Clarification: For CDB Projects, refer to CDB Review Checklists for Program Analysis, Design Development and 50% Design submittals. These are available in at the CDB website.*

For CDB Projects, the AE will submit for review, the appropriate edited checklist at each submittal.

### **Conceptualization Phase:**

Review the data in the Owner's Project Requirements, consult with the U of I (and the CDB when required) to clarify the extent of the project scope, schedule and budget constraints. AE shall visit the project site to obtain a thorough understanding of the existing conditions and the project.

Provide a program analysis containing a coordinated project scope supplemented with information necessary to form a complete Basis of Design. Include verification of any information provided by the U of I.

*The Basis of Design is the AE's response to the Owner's Project Requirements and will be edited throughout the project design to reflect changes during design.*

Content requirements for the program analysis submittal will vary with the scope of

the project, but will generally include the following:

a. Design narrative and sketches of building and diagrams showing program elements and their relationships. Provide flow and adjacency diagrams.

b. Space itemization including: function and size (show as net assignable sq. ft./area), number and classification of occupants, type and quantity of fixed and movable equipment (noting required utilities), special environmental and/or system requirements.

c. Total of all program areas including a percentage allowance for circulation, mechanical and maintenance functions.

d. Narrative and sketches of existing and proposed building infrastructure.

e. Provide a narrative on LEED design consideration such as building siting, orientation, and anticipated LEED points.

f. Code analysis indicating all regulatory agencies, permits, building codes, and standards that apply to the project. Include in this report an action checklist indicating required regulatory agency reviews and permits.

g. Unless included in the AE's Professional Service Agreement Scope of Work, AE shall be provided from the U of I, a statement of the status of asbestos inspections and/or abatement. The AE shall review the asbestos inspection report and/or management plan, stating the impact on the Program. The purpose of the management plans is not to provide a scope for renovation / demolition projects. They are a good starting point, but should not take the place of a project-specific inspection.

h. The U of I shall provide a Utility Program Statement (UPS) that indicates the general location of known utilities in the area of the project. The AE shall verify this information.

i. Provide AV system requirements based on the Owner's Project Requirements (AV) and through interviews with end users and Owner representatives. AV Basis of Design shall include AV system operation narrative,

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measurable technical requirements, and estimated cost. AV Basis of Design will be continually updated through all phases of the project.

j. Provide an opinion of probable construction costs including itemization of major work categories.

k. Provide the estimated duration of project design and construction schedule.

l. Resolve, in consultation with CDB and the U of I Project Manager, any discrepancies in the project scope or budget prior to proceeding to the next design phase.

m. The AE may be required to provide a geotechnical report during Conceptualization or Schematic Design phase.

n. Provide a construction staging plan, specifying the proposed size, access and impact on the campus community.

o. The AE's proposed design and construction cost estimate shall be based on new and existing HVAC equipment not being used for temporary heating and cooling purposes. The AE shall request any proposed exceptions to this policy by means of a Variance Request early in the design process and shall incorporate only Owner-approved Variances in the design.

p. The AE's proposed design and construction cost estimate shall be based on new and existing elevators not being used during construction. The AE shall request any proposed exceptions to this policy by means of a Variance Request early in the design process and shall incorporate only Owner-approved Variances in the design.

### ***Schematic Design:***

The Schematic Design shall proceed following acceptance of the Conceptualization Phase or the U of I provided Program Statement.

AE shall submit all deliverables as required in the Professional Services Agreement and in accordance with the Project Submittal Requirements.

Except as deleted from the AE's scope of work, both the Architect and the Engineers shall prepare a minimum of three design studies which meet the program and budget requirements for review and consideration by the CDB and the U of I.

Design Studies shall include alternatives, drawings or other documents as appropriate to define the alternatives. Drawings can be sketch format, single line drawings or other as appropriate to illustrate basic information. Submittals shall include written analysis of the advantages and disadvantages of each alternative.

Provide budget cost estimates for each schematic design study.

Life Cycle Cost Analyses shall be provided for all alternatives exceeding 25,000 GSF in size.

Provide an updated narrative on LEED design goals.

