CHAPTER 4

The Design Process

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The Design Process

The design process is the implementation of the planning process. The school board and the community have been involved in the project development and support the plan, and the financial plan for funding the project is in place. The next steps include retaining the design team, designing the facility, selecting the delivery method for construction and completion of the bid documents.

I. RETAINING THE DESIGN TEAM

The district architect, construction manager, and a team of consultants are vital members of the district's design team that is charged with the responsibility of implementing the design and construction processes. The team must provide the expertise to conceptualize the building in such a way that the end product will serve the educational goals of the school district and be an asset to the community. The architect is the lead person on the design team and guides the project through the design process.

Engineering expertise on the design team usually follows the traditional disciplines associated with the construction industry. If the project is complex, such as with the construction, renovation or addition to an educational facility, the design team may have separate full-time engineers for all of the engineering disciplines, electrical, mechanical, structural, civil, plumbing and heating/ventilating systems. There may also be specialized engineering expertise needed on projects in the design of communications, data, acoustical control and hazardous materials.

In order to practice the profession of architecture, engineering and land surveying, a person must have met training and experience requirements to be licensed by the state. A great deal of attention should be given in selecting the architect and consultants comprising the design team. The efforts involved will pay dividends to the school district in terms of a high quality educational facility.

Selecting the Design Professional and QBS

Quality Based Selection (QBS) is a procedure that facilitates the selection of professional design firms. QBS entails a proven step-by-step process that facilitates the district's selection of a design professional firm on the basis of qualifications and competence in relation to the scope of the project. The process is straight forward and easy to implement. It is objective and fair. It can be well documented, and it is open to public scrutiny.

In Illinois, school districts are required to follow the Local Government Professional Services Selection Act, which establishes a local government policy to select architects, engineers and land surveying services on the basis of qualifications and to negotiate contracts that are fair and reasonable. The requirements of the act are as follows;

- Applies to all units of local government except home rule units and units with more than three million inhabitants.
- Allows firms to annually submit statements of qualifications.
- Requires local governments to notify firms of projects by mail or by advertising in newspaper.
- Requires local governments to rank a minimum of three firms in order of preference and begin negotiations with only the top ranked firm.
- Requires the local government to prepare a written scope of work for negotiations.
- If unable to reach a contractual agreement, the top ranked firm must be dropped from consideration, and negotiations should begin with the next ranked firm, and so on until a satisfactory agreement is reached.
- Except for the negotiation process, the requirements of the Act do not have to be met by a local government if they have a satisfactory relationship with one or more firms, if an emergency exists and a firm must be selected in an expeditious manner, or if costs of the services are expected to be less than $25,000.

A helpful guide for the selection of architects, engineers and land surveyors is available from AIA Illinois (http://www.aiail.org), Consulting Engineers Council of Illinois (or the Capital Development Board (CDB) (http://www.cdb.state.il.us).

The QBS selection process evolves from many variables that must be tailored to fit each specific project's requirements and should include all or some of the following steps:

- The school district identifies the general scope of work and the projected time frame.
- Public notice is given to design professional firms.
- A selection committee is appointed.
- Statements of Qualifications are requested and received from interested firms.
- After evaluation, a shortlist is established.
- A tour of the site and interviews may be arranged for short-listed firms.
- Three firms are ranked in order of qualifications.
- All firms involved receive post-selection communications.
- Negotiations are conducted relative to actual scope, services, fee payment schedule and contract. If an agreement cannot be satisfactorily negotiated with the top-ranked firm, negotiations are terminated and the owner enters into negotiations with the second-ranked firm, and so on down the line, until agreement is reached and a firm is selected.

II. NEGOTIATING AN AGREEMENT WITH THE SUCCESSFUL DESIGN FIRM

As soon as possible after selection, the school district should begin negotiations with the successful firm. Normally it is not difficult to reach an agreement on fee, since the QBS process facilitates an early understanding of the project scope and requirements. If agreement on scope of services to be provided and compensation cannot be reached, negotiations with the first-ranked firm should be terminated, and the school district should open negotiations with the second-ranked firm.

