

COMMODITY, FIRMNESS & DELIGHT IN DESIGN-BUILD

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What is Quality?

While it has been addressed very well in other parts of the Handbook, as an architect I feel compelled to provide my own “take” on quality in architecture and construction. I believe that classical Roman architect Vitruvius defined quality best when he determined the necessary components of architecture itself:

Firmness: How sound and well built is the structure?

Commodity: How successful is the structure in satisfying its purpose?

Delight: Does the structure contribute to the beauty in this world? Does it stir the heart?

For each member of the *Design-Build* team, (owner, builder, and architect) these three key components are obviously important. Each must be present to the degree required by the needs of the occupants, the economic circumstances, and the dictates of society. However, I would submit that each component generally gravitates to being the purview of one particular member of the team. Each has its own special interest, as it were, in the project.

The **owner** may be more apt to define quality in terms of **commodity**: *"How well does this structure satisfy my needs in terms of why it was built in the first place?"* The **builder** may be more prone to define quality in terms of **firmness**: *"How well have I built this structure? Will it stand up over time? Am I proud of my workmanship?"* The **architect**, as may be expected, while certainly cognizant and respectful of the other two criteria, will want to also assure the **delight**: *"Is this a handsome structure? Does it contribute positively to the environment? Has the building accomplished as much as it can architecturally, given the programmatic and financial dictates placed on the design?"*

The message in all of this is simply: Each team member (owner, builder, and architect) should and does care for each of the three components. But (and this is an important "but") each member invariably brings to the table individual definitions, priorities, and agenda. The success of the project, and therefore its quality, is directly linked to the **mutual** understanding and respect for team members' **different** goals and aspirations for the **same** project.

Quality Management in Design-Build

The key elements for a successful *Design-Build* project are essentially the same as any other project delivery method, namely:

- mutual understanding of the project's overall goals, the program of needs, the budget and the schedule;
- mutual buy-in of each team members' definition of quality as well as the value that each team member brings to the project;
- mutual trust and respect for each party and confidence that each member will do his/her part honestly and with the utmost professionalism.

This last item speaks to the **BIG** difference between *Design-Build* and more traditional *Design-Bid-Build* scenarios. Mutual trust, respect, and confidence are absolutely essential for the success of any *Design-Build* project. The normal checks and balances usually associated with traditional delivery systems are, on the surface, absent. The architect and builder are a single contractual entity, not two as is the norm when each is independently under contract with the owner. In perception (and sometimes reality) there can be understandable prejudice against the "fox watching the hen house" syndrome. If, for no other reason than this (and there certainly are others) quality management procedures must be firmly in place for *Design-Build* project delivery.

Although it may appear to be an oxymoron, the greatest *Design-Build* project success is often achieved if the project is conducted in a "traditional" (i.e. *Design-Bid-Build*) manner. The owner should be made to feel confident that he is not pitted against a single "two-headed monster," that the architect and builder are not in alliance, gleefully plotting against his/her interests. To accomplish this sense of trust and confidence, the following Quality Management issues should be in place prior to initiating any work:

- **A team approach to the project must be established.** The owner, builder, and architect should play important, visible roles in the process. For instance, both architect and builder should be allowed direct access to the owner, be in attendance at meetings, and have access to all project information, etc. In this way, the process is an "open book" and documentation and design does not mysteriously appear.

Probably the simplest way to achieve this team climate is for the owner to have direct access to the *design-builder's* contacts with consultants and contractors. This also holds true for such items as change orders, RFIs, etc. during the construction process. This open book policy is the clearest method to establish trust and inform the client of the team relationships and how they work.

- **Roles and responsibilities should be clearly defined.** Who is responsible to whom and for what? This will also help to allay any discomfort on the part of the owner as to what level of advocacy he/she may be able to expect from the architect, who, under a traditional delivery system, would be under direct contract and acting as his/her representative on the project. A very straightforward way to communicate the respective roles and responsibilities is a simple **matrix of assignments**, perhaps broken down into primary and secondary levels of involvement.
- **Lines of communication should be clearly established.** In this way the team members, particularly the owner, understand the methods of communication with other team members, as well as their level and the nature of direct contact with each other. The best, and most easily understood document for this is a simple team **organization chart**. Once this firm foundation is established, the project can proceed with the assurance that the parties are in sync, all headed in the same direction.

Since this handbook is written primarily for the design profession, one additional item relative to the Quality Management should be addressed in this section: **Design Led Design-Build**. There are several very compelling reasons for the design professional to lead the *Design-Build* team:

- This methodology allows the designer to return to the role of Master Builder. The designer (architect) maintains the overriding control of the project, and therefore, the quality of the product.
- The architect usually has a closer relationship to the client than the contractor. This is particularly applicable in the formative stages of a project in terms of understanding the process of programming and development of design. Both issues are absolutely essential and germane to Quality Management.
- Throughout the process, decisions must be made that affect the aesthetics, functions, and budget of a project. The architect is in the best position to understand the global implications of these decisions.

The above issue is discussed in depth in *Return of the Master Builder* by Larry Flynn, Senior Editor, *Building Design & Construction*, 02/01/2002. I strongly suggest that readers read this article regarding Design Led Design-Build.)

