ConsensusDOCS 301 BIM Addendum

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On June 30, 2008, ConsensusDOCS issued a new document dealing with building information modeling (BIM): the ConsensusDOCS 301 BIM Addendum (BIM Addendum). This article provides an overview of the BIM Addendum, first by discussing the drafting process, and then by addressing the specific rights and obligations set forth in the document.

The Drafting Process

The BIM Addendum is a product of industry consensus. Although principally drafted by the Associated General Contractors of America (AGC) BIM Forum, the BIM Addendum is not just the product of a "contractors' group." Instead, the AGC BIM Forum includes representatives from the design community (architects and engineers), owners, suppliers, fabricators, subcontractors, general contractors, sureties, insurers, the National Institute of Building Sciences (NIBS), and construction lawyers, including several from the American College of Construction Lawyers.[1]

In order to prepare a document that would be accepted industrywide, the drafters sought to incorporate the best practices in the use of BIM techniques and technology. During this process, the drafters revisited many of the issues that parties face on a project implementing traditional two-dimensional drawings and specifications, such as the lack of a clear distinction between the boundaries of design and construction. They also faced new issues unique to a project implementing BIM, such as how to address the copyrights of expression contained in the three-dimensional BIM models. In the end, the drafters of the BIM Addendum addressed myriad issues, some of which were novel to BIM projects, with creativity and verve, but always with an eye toward achieving a true consensus that would be reflected in a fair and balanced document that would be acceptable to all parties involved in a project utilizing BIM.

The result of this collaboration is the BIM Addendum, which has been endorsed by no fewer than 16 industry groups.[2]

The Framework

For many years, BIM has been seen as a promising new technology that could revolutionize the construction industry by enabling construction professionals to engage in virtual design and construction, thus allowing the parties to achieve an unprecedented level of collaboration, cost efficiency, and effectiveness.[3] One of the biggest challenges to implementing BIM was the fact that most, if not all, of the standard form agreements employed by construction professionals completely ignored, or inadequately addressed, BIM.[4] Moreover, as Dwight A. Larson and Kate A. Golden of Mortenson Construction aptly pointed out, BIM raises a host of legal and contractual questions:

> Does it alter the traditional allocation of responsibility and liability exposure among owners, designers, contractors, and suppliers? What are the risks of sharing digital models with other parties? Does the party managing the modeling process assume any additional liability exposure? What risks arise from potential interoperability of the various BIM software platforms in use? How should intellectual property rights be addressed? What risks arise for the party taking responsibility for establishing and maintaining the networked file-sharing site used as a depository for models? How might BIM alter the set of post-construction deliverables on a project, and what are the implications of the changes? And, perhaps most importantly, how can the project contracts enhance rather than limit the benefits to be gained through the use of BIM?[5]

The purpose of the BIM Addendum is to address each of these concerns.

In drafting the BIM Addendum, one of the most daunting tasks the drafters faced was figuring out where to start. The Legal Subforum of the AGC BIM Forum was charged with this task. In July 2007, the Legal Subforum met to determine what type of standard form document could best be used to implement BIM on construction projects and to begin drafting that document. It quickly became apparent to the Legal Subforum that, rather than attempt to draft all new BIM-specific standard form agreements between owner and design professional and between owner and contractor, the best approach would be to build on the owner-design professional and owner-contractor standard form agreements that are so widely in use in the construction industry. These standard form documents have been developed and refined over the course of decades, and their widespread use indicates that construction professionals had at least come to expect, if not rely on, certain allocations of risk

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and responsibility. The Legal Subforum also believed that any attempt to rewrite these standard form documents, and any shift in contractual responsibility or in the allocation of risk associated with such a rewrite, would only provide yet another hurdle to implementing BIM.

In the end, rather than attempt to draft a BIM-specific standard form agreement between the owner and the design professional or between the owner and the contractor, the Legal Subforum decided it would be more effective to attach what was initially called a "BIM Rider," which would later evolve into the BIM Addendum, to standard form agreements.[6] The proposed attachment would modify the terms of the standard form agreement to which it was attached and also address myriad BIM-related issues that were beyond the original scope of the standard form agreement. The drafters' goal was to create a document that would enable parties to easily and effectively introduce 21st century technology, namely virtual design and construction or building information modeling, into construction projects utilizing standard form documents.

The following sections will discuss in greater detail the framework of the BIM Addendum.

No Restructuring of Contractual Relationships

Much of the anxiety associated with BIM stems from a fear shared by design professionals and contractors.[7] Design professionals, on one hand, may be concerned that they may assume some responsibility for the means and methods of construction by engaging so closely with contractors. Contractors, conversely, may be similarly concerned about any unintended assumption of responsibility for design. In response, many commentators have suggested that the use of BIM does not require the parties to assume any roles other than their traditional roles.[8] The BIM Addendum adopts this position and addresses the valid concerns of design professionals and contractors by assuring that there is no restructuring of contractual relationships on a BIM project. In doing so, the BIM Addendum may help debunk some serious misconceptions about BIM that may have served to hinder the utilization of BIM on projects where it may have otherwise added substantial value.

