

SECTION 07 DESIGN DEVELOPMENT PHASE

Table of Contents

07.01 GENERAL	2
A. REFERENCE ABBREVIATIONS	2
B. AGREEMENT BASIS	2
C. DESIGN PROFESSIONAL RESPONSIBILITIES	2
D. OWNER RESPONSIBILITIES	3
07.02 REQUIRED DESIGN DEVELOPMENT DOCUMENTS FOR UNIVERSITY REVIEW	3
A. DRAWINGS	3
B. OUTLINE SPECIFICATION	5
C. TABULATION OF AREAS	5
D. STATEMENT OF PROBABLE CONSTRUCTION COST	5
E. LIFE CYCLE COST ANALYSIS	6
F. OTHER DOCUMENTS	6
07.03 FINISH SAMPLES	6
A. EXTERIOR	6
B. INTERIOR	6
07.04 REVIEW AND APPROVAL PROCESS	6
A. UNIVERSITY REVIEW	6
B. STATE BUILDING CODE BUREAU PRELIMINARY PLAN REVIEW	7
C. UNIVERSITY APPROVAL	7

Unless stated otherwise, the standards in this Facilities Design Manual (FDM) are directed to the Design Professional to incorporate into the Project.

*Changes to this Division since the last issuance are indicated with **yellow highlighted text**.*

Links to Support Documents, external webpages and other FDM sections are shown in underlined text.

07.01 GENERAL

A. REFERENCE ABBREVIATIONS

1. O-DP Sample Agreement Between Owner and Design Professional or executed Agreement

B. AGREEMENT BASIS

1. This phase of the Capital Planning Process is based on the sample Agreement for Architectural projects.
2. In the Engineering project version, this phase is named the Preliminary Design Phase and requires different services and deliverables.
3. This phase is normally not included in the sample Agreement for Special Services projects.
4. For a brief description of the sample Agreements for Architectural, Engineering and Special Services projects and their differences, see paragraphs under subsection 00.02 in FDM Part 1/[Sec 00 Introduction.pdf](#).

C. DESIGN PROFESSIONAL RESPONSIBILITIES

1. For responsibilities of the Design Professional, including those referenced under 07.01C, consult the sample Agreement for Architectural or Engineering projects at (<http://www.fpm.iastate.edu/planning/professionalconsultants/>) or, if the Project is active, the executed Agreement.
 - a. For general administrative responsibilities, see paragraphs under subsection 01.03 in FDM Part 1/[Sec 01 Working Relationships.pdf](#).
 - b. For general design phase responsibilities, see paragraphs under subsection 01.04 in FDM Part 1/[Sec 01 Working Relationships.pdf](#).
2. Prepare Design Development Documents from the Schematic Design Concept approved by the Owner's Representative that substantially define the Project in all aspects including structure, enclosure, building systems and items of equipment.
 - a. Create text documents using (or converted to) DOC files from the latest version of Microsoft Word and convert to Adobe Portable Document Format (PDF) for publishing to the Owner's project web site.
 - b. Create drawings using (or converted to) DWG files from the latest version of Autodesk AutoCAD, Architectural Desktop or RVT files from the latest version of Autodesk Revit and convert to Adobe PDF for publishing to the Owner's project web site.
3. Determine design solutions to all Project requirements.
 - a. Discuss with the Planning Committee, and appropriate personnel in Environmental Health and Safety and in Facilities Planning and Management.
 - b. Discuss with using departments through arrangements made by the Owner's Representative.
 - c. For consideration of a concept, method or product that deviates from the design standards stated in either Part 1 or Part 2 of the Facilities Design Manual, initiate a comprehensive review by the Owner's Representative as early as possible during the Design Development Phase.
 - 1) Review will not normally be done after the Design Development Phase.
 - 2) Incorporate into the Project only after providing written justification and receiving written approval by the Owner's Representative.
 - d. Develop the design to the point of being completely ready for final documentation.
4. Continue the Building Automation System specification development. **Consult with the Owner's Representative and ISU Energy Management.**
5. Publish interim documents in Adobe PDF to the Owner's project web site as needed or as requested by the Owner's Representative.
6. Communicate responses to review comments by the Owner using the Owner's Microsoft Excel template (see FDM Part 1/Support Docs/[Review Comments.xls](#)) published to the Design tab > Design Development > DD Review on the Owner's project web site.
 - a. In the XLS file(s), for each comment, enter a response in the yellow "Follow Up Comments" column that describes how the issue(s) will be addressed.

