A look at advantages and disadvantages

Design/Build and the Structural Engineer

The Hillsborough County Sheriff's Office selected The Haskell Company especially for its design-build experience for the Falkenburg Road Jail in Tampa. The project is a five-building campus, consisting of a 44,000 s.f. reception and operations center, two 50,000 s.f. dormitories with 256 beds each, a two-story 71,000 s.f. special management housing facility with 256 beds, and an 8,000 s.f. unit control/program center.

The 768-bed jail required precise communication. Through partnering, a process which increases the owner's access to all aspects of the design and construction process, The Haskell Company was able to maintain communication and enhance coordination with the owner. The jail's 17.3-acre site was fully developed by Haskell with truck and automobile parking, double perimeter security fencing, lighting, cameras, site utilities, and landscaping. In addition, all buildings were connected with a covered walkway.

By Joseph P. Watson III, P.E.

Design/build definitely presents many advantages to participants in a project. First of all, design/build offers the owner a single source of responsibility—one contact point for all questions, conflicts, and revisions. Conflicts, questions, and problems can be addressed more easily because all of the players are on the same team. As an engineer, one of the things I like best about design/build is the problem-solving aspect. When a problem arises at job site, there is no finger-pointing to determine who's at fault, which, under other project delivery systems, can take months of accusations and digging back through design files—even legal action in some cases—to determine. With design/build, the question is not "Whose fault is it?" but rather "O.K., we've got a problem; what do we do to solve it". Revisions can be handled much more smoothly under design/build, again because all affected parties – architect, engineers, and contractor – are on the same team. Preliminary analysis can be worked up easily, priced, and a definite "go/no go" decision made before the drawing revisions are made.

Second, design/build also lends itself to "fast-track" construction. The project can be designed in stages and based on construction schedule priorities rather than needing to put a finished design out to bid. Design priorities can be set based on long-lead items as well. The construction members of the team know when

certain items need to be ordered for an on-schedule delivery.

Third, cost analysis is ongoing. Preliminary pricing can determine ballpark costs and can be based on minimal design effort (typical bays, etc.) and the construction division's past experience. If the pricing effort is going to stay in-house, the engineer doesn't need to spend time making the pricing drawings as presentable as if they were going out to bid. Because the pricing effort can be minimized, the engineer can study several design schemes to determine the most efficient or most appropriate design. Value engineering is ongoing throughout the life of the project as engineering and construction personnel work together to continually refine the design.

Design/build also has several design advantages. First, the engineer is involved in the project development from the very first; he/she can steer the project away from potential problems which may be adherent in the preliminary design.

Second, the engineer has the advantage of input from the job site. Each project can be a learning experience as the field personnel identify problems of which the engineer would not be aware otherwise.

Third, since the project design team is all under the same roof, the project construction drawings will probably be on the same CADD system—the engineer has instant access to the most current drawings from all of the other design disciplines.

Fourth, the project can be designed to the construction department's strengths. Design and detailing of the project can be tailored to take advantage of what the construction team does best and avoid any techniques that have caused problems on past jobs.

Fifth, the design professional who is involved in several projects at the same time can establish workload priorities more easily—all of the pro-

The Haskell Company was selected to design and construct a 63,800-sq.-ft. three-story office building in Ponte Vedra Beach, FL for Meridian Management Corporation. In addition, Haskell developed a master site plan to accommodate a total of four office buildings, a hotel, and a parking garage, all located adjacent to The Players Championship golf course entrance.

The new office building, which features a curved, "L-shaped" design, defines one corner of the master-planned campus. The building is situated to maximize exposure and gain valuable lakefront views. The site also features a pedestrian promenade that ends at an outdoor seating area utilized by Ruth's Chris Steakhouse, which is located on the ground floor of the new building.

The exterior design features site-cast concrete panels with an applied exterior insulated finish system (EIFS). The EIFS design utilizes classical proportions, elements, and detailing, such as arches with keystones and columns with bases and capitals. The building's interior includes an elevator lobby featuring a shallow dome and classical columns.

