

# Construction Submittal and Shop Drawing Liability

- Risks arising out of the submittal process
- How submittals by e-mail can increase risk
- The Submittal Exchange™ system as a tool for mitigating risk

October 15, 2007

By Matt Ostanik, AIA, CSI, LEED® AP

## Abstract

The construction submittal and shop drawing process presents risks that must be carefully managed, as problems during submittal review can lead to incorrect product installations, delays, and other costly mistakes. Risks result both from errors in professional judgment and from failure to maintain a highly organized, efficient, and timely review process. Exchanging submittals by e-mail or FTP site may increase the risk of breakdowns in the process, due to file size limitations, lack of clear version histories, temptations to bypass a structured logging and tracking process, and other issues. In contrast, the Submittal Exchange™ system is an example of an electronic submittal management tool that architects, engineers, contractors, and owners can use to reduce risk and avoid many of the common organizational problems that may occur during submittal review.

## Overview of the process

Shop drawings and submittals are a necessary but cumbersome part of the construction process. In the words of Arthur O'Leary, FAIA, many in the industry perceive shop drawings as a "necessary evil" (*Design Cost Data* magazine, March/April 2003). During most commercial construction projects, contractors and suppliers provide submittal documents to the architect and engineers in order to document the exact materials and components that will be used in the building. Submittal review is a critical check-and-balance during construction to ensure that the end result conforms to the design intent reflected in the architect and engineers' drawings.

A typical project of one million dollars or more may involve over a hundred submittals, documenting items from concrete mix designs to ceiling tiles. They begin with a supplier or subcontractor, are reviewed by the general contractor or construction manager, then the architect and engineering consultants. The industry standard is for multiple paper copies of each document to be submitted—typically six to eight, although in some cases twelve or more—resulting in thousands of pages. Every party in the review chain spends extensive time reviewing each document, hand notating comments and corrections, placing review or approval stamps, and managing the paperwork flow.

## Risks arising out of the submittal process

Adding to the complexity of the submittal process is the liability risk that all participants assume. As one of the areas of construction practice and law where all disciplines converge, the submittal process poses risks that must be carefully managed. Problems during submittal review can lead to incorrect product installations, delays, and other costly mistakes that can cause long-term headaches. The risks related to submittal review have been well documented, including in an excellent 2001 article, "Shopping for Liability" by Eric Singer, a construction law attorney with the firm of Ice Miller LLP, and a frequent author and speaker on construction law topics. (The full article can be found on a/e ProNet, [www.aepronet.org](http://www.aepronet.org).)

When construction liability claims are investigated, they often can be found to involve a submittal issue as an underlying problem or contribution to the problem. *Lessons in Professional Liability*, published in 2002 by DPIC Companies (now XL Design Professional, a leading professional liability insurer), discusses the shop drawing and submittal process extensively and begins with a statement that “the review of shop drawings and submittals often results in claims against design professionals.” Because of the role that submittal issues can play in construction liability claims, it is important to understand the specific risks that arise out of the submittal process.

Definition of the submittal process begins in the contracts signed by the facility owner, the architect, and the contractor. For example, sections 3.12 and 4.2.7 of one frequently used legal document, the AIA’s A201-1997 form titled “General Conditions of the Contract for Construction”, describe the purpose of submittals and the architect’s and contractor’s responsibilities. The A201-1997 includes statements such as, “The Architect will review and approve or take other appropriate action upon the Contractor’s submittals such as Shop Drawings, Product Data and Samples.” The A201-1997 further defines what content submittals shall be reviewed for and what responsibilities are born by each party.

If a liability claim does occur related to the submittal process, this legal language often can be a starting point for analyzing the claim. In May/June 2006 the AIA Northern Virginia chapter published an article titled “Shop Drawing Liability” by Timothy Hughes, Esq., a principal in the law firm of Hughes & Associates who specializes in construction litigation. The article explored one specific example of how contract language impacted the results of a liability claim and noted that submittal review is one of the areas of design and construction where there is a clear historical record of previous cases that illustrate the types of issues that can arise.

#### *Professional judgment*

Fundamentally, professional judgment is a key component of the submittal review process. Submittal reviewers must have adequate knowledge of the project and experience in the industry to make intelligent, professional decisions on the acceptability of materials and assemblies, coordination with other project components, and the overall design intent.