The BIM Addendum is an *addendum*, and is not intended to be used as a substitute for other standard form agreements between owners, design professionals, and contractors. Rather, an identical copy of the BIM Addendum is required to be appended to the contract between the owner and design professional *and* to the contract between the owner and the contractor. The effect of this arrangement is that the contractual relationships among three principal parties (owner, design professional, and contractor) are largely preserved, and any significant shift in contractual responsibility among these parties is avoided. At the same time, by implementing the BIM Addendum, all three of the principal parties agree to perform certain BIM-related tasks and assume certain BIM-related responsibilities, all of which must be addressed in order for a BIM project to be successful.

One aspect of the segregated contractual relationships between (a) owner and design professional and (b) owner and contractor that was intentionally maintained is the lack of privity between design professional and contractor. Specifically, the BIM Addendum is not intended to create privity of contract between the design professional and the contractor. The drafters believed that the creation of horizontal privity between contractor and design professional—whether intentional or not—would unnecessarily complicate matters and dissuade, or disincentivize, design professionals from using the BIM Addendum.

The conscious decision to avoid the restructuring of contractual relationships also extends to the contractual responsibilities of the parties. Although the BIM Addendum allocates certain BIM-related responsibilities among the parties (or at least provides a mechanism enabling the parties themselves to choose how to best allocate those responsibilities), the BIM Addendum largely avoids restructuring any of the basic contractual responsibilities typically borne by the parties on any given construction project, such as the responsibility for the design of the project by the design professional.[9] On projects utilizing the BIM Addendum, the architect remains the person in responsible charge of the design of the project, and the owner remains responsible under *Spearin*[10] for loss or damage that results solely from insufficiencies or defects in owner-supplied information, plans, and specifications. These issues had previously been the speculation of much debate about how BIM would affect the responsibilities of the architect and the contractor.[11]

Usage

The drafters' goal was to write the BIM Addendum in such a manner that it could be used on as many projects as possible. The BIM Addendum, however, is best suited for certain types of projects and under conditions in which project participants have reached a common understanding on certain project-related issues. First and foremost, the BIM Addendum is intended to be used when all of the key players (owner, design professional, contractor, major subcontractors, and suppliers) are willing to commit to BIM and to commit to exchange the information necessary to execute BIM effectively and efficiently. BIM is inherently information-intensive and requires more cooperation than would typically be required on a traditional project. The product of this mix of information and cooperation is increased productivity and efficiency.[12] In order for the parties to capture the efficiencies made available by BIM, all of the key parties involved must be committed to exchanging a massive amount of information. Ideally, although not necessarily, the project participants' commitment to BIM is made very early in the project planning phase.[13]

Second, the BIM Addendum is intended to be used with traditional project delivery methods such as design-bid-build. Moreover, the BIM Addendum is especially appropriate where construction is to be priced by means of a negotiated guaranteed maximum price (GMP) contract with significant preconstruction services.[14]

Although the BIM Addendum is best suited for certain types of projects, it is intended to be an extremely flexible document. The BIM Addendum can, but need not, be a contract document—it is left to the parties to make this decision. More-

over, the BIM Addendum can be used in such a manner that three-dimensional computer models can coexist on a project with traditional two-dimensional drawings that are not derived from the information contained in the three-dimensional model. In fact, on some projects, it may be more practical and more cost-effective to draw certain details rather than to model them. For example, the waterproofing of a parapet wall may be more conveniently drawn, and at a lesser expense of time and money, than modeled in three dimensions. On projects where the parties have decided to implement three-dimensional computer models and two-dimensional drawings, the BIM Addendum provides a mechanism that also enables the parties to select, if they so choose, an order of precedence between three-dimensional models and two-dimensional drawings.

Definitions

The BIM Addendum required the formalization of a number of definitions for BIM-related documents, concepts, processes, and participants. A discussion of these definitions will assist in explaining the information exchange process contemplated by the BIM Addendum as well as identify some of the key issues addressed by the BIM Addendum.

On a most basic level, the BIM Addendum is all about models, which are the building blocks on any project utilizing BIM. The BIM Addendum defines *Model* as a "three-dimensional representation in electronic format of building elements representing solid objects with true-to-scale spatial relationships and dimensions" that "may include additional information and data."[15] Although rather straightforward, the definition of Model is a necessary foundation, so that other BIM-related Models can be accurately defined in the BIM Addendum. Moreover, in the BIM Addendum, Models (models with a capital *M*) are distinguished from Drawings (drawings with a capital *D*) because Drawings are defined to be designs that are not derived from the Models.

A Model is typically a *Contribution*, which is defined by the BIM Addendum as the expression, design, data, or information that a project participant (a) creates or prepares and (b) incorporates, distributes, transmits, communicates, or otherwise shares with other project participant(s) for use in or in connection with a Model for the Project.[16] Contributions are not limited to three-dimensional Models. Provided they meet the criteria of a Contribution, two-dimensional drawings and/or sketches not derived from a Model also can be considered Contributions.

From a design and construction standpoint, the BIM Addendum makes a distinction between two principal types of Models: a *Design Model* and a *Construction Model*. Specifically, with regard to the Design Model, the drafters decided that the BIM Addendum would treat Design Models similarly to two-dimensional Construction Documents. The BIM Addendum defines a Design Model as a Model that has reached the stage of completion that would customarily be expressed by an architect or engineer in two-dimensional Construction Documents.[17] Accordingly, a Design Model specifically does not include Models such as analytical evaluations, preliminary designs, studies, or renderings. Moreover, the BIM Addendum also specifies that a Model prepared by an architect or an engineer that has not reached the stage of completion specified in the definition of a Design Model is simply referred to as a Model. A Design Model is also further defined by the project participants in the BIM Execution Plan, an ancillary document that further delineates project-specific processes, functions, and requirements and assigns BIM-related responsibilities. Upon its execution, the BIM Execution Plan becomes an amendment to the BIM Addendum.