Pembroke Pines Middle School in Broward County, FL, is the second of a three-phase, multi-site charter school system. The City of Pembroke Pines entered into a public-private partnership with The Haskell Company for management consulting and design/build services. Management consulting services include pre-opening and post-opening services necessary to develop educational curriculum, provide all administrative services to staff, and operate the school.

The facility is a 60,000 sq.ft. two-story middle school with a 600-student capacity. It contains classrooms, media centers, multipurpose space, cafeteria, administrative, and physical education facilities. Tilt-up concrete panels have been used for the structure. Roofing is modified bitumen with accents reminiscent of barrel tile.

Borrowing from the Mediterranean style and Mizner's Boca Raton architectural influence, the building blends with the South Florida community. The entrance to Pembroke Pines presents a subtle but certain sense of continuity.

jects are for the same in-house "client", the construction team (the single source of responsibility is not just an advantage for the owner!).

Finally, once a project goes into the construction phase, it is a simple task for the engineer to issue a field order or addendum to correct errors/conflicts or to make revisions based on owner requests or value engineered decisions.

Design/build has additional advantages to the structural engineer. With fast-track construction, the civil engineering package is usually going to be developed ahead of the rest of the construction documents so that the permitting process can get underway. The structural engineering drawings are next on the critical path to obtain a foundation permit and order the structural steel. Since they lead the design efforts at the start of the project, the civil and structural engineers develop into project leadership roles. Another aspect of developing the project leadership role is the fact that the civil and structural engineer will initiate more contact with the other disciplines to generate the information needed from those disciplines to complete the civil and structural design.

The engineer will go to the project construction site to observe and inspect the project under construction, not just when there is a problem to solve. He/she can interact with the project superintendent and learn from his/her experience. The structural engineer is involved in the project from start to finish—he/she will have contact with the project all through the construction phase to completion. Quality assurance inspections can be done by the engineer, who is the best, most knowledgeable set of eyes to recognize problems or shortcomings in the construction of "his/her" design.

Time management and organization are key to the engineer's success in design/build work.

Additionally, ethics is a crucial point. The architect/engineer is still the professional who puts his/her name and reputation on the line when he/she signs and seals the drawings; his/her approval must be the final word relating to the materials, design, and specifications that define the project. When the construction members of the team want to consider other materials or methods, the design professional, recognizing that there are always more than one way to do anything, must try to make the choice that will be best for the project.

Owner Input also remains valid. Depending on the size of the project and the interest of the project's owner, Owner Review Sessions, or drawing issues can be scheduled throughout the development of the project, typically at 30%, 60%, 90%, and immediately prior to construction issue. At that time the owner can question all aspects of the design, provide equipment information, etc.

Again, since the whole design team is under one roof, design/build offers the opportunity for thorough project evaluation throughout the life of the project and also after the completion of the project. A project post-construction wrap-up session offers the chance for the designers, the construction personnel, and the field personnel to reflect back on all aspects of the project, noting both the good and bad aspects of the project. This session is to find out what worked well and where improvements need to be made the next time around.

Several disadvantages or hindrances should be noted as well. First, the engineer must recognize that he/she is not designing a project independently; he/she is part of a design team. He/she cannot design in a vacuum and must be open to more give-and-take among all the design disciplines, as well as with the construction team.

The engineer also needs to be willing to approach his design as "a work in progress"; design/build, by its fast-track nature, tends to mean that a project will evolve throughout the design development stage. The

structural engineer starts his design while the architecture of the project is still under development. In the same vein of the fast-track concept, the engineer must be willing to design while anticipating changes.

The architect or engineer who is involved in design/build work does not have the luxury of putting a finished product out to bid; he/she must recognize that his design and construction drawings will go to subcontractors before they are "perfect." The package should all be there; it just won't be tied up with all the finishing touches.

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