*Clarification: Fundamental Commissioning will be required on all LEED projects with Enhanced Commissioning included as agreed upon by the AE and the U of I. The AE shall include a line item in the Cost Estimate to indicate an early estimate of costs pertaining to the agreed upon level of Commissioning.*

Design Development will be based on the alternative accepted by CDB and the U of I, as modified by their comments during the review process.

Provide an updated Basis of Design.

Provide preliminary FF&E Binder/Boards.

Provide preliminary list of bid alternates.

### ***Design Development Phase:***

The Design Development Phase shall proceed following acceptance of the Schematic Phase.

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Prepare design development submittal based on the accepted schematic design and in accordance with the Project Submittal Requirements. The submittal shall illustrate the resolution of all building elements. Solidify and illustrate the relationship of the project components for structural, mechanical and electrical systems. Identify materials and specify performance characteristics and quality standards.

Requirements for the design development submittal vary with the scope of the project, but generally include the following:

a. The initial draft of the Project Manual: Table of Contents, Updated Basis of Design, Specification sections, First Edits for each major project component.

b. Site Plan. Locate each building, existing and finished contours, ground floor elevations, roads, walks, parking areas, utilities (existing, new, and relocated), construction staging area, other site construction, and limits of the contract. (Coordinate any proposed interruptions to services, roads, etc. with the U of I.)

c. Estimate of probable construction cost.

d. Project schedule.

e. Life Cycle Cost Analysis for each alternative energy system that exceeds 25,000 GSF.

f. A statement indicating compliance with the Federal Energy Policy Act and ASHRAE 90.1, 2010 edition.

g. An area analysis tabulation comparing the net and gross square footage with those provided for in the Program Analysis.

h. Floor Plans. Identify room numbers, names, and mechanical spaces.

i. All elevations showing finishes, window and door styles, etc.

j. A minimum of two vertical building sections.

k. Location and type of primary structural members.

l. Permanent and temporary utility service requirements, including approximate utility connection, building entry, size and capacity. Include all Owner-approved variances for the permitted use of HVAC and elevator equipment for temporary purposes. Otherwise, new and existing HVAC and elevator equipment are not permitted to be used for temporary purposes.

m. Plumbing main layouts and fixture schedules. Include for domestic water, storm water, sanitary and waste mains.

n. HVAC systems and their major components including chases and service access. A preliminary riser diagram for the chilled water, hot water and steam system is expected with the design development submittal.

o. Preliminary layouts of lighting, power, fire alarm, emergency lighting, exit signs, and communication systems.

p. Fixed equipment in tabular form with utility connection requirements noted.

q. AV system and components.

r. Preliminary Fire Protection Plan

s. Preliminary Life Safety Plan.

t. Preliminary Energy Analysis

u. Updated LEED points summary

v. Updated commissioning information

w. Binders and Finish Boards for exterior and interior materials to Owner for review and approval by the Architectural Review Committee (ARC)

x. Possible Bid Alternates and associated cost estimates for each.

y. Elevator Design Process Worksheet. See *Exhibit 14 20 00-2, Elevator Design Process Worksheet*.

**Construction (Bidding) Documents Preparation:**

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The Construction Documents Phase shall proceed following acceptance of the Design Development Phase.

General: The AE shall prepare the Construction Documents (Project Manual, Drawings and Addenda) in conformance with the Illinois Procurement Code and in accordance with the Project Submittal Requirements.

The Professional Services Agreement will define the number and stage of development of submittals that are to be provided during this phase.

LEED documentation shall be updated throughout the Construction Document Phase.

Complete Commissioning instruction shall be included in the Construction Documents.

Bid Alternate recommendations and cost estimates shall be updated throughout the Construction Document Phase.

FF&E Binders/Boards shall be updated throughout the Construction Document Phase.

Application of Professional Seals: Bidding documents shall contain a legible seal, applied in accordance with the State of Illinois, including signatures, date and license expiration date of the architect, structural engineer and/or professional engineer responsible for the document or under whose supervision the document was prepared.

Submit completed Elevator Design Process Worksheet. See *Exhibit 14 20 00-2, Elevator Design Process Worksheet*.

### ***Plan Reviews:***

The U of I Project Manager will schedule design review submittals and review meetings required by the agreement.

