A/E RISK REVIEW

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CAD Part 1: Capabilities and Liabilities Evolve

The following material is provided for informational purposes only. Before taking any action that could have legal or other important consequences, speak with a qualified professional who can provide guidance that considers your own unique circumstances.

Computer-aided design (CAD) software has made incredible strides since first appearing on the scene in the 1980s. Today, virtually every design firm from the sole proprietorship in a home office to international mega-giants rely on CAD as their bread-and-butter design tool. Year after year, CAD evolves to include more and more sophisticated capabilities. New forms of electronic design, such as Building Information Modeling (BIM), continue to advance and improve, enabling today's leading architects and engineers to deliver a wide range of design and client services unimaginable only 20 years ago.

CAD certainly has a proven track record of providing many design advantages. It also has shown that it poses new costs, challenges and liabilities. For example, if various design team members are using different types of CAD software and hardware, communication and coordination can be complex and prone to errors. The latest and greatest versions of CAD can also increase client expectations in terms of both project schedules and quality and scope of services. Therefore, a clear and realistic understanding must be established in terms of how CAD files and documents will be delivered and used and what services you are hired (and paid) to provide. All members of the project – from the client, to the prime, to the contractor, to the entire team of subconsultants and subcontractors – must be aware of the potential liabilities that arise when CAD is used to share design information and each party is capable of adding, altering or deleting elements of design.

Five Common CAD Liabilities

Here are five prevalent problems that can crop up with CAD in regard to potential liabilities:

1. **Software defects.** The number of CAD products that hit the market every year is astonishing. Unfortunately some products are rushed to market by software developers trying to beat their competition. Hidden software defects or bugs may not be detected until years later, after a user's design is completed and delivered and construction is in progress or complete. Architects and engineers can be liable for resulting errors or omissions in their computer-aided designs.

2. **Incompatibility.** Files generated with one CAD program can't necessarily be fully read by another. Even different releases of the same software can present transfer problems. Changes in the operating systems on which the software is run presents compatibility issues as well. Although translating electronic files from one CAD system to another can generally be accomplished, it requires careful planning, communication and coordination.

3. **Transmission errors.** The potential for transmission errors exists whether the data transfer takes place on disk, on a USB flash drive, over the Internet or on a cloud. The computer from which the data is transferred may have a hard disk error. The disk or flash drive onto which data is transferred can be

defective. In transit, a disk can be subject to physical damage, compromising data. Information sent over the Internet can be altered while passing through any number of servers. The recipient's computer may have a damaged drive. Power outages, spikes and dips can interfere with transmissions. With any of these problems, errors can creep in undetected.

4. **Inaccuracies.** The old adage "garbage in, garbage out" holds true in the CAD world. When your client or another party to the project provides you with electronic data, you may have no way of determining whether it is complete or accurate. Likewise, an inputting error by your own staff can be replicated many times throughout a CAD project.

5. **Viruses.** Computer viruses can be spread through disks, drives and Internet transmissions. Viruses in your CAD files not only result in errors, they can damage or destroy hardware, software and files while spreading throughout your and your clients' computer network.

Clients, Contractors and Subs -- Oh My

Suppose you deliver a "perfect" CAD file to your client, the contractor or a subconsultant. There are no design errors, software defects or compatibility issues. The data is complete and accurate and transferred smoothly without viruses via a problem-free transmission. Even with this idyllic scenario, you're not home free. How others use your files presents a whole new realm of potential liabilities.

For example, a CAD file delivered to your client can be easily altered. Changes may be deliberate or inadvertent and are often made without leaving a clear trail to trace the origin. A client may make the unauthorized change, or pass the file to the contractor who changes it and then uses the modified file. If a design error or omission results, you very likely may face a claim. You may also have great difficulty proving the electronic file was modified.

Unbeknownst to you, an unscrupulous client may use your CAD files as the basis for designing subsequent project phases or even starting new projects. You may end up facing future claims and legal fees without even knowing your design was being reused – and without receiving compensation for the reuse of your design.

Some clients like to retain CAD files as archives of the project. Unfortunately, electronic files are not ideally suitable as archives. First, data on disks and drives may deteriorate over time. The information can also be compromised every time it is copied or there is an update in software, operating systems or hardware. A CAD file developed only ten years ago may not be readable or may deliver faulty information when run on a new system. How many computers today even have a drive for a floppy disk? Are CDs the next to go? Despite some software manufacturer claims, not all programs and hardware are "backward compatible."

