

# **Building Information Modeling (BIM): Special Contract Issues**

**By Gregory R. Andre**

Building Information Modeling (“BIM”) is the use of a digital database to integrate the work of all of the design and construction project team members and generate two-dimensional and three-dimensional models, plans and reports. Cost and scheduling can be added to create fourth and fifth dimensions. It is a tool that facilitates design collaboration and is intended to avoid conflicts and errors in the plans. Simply stated, BIM makes design a group effort, and it raises special contract issues as discussed below. BIM can be used under all of the delivery methods, and is especially encouraged under Integrated Project Delivery (“IPD”).

Instead of each design professional (architect, steel fabricator, HVAC subcontractor, etc.) producing multiple separate and independent plans for one building, BIM allows a team of architects and engineers to all contribute their respective plan and specifications data to one computer model for one building. BIM provides the technology to not only coordinate various building component designs, but also to understand how design changes will impact the cost and timing of the project. The design of one building component, say the HVAC ductwork, can be changed, and BIM will automatically change the other building components to accommodate it and present the overall economic effect and schedule impact due to the change.

BIM is currently an evolving technology. One of the challenges facing the industry is coordinating the different computer systems and models used by various design professionals to interface properly. For example, the computer models used by different parties to create the roof truss system, the curtain wall and the HVAC ductwork must all be compatible with the BIM. Without it, BIM is merely a theory without practical application. However, with the development of internationally consistent computer standards and technology that is currently underway, it appears that full interoperability of computer models for design professionals will soon allow BIM to achieve its full potential.

Aside from technology issues, the teamwork approach to creating and using BIM raises a number of special contract issues. Think of BIM as making soup. When several cooks each drop their respective ingredients into the soup pot, who is responsible for the soup? The contract issues arising from BIM largely stem from the fact that contract law in the United States, which is based on the English common law, contemplates a black and white world in which one party is right and one party is wrong (in default). The United States system of jurisprudence is generally designed to accommodate that perspective with a clear winner and loser in every contract case (and then an assessment of economic damages or other relief), although tort cases commonly apply comparative fault statutes and principles. The creation and use of a building information model, therefore, must be supported by contracts that properly allocate or share risk and liability among those responsible for it.

## **[A] Models**

As a threshold matter, the parties need to agree to use BIM technology. Next, the parties need to agree on how they intend to accomplish that. They can either agree on specific technological steps for each party to take or merely agree to use commercially reasonable efforts to coordinate their respective models or data and then sort out the details after the contract is signed.

BIM can be used many different ways. At one extreme, BIM can be used to fully integrate and coordinate all of the design models created by all of the design professionals (the architect, the structural

engineer, the mechanical engineer, etc.) as well as the design models created by the contractor, subcontractors and equipment and material suppliers. One design element submitted to the model or a change to it, can cause corresponding changes to the overall model so that all design elements are coordinated without conflicts. This fully integrated and coordinated approach allows BIM to achieve its full potential. It also raises the most difficult legal issues as discussed below.

At the other extreme, BIM can be used simply as a central data storage place containing all of the separate and independent design models that are linked together and easily accessed, but not integrated into one coordinated model – one model will not change another. This separate and uncoordinated approach raises the fewest legal issues, which are discussed below, but does not allow BIM to achieve its full potential.

Many hybrid approaches may also be used. For example, the parties may decide to fully integrate only certain models and/or to leave out of the model certain insignificant data that can easily be coordinated in the field (for example, data relating to elements under a certain size, such as one inch, which can be coordinated in the field).

## [B] Model Manager

The model is created and used by a project team, and some believe that every team should have a captain. Accordingly, the parties may wish to designate one of the parties as being responsible for managing the model. The model manager acts as a “gatekeeper” and governs access to the model, security for the model, the tracking of data entry into the model and generally ensures that all of the data is properly coordinated. The lead architect or engineer is probably the best candidate to be the model manager, but it could also be a separate party whose sole job is to be the model manager. A contractor is probably the least likely candidate. Of course, the fee paid for a model manager adds to the overall cost of the job.

