

SHARED DESIGN

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CHAPTER 7

GENERAL CONSTRUCTION CONTRACTS WITH DELEGATED OR SHARED DESIGN

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§ 7.01 MORE THAN SHOP DRAWINGS

Shop drawings are intended to demonstrate how a contractor (and its sub-contractors) intends to meet the designer's detailed design. Traditionally, the closest a contractor came to designing anything on a design-bid-build project was to prepare shop drawings that showed how the contractor was to implement the designer's design. The roles were clear. The designer designed and the contractor built, following the designer's design.

This tradition has gradually morphed to now permit (if not encourage) contractors to design. Design is delegated to the contractor for those really hard parts of the design best left to those contractors regularly dealing with whatever that really hard part is. Curtainwalls, structural steel, and fire protection are most often held up to the examples of work best designed through contractors with specialized if not secret knowledge.

Delegated or shared design takes the significant step to make the contractor the designer by transferring the design obligation from the design team to the contractor. Sharing a design obligation with contractors is currently a popular, technologically driven phenomenon under scrutiny by the construction and design community.

There are problems with delegated design. One problem deals with whether there is an obligation to announce or warn that some part of the design is delegated. The decision to delegate or share design most often is made by the designer. The designer delegates design to contractors through the specifications. It is the specifications of a particular system that require a contractor to prepare part of the design. Often, the design obligation in the specifications is not readily apparent even to contractors that specialize in the work. The contractor may not want a design obligation and avoid bidding a project with a design obligation. If the delegation is subtly made, a contractor that doesn't want to design may end up with the design responsibility and liability. Once the obligation is delegated, courts do not evaluate the merit of the delegation if challenged. Courts will generally enforce contracts and any delegated design liability that the contract includes.

Consider *Travelers Indemnity Co. v. Zeff Design*.¹ A contractor's all-risk insurance company brought a subrogation action against an engineering firm based on the settlement of a wall. The insurer's claims against the engineering firm included professional malpractice, breach of contract, and misrepresentation. The trial court dismissed the insurer's complaint against the engineering firm because the engineering firm had no obligations in regard to the wall's underpinning. The engineering firm was not contractually obligated to perform any design services connected with the installation of underpinning, shoring, or other stability measures. Notations on the engineering firm's drawings and specifications indicated that all underpinning or shoring would be the contractor's responsibility,

¹ 60 A.D.3d 453, 875 N.Y.S.2d 456 (1st Dep't 2009).

that the contractor was supposed to retain a licensed professional engineer to provide necessary designs and inspections, and that the contractor was required to take all precautions necessary to prevent damage and settlement of existing or new construction. Although the engineering firm filed a technical report, stating that it would inspect the shoring, structural stability, and concrete, the engineering firm did so only to expedite receiving a construction work permit. The settling of the wall happened only after there was a deviation from the engineering firm's instructions. There was no record of negligence on the engineering firm's part. The insurer's other claims against the engineering firm were based on the same allegations of professional malpractice and thus could also not be sustained.

Another problem concerns whether the owner knows that its designer has delegated part of its design obligation to the contractor. Delegating or sharing design should be transparent to not only the contractor, but also the owner. The AIA's standard form B-101 owner-architect contract gives the design obligation to the architect. The architect owns the design under B-101 ("the instruments of service"). It is the architect that prepares the specifications. AIA's form B-101 defines specifications prepared during the design development phase as identifying "major materials and systems" and establishing "in general their quality levels."² When in the construction documents phase, AIA defines the specifications as "setting forth in detail the quality levels of materials and systems and other requirements for construction of the Work."³ Nothing in the AIA's owner-architect form contract suggests, infers, or implies that some part of the design will be delegated to the contractor in the specifications.

However, if a part of the designer's design obligation is delegated, it is generally done in the specifications and as a result requires the architect to purposefully act to insert the delegation into the specifications.

If the architect does delegate some part of its design obligation, it modifies the AIA's standard form. An architect that delegates must ask for a modification. The AIA form B101 requires "a written instrument signed by both Owner and Architect" for an amendment to the architect's agreement.⁴ For the architect to delegate some of its design obligations, appears to require a written modification announcing such. The owner is the party with the the option to permit or refuse design delegation. How many written modifications to the owner-architect agreement memorialize the architect's delegation of design to a contractor?

§ 7.02 DESIGN SERVICES PROVIDED BY THE CONTRACTOR

[A] Identified Within the Construction Contract

As many as ten years ago, it became well settled that contractors could assume some parts of the design obligation for construction of a project. Indeed,

² At B101-2007 3.3.1.

³ B101-2007 3.4.1.

⁴ B101-2007 13.1.

years ago the American Institute of Architects (AIA) developed certain contract documents that shift some of the design responsibility from the professional design team onto the contractor. The AIA documents have been widely used in the industry by contractors for years.

More recently, however, contractors have also begun encouraging use of contract documents called ConsensusDOCS, which were developed in 2007 principally by the Associated General Contractors (AGC), previously titled the "AGC Documents."⁵ In helping to create ConsensusDOCS, the AGC endeavored "to create documents that best place the [p]arties to construction contracts in a position to complete the project on time and on budget with the highest possibility of avoiding claims." As the name "ConsensusDOCS" implies, the AGC advertises its form agreements as drafted "jointly with representatives of [o]wners, [c]ontractors, [s]ubcontractors and [s]urety professionals," resulting in contracts that are "the most balanced and widely endorsed contracts in the industry."

Like the AIA form agreements, the ConsensusDOCS contain a few, limited provisions that address delegated design, and essentially no provisions that address shared design. These provisions are found primarily in section 3.15 of ConsensusDOCS 200, the form owner/contractor agreement, and section 3.2 of ConsensusDOCS 240, the form owner/architect agreement. There are a few, noteworthy differences between the AIA and ConsensusDOCS form agreements:

1. The ConsensusDOCS limit the type of design services that may be delegated to the contractor;
2. The terms of the ConsensusDOCS design delegation provisions de-emphasize the design nature of the services being delegated;
3. The ConsensusDOCS impose a greater, overall coordination duty on the architect;
4. The ConsensusDOCS impose a greater duty on the architect to review with respect to delegated design; and
5. The ConsensusDOCS include an express provision which requires the owner and architect to detail those design services being delegated to the owner and contractor.
6. The ConsensusDOCS include several cross-indemnity provisions that are not included in the AIA form agreements.

The latter provision in section 3.15, which requires the owner to specify performance and design criteria for those professional services "specifically called for by the Contract Documents," does not increase the types of design services that can be delegated to the contractor, but instead refers to those professional

⁵ The AGC BIM forum included representatives from the design community, owners, suppliers, fabricators, subcontractors, general contractors, sureties, insurers, the National Institute of Building Sciences, and construction lawyers.

services that relate to the project's construction means, methods, techniques, sequences and procedures (the "means and methods"). Accordingly, if the parties intend for the contractor to perform design services and to extend beyond construction means and methods, then they must expressly modify the form ConsensusDOCS to reflect such intent.

In contrast to the AIA Owner/Contract Agreement, ConsensusDOCS 200 limits purported design delegation to only those services that relate to the means and methods. Moreover, this first sentence requires that this delegation be "specifically called for by the Contract Documents." The provisions of the ConsensusDOCS and AIA documents, from a delegated design prospective, will be addressed and compared throughout this chapter.

[1] Design Delegation in the Specifications

In the delegated design, the determination of a specification as design or performance is critical because the architect's use of performance specifications in the drawings effectively shifts design responsibility to the contractor for at least that portion of the project's design work. Accordingly, the classification of a specification as design or performance can ultimately determine the allocation of responsibility and liability for design duties and defects.

For example, in *Connor Brothers Construction Co. v. United States*,⁶ the contractor-plaintiff argued that the design drawings were defective because they failed to include details for attaching a portion of the work to the HVAC system, which would make the system operational. The court disagreed, holding that the terms of the contract documents which were silent as to the details of how to connect a portion of the work to the HVAC system were, in fact, performance specifications, as opposed to design specifications. Accordingly, the court held that the contractor had the responsibility to design and complete the attachment of its work to the HVAC system. In reaching this conclusion, the court considered the construction contract as a whole to determine the scope of the contractor's duties, and found it significant that the contractor had contracted to construct a fully operational HVAC system. The court concluded that the lack of detailed information in the drawings merely afforded the contractor with the discretion as to how to complete the HVAC work, but did not constitute a design defect.

The *Connor* case is a clear example of how disputes about design scope or responsibility may arise when parties to a construction contract rely on drawings and specifications to effectively delegate design responsibility, without requiring more explicit and obvious contract provisions to that effect. AIA A201 (1997) includes a reference to section 3.12.10, relating to design services provided by contractors. AIA A201 (1997) and the 2007 version article 3.12.10 states that if professional design services or certifications by a design professional related to systems, material or equipment are specially required of the contractor by the

⁶ 65 Fed. Cl. 657 (2005).

contract documents, the owner and the architect will *specify* all performance and design criteria. Further, 3.12.10 requires that such services be provided by a properly licensed design professional whose signature and seal shall appear on all drawings, calculations, specifications, certifications, shop drawings and other submittals prepared by that professional. Note that the AIA A201 indicates that any portion of the design that is to be shared with or delegated to the contractor, be identified in the specifications.

The language in that provision suggests that any professional design services required to be supplied by the contractor should be identified specifically within the contract documents. If the construction contract at issue in *Conner* had included more explicit design delegation provisions, as contemplated by article 3.12.10 of the AIA 201 (1997), then the contractor's role and duties would have been more clear, most likely obviating the need for the contractor to bring suit on a claim that the drawings were defective for failure to include the design specifications.

The guidelines in 3.12.10 of the AIA 1997 General Conditions also underscore the importance of ascertaining before bidding which specifications are design and which are performance-based to identify how each contracting party will bear the risk of design defects and constructability.⁷

[2] Delegated Design Called-Out

In contrast, the 2007 ConsensusDOCS 200 Standard Agreement and General Conditions Between Owner and Contractor, contemplate that the contractor has no responsibility for design and data:

1. Prior to commencing the Work, the Contractor shall examine and compare the drawings and specifications with information furnished by the Owner. . . . ;
2. If in the course of the performance of the obligations . . . the Contractor discovers any errors, omissions or inconsistencies in the Contract Documents, the Contractor shall promptly report them to the Owner. It is recognized, however, that the Contractor is not acting in the capacity of a licensed design professional, and that the Contractor's examination is to facilitate inconsistencies or to ascertain compliance with applicable laws, building codes or regulations; and
3. The Contractor shall have no liability for errors, omissions or inconsistencies discovered . . . unless the Contractor knowingly fails to report a recognized problem to the owner.