- b. If there is not agreement by the Owner's Representative concerning how an issue will be addressed, work to attain a mutual resolution with the Owner's Representative.
 - 1) Record the revised follow up to the comment in the "Follow Up Comments" column.
- c. Enter the follow up completion date in the yellow "Complete" column for each comment.

D. OWNER RESPONSIBILITIES

1. For responsibilities of the Owner, including those referenced under 07.01D, consult the sample Agreement for Architectural or Engineering projects at (<http://www.fpm.iastate.edu/planning/professionalconsultants/>) or, if the Project is active, the executed Agreement.
 - a. For general administrative Owner responsibilities, see paragraphs under subsection 01.05 in FDM Part 1/[Sec 01 Working Relationships.pdf](#).
2. The Owner will furnish the services of a geotechnical engineer or other Professional Consultant when deemed necessary by the Design Professional and approved by the Owner.
3. The Owner will assist the Design Professional to develop a design that fits contextually, and properly correlates with existing buildings, topography, site features and utility systems.
4. The Owner will define final room numbers and door numbers for the Design Professional and will provide follow-up renumbering if room configurations and/or door locations are subsequently revised.
 - a. See the Owner's room numbering and door numbering standards at FDM Part 1/Support Docs/[Room Numbering Standards.pdf](#) and [Door Numbering Standards.pdf](#).

07.02 REQUIRED DESIGN DEVELOPMENT DOCUMENTS FOR UNIVERSITY REVIEW

A. DRAWINGS

1. Provide drawings and diagrams that clearly show the Project's major details, materials, surface characteristics, constructability and the coordination and integration of system components.
2. Provide Adobe PDF files that print to standard sheet sizes.
 - a. Sheet sizes 24x36 or smaller are preferred.
 - b. Sheet sizes larger than 24x36 require approval by the Owner's Representative.
3. Use of Autodesk Revit or use of Autodesk Architectural Desktop with objects and following U.S. National CAD Standard layering and organization (<http://www.nationalcadstandard.org/>) is recommended.
4. Requirements for All Sheets
 - a. Consistent drawing orientation and scale
 - 1) Use the scale that will be used for Construction Documents, normally not less than 1/8" = 1' - 0".
 - 2) Use the same scale for plans, elevations and building sections.
 - b. Official Project Title
 - c. Submittal date
 - d. Design Professional's name
5. Required Drawing Types
 - a. Site plan (see FDM Part 1/Support Docs/[Landscape And Site Design Development Checklist.xls](#))
 - 1) Show required demolition of physical and natural elements.
 - 2) Show building and site in context with surrounding area.
 - 3) Show utilities locations and connections.
 - 4) Show hardscape and circulation elements.
 - b. Preliminary Pollution Prevention Plan
 - 1) A Pollution Prevention Plan is a prerequisite to obtaining a National Pollutant Discharge Elimination System (NPDES) Construction Permit when any of the following conditions exists.
 - a) The area disturbed inside the construction limits is 1 acre or more.