“Shopping for Liability” (Singer, 2001) cites an example of a design that called for a cast iron floor drain. A submittal showing a PVC floor drain instead was mistakenly approved. After the drain was installed, the PVC melted due to heat. Both the drain and the surrounding floor had to be removed and replaced, resulting in a costly claim. A more horrific example is the changes that were made on the shop drawings for a suspended walkway in a Hyatt Regency Hotel in Kansas City. An engineer approved the shop drawings showing the connection changes, and on July 17, 1981, the walkways collapsed in the midst of a crowded event, killing 114 people and injuring hundreds of others. (For a full history of this incident, visit the “Walkway Collapse” article on [www.engineering.com](http://www.engineering.com).) These are both examples of errors in professional judgment that occurred during the submittal process, leading to costly or deadly results.

#### *Organizational issues*

While there is no substitute for professional judgment, liability risks can also arise during submittal review due to failure to maintain a highly organized, efficient, and timely review process. Failure to review submittals within a certain time period or other organizational missteps can result in problems for all parties. *Guidelines for a Successful Construction Project* (a joint 2006 publication of the Associated General Contractors of America, the American Subcontractors Association, and the Associated Specialty Contractors), states that “any hitch or stumble affects the entire process and creates risk for claims.”

Organizational issues that can occur with the submittal process, leading to liability risks, include:

- Lack of a clear schedule for submittals, or too many submittals arriving on the architect’s or engineer’s desk at the same time (referred to in the industry as “submittal dumping”).

- Lack of a clear logging and tracking process that documents dates received, dates returned, actions taken, and does so with consistency for thousands of documents and reviews.
- Lack of consistency between different project managers in the same office, or lack of consistency between different offices in the same company.
- Submittals not being delivered promptly to the final reviewer, whether it is another individual in the same office or an outside consultant.
- Submittals not being reviewed and returned in a timely manner.
- Notes and revisions not being copied consistently to all copies of a submittal.
- Not all submittals required by the specifications being delivered for review.
- Design team reviewing submittals that are not required by the specifications.
- Submittals bypassing key steps in the review process; for example, going directly from a subcontractor to the architect, bypassing the general contractor, or going from a subcontractor to an engineering consultant, bypassing both the general contractor and architect.

### **How submittals by e-mail can increase risk**

With the proliferation of electronic communications, some contractors and designers have begun experimenting with exchanging submittals and shop drawings by e-mail. Firms may see this as a quick and easy way to improve the traditional paperwork intensive submittal process. E-mail is quick, “free”, and can allow one electronic copy of a document to be exchanged for review instead of a stack of paper.

However, exchanging submittals by e-mail may increase overall risks associated with the submittal process. As discussed previously, a highly organized, efficient, and timely process for submittal management is key to reducing risk. With e-mail usage exploding—one site estimates that 2.7 trillion e-mails will be exchanged in 2007, a rate that is growing 14.6% per year—e-mail is often anything but organized. With the typical user’s e-mail inbox containing a mix of rapidly flowing business, personal, and spam messages, risks can occur by making the submittal process dependent on this medium.

- File size limitations. Size limits can prevent submittal attachments to e-mail from reaching the intended recipient. There is no consistent rule for this, although problems can often occur when attachments exceed 5 or 10 MB in size. The message author may or may not receive notice that their file was too large to be delivered. What happens when a contractor calls and asks, “What’s the holdup on the submittal I e-mailed two weeks ago?”—but the architect never received it?
- Lack of clear version history. Exchanging documents by e-mail typically creates a new version of the file on each recipient’s computer. Instead of working off of one central copy, every participant has their own individual version, creating a breeding ground for confusion. Which version is the final approved copy? What if copies have different notations? Where is the official, final record?
- Temptation to bypass logging. Many offices have a central person responsible for logging paper submittals. But what happens when the contractor can e-mail a submittal directly to an architect or engineer? The submittal falls “off the grid”, unable to be tracked. The reviewer could log it themselves, but with the speed of electronic communications, manually logging dates in Excel feels like painful drudgery. It is easier to just hit “Reply” and bypass logging all together. Many reviewers, particularly those new to the industry, may not understand the critical importance of an organized logging system to loss prevention (see Singer’s article, “Shopping for Liability”).

