PROJECT DECISIONS BY PHASE

INTRODUCTION

The following matrix identifies primary project decisions that need to be made in each phase before the next phase is started. Project teams should evaluate the decisions for each phase to establish priorities within the phase. For example, the preliminary code analysis in Schematic Design phase should be completed early in that phase so that the design of the project reflects applicable regulatory requirements.

Where other industry documents list deliverables for project phases, this matrix focuses on the decisions needed to establish the information to be conveyed in those deliverables.

Decisions made at the correct phase are less costly to project teams than decisions that are postponed to a succeeding phase. When a decision is deferred, there is a multiplier effect that increases costs the longer that decision is deferred. For example, on a recent major project designed by another firm, the design of a special sloped, faceted curtain wall feature was deferred until more than halfway through the Construction Documents phase. When a system was finally selected and detailing began, it was discovered that major changes for technical reasons had to be made to the appearance of the feature that affected the floor plans. The floor plan changes in turn required redesign and redrawing by all the engineering disciplines.

Decisions appropriate to Construction Documents phase that are postponed to the Contract Administration phase result in unnecessary additional costs to the Owner in the form of change orders as well as re-design and administrative costs for the design team, and could result in costly claims and disputes.

The matrix is set up for all projects—small and large, simple and complex—and may need some adjustments for specific project needs.

Like any set of guidelines, there may be circumstances where certain decisions may have to be deferred because of owner decisions or other circumstances outside the design team's control. On the other hand, some owners may want certain decisions moved to earlier phases.

Integrated Project Design projects and implementation of lean principles may need to have certain decisions moved to an earlier phase.

For fast-track projects, there will be overlaps in the phases, but the decisions appropriate to each phase of each Work Package remain the same. However, the matrix should be reviewed during work package planning to see if it is necessary to move certain decisions to an earlier phase.

After the decisions for a given phase are identified, they should be prioritized as a step toward identifying the critical path for production of drawings and specifications.

This matrix was developed over several years with input from code and ADA consultants, a trainer in design project management, and a certified construction estimator.

Louis Medcalf, FCSI, CCS

CATEGORIES	PREDESIGN	SCHEMATIC DESIGN	DESIGN DEVELOPMENT	CONSTRUCTION DOCUMENTS
Key Word	Concept	Scheme	Development	Contract
Primary Communication	Owner and estimator.	Owner, design team, estimator	Between design team members for coordination	Constructor and code enforcement officials
Phase Purpose	Conceptual descriptions and drawings to: Evaluate feasibility Establish scope of project Establish budget	Functional descriptions to: Verify conformance to Program Communicate desired functional requirements Communicate desired quality level	Design decisions to: Verify constructability of Schematic Design Coordinate product selections with interdiscipline constraints (e.g., how does the roof design affect structure)	Final decisions to: Establish contractual requirements Establish procedures for all participants to carry out their responsibilities Be legal record of design
Cost Management	Evaluation of proposed concepts. Owner establishment of budget. Owner decisions regarding sustainability and energy efficiency requirements.	Evaluation of proposed scheme to verify conformance to budget. Life cycle cost analysis (if applicable).	Statement of probable cost based on detailed estimate. **Goal:** Sufficient information for GMP.	Review and update of DD estimate to determine effect of subsequent changes. **Goal:** Bids within +/- 5% of estimate.
Consultants	Identification of consultants needed.	Consultants under contract.	Coordination of responsibility for drawing and specification requirements (who is doing what).	Full interdiscipline coordination of drawings and specifications.
Project Delivery:	Owner decision regarding project delivery method.	Identify fast-track work packages or other early-release packages. Identify construction phasing.	Identify bidding requirements (if applicable). Plan content of work packages.	Prepare Work Package documents that clearly describe scope.
Regulatory Requirements	Determine regulatory criteria that affect project design and construction.	Verify that proposed scheme complies with criteria. Obtain necessary variances and interpretations.	Verify that design complies with regulatory requirements. **Goal:** Sufficient information to obtain permits for construction.	Review documents to determine effect of CD phase changes on compliance. **Goal:** No delays in obtaining permits, no re-design or re-drawing.
Zoning	Completed checklist: ▪ Obtain copy of zoning code. ▪ Verify use. ▪ Identify constraints. ▪ Identify possible variances or interpretations needed.	Completed checklist. Preliminary discussions with zoning official to verify proposed site design. Prepare preliminary site plan.	Completed checklist: ▪ Verify compliance. ▪ Zoning information on Drawings. Obtain necessary variances or interpretations.	Completed checklist. ▪ Design changes from DD reviewed for compliance. ▪ Zoning information on Drawings.

