

White Paper

**Legal Implications of Building Information Modeling**

I. INTRODUCTION

The construction industry has lagged behind other industries, in part, because of its inability to incorporate new technologies into the construction process.<sup>1</sup> In particular, the required interoperability and architect/engineer/contractor cooperation to create a “virtual model” of a project has only recently matured to the point where a true computer generated design of a building, including all of its components, can be shared among all participants in the construction process. Building Information Modeling (“BIM”)<sup>2</sup> holds the promise of generating real and lasting productivity gains through the collective effort of all parties to the construction process.

This article will not focus on the technical aspects of BIM, but rather will analyze the legal implications and challenges facing projects using BIM. This article will examine the copyright/intellectual property issues, indemnity/liability issues, management and conflict issues, and will provide a brief conclusion regarding the future legal prospects for BIM.

While McGraw Hill and Stanford University have concluded that BIM reached the technological “tipping point” in Spring 2008 with technical issues and interoperability improving, legal solutions lag behind. See H. Ashcraft, “Building Information Modeling: A Framework For Collaboration” 28 Construction Law 5 (Summer 2008). Until a legal and contractual framework is universally adopted, BIM’s widespread use will remain problematic. The ConsensusDOCS represent a laudable effort in addressing these issues, but challenges remain before BIM will become the working framework for the massive increases in construction productivity sought by the industry. The great promise offered by BIM will be

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<sup>1</sup> P. Bernstein & J. Pittman, “Barriers to the Adoption of Building Information Modeling in the Building Industry,” Autodesk Building Solutions White Paper at p.3 (Nov. 2004) (“Investment technology in worldwide building economy lags the similarly sized manufacturing industry by six-fold.”).

<sup>2</sup> “What is Building Information Modeling? Imagine a technology that enables all parties to a construction project to virtually model all material aspects of a structure before commencing construction. Imagine further, if you will, that a 3D model is not simply a pretty picture, as it also imbues every element modeled with ‘intelligence’ such that all information needed to design, build, maintain, and operate the envisioned work is contained within the model. Focus for a moment on one of the beam-like objects (a line represented in one of the graphic tranches of the model). Click on the ‘beam’ and a wealth of information emerges. You can learn the beam’s size or structural characteristics (e.g., the structural forces acting upon the beam and its capacity). If you are interested in the beam’s connections, this information is available. Perhaps you are interested in when the beam was fabricated, its erection sequence or when it is scheduled to be delivered? If the model contains a 4-D component (contains scheduling information), this information is at your fingertips. If you are interested in the cost to purchase, fabricate, or erect the beam, this too is available under 5D project database (i.e. a 5D model).” P.O’Connor, “Productivity and Innovation in the Construction Industry: A Case for Building Information Modeling” 537 PLI/Real 89, 112 (Mar. 2007).

hollow unless legal structures are put in place to embrace this new approach, foster collaboration and appropriately allocate responsibility and risk.

## II. BIM MANAGEMENT/CONFLICTS

### A. Current Legal Framework.

BIM represents a major shift in the way construction projects will be handled. Collaboration has not been a “construction industry hallmark. Rather, the industry, its practices and its contract documents assume definite and distinct roles and liabilities.” *Id.* at 5.

Great effort is expended in our legal system determining who is the “responsible” party when a problem occurs on a construction site. In contrast, BIM focuses on collective effort and responsibility. “Thus, there is a tension between the need to tightly define responsibilities and limit reliance on others and the need to promote collaboration and encourage reliance on information imbedded in the model, regardless of how it was developed.” *Id.* at 11.

This fundamentally different philosophical approach impacts who will, ultimately, administer future BIM projects. Most major construction projects rely heavily on professional architects and engineers of record on the project. Traditionally, architects have been loath to assume the risk of other parties making changes to their designs. This is appropriate because most states require the architects or engineers to be the “responsible” party. *Id.* at 13.