## [C] Contract Documents

The “contract documents” are the documents that collectively form the agreement between the owner and the contractor. The agreement, general conditions, plans, specifications, any addenda and any change orders all typically form the contract documents. The contractor, therefore, is obligated to perform the work in accordance with all of the contract documents. Submittals and shop drawings are typically not contract documents, so if they deviate from the plans and specifications, the contractor will be liable for the error.

An important decision is whether to include the model as one of the contract documents. If it is one of the contract documents, then the contractor will be bound to perform the work in compliance with it, which would render the model critically important. Furthermore, because the model evolves as the job progresses, the parties will need to address what the contractor is bound by and when in terms of the model as it evolves. A related decision is what priority the model should be given in the event of conflicts or inconsistencies with other contract documents, such as the separate and independent plans and specifications or other design documents. If the model is used as an integrated and coordinated model and the various computer systems of the design team are interoperable, then the model should take the highest priority among all of the design documents and data.

If it is not one of the contract documents, then the contractor will be bound to perform the work in strict compliance with the plans and specifications (and the other contract documents) – not the model, which would render the model merely a convenient assemblage of data with limited utility and no legal

consequence. For the model to be meaningful and achieve its full potential, it should be expressly included as one of the contract documents.

## [D] Record Documents

State licensing and professional services laws applicable to the practice of architecture and engineering generally contemplate a “designer of record” – one licensed professional who stamps a record set of plans and specifications and takes responsibility for them. Accordingly, a licensed architect stamps the architectural drawings, a licensed structural engineer stamps the structural plans, a licensed civil engineer stamps the civil plans, etc. This concept of one party being responsible for a certain design does not fit neatly into BIM because BIM represents the design work performed by many and integrated into a single computer model used by all.

Traditionally, certain subcontractors and material and equipment manufacturers, prepare designs in the form of submittals, shop drawings and plans intended to satisfy the architect’s or engineer’s performance specifications. Basically, the designs of these parties pick up where the plans and specifications leave off. These designs would be reviewed by a licensed architect or engineer, usually on a limited basis, such as for general conformance with the design intent, and then stamped as “reviewed but not approved” or otherwise in a similar manner. Some believe that BIM warrants a higher level of design scrutiny than the traditional procedure.

Just as the parties must decide whether the model will constitute one of the contract documents, the parties must decide whether the model or any of its component parts will constitute record documents for which a licensed architect or engineer will be responsible. If the model is made a record document, then a licensed architect or engineer should be given the responsibility of reviewing it. Unlike the limited review of shop drawings, some believe that the review of data submitted into the model should be a full review and approval, subject to the architect or engineer being able to rely on the dimensional accuracy of the data as noted below, and any disclaimers or limitations on the review should be carefully negotiated.

If the architect or engineer provides a full review and approval of the data submitted into the model, then it will arguably require them to perform more services than what are typically required. Is the cost worth it? Proponents say yes because by doing so, BIM minimizes the risk of defects and conflicts at the design phase, which is much less expensive and more timely than waiting to discover errors in the field during the construction phase – an ounce of prevention is worth a pound of cure.

## [E] Responsibility for Data

Because multiple designers will be relying on the dimensional accuracy of the information provided to the model by each other, owners will want all parties to represent and warrant that the information they submit will be dimensionally accurate. One dimensional error by one party can cause a ripple-effect of dimensional errors throughout the entire model. Indeed, BIM may present a higher stakes game in that regard, but is widely viewed as beneficial because it is very successful at ferreting out design problems early. The parties should discuss whether these representations and warranties will be acceptable and/or backed by appropriate indemnities and insurance.

However, the potential problems associated with submitting data go further than dimensional accuracy. Responsibility for data should extend to potential technological issues associated with the transmission and corruption of data as well – a software glitch or incompatibility of one party’s computer could adversely impact the overall model. A design professional or subcontractor may legitimately protest being liable for a potential sum exceeding many times its fee for inadvertently throwing a wrench

into the model. Being liable for an error or omission in your specific design is one thing, but being liable for an error or omission that infects the entire model is another. The potential for such magnified liability must be acknowledged by the parties and dealt with in the contract. The contract should address how such systemic errors will be prevented and how to allocate, limit or share liability in the event that they occur.

