

Design for Construction Safety (DfCS) **A Review of Risks and Challenges for Design Professionals**

ACEC Risk Management Committee

Design for Construction Safety (DfCS)¹ is a safety initiative that calls for design professionals to “explicitly consider construction worker safety when designing a building”² or other type of project. It adds “another item to architects’ and engineers’ design criteria: the facility should not include unnecessary construction risks and project documents should alert constructors to unavoidable hazards.”³ One of the classic examples of DfCS in action involves a parapet wall, which is required by IBC to be at least 30 inches above the roof. OSHA presently requires a guardrail that is 36-42 inches high. By specifying a parapet that is, say, 39 inches high, the designer can provide built-in fall protection for roofers and HVAC installers.

DfCS is part of a larger movement called Prevention through Design (PtD): “Addressing occupational safety and health needs in the design process to prevent or minimize the work-related hazards and risks associated with the construction, manufacture, use, maintenance, and disposal of facilities, materials, and equipment.”⁴ The PtD and DfCS concepts are gaining traction in various sectors of the construction industry. For example:

- The National Institute for Occupational Safety and Health launched a PtD initiative in 2007.
- In 2012, the American National Standards Institute (ANSI) and the American Society of Safety Engineers (ASSE) published a voluntary standard entitled “ANSI/ASSE Z590.3-2011 – Prevention through Design: Guidelines for Addressing Occupational Hazards and Risks in Design and Redesign Processes.”
- Two scholars at Oregon State University have proposed a “Sustainable Construction Safety and Health Rating System,” which posits that safety should be part of a project’s sustainability goals and lays out a scheme whereby projects could earn credits by incorporating certain safety and health elements in the design.⁵

In this paper, we’ll focus on the concept of DfCS, although many of the points made here would apply to PtD in general.⁶ The idea of designing hazards out of the construction process has undeniable appeal.

¹ DfCS is also known as Construction Prevention through Design (CHPtD).

² T. Michael Toole and John Gambatese, *The Trajectories of Prevention through Design in Construction*, 39 *Journal of Safety Research* 225 (2008).

³ *Ibid.*

⁴ National Institute for Occupational Safety and Health (NIOSH), *Prevention Through Design*, <http://www.cdc.gov/niosh/topics/ptd/>

⁵ See www.sustainable-safety-and-health.org

⁶ PtD encompasses a duty to design not only for construction safety (DfCS), but also for the safety of those who will use and maintain the facility. While this aspect of PtD is beyond the scope of this paper, it is of concern to design professionals for reasons similar to those we outline with respect to DfCS. We would normally assume that occupational safety risk should be borne by the owner – the party best able to control the risk – so long as the

Construction is a hazardous industry and it may well be true that design professionals can take part in making it safer depending on the design professional's role in each project.

But before design professionals can embrace the concept of minimizing construction hazards through design, we will need to find a way to minimize the hazards that DfCS poses for design professionals. Design firms who are not responsible for constructing the project – “pure design” firms – typically sign contracts that expressly disclaim responsibility for the means and methods of construction, including jobsite safety, and assign that risk solely to the construction contractor. This is consistent with the risk management maxim that risk should be allocated to the party best able to control the risk.

DfCS has the potential to change that allocation of risk by suggesting that design professionals do have some obligation to consider construction safety when designing the project. In this paper, we'll explore some of the potential problems with that reallocation, and consider if and how it could be made more appropriate.

It should be noted that the discussion below pertains to “pure design” firms only. Design professionals who are responsible for construction, such as EPC firms and designer-led design-builders, may be proper parties to bear its risks, including the risk of jobsite safety. For these firms, the DfCS initiative may represent an important opportunity to protect their own employees as well as subcontractors' employees from jobsite hazards and thereby not only reduce injuries on a given project but also, less importantly, reduce their insurance premiums through the resulting decrease in ratable losses.

The Hazards of DfCS

Risk of Lawsuits by Injured Workers

If design professionals are to design with construction safety in mind, it seems likely that they will become much more vulnerable to lawsuits filed by injured workers alleging that “but for” the designer's failure to include some protection or other, the worker would not have suffered harm. Unlike the worker's employer, the design professional is not protected by Workers Compensation immunity, and thus is a target for this type of lawsuit.