Article 3.12.10 of AIA A201 and article 3.6.4.2 and 3.6.4.3 of AIA B101 place affirmative duties on the architect to design and to review certain aspects of

⁷ Laura A. Hauser & William J. Tinsley, Jr., *Eyes Wide Open: Contractors Must Learn to Identify and React to Design Risks Assumed Under Performance Specifications*, 27 *Con. Law* 32, at 32 (No. 3, Summer 2007).

the design work delegated to the contractor. Again, the architect's duties in this regard are very limited and, arguably, serve to create liability protection only for the architect. Article 3.12.10 of AIA A201 states that (i) the architect and owner remain responsible for specifying all performance and design criteria for design services related to systems, materials or equipment that have been delegated to the contractor, and (ii) that the architect will review, approve or take other appropriate action on submittals only for the limited purpose of checking for conformance with the information provided and the design concept expressed in the contract documents. These articles omit a number of critical issues with respect to the architect's affirmative duties for the delegated design.

First, nothing in the AIA documents defines the level of specificity or detail the architect must provide where the architect is required to specify design and performance criteria for the contractor. While the last sentence of article 3.12.10 of AIA A201 states that the contractor shall not be responsible for the adequacy of the performance and design specifications, the contractor is still required to perform its design services in accordance with such specifications. An obvious risk to the owner is that the contractor may have based its contract price to complete the work on specifications that are not adequately defined, and accordingly the contractor may have inadvertently failed to account for certain additional costs in its bid to the owner.

Another key difference between the AIA form contracts and the ConsensusDOCS is that the ConsensusDOCS confer a greater duty on the project architect to integrate its services with those of the other project design professionals. The ConsensusDOCS coordination provision is found in section 3.2.6 of ConsensusDOCS 240, and requires the project architect to "coordinate the services of all design consultants for the Project." Clearly, this coordination duty is applicable to both shared and delegated design services. This provision includes a blank field which calls for the owner and project architect to specify the other project design professionals whose services the architect must coordinate. In contrast to the ConsensusDOCS coordination provision, AIA B101 merely provides that the architect shall coordinate "its services" with those provided by the "Owner and the Owner's consultants." The architect's coordination duty in section 3.1.2 of AIA B101 does not extend to the design services provided by the contractor's retained design professionals.

Section 3.2 of ConsensusDOCS 240 and section 2.3 of ConsensusDOCS 200 include provisions requiring the parties to identify in the agreement or in a separate exhibit "those portions of the Project design" to be completed by the owner and contractor. AIA B101 does not contain such a provision.

The ConsensusDOCS Addendum makes clear that "[n]othing in this Addendum shall relieve the Architect/Engineer from its obligation, nor diminish the role of the Architect/Engineer, as the person responsible for and in charge of the design of the Project." Further, the Addendum provides that "[n]othing in this Addendum shall diminish the extent to which, under applicable law, the Owner warrants to any [p]arty the adequacy and/or sufficiency of the design."

If the contractor has little or no design expertise and merely arranges for specialty design services to be provided by specialty trades, then the contract with the owner should reflect that limited role. Among other things, this means the general contract should state clearly whether the contractor's customary warranty and the customary indemnity covering the contractor's performance include the design services embedded in the specialty design features.

[3] Electronic Data

The AIA's 2007 version of its A201 general conditions form included a reference to electronic transmission of data offered in a Digital Data Protocol Exhibit, identified as AIA Document E201-2007. Another new AIA form, C106-2007, provided a warranty that the data conveyed is complete, suitable, or worthy of reliance. E201-2007 takes precedence over the terms of the agreement with which it is used. But E201-2007 is a two-party agreement and the transmitting and receiving parties may not be, and in fact are likely not to be, the same parties as the parties to the main contract.

The AIA documents do not address a collaborative process in which various members of the design and construction team contribute to and modify the database. This limitation is primarily due to the AIA documents' focus on two-party communication, as most clearly exemplified by the Licensing Agreement's basic structure as an agreement between a single transmitting party and a single receiving party. Also, the reliance by the Protocol Exhibits on licensing provisions contained in the underlying contract is misplaced in a BIM project, where significant contributions to the BIM database will be made by contractors and subcontractors. 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.

The liability provisions of the AIA documents do not go beyond the technical aspects of the file formats and software and do not address the larger risk management issues posed by collaborative participation in a BIM database. And while the AIA documents seek to put to rest the "paper versus digital" duality, they do not deal with the possibility of inconsistencies between various digital files. In summary, the AIA documents can serve as a starting point for documenting the rules of the game for BIM collaboration, but they do not go very far in addressing the issues posed by this emerging technology.

With respect to BIM collaboration, two additional contract documents are often necessary. The first is a truly BIM-focused data exchange agreement. The second is a full project design and construction contract form that not only provides for collaborative information sharing and work flow, but also addresses the larger commercial risk management challenges of BIM-enabled integrated project delivery.

[4] Shop Drawing Still Required

Both the AIA and Consensus 2007 form contracts have included provisions that take a step toward sharing design obligations with contractors. Both groups, however, have provided a strong signal of their uncertainty as to just how much of an impact shared design will have on construction and design relationships. Both groups of standard forms continue to include a shop drawing protocol, albeit revised from earlier versions of their shop drawing clauses.

The 2007 version of the standard American Institute of Architects Owner-Architect agreement continues to require the designer to review and approve or take other appropriate action upon the contractor's shop drawing submittals, product data and samples, but only for the limited purpose of checking for conformance with information given and the design concept expressed in the contract documents.⁸ The main difference is found in the 2007 edition of AIA B201, which divides subparagraph 2.6.4.1 of the 1997 edition into two subparagraphs, 2.6.4.1 and 2.6.4.2.

Subparagraph 2.6.4.2 provides that the architect's review or other actions are only for the limited purpose of checking for conformance with information given and the design concept expressed in the contract documents. Subparagraph 2.6.4.2 does not, however, provide that the architect's review includes a determination of the accuracy and completeness of dimensions, quantities, and installation or performance of equipment or systems, which remain the contractor's responsibility. Likewise, the architect's review does not constitute approval of any construction means or methods.⁹

These provisions were intended to protect the architect from being legally responsible for omissions or errors contained in the shop drawings and other submittals. The American Institute of Architects Document A201-2007 states the contractor shall not be relieved of responsibility for deviations from requirements of the contract documents by the architect's approval of shop drawings unless the contractor has specifically informed the architect in writing of such deviation at the time of submittal and (1) the architect has given written approval to the specific deviation as a minor change in the work, or (2) a change order or construction change directive has been issued authorizing the deviation.¹⁰ This procedure eliminates disputes arising out of deviations from contract documents that are nonetheless in compliance with the shop drawings, and further illustrates the superiority of contract documents and the design reflected therein to shop drawings, as well the exclusion of shop drawings from the set of contract documents.

⁸ AIA Document B201-2007, subparagraph 2.6.4.2 [former ¶ 2.6.4.1 (1997 ed.), former ¶ 2.6.12 (1987 ed.), former ¶ 1.5.13 (1977 ed.)] and AIA Document A201-2007, subparagraph 4.2.7 [former ¶ 4.2.7 (1997 ed.), former ¶ 4.2.7 (1987 ed.)].

⁹ AIA Document B201-2007, subparagraph 2.6.4.2 [former AIA Document B141 ¶ 2.6.4.1 (1997 ed.)].

¹⁰ AIA Document A201-2007, General Conditions of the Contract for Construction, subparagraph 3.12.8 [former ¶ 3.12.8 (1997 ed.)].

[B] Performance by Licensed Professionals

Contractors also must carefully consider whether any special licensing requirements apply when adding design elements to an otherwise traditional construction project. Licensing requirements vary among jurisdictions in the manner in which they apply to firms that serve both design and construction functions for a project. While licensing laws in most jurisdictions provide that only licensed professionals are permitted to engage in the “practice” of engineering or architecture, most allow design-build operations either expressly or implicitly so long as all design services are provided by or under the supervision and control of properly licensed professionals.¹¹ Contractors who enter into contracts that require trade contractors to supply specialty designs must determine whether the inclusion of what amounts to design-build responsibility within the scope of the prime contract creates licensing or other regulatory issues not involved in a traditional design-bid-build project.

Article 3.12.10 of AIA A201 includes a provision that the contractor is not required to provide professional services in violation of applicable law (the “state law carve-out”). Accordingly, if local or state law provides that a specific design service must be undertaken by a licensed professional architect or engineer of record, by the terms of article 3.12.10, any purported delegation of the specific design service is void. Several states have passed laws that govern and restrict the design professional’s attempts to delegate certain design duties to the contractor; article 3.12.10 of AIA A201 is a response to such state regulation. While the purpose of AIA’s state law carve-out may be well intended, article 3.12.10 does not adequately address the potential ambiguities that may arise when a state’s laws potentially conflict with a purported delegation of design duties.

For example, the New York State Board of Regents revised section 29 in its rules on unprofessional conduct to limit the circumstances under which a project design professional may delegate portions of the project’s design to another design professional through an unlicensed intermediary (in this case, the general contractor). Specifically, the revised rule permits the primary design team to delegate only those design services that are “ancillary to the main components of the project.” The New York rule also requires that the delegating primary design team “review and approve the design as meeting the design parameters that were specified and ensure that the designed element can be integrated into the overall project.”