Contractors have increasingly followed a design-build model, where they play a role in contract management, design, and construction. An architect’s desire to limit liability while playing an integral role in BIM, has created tension regarding who will be the central figure in BIM in the future. “The great fear on the part of architects is that general contractors will take a ‘huge part’ of the industry by ‘owning the model’ . . . ‘Our biggest fear right now is the contractor selling the model to the client and just hiring the architect as a consultant that puts the design down.’” T. O’Brien, “Successfully Navigating Your Way Through The Electronically Managed Project,” 28 *Construction Law* 25, 26 (Summer 2008). It remains unclear whether the architect or the contractor (or both) will come to dominate BIM as its central figure. As discussed below, the recent and preliminary drafts of BIM documents by the ConsensusDOCS and AIA emphasize the differences between these two competing camps.

### B. Approach Taken by ConsensusDOCS and AIA.<sup>3</sup>

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<sup>3</sup> Some SMACNA members have been critical of the excessive emphasis on standard form contracts when, increasingly, owners and general contractors are using their own forms in lieu of AIA, AGC, or ConsensusDOCS forms. Nevertheless, as one author recently noted, standard form contracts play a crucial role in construction contracting. The absence of definitive BIM contracts is actually inhibiting BIM development: “Standard contract documents perform four key functions. First, they validate a business model by providing a recommended

ConsensusDOCS 301 BIM Addendum acknowledges that the architect and engineer continue to be obligated under state law to insure plans conform with law. See ConsensusDOCS 301, § 1.4. Nevertheless, it is not a foregone conclusion that the engineer or architect will act as the Information Manager (“IM”) and be responsible for the Full Design Model and Drawings. ConsensusDOCS adopts a check the box approach where the “Architect/Engineer,” the “Contractor/Construction Manager,” or an “Other” party may be designated as the IM. Id. at §3.1. ConsensusDOCS impose on the IM numerous duties, including maintaining the model and all appropriate records. See Id. at §3.2.

AIA E202 BIM Protocol Exhibit remains comparatively short with far more limited descriptions regarding the responsibility of the party coordinating the model. It does not provide a “check the box” approach to identifying the information manager. Indeed, the AIA designates the Architect as the presumed manager: “The Architect will manage the Model from the inception of the Project. If the responsibility for the Model management will be assigned to another party at a particular phase of the Project, indicate below the identity of the party that will assume that responsibility and the phase at which that party will assume those responsibilities.” AIA E202 §2.4.1.

To some extent, both standard construction forms create an opportunity for parties, other than the architect and engineer, to play a key role in coordinating the design and construction of projects subject to BIM.

“A significant controversy may develop between the architectural and contractor professions as to who will control the project when BIM emerges on a mature and large-scale basis. The outcome likely will depend upon which contract delivery system is determined to best facilitate the implementation of BIM. If BIM somehow can be successfully shoe-horned into a variation of the design-bid-build format, the architect likely will maintain her hand on the rudder. If, on the other hand, and as surmised herein, it is determined that BIM works best within the framework of design-build, or if project alliance or integrated practice agreements begin to flourish, the architect’s traditional role may well be usurped by the contractor.”

T. O’Brien, “Successfully Navigating” 28 Construction Law at 26. Whether the architect, engineer, construction manager, or contractor will become the focus of information management in BIM projects remains to be seen, but the two standard form contracts clearly reflect the desires

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framework for practice. As noted above, a consensus business model for BIM has not emerged. Second, standard documents establish a consensus allocation of risks and an integrated relationship between the risks assumed, compensation, dispute resolution, and insurance. Custom agreements, unless crafted by seasoned practitioners, often are unbalanced and overlook key issues. Third, standard documents reduce the effort involved in documenting the roles and responsibilities on a project. Designers want to design structures, not structure contracts. Finally, crafting custom documents increases the transaction costs, and thus reduces the profitability of every transaction. Unfortunately, the current standard contract documents are just beginning to address BIM use.” Ashcraft, “Building Information Modeling” 28 Construction Law at 9.

of all groups to play a central role in this emerging model for construction and information management.

### **C. Practical Implications.**

Given the evolving nature of the controlling construction forms and their relative incompleteness, it is crucial that parties, to the maximum extent possible, identify the key issues in managing a project. These issues may include the following:

- “X The models to be developed for the collaborative use of the team, the parties (designers, contractors, and fabricators), responsible for preparing the models, and the required content of the models. Depending on the agreed-upon purposes of a model, the required content might be greater or less than the content required for the model creator's own purposes, and it might be greater or less than the content of the two-dimensional drawings prepared by the model creator.
  