Owners and architects/engineers should be mindful of the fact that professional liability insurance covers only the negligent acts or omissions of the architect/engineer. Therefore, if the architect/engineer causes a BIM problem due to their negligence, then the professional liability policy should respond to a claim for it. However, if the architect/engineer causes a BIM problem due to a defect in their computer or as a result of someone hacking into their computer system, then the professional liability policy might not respond to the claim.

## [F] Intellectual Property

The collaborative, multi-party authorship of the model raises intellectual property issues not present in the traditional preparation of plans and specifications. Under the traditional preparation of plans and specifications, the architect or engineer owned the copyright to them. The copyright protected the architect or engineer from others copying, preparing derivative works or distributing the plans and specifications. By contract, the owner and the contractor were commonly given a limited license to use the plans and specifications for the project in question. Alternatively, the architect or engineer might transfer and assign the copyright to the owner, except for standard details and specifications not unique to the project. A compromise approach was for the owner and the architect or engineer to jointly own the copyright, except for standard details and specifications.

For a project utilizing BIM, the contract must address the copyright of the data submitted by each party to the BIM as well as the copyright to the model itself. Each party contributing data to the BIM should represent and warrant, and provide an indemnity, that it owns the copyright, or has a valid license, to the data it contributes to the model. Otherwise, the other parties could unknowingly violate a third party's copyright by copying or using data to which they have no rights.

The next step is to decide who will ultimately own the data contributed by each party and the overall model itself. As for the data contributed by each party, BIM presents the same copyright ownership alternatives as traditional plan preparation – the author can retain the copyright, grant a license to use it, transfer the copyright or agree to joint ownership. As for the model itself, if the model is merely a repository for, or computer link to, all of the separate and independent designs and not an integrated and coordinated model, then the intellectual property issues are arguably no different from the traditional preparation of plans and specifications -- the model merely serves as a basket of data, like a file cabinet holding paper plans and specifications, except with respect to the additional issue of possible technological glitches arising from the model.

However, if the model is an integrated model that coordinates all of the various plans and specifications, then additional intellectual property issues arise. With an integrated and coordinated model, after the parties deposit their respective data into the model, the data does not remain static; it is subject to modification based on the data input by others. For example, the structural engineer deposits its data in the model. As part of the value-engineering process, the HVAC contractor determines that an overall cost savings could be realized by modifying the structural plans to accommodate a certain HVAC ductwork design; all agree to the change; the HVAC plans are put into the model and the model automatically modifies the structural engineering plans accordingly. The integrated and coordinated

model is ultimately co-authored or, in other words, represents a blended version of the data submitted by each party.

Given the co-authorship of the ultimate model, who should own the copyright to it? There is no right or wrong answer, and it is subject to negotiation among the parties. If a separate legal entity is formed under the Integrated Project Delivery approach, like a joint venture among all of the core team members for the project, then that entity might be a likely candidate to own the copyright with proper flow-down to the subcontractors. Otherwise, a joint ownership arrangement among all of the contributors might be most acceptable to all. However, if one party is to own it, then the likely candidates would either be the lead architect/engineer or the owner. The architect or engineer will contend that they should own it because the model consists mostly of their work and, if the owner were to withhold payment from them, the model gives them leverage. The owner will contend that it should own it because it owns the project and needs to own the model to use it for maintenance and operations long after the project is completed and, in case the architect or engineer needs to be replaced, to avoid having to start the design from scratch with a new architect or engineer.

## [G] Confidentiality

Certain data submitted to the model may be proprietary, especially data submitted by contractors, manufacturers and suppliers. For example, if the model provides cost and schedule information, a contractor might not wish to input data regarding its cost estimating or work production rates which is usually not disclosed even in “open book” contracting common in cost-plus (with or without a guaranteed maximum price) contracts. Accordingly, the contract may need to allow certain parties to submit limited data only to the extent necessary for the model to fulfill the needs of the project. Otherwise, the contract could obligate the parties to keep confidential and not disclose to third parties the data submitted to the model, except for standard details, specifications and other data that is not unique to the subject project.

*The author thanks his partner, Josh Leavitt, for his insightful comments.*

*This publication is for informational purposes only and does not contain or convey legal advice. The information herein should not be used or relied upon in regard to any particular facts or circumstances without first consulting with a lawyer.*

*Reprinted with Permission. ©2011 CCH Incorporated. All rights reserved.*