



Capital Projects – or projects that result in construction or installation of elements that require significant capital investment – are complex undertakings for any organization. For museums, capital projects may include buildings, site improvements and exhibits with a wide range of uses and requirements.

This list is a “living document,” which we often edit, add to or update. The hope is that those whose job description does not generally include design, construction, fabrication or installation tasks can use this document to become familiar with the terms and ideas that go along with those processes.

Your comments are welcome! Contact us at Alissa@FrameDesignStrategies.com

Basis of Design (BOD) – or – Owner’s Project Requirements (OPR)

A document that outlines the owner’s goals for all aspects of the project, from Pre-Design through Construction Contract Administration, and establishes the Architectural Program. (See list of goals, by type, below.) It will increase the efficiency and efficacy of the project if the client/owner engages a wide array of stakeholders/users who are affected by the design when gathering the data for the design team. The BOD or OPR includes documentation of goals and requirements as understood by all members of the design team, including architects, landscape architects, engineers and design consultants, and helps set the stage for the design and construction phases of work

Project Team Disciplines

Architecture and Engineering Disciplines

- Architecture
- Landscape Architecture
- Interior Design
- Civil
- Structural
- Mechanical
- Electrical
- Plumbing
- Fire Protection
- Lighting

Other Design Consultancy Disciplines

- Code Review
- Sustainability / Commissioning
- Accessibility / Universal Design
- Retail, Food Service or other specialty design
- Signage and Graphic Design
- Geotechnical Design
- Fundraising or Donor Sketches and Renderings
- Independent Cost Estimating

Exhibit Design Disciplines

- Exhibit/Interactive Design
- Graphic Design
- Content Development
- Visualization and Rendering
- Cost Review
- AV / Multimedia Design and Production
- Specialty Lighting
- Playground/Climbing Safety Review
- Evaluation + Audience Assessment



Project Goals help define the scope of work and set the benchmarks for success:

Design and Organizational Goals:

- What are the goals, vision and mission of the organization? How are these reflected in, or supported by, physical space?
- What is the desired aesthetic and psychological impact of the design?
- Comparable facilities
- Incorporation of art
- Aesthetic goals such as extent of daylight, use of color, regional or cultural references, relationship between indoor and outdoor activities.
- Organizational goals such as input by children or community members, role of staff in the design process, project longevity.
- Phasing requirements – can all of the organizational and design goals be met via one phase of work?

Functional Goals:

- What major functions will take place in the building and via outdoor spaces
- How many people will be using the space?
- How might specific material choices enhance the building design for the uses?
- How do people arrive, depart (e.g drop-off and pickup, loading, staff arrival, guest arrival)?

Financial Goals:

- Typical costs per square foot for the building type, based on the region and site conditions
- Specific funding opportunities or restrictions
- Total project budget (see below for project cost breakdown)

Sustainability Goals

- Indoor Air Quality
- Carbon Footprint / Offset
- Water and energy use/costs (construction and operations)
- Green materials and “red list” review

Schedule Goals

- When will funds be raised/secured?
- When is the project to be occupied?
- When can construction begin? What is the duration of the construction period?
- How/when will staff be trained at the new facility?

Architectural Program

Basic Program to include:

- Type of spaces required to meet the needs of building type. Includes typical and singular spaces (classrooms, offices, kitchen, staff areas, storage, family support, rest rooms, meeting space (staff and students), greeting, coats/lockers, etc)
- Size (in square feet or rectangular dimensions) of each space
- Typical relationships and adjacencies of spaces and functions

Extended Program (as part of Basis of Design) to include:

- Equipment, systems and/or technology, and/or specific design/engineering requirements by space (e.g lighting, electrical, data, water, mechanical, fixtures, air change)
- Requirements specific to building type and specific spaces (e.g. childcare licensing requirements)
- Transition and circulation requirements between spaces, as well as relationships between indoor and outdoor program areas
- Flexibility of spaces – different uses for different parts of the day, week or year
- Security requirements or access restrictions by space or room

OTHER KEY DEFINITIONS

Scope of Work

A description, created through the collaboration of client and architect or lead design consultant, of

- the work that the Architecture and Engineering (A/E) team will do over the course of the project;
- how much that work is expected to cost;
- how long that work is expected to take;
- including meetings, documents and deliverables by phase; and
- including the work of each consultant discipline.

Affordance

A conceptual framework to understand the relationship between the environment and the occupants, especially with respect to form and function. Often used in urban design, certain features or installations are said to “afford” users the opportunity or inclination to (for example) interact, slow down, engage with a space, listen more closely, move more quickly through a space, feel engaged or at peace, play, or be inclined to learn. Designing with affordances in mind can allow the team to discuss specific goals for the occupants’ experience and to create situations where those goals are more likely to be met.

Bubble diagrams

These diagrams are generally done during Concept Design and illustrate the relationships, adjacencies and relative size of specific building functions. Relation diagrams can also be used indicate the desired circulation connections between spaces, indicating which functional components are grouped together and which are segregated.

