

# New Jersey Law Journal

VOL. CLXXXVIII—NO.13—INDEX 1169

JUNE 25, 2007

ESTABLISHED 1878

## Real Estate Title Insurance & Construction Law

JUNE 25, 2007 ALM

# Liability for Flawed Shop Drawings

Contractor, architect and engineer each play a crucial role in evaluation of work plans

By Robert C. Epstein

There is perhaps no aspect of construction more misunderstood than the shop drawing submittal and approval process. The term “shop drawings” refers to drawings, diagrams, illustrations, schedules and other information prepared by or for the contractor to illustrate some portion of the work. Shop drawings are usually prepared by specialty subcontractors or fabricators and then submitted by the contractor to the architect or engineer for approval. When the process breaks down, the most common result is economic loss caused by project delays or the need to correct deficient work. However, in some instances, effective shop-drawing review can literally be a matter of life and death.

The most dramatic example of this was the Kansas City Hyatt Regency Hotel skywalk collapse of 1981 that claimed 114 lives. The skywalks, which were suspended walkways in the hotel’s atrium, collapsed during normal use. An investigation by the Missouri Board of

*Epstein is with Greenberg Traurig of Florham Park.*

Architects and Engineers found that the failure was caused by insufficient load capacity of the connections that held the skywalks in place. The investigation revealed that, during the shop drawing process, the fabricator proposed a modification to the design that doubled the load on the connections at the fourth floor walkway. The fabricator assumed that the engineer would redesign the connections to carry the increased load. The engineer incorrectly assumed that the fabricator would redesign the connections to carry the increased load, and eventually approved the modifications without determining what the connections looked like in detail. The investigation by the engineering board found that the modified skywalk design barely had enough strength to resist its own weight, and had virtually no capacity to carry the additional loads that resulted as people actually used the walkways. The Missouri licensing authorities revoked the engineer’s license, a decision upheld by the courts. *Duncan v. Missouri Bd. of Architects, Professional Eng’rs & Land Surveyors*, 744 S.W. 2d 524 (1988). This failure of communication between an engineer and a fabricator during the shop drawing approval

process resulted in one of the most devastating building failures in United States history.

In another well-known case, ironworkers were waiting for guy lines to secure a portion of steel framework on which they were standing, when a gust of wind hit the structure, causing it to collapse. Two workers were killed and a third was injured. The ensuing lawsuit alleged that the architect was negligent in approving the shop drawings, which failed to show temporary connections on certain expansion joints. The court ultimately held, however, that the contractor, not the architect, was liable because the accident occurred during construction and the contractor had a duty to review the shop drawings as they affected construction means and methods, and site safety. *Waggoner v. W&W Steel*, 657 P.2d 147 (Okla. 1982), *reh’g denied* (1983).

These two cases seem contradictory. Each involved beam-support connection details. However, in the Hyatt case, the engineer was held liable for omissions in the shop drawings, while in the ironworker case, the contractor was held liable for omissions in the shop drawings. To understand why these

cases really are consistent, it is important to understand the functions of shop drawings and the shop drawing review process.

Shop drawings are defined as “drawings, diagrams, schedules and other data specially prepared for the Work by the Contractor or a Subcontractor, Sub-subcontractor, manufacturer, supplier or distributor to illustrate some portion of the Work.” American Institute of Architects (AIA) form A201, section 3.12.1. The term is also generally understood to refer to catalog cutouts (known as cut sheets), product performance or specification schedules, manufacturer’s installation instructions, or any other material that the contractor or subcontractor must submit for approval by either the owner, architect or engineer.

Shop drawings are used on construction projects for two primary reasons. First, with any project of significant size and complexity, it is simply impossible for the designer to prepare graphic or written descriptions of every detail. It also is not economically feasible to engage the designer to depict the thousands of standard construction details. Also, many details on construction drawings are at such a small scale that they cannot be used easily during construction. Also, many drawings are largely diagrammatic, such as mechanical or electrical drawings, requiring shop drawings for purposes of coordination between the trades and to depict necessary construction, which is inferable from, but not actually shown on the plans.

Second, the drawings and specifications may only establish performance requirements, granting the contractor wide discretion as to the details and methods of construction so long as the performance objective is attained. Where performance specifications are used, shop drawings play an important role in depicting the actual design, the coordination of subtrades, or simply providing larger scale direction to the contractor’s own forces.

The process of shop drawing submittal and review is intended to be a dia-

logue between the designer and the builders concerning the details of construction. Shop drawings are prepared and submitted by a host of subcontractors and fabricators, and are reviewed and approved by *both* the general contractor and the architect or engineer.