- b) The Project is a part of a "larger plan of development" being constructed in stages that will disturb 1 acre or more.
 - 2) See FDM Part 1/Support Docs/[ISU SOP For Development Of NPDES Construction Permits.pdf](#) and example details in FDM Part 1/Support Docs/[ISU NPDES Details 1-13.pdf](#).
 - 3) Where a permit is not required, follow best NPDES practices on sites.
 - 4) When required, consider the Preliminary Pollution Prevention Plan the beginning of the Final Pollution Prevention Plan required midway in the Construction Documents Phase.
 - 5) When required, midway through Design Development Phase, submit the Preliminary Pollution Prevention Plan to the Owner's Representative for review.
- c. Building plans of all levels
- 1) General requirements
 - a) Show name, Program Name and Number.
 - b) Show names and NASF of non-programmed circulation, public and service spaces.
 - c) Show final room numbers and door numbers provided by the Owner's Representative.
 - d) Show major control dimensions and dimensions needed to determine room sizes.
 - 2) Show required demolition if the Project is a renovation.
 - 3) Show foundation and structural systems.
 - 4) Show exterior walls.
 - 5) Show roofing systems.
 - 6) Show continuity of thermal, air barrier and moisture control systems.
 - a) Show detail sketches at roof/wall/opening/floor/foundation intersections.
 - 7) Show interior construction.
 - 8) Show fixed equipment to be furnished and installed by the Contractor.
 - a) Examples are built-in items such as, but not limited to, laboratory casework, fume hoods, benches, wall cabinets, shelves, counters, white boards, tack boards, projection screens and coat racks.
 - 9) Show fixed equipment to be furnished by the Owner and installed by the Contractor.
 - a) Examples are items such as, but not limited to, media cabinets, teaching stations, carpet, drapes and blinds, that are identified in the Building Program or during the Design Development Phase.
 - 10) Show major pieces of programmed furniture and other movable equipment.
 - a) Movable equipment typically designed or selected, furnished and installed by the Owner are non-built-in items such as, but not limited to, office furniture, file and storage cabinets, free-standing bookcases, scientific equipment and office equipment.
 - (1) The cost of movable equipment furnished and installed by the Owner is not included in the total construction cost of the Project.
 - (2) Show movable equipment furnished and installed by the Owner to verify adequate space and utilities are provided by the Project.
 - 11) Show conveying equipment.
 - 12) Show special construction.
 - 13) Show mechanical and plumbing systems.
 - 14) Show electrical systems.
 - 15) Show life safety and security/access systems.
 - 16) Show voice, data and audio/video systems.

- d. Exterior Elevations
 - 1) Show initial drawings that will be included in the Construction Documents.
 - 2) Show exterior finish materials
- e. Interior Elevations
 - 1) Show initial drawings that will be included in the Construction Documents.
 - 2) Show interior finish materials
- f. Building Sections
 - 1) Show initial drawings that will be included in the Construction Documents.
 - 2) Show interior finish materials.
 - 3) Show major level changes.
 - 4) Show structural system materials.
- g. Schedules
 - 1) Show initial schedules that will be included in the Construction Documents.
 - 2) Show room numbers (provided by the Owner's Representative) in the Room Finish Schedule.
 - a) When labeling subdivided rooms in the schedule, use the room number plus a text modifier.
 - 3) Show door numbers (provided by the Owner's Representative) in the Door Finish Schedule.
- h. Plumbing, Mechanical and Electrical System Schematic Diagrams

B. OUTLINE SPECIFICATION

- 1. Show all specification sections that will be included in the Construction Documents.
- 2. Follow recommendations of Construction Specifications Institute's MasterFormat 2004 and Project Resource Manual – CSI Manual of Practice.
- 3. Provide manufacturer's illustrations of specified products that include the following.
 - a. Products that will be assembled, fabricated or manufactured
 - b. Products that will be visible when construction is completed
 - c. Products that comprise the thermal, air barrier and moisture control systems within the exterior envelope.
- 4. For products that deviate from standards stated in this Facilities Design Manual, include a copy of the Design Professional's justification and written approval by the Owner's Representative.

C. TABULATION OF AREAS

- 1. Add columns to the Tabulation of Areas created during Schematic Design with the following updated information based on Design Development Documents.
 - a. Final room number for each space
 - b. Net Assignable Square Feet (NASF) for each space and amount over or under programmed NASF
 - c. Gross Square Feet (GSF) per floor and total GSF for the Project
 - d. NASF-to-GSF ratio for the Project

D. STATEMENT OF PROBABLE CONSTRUCTION COST

- 1. Provide an updated Statement of Probable Construction Cost based on Design Development Documents.
 - a. Show current total amounts and amounts for contingency.
 - b. Provide a multiplier that shows anticipated inflation to reflect conditions at time of bid.
 - c. If the Owner employs an independent cost consultant, review and, if applicable, provide a written exception to any part of the report produced by the independent cost consultant.

E. LIFE CYCLE COST ANALYSIS

1. Provide a [Life Cycle Cost Analysis](#) based on Design Development Documents that meets [the State Fire Marshal's Office requirements](#) and prepare for formal submission.