All of the Design Models to be produced by the design team are intended to be coordinated together to form a *Full Design Model*, which is defined by the BIM Addendum as a Model consisting of all of the coordinated structural, architectural, MEP, and other Design Models that are to be produced by the design team.[18]

Similar to how a Design Model is the equivalent of two-dimensional Construction Documents, the BIM Addendum defines a *Construction Model* as the equivalent of shop-drawings and other information useful to construction.[19] Moreover, the BIM Addendum defines a Construction Model as a Model that consists of data imported from a Design Model or, if none exists, from a designer's Construction Document.[20] Similar to the Design Model, a Construction Model also may have to meet certain requirements as set forth in the BIM Execution Plan.

One of the most important concepts for the drafters to grasp and incorporate into the BIM Addendum was the concept of a *Federated Model*. The BIM Addendum defines a Federated Model as "a Model consisting of linked but distinct component Models, drawings derived from the Models, texts, and other data sources that do not lose their identity or integrity by being so linked, so that a change to one component Model in a Federated Model does not create a change in another component Model in that Federated Model."[21] The drafters adopted the phrase Federated Model from the National BIM Standard created by NIBS.[22] From the beginning of the process, the drafters wrestled with how best to conceptualize the processes that took place behind the scenes in BIM. How would project participants contribute models and drawings to the project, and how would these models interact or be combined to create a three-dimensional representation of all the individual pieces of the project? As it turns out, the Models contributed by project participants are not combined into a single master model, but instead remain as distinct component Models. These distinct component models can be linked together to create a Federated Model in such a manner that the linked data sources do not lose their identity or integrity by being so linked. In other words, a change to one component Model in a Federated Model does not create a change in another Model in that Federated Model. Thus, a Federated Model can be created at almost any time by linking any number, or combination, of Models that had been contributed by project participants.[23] A Federated Model can be used for a variety of purposes, including, but not limited to, clash detection, marketing, and facilities maintenance.

One of the important characteristics of a Federated Model is that the Contributions of all the project participants are discrete, and no project participant can change or alter another project participant's model.[24] Thus, the process is largely trans-

parent, in that one project participant cannot alter another project participant's Contribution. This helps maintain the distinction between design and construction as well as maintain the lack of privity between design professional and contractor.

Additional defined terms serve to describe the relationship of the BIM Addendum to the various contracts between project participants. First, the BIM Addendum defines *Governing Contract* as the agreement to which the BIM Addendum is attached and in which it is incorporated.[25] The BIM Addendum, however, also may be attached to contracts other than the Governing Contracts, which the BIM Addendum defines as *Affiliated Contracts*.[26] So the particular contract that is considered a Governing Contract or an Affiliated Contract changes, depending on which contract is being examined at any time. If the owner-contractor agreement is under review, then it is the Governing Contract and the contractor-subcontractor agreements would be Affiliated Contracts. If, however, the contract at issue is a contractor-subcontractor contract, then the owner-contractor agreement is considered an Affiliated Contract. The BIM Addendum also defines *Project Participant* as each party to a Governing Contract and each party to an Affiliated Contract.[27]

The BIM Addendum also modifies the Governing Contract's definition of *Contract Documents*. Specifically, the BIM Addendum modifies the definition of Contract Documents to include all Design Models, unless otherwise specified.[28] Thus, as a default, project participants can rely on Design Models just as they would Contract Documents in a project using conventional two-dimensional drawings.

Information Management

BIM would not exist but for the widespread availability of today's powerful computers, fast networks, and innovative software.[29] BIM's heavy reliance on this technology requires that certain information technology-related functions be performed and certain information technology-related roles be filled.[30] The BIM Addendum recognizes this fact and addresses it in the *Information Management* section of the document.

Borrowing heavily from standards set forth by the National Institute of Building Standards (NIBS), the BIM Addendum sets forth the minimum information technology (IT) functions that must be performed in order for BIM to be successfully implemented.[31] The Information Management section also facilitates the preservation of the traditional distinction between design and construction by requiring the parties to establish secure access controls and an audit trail of Contributions to the Model that clearly identifies the source and the date of all changes. In this manner, the BIM Addendum prevents anyone other than the appropriate Project Participant from changing its own Model.[32]

The BIM Addendum allocates these IT responsibilities to an *Information Manager* selected by the parties rather than adding a new player to the mix. Unless the parties agree otherwise, the owner may replace the Information Manager at its own discretion. By default, the owner is responsible for the costs associated with the functions performed by the Information Manager. The parties, however, may agree to allocate the cost of the Information Manager as they see fit. The BIM Addendum defines the Information Manager's role and responsibilities by a set of minimum functions that the appointee (or its designee, if approved by the Owner) must perform.

