

## EMERGING ROLES IN STRUCTURAL BIM

BIM could reach critical awareness in the structural engineering industry this year, and two new BIM roles look poised to go mainstream.

BY MICHAEL GUSTAFSON, P.E.

**ONE OF THE MOST FREQUENT QUESTIONS** I receive from structural engineering firms about building information modeling is: “Who will use BIM tools in their day-to-day work?” After hearing and seeing the various workflows that firms use, I see two roles emerging: the BIM Modeler and the BIM Engineer.

### The BIM Modeler

The BIM Modeler is responsible for a majority of the duties of generating the BIM design and documentation, while also coordinating changes with the project team; larger projects may require several BIM Modelers. Where the design engineer is more detached from the coordination process and has a more responsive role with the actual BIM technology, the BIM Modeler takes on more responsibility for and leadership of design coordination.

The structural drafter, who traditionally uses 2D drafting software to generate documentation for his or her projects, is the prime candidate for the BIM Modeler role. As BIM Modeler, the drafter’s role would expand to take on responsibility for most of the project coordination and documentation delivery.

Does the role of BIM Modeler overlap with that of project engineer? A good analogy is the relationship between a football offensive coordinator and quarterback (project engineer and BIM Modeler, respectively). The project engineer generates the game plan of what is going to be done and why. The BIM Modeler is tasked with finding the best way to achieve the goal—and can improvise as needed on the field.

Based on this separation of roles, the BIM Modeler will use BIM tools that are focused on design aspects such as constructability and the related management and documentation of the design. The design engineer will most likely work with his or her structural analysis application and send updates of the design into the BIM model.



*Michael Gustafson is Product Manager – Engineering, North America with Tekla, Inc. in Kennesaw, Ga.*

### The BIM Engineer

The second emerging role is that of BIM Engineer. The BIM Engineer is a dedicated structural engineer, most likely with two to six years of experience, who is responsible for a majority of the duties of generating the BIM design and coordinating changes with the project team.

Documentation may or may not be generated by the BIM Engineer. Some companies take the approach of having the engineers perform design work and create the design drawings, though the BIM Engineer doesn’t have to take on that responsibility. The main difference

between the BIM Engineer and the BIM Modeler is that the former focuses much of the structural design efforts within the BIM model, as well as the coordination with other disciplines.

The BIM Engineer role seems to be evolving in heavy industrial projects where coordination of the structure is more important and more engineering thought has to be put into every design element. Basically, the workflow matches the requirement of the person building the structural model: the need to have the information in place and managed by one person who understands the behavior of the structure.

### What’s the Right Path?

Which of these approaches wins out is yet to be determined by the industry. Interestingly, I have seen both approaches put into practice by structural firms. But I think the approach that a firm chooses depends on a few key factors: the level of design repetition on the project, the intensity of structural analysis, and the existing climate of the firm looking to adopt BIM.

The BIM Modeler approach may work well in larger firms where there is already more specialization of duties. The duties of structural analysis are more reactive to the design as opposed to proactively driving it, and the firm already harbors some experienced yet technology-savvy structural drafters.

The BIM Engineer approach fits better in smaller firms where the engineers multi-task the roles of design, analysis documentation, and coordination. The challenge here is for the BIM Engineer to have at his disposal the proper structural analysis tools available during his steps of design iteration.

Depending upon the stage of a project, one method may work better than the other. For example, in the early stages of a project, where engineering decisions are more critical, the BIM Engineer hat might be worn. Then, as the project evolves and major structural decisions have been made, the BIM Modeler takes on the leadership of the project.

Furthermore, a hybrid approach can be taken, where the BIM Modeler concept is used, but design engineers are more actively integrated into the BIM process.

### Critical Awareness

Some recent statistics (from a 2007 McGraw-Hill Construction SmartMarket Report) state that the U.S. structural engineering industry will reach a critical point of awareness about BIM in 2008. Reaching such a tipping point seems quite profound when just a few years ago, most structural firms didn’t know about BIM. Whichever path is taken, I believe both roles will require a heightened level of responsibility and compensation, as well as knowledge about design—specifically, the effects of economics and constructability on the design.

MSC

*Have an opinion you’d like to share in Topping Out? Send your feedback to Keith Grubb, managing editor of MSC, at [grubb@modernsteel.com](mailto:grubb@modernsteel.com).*