F. OTHER DOCUMENTS

1. Project Design Narratives
 - a. Based on Design Development Documents, update and clearly indicate deletions and additions to the Project Design Narratives created in the Schematic Design Phase.
2. Art in State Buildings (AISB) Program Narrative – a discussion of how fine arts will be incorporated into the Project if the total estimate for the Project is \$1 million or more.
 - a. For AISB Program details see paragraphs under 01.04F in FDM Part 1/[Sec 01 Working Relationships.pdf](#) and paragraphs under 03.12 in FDM Part 1/[Sec 03 Space and Site Design.pdf](#).
3. Design Standards Exception Narrative
 - a. Provide an updated narrative of concepts, methods or products that deviate from standards stated in this Facilities Design Manual based on Design Development Documents.
4. Project Schedule
 - a. Provide an updated schedule based on Design Development Documents that shows major milestones that meet Project phasing and completion requirements.
5. State Building Code Bureau Analysis
 - a. Provide drawings that show design compliance with State Building Code Bureau requirements, including type of construction, fire separations, exiting and site layout (<http://www.dps.state.ia.us/fm/building/index.shtml>).
6. Leadership in Energy and Environmental Design (LEED) Analysis
 - a. Based on Design Development Documents, describe strategies to be used which comply with current requirements for the LEED-NC target level of the Project.
 - b. The Owner's check list of LEED points may be used as a support document for the analysis.
 - 1) See FDM Part 1/Support Docs/[Minimum Required LEED Points for ISU New Construction Capital Building Projects.xls](#).

07.03 FINISH SAMPLES

A. EXTERIOR

1. Create a board that displays samples of exterior finish material showing color and texture.

B. INTERIOR

1. Create a board that displays samples of interior finish material showing color and texture.

07.04 REVIEW AND APPROVAL PROCESS

A. UNIVERSITY REVIEW

1. Publish the Design Development Documents in Adobe PDF to the Owner's project web site.
2. If published documents are considered by the Owner's Representative to be insufficiently complete for Owner review, revise and republish documents by a mutually agreed date and time at no additional cost to the Owner.
3. After acceptance by the Owner's Representative, submit to the Owner's Representative the following documents in the quantity defined in the table under paragraph 15.3.2 in the executed Agreement.
 - a. Drawings as required under 07.02A
 - b. Outline Specifications as required under 07.02B
4. Submit 2 each of material finish sample boards required under 07.03A & B to the Owner's Representative.
5. The documents and boards will be critically reviewed in detail by the following groups.

SECTION 07 DESIGN DEVELOPMENT PHASE

- a. Planning Committee
 - b. Department representatives not on the Planning Committee
 - c. Department of Environmental Health and Safety
 - d. Facilities Planning and Management
 - e. Other administrative and academic personnel
6. During review, comments will be published in 1 or more Microsoft Excel (XLS) files to the Owner's project web site by the Owner's Representative.
- a. Respond to comments using the process described in paragraphs under 07.01C6.

B. STATE BUILDING CODE BUREAU PRELIMINARY PLAN REVIEW

1. Concurrent with university review, meet with personnel of the Department of Public Safety, Division of State Fire Marshal, State Building Code Bureau to review the Project.
 - a. Ask the Owner's Representative whether personnel in the Department of Environmental Health and Safety desire to be involved in the code review with the Bureau.
2. Publish the Bureau's comments and the design team's response to the Design tab > Code and Fire Marshal in Adobe PDF on the Owner's project web site.

C. UNIVERSITY APPROVAL

1. After all required documents have been received and review issues have been resolved to the satisfaction of the Owner's Representative, the Owner's Representative will provide written approval to proceed to Construction Document Phase.
2. After approval, publish updated Design Development Documents in Adobe PDF to the following locations on Owner's project web site.
 - a. Drawings to the Design tab > Design Development > Final DD Drawings
 - b. Specifications to the Design tab > Design Development > Final DD Specs
3. After approval, submit the to the Department of Public Safety, Division of State Fire Marshal, State Building Code Bureau.

END OF SECTION 07 DESIGN DEVELOPMENT PHASE