- X The milestones at which the models are to be made available and the required degree of completion at each milestone. A possible starting point for consideration—at least for model content that will also be included in the two-dimensional documents – is the corresponding degree of completion of the two-dimensional documents at the same milestone, a relatively-familiar frame of reference. For instance, if the required content of an architectural model includes door hardware, the door hardware would appear in the model at the same time as it would appear in the development of the two-dimensional drawings. Such a standard could, of course, be varied as deemed appropriate by the team based on the needs of the project.
  
- X Clear descriptions of those aspects of the work to be designed by contractors and suppliers, whether through design-build scopes or performance specifications.
  
- X A description of the specific collaborative responsibilities of the parties that include only design-related responsibilities for the designers and only means-and-methods-related responsibilities for the contractors and suppliers. (When design responsibilities are assigned to contractors and suppliers, the description should address those clearly-defined design responsibilities as well.)
  
- X A provision stating that the collaborative efforts do not make the designers responsible for means-and-methods or the contractors and suppliers responsible for design, with exceptions for any clearly-defined design responsibilities of contractors and suppliers.

- X The process for downloading models to and uploading models from the file-sharing site.
- X A requirement that only the parties who created the model on their own information technology systems may modify it, with narrowly-defined exceptions if necessary (and appropriate process guidelines for any exceptions).
- X A clear statement in the definition of contract documents as to whether the parties deem any digital model to be contract documents, and if so, for what purpose.
- X Appropriate provisions in the shop-drawing and submittal terms as to whether submittals in the form of digital models will be acceptable (or required).
- X Appropriate provisions in the terms concerning requests for information as to how contractor and supplier requests for information, along with designer responses, will be documented in the collaborative process.
- X References in the protocol to the contract change provisions, and appropriate processes to ensure that changes in the contractors' work are properly documented in the contract documents.
- X An appropriate process for incorporating construction-phase design changes into the working models.
- X Provisions requiring that each party include identical BIM-related terms in subconsultant agreements and subcontracts.
- X Assignment of responsibility to establish a three-dimensional coordinated system for use by all modeling parties.”

D. Larson & K. Golden,<sup>4</sup> “Entering the Brave, New World: An Introduction to Contracting For Building Information Modeling” 34 Wm. Mitchell L.Rev. 75, 89-91 (2007). A collaborative approach addressing the issues above may forestall problems caused by existing gaps in the current standard form contracts as a result of a lack of industry consensus. Even if the industry has not reached agreement on all the issues above, it is crucial that parties engaging in BIM address and reach agreement on these issues before problems occur.

Finally, the central role often played by HVAC subcontractors in creating designs provides a superb opportunity for SMACNA members to act as the IM under either the ConsensusDOCS or the AIA. Both contracts permit a party to identify the manager for

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<sup>4</sup> Authors are General Counsels at Mortenson Construction.

responsible for information on BIM. This role can be played by anyone, including HVAC subcontractors.

### III. INDEMNIFICATION AND LIABILITY

#### A. Current Legal Framework.

As discussed above, American jurisprudence, and construction law in particular, places an emphasis upon assessing individual liability and minimizes “collaborative” imposition of responsibility. To further emphasize this presumption, “architects and other design professionals often rely upon draconian disclaimer notices to insure that drawings and other documents delivered in digital format are not infringed or misused.” See C. Noble & B. Heart, “The AIA’s New Digital Data Documents,” 28 Construction Law 12, 13 (Spring 2008).<sup>5</sup> Those who furnish others with drawings have a compelling concern: “To avoid liability for changes made to models after they leave their control. This fear has led to the development of disclaimers and releases that significantly limit, or even eliminate, the right of recipients to rely on transferred models for any purpose. The tensions between these competing concerns poses a significant obstacle to the full realization of BIM through the unfettered exchange of electronic data.” D. Larson & K. Golden, “Entering the Brave New World: Introduction to Contracting for Building Information Modeling,” 34 Wm. Mitchell L.Rev. 75, 93 (2007).<sup>6</sup>

