

# Lean Design Forum - Chicago June 1 & 2, 2006

## Comments & Discussion on the Recommendations

### The Value of Virtual Models after 100% CD documentation

As others on this panel have stated there are tremendous benefits for a design team to work together in a virtual modeling environment, however I also believe that there is value in building virtually after the project has been designed and the design team is in RFI/Submittal mode. The key benefits to building models after design can be summarized as follows:

1. Validate the drawings, prior to finding problems in the field
2. Resolve constructability problems in the design
3. Visualize what will be built, not everyone can read 2D drawings and understand what they are looking at, especially the client
4. Plan impacts to activities on the site
5. 4D workstream planning
6. Subtrade coordination

At RQC, we have built 10 virtual models of projects from either 100% CDs or in the case of proposals from DD drawings (4 of these projects have been fully detailed BIM models. In each case, the design team was minimally involved with our virtual model. Is this an ideal situation, No. Did we get value, Absolutely.

We have also done modeling on 4 Design Build projects. In two DB projects the Bim models were started at the beginning (both projects were taken to a DD stage and are currently waiting project restart). In the other two DB projects, in one case the modeling was started at 45% CD and completed based on 100% CDs; on the other project the modeling was started at 45% DD and more detail is currently being done at the 90% DD submittal. We will be starting this project up again for the CD phase and intend to go to a weekly 3D digital build where the design team works in standard 2D mode and we use the 3D model to “pull” design information and issues from the design team.

At RQC, we are still looking forward to working with designers who have made 3D as part of their standard practice (with some designers it would be nice if they made 2D part of their standard practice). However, the construction team can gain tremendous value out of 3D model. And the model serves a great communications tool for the team. Here is a sort of tongue-in-cheek top 10 list for building BIM models when the design team is “3D Challenged.” (Though, I can cite real world examples.)

### Top 10 Lessons Learned Building BIM Models on Hard Bid Jobs\*

1. Figure out why you want a 3D model before you build it.
2. Everybody, their dog and their engineer may use AutoCad, but make sure that the dog's copy is at least version 2002.
3. It helps if the zero, zero, zero point in the model isn't in the next county.
4. It helps if you don't name your floor plan, “Debbie's Floor Plan.”
5. Don't change the name of Debbie's Floor Plan to Sam's in the next drawing release.

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6. When in doubt, build the structural model. After all, that is what the architect tells you to do in General Note 57.
7. Model space and Paper space aren't the same thing
8. Don't use x-refs (just kidding), but if you do, send them with your drawing and don't move them in the next version of your drawing.
9. Once you have your model, show it to everyone, especially the Superintendent
10. Don't expect that 100% CDs coordinate themselves at the blueprint service (BPS just makes sure that Sheet A2 follows A1).

#### Top 10 Lessons Learned Building BIM Models on Design-Build Jobs\*

1. See above
2. Don't wait to 45% DDs to start modeling
3. If you do have a 45% model, don't wait to 95% DDs to update it.
4. Use a weekly digital build to "Pull" design from the design team
5. Involve your superintendent and specialty contractors into the design process (you'll be surprised what they know about design that your architect doesn't).
6. Don't let your architect tell you that means and methods aren't part of design process.
7. Just because your engineer got a free copy of Building Systems doesn't mean that you should use his/her 3D model, model from the specialty contractors shop drawings.
8. Clouds don't just belong in the sky, they look good on drawings revisions too.
9. Building a 3D model in VIZ doesn't count as experience for BIM modeling.
10. If your architect hasn't built a 3D model before, don't let him learn on your job, do it for him.

\* With apologies to David Letterman

Some other thoughts:

1. Team should get together early in the project to define the unique challenges of the project in which VDC methods can help address and focus VDC efforts on these areas. More concentrated and meaningful VDC efforts can offer more value than shallow "across the board" implementations.
2. Lack of design build or other collaborative contractual models should not be viewed as a reason to avoid VDC practices. Great value may be recognized by using BIM in the design and analysis process to both the design team and the owner. Furthermore, opportunities should be explored for sharing data with construction team members where it makes sense by using special data sharing agreements when a collaborative contractual model does not exist.