Suits filed by injured workers against design professionals can be difficult to defend and expensive to settle, and frequently involve little, if any, fault on the part of the design professional. Fortunately, they are relatively uncommon – one major professional liability insurer reports that they account for only 1% of claims against their policyholders – but the likely reason is that design professionals' contracts

design professional performs in accordance with the standard of care and applicable codes. PtD would shift some of this risk to the design professional, despite the fact that the design professional has extremely limited ability to control it.

typically place complete responsibility for worker safety on the constructor, rather than the design professional.⁷

If, however, the standard of care for design professionals comes to include a duty to design for worker safety, the contractual disclaimer of jobsite safety responsibility will lose much of its defensive force. Whatever the contract says, the plaintiff can and will argue that the design professional's failure to prevent the hazard that caused the plaintiff's injury amounts to professional negligence.⁸

One suggested solution is to enact legislation that would allow design professionals to perform some level of DfCS without incurring "inappropriate liability."⁹ To our knowledge, no such legislation has yet been drafted or proposed in any state. It seems likely that the plaintiff's bar would vigorously oppose any such "Safety Samaritan" legislation, not to mention the challenges of having such legislation enacted in all 50 states.

Risk that the Owner may not support DfCS

DfCS adds a new criterion to the design process: the mitigation of construction safety hazards. But what if the client does not agree that this criterion is worth considering or, perhaps more importantly, funding? It seems fair to assume that some DfCS elements will involve additional design and construction cost and add more time to the project schedule, and others may not align with the client's aesthetic or other goals for the project. One possible solution lies in educating clients about the benefits of DfCS. That said, there will probably always be clients who fail to see its utility. And even assuming that it is possible to eliminate all hazards through design, the measures taken may render the project inoperable, not constructable, or simply too expensive to build, operate, or maintain.

This "rock and a hard place" scenario is inevitable unless DfCS is truly optional, rather than an essential step toward meeting the standard of care on each and every project. If DfCS does eventually become

⁷ Victor O. Schinnerer & Company, Inc., *Claims Study: Nonworker Bodily Injury Claims*: "Between 2002 and 2011, bodily injury claims from construction workers accounted for just 1% of all claims, whereas bodily injury claims from nonworkers accounted for 10% of all claims. The lower rate for construction workers may be the result of contractual language that places responsibility for job site safety with the contractor and not the design professional." Note that an individual firm's incidence of claims may be higher than 1%, depending on the firm's discipline, area of practice, and other factors.

⁸ While it will be up to the courts to determine the applicable standard of care as DfCS evolves, possible contract language to consider in the interim might look like this: "The Client understands and acknowledges that the design and construction process for this project poses certain risks to the Design Professional, the Owner, and the Owner's Contractors. The parties agree that the Contractors who will be carrying out the Work are in the best position to establish the means and methods for construction, including consideration of job site safety which is consistent with Contractors' planned execution of the Work, together with the impact of such means and methods on the Owner's project budget and schedule. Accordingly, the Client acknowledges and agrees that Design Professional shall not be responsible for the means and methods of construction, including safety precautions, and its design shall not address the potential hazards of the construction process. Design Professional's standard of care shall not be increased to include these responsibilities."

⁹ Toole and Gambatese, *Trajectories of Prevention* at 228.

the standard of care for design professionals, then the design professional will have no choice but to implement it or face liability for negligence.

If the Owner's project delivery approach is design-bid-build (DBB), this adds another obstacle for the design professional to have much impact on construction worker safety. During the design process, especially in the public sector civil works realm, the design professional has no idea which contractor will be building the project, has no opportunity to discuss with the contractor any safety issues during the design phases, and has no knowledge of the contractor's planned means and methods. The design professional's ability to effectively contribute to construction safety under this scenario is greatly diminished, if not completely eroded.

Risk that the design professional does not possess the requisite skills

Effective deployment of PtD and DfCS requires that design professionals possess "at least a cursory understanding of what goes on in the field – that is, to gain at least a fundamental understanding of building means, methods, and processes" along with an understanding of the interaction of each trade with other trades.¹⁰ To the extent design professionals lack this knowledge, training, and experience, they must acquire it for DfCS to be successful.¹¹ The potential cost of this training likely would be substantial, and would include a significant investment of employee time as well.

Conclusion

Design professionals should monitor the Prevention through Design and Design for Construction Safety initiatives and, through professional organizations like ACEC, make sure that their proponents are aware of the importance of a fair allocation of risk for the design professionals involved.

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¹⁰ T. Michael Toole, *Internal Impediments to ASCE's Vision 2025*, April 2011 Leadership and Management in Engineering 197, at 202.

¹¹ Complicating this learning process is the fact that each contractor's means, methods, and processes are unique to that contractor. Hence the design professional will need to acquire this knowledge for *every project*, and find a way to respond to it with DfCS tactics.