

Building Design and Construction Process

This is an outline of the building process. Your project may or may not require all of the steps outlined below. You may perform some or all of the steps but seeing them outlined will help you to see the road ahead.

Feasibility Study

This first step undertakes to examine the issues that will make the project feasible or unfeasible, and in some cases to determine the best strategy for proceeding with the project. The following may be addressed in the Feasibility Study:

- Budget and scope of the project: Will the proposed project work at the desired budget?
- Site analysis: Is the site chosen suitable? Is it zoned for the project? Are there, utilities, etc.? For some projects, Structures NW may assist in analyzing the site to assess the feasibility of its use for the proposed project.
- What is the best strategy for developing the project on a given site?
- What is the optimal size and type of building?
- Is the building or site chosen structurally sound? What will be required in the way of soils tests, seismic design, etc.?
- How will other site considerations, such as solar access, wind, etc., affect the project?
- What other cost, planning, and design constraints might the project run into?

By addressing these questions up front, we can avoid costly and frustrating surprises down the road.

Programming

Programming is the process used to arrive at the set of criteria on which the design is based. The programming phase is where the project is built—not brick by brick, but decision by decision. This is the time when a common vocabulary for the project is created, and preferences and requirements are determined and built into the overall picture before time is invested in design.

One of the most important purposes of the program is to reduce the need for later backtracking and redesign. A thorough programming process is essential for maintaining an orderly and cost-effective design process later in the project. We have found that many problems that people encounter with the design of their building could have been avoided with a thorough programming process. Structures NW goes through a detailed list of criteria or what I call drivers with the client, looking for client needs that translate into square footage or other design requirements. Programming is the process where Structures NW goes through all the needs of the client so that appropriate design decisions can be made later in the process.

Structures NW encourages clients to get directly involved in establishing the program. Programming usually involves a meeting or series of one to two hour meetings with us. In the programming meetings, the client's specific goals, priorities, and uses for the building are discussed in detail. Structures NW will encourage the client to consider all important issues up front, help the client understand the ramifications of their decisions, and make recommendations based on past experience and professional knowledge. All of the requirements of the project are then put into a clearly-organized written program which will be a reference throughout the design process.

Items specifically analyzed in the programming phase typically include the following:

- Goals, needs, wishes, limitations, expectations, aesthetics.
- Scope of work: size of the building; number of rooms; room uses.
- Safety security and accessibility requirements.
- Existing and anticipated utility locations and requirements.
- Site context: Weather, noise, solar access, vehicle access, handicap accessibility, sense of entry, site analysis.
- Codes and regulations: Outline of planning and building department parameters.
- Budget and priorities: Preliminary cost analysis usually based on area and/or volume, to be refined later.
- Project Scheduling.
- In the case of reusing an existing building: Carefully document and evaluate present building and its conditions. Determine what can be reused, what must be discarded, what must be rebuilt.

Schematic Design Development

The Schematic Design synthesizes the building into a defined, feasible design. The design will be shown in the form of Schematic Drawings, and in some cases a study model. The Schematic Design will address all significant areas of design and will be reviewed with the client before proceeding with more detailed drawings. A preliminary cost estimate can also be provided at this stage.

Work in this phase typically includes the following:

- Preliminary building floor plans, sections, and elevations to determine space dimensions, areas, and volumes; sketches showing circulation, uses, relationships of spaces. Site plans can also be done at this stage
- Complete room layout of all special furniture, plumbing fixtures, etc.
- Preliminary material choices.
- Study model, if appropriate
- Address preliminary mechanical, electrical, and plumbing issues.
- Answer preliminary structural engineering questions.
- Code research and coordination with regulating agencies (licensing, building department, planning department, etc.).
- Preliminary cost estimate if needed.
- Present design to interested parties.
- Revise design subsequent to client discussions.

Design Development

Based on an approved Schematic Design, Design Development is the process of refining and fixing the design, and working out all the details, including the selection of materials and the engineering systems. The aim is to finalize all design decisions before proceeding with Construction Documents, the more detailed and expensive documents that the contractor will need to complete the project. A more detailed cost estimate may also be provided at this phase. In smaller projects, Design Development may become part of the Schematic and Construction Document phases, rather than being a distinct phase of its own. The Design Development package will be reviewed with the client before proceeding further with the project.

Work in this phase typically includes the following:

- Finalize all engineering issues such as structural system, heating and cooling systems, lighting system, etc.
- Coordinate with any other design consultants.
- Finalize construction techniques and materials.
- Finalize HVAC equipment requirements, sizes, layout.
- Finalize all design issues that affect the look of the building and the feel of the rooms. Overhangs Roof pitch etc
- Finalize any code issues.
- Complete outline specifications, a written list of criteria for materials and building methods.
- Revise cost estimate, considering probable labor and material requirements.

Construction Documentation

Based on approved Design Development documents, construction drawings and written specifications are put together which describe in detail all of the construction work to be done. These are the documents upon which the construction contract will be based, and which the contractor will use to build the project. If a building permit is required, the application is usually made at the end of Construction Documentation.

Work in this phase typically includes the following:

- Prepare specific and detailed Construction Drawings required to bid, apply for approval from building and planning departments, and complete construction. These will include dimensioned floor plans, elevations, sections, details, engineering plans such as electrical, mechanical, structural, and/or civil engineering plans, landscape plans, energy use analysis, and written Specifications that covering all materials, methods of construction, and construction contract requirements. Specifications are closely coordination with construction drawings.
- Complete all coordination with consultants. Drawings and written Specifications is essential to avoid conflicts between the various trades during construction.
- Resolve any outstanding building or planning code issues.
- Apply for permit if required.

Bidding and Negotiation

The project is put out to bid, a contractor is selected, and a construction contract is drawn up between the contractor and the client.

Work in this phase typically includes the following:

- Prepare documents for bidding such as the Invitation to Bid, Instructions to Bidders, Bid Form, etc.
- Advertise bids and solicit contractors to bid on the project.
- Coordinate and provide bid documents to bidders.
- Check bidders' qualifications (references, insurance, experience, personnel, etc.).
- Provide additional information (in the form of Addenda to the Construction Documents) as needed to bidders.
- Meet with contractors and material suppliers.
- Receive bids.
- Assist client in negotiation and preparation of Owner/Contractor Agreement and other necessary documents.

Construction Administration

On-site observation and conscientious administration of paperwork throughout construction is necessary to assure that communication flows smoothly, that high standards are maintained, and that the client gets their construction money's worth.

Work in this phase typically includes the following:

- Make periodic site visits while project is under construction, observing construction for compliance of design intent.
- Conduct on-site meetings with contractors, suppliers, client, etc.
- Administrate changes with client and contractor. (there are always changes)
- Clarify drawings as required.
- Complete additional drawings as required.
- Process numerous documents and paperwork for contractor's payment, changes, submittals from the contractor, etc.
- Participate in resolution should any disputes arise during construction.

Post-Occupancy Training

On-site training and/or phone consultation with mechanical contractors upon completion of the construction project to fully understand the operation and maintenance of all equipment.

Work in this phase typically includes the following:

- Filing all construction documentation
- Filling out warranty cards
- Walk through to answer any final questions.