The school district and the architect should first reach consensus on the services required to fulfill the scope of work to be accomplished before attempting to reach a compensation agreement. A detailed scope of services should be developed jointly by the architect and the school district. This is often accomplished through a meeting, after which the architect submits the list of consultants and the roles and responsibilities of all members of the design team. Once there is agreement, the design firm should submit its proposal for compensation to initiate fee negotiations.

Professional design fees can be looked at as three specific components - basic services fees, additional services and on-site representation. Basic services fees are often determined as a percentage of the estimated total construction cost of the proposed project, with the percentage adjusting for complexity. Remodeling and renovation are typically more complex in nature, due to the unknown conditions. Additional services would be lump-sum costs established by the hours required for each task, and on-site representation would be based on the professional to be assigned to the project, their actual hourly rate and the firm's overhead and profit on those rates. This number can be budgeted and adjusted once the project is bid. The tasks associated with the basic services may be as identified below, but may vary based on the specific requirements of the project.

Basic Services Fee Includes:

Program Analysis Phase

- Orientation meeting with the school district.
- Analysis of project conditions and requirements. This includes site investigation, scope and program review, regulatory, environmental and code analysis.
- Program analysis and probable cost estimate presentation and meeting with the school district.

Preliminary or Schematic Design Phase

- Schematic Design Studies: This includes resolution of building and site elements, preliminary investigation of architectural, structural, civil, mechanical and electrical components and a presentation meeting with the school district.
- Preparation of preliminary design drawings, project manual and probable cost estimate.
- Presentation and design meeting with the school district.

Bidding Documents Phase

- Preparation of working drawings and project specifications.
- Reconciliation of local regulatory requirements.
- Progressive final statements of probable construction cost.
- Bid document review meeting with the school district.

Bidding Phase

- Document printing and distribution.
- Prebid conference.
- Responses to bidder's inquiries, and issuance of addenda.
- Bid openings, bid analysis, dissemination of bid results.

Construction Phase

- Preconstruction meeting.
- Review and responses to contractor's submittals and inquiries.
- Observation of the work / quality control.
- Pay meetings and payment processing.
- Performance testing and start-up.

Project Closeout Phase

- Preliminary inspection and substantial completion.
- Final inspection and acceptance.
- Final payment processing.
- Submittal of record drawings.
- Nine-month inspection.

Additional Services are services not included in the basic services scope. The items listed below are examples of services generally considered as being outside the scope of basic services necessary to design and construct a facility.

- Project programing often accomplished in the planning phases of a referendum.
- Conceptual project cost estimating for purposes of planning a referendum.
- Changes in project scope.
- Design of alternate bids that are beyond the agreed scope as an enhancement to the project.
- Programming of specific equipment and furnishings.
- Environmental impact statements.
- Wetland compensation / mitigation design.
- Special presentations or meetings beyond those required to facilitate the design process.

On-Site Representative

The duties of the on-site representative are limited and exclusive of construction phase basic services. Typically on-site representatives are full-time permanent employees of the architect or its consultant(s). The role of the on-site representative is to observe the construction operations and report on the progress and quality of the work being performed to determine in general, that the work is proceeding in accordance with the approved construction schedule, and that the materials, finishes and workmanship are all in accordance with the contract documents. A written observation report should be

prepared for each visit. The number of days of on-site representation to be provided is determined by the complexity of the project and the actual days the contractors are present on the site and installing their respective trade work. The number can vary from three visits per month to full time five days a week, based on project needs.

The Design Contract

A written contract finalizes the agreement between the school district and the design professional firm, ensuring that both parties have an understanding of the project requirements. The parties may wish to use a contract developed by the school district which contains specific clauses to meet state law and local policies, or may use that of The American Institute of Architects or the Engineers' Joint Contract Documents Committee, which are widely used, time-tested and designed to coordinate the needs of the owners, contractors, design professional firms and insurers.

Project Delivery Method

The subject of the appropriate delivery method for the project should be addressed at this time. The project complexity, schedule, budget, and administrative assistance required by the school district are criteria utilized when considering project delivery methods. The **Construction Chapter** of this document, outlines the alternative project delivery methods available. Included are Design / Bid / Build, Construction Management as Agency, Construction Manager at Risk, and Design / Build. Some delivery methods, as discussed in the **Construction Chapter**, may be prohibited by the Illinois School Code as viable methods of contracting on public school projects and should be reviewed by counsel for the district.