At a minimum, the BIM Addendum requires the Information Manager to perform the following functions: (1) account maintenance and account access; (2) backup and security; and (3) cooperation and transfer of duties to a successor Information Manager. The Information Manager also is required to perform any and all other responsibilities or functions as required in the BIM Execution Plan.[33]

The BIM Execution Plan

The BIM Addendum requires the implementation of a *BIM Execution Plan*, which must be flexible in light of the parties' varying levels of sophistication and resources. In large part, the BIM Execution Plan addresses this need. Rather than attempt to lay out all BIM-related responsibilities and requirements up front, the BIM Addendum contemplates that many parties will not be in a position, nor will they be armed with sufficient information, to adequately map out every facet of BIM when the BIM Addendum is executed. Instead, the BIM Execution Plan provides the parties with a tremendous amount of flexibility to tailor the BIM Addendum to the requirements of both the project at hand as well as the needs and resources of the Project Participants.

Specifically, with regard to the BIM Execution Plan, the BIM Addendum requires that, as soon as practical, but in no event later than 30 days after the latter of the execution of the owner-architect agreement or the owner-contractor agreement, "all Project Participants shall meet, confer and use their best efforts to agree upon the terms of or modifications to the BIM Execution Plan."[34] The BIM Execution Plan is a checklist of issues for the Project Participants to consider as they map out various responsibilities, requirements, and processes in greater detail than they accomplished in the BIM Addendum.

Although the BIM Execution Plan is intended to represent a list of essential issues that should be addressed by the Project Participants, the BIM Execution Plan is not intended to be exhaustive. In addition to the issues specifically enumerated in the BIM Addendum and the BIM Execution Plan, Project Participants have the ability to include in the BIM Execution Plan any additional issues they see fit. When agreed upon, the BIM Execution Plan and any modifications thereto become an amendment to the BIM Addendum.

The BIM Addendum requires the BIM Execution Plan to address a number of issues that are crucial to the success of a BIM project. First, in the BIM Execution Plan, the parties must identify what Models are to be created, the purpose(s) each Model is intended to serve, and which Project Participant(s) is(are) responsible for creating each Model. The parties also must include a definition of what Design Model or Models, if any, shall not constitute Contract Documents. These are basic elements, but essential nonetheless.

The parties also are required to identify (1) the spatial portions or areas of the Project to be modeled in each Model and (2) the spatial portions or areas of the Project not to be mod-

eled. The parties also must identify the expected content of each Model and the required level of detail at various Project milestones, which content includes geometric and spatial data, object property data, object constitution data, provisions for object parameters as place holders for cost and schedule data, and authoritative source information.[35] The scope and content of each Model must be clearly identified so that Project Participants can be sure on what aspects of the Model they can rely, and on what aspects of the Model they cannot rely.

Many practitioners have commented on the importance of specifying what level of reliance Project Participants are permitted to place on Model data.[36] It is widely believed that Project Participants can achieve even greater integration and project efficiencies if they agree on reasonable rights to rely on the completeness and accuracy of shared models.[37] Moreover, a three-dimensional Model may convey more information than the contributor intends, reliance on which may cause significant unintended consequences. To prevent any such unintended reliance, the BIM Addendum requires that, in the BIM Execution Plan, the parties agree to a set of representations that each contributor will make regarding the dimensional accuracy of their contributions. According to the BIM Addendum, the representation regarding dimensional accuracy is (1) limited to other parties to the Governing Contract, (2) in accordance with the standard of care applicable to the contributor for such contribution, and (3) effective at the time the Model has been developed to the same stage of completion as two-dimensional Construction Documents.

The BIM Addendum provides three "check boxes" that the parties may use in the BIM Execution Plan to identify the level of reliance that project participants may place on Contributions. Alternatively, the parties have a fourth option of specifying on their own the level of reliance that Project Participants may place on Contributions. The three "check boxes" provided by the BIM Addendum that the parties may choose from are as follows:

> ☐ Each Contributor represents that the dimensions in its Contribution to a Model are accurate and take precedence over the dimensions called out in the Drawings or inferred from the Drawings. Details and components that are not represented in a Contribution to a Model must be retrieved from the Drawings; [or]
>
> ☐ Each Contributor represents that the dimensions in its Contribution to a Model are accurate to the extent that the BIM Execution Plan specifies dimensions to be accurate, and all other dimensions must be retrieved from the Drawings; or
>
> ☐ Contributors make no representation with respect to the dimensional accuracy of the Contributor's Contribution to a Model. A Model can be used for reference only and all dimensions must be retrieved from the Drawings.[38]

The scope of the Models to be created and the level of reliance that may be placed on those Models are some of the most crucial elements that are required to be addressed by the BIM Execution Plan. The BIM Execution Plan, however, requires the parties to address a host of other elements, only some of which will be mentioned in this article. These elements include:

- a schedule for the initial delivery of each Model to the Information Manager and a schedule for updating each Model and preserving versions of each Model and its constituent Models;
- procedures and protocols for (i) the submission and approval of Models including electronic stamping, (ii) the designation of a Model as a Design Model, (iii) the notification of action on a request for approval, and (iv) the designation of two-dimensional projections derived from a Model as Contract Documents;
- a number of IT-related elements including (i) the file format to be used, (ii) the file-naming and object-naming conventions to be used, (iii) the file structure to be used, (iv) the software to be utilized, and (v) the measures needed to achieve interoperability of applications;[39]
- coordination and scheduling of clash detection, including engagement of the Information Manager in these processes;[40] and
- the utilization of the project's BIM website.