RFQ – Request for Qualifications

An RFQ is issued to solicit statements of interested from qualified service providers, consultants, fabricators or contractors. General project information is provided. Qualifications may include firm capabilities, likely project team, relevant past projects, references, as well as responses to limited specific questions. Generally RFQ submissions do not include project-specific fees, schedules or workplans. The goal of an RFQ is to find firms who you feel are qualified to respond to a Request for Proposals. An RFQ maybe sent to a targeted group, or publicly posted.



RFP – Request for Proposals

An RFP is a request for a proposal in response to a specific scope of work. Since a consultant’s proposal will include information about schedule, fee, phases of work and team responsibilities, it is important to provide a clear scope of work and a defined request for additional materials. Response to an RFP often requires a significant investment of time and energy by consultant teams, so limiting the number of teams who receive the RFP is advisable. (An RFQ can be used to create a “shorter list” of qualified firms.) As it is often very difficult to create an entire plan, fee and schedule for a project one has only learned about from the text of an RFP, it is important that an RFP create a situation where proposals can be created to provide “apples to apples” comparisons.

Editorial: We advise clients to write succinct, clear RFQs and RFPs, and to significantly limit the number of firms they are sent to, for the following reasons:

- You will have to read and review everything you request from the proposing teams. In order to meet your schedule and keep the work of your review team reasonable and on schedule, it is better not to request and receive extensive submissions.
- Consultants keep their firms in existence by doing actual projects. Those projects have to “pay for” all of the other activities they do, including marketing. The more extensive the effort required to get work, the more expensive the work has to be to keep the firms solvent. Keeping the process lean is in everyone’s interest.
- Your project is more likely to go well if you hire for fit rather than price. A significant capital project is like a marriage – everyone is intimately connected to each other for a long time, under fairly stressful circumstances. You need a team you can trust, and who will go to bat for the project over the long term. If the relationship is good, you will find a cost and scope that work for everyone.

NASF

Net Assignable Square Feet, generally outlined in the architectural program

TARE (often expressed as a percentage of NASF)

The spaces that are added to the program to ensure a functional, complete building, such as: circulation, walls, service space, mechanical, data electrical room, rest rooms.

TARE PLUS NASF

Total constructed square footage

MACC

Maximum Allowable Construction Cost

Bid

A price provided in a competitive environment, where all bidders use the same information to develop their cost for constructing the documented scope of work. Bids are provided once Construction Documents are fairly complete, so that all of the desired design elements and project conditions can be considered in the price.



Cost Estimate

An estimate of the probable costs of the project, developed by inferring the contractors' labor and construction costs from the design and pricing drawings provided. Cost Estimates may be provided at any point in the project, with the recommended contingency determined based on the level of completion of the documents. Early estimates will include significant contingencies, to account for aspects of the project not yet fully defined. Later estimates will indicate smaller contingencies, based on more complete documentation of the project goals.

Contingency

An amount set aside at the beginning of the project for conditions that are not seen or encountered until later in the design or construction process. While it is never clear at the beginning what the contingency will be spent on, the team's assumption should be that it will be spent, and it should not be reallocated to other parts of the project until the very end of the work. A contingency allows for the inevitable change of scope or price without jeopardizing the overall success of the project, as the funds are allocated and already "set aside" to be used.

- Design Contingency allows for changes, modifications, additional work, or added subconsultants later in the design phases.
- Construction Contingency provides a cushion by which the owner can manage unforeseen conditions, price hikes, later selection of more expensive materials or equipment, or (the inevitable) changes that are made in the field once construction is underway.
- Owner's Contingency sets funds aside for unexpected permit requirements, fees, inspections, moving costs, financing costs, etc.

Total Project Costs:

- Construction costs
 - Building and site work by contractors
 - Site prep
 - Mobilization
 - Overhead (Management, Insurance, Bonding)
 - Profit
 - Contingency
- Soft Costs
 - Initial Planning and Programming
 - Design, including Architecture, Engineering, Consulting Fees (Building Design, Site Design, Interior Design, Signage and Graphic Design; Engineering – Civil, Structural, Mechanical, Electrical, Plumbing, Lighting; Experts – Accessibility, Sustainability, Food Service, Acoustics,)
 - Independent Cost Estimates
 - Surveys
 - Testing and Studies (Soils, Geotechnical Engineering, Parking, Traffic, HazMat)
 - Furniture and equipment-soft costs
 - Communications
 - Contingency



- Project Costs
 - Site Acquisition
 - Borrowing costs, bridge loan costs or interest on project debt
 - Staff time on the project, including Project Manager or Owner’s Representative
 - Permits, Inspections and Fees set by Authorities Having Jurisdiction (AHJ)
 - Furnishings, Fixtures and Equipment (FF&E) – defined as what would fall out if you turned the building upside down and shook it
 - Fundraising Costs
 - Moving Costs
 - Temporary Facilities
 - Advertising
 - Contingency

Project Manager or Owner’s Representative

Provides technical expertise in managing design, construction, permitting and real estate issues on behalf of the owner. May be an in-house person, or an external hire for organizations that don’t have the in-house capacity and technical skills on staff. Should know all relevant codes and standards, covenants, zoning, licensing. Note that this is generally a significant portion of an FTE, depending on the project phase, size and scope; adding this work to someone’s full time job responsibilities without redistributing other obligations is not a recommended strategy.