III. SELECTING A CONSTRUCTION MANAGER

A construction management firm works closely with the school district and architect in the early stages of the project design to provide cost estimating, value engineering, constructability reviews and scheduling. The construction management firm provides supervision and coordination during construction. A request for proposal for construction management services should be developed, identifying the scope of the project, and the information to be included in the proposal. The proposal should include:

- Experience of the construction management firm.
- Experience on educational projects.
- Client references.
- Construction schedule, budget and quality control experience.
- Resumes of key individuals including; project executive, lead cost estimator, mechanical estimator, electrical estimator, project scheduler, project manager, project engineer, field engineer / superintendent.
- Financial statement.
- Each proposal shall include the proposed cost, based on the services requested by the school district.

IV. THE DESIGN PROCESS

Stakeholder's Involvement

It is important that the design team maintain continuity in utilizing stakeholders in problems solving and decision-making who are personally involved in the day-to-day operations of the district, such as the district superintendent, board members, administrators, educators, grounds and maintenance staff, building support staff and representatives from the community. It is important to involve those individuals whose abilities and experience would allow them to make informed decisions concerning the district's needs and whose personalities are such that they could easily interact with architects, consultants and other team members.

Program Analysis Phase

The program analysis phase provides for the analysis of the project conditions and requirements. Brainstorming sessions, charettes, open design meetings are often utilized in this phase of design. The design team will provide a report and provide a presentation which generally includes the following information:

- Narratives or diagrams to show all program functions, existing conditions and their relationships; this may be done with flow diagrams showing the movement of persons.
- Space itemization, including function and size, number and occupants, equipment, utilities, special requirements.
- Total of all program areas, including a percentage allowance for circulation, mechanical and maintenance functions.
- Code analysis report.
- For remodeling projects, a statement of the status of asbestos abatement requirements.
- Opinion of probable cost.
- Estimated duration of project design and construction schedule.

Preliminary or Schematic Design Phase

The schematic design phase resolves and develops the building and site elements. The design team will continue to generate feedback from the stakeholders in this phase of design. Quality and performance standards on materials and systems are developed at this stage. Again, the design team will provide documents for preview and a presentation, which generally includes the following information:

- An outline specification.
- Site plan - locating each building, existing and finished contours, roads, walks, recreational facilities, parking ,utilities and other site construction included in the scope.
- Opinion of probable cost.
- Current design and construction schedule.
- Floor plans, elevations, preliminary mechanical, electrical and plumbing plans.
- Equipment information.
- Area analysis including net and gross square footage.

Bidding Documents Phase

The bidding document phase involves the final development of the working drawings and the project specifications. The complete set of documents for bidding will be developed. It is helpful for the design team to meet and review the documents as the

project develops. Stages of completion for review can be 25 percent, 50 percent, 75 percent and final completion prior to release on the streets for bidding. This is a way for the district to provide input as the project develops. The project delivery method will define the specific trade contract divisions to be identified in the drawings, specifications and bid forms. A detailed cost estimate by each trade and a proposed bid date and a construction schedule should be reviewed at each progress meeting. Defining alternate bids in the documents allows the maximum amount of the award as opposed to the change order process, which is typically more costly.

Bidding Phase

The final bidding documents should be approved by the school district prior to the printing and distributing documents to the public. The steps in the bid phase include the following:

- *Official Advertisement for Bids:* The advertisement shall include the prebid conference information, when the bids are to be taken and where the bids are to be received.
- *Document Distribution:* The reproduction and distribution of bidding documents are the responsibility of the architect. The architect will maintain an accurate record of all plan holders. It is in the interest of both the architect and school district to solicit competitive and multiple bids for each contract to avoid redesign and rebid.
- *Addenda:* The architect shall prepare all required addenda. The addenda may include the meeting minutes of the prebid meeting and any clarifications required of the issued documents. The addenda must be issued in sufficient time prior to acceptance of bids with three business days being typical practice.
- *Final Estimate:* The architect should provide a final cost estimate of the project to the school district, including any changes by addendum.
- *Bid Openings:* The architect should attend the bid opening and provide the bid results to all parties that require information. The architect should provide a tabulation of bids and an analysis for the school district.