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## Performing Effective Constructability Reviews

Constructability reviews are routinely performed throughout the industry, but with mixed results. These varied results are driven by many factors, but the most predominant factors are the reviewer's experience level and amount of time allotted to complete the review. Construction management firms and general contractors regularly charge young project engineers with the task of performing constructability reviews simply because the more experienced executives do not have the time. Today's young engineers are very smart, but they have not yet attained enough experience to perform a comprehensive constructability review for a complicated project. Further, because design schedules and bidding periods are customarily short, the time allotted for a constructability review is routinely very brief. This important task is sometimes limited to only two or three days. However, we must accept the fact that performing a constructability review requires an intimate knowledge of the project. The unfortunate reality is that when a mere few days is set aside for this important step the reviewer barely has enough time to attain an overview of the project, much less review and understand its intricacies.

There is a widespread misconception that constructability reviews must be completed in time for all solutions to be incorporated into the bidding documents. This belief is absolutely untrue. Incorporating all of the solutions prior to bidding would be optimal, but it is not a realistic expectation. Nor should this sequencing concern be a deterrent from performing thorough constructability reviews. It is still greatly beneficial when problems are identified and resolved shortly after the bidding phase. The sooner problems are identified and resolved, the greater success a project will have.

It is also important to keep in mind that constructability reviews benefit a project in more ways than one. For instance, a constructability review is an excellent exercise for the reviewer to learn and become knowledgeable of every facet and intricate detail of a project. This exercise is a tremendous benefit to the Project Superintendent in particular. It is also a more efficient method of solving problems than the alternative of issuing RFI's for each individual issue. And yet another advantage is that value engineering suggestions are a natural byproduct of this process.

A few of the fundamental benefits that are still realized when constructability reviews are completed shortly after the bidding phase include the following.

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- a. A reduction of change order issues resulting from re-work, as the problems will be identified and resolved before errant work is performed.
- b. The luxury of time to review and negotiate change order pricing from the general contractor and subcontractors. When problems are discovered during the course of work time constraints often force us to hastily approve change order requests, even when we feel they might be excessive.
- c. Avoidance of delays caused by problems discovered during the course of construction. The time it takes to examine a problem and devise a solution chronically slows, or even halts, progress.

Methodologies of completing thorough and comprehensive constructability reviews vary widely. For instance, they may be performed by the general contractor, construction manager or even an independent firm. Furthermore, sometimes the review will be performed by a different person for each individual design discipline and other times the entire review will be performed by a single person. All of the different methodologies comprise their own unique set of advantages and disadvantages.

For example, a constructability review performed by a different party for each design discipline will enable a person with specialized skills and deep experience in each respective field to be assigned. However, this approach will be deficient in regards to interdisciplinary coordination because the independent reviewers narrowly focus on their assigned set of drawings and specifications. Interdisciplinary coordination is tremendously important, as many change order issues originate from conflicts between the various design disciplines. Conversely, a review performed by a single person for the entire project will be highly effective with regard to interdisciplinary coordination, but may lack deep experience in each of the individual design fields.

When allocated the task of performing a constructability review for the first time many look at the tremendous stack of drawings and specifications with the same unsettling thought; “where do I start?” The answer to this question is actually quite simple, start at the bottom and work your way up. Go through the drawings in the same manner in which the project is built. A common procedural mistake made by inexperienced reviewers is starting on the first sheet of the drawings and simply flipping page by page looking for problems. Because construction projects are highly complex it is not realistic to expect that the problems will be clearly evident to us as we sift through the drawings. The most effective constructability reviews are completed by going through the construction process step by step. As we conceptually walk through the construction process we will inevitably discover details or written information that are either incorrect or missing from the documents. When these problems are noticed, we add them to our review comments. This is a basic and simple methodology, but it is also very time consuming. Personally, I perform constructability reviews in five common phases: 1) Structural, 2) Building Envelope, 3) Interior Architectural, 4) MEP and finally 5) Sitework.

To help answer the question “where do I start?” I’ve created the top five rules for an effective constructability review. Hopefully this is of help to your team in producing quality constructability reviews that aid in the success of your projects.

**The TOP FIVE RULES for an effective Constructability Review:**

- 1) **Build the project; don't focus solely on the problems.** *Only by taking the time to walk through the construction process step by tedious step will the problems be discovered. Avoid viewing a constructability review as an exercise in flipping through the construction documents with a focus on finding the problems, as the problems will not jump out at us.*
- 2) **Review the interface of various systems.** *Whether it be interior, exterior, structural or MEP, problems are not discovered nearly as frequently within the body of a system as they are at the perimeter of a system where it interfaces with the various adjacent systems and trades.*
- 3) **Keep the review of preliminary documents constructive.** *When performing a constructability review on 50%, 75% or even 90% documents be cognizant that the design documents are not complete and avoid providing the design team an exhaustive list of things they already know aren't done. Preliminary reviews should focus on general design approaches, correcting items that have been completed and identifying the obscure, easy to miss, details.*
- 4) **Stay focused on the important items.** *Before making a comment to the design team, ask yourself two questions. First, "will this impact the cost, time or quality of the project?" and secondly, "will the contractor, or subcontractors, require an answer to this question in order to perform their work?" If the answer to either of these questions is yes, pose the comment. Otherwise, posing the comment will consume the design team's time that could be better spent directed to other issues.*
- 5) **Take the time to complete a thorough review.** *A thorough constructability review will take weeks, even months, but for every hour spent planning a project the hours saved down the road are exponential. Thorough reviews cannot always be complete and incorporated into the design documents in time for bid, but it is nonetheless important to address the problems early in the project.*

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