Other clients may want to keep the CAD files as project record drawings (commonly called "as-built" drawings) or for building maintenance purposes. But construction drawings are rarely the same as as-builts. Construction drawings do not typically include any design and detail changes made during construction and they rarely portray the project as it was actually built.

Managing CAD Risks

Fortunately, CAD risks can be managed effectively. However, minimizing your liabilities requires a coordinated two-pronged approach that enlists the support of your entire design team. In this issue we will cover the first of those two prongs: Establishing a CAD use policy. In part two of this report, we'll tackle the contractual protections that can further limit your liabilities.

Establishing Your CAD Policy

Your first line of defense is to develop a written policy that outlines CAD uses and procedures. Such a policy should be shared with all employees and every client.

When meeting with a new client for a new project be sure to discuss your CAD policy early on. Outline the risks, advantages and limitations of CAD from your perspective. Address hardware and software compatibility concerns. Set realistic expectations and time schedules for generating CAD drawings.

As part of your CAD policy, we recommend you take the following steps for each project:

Set CAD specifications. Address in detail all requirements for hardware and software compatibility. Select your CAD software carefully and follow all documentation and license agreements. Make it clear that transferring files to your client does not transfer any license for use of the underlying software. Establish procedures for file submittals – on disk, via a flash drive, over the Internet, through a private network, etc. Also establish measures for conducting pilot tests of data exchanges between different programs and systems before any significant production work begins. During the project, monitor ongoing production and review drawings to make sure there are no compatibility issues and all project team members are following agreed-to CAD specifications.

Identify all CAD deliverables. With each project, spell out exactly what electronic files the client will receive and when, as well as the desired forms of delivery and transmission. Seek added compensation of any special CAD requests that increase either your cost of or liability for completing the project.

Determine client uses of CAD. Explain the limitations of use for your CAD files – e.g., for the client's benefit on this specific project only. If the client or contractor intends to use the CAD files for determining material quantities, for facility management, for as-built drawings or on subsequent projects, consider offering extended services at an additional fee to meet those demands. Propose to update the electronic files through post-construction changes. Also discuss security issues and the need to restrict access to CAD files on a need-to-know basis.

Limit third-party deliveries. If at all possible, refuse to deliver CAD files directly to third parties with whom you have no contractual relationship, such as contractors. Deliver files to your clients and let them deliver copies to others, if necessary. Have your client assume responsibility for reuse or misuse by others, as well as responsibility for updating third parties of design changes. If you must deliver CAD files to third parties, discuss your CAD specifications directly with those parties. Charge an appropriate fee for your additional work and tightly restrict authorized use through separate agreements with third parties.

Establish a transmission policy. Set rules for transferring and downloading files or information via email, over the Internet or through other networks. Immediately check the content of any file attachments received. Use updated antivirus software for receiving information over the Internet or on a disk or portable drive.

Train staff. Once hardware and software specs are set, make sure your staff is thoroughly trained to use your CAD system. Document your training efforts – this may help limit liabilities should a subsequent software error or hardware failure result in a project error. Establish internal quality control procedures for proper software use.

Verify accuracy. To the best of your ability, verify the accuracy of all CAD files and data received from your client or other parties before releasing them to your staff. Similarly verify accuracy if you must convert these CAD files to another software program or computer operating system.

Making corrections. When delivering CAD files to clients or others, agree to correct any errors or discrepancies during a limited acceptance period (e.g., up to 30 days after delivery) as part of your basic agreement. Make any corrections or changes requested after the acceptance period for an additional fee only.

Refuse to give electronic seals and signatures. It is far too easy for someone to modify the content of a file on which you originally placed your electronic seal or signature – or to copy your electronic seal or signature and place it elsewhere. For maximum protection you should remove your seal, signature, company logos, title blocks, proprietary symbols and other identifying marks from any electronic file you deliver to your client.

Document delivery of files. With every receipt or delivery of a CAD file, we suggest you print a hard copy of the drawings and keep a log of all files and their authorized usage. It is also advisable to keep a permanent record of all procedures, drawings and transmittals made through the life of the project.

Part 2: Contractual Protections

Following the procedures outlined here will go a long way toward controlling CAD-related liabilities. However, a key tool to minimize liabilities is your

contract language. In Part 2 of this report, we will address contractual protections as well as the important issues of design ownership and copyright.

Can We Be of Assistance?

We may be able to help you by providing referrals to consultants, and by providing guidance relative to insurance issues, and even to certain preventives, from construction observation through the development and application of sound human resources management policies and procedures. Please call on us for assistance. We're a member of the Professional Liability Agents Network (PLAN). We're here to help.