The desire of designers and architects to limit liability through disclaimers is neither unreasonable nor irrational. Indeed, the genesis of this fear stems from a 1918 Supreme Court decision U.S. v. Spearin, 248 U.S. 132 (1918) which held that an owner supplying a contractor with plans and specifications created an implied warranty that the design was adequate for the work intended. If the contractor established that he followed the plans and specifications, the party supplying the plans, and not the contractor, would be liable for any defects. Thus, architects are rightly concerned that if they provide plans and specifications and subsequent changes are made without their knowledge, and the building is constructed, they may be found liable under Spearin. While some commentators believe that Spearin’s applicability to BIM is in doubt,<sup>7</sup> this fear of potential liability drives architects’ insistence on disclaimers, and to some extent their reticence to embrace BIM.

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<sup>5</sup> “[T]he architect typically disclaims the accuracy of its design-model and requires the contractor to acknowledge that disclaimer, so, too, does the contractor typically disclaim the accuracy of the construction model that it makes available to its subcontractors. The disclaimer by the architect arises from the architect’s antipathy to assumption of risk. The contractor’s disclaimer, in turn, is grounded upon common sense since the contractor certainly has no reason to provide a warranty of a construction model derived from a disclaimed design model.” T. O’Brien, “Successfully Navigating” 28 Construction Law at 32.

<sup>6</sup> “Designers in particular have been concerned with improper use, reuse or alteration of their designs. . . . In response to these concerns, designers and other creators of electronic information have come to rely on disclaimers and releases, intended to either accompany or precede any transfer of electronic data; . . . some disclaimers go further and expressly disclaim any liability for the completeness or accuracy of any electronic data. . . . Without the right of reliance, the deficiencies afforded by BIM are limited.” Id. at 94-95.

<sup>7</sup> See T. O’Brien, “Successfully Navigating” 28 Construction Law at 31.

## **B. ConsensusDOCS Approach.<sup>8</sup>**

The ConsensusDOCS attempt to address the issue of liability by specifically enumerating the “Risk Allocation” between the parties:

“Each party shall be responsible for any Contribution that it makes to a Model or that arises from that Party’s access to that Model. Such responsibility includes any Contribution or access to a Model by a Project Participant in privity with that Party and of a lower tier than that Party.”

ConsensusDOCS 301, §5.1 (2008). Furthermore, to address whether parties may rely on the documents it provides:

“To the extent any or all Design Models are included as Contract Documents, Project Participants may rely upon the accuracy of information in those Design Models . . .”

Id. at §5.3. It is not the intent of ConsensusDOCS to change the overall standard of care. “The ‘standard of care’ applicable to each Party regarding the Party’s Contributions to or use of a Model shall be in accordance with the Party’s Governing Contract, or common law as applicable.” Id. at §5.4.

As a practical matter, it does not appear that the ConsensusDOCS make a major change or shift in the risk allocation that would typically be present in the absence of a BIM project model. Thus, while the ConsensusDOCS attempt to address “Risk Allocation,” they do not offer a “new” form of liability allocation that may be impacted by the collaborative BIM work product.

## **C. Practical Implications.**

The ConsensusDOCS, and to a larger extent the AIA form, continue to be “works in progress.” As discussed above, neither the law nor the standard form contracts have “caught up” with the industry’s desire to produce BIM modeling. As a practical matter, regardless of the final forms of the standard BIM contracts, parties will continue to be held accountable to a basic standard of care. That is, if a party provides negligent or defective work, there will likely be legal consequences. The extent to which parties may rely on others, or must “double check” work, has not yet been definitively resolved.

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<sup>8</sup> The focus of this section will be on the ConsensusDOCS provisions, as AIA E202 has a far more limited discussion on imposition of liability and allocation of risk. Contra E202, §4.1.3 (“To the fullest extent permitted by law, subsequent Model Element Authors and Model Users shall indemnify and defend the Model Element Author from and against all claims arising from or related to the subsequent Model Element Author’s or Model User’s modification to, or unauthorized use of, the Model Element Author’s content”).