Quality Management Throughout the *Design-Build* Process

Project Definition:

The purpose of this stage of the process is to establish the basic parameters of the project: (1) the Program, (2) the Budget, and (3) the Schedule. In the *Design-Build* process, there are several means to this end:

1. The owner establishes a comprehensive Program of Needs and Performance Criteria and issues Request for Proposal (RFP) to *Design-Build* companies. The selected *Design-Build* company proceeds into the project based upon information contained in the RFP. Usually a Guaranteed Maximum Price (GMP) is established in the contractual arrangements. In this scenario, the owner, through in-house personnel or with design consultants, will develop the program. This is usually supplemented with performance criteria for key building elements such as MEP systems, envelope, etc.
2. In a second scenario, the owner issues an RFP containing the basic requirements of Scope, Schedule, and Budget. The successful *Design-Build* company responds with a proposal with GMP based upon this basic information. Subsequently, a project team of owner, contractor, and architect develops the specifics of the program based on commitments made in their proposal.
3. A third method of project delivery through *Design-Build*, referred to as *Bridging*, is gaining a great deal of acceptance. Under this method, the owner retains an architect to develop a schematic design supplemented by a comprehensive outline specification of materials and systems. This material is then incorporated into an RFP for bidding by *Design-Build* companies. The *Design-Builder* bases his/her proposal on this material and turns the material over to his/her own design team for documentation and construction upon award of contract.

Regardless of scenario, the basic message regarding Project Definition is simply this:

A firmly established (and understood) program of needs, budget, and schedule is absolutely essential at the onset of the project. The management and quality assurance of the effort from this point forward fully depends on it.

Project Design

The purpose of this stage of the process is to translate the program into a design that reflects the owner's requirements, consistent with the established budget.

The following activities are encouraged during the design phase to assure quality:

- A key element to the success of any *Design-Build* project is to assure that all parties are involved and visible throughout the process. At meetings, through correspondence, etc., each team member should have access to the other team members, thereby eliminating the "mystery" of the design being presented.
- The deliverables at the end of the design phase should be established at the beginning of design. The information the client will need to understand and approve the finished design should also be clearly stated. These steps, coupled with the corresponding budget, protects all parties.
- A design and scope contingency must be incorporated into the budget. A degree of flexibility must be maintained in the budget throughout the design process. The owner and the *Design-Build* team must be prepared to make compromises in terms of design, materials, and systems to achieve the budget. If an adequate contingency is not provided upfront, quality will suffer.
- Unless the owner has a very clear RFP (or a comprehensive Schematic Design Package such as that prepared under the "Bridging" scenario) he/she must be prepared to accept materials and systems as dictated by the *Design-Builder*. This is potentially one of the most contentious areas of any *Design-Build* project. The tighter the quality is defined in the Program, the more assurance that the owner will get what he/she asked for.

- Project Schedule is another major area of potential contention. The design, the materials, and the systems selected during this formative phase completely dictate the schedule outcome. Complex assemblies, long-lead items, and weather sensitive construction should be avoided, or, at the very least, factored in. All this begins with the client's requirements as stated in the RFP.

Project Documentation

The purpose of this phase of the process is to develop documentation for construction based on design and budget established in the Program. The issues that apply to Quality Management for the design phase are also relevant in the documentation phase, but additional factors to keep in mind include:

- There is a great temptation for the *Design-Build* team to shortcut the level of documentation. With both the architect and the contractor under the same roof, why create such a complete set of documents? "What we don't draw, we can solve in the field" is a common mantra. WRONG! Experience has taught us that this quickly falls under the *pay me now, pay me later* syndrome. It is strongly encouraged for quality control as well as budget control that a standard set of plans and specifications be prepared.
- A second justification for a comprehensive set of documents is that subcontractors and suppliers still must be retained, and this requires bidding and/or negotiating. There is no better benchmark from which to solicit accurate bids than quality documentation.
- While prudent under all project delivery methods, it is absolutely paramount in *Design-Build* that the client approves in writing the design and budget prior to initiating documentation. Usually inherent in *Design-Build* is fast-track construction, with the associated multiple bid packages and accelerated schedule. Nothing will do more to disrupt a project (to say nothing about the *Design-Builder's* bottom line!) than a *ready...fire...aim!* approach to project delivery.
- In many cases, the *Design-Builder* works with a team of design and engineering professionals on a regular, ongoing basis. This is to be encouraged for Quality Management. Long-term relationships are the best assurance that the *Design-Builder* will maintain consistency in product and process over time. The same philosophy holds true for subcontractors.

Project Construction

The purpose of this phase is to get the building up and running. Here again, it cannot be reiterated enough that the more the *Design-Build* project is managed in a traditional project delivery manner (that is, similar to the conventional *Design-Bid-Build* method), the more that quality assurance will be maintained. Some key activities are:

- Hold weekly job meetings with the owner, contractor, and consultants participating. Keep and distribute minutes.
- Consultants should tour the site on a regular basis. The owner and contractor should be encouraged to participate together in these tours.
- An open book policy with the owner regarding payments to subcontractors should be maintained. The architect should be required to perform in the traditional manner in terms of reviewing and signing off on monthly requisitions.
- Avoid the temptation to short-circuit or eliminate paperwork. Maintain the standard stream of shop drawings, RFI's, SK's, etc. It protects everyone in the long run.
- The project should be closed out in standard fashion; i.e. complete the punch list with owner's participation; hold post-construction critique; be assured that client is satisfied with the project. Experience with *Design-Build* indicates that this project delivery method is utilized most often by clients with ongoing construction programs. It is the best marketing possible for getting the next job.

Summary

Quality Management in *Design-Build* requires the following:

- Mutual **trust** among all team members, and the **confidence** that each will honorably carry out their respective roles on the project.
- A mutual **sensitivity** and **understanding** that each team member brings his/her own goals and aspirations to the table – and that these goals and aspirations are **respected**.
- Given that team members have their own agenda it is imperative that it is agreed that **each member has the same interest in creating a successful project**.
- The client's needs are clearly articulated, i.e. the program, schedule, and budget are understood and bought into by all team members.
- To avoid the *fox watching the hen house* syndrome, maintain a totally open book policy throughout the entire design and construction process.
- Engage all team members equally in the process and treat each team member as you would under a more traditional delivery method such as *Design-Bid-Build*.

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