Risk Allocation

The very nature of BIM introduces additional risks that must be allocated among the Project Participants. The BIM Addendum attempts to allocate these risks in the most fair and efficient manner possible. At the same time, the BIM Addendum attempts to deal with these additional BIM-related risks in such a manner as to not upset the typical allocation of risk on a project utilizing two-dimensional drawings and specifications.

One of the risks unique to a BIM project is the risk that Project Participants may rely on the Contribution of another Project Participant as accurate when in fact that Contribution is not accurate. To account for this risk, according to the BIM Addendum, each party is responsible for any Contribution that it makes to a Model or that arises from that party's access to that Model.[41] This 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 (i.e., a subcontractor to the general contractor). The approach adopted by the BIM Addendum is simple and straightforward—each party is responsible for any Contribution made by it or by any party for whom it is responsible.

With regard to the issue of a waiver of consequential damages, the BIM Addendum defers, for the most part, to the Governing Contract. Specifically, the Governing Contract governs the issue of any waiver of consequential damages arising from a Contribution, with one important exception: In the BIM Addendum, each party agrees to waive claims against the other parties to the Governing Contract for consequential damages arising out of or relating to the use of, or access to, a Model.[42] To the drafters of the BIM Addendum, this was an important decision. The drafters felt that, if the parties were subject to consequential damages arising out of, or relating to, the use of their Contributions, the substantial risk could potentially deter

the parties from actually agreeing to use BIM. The obvious solution was a mutual waiver of consequential damages for use of, and access to, the Models.

The BIM Addendum also does nothing to alter the standard of care applicable to Project Participants under common law or contract. According to the BIM Addendum, the standard of care applicable to each party regarding each party's Contributions to or use of a Model is determined by that party's Governing Contract or common law, whichever is applicable.[43]

The BIM Addendum also places an affirmative duty on each party to use its best efforts to minimize the risk of claims and liability arising from the use of or access to its Model or the Project Model.[44] These efforts include promptly reporting to the relevant Project Participants any errors, inconsistencies, or omissions that it discovers in its Model or the Project Model.

By default, the BIM Addendum also tries to encourage the parties to manage some of the risk associated with BIM by requiring each party to procure and maintain valuable papers and records insurance coverage that covers all of that party's Contributions or intended Contributions.[45] Moreover, each party to the BIM Addendum is required to include this insurance requirement in its contracts with any other Project Participant. If the parties choose to do so, they may eliminate or revise this insurance requirement in the BIM Execution Plan.

The BIM Addendum also addresses another risk unique to BIM: the threat of a software malfunction. Although it is arguable that under traditional projects parties are faced with some risk related to software malfunction (i.e., CAD software), the threat of a software malfunction appears to pose greater risk in a heavily technology-dependent process such as BIM. Based on the software vendor's limited warranty, many practitioners felt that, in the event of a software malfunction, the software vendor would be shielded from great loss while the user of the software could be subjected to significant liability from the other parties injured by the software error.[46]

Under the BIM Addendum, the owner bears most of the risk associated with a software malfunction.[47] In the event of a software malfunction, a party to the BIM Addendum may be excused from performance and may be entitled to an extension of time to the extent that that party could not have avoided any delay or loss by the exercise of reasonable care.[48] Although the BIM Addendum permits a time extension, the drafters were mindful that establishing a claim might be quite difficult. Although a software malfunction is possible, the assumption is that software malfunctions are, in fact, quite rare, and that most errors (such as problems in the transfer of data from a model generated in one type of software to another) can be attributed to human error, to which responsibility can be allocated.

Intellectual Property Rights

The current generation of standard form agreements does not adequately address the intellectual property rights issues on a BIM Project, especially the copyright and licensing issues relating to contractor and subcontractor Contributions.[49] Compared to two-dimensional drawings and specifications, BIM Models contain a tremendous amount of electronic information that can be transmitted quickly and efficiently. Moreover, the electronic information contained in a BIM Model can be easily extracted and reused in whole or in part. In particular, the final Project Model may have significant value for owners, many of whom believe they can use it to enhance facilities management.[50] Moreover, there is risk involved with a party using the Model of another party and inadvertently infringing upon the other party's intellectual property rights. These factors impose importance in addressing the intellectual property rights in BIM Models.

The BIM Addendum addresses these intellectual property issues in a unique, and rather clever, manner. First, in order to manage the risk associated with potential claims of copyright infringement from third parties, each party to the BIM Addendum warrants to the other parties to the Governing Contract that (1) it is the owner of all the copyrights in all of that party's Contributions or (2) it is licensed or otherwise authorized by the holder of the copyright of expression contained in the Contribution to make such Contribution.[51] Moreover, each party agrees to indemnify and hold other parties harmless for claims of third parties arising out of, or relating to, claims or demands asserting infringement or alleged infringement of expression contained in that party's Contribution.

Second, each party to the BIM Addendum grants each other party to the Governing Contract a limited, nonexclusive license to reproduce, distribute, display, or otherwise use that party's Contributions for the purposes of the project only.[52] Moreover, each party grants the other party the right to grant an identical sublicense to any other Project Participants with which the licensee has an Affiliated Contract in which the BIM Addendum is incorporated by reference. The effect of this arrangement is that a license to reproduce, distribute, display, or otherwise use that party's Contributions for the purposes of the project only is granted upstream and downstream to all parties working on the project. The license in each case is limited for the sole purpose of carrying out the Project Participants' respective duties and obligations on the project. Although the parties are permitted to maintain an archival copy (so long as it is permitted by the Governing Contract), the licensees are not allowed to reproduce, distribute, display, or otherwise reuse all or part of any other party's contributions except as permitted by the BIM Addendum or the Governing Contract. According to the BIM Addendum, these licenses remain in effect as long as permitted by law, or at least until final completion of the project, after which time the licensee is limited to keeping an archival copy of project-related Contributions.

