



Design and Construction Project Definitions and Related Information

These definitions are intended to provide rudimentary information about the professionals or processes commonly encountered during a design and construction project. Almost all design and construction professionals are licensed and regulated by state government. While there are many similarities, these laws vary from state to state. Take the time to educate yourself about the laws, requirements, and regulations of your state before you start your project. Many state licensing boards have consumer education sections on their web sites.

Design Consultants and Construction Related Professionals (List is not exhaustive.)

Acoustical Consultant - state licensed consultant who is qualified to test noise levels and design or recommend design features that will moderate ambient, external or internal noise levels.

Architect - state-licensed consultant who is responsible for the design and coordination of the overall project including site, building and systems. The project architect will serve as the interface between the Owner, consultants and outside agencies.

Architectural/Engineering Consultant - design consultant, usually licensed, who has special knowledge of and experience with specific building types or systems required for a project, e.g. swimming pool engineer.

Civil Engineer - state-licensed consultant responsible for a project site design including drainage, water management, paving, roadways and utilities related to the project. The civil engineer does not design electrical service or landscaping. On larger projects, this engineer is responsible for assisting in the site master planning including traffic flow.

Cost Estimator - consultant qualified to review the design documents and prepare Statements of Probable Construction Cost based on project type, prevailing materials costs and labor conditions of the project location. This consultant may also provide value engineering, review construction schedules, pay requests and contractor Change Orders.

Designer/Computer Drafter - individuals of widely varying degrees of skill who work under the direct supervision of a licensed architect or engineer to design portions of a project. While manual drafting is still used in some cases, most projects are now designed and drafted with the aid of computer programs such as CADD (computer aided drafting and design). Some advantages of computer drafting are greater accuracy in the construction documents, easier redesigns, and direct communication with engineering consultants and files management. Disciplines often digitally transfer current drawings to each other via the internet.

Electrical Engineer - state-licensed consultant responsible for all electrical (power and lighting) including site designs for the project; concerned with all communications including telephone and computers, television and power generation, etc.

Environmental Consultant - a variety of usually industry certified or state-licensed consultants qualified to study, recommend, design and perform remedial work concerning a myriad of environmental tasks such as wetlands mitigation, endangered flora and fauna on a site, chemical/fuels contamination or asbestos and lead-based paint abatement.

Geotechnical Engineer - state-licensed consultant responsible for testing and determining soil and sub-surface conditions. These test results help determine building placement as well as foundation and pavement design. Investigation may further define environmental and hidden conditions.

Landscape Architect - state-licensed consultant responsible for the landscape design, plantings, and irrigation system, some site permitting, and site amenities including lighting, furnishings, accessories, etc.

LEED® AP - A design professional with accreditation from the U.S. Green Building Council in sustainable design.

Mechanical Engineer - state-licensed consultant responsible for all the mechanical systems such as HVAC (heating, ventilating, air conditioning) systems. This consultant is often the plumbing engineer, too.

Plumbing Engineer - state-licensed consultant responsible for the plumbing and fire suppression systems and may include the water supply, waste water and storm water systems, etc.

Roofing Consultant - qualified, and often industry-certified, consultant who evaluates, recommends, designs and reviews the construction of roofing systems for structures. This consultant often involved in renovations and remedial projects.

Structural Engineer - state-licensed consultant responsible for the structural infra-structure of a building including foundations, wall construction, roof framing, etc. conforming to all code requirements including wind and hurricane and snow loads. Threshold Inspectors are also structural engineers.

Surveyor - state-licensed consultant responsible for establishing site boundaries including legal descriptions, set backs, easements, etc., existing and new building locations, elevations (grades), utilities, wetlands, trees, etc.

Design Phases

Programming - this phase determines both internal and external spaces required for the project. This may include the size, location, relationship to other spaces, furnishings, equipment, and all other support information.

Pre-design - site evaluation, existing structure evaluation, space needs planning, investigation into development and permitting requirements, programming, and preliminary floor plans.

Schematic - this phase develops the program into a two or three dimensional graphic format. Scale is developed, relationships are further refined, systems are reviewed and materials are evaluated. Basic costs are established.

Design Development - this phase refines the schematic phase and establishes in graphic and written format, the entire building including plans, elevations, systems, materials, equipment, etc. A more detailed Statement of Probable Construction Cost is provided.

Construction Documents - this phase sets forth in both graphic and written format the construction documents for both bidding and construction. This is the culmination of the design process. A comprehensive Statement of Probable Construction Cost is provided.

Bidding - during this phase contractors review the contract documents and contract requirements and submit a fee proposal to complete the construction. This usually includes both cost and construction schedule. The architect is responsible for plan interpretation, clarifications, bid review and recommendations.

Negotiation - In lieu of bidding, one to three pre-qualified contractors may be asked to submit a fee for construction that is a negotiated price. This avenue of contractor selection eliminates the time expended during a formal bidding procedure. This may not be possible for government projects.

Construction - this is the time where the successful bidder is contracted to complete the construction of the project. Architects/engineers provide construction observation services where members of the design team observe the progress of construction to assure the building is built according to the intent of the design and according to the permitted construction documents. Product / system submittals and shop drawings are provided by the contractor / sub-contractor for review by the design team to assure the products and systems specified are being installed. Architects also review/approve contractor's pay request, perform a "punch-list" review and substantial completion walk-through review. Close-out documents, technical manuals, as-built drawings, and warranty information on the building's systems, etc., are submitted to the architect for review and submission to the owner.