The purpose of the contractor’s review is to coordinate the trades and verify that the project can be built. The contractor is responsible for the means and methods of construction and for verification of field dimensions. The contractor’s review and approval of shop drawings requires the contractor to check shop drawings against each other. In this way, the builder coordinates the work before the brick and mortar go up — because it is the builder’s responsibility to ensure that the construction process is feasible and safe.

The architect or engineer, on the other hand, reviews the shop drawings to ensure that the proposed construction scheme meets the design intent for the completed structure.

This division of responsibility explains the seeming contradiction between the Hyatt skywalk collapse case and the ironworkers case. Generally, the architect or engineer is responsible for the design — that is, the architect or engineer has the final and total responsibility for the adequacy and safety of the completed structure, as in the Hyatt case. Construction safety is the contractor’s responsibility, as in the ironworkers case.

Shop drawings are supposed to show how the contractor intends to carry out the architect’s plans, and are not supposed to be a vehicle for proposing substitutions, changes or deviations from those plans. If the contractor wishes a substitution or change, the proper vehicle is a separate request for a change order.

A recurring problem in the shop drawing review process arises where the contractor prepares shop drawings, the architect or engineer approves the submittals, returns them to the contractor who then completes the work, and later discovers that there was an error in the approved shop drawings, so that the

work has to be re-done with resulting delay to the project.

Does the erroneous approval of shop drawings mean that the owner accepted everything on that shop drawing and so waived its right to require the contractor to properly carry out the design plans? Generally speaking, the answer is no, but the cases are mixed. However, it is fairly clear that, if the changes or deviations are prominently called out by the contractor on the submittals and *then* approved, the designer and owner probably *will* be deemed to have approved the changes.

The shop drawing review process also frequently gives rise to claims for construction delays. The general conditions normally require the contractor to present a shop drawing submittal schedule to the architect and engineer promptly after the contract is signed. The submittal schedule is needed to verify that the proper shop drawings will be timely submitted, and also to allow the designers to plan for shop drawing review. There is nothing more disruptive to a design professional’s office than to plan the manpower for shop drawing review, have the shop drawings come in late, and then be told that a 140-page submittal for steel erection drawings must be reviewed within four days or the construction schedule will be delayed.

How long should the designer take to turn around shop drawings? Commonly used contracts only require that the architect’s action on shop drawings “will be taken with such reasonable promptness as to cause no delay in the Work.” AIA A201, section 4.2.7. Vague provisions like this should be modified in the contract between the owner and designer to require the designer to turn around the shop drawing submittals within a fixed time frame, usually a maximum of 10 days to two weeks.

If the architect’s or engineer’s turnaround time for the review of shop drawings is excessive, then the contractor may legitimately claim that its work has been delayed.

What can the project parties do to minimize delays in the shop drawing review process? First, the owner and

designers should require that the contractor promptly submit the contractor's submittal schedule. Then, the contractor must be held to the submittal schedule. Where submittals are late, those delays should be documented promptly and in writing.

From the contractor's point of view, the submittal schedule should be followed and any errors in the plans and specifications discovered during the shop drawing submittal process should be called to the attention of the owner and designer. If minor deviations from the plans are needed to accommodate the means and methods of construction, those changes should be prominently called out on the submittals both graphically, by highlighting the affected area, and in writing, with a written narrative on a separate form attached to the submittal describing the change or deviation.

The cases addressing responsibility for shop drawing review reflect a constant struggle between designers and contractors over who is responsible for what in the shop drawing review

process. As noted, contractors have successfully argued that a design professional's approval of a shop drawing constitutes acceptance of whatever is contained in that shop drawing. Where the system or design details contained in the approved shop drawings do not work as they should, contractors have argued that they are excused from responsibility because the design professional "approved" the shop drawings and therefore the designer is responsible for any failure. Some contractors have even argued that *they* relied on the designer's expertise in approving the details contained in the shop drawing.

One key to limiting liability is to have clear contract language describing exactly the purpose of and limitations on the designer's review of shop drawings. But it is just as important for the designer to act and communicate in ways that are consistent with that contract language; if not, the courts could find that the contract limitations have been modified or waived by the parties' course of conduct.

Scheduling of shop drawing review is also critical to assure proper review and timely turnaround. With poor advance planning, the designer may find himself suddenly inundated with shop drawings to review, all of which require quick turnaround time. Faced with a sudden surge of work under deadlines, the designer is forced to spend less time on each drawing or to put less experienced personnel on the job. Mistakes are therefore more likely to occur.

Finally, architects and engineers must also recognize their critical responsibilities in the shop drawing review process and the potential for disaster. It is common for shop drawing review to be left to the least experienced member of the design professional's firm, and some firms consider shop drawing review as a cost reduction item when project overruns begin cutting into the designer's anticipated profit. The Hyatt case illustrates that spot checking and other cost-saving shortcuts can be short-sighted and even disastrous. ■