The BIM Addendum also attempts to limit any unintentional transfer of intellectual property rights by specifically stating that it is not intended to limit, transfer, or otherwise affect the intellectual property rights that a party may have with respect to any Contribution, except for licenses and permissions expressly granted by it.

The BIM Addendum also acknowledges two owner-related intellectual property issues. First, the BIM Addendum specifies that the owner's entitlement to use the Full Design Model after completion of the project is governed by the contract between the owner and the design professional.[53] Second, the owner can lose its license(s) as a result of its nonpayment to a Contribu-

tor. Specifically, the BIM Addendum provides that, in the event a court of law or arbitration adjudicates that the owner has materially failed in its project-related payment obligation to a Contributor, any project-related licenses to the owner from that Contributor shall be terminated as of the time of such adjudication.[54]

Enabling Collaboration

The BIM Addendum is a new standard form document intended to enable construction professionals to successfully utilize BIM techniques and technology by successfully managing the risks and responsibilities associated with BIM. Many see BIM as a game-changing process that will enable construction professionals to achieve unprecedented levels of collaboration and efficiency not attainable under traditional two-dimensional methods. The BIM Addendum is an important step in this exciting new direction.

Endnotes

1. The lawyers participating from the American College of Construction Lawyers were extremely valuable in assisting in the drafting effort, but the College does not endorse documents and, hence, did not endorse the BIM Addendum.

2. National Association of State Facilities Administrators (NASFA); The Construction Users Roundtable (CURT); Construction Owners Association of America (COAA); The Associated General Contractors of America (AGC); Associated Specialty Contractors (ASC); Construction Industry Round Table (CIRT); American Subcontractors Association (ASA); Associated Builders and Contractors, Inc. (ABC); Lean Construction Institute (LCI); Mechanical Contractors Association of America (MCAA); National Electrical Contractors Association (NECA); National Roofing Contractors Association (NRCA); Painting and Decorating Contractors of America (PDCA); Sheet Metal and Air Conditioning Contractors' National Association (SMACNA); National Association of Surety Bond Purchasers (NASBP); and Surety and Fidelity Association of America (SFAA). Although the American Institute of Steel Construction (AISC) has a policy of not endorsing any specific document, the AISC has offered a letter of support, in which the AISC "fully embraces" the use of the BIM Addendum.

3. *See* Dwight A. Larson & Kate Golden, *Entering the Brave New World: An Introduction to Contracting for Building Information Modeling*, 34 Wm. Mitchell L. Rev. 75, 76–77 (2007) (BIM's benefits for the construction industry include "improved spatial program validation; a greatly-enhanced ability to visualize and comprehend designs, complicated details, and sequences; more effective coordination and detection of system clashes; better quality design and design detailing; greater dimensional precision; improved productivity; better capability to optimize budget and schedule options; better tools for field teams; greatly-enhanced communication and collaboration among owners, designers, contractors, and suppliers; more efficient fabrication; an increased ability to modularize and prefabricate building components; improved quality and safety; reduced project delivery time; and improved as-built documentation. BIM, competently applied, can also reduce the overall liability exposure of all of the players involved in a construction project.").

4. *See* Patrick J. O'Connor Jr., *Productivity and Innovation in the Construction Industry: The Case for Building Information Modeling*, 1 J. Am. Coll. Constr. L. 5, 167–77 (2007) ("One of the most pressing [challenges] is the fact that there currently exists no contractual framework within which to encourage the full implementation of this technology.").

5. Larson & Golden, *supra* note 3, at 77.

6. Although the BIM Addendum was not specifically drafted to interface with AIA documents, there is no reason the BIM Addendum cannot be adopted by parties utilizing AIA documents.

7. *See* Larson & Golden, *supra* note 3, at 82 ("Perhaps the greatest source of angst associated with BIM is the fear that its use will inevitably result in an unintended assumption of responsibility for design by contractors and of responsibility for means-and-methods by designers.").

8. *See id.* at 84 ("Mortenson's experience is that, with the possible exception of the role of model manager, using BIM effectively in a collaborative way does not require the project participants to assume any roles other than their traditional ones."); *see also* Richard H. Lowe, *Get Ready for BIM*, Constr. Today, Summer 2006, at 10 ("Some in the design community are especially concerned about the contractual risk issues that may arise in the use of BIM Models. Although the concern is understandable, any such fears should be allayed considering . . . the same allocation of risk should apply to a BIM model as to the 2-D CAD world. So the architect remains responsible for the design, and the contractors have responsibility for shop drawings. Thus, for example, the fact that the shop drawings are added into a model should not change the risks for the information being added.").

9. *See* Richard H. Lowe, *Buckling Up Risks*, Constructor, Jan.–Feb. 2007, at 43–44 ("A concern from the design side is whether the architect-of-record or design-builder remains in 'responsible charge' of design, as required by many state laws. That's based on the faulty assumption that the line between design and construction is blurred using 3D design, including fears that someone else other than project leaders can change the model without their knowledge or approval.").