- Bypassing proper steps in the review process. The industry has developed a de facto standard for the order in which submittals proceed up and down the chain of reviewers. Submittals originate with the subcontractor. They are passed to the general contractor for review; only then do they proceed to the architect. The architect sends to and receives back from a consulting engineer. Both the architect and contractor serve as gatekeepers, due to their unique and overarching responsibilities for the project and the resulting liability risks they both assume. But with submittals by e-mail, these gatekeepers can be easily bypassed. (Again, see Singer's article for the importance of the General Contractor reviewing submittals.)
- Time delays when a reviewer is away from the office. An architect or engineer may be away from the office for several days due to meetings or personal trips. In the old days, if submittals were piling up in their absence, there would be physical evidence: a growing stack of paper on their desk. If necessary, others in the office could intervene to ensure that nothing became too tardy. But with submittals by e-mail, the evidence is hidden from sight in the vacationing reviewer's e-mail inbox. What happens if a submittal flagged as critical and extremely urgent arrives via e-mail on the first day that the reviewer has left for a two week vacation? No one will know.
- Technological incompatibilities. E-mail attachments can be altered or corrupted by anti-virus software, spam filters, or technical incompatibilities across networks. Use of file types that are not open standards (for example, most proprietary CAD software file formats) can result in inconsistencies or incompatibilities across companies, versions, and brand names.
- Submittals blocked as spam. A growing trend in the world of spam e-mail is for spammers to send advertisements or deceptions as PDF attachments to e-mail messages. Industry experts have reported a rapid increase in the use of this spam technique. Professionals who are victim to this style of spam may learn to generally disregard emails with PDF attachments, and anti-spam software will begin to block messages with PDF attachments that meet certain criteria, making it difficult for submittal attachments to be sent by e-mail without being overlooked or blocked.

The conclusions are clear: submittals by e-mail can increase risk. Successful mitigation of submittal risk relies on managing a highly organized, efficient review process. A typical person's e-mail inbox can often be the exact opposite of organization. The relative low cost and easy access to e-mail makes it tempting as a medium for submittal review, but firms that choose to rely on it exclusively over time risk discovering significant headaches down the road.

### **FTP is no solution either**

An alternative to submittals by e-mail is use of a company FTP site. An FTP site is online location, usually hosted by an architect or a contractor, where files can be passed back and forth. While FTP sites avoid the file size limitations of e-mail, they present other issues and concerns:

- Security risks. According to one Internet expert, "FTP is a security disaster."
- Lack of clear version histories. Which copy of the file is the final, approved version?
- Temptation to bypass logging. As with submittals by e-mail, the opportunity exists for an incoming or outgoing file to be saved to the FTP site without following proper logging and tracking procedures. Tracking information can then be very difficult to re-create after the fact.
- Bypassing proper steps in the review process. As discussed previously, it is critical that the proper review order be followed. FTP opens the door to key steps or parties being bypassed.
- Notifications. Most FTP sites do not send notifications when an item is submitted for review or returned after review is complete. Someone must pick up the phone or manually send an email, creating extra work. When that fails, submittal files can sit for days before they are noticed.

## The Submittal Exchange™ system as a tool for mitigating risk

Submittal Exchange™ is a comprehensive, secure, web-based management tool for submittal exchange, review, and archiving. With four years of development to date, the Submittal Exchange™ system is currently in use by leading professional firms, contractors, and facility owners across the upper Midwest. The system has been built by architects, engineers, and contractors who sought a better solution for the submittal process, one that would reduce the time, frustration, and risk associated with submittal review.

Submittal Exchange™ provides a central website where submittal files are uploaded, downloaded, and automatically tracked step-by-step through the entire review process. The system is structured to make the submittal process as organized and efficient as possible. As a result, Submittal Exchange™ can play a key role in helping to mitigate the common organizational risks associated with the submittal process.

### *Comparison to submittals by e-mail or FTP*

The Submittal Exchange™ system avoids the issues seen with submittals by e-mail or FTP:

- No restrictive file size limitations.
- No issues with spam filters blocking the transfer of a submittal file.
- Clear version histories, with record copies of the documents being saved at every step in the review process, and a clear indicator of the final approved copy.
- Automatic logging, so dates and turn-around times are always part of the project record. *Lessons in Professional Liability* lists this as a basic requirement of the submittal process: “Date stamp each submittal as soon as it is received and log it in.” Submittal Exchange™ automates this critical task, ensuring that logging occurs for each and every document.
- Automatic notifications, so the next reviewer receives immediate notice that it is their turn to act.
- Enforcement of the industry standard order for submittal review, such as requiring subcontractor submittals to go through the general contractor or construction manager for review before being sent to the architect, and giving the architect the option to sign off on consultant-reviewed submittals before they are returned to the contractor. DPIC’s *Lessons in Professional Liability* emphasizes the importance of this step as well, advising reviewers: “Don’t accept submittals directly from a subcontractor or vendor.”
- If an individual is out of the office, others from their company can still access and monitor submittals pending for their projects.