Documents shall be submitted for review to the U of I (and CDB) at the stages of

completion (Conceptualization Phase, Schematic Design, Design Development and 50% and 95% Construction Documents) or as set forth in the agreement and at final completion (100% Bidding Document). The AE shall provide the contracted number of sets of review documents for the U of I (and CDB) for each review. The typical review period required is 2 weeks per submittal by the U of I, and 3 weeks per submittal for CDB projects.

*Clarification: Additional submittals may be required by the CDB Project Manager, i.e., 75% CD.*

Each submittal will contain (at a minimum), the Narrative or Project Manual, Drawings, Life Cycle Cost Analysis, and estimate of probable cost.

*Clarification: AE shall refer to the List of Deliverables in the PSA Agreement.*

The U of I Plan Review does not replace the AE's quality control but does review documents for general compliance with the program objectives, Owner's Project Requirements, the U of I Design Standards, contract requirements and "Design to" budget. The U of I may also review for cost effective design, energy conservation, competitive bidding procedures, operating and maintenance costs, and general compliance with applicable codes, rules and regulations. The U of I's acceptance of the documents does not relieve the AE of its responsibilities as a design professional. The review of documents by CDB is independent of the U of I Plan Review.

Review comments prepared by the U of I and/or regulatory agencies will be provided to the AE at or prior to the review meetings.

AE shall ensure that all key design staff and consultants attend the review meeting(s).

Following the reviews, the AE shall:

a. Prepare meeting minutes indicating issues discussed/resolved.

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b. Provide CDB and the U of I with a written response to all review comments and questions within 14 calendar days.

The 100 percent Bidding Documents submittal shall include a final code analysis/regulatory review action checklist, copies of all permits and approvals, proposed list of critical work, ASHRAE 90.1 2010 compliance forms, explanation of factors used in determining specified construction duration.

The AE will, in writing or at the review meeting, be given notice of the acceptance of the review documents or be issued instructions to correct and resubmit. If the required corrections are minor, documents may be conditionally accepted and the AE may proceed to the next phase. When documents are not accepted, the AE shall repeat the review stage (including another review meeting).

### **Project Manual:**

Specifications shall be written in the 2004 CSI format and in accordance with the Project Submittal Requirements.

Specifications shall be edited to meet the requirements of the Project. Extraneous sections and inapplicable verbiage shall be edited out.

The U of I has detailed information in CSI format as part of the *University of Illinois at Urbana-Champaign Facilities Standards*, for use by the AE. These Standards shall be translated into contract language and inserted as requirements of the project.

### **Drawings:**

Bid and project record drawings must comply with the *University of Illinois at Urbana-Champaign Facilities Standards* and be in accordance with the Project Submittal Requirements. Drawing details are included in the *U of I Facilities Standards*, for use by the AE. When applicable, these details shall be edited to be project-specific and included in the Project Drawings.

All floor plans and partial floor plans shall show consistent column grid line indications, room names and numbers and shall be to the same scale. Building elevations and sections shall also indicate column grid lines. Larger scale plans of special areas such as toilets (including elevations), lecture rooms, stairs, kitchens, shall be provided as necessary to show details of the work.

The elevation of the finished floor shall be indicated under the title for each floor level (all disciplines).

All details shown on drawings shall be applicable to the project.

Items shown on the drawings that are not a part of the contract shall be labeled as NIC (not in contract).

Clearly identify and show all work involved in demolition, alternate bids, removals, abandonment, or other activities associated with the project.

A key plan in the lower right-hand corner of the drawing shall be used to locate a building, a portion of a building or portion of a site in relation to the larger unit.

All work shown is assumed to be new unless stated otherwise. Do not use the word "Proposed" on contract drawings when referring to required work. Existing items pertinent to the project may be marked as "existing" to avoid confusion with new work. Future work shall be shown only where necessary to coordinate with current project and shall always be noted as "NIC".

Reference drawings may be provided to clarify the scope of work if clearly identified.

Photographs may be used to clarify existing conditions.

### **Bidding and Award:**

AE shall submit updated interior and exterior FF&E Binder / Boards based on the Bid Results to the U of I Project Manager for review and approval by the ARC.

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See *Exhibit 00 01 00-1, AE Minimum List of Deliverables* for a complete list of deliverables required for each project phase.