10. United States v. Spearin, 248 U.S. 132 (1918).

11. *See*, *e.g.*, Larson & Golden, *supra* note 3, at 83 ("[D]oes the step-change in collaboration among designers, contractors, and suppliers enabled by BIM—much of which can occur during the design phase—deprive the contractor of protection from responsibility for design error provided by the *Spearin* Doctrine?").

12. *See* O'Connor, *supra* note 4, at 160 ("BIM . . . has the potential for truly changing the way people work and communicate. The efficiencies that might be gained through the use of truly integrated information technology networks in the building industry can be gleaned by the remarkable statistic that an estimated 16 percent of the time spent in any project delivery process is wasted looking for and recreating project information.").

13. *See* Larson & Golden, *supra* note 3, at 81 ("The use of BIM becomes more integrated when contractors begin their modeling work during the design phase. This brings important advantages, like allowing the contractors' means-and-methods work to inform the design, allowing the models to be used to a greater degree and earlier in the process as the primary tool for collaboration among the parties, and—in some cases—permitting a compression of the overall project delivery schedule. Of course, the earlier that all of the key modeling parties are involved, the greater the integration and the greater the potential benefit.").

14. The drafters concluded that the BIM Addendum should be drafted to facilitate the use of BIM. In so doing, the drafters were attempting to counter all the excuses one might have to avoid using BIM and the BIM Addendum. Accordingly, the drafters used the most common project delivery method appropriate for the application of BIM, a GMP project, as the starting point to draft the BIM Addendum. For the same reason, the commentary to the BIM Addendum makes clear that it is not necessary to engage in the parties' sharing of a common contingency (such as envisioned in the ConsensusDOCS 300 agreement) in order to use BIM and the BIM Addendum.

15. ConsensusDOCS 301 BIM Addendum ¶ 2.14.

16. *Id.* ¶ 2.4. The drafters believe that the BIM Addendum is the first standard form contract to recognize that contributions can be made by persons other than design professionals, such as subcontractors.

17. *Id.* ¶ 2.6.

18. *Id.* ¶ 2.9.

19. *Id.* ¶ 2.2.

20. Thus, the BIM Addendum can be used if the contractor converts a two-dimensional design into a three-dimensional Construction Model. But the BIM Addendum encourages the parties to design in three dimensions from the start.

21. Consensus DOCS 301 BIM Addendum ¶ 2.8.

22. This concept can be understood by analogizing to a federation, in the political sense. A federation is a league, confederacy, or a parent organization formed by the linking of several states, countries, companies, or societies, each retaining the control of much of its own affairs. Dictionary of Collective Nouns and Group Terms (Gale Group, Inc. 2008). The United States, for example, was originally a federation of states under the Articles of Confederation. That form of government failed because each of the states retained too much autonomy—a result not good for the republic, but just fine for Federated Models.

23. For an excellent description of the model-sharing process, see Larson & Golden, *supra* note 3, at 85–87.

24. While the inability of one participant to change the Model of another is more of a technical issue than a legal one, the BIM Addendum's incorporation of that idea into its framework helps give parties the comfort they need that the Models will maintain their integrity.

25. ConsensusDOCS 301 BIM Addendum ¶ 2.10.

26. *Id.* ¶ 2.1.

27. *Id.* ¶ 2.16.

28. *Id.* ¶ 2.3.

29. *See* Lowe, *supra* note 9, at 10 ("Up to now, what has held back the use of modeling in a project wide basis for vertical construction has been the inability of everyone in the process to use the same model. Now there is software that permits one model to be created by the integration of all the models on a project.").

30. *See* Christopher L. Noble & Bennet Heart, *The AIA's New Digital Documents*, 28 Constr. Law. 2, 15 (Spring 2008):

> Because a model has the capacity of being so information-rich, it can receive input from and generate output to numerous users at numerous stages of the design and construction process. This information can be shared, correlated, analyzed, tested, and commented upon, thus increasing the knowledge, efficiency, and collective intelligence of the members of the design and construction team. The result can, at least in theory, be an optimization of all three of the traditional metrics of the construction process: time, cost, and quality.
>
> This can happen, of course, only if the design and construction team members have access to the model and if the electronic information is reliably and accurately transmitted. The role of standards, protocols, and agreements between and among the project participants is, if anything, more important in a BIM environment than when CAD files are being transmitted and exchanged.

31. *See* National Institute of Building Sciences, National Building Information Modeling Standard 63–70 (2007).

32. *See* Lowe, *supra* note 9, at 44 ("[The fear] that someone other than the project leaders can change the model without their knowledge or approval . . . can easily be addressed by adopting a protocol where all changes to the model must come from the designated team leaders. They need to establish tight access controls and an audit trail of additions to the model that clearly establishes the source and date of all changes.").

33. ConsensusDOCS 301 BIM Addendum ¶¶ 4.1, 4.2.

34. *Id.* ¶ 4.1.