Regardless of these state law protections, contractors cannot usually self-perform the type of design services provided by licensed design professionals. Accordingly, industry form contracts anticipate that the contractor will retain

¹¹ Allocating Design Responsibility, at 602 (citing State-By-State Guide to Architect, Engineer, and Contractor Licensing (Stephen G. Walker et al. eds., 1999) (summarizing specific design-build licensing requirements that apply from jurisdiction to jurisdiction).

third-party design professionals to perform such work. Before assigning responsibility to the contractor for professional or design services, the parties must satisfy themselves that the construction contract does not delegate professional services directly to the contractor; but, rather, imposes the requirement on the contractor to obtain the services of a professionally licensed third party. A contract that ignores this obligation may be void and unenforceable.¹²

Design delegation also creates issues with licensing and what is commonly referred to in the industry as “responsible charge.” In all jurisdictions, the design professionals of record must be in “responsible charge” of the design. Shared design like BIM, especially when based on object technologies, can contain embedded information provided by manufacturers and subcontractors. In addition, some BIM software can react to changes in the model. Structural design software, for example, can change details in response to changes in the design. Design and detailing software includes commands that conform structural design to construction regulations, such as building codes. Moreover, such software often contains the specialized knowledge of engineering principles beyond what a lay person typically understands. In most instances, BIM design software is used by licensed professionals, rather than a lay individual. Typically, however, it is not reasonable to assume that the architect or engineer of record created the information or even checked the information for accuracy before incorporating it into the model.¹³ Contractors face the same challenges: Subcontractors or suppliers may change the model without the knowledge or consent of the contractor, or the contractor’s specialty designer or design consultant.

Responsible charge is generally met by either performing the work or having the work performed under the supervision of a licensed design professional. However, work performed automatically by the software has clearly not been “supervised” by a licensed architect or engineer of record. Moreover, the software or embedded object is probably not prepared by an appropriately licensed professional. Thus, design work provided by a contractor (or subcontractor, as the case may be) and embedded in the BIM may, or may not, have been prepared, reviewed or approved by a licensed professional.¹⁴

[C] Protection from Design Risk

Building contractors typically are well-equipped at managing construction risks, such as estimating, controlling labor and material costs, scheduling and

¹² Laura A. Hauser & William J. Tinsley, Jr., *Eyes Wide Open: Contractors Must Learn to Identify and React to Design Risks Assumed Under Performance Specifications*, 27 *Con. Law.* 32, at 33 (No. 3, Summer 2007).

¹³ Howard W. Ashcraft, *Building Information Modeling: A Framework for Collaboration*, 28 *Con. Law.* 5, at 10 (No. 3, Summer 2008) [hereinafter *A Framework for Collaboration*].

¹⁴ *A Framework for Collaboration*, *supra* note 14, at 11.

coordinating the work of separate trades, manufacturers, and suppliers, and controlling the quality of workmanship.¹⁵ By trade and experience, contractors are also typically well-equipped at evaluating those risks and establishing prices based on the nature and extent of the construction risks they assume by contract.¹⁶ However, oftentimes contractors fail to appreciate the additional risks they assume when owners and their design firms provide for specialty designs to be furnished through subcontractors or suppliers.¹⁷ Contractors who embark upon a construction project with design elements should not passively accept whatever design responsibility owners and their design firms wish to impose upon them and their subcontractors.¹⁸ If the contractor is able to negotiate its contract, perhaps one of the least costly and best ways a contractor can ensure protection against design liabilities is through the drafting of a variety of specific contractual provisions.

The construction contract should clearly set out the contractor's duties and responsibilities when the scope of work under the construction contract includes design services. The construction contract should also spell out the additional costs and risks involved in arranging, monitoring, and administering specialty design subcontracts. Such provisions will assist the contractor in managing the additional liability and cost risks it assumes in the role of designer, and will better protect the contractor from those risks.

The contractor should also be mindful of taking the risks of offering design services into account when submitting bids or proposals and when soliciting proposals from the specialty trades that will provide the specialty design services. For example, contractors should negotiate with owners for express design liability limits in projects in which they merely arrange for the specialty design services as an accommodation to the owner and the owner's design team, as opposed to providing such design services. Contractors should also consider seeking indemnification and insurance protections from the specialty trades and specialty designers directly involved with the specialty design process. Because contractor's cannot always negotiate additional or modified terms to its contracts with the owner, the contractor's standard form subcontracts may be amended to require indemnification and appropriate professional liability insurance if the subcontractor must provide design services. Because design delegated in specifications can be difficult to identify, even for specialty subcontractors, it is better to have indemnification and insurance imbedded in the subcontract rather than rely on the ability to spot

¹⁵ Carl J. Circo, *Contract Theory and Contract Practice: Allocating Design Responsibility in The Construction Industry*, 58 Fla. L. Rev. 561, 602 (July, 2006) (citing Philip Lane Braner & Patrick J. O'Conner, Bruner & O'Conner on Construction Law, §§ 7:23-:24, 7:26, 7:29, 7:81-:88, 7:163-:170, 7:189-:194, & 7:225-:227 (2002)).

¹⁶ *Allocating Design Responsibility*, *supra* note 16, at 602 (citing Alan B. Storer, *Construction and Design Contracts*, Construction Law § 3.01[2][d] (Steven G.M. Stein ed. 2005)).

¹⁷ *Allocating Design Responsibility*, *supra* note 16, at 602 (citing Carrie Okizaki, *Design Delegation*, in *The Construction Contracts Book* 285-289 (Daniel S. Brennan et al. eds., 2004)).

¹⁸ Carl J. Circo, *Contract Theory and Contract Practice: Allocating Design Responsibility in The Construction Industry*, 58 Fla. L. Rev. 561, 602 (July, 2006) (citing *Gen. Bldg. Contractors of N.Y. State, Inc. v. N.Y. State Educ. Dep't*, 670 N.Y.S.2d 697, at 698 (Sup. Ct. 1997)).

delegated design and then initiate these steps for the contractor's protection. Such provisions may lead to increased subcontract costs; however, the contractor should pass those costs through to the owner in its bid or price proposal.¹⁹

To the extent that they assume design liability, contractors should also attempt to secure professional liability insurance, and pass those costs through to the owner as well. Without question, any contractor that assumes design responsibility should make sure that its insurance agent is well-informed of the contractor's design scope of work and increased responsibility for the design aspects of the project.

The construction contract also should resolve whether and to what extent the owner will have contract rights against the specialty designers. Negotiations on these points seem likely to lead to provisions that give the contractor significant protection against liability for design defects in exchange for the requirement that the contractor must secure for the owner or other intended users or owners of the project express third-party beneficiary status in all specialty design agreements.

Typically, a contractor expects the lawyer negotiating on its behalf to demand contractual terms that limit or disclaim design liability. However, it is important to remember that the contractor is not serving as a design-build contractor, presumably has no expertise in specialty design, and is not well positioned to control those design risks. The contractor is merely better positioned than any of the other participants in the construction process to arrange for the specialized design and to coordinate its installation because of the contractor's working relationships with the trade subcontractors. The contractor also has more experience and administrative capability and contractual authority to coordinate the work and schedules of the different trades. As such, the contractor should resist accepting contractual liability for design risk, and some should be even less willing to warrant against design defects.

If the contractor receives a premium for assuming design risk in addition to a typical general contractor's fee, then limiting its design liability may not be appropriate or even necessary. Even in those cases, however, the contractor may be reluctant to provide to the owner with a warranty against design defects and errors if the contractor assumes liability for design matters solely based on the traditional professional standard of care. The contractor is even less likely to agree to assume any responsibility for specialty design if such design is provided by another consultant retained by a third party.²⁰

§ 7.03 GENERAL CONSTRUCTION CONTRACTS AND 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.

¹⁹ *Allocating Design Responsibility*, *supra* note 16, at 602.

²⁰ *Allocating Design Responsibility*, *supra* note 16, at 603.

If BIM somehow can successfully be molded into a variation of the design-bid-build format, the architect likely will remain a significant player. If 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.²¹

With only a non-BIM contract, a contractor brought into the project after the owner-designer contract has been signed must either persuade the project owner to modify the owner-designer contract to reflect basic BIM obligations and practices or negotiated a separate agreement with the designer for the BIM. For example, the ConsensusDOCS 301 BIM Addendum is best utilized when project participants have reached a common understanding that BIM is intended to be used and to commit to exchange the information necessary to execute BIM effectively and efficiently.²²

Assuming the owner will incorporate BIM provisions into the parties' contracts, the contractor likely would require the architect and its consultants to make copies of digital model files available to the contractor for building area and volume computations; determination of quantity of components; volumes of materials or assemblies necessary for completion of the work; clash detection; and, determination of construction sequencing and logistics. The contractor also might request that the design models be consistent with the hard-copy plans and specifications and that the contractor be entitled to rely on the information in the digital model.²³

If the contractor cannot persuade the owner to modify the contracts to accomplish BIM, the contractor still may persuade the designer that it is in the best interest of the project that BIM practices be employed. In such circumstances, negotiation likely will lead to the designer and the contractor agreeing that the contractor will receive design models, with the explicit understanding that the design models are not construction documents or contract documents; the design models are to be used for coordination purposes only. Further, the parties would likely have to agree that the designer is making no representation as to accuracy in the design models. The contractor then will enter into similar agreements with its subcontractors.²⁴

BIM has advantages to general contractors, but currently presents problems to smaller subcontractors. For large contractors, BIM is the norm for how they create estimates, track projects, and calculate costs. For smaller subcontractors who do not use BIM, however, they will most likely not be able to bid on larger projects that utilize BIM. Although BIM vendors sell "read-only" licenses that allow smaller contractors to open and view models produced by the principal players, the licenses are costly and do not support model design or editing.

²¹ Timothy M. O'Brien, *Successfully Navigating Your Way Through The Electronically Managed Project*, 28 Con. Law. 25, at 26 (No. 3, Summer 2008) [hereinafter *The Electronically Managed Project*].

²² Lowe & Muncey, at 19.

²³ *The Electronically Managed Project*, *supra* note 22, at 29.

²⁴ *The Electronically Managed Project*, *supra* note 22, at 29.

Smaller contractors get access without manipulation, forcing them to map changes separately or estimate manually, which drives up costs and the potential for human error.²⁵

[A] BIM and the Owner's Design Warranty

[1] The *Spearin* Doctrine

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. This fear arises naturally from the degree of collaboration it requires among owners, designers, contractors, and suppliers. Enabled by BIM, does the increased collaboration among designers, contractors, and suppliers—much of which can occur during the design phase—deprive the contractor of protection from responsibility for design error under the *Spearin* doctrine?²⁶

BIM may diminish an implementing contractor's ability to invoke the defense of inaccurate or inadequate plans and specifications in a claim by the owner. Implementing BIM may also reduce the contractor's ability to recover from the owner for damages it sustains as a consequence of inadequate design. Both potential consequences merit a more detailed review of the *Spearin* doctrine.²⁷

In *United States v. Spearin*,²⁸ the plaintiff-contractor challenged the government's annulment of a contract for the construction of a dry dock at the Brooklyn Navy Yard. More specifically, the government prepared the plans and specifications and provided them to the contractor for the construction of the project. The plans showed a six-foot brick sewer running through the site. To properly prepare the dry dock for excavation, the sewer line needed to be diverted. The contractor diverted and relocated the sewer, and its work was accepted by the government. One year after the sewer line was relocated, a heavy rain broke the sewer and flooded the dry dock during the course of construction.