Likewise, the continued presence of onerous indemnity obligations will likely create “great mischief” and “inhibit collaboration between the parties.” On the other hand, saddling parties with “the responsibility to defend and indemnify all others in connection with any loss” may also be unrealistic. P. Bruner & P. O’Connor 2 Bruner & O’Connor Construction Law §7:107.25 (May 2008 Supplement). “In the end, the guiding principle when developing contractual arrangements between the parties in a BIM environment must be to develop arrangements that foster the collaborative working relationships so crucial for achieving the full benefits of BIM.” *Id.* As the aspirations of BIM have not yet been achieved, parties must work together to address problems before they occur (see list of topics above, Section I(c)).

#### IV. COPYRIGHT/INTELLECTUAL PROPERTY

##### A. Current Legal Framework.

Under architectural copyright law, the “author” is presumed to own the copyright of the plans. Unless the agreement between the owner and architect provides otherwise, through a “work for hire” provision, the architect is the presumed author and owner of the copyright. 17 U.S.C. §201(b). Under BIM, multiple parties are submitting plans and specifications which may (or may not) be subject to copyright protection. That is, while standardized documents and functional specifications are not subject to copyright protection, the combination of standard and individualized features may permit a party to claim copyright. See CSM Investors, Inc. v. Everest Development Ltd., 840 F.Supp. 1304, 1310 (D.Minn, 1994); Richmond Homes Mgmt, Inc., v. Raintree Inc., 862 F.Supp. 1517, 1524 (W.D.Va. 1994). Put another way, while the components of a HVAC system may not be subject to copyright protection, their unique and “original” arrangement may entitle a party to claim copyright protection of those plans.

##### B. ConsensusDOCS Approach.

The challenge under BIM is that multiple parties may submit plans which, in and of themselves, may be subject to copyright protection, but are incorporated into a larger plan (aka “Model”) which is used as part of the design process. The issue of copyright ownership is not expressly addressed in either of the standard form contracts or the latest treatises addressing BIM. Indeed, the AIA is completely silent on the issue of copyright and the ConsensusDOCS merely note that the “Project Owner’s entitlement to use of the Full Design Model after completion of the Project shall be governed by the Contract between the Owner and the Architect/Engineer.” ConsensusDOCS 301 §6.4. Thus, the ConsensusDOCS merely provides the ownership of the design by and between the Owner and Architect/Engineer must be addressed in the contract between them. It does not address any rights or interests of the subcontractor to its interests in those plans.

At the same time, the ConsensusDOCS do contain some useful provisions, including a requirement that each party warrant that it is the “owner of all copyrights in all of that Party’s Contributions.” *Id.* at §6.1. While this provision provides protection to the parties contracting, it does not address the underlying problem that a set of plans may be incorporated into a BIM project and may be claimed as part of the “Full Design Model.” If the incorporated plans are used in a later project, the owner of the BIM plans might view this as a violation of copyright.

### **C. Practical Implications.**

While the ConsensusDOCS has made a good “first effort” in addressing intellectual property, the courts and/or form revisers will need to address these issues further to avoid the inevitable quagmire caused by competing parties claiming copyright ownership.

## **V. CONCLUSION**

The operational aspects of BIM have increasingly been addressed and are being worked out through practical experience. Unfortunately, the legal issues have not been fleshed out in as great a detail. Thus, unless revisers to the form construction documents provide greater guidance, the likely venue for addressing the issues identified above will be the courts or arbitration panels.

In order to minimize exposure to litigation, parties should endeavor to ensure their documents address the issues identified above. To the greatest extent possible, and, consistent with the collaborative approach inherent in BIM, parties should openly discuss issues concerning risk allocation, liability, indemnity and copyright ownership at the time of contracting, rather than leaving these issues to potential future disputes where little guidance exists in the contracts or case law.

Finally, as Albert Einstein noted: “In the middle of difficulty lies opportunity.” This flux caused by the advent of BIM presents a unique opportunity for contractors and subcontractors to play a central role in BIM. There is no consensus as to the most appropriate individual to act as the “Manager” controlling and coordinating information exchanged as part of the BIM construction process. HVAC and sheet metal contractors have long played a central role in on-the-job plan generation and project coordination. The advent of BIM provides the HVAC and sheet metal contractors an opportunity to take the lead among the parties applying BIM. SMACNA members should endeavor to formalize their central role in BIM as well as tap this new potential source of work and revenue. However, before contractors “step up” it is essential they understand the potential liabilities and opportunities inherent in this brave new world.