35. Although a delineation of the level of detail for which designers are responsible and the level of detail for which the contractor and its subcontractors are responsible may have been lacking in many traditional projects, there is nothing in BIM that prevents project leaders from clearly establishing who owes exactly which deliverables at what level of detail. The American Institute of Steel Construction's Code of Standard Practice for Steel Buildings and Bridges (the AISC Code) is a great example that such a delineation can be achieved. In the AISC Code, the structural engineers' deliverables—specific information about the connections the fabricator must detail—and the fabricators' deliverables—connections based on that information—are clearly delineated. *See* American Institute of Steel Construction, Code of Standard Practice for Steel Buildings and Bridges (2005). There is no reason that the deliverables in a BIM project cannot similarly be delineated. For a discussion of AISC Code provisions intended to facilitate the use of three-dimensional digital building product models as a replacement for contract drawings as the primary means of designing, representing, and exchanging structural steel, see *id.*, app. A, at 65–68.

36. *See* Patrick J. O'Connor & Kimberly A. Hurtado, *Contract Issues in the Use of Construction Building Information Modeling*, 25 Int'l Constr. L. Rev., 262, 267 (2008) ("Reliance on model data is a key issue that cannot be divorced from purpose. A model intended solely for visualization purposes should not be relied upon for accurate or complete construction material quantity takeoff. As a consequence, care should be used to spell out levels of permitted reliance on model data in the parties' contracts after the complete purposes for the model have been identified."); *see also* Larson & Golden, *supra* note 3, at 95 ("Without a right of reliance, the efficiencies afforded by BIM are limited. Each recipient is left with limited choices and considerable risks. These risks can be mitigated only by detailed comparisons of the electronic data to the two-dimensional drawings or re-creation of electronic data from two-dimensional drawings, which involves substantial duplication of effort and great cost to the project (and additional potential for error). The number of recipients and participants in a project using BIM compound the inefficiencies. . . . If at each transfer of data the recipient must perform additional duplicative work to confirm the electronic data has no errors for which it will be held responsible and that the electronic data matches the paper design documents, the efficiency and usefulness of BIM is [sic] significantly limited.").

37. *See* Larson & Golden, *supra* note 3, at 81 ("The modeling parties can achieve even greater integration and project efficiencies if they agree on the project team members' reasonable rights to rely on the completeness and accuracy of shared models.").

38. ConsensusDOCS 301 BIM Addendum ¶ 4.3.11.

39. *See* Howard W. Ashcraft, Building Information Modeling 2.0: Issues and Implementation (manuscript at 6, on file with author) ("Interoperability is a major issue. An oft cited National Institute of Standards and Technology study estimates that the annual cost of inadequate inoperability in the United States is $15.6 billion, and a recent McGraw Hill study reports that project participants estimate that lack of adequate interoperability adds 3.1% to total project cost.").

40. *See* O'Connor & Hurtado, *supra* note 36, at 4 ("One of the more highly touted aspects of BIM is its ability to make early detection of design conflicts among the base architectural designs, the consultants' auxiliary designs and contractors' design-build portions of the project, shop drawings and manufacturing data. Instead of light table overlay review of 2-D plan sets supplied by each party, the model adds contributed designs of structural engineers, contractors, and material manufacturers directly into its interlocking matrix and a *clash detection* program highlights each of the overlapping elements in conflict with each other (for example, identifying a structural beam and a plumbing pipe that have been designed by two different modelers to run through the same contiguous space).").

41. Consensus DOCS 301 BIM Addendum ¶ 5.1.

42. *Id.* ¶ 5.2.

43. *Id.* ¶ 5.4.

44. *Id.* ¶ 5.5.

45. *Id.* ¶ 5.7.

46. *See* Ashcraft, *supra* note 39, at 3 ("In *M.A. Mortenson Co., Inc. v. Timberline Software Corp*, 140 Wash. 2d 568 (2000), a contractor's bid was $1,950,000 too low because of a software error. In affirming the software vendor's motion for summary judgment, the Washington Supreme Court held that the software was incorporated into the purchase contract and that its limitation to the purchase price was valid and not unconscionable. Thus, if errors in BIM software cause economic loss to the user, the injured party has no realistic remedy. But the user's liability to other parties injured by the software error

is not similarly limited, causing a liability gap between the software vendor's limited liability warranty and the designer's responsibility to produce plans or other deliverables in accordance with the standard of care.").

47. *See* Lowe, *supra* note 9, at 46 ("What if there is a glitch in the 3D modeling software where the integration of individual models is still a relatively new technology? The project owner should bear the risk of those glitches, provided the participants are adhering to the protocol. After all, the owner hopes to benefit from the lower costs of 3D modeling.").

48. Consensus DOCS 301 BIM Addendum ¶ 5.8.

49. *See* Noble & Heart, *supra* note 30, at 16 ("Although construction contracts and subcontracts may refer to the intellectual property rights in the architect's drawings and specifications, they are usually silent with respect to copyright and licensing issues relating to the contractors' and subcontractors' own creative work product.").

50. *See* O'Connor & Hurtado, *supra* note 36, at 268–69 ("Some project owners, the United States General Services Administration being the most prominent, believe that BIM can greatly enhance facility management, and so, are contractually mandating that they own the completed model so they may use it for ongoing operation of the building through the end of its lifecycle and decommissioning. This is a significant departure from the current 2-D design paradigm where a designer owns the designs they separately create and licenses them to the project owner solely to construct one unique project.").

51. Consensus DOCS 301 BIM Addendum ¶ 6.1.

52. *Id.* ¶ 6.2.

53. *Id.* ¶ 6.4.

54. *Id.* ¶ 6.7.