The owner and *Spearin* were both unaware of the fact that the sewer had a dam in one area that significantly restricted water flow. This blockage caused pressure to build, and ultimately caused the sewer to fail. The contractor refused to continue work unless the government took responsibility for the damage and remedied the sewer's defects to allow for a safe work condition. The government refused, claiming the contractor was responsible for repairing the damage and addressing the safe working condition issues. The contractor sued.

²⁵ Michael Gillum, *The Race for BIM*, *Modern Contractor Solutions*, 48 (Mar. 2008).

²⁶ Dwight A. Larson & Kate A. Golden, *Construction Law: Entering the Brave, New World: an Introduction to Contracting for Building Information Modeling*, 34 *Wm. Mitchell L. Rev.* 75, 83 (2007) [hereinafter *Entering the Brave, New World*].

²⁷ *The Electronically Managed Project* at 31.

²⁸ 248 U.S. 132 (1918).

The Supreme Court recognized that in a contract to perform a specific task, the performing party is neither relieved of its contractual responsibility, nor entitled to additional payment when unforeseen circumstances interfere with performance. This concept applies in the construction industry when a construction contract requires a contractor to produce a specific result without specifying the particular method or means of achieving that result. Under the traditional method of construction, the parties have contracted for a final product, and the contractor is free to choose the means and methods to achieve that goal. The *Spearin* Court, however, created an exception to this general rule in those cases where a contractor is provided with the design specifications. According to *Spearin*, a contractor is absolved of responsibility for the consequences of defects in plans and specifications if the construction agreement requires the contractor to build according to the plans and specifications and the contractor does so. The distinction recognized in *Spearin* is that of an owner requiring a contractor to follow design, as opposed to performance, specifications.

Unlike performance specifications, where the contractor controls how to accomplish a particular task, when a construction contract contains design specifications the contractor is bound to build according to plans and specifications prepared by the owner. The contractor will not be responsible for the consequences of defects in the plans and specifications. The specifications within *Spearin*'s contract contained the dimensions, character, and location of the sewer, which implied a warranty that if the specifications were complied with, the sewer would be adequate. Notably, *Spearin*'s contract also contained general clauses requiring *Spearin* to examine the site, review plans, and assume responsibility for the site from completion to acceptance. However, the Court held that such clauses did not impose an obligation upon the contractor to employ extraordinary measures to determine the adequacy of the site, and it did not change the Court's ultimate decision that the owner, and not the contractor, was responsible for the design aspects of the dry dock project.

Although *Spearin* was decided in 1918, its principals apply to users of BIM, a highly advanced computer technology, some 90 years later. Indeed, it is likely that the *Spearin* doctrine might be invoked in BIM when the information provided to the design-builder by the owner, and upon which the design-builder has founded its design, was defective. Certainly, if design information provided to the contractor in a digital model turns out to be inaccurate, the contractor should have a corresponding *Spearin* doctrine defense, as well as a remedy in the event of design deficiencies. A trier of fact likely would scrutinize whether the project owner was obligated to warrant such specific aspects of design.²⁹

However, implementing BIM methodology anticipates full participation by the contractor in reviewing the design model early in the design process. So, BIM participation by the contractor could well lead to timely preconstruction discovery and correction of certain design errors, which will avoid any need for the protections afforded by *Spearin*. Nevertheless, some design errors in certain

²⁹ *The Electronically Managed Project*, at 31.

circumstances will not be detected. In such cases, the contractor's right to invoke the *Spearin* doctrine may turn on whether the error is patent or latent. More specifically, the warranty of design does not apply to patent errors that are not brought to the owner's attention before the contract is executed. Of course, any contribution to design at any phase should not preclude resort to the *Spearin* doctrine as regards other, unrelated areas of design.³⁰

While it is natural to focus on whether the contractor's right to recover from the owner for defective plans and specifications will be undermined by the contractor's participation in BIM, BIM may lead to even greater rights on the part of the contractor to recover from the designer for design errors. Recently, courts have allowed contractors to claim against the designer that they are a third-party intended beneficiaries of the design information, and, therefore have an absolute right to rely on its accuracy.³¹ As long as the parties' roles are appropriately defined by the contract documents and appropriate control is exercised over the collaborative process, the contractor's right to claim third-party beneficiary status will likely be restricted. However, BIM's application and potential impact on the debate between owners and contractors over responsibility for the adequacy of design is a legal issue that must be addressed in the contract documents.

The *Spearin* doctrine can easily extend beyond specifying the location of a sewer to a BIM situation where an owner provides a contractor with a data-rich, intelligent model that is basically a virtual duplicate of the finished building. Again, the construction contract is the best place to identify and address the risks associated with BIM modeling. It may not be as easy to address the risks and costs associated with BIM as it is to address the risks typically associated with traditional delegated design issues. In fact, in a fully integrated BIM project, collaboration means that a contractor is rarely given design specifications in the same manner as *Spearin* was given a detailed design for the sewer. With the advent of BIM, the contractor's shop drawings have the ability to influence the owner or architect's design. In a sense, the BIM collaborative approach allows for a hybrid of design and performance specifications whereby each party shares its knowledge—both in the practicalities of achieving particular performance goals and in how that information should be incorporated into the final design. It is not clear how the *Spearin* doctrine will apply in this situation, but the parties to a construction contract should resist letting common law fill in these gaps. The construction contract should clearly define each party's particular scope of work and to what extent others are entitled to rely on the digital representation of that scope of work when it takes the form of a BIM model.

Other problems may also arise when BIM is not fully utilized throughout the project. For example, consider what might happen when a contractor takes an architect's 2D drawings and causes them to be transformed into a workable 3D BIM model. If defects are ultimately discovered in the BIM model, without clear provisions in the contract documents, it is uncertain how liability will be assessed

³⁰ *The Electronically Managed Project*, at 31-32.

³¹ *The Electronically Managed Project*, at 32.

or allocated. Ultimately, the manner in which liability is assessed or allocated may depend on whether the defect is in the drawings, the model, or both. Even if a project is required to be undertaken in BIM, parties should be aware that various members of the project team may be using a limited implementation of BIM technology.

Although though the parties will want to contractually allocate risk and avoid relying upon traditional common law doctrines to allocate liability for new technologies, it is important to understand that state laws vary in determining who is responsible for defects in performance and design specifications. Some states, like Texas for example, have consistently rejected the *Spearin* doctrine under the guise that an owner is typically in no better position than a contractor to discover defects; and absent express or implied contract language shifting the risk for such defects to the owner, the owner is not liable for the same.

In those cases where the contractor contributes to the project's design, the owner's implied warranty may not exist.³² For example, in *Austin Co. v. United States*, a contractor agreed to design, manufacture, test, and deliver an innovative, novel digital data recording system. The contract already contained some detailed specifications as to the method of construction the system, but the contractor determined that the contract would be impossible to perform using those specifications. The contractor modified the design, but still was unable to successfully execute the contract, and claimed impossibility of performance. The court rejected the contractor's impossibility of performance defense, finding that because the contractor had integrated its own design into that of the original contract, the contractor warranted its ability to successfully perform those substituted specifications. Using this same rationale, a contractor's active participation in the design process via BIM modeling could arguably shift the impact of damages related to design defects from the owner to the contractor.³³

Although there are no cases specifically addressing how the owner's implied warranties recognized in *Spearin* are affected by BIM collaboration, it seems clear from analogous cases that extensive contractor and subcontractor involvement may sharply curtail an owner's implied warranties.³⁴ Significantly, however, the ConsensusDOCS Addendum provides that "[n]othing in this Addendum shall diminish the extent to which, under applicable law, the Owner warrants to any Party the adequacy and/or sufficiency of the design."

Whether the *Spearin* doctrine will remain viable in the BIM future will depend upon whether BIM will evolve to accelerate the migration to design-build as the procurement method of choice. If it does, then the need for the contractor to rely on the *Spearin* doctrine will likely diminish.³⁵

³² *A Framework for Collaboration*, *supra* note 14, at 14 (citing *Blake Constr. Co. v. United States*, 987 F.2d 743, 746 (Fed. Cir. 1993)); *Austin Co. v. United States*, 314 F.2d 518, 519 (Ct. Cl. 1963); *T. L. James & Co. v. Traylor Bros.*, 294 F.3d 743, 751 (5th Cir. 2002); *Martin K. Eby v. Jacksonville Transp. Auth.*, 436 F. Supp. 2d 1276, at 1310 (2005), *aff'd*, 178 Fed. Appx. 894 (2006).

³³ *A Framework for Collaboration*, at 14.

³⁴ *A Framework for Collaboration*, at 14.

³⁵ *The Electronically Managed Project*, at 31.

[2] Maintaining Traditional Design Allocation

Design liability can transfer to the contractor through careless design evaluation or value engineering. Construction liability can transfer to designers through careless shop drawing processes, and liability can transfer in either direction through careless RFI and change order processes. The increased collaboration enabled by BIM increases the potential for such unintended liability transfers.³⁶ It is possible that the administrative change order process will be forgotten after changes are agreed to while peering over a computer monitor. It is likewise possible that 2D model print-outs that might be attached to paper change orders could lack relevant information contained in the models over which the changes were originally agreed. As a result, BIM requires that the parties carefully define in the contract documents the collaborative process, who will manage the process, how the process will be managed, and then carefully adhere to the process.³⁷

Using BIM modeling does not necessarily alter the traditional allocation of responsibility among designers, contractors, and suppliers. In fact, with the possible exception of the role of model manager, using BIM effectively in a collaborative way typically does not require the project participants to assume a role that is different than their traditional role in the construction process. Contractors in collaborative BIM environments furnish essentially the same services during the preconstruction phase as a construction manager under a commonly used AIA contract form that, historically, were not furnished until after delivery of the contract documents. Contractors furnish these services with more powerful tools that allow their greater contribution to the projects.³⁸ Altering any allocation of responsibility is purely a function of the roles and responsibilities assigned to the various parties, the collaborative process that is established, and the parties' ability to maintain their roles and follow the established process, all of which is best accomplished by of clear and concise language contained in the contract documents.³⁹

Further, the BIM collaborative processes can be designed to maintain the separation of the traditional roles. In this respect, collaborative BIM processes are no different than the myriad of traditional design and construction processes which, if mishandled, can result in unintended transfers of responsibility for design.⁴⁰ These include processes for "value engineering," constructability reviews, fast-track design and construction, performance specifications, shop drawings, requests for information, and contract changes. The industry has not always handled these

³⁶ Derek Cunz & Dwight Larson, M.A. Mortenson Company, *Building Information Modeling, Under Construction 1*, at 4 (Dec. 2006) [hereinafter *Building Information Modeling*].