Adjacencies

The determination of which spaces need to be near or next to each other

Volume

Overall three-dimensional space for a room or use. Indicates ceiling height, often discussed in connection to windows, views, vertical circulation.

CONSULTANT TEAM TASKS

Pre-Design

Client consultation: work that includes a client and project-type expert, architect or lead designer to determine overall project vision and goals. Key areas to discuss include list of GOALS above, as well as other specific requirements for a successful design. Pre-design documentation may include general indication of project costs, overall project schedule, significant milestones, and preliminary Architectural Program.

Code Review

Determination of code requirements, as well as existing conditions, site surveys, relevant documents, covenants, etc.



Project Documentation

PRE-DESIGN DOCUMENTS

The project may require some or all of these phases of work, depending on the project scope, the owner/user relationship, the site conditions, or the funding strategy.

Basis of Design (recommended, see above)

Site Selection Study

Master Plan (if the project is part of a campus, larger facility, or a multi-phased project)

Strategic Plan

Business Plan or Market Feasibility Study

Capital Campaign Plan

DESIGN DOCUMENTS

Drawings, specifications, sketches, renderings, basis of design, meant to create understanding of the project goals and requirements between the owner and the design team. The project team may engage users, board members, community members or other stakeholders to confirm the efficacy of the design and appropriateness of the response. With each level of design drawing, there is more information about materials, dimensions, volume and systems. Each phase of design builds on the previous, such that all relevant information will be incorporated into each subsequent set of documentation.

Concept Design

Schematic Design

Design Development

BIDDING OR PRICING DOCUMENTS

Drawings and specifications used to create bids or develop pricing for the project. These may be issued at various times, depending on the procurement methodology. If the project is undergoing competitive bidding for the purpose of awarding the construction work, bid documents will include information necessary for bidders to produce thorough, accurate pricing. If a contractor is selected based on qualifications, a Pricing Set may be issued in order for the selected contractor to determine the Maximum Allowable Construction Cost (MACC), which will guide the project budget and cost allocations going forward. A pricing set may also be issued for the purpose of developing cost estimates, in order to confirm that the anticipated scope of work matches the available budget and schedule.

WORKING DRAWINGS or CONSTRUCTION DOCUMENTS

Drawings and other documents which document the design decisions made, for use during the phases of construction. Working drawings or Construction Documents (CDs) may include drawings produced by the architect, engineers and other consultants, details and specifications. They describe project administrative requirements, materials, performance requirements for systems and components, assemblies, size, location, quantity and quality of all built components. Specifications include information about how the contractor will report progress, track costs, procure or dispose of materials, and request payment. They describe the resulting desired outcomes and conditions, but do not indicate the “means and methods” the contractors should use to achieve those outcomes. Construction documents should be fully reviewed by the owner for accuracy and fidelity to the design intent, but design decisions should be made in earlier phases.

Value Engineering

A systematic approach to meeting or improving the value of a project while achieving the lowest cost. Value engineering involves using substitute materials, systems, equipment or methods that are less expensive but preserve the functionality, impact and usability of the system, service or product. While it can be done by the project team, it is generally most effective when done by outside experts or consultants trained in a VE process. **Note that VE is not the same as cutting to meet a budget, though the terms are often interchanged.** VE is an exercise in efficiency and efficacy. A thorough VE review may reduce costs or environmental impact, while still retaining the design intent, or value, of the project. Cutting costs to meet a budget generally results in reduced program, usability or quality of materials, and is used when the costs that emerge from the pricing or estimating exercises are higher than the available budget.

ARCHITECTURAL AND ENGINEERING DRAWING TYPES

Floor plan

A scaled diagram of the room arrangements in one story of a building. The plan is drawn as if the building is sliced open about 4’ above the finished floor, and the viewer is looking down into the building.

Reflected Ceiling Plan

A scaled Floor Plan drawn as if the floor is a mirror and the viewer is seeing all elements located on or near the ceiling, including lighting, ducts, soffits, ceiling tiles, decorations, equipment, etc.

Elevation

The face of the building, as if the viewer is standing and looking at it straight on from a specific direction. A “North Elevation” is the elevation that faces north.

Section

A scaled drawing made as if the viewer had sliced the building open from top to bottom and was looking through the various spaces that are visible in that slice. Documents may show several Sections, cut in various ways through the building, to indicate important volumetric relationships among spaces.

Detail

A drawing of a specific aspect of a project, to show how materials are put together to create a larger installation, how specific materials are meant to be treated, fastened or assembled, or to show the order of installation for specific materials, for example the sequence of materials that form a wall or roof assembly.

Post Occupancy Review

The process of analyzing how functional and comfortable a building is after the users have been in it for some time.