CATEGORIES	PREDESIGN	SCHEMATIC DESIGN	DESIGN DEVELOPMENT	CONSTRUCTION DOCUMENTS
Building Code	Completed checklist: ▪ Identify applicable code, including local amendments. ▪ Identify possible construction classifications. ▪ Identify occupancy classification. ▪ Identify area and height limitations. ▪ Identify possible special considerations (e.g., seismic, atrium, high rise, multi-family projects). ▪ Identify fire district and requirements. ▪ Identify historic district and requirements. Does NFPA 101 *Life Safety Code* apply to project either because of AHJ or Owner requirements?	Completed checklist: ▪ Develop preliminary Code analysis. ▪ Select construction classification. ▪ Sprinklered / not sprinklered. ▪ Determine minimum exit width. ▪ Determine preliminary plumbing fixture count and decide on distribution throughout building. ▪ Prepare preliminary Life Safety Plans. ▪ Verify that design meets Code requirements identified in predesign research. ▪ Identify possible variances or interpretations needed. Exiting scheme shown on drawings.	Review changes from SD phase for Code compliance. Completed checklist: ▪ Finalize code analysis. ▪ Code information on Drawings. ▪ Verify exiting capacities and minimum widths. ▪ Verify plumbing fixture count. Obtain list of IBC Special Inspections from engineering consultants. Detailed evaluation of design for Code compliance. Life safety plans.	Review changes from DD phase for Code compliance. Completed checklist. Life safety plans are included in the documents. List of Special Inspections and required testing included in Project Manual.

CATEGORIES	PREDESIGN	SCHEMATIC DESIGN	DESIGN DEVELOPMENT	CONSTRUCTION DOCUMENTS
Authorities Having Jurisdiction	Contact Authorities Having Jurisdiction: ▪ Determine requirements for permitting and plan review process. ▪ For large projects in small municipalities, determine whether local AHJ has resources to perform plan examination and code inspections. ▪ Determine which disciplines are included in the permitting and plan review process: building, fire protection, mechanical, plumbing, electrical, health, energy, and planning / zoning.	Obtain determination by AHJ of occupancy classification. Discuss special requirements that may need a formal interpretation.	Discuss design changes from SD that may affect compliance. Obtain necessary variances or interpretations.	Coordinate permitting process.
Accessibility	Completed checklist. Identify applicable regulations. ▪ ANSI A117 ▪ ADA-ABA Accessibility Guidelines [ADAAG] ▪ Fair Housing Act ▪ Special requirements for Project type or use Identify site restraints. Identify accessibility requirements that may affect design.	Completed checklist. Verify that SD drawings meet accessibility requirements. Identify issues that need DOJ interpretation of ADA requirements.	Completed checklist. Detailed evaluation of DD drawings compliance. Obtain necessary DOJ interpretations.	Completed checklist. Review changes from DD for compliance.

CATEGORIES	PREDESIGN	SCHEMATIC DESIGN	DESIGN DEVELOPMENT	CONSTRUCTION DOCUMENTS
Energy Code – Building Envelope	Identify Climate Zone. Identify local Code amendments. Provide minimum R- and U-values for prescriptive compliance method as minimum standard criteria. Obtain decision from Owner as to whether Code minimum design or more stringent design is desired.	Evaluate building glazing area percentage to opaque walls and roofs to determine if Prescriptive or Total Building Performance approach will be used. Analyze design using alternate compliance method.	Provide R- or U-value for each material in the thermal envelope. Provide area calculations and R- or U-values for each thermal envelope assembly. Indicate R-value of slab perimeter and foundation insulation. Obtain mechanical system and service water heating compliance calculations from engineering consultants. Obtain electrical power and lighting system compliance calculations from engineering consultant. Provide Energy Code summary information on drawings for building envelope with other regulatory requirements.	Review building design changes from DD for compliance. Review changes in mechanical system and service water heating compliance calculations from engineering consultant. Review changes in electrical power and lighting system compliance calculations from engineering consultant. Update Energy Code summary information on drawings for building envelope with other regulatory requirements.