³⁷ *Building Information Modeling*, at 4.

³⁸ *Entering the Brave, New World*, at 84-85 (citing The Am. Inst. of Architects, AIA Document A121 CMc/AGC Document 565, 3-4 (2003)).

³⁹ *Entering the Brave, New World*, at 83-84.

⁴⁰ *Entering the Brave, New World*, at 85 (citing Derek Cunz & Dwight Larson, *Building Information Modeling, Under Construction 1*, at 4 (Dec. 2006), <[http://www.abanet.org/forums/construction/publications/eunder construction 12 06.pdf](http://www.abanet.org/forums/construction/publications/eunder%20construction%2012%2006.pdf)>).

processes and others like them successfully, and the result, even before BIM, has often been a blurred line between design and means-and-methods responsibility. As the demand for BIM increases, it may well bring more opportunity for clarifying the line between design and construction obligations.

Many commentators have suggested that the use of BIM does not require the parties to assume any roles other than their traditional roles.⁴¹ ConsensusDOCS 301 BIM Addendum adopts this position, assuring that there is to restructuring of contractual relationships on a BIM project. In doing so, the ConsensusDOCS BIM Addendum may help eliminate 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.⁴²

The ConsensusDOCS BIM Addendum is an addendum, and is not intended as a substitute for other standard form agreements between owners, design professionals, and contractors. Rather, a 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. By this arrangement, the contractual relationships among the 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 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.⁴³

The ConsensusDOCS 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 would unnecessarily complicate matters and discourage design professionals from using the BIM Addendum. On projects using the BIM Addendum, the architect remains the person in responsible charge of the design of the project, and the owner remains responsible under *Spearin* for insufficiencies in owner-supplied information, plans, and specifications.⁴⁴

The industry often refers to “the model,” as if a single, unitary model contained all of the digital information produced by designers, contractors, and suppliers. However, that is rarely the case; instead, typically many models exist. Each design discipline, each contractor, and each supplier involved in the modeling process creates its own model. Further, with process control, each of these parties maintains complete control over its own model. Thus, the structural engineer creates and maintains control over the structural engineering model and the

⁴¹ Richard H. Lowe & Jason M. Muncey, *ConsensusDOCS 301 BIM Addendum*, 29 Con. Law. 17, at 18 (No. 1 2009) (citing Dwight A. Larson & Kate Golden, *Entering the Brave New World: An Introduction to Contracting for Building Information Modeling*, 34 Wm. Mitchell L. Rev. 75, at 84 (2007); Richard H. Lowe, *Get Ready for BIM*, *Constr. Today*, Summer 2006 at 10.

⁴² Lowe & Muncey, at 18.

⁴³ Lowe & Muncey, at 18.

⁴⁴ Lowe & Muncey, at 18.

structural steel fabricator creates and maintains control over the fabrication model, and so on.⁴⁵ Moreover, the model sharing process is easily structured to preserve individual control and to maintain separation between design and construction-related activities. In a typical process, each party develops, maintains, and modifies its own model on its own network system, and only downloads a copy to the “in box” in the networked file-sharing site, where only the party managing the modeling process can access it. The model manager can move models from various parties into a collaboration space where the models can be combined for viewing, conflict checks, analysis, and problem solving. However, data is neither altered nor created in this process. Instead, if the structural engineer, for example, determines in the collaborative process that the design should be modified, the engineer will make any changes to the model on the engineer’s information technology system. Other parties have the ability to do the same, and updated models can then be downloaded to the sharing site for further collaborative review and analysis. The key modeling parties can and should jointly prepare a protocol to establish—in detail beyond that set forth in the project contract documents—the processes to be followed by the parties in order to ensure that design decisions are made by the appropriate designers and documented in their models, drawings, and specifications. Moreover, the parties should ensure that only the appropriate contractors and suppliers make construction-related decisions and document them in the BIM models and shop drawings.⁴⁶

Similarly, the process for sharing models to create derivative ones is easily designed to preserve the control of each party over its model. If the steel fabricator is to create a derivative model from the structural steel model, the model manager can place the base model in an “out box” where only the intended receiving party can access it. The receiving party cannot make changes to the base model on the sharing site, but can upload the base model to its own IT system for preparation of the derivative model. The derivative model can then, with the permission of the model manager, be downloaded to the file-sharing site. The parties should decide in advance which parties will be entitled to make derivative models from other parties’ models and how and when record copies of models will be created and preserved.⁴⁷

Many industry experts agree that the collaborative use of BIM does not change the traditional allocation of responsibility for design and construction. A potential exception flows not from any change in role, but instead from a change in the timing of the fulfillment of a role. On traditional projects, designers execute their designs and deliver the contract documents to the contractor. It is only after the contract documents are delivered by the design team that the contractor and its subcontractors and suppliers prepare and deliver their shop drawings and other submittals, as based on the design information. Designers have little opportunity

⁴⁵ *Entering the Brave, New World*, at 85-86 (citations omitted).

⁴⁶ *Entering the Brave, New World*, at 86.

⁴⁷ *Entering the Brave, New World*, at 86-87.

to rely on the details of the submittals in executing their designs. In collaborative BIM modeling, in which contractors begin modeling in the design phase and share their models with designers, the design team has a greater opportunity to review and rely upon the submittals prior to completing their project documents.⁴⁸

For example, an architect prepares a design based on input from a mechanical engineer that included a specified plenum depth. Then, the mechanical contractor prepares (and shares) a mechanical, electricity, and plumbing (MEP) coordination model, which showed that the depth of the plenum space could be reduced. The architect relied on the MEP coordination model and reduced the depth of the plenum space (and the height of the building) in the final design. What would happen if the mechanical contractor's MEP coordinated model contained an error and the depth of the plenum space proved to be inadequate? The architect would likely rely on input from the mechanical engineer and other designers in making such a design change; but, assume for purposes of this hypothetical that the architect relied solely on the mechanical contractor's model. Would the mechanical contractor that is participating in the design of the MEP lose the protection of the *Spearin* doctrine? Would it otherwise bear responsibility for the design error for having participated in the design aspects of the project through BIM modeling?⁴⁹

Whether the mechanical contractor would lose the protections afforded by the *Spearin* doctrine and assume general design liability in this hypothetical likely turns on a variety of factors, including the agreed-upon roles and responsibilities of the parties, the required content of the various models at the various stages of development, and the agreed-upon rights of reliance on the models of others. The legal issues are the same as those under a traditional construction approach; this hypothetical merely casts the application of long-standing legal principles in a new light. Further, particularly with reasonable process controls in place, the preparation and sharing of BIM models by contractors during the design phase is far more likely to bring benefit than cause harm.⁵⁰

Another matter that should be carefully managed to preserve the separation between design and construction obligations arises out of the current reality that a project team using BIM for collaborative purposes operates in "parallel universes." The collaborative efforts are based primarily on digital models, while the contract documents legally governing the contractors' work continue to be two-dimensional plans and specifications. Although many owners, particularly the federal government, are pushing the construction industry from a document-based to model-based delivery of designs, some information such as quality requirements and assembly of internal components are still better described in

⁴⁸ *Entering the Brave, New World*, at 86-87.

⁴⁹ *Entering the Brave, New World*, at 87-88.

⁵⁰ *Entering the Brave, New World*, at 88.

two-dimensional documents.⁵¹ However, the issues related to the existence of these “parallel universes” will likely diminish over time as models become increasingly accepted as part of the contract documents. Parties must keep in mind that decisions made in the modeling process and the liabilities arising therefrom should be clearly and properly reflected in the construction contract and related documents. It can be particularly tempting during the construction phase to resolve issues using the BIM model, assume that changes to the appropriate model(s) provides sufficient documentation of agreed-upon changes, and then fail to document changes to the work in a change order or other appropriate document pursuant to the contract change process. This issue is not new; but, instead is an extension of the issues involved in properly managing the request-for-information and contract change processes.⁵²

Topics that should be considered in the parties’ construction contract or the modeling protocol to help ensure that responsibility for design remains with the intended designers and responsibility for construction remains with the contractor and its subcontractors include:

- 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.⁵³
- Clear descriptions of those aspects of the work to be designed by the contractor, whether through design-build scopes or performance specifications.
- A description of the specific collaborative responsibilities of the parties that include only design-related responsibilities for the designers and only construction-related responsibilities for the contractor. When design responsibilities are assigned to the contractor, the description should address those clearly defined design responsibilities.
- A provision stating that the collaborative efforts do not make the designers responsible for construction or the contractor responsible for design, with exceptions for any clearly defined design responsibilities of the contractor.

⁵¹ *Entering the Brave, New World*, at 88-89 (citing U.S. Gen. Servs. Admin., GSA Building Information Modeling Guide Series, 01-GSA BIM Guide Overview 2, at 11 (2006)), available at <http://www.gsa.gov/gsa/cm_attachments/GSA_DOCUMENT/GSA_BIM_01_v05_R2-Ca3-10Z5RDZ-i34K-pR.pdf> [hereinafter GSA BIM Guide Overview].

⁵² *Entering the Brave, New World*, at 89.

⁵³ *Entering the Brave, New World*, at 90.