Basic and Non-Basic Design Related Services

The following is a list of what is considered Basic and Non-Basic Services offered by an Architect and/or the design team.

Basic Services

- Schematic Design
- Design Development
- Construction Documents
- Bidding
- Construction Observation

Non-Basic Services

- Programming
- Boundary and Topographic Surveys
- Geotechnical and Soils Testing
- Environmental Evaluation, i.e., asbestos and lead-based paint surveys and testing
- LEED® Certification

- Acoustical Engineering and testing
- Security / CCTV systems design
- Furniture, Fixtures & Equipment (FF&E) specifications
- Permitting and Permit Expediting
- Extensive Interiors Design, i.e., furniture systems
- Detailed cost estimating
- Value Engineering (VE)
- Construction Administration (a more extensive version of Construction Observation that has greater legal implications)

Permitting

Permit Expediter – Individual who coordinates and monitors the site and building documents permitting process, especially in jurisdictions known to have lengthy and complicated review requirements.

Plans Reviewers – this representative of a local, state or federal entity is responsible for reviewing and qualifying that construction plans meet local, state, and national building codes, fire safety codes, accessibility codes, etc.

Construction

Building Inspector - this representative of a local, state or federal entity is responsible for reviewing the construction relative to the codes of his/her jurisdiction.

Clerk-of-the-Works - responsible for documentation of the day-to-day construction activities, expedites official requests for information, proposals and change orders, verifies with the architect the accuracy of pay requests prior to submission to the owner, maintains clear and correct lines of communication between all parties, and coordinates move-in and close-out documents and any systems training. Clerks are present full-time on the construction site, may be an employee of the Owner or may be provide via contract with the architect. Because of cost, clerks are utilized most often on larger projects. In the absence of the full-time clerk, the architect, or representative from the design team, is usually required to be on-site on a weekly basis to provide construction observation.

General Contractor - this entity is responsible for the overall construction of the project including coordination of the sequence of work, sub-contractors and schedule. The contractor is legally contracted with the Owner, not the architect. GC's are regulated by the state and usually are state licensed.

Sub-contractor - this entity works for the prime contractor for specific areas of construction. The sub-contractor is legally contracted with the prime contractor and most are state licensed in their specialty.

Superintendent - works for the GC and is responsible for the day-to-day supervision of the job site.

Project Delivery Methods

Design/Bid/Build - this is the most recognized method of project delivery. The Owner selects a design entity to design the project to budget and the Owner's needs. The contract documents are then bid with the contract awarded to the most responsible bidder. The Owner then enters into a contractual relationship with the contractor. The architect and contractor do not have a contractual relationship. Advantages of this method are it is suitable for competitive bidding, has a system of checks and balances and insurance/bonding programs are well defined. Disadvantages include diffused responsibility and project delivery may be slow.

Design/Build - this method of project delivery is used when the Owner desires a single source of contact and responsibility. Both the architect and contractor act as a single contractual entity. The advantages for the Owner may include faster delivery time, earlier knowledge of construction costs, and lower incidence of claims. Some disadvantages include reduction of checks and balances and not as much assurance that materials of lesser quality are being substituted without the Owner's knowledge.

Partnering - this method of project delivery requires the owner to enter into contracts with the architect and contractor at about the same time. All three entities work together to establish the most cost effective project. This method endeavors to eliminate adversarial relationships.

Construction Management (CM) - a project delivery method where the Owner contracts directly with a Construction Management firm that in turn contracts with the trade contractors. The Owner contracts with the architect. Advantages include preconstruction involvement, cost savings and better scheduling. Disadvantages of pure CM place too much risk and burden on the Owner while modified CM is not very different from design/bid/build.

Design Professionals Education, Training and Licensure

Services provided by an architect or engineer are considered professional services like those of a CPA, medical doctor, or attorney. In general, the following applies:

- Architects have earned a professional Bachelor of Architecture or Master of Architecture degree from a college or university that is accredited by the National Architectural Accrediting Board.
- Architects have completed a three-year internship under the supervision of a registered architect before they can sit for their licensing exams.
- Architects have passed a seven-part licensing exam administered by the National Council of Architectural Registration Boards (NCARB).
- Architects are licensed and regulated by individual state governments.
- Individuals must be licensed before they are allowed to use the title "architect".
- Most states require architects to complete continuing education classes before license renewal.
- Some states license commercial building design architects and residential design architects separately.
- Engineers and Landscape Architects are similarly educated, tested, and licensed.
- Interior Designers are similarly educated, tested, and licensed, as opposed to interior decorators.
- Architects may offer all the same services as licensed Interior Designers but not vice versa.
- Licensing for General Contractors and sub-contractors vary widely so check with your state's licensing board.

A web search for design and construction associations will result in a myriad of choices. Listed below are sources of additional information.

- American Institute of Architects, www.aia.org
- National Council of Architectural Registration Boards, www.ncarb.org
- American Society of Civil Engineers, www.asce.org
- National Society of Professional Engineers, www.nspe.org
- Construction web links, www.constructionweblinks.com (See licensing section for links to state licensing boards.)
- Associated Builders and Contractors, Inc., www.abc.org/
- The Associated General Contractors of America, www.agc.org
- Design-Build Institute of America, www.dbia.org
- U.S. Green Building Council, www.usgbc.org

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