### *Reduce the risks seen in traditional paper-based review*

In addition to simply addressing the risks and issues associated with e-mail and FTP, the Submittal Exchange™ system has been designed to proactively address and mitigate many of the common issues that occur with the traditional paper-based submittal process. By improving the organization and efficiency of the process, participants can reduce their potential risk. Examples include:

- Prompt notification of new submittals. Reviewers are immediately notified of new submittals on Submittal Exchange™, as recommended by *Lessons in Professional Liability*. With paper submittals, a stack of paper may come in the door and sit for a day before logged in and passed on to the appropriate reviewer. Or, it may sit on a project manager’s desk for a day or more before being forwarded on to a consultant’s office. Every time delay in the submittal process increases risk.

- Consistency. Large companies can struggle with enforcing a consistent, standard submittal process across multiple offices or between different project managers in the same office. Submittal Exchange™ provides a consistent, uniform platform across the entire company.
- Reminders to keep the process on track. The Submittal Exchange™ site sends automatic reminders if a submittal has sat for too long without being reviewed. The importance of a systematic reminder process is noted as well in the *Lessons in Professional Liability* publication.
- Removing the risk of error in hand copying notes. In many offices, it is common practice to hand copy notations and corrections to six, eight, or more paper copies of. Every new copy is a risk—what if a critical note is forgotten on just one copy of the document? Often times the task of copying notes is assigned to interns or administrative personnel, reducing labor cost but increasing risk as the individual copying the notes may not fully understanding their meaning.
- Step-by-step version histories. Submittal Exchange™ provides a clear, step-by-step version history of every document through every step of the review process. This version history can be a critical piece of backup documentation should a question arise about what change was made when, or how long a document sat before being reviewed and returned to the contractor.
- Central list of required submittals. Project logs on the Submittal Exchange™ site can be set to include a full listing of all required submittals for the project based on the specifications manual, allowing the architect and contractor to coordinate from a central list, and ensuring both that all required items are received and that items not required by the specifications can be avoided. O’Leary’s article in *Design Cost Data* discusses the importance of this: “Architects should be certain that all specified submittals are actually received from the contractor. . . . If shop drawings of a certain trade have been specified, but not submitted and therefore not reviewed, the architect could be found negligent if mistakes were carried out in the construction which could have been prevented if the shop drawings had been checked.”
- Setting a submittal schedule. The submittal log on Submittal Exchange™ can also include expected dates for when a contractor anticipates submittals arriving, based on their project workflow. Proper scheduling of dates in advance helps avoid “submittal dumping”, a practice where a large pile of paper submittals arrives on a reviewer’s desk at one time, forcing them either to delay some items or to rush through them without proper time spent on full review.
- Keeping the client in the loop. Many facility owners do not understand the importance or function of the submittal process. However, others—particularly those who build more frequently—request to be kept updated on submittal progress or even receive copies of submittal documents. (O’Leary also discusses this in his article, stating that it is beneficial to keep the client in the loop and aware of the submittal process.) The Submittal Exchange™ system allows clients and facility owners to monitor the submittal process or to view individual documents easily online. Submittal Exchange™ also provides a CD or DVD archive copy of all submittals once construction is complete, which the client can then utilize for future facility maintenance and record keeping.
- Increased accountability. If questions do arise over actions or timing of a particular submittal, all of the information, history, and backup are in one place so no one can point fingers at each other or disagree over a sequence of events.

An organized, efficient submittal review process is critical to reduce risks to all parties involved with a major construction project. While there is no substitute for professional judgment, the organizational issues associated with submittal review can cause headaches and lead to claims down the road.

The Submittal Exchange™ system can mitigate these risks by providing a platform for consistent, efficient, highly organized submittal review, reducing common risks as compared to the traditional paper-based submittal process.

## About the author

Matt Ostanik, AIA, CSI, LEED® AP, is a registered architect in the state of Iowa. His background includes tenures at four firms in Iowa and Illinois ranging in size from three to a hundred plus employees. In 2003, he developed the concept for the Submittal Exchange™ system as a result of frustration with the volume of paper shop drawings crossing his desk. Today, he serves as president of Submittal Exchange, LLC, where he and his staff work with clients and users across the upper Midwest and the country. He is a frequent speaker on the topic of shop drawings and electronic documents at professional conferences.

For more information on the Submittal Exchange™ system, visit [www.submittalexchange.com](http://www.submittalexchange.com).

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