- The process for downloading models to and uploading models from the file-sharing site.
- 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).⁵⁴
- A clear statement in the contract, such as in the definitions section, as to whether any digital model is considered to be a contract document, and if so, for what purpose.
- Appropriate provisions in the shop-drawing and submittal terms as to whether submittals in the form of digital models will be acceptable or required.
- How contractor requests for information, along with designer responses, will be documented in the collaborative process.
- References in the protocol to the contract change provisions, and appropriate processes to ensure that changes in the contractor's work are properly documented in the contract documents.
- An appropriate process for incorporating construction-phase design changes into the working models.
- Provisions requiring that each party include identical BIM-related terms in sub-consultant agreements and subcontracts.
- Assignment of responsibility to establish a three-dimensional coordinate system for use by all parties that will prepare models.

Because of the range of possible owner and project team goals for the use of BIM, the variety of BIM software platforms in use, the varying experience and expertise of the project participants in using BIM, and the evolving capabilities and uses of BIM, parties will likely find it challenging to address many of these specific terms by the use of form agreements. Instead, for owners and project teams interested in integrating BIM modeling into the entire project-delivery process, there is no substitute for assembling the key modeling players and contract drafters during the preliminary project planning stages (or, if that is not feasible, as early as possible), to address these and other important BIM-related issues. Counsel can add considerable value to such an exercise by helping the participants specifically define responsibilities and processes that preserve the traditional roles and liabilities of the various parties or, if the parties choose to depart from their traditional roles, by advising the parties of the ensuing implications and drafting contract provisions to address the same. In doing so, counsel and their clients should keep a close eye on the capabilities of the BIM tools being used and the BIM-related processes being applied, both of which are ever-evolving. Capability and process changes that might alter the traditional allocation of liability between design professionals and contractors might include the integration

⁵⁴ *Entering the Brave, New World*, at 91.

into design models (as opposed to contractor or supplier models) of intelligent objects or other design information from subcontractors or suppliers, and the use of a single, unitary model incorporating the work of multiple designers, contractors, and fabricators.⁵⁵

[B] Liability for the BIM Model

The ConsensusDOCS 301 BIM Addendum distinguishes between a “design model” and a “construction model.” The design model is treated as a two-dimensional contract drawing, defining it as the stage of completion that would customarily be expressed by an architect or engineer in two-dimensional construction documents.⁵⁶ The BIM Addendum also identifies a “Full Design Model” and defines it as consisting of all of the coordinated structural, architectural, MEP, and other Design Models that are to be produced by the design team.⁵⁷ The “construction model” under the BIM Addendum is the equivalent of shop drawings and other information useful to construction. A construction model consists of data imported from a design model or, if none exists, from a designer’s construction document.⁵⁸

The models contributed by parties under the BIM Addendum 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 a manner that does not lose the identity of the other models. A federated model can be used for clash detection, marketing, and facilities maintenance, for example. No project participant can change or alter another project participant’s model.⁵⁹

At the beginning of any project, it is critically important to define each party’s scope of work and responsibilities. In a BIM-based project, the question becomes to what extent does a party assume the risk of the BIM model’s failure? Several provisions in the AGC’s BIM Addendum squarely address this issue. First, the Addendum requires that each party to the Addendum use their “best efforts” to minimize the risk of claims and all liability arising from the use of or access to its model or the project model. The Addendum gives only one example of the meaning of “best efforts”: one party promptly reporting to the other project participants any errors, inconsistencies or omissions it discovers in the model. Second, the Addendum limits recovery to a project participant that misuses or abuses the model:

⁵⁵ *Entering the Brave, New World*, at 91 (citing Howard W. Ashcraft, Jr., *Building Information Modeling: Electronic Collaboration in Conflict with Traditional Project Delivery*, 27 *Construction Litig. Rep.* 335, at 343-344 (West) (2006)).

⁵⁶ *Lowe & Muncey*, at 19 (citing ConsensusDOCS BIM Addendum at ¶ 2.6).

⁵⁷ *Id.* at 20 (citing ConsensusDOCS BIM Addendum at ¶ 2.9).

⁵⁸ *Id.* at 20 (citing ConsensusDOCS BIM Addendum at ¶ 2.2).

⁵⁹ *Id.* at 20 (citing ConsensusDOCS BIM Addendum at ¶ 2.1).

No Party involved in creating a Model shall be responsible for costs, expenses, liabilities, or damages which may result from use of its Model beyond the uses set forth in this Addendum or fully executed amendments thereto.

Under AGC's BIM Addendum, a contractor has an opportunity to negotiate its liability and responsibility for a model. To address the preparation and status of the various models that may be used on an integrated BIM project, the Addendum provides for a BIM Execution Plan. This plan is developed in a meeting with the owner, designer, and the contractor. The participants must meet within 30 days from the execution of their respective contracts. Among the elements that must be discussed and incorporated into the BIM Execution Plan are: Determining the type, purpose, and creator of each model necessary for the project; determining which, if any, models will be incorporated into the contract documents, a schedule for delivery of the models; and, various other tasks that help define each party's role in the overall BIM system. The BIM Execution Plan, when agreed upon, becomes an amendment to the Addendum. Many unique problems that cannot be addressed in a standard form contract are decided upon by the participants in this pre-construction meeting, and the parties will be bound by their final agreements. A contractor should determine the level of BIM incorporation that it desires, and how much it intends to rely upon the models produced by other participants. All of the discussions in the BIM Execution Plan meeting should be reduced to writing and closely reviewed before a party approves and incorporates that plan into the final contract documents.

The BIM Execution Plan is even more significant because the various contributors of Models to the project must select—and be bound by—the “Contributor's Dimensional Accuracy Representation.” These categorizations of a model's conformity with the traditional two-dimensional drawings will govern how each participant responds and relies upon any given model.

This representation applies only to the particular project, does not change the standard of care, and will become effective when the model is completed to a point where it is as finalized as the two-dimensional construction documents. For each model or for a contribution to a model, one (and only one) of the following accuracy representations must be made:

1. 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;
2. Each contributor represents that the dimensions in its contribution to a model are accurate to the extent that the BIM Execution Plan specifies dimensions are accurate, and all other dimensions must be retrieved from the drawings;

3. 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;
4. Or the contributor may write in an alternate representation.

If the parties can adequately and honestly categorize the extent that a given model can be relied upon by other users, then it will be easier to trust the model's dimensions or know that it is time to look at the traditional two-dimensional drawings.

Contractors, recognizing the intrinsic value of digital models in the shop drawing process and for detecting clashes, are generating BIM models for their own purposes whether the designer issues digital models or 2D construction documents. Presently, contractors employ BIM for clash detection purposes and for preparation and review of shop drawings.⁶⁰

A typical protocol would include a contractor acknowledgment that there is no warranty of accuracy of the digital models received from the architect and that the models are provided to the contractor for its convenience and at its risk. Upon receipt, the contractor, as a matter of practice, would check the 3D models against the 2D drawings, but would limit its focus to that portion of the model that is related to the work that the contractor will perform.⁶¹

In the construction phase, the contractor might well assume control over the models to manage the process. Thus, the contractor might post the models to a file transfer exchange site, require that designated subcontractors and suppliers individually model their respective work in 3D format, require that the subcontractors' models be consistent with the contract documents, and require that the subcontractors check their models for accuracy against the 2D contract documents. Access to the exchange site would be limited to those subcontractors and suppliers that acknowledge that there is no warranty of accuracy and that their use is for their convenience only and at their risk. To prepare shop drawings, the subcontractor typically imports the design team's model into its modeling system. Coordination meetings between the contractor, subcontractors, and architect would be held, with the subcontractors and the contractor utilizing the models to coordinate the work and with the architect resolving the physical conflicts that are identified. Decisions to resolve conflicts would be approved by the architect. Upon completion of the coordination process, the subcontractor would post its 3D shop drawings on the contractor's website and deliver 2D shop drawings to the contractor. The contractor would then both the 2D drawings and the 3D models and submits them to the architect. Upon approval of the shop drawings and from this point forward, the digital 3D shop drawing model would comprise the working construction models.⁶²

⁶⁰ *The Electronically Managed Project*, at 27-28.

⁶¹ *The Electronically Managed Project*, at 28.

⁶² *The Electronically Managed Project*, at 28.

[C] BIM and Copyright

With the advent of BIM modeling comes the complex issue of who owns the intellectual property rights in the model. The electronic information contained in a BIM model can be easily extracted and reused in whole or in part. The final project model may have significant value for owners, many of whom believe they can use it to enhance their facilities management. Further, there is risk involved with a party using another party's model and inadvertently infringing upon the other party's intellectual property rights. Addressing the intellectual property rights in BIM models is important.⁶³

The AGC's BIM Addendum provides a good guideline for addressing intellectual property rights in models. First and foremost, the Addendum requires that each party to the underlying agreement warrants that it is the owner of the copyright with respect to that party's contributions to the BIM model. The Addendum also grants each party a limited, nonexclusive license to reproduce, distribute, display, or otherwise use that party's contributions to the BIM model, for purposes of that particular project only. Further, the Addendum grants to the project owner an entitlement to use the full design model after completion of the project and states that that use shall be governed by the contract between the owner and the designer, which most likely would be on a ConsensusDOCS 240 form. Finally, the Addendum provides that if an owner fails materially in its project-related payment obligations to a project participant who makes a contribution to the BIM model, then any project-related licenses to the owner from that participant shall be terminated upon such decision by a court of law or an arbitrator.

[D] BIM and Scheduling

One of the potential benefits of BIM is the reduction of project duration due to extensive coordination and planning at the initial phases of the project. When discussing scheduling and BIM, the 3D modeling expands to include a fourth dimension or 4D. A 4D model is created when a traditional 3D model is combined with project time. The GSA has, for example, found that 4D models allowed project teams and GSA associates to communicate the proposed project phasing to all participants. Further, the GSA determined that with 4D modeling, the parties were able to better understand how the project will affect them. The GSA also claims that it is able to use 4D models to better understand projected construction schedules for funding purposes.

The GSA does not take the position that 4D BIM would shorten a project's duration. Most of the existing BIM comment focuses on the design and assembly of larger exterior pieces to frame and enclose a structure. But it is in the interior, small pieces where most work and can take more time than erection of the

⁶³ Richard H. Lowe & Jason M. Muncey, *ConsensusDOCS 301 BIM Addendum*, 29 *Con. Law.* 17, 23 (No. 1 2009).

exterior. A question to consider is how BIM improves the coordination and installation of the mechanical and finish trades?