CATEGORIES	PREDESIGN	SCHEMATIC DESIGN	DESIGN DEVELOPMENT	CONSTRUCTION DOCUMENTS
Architectural Construction Information	Obtain legal and topographic survey from Owner. Evaluation of site. Evaluation of existing buildings and other improvements. Due diligence report (if required) for existing construction.	**Goal:** Basic design that does not require major re-design in DD phase and is in budget. Geotechnical report. Foundation system scheme. Structural system scheme. Architectural scheme: ▪ Enclosure, with sufficient information to verify energy code compliance ▪ Waterproofing ▪ Roofing system ▪ Exiting ▪ Fire-rated assemblies ▪ Locations of building expansion and seismic joints ▪ Window washing (interior and exterior) ▪ Interiors ▪ Vertical transportation ▪ Equipment ▪ Audio-visual equipment ▪ Performance equipment ▪ Laundry and uniform service ▪ Food and beverage service	**Goal:** All product decisions that affect cost. Evaluation of envelope design for vapor transmission, insulation, and sound. Dewpoint calculations for exterior walls and roof to determine whether vapor retarders are needed in walls or roof. Primary products and preliminary details for envelope: ▪ Wall construction ▪ Soffits ▪ Roofing system, including rain drainage design ▪ Glazing systems: storefront, windows, curtain wall, and glass selection ▪ Entrance doors ▪ Decorative features ▪ Window washing equipment Primary Interior Products: Identify by type and quality level, if final colors and other proprietary attributes are not yet decided. ▪ Decorative finishes (stone, tile, wood paneling, wall coverings) ▪ Operable partitions ▪ Flooring ▪ Ceilings ▪ Doors and hardware ▪ Special equipment (e.g., commercial kitchens, athletic equipment)	All products, primary and secondary. ▪ Finish selections. ▪ Wood species. ▪ Stone varieties. ▪ Masonry selections.

CATEGORIES	PREDESIGN	SCHEMATIC DESIGN	DESIGN DEVELOPMENT	CONSTRUCTION DOCUMENTS
Structural				
Plumbing		Rain water management schema.		
Fire Protection				
HVAC				
Electrical				
Communications/Data				
Electronic Security				
Exterior Improvements				
Site Utilities				
Drawings	Concept drawings and diagrams. Site development diagrams.	Plans. Elevations. Building sections. Presentation drawings. Representative wall sections developed to verify constructability and energy code compliance.	Plans. Elevations. Building sections. Representative wall sections and details. Existing conditions that affect design are fully documented. Site utility connection sizes.	Plans. Elevations. Building sections. Wall sections and details.
Schedules	N/A	N/A	Room Finish Schedule. Door Schedule. Window Schedule.	Room Finish Schedule. Door Schedule. Window Schedule. Toilet and Bath Accessories. Interior Finish Products.
Written Documents	Program. Input from Specifications team on production budget and schedule. Assignment of Project Specifier.	Preliminary Project Description based on *UniFormat*: functional descriptions of systems and assemblies. Start notebook for primary products.	Outline Specifications based on *MasterFormat* or extended PPD. Notebook of catalog cuts and selection notes for primary products. Establishment of product terminology for use on drawings. Prepare Specifications Work Plan.	Construction Specifications based on *MasterFormat*.

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Quality Reviews	Input from QM team on production budget and schedule. Specific plans for phased quality reviews, identification of off-team reviewers.	Verify completeness and constructability. Verify conformance to regulatory requirements. Identify completion items for DD Phase.	Verify completeness and interdiscipline coordination. Identify completion items for CD Phase.	Verify conformance to regulatory requirements of changes from DD. Verify that documents are complete, coordinated, compliant, correct, and ready to be issued for construction. Verify that there are no completion items for Bidding Phase or Construction Phase.
Contract Administration	Input from CA team on contract administration budget and schedule.	Evaluation of SD documents by CA Team for effects on contract administration planning. Assignment of CA staff to Project.	Review of DD documents by CA Team for effects on contract administration planning.	Evaluation of CD documents by CA Team for effects on contract administration planning.
Phase Completion – Owner	Written authorization to proceed to SD Phase.	Written approval of SD documents and authorization to proceed to DD Phase.	Written approval of DD documents and authorization to proceed to CD Phase.	Written acceptance of CD documents and authorization to release for bidding or construction.

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