Both the AIA and the AGC require a project schedule in their respective form contracts, and also require that the project schedule be updated for the owner's review and approval throughout the project. The AIA foresees that the ability to link schedule, phasing and detailed construction sequencing during design will provide efficiencies in material procurement. The AIA claims this will reduce the time from the completion of the design to the beginning of active working on the site of a project.

Ineffective use of, or failure to use, a schedule often results in delays on a project. Both the AGC Addendum and the AIA documents contain a standard waiver of consequential damages for losses relating to the preparation of the model. The AGC has included both a standard waiver of consequential damages in ConsensusDOCS 200 and a specific waiver of consequential damages in the Addendum regarding damages resulting from BIM Models. The general conditions apply to the waiver of consequential damages for a "Contribution," which is defined as "the expression, design, data or information that a Project Participant (a) creates or prepares, and (b) incorporates, distributes . . . or otherwise shares with other Project Participant(s) for use in or in connection with a Model for the Project." Furthermore, consequential damages are waived that arise out of or relate to the use or access to a model, including: "damages for loss of use of the Project, rental expenses, loss of income or profit, costs of financing, loss of business, principal office overhead and expenses, [and] loss of reputation or insolvency." The parties are limited to any mutually agreed upon damages or losses covered by insurance if required by the contract documents.

The primary remedy for delays encountered by one party is an extension of time; the Addendum goes so far as to allow an equitable extension of time if "the Contractor is delayed at any time in the commencement or progress of the work by any cause beyond the control of the Contractor." Equitable adjustments in price are also allowed for additional costs associated with delays, but such recovery is limited by the waiver of consequential damages.

The AIA documents deal with damages for delay similarly to the AGC ConsensusDOCS. The AIA A295 contains a waiver of consequential damages in article 13.1.6, and allows a similar extension of time for any delay that is not the fault of the contractor in article 9.22.3.1.

[E] Reliance on the Model

Can the parties rely on information that is provided in electronic format or through BIM? Under current editions of standard contract documents, the answer is "no" because the hard copies solely govern. This limitation includes basic electronic communications such as fax transmissions and e-mail.⁶⁴

⁶⁴ Larry D. Harris & Brian M. Perlberg, *Advantages of the ConsensusDOCS Construction Contracts*, 29 *Con. Law.* 5, at 7 (No. 1, Winter 2009) (citing ConsensusDOCS 200 ¶ 4.6.1).

What is the designer's liability to the contractor for problems or defects resulting from reliance on the model? The extent to which a contractor may rely upon a designer's work in defense of the contractor's own liability for defects or deficiencies in construction is hotly contested across the United States. Two defenses often interposed are that there is a lack of privity of contract between the contractor and the designer, and that the designer's services are not for a contractor's benefit. The efficacy of these defenses varies widely between jurisdictions. In Pennsylvania, for example, a contractor who reasonably relies on an architect's design may maintain a negligent misrepresentation claim against the architect, even though there is no privity of contract between the contractor and the architect. In *Bilt-Rite Contractors, Inc. v. The Architectural Studio*,⁶⁵ the Architectural Studio contracted with East Penn School District to provide architectural services for the design and construction of a new school. The services included the preparation of plans, drawings, and specifications to be submitted to contractors for the purpose of preparing bids for the construction of the school. The school district awarded the general construction contract to Bilt-Rite Contractors. The contract incorporated the architect's plans, drawings, and specifications. The plans provided for the installation of an aluminum curtain wall system, sloped glazing system and metal support systems, all of which the architect expressly represented could be installed and constructed through the use of normal and reasonable construction means and methods. Once construction commenced, however, the contractor had to employ special construction methods, resulting in substantially increased costs of construction. The contractor sued the architect for negligent misrepresentation under Section 552 of the Restatement (Second) of Torts, seeking damages for its increased construction costs. The contractor argued, among other things, that privity of contract was not required to sue on negligent misrepresentation, that negligent misrepresentation was a recognized exception to the economic loss doctrine, and that the architect knew contractors would rely upon its designs and specifications in submitting bids.

The architect countered arguing that design professionals could not be held liable for purely economic loss to a party with whom they shared no contractual relationship. The architect also argued that Section 552 should be not applicable to cases involving design professionals. The Pennsylvania Supreme Court, however, formally adopted Section 552 as the law in cases where information was negligently supplied by design professionals and where it was foreseeable that the information would be used and relied upon by third persons, even if the third parties had no direct contractual relationship with the supplier of information. Section 552 negated any requirement of privity and the economic loss rule did not bar recovery. The architect provided plans and specifications for the school project with full knowledge that those plans and specifications would be included in the bid package supplied to prospective bidders. The absence of privity did not negate the contractor's claim against the architect and the contractor was not barred from recovering damages.

⁶⁵ 581 Pa. 454, 866 A.2d 270 (2005).

Similarly, a Louisiana contractor may have a right of subrogation against an architect if the contractor incurs additional costs as a result of the architect's failure to provide adequate designs for the correction of construction defects. In *Sunrise Development, Inc. v. Carl E. Woodward, Inc.*,⁶⁶ Sunrise Development, Inc. hired Beery-Rio & Associates to design an assisted living facility. The architect subcontracted with Danos Land Design to design the landscaping. The developer entered into a contract to construct the facility with Carl E. Woodward, Inc. The developer alleged that it experienced two major problems as a result of the contractor's defective construction work: a ground heaving problem around and underneath the building and a mold and mildew problem within the building walls. In connection with these problems, the parties entered into a second contract (the Remediation Agreement) to perform certain corrective work. The developer filed an action against the contractor, asserting claims based on breach of the construction contract, breach of statutory warranty, and breach of the Remediation Agreement. The contractor brought the architect and the landscape designer into the action, alleging that the landscape designer was liable to it for amounts incurred to remediate the facility and for any future damages for which the contractor could have been liable because the landscape designer improperly designed the facility's landscaping.

The contractor contended that if it incurred additional remediation costs as a result of the developer's claims, then it had a claim against the architect and designer based on legal subrogation. The contractor argued that the remediation resulted from the failure of the architect and designer to provide adequate designs, and further argued that it had performed and would perform the obligations of the architect and designer when it incurred the costs of remediation, and, therefore, it could avail itself of the action and security of the original obligee, the developer, against the architect and designer. The court could not conclude that there was no set of facts under which the contractor could establish a right to subrogation recovery from the architect and landscape designer. The court therefore found that the contractor stated a claim against the architect and designer, and denied the developer's motion to strike the third-party claims against the architect and designer.

In contrast, a Montana court held that an architect has no duty of care to a design-build contractor when the architect does not communicate professional information to the contractor with the intention or knowledge that the information will be relied upon by the contractor. In *Glacier Tennis Club at the Summit, LLC v. Treweek Construction Co.*⁶⁷ Glacier Tennis Club at the Summit, LLC retained the services of Jim Thompson to provide preliminary design and building specifications of the facility. Based upon the schematic drawings prepared by the architect, Treweek Construction, Inc. bid and was awarded the contract to design and construct the facility. Shortly after completion of the facility, the

⁶⁶ 2004 U.S. Dist. LEXIS 4661 (E.D. La. 2004).

⁶⁷ 2004 MT 70, 320 Mont. 351, 87 P.3d 431 (2004).

owner reported a bulge in the surface playing area of one of the tennis courts. The owner also noticed water seeping into the building from the exterior walls—many of which were below ground—whenever the exterior ground became saturated with moisture. An independent engineer determined the building was leaking due to a poor subsurface drainage design as well as defective workmanship in the drainage system. The owner brought suit against the contractor, claiming that it was negligent and had breached its contract. The contractor brought third-party claims against the architect, alleging that the architect had been negligent in his preparation, review, and approval of the construction drawings.

The architect denied that he owed any independent duty of care to the contractor, contractually or otherwise, and maintained that the contractor was unjustified in relying upon him as the project architect. The architect offered evidence that his responsibilities for the design of the tennis facility were limited to preparing an initial site plan, which was used to solicit bids for design and build services. After commencing construction of the facility, the architect periodically reviewed the contractor's plans and progress for the owner to confirm that the contractor was entitled to receive progress payments. According to the architect, the architect had no involvement in the design of the drainage system, which contributed to the leaking water problem. The Montana Supreme Court concluded that the architect owed no duty of care to the contractor. The contractor had not contracted for the architect's services, and there was no evidence that the architect offered any guidance to the contractor in this regard. Although the parties agreed that the architect periodically reviewed the contractor's progress, any certification by the architect was done for purposes of making interim payments, and was made to the owner, not the contractor. Because the contractor failed to offer any evidence showing that the architect communicated professional information to the contractor with the intention or knowledge that such information would be relied upon by the contractor, and no contractual relationship existed, there was no duty of care. The court held that absent such a duty, there was no breach, and the contractor's negligence claim failed as a matter of law.

Defective plans and specifications may interfere with a contractor's performance and both excuse its performance obligation and prevent its termination for default. However, a design is not defective until a contractor attempts to follow the plans and fails. In *Evan Johnson & Sons Construction, Inc. v. State*,⁶⁸ Evan Johnson & Sons Construction, Inc. was awarded a contract to build the STARC Armory facility which was owned by the State of Mississippi Military Department. Tompkins, Barron & Fields Architects was selected as the architect. A portion of the project required the contractor to construct a curved barrel vault roof. The architect prepared Addendum No. 1 which consisted of seven drawings clarifying the design of the curved portion of the barrel vault roof. The contractor completed all portions of the project except the construction of the curved portion of the roof. The roofing subcontractor informed the contractor that the construction as specified in the plans and in Addendum No. 1 would not achieve the

⁶⁸ 877 So. 2d 360 (Miss. 2004).

results sought by the State. The State and architect instructed the subcontractor to install the roof as specified in the design. The contractor attempted to place the roof over a structure of corrugated "S" deck which did not incorporate the use of bent or rolled "Z" purlins as required by the specifications. As the subcontractor was constructing the last layer of the roof, the State rejected the project stating it did not produce the appearance the State desired. The contract was terminated by the State. The contract was later rebid, and the roof was eventually completed by another contractor. However, it was not built according to the original design and specifications. In order to save time, the State and architect modified the design substituting bent pipe for the "Z" purlins. The contractor filed a complaint against the State and architect alleging negligent design, wrongful termination, and breach of contract, alleging that the plans and specifications for the curved portion of the barrel vaulted roof were defective and ambiguous; and that the termination of the contractor's contract for failure to complete the roof was wrongful and a breach of contract.

Although the contractor claimed it was not arguing impossibility of performance, but was suing for negligent design and wrongful termination, the Mississippi Supreme Court held that the contractor's claim was, in actuality, one of impossibility of performance because the contractor argued materials were unavailable and the plans and specifications were defective; therefore, it was impossible to construct the roof as depicted in Addendum No. 1. However, the contractor made no effort to construct the structure as shown in the plans, but instead attempted to place a roof over the structure that did not incorporate "Z" purlins, and therefore, did not achieve a satisfactory result. The evidence established that a metal supplier could have supplied bent or rolled "Z" purlins, and further established, through a full scale model of a portion of the roof, that the roof could have been successfully completed using the original plans and Addendum No. 1. Because the contractor failed to prove any other contractor was unable to comply with the original design and specifications; and because the contractor failed to attempt to construct the roof according to the original design and specifications, the contractor's claim for defective design failed.

In *Auto-Owners Ins. Co. v. Mid-Am. Piping, Inc.*,⁶⁹ the city of Troy, Missouri, entered into a contract agreement with Cannon General Contractors for a sewer main improvement project. The general contractor subcontracted with Mid-America Piping, Inc. The subcontractor and its owners had entered into an earlier General Agreement of Indemnity with its surety Auto-Owners Insurance Co. In anticipation of entering into the subcontract with the general contractor, the subcontractor and its owners applied and obtained from the surety a performance and materials and labor surety bond. Three months later, the general contractor provided the subcontractor 48-hours' notice that it was terminating the subcontract. Shortly thereafter, the general contractor hired another contractor to finish the subcontractor's work, and terminated the subcontract based on the subcontractor's failure to properly install manholes, comply with the time requirements of

⁶⁹ 2007 U.S. Dist. LEXIS 72177 (E.D. Mo. 2007).

the subcontract, and make payments to suppliers, vendors, and employees. The general contractor then filed a claim against the surety bond for additional costs incurred because of the alleged deficient performance of the subcontractor. The surety brought a lawsuit against the subcontractor, seeking indemnity from the subcontractor for the amount of the claim asserted by the general contractor. The subcontractor, in turn, filed a third-party complaint against the architect for negligent misrepresentation, breach of warranty based on negligent misrepresentation of a material fact, and indemnity, on the basis that the architect provided the subcontractor with "defective specifications" and the subcontractor based its subcontract bid upon these faulty specifications.

The architect filed a motion to dismiss the third-party complaint, claiming that because there was no privity of contract with the subcontractor, it did not owe an independent duty of care to the subcontractor. The subcontractor countered that it possessed a valid claim despite the lack of privity of contract because its indemnity agreement with the surety subrogated it to all rights of the surety. Specifically, the subcontractor insisted that the architect owed it an independent duty of care because it was foreseeable that the architect's cubic rock excavation estimate would be used in submitting a bid for the subcontract with the general contractor. The subcontractor cited two prior cases holding an architect liable to a third party despite a lack of privity of contract. However, the federal district court noted that the loss incurred by the surety in each of the prior cases resulted directly and proximately from the negligent acts of the architect. Furthermore, both cases relied upon the subcontractor, the architects had contractual duties that gave rise to a duty of care, and the architects failed to perform their duty. The subcontractor did not allege that its injury was directly and proximately caused by an action by the architect. Instead, its injury resulted from the general contractor's termination of the subcontractor for the subcontractor's failure to comply with the subcontract. The court concluded that the surety could not have relied upon any contractual provision that created a duty of care to which the architect had to abide, and thus, no negligent misrepresentation claim was subrogated to the subcontractor as indemnitor. The subcontractor's third-party complaint was dismissed.

Recipients of digital models desire to rely on the models they have received. Recipients want to proceed with their work without fear of liability for errors in the data they furnish, and as long as the industry continues to operate in the "parallel universes" of two-dimensional contract documents and three-dimensional models, they want to safely assume that the models furnished by others match the two-dimensional contract documents or shop drawings in their equivalent state of development.

BIM efficiencies are limited without the element of reliance. 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. For example, an architectural model may

be provided to the structural designer to develop the structural steel design model. This structural steel design model may then be transferred to the steel fabricator to develop a steel detailing model. The steel detailing model may then be provided to the erector to develop the steel erection model. Similar series of transfers may occur with respect to the design and construction of many other systems, including those for pre-cast concrete, enclosure, interiors, mechanical, plumbing, controls, and fire protection systems. If at each transfer of data the recipient must perform additional duplicative work to ensure that 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 significantly limited.⁷⁰

Preparing models so that other parties may rely upon them in generating derivative models creates great value, but it also requires additional effort and creates additional risk for the sharer of the model, particularly as compared with the traditional, two-dimensional world of construction. Reasonable process protections can diminish, but not completely eliminate, the risks. The value created and the risks borne should naturally be reflected in the compensation of the parties allowing others to rely on their models.⁷¹

Considering and addressing these issues in the earliest stages of a project, prior to agreement on the basic terms of the design, reduces the likelihood that the right to rely will be an issue. When addressed at project conception, parties can designate models as design deliverables (even as contract documents themselves), work out appropriate standards of reliance, establish procedures to protect the parties sharing their models (regardless of whether they are designers, contractors, or suppliers), receive appropriate compensation for sharing their models, and comprehensively address the range of issues associated with the right to rely and incorporate them into the contract documents up or down the contract chains. Indeed, incorporating agreements on the right to rely and other issues within the traditional contract chain should avoid the need for multiple side-agreements containing disclaimers or releases between entities not typically in contractual privity (e.g., designer and contractor, designer and subcontractors) and the creation of a “contract cloud” around the basic agreements.⁷²

In addition, creators and recipients of electronic data alike will take comfort from processes that assure transferred models will be appropriately preserved and archived. This will ensure the existence of a “record” copy against which later-discovered errors or omissions can be compared to accurately assess responsibility. These processes should be discussed in the preliminary project planning stages and incorporated into the contracts and the collaboration protocol.⁷³

⁷⁰ *Entering the Brave, New World*, at 95 (citing Patrick J. O’Connor, Jr., *Productivity and Innovation in the Construction Industry: The Case for Building Information Modeling*, 1 J. Am. C. Construction L. 5, 178-179 (2007)).

⁷¹ *Entering the Brave New World*, *supra* note 71, at 96.

⁷² *Entering the Brave, New World*, *supra* note 71, at 96-97.

⁷³ *Entering the Brave, New World*, *supra* note 71, at 97.

[F] Software Malfunction

Corruption of files, which may result in delays, is a subject of real concern when the contract documents become digital models that are accessed and, perhaps created by many parties. The AGC Addendum requires an owner or its representative to designate one or more information managers (IM) for the project. The IM is effectively the guardian of the model, performing such functions as restricting access to various models to only authorized users, backing up data, scanning and protecting data to ensure that the model runs smoothly. The IM must also “document and report any incident relating to the Model (including but not limited to an incident originating outside the Model that results in the Model being the victim of an attack) and take action to protect the Model.”

Even though the AGC Addendum provides for an IM to protect the data, the legal ramifications of corrupt data are not thoroughly discussed. The threat of 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 the software vendor would be shielded from great loss in the event of software malfunction, while the user of the software could be subjected to significant liability from other parties injured by the software error.⁷⁴

Under the Consensus BIM Addendum, the owner bears most of the risk associated with a software malfunction. In the event of a software malfunction a party 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.⁷⁵

The primary contract clause that addresses the consequence of data corruption is as follows:

A defect in the software used in the creation, modification, federation or other use of a Model, including the Project Model, shall entitle a Party to a time extension or other excuse from performance, but only to the extent that the Party could not have avoided any delay or loss by the exercise of reasonable care. In addition, a Party has the duty to mitigate any such loss or delay.

The BIM Addendum permits a time extension, although it may be difficult to establish the length of the extension.

Using a collaborative model lessens the likelihood that the defenses will be successful anywhere. In a collaborative project, the designer is aware that other parties are relying on the model’s accuracy. A designer on a BIM project should know that the model is intended to provide information for the contractors’ and

⁷⁴ Richard H. Lowe & Jason M. Muncey, *ConsensusDOCS 301 BIM Addendum*, 29 Con. Law. 17, 23 (citing Howard W. Ashcraft, *Building Information Modeling 2.0: Issues and Implementation*, at 3).

⁷⁵ Richard H. Lowe & Jason M. Muncey, *ConsensusDOCS 301 BIM Addendum*, 29 Con. Law. 17, 23, BIM Addendum at ¶ 5.8 (No. 1, 2009).

subcontractors' benefit. Liability under the Restatement requires that there be intent to influence and reach a group or class of persons. For this reason, contractors and subcontractors relying on the model will likely be able to bring an action against the designer for damages caused by negligent errors.⁷⁶

Project design needs to be clearly expressed and thoroughly documented in the parties' contract documents. Contractors need to know what they are bidding on. They need to be able to compare revised design elements to earlier versions to determine if there are changes in scope. The design fluidity allowed by new technologies competes with the precision required for contract enforcement. Contract definitions of design should address the following issues:

- The contracts between the parties should define the design deliverables in content, time, and type of electronic media used.
- The contract documents should determine whether incorporated submittals, such as objects provided by vendors, are part of the designer's deliverables and which party takes responsibility for incorporation and coordination.⁷⁷

In a collaborative setting, the design details that create disputes may well be provided by the contractor's subcontractors or vendors through submittals or object specifications. To this extent, those subcontractors and vendors become the "designer." The distribution and "hiding" of the design process raise several significant questions:

- How will the contributions of various "designer" be unwound to determine responsibility?
- Will parties accessing the shared model be able to legally rely upon the contributions of others? Is privity an issue?
- If the software can communicate between objects and cause them to adjust their properties, does the software become a "designer" as well?
- Do the standards committees that develop inter-operability protocols and object specifications become project "designers?"
- What are the responsibilities of these secondary "designers?"
- To what extent can the design professional rely upon the products of these "designers?"
- If these "designers" do have responsibility, do they have insurance for design risks? Do we need new insurance products better tailored to collaborative projects?⁷⁸

⁷⁶ A *Framework for Collaboration*, at 12.

⁷⁷ A *Framework for Collaboration*, at 12.

⁷⁸ A *Framework for Collaboration*, at 13.