

CONSTRUCTION SAFETY DESIGN  
SOLUTION #12  
DESIGN CATEGORY: SITE  
HAZARD: FALLS DUE TO SCAFFOLD  
COLLAPSE  
DESIGN SOLUTION: DESIGN  
PERMANENT FEATURES INTO  
THE BUILDING THAT MAKE IT  
EASIER AND SAFER TO



This design solution reduces the risk of serious falls due to scaffold collapse. Scaffolding is a temporary structure used to support workers and material during the construction, repair, or maintenance of buildings and structures. Design professionals generally do not concern themselves with scaffolding, thinking it is the responsibility of the contractor(s). Falls from scaffolding ranks second in the number of construction fatalities due to falls, about 46 each year (BLS, 2009). A percentage of these falls are due to scaffold collapse. In August of 2009, a 42-year-old construction worker at a Brooklyn apartment building plunged four stories to his death when a scaffold suddenly collapsed.

#### **SOLUTION**

Designers should consider permanent features that will make it easier and safer to erect scaffolding. For example, scaffold needs to be laterally supported to resist wind and other lateral loads. An important element of the scaffold system is the building tie which connects the scaffold to the structure. Permanent building ties such as the one shown in the figure below not only can be reused if scaffolding is needed in the future, but is stronger than relying on the strength of day old veneer. A metal bracket is permanently connected to a concrete floor deck or steel. An eye bolt threads into the bracket to provide a building tie. The tie is easily removed by simply unthreaded the eye bolt and can be reused in the future.

Davits can be installed around the perimeter of the roof to provide a permanent suspension system for self powered platforms and single man cages. Davit sockets can be recessed below the pavers and the davits can be bolted in place only when needed. Monorail systems can be installed along the building profile. These systems can be used to suspend work platforms and be aesthetically pleasing at the same time. Gantry systems can be designed to maintain atriums and skylights



Figure 1 This photo shows how building ties can be designed so that they are easier to remove and can be reused.



Figure 2 This photo shows how davits can be installed to provide a permanent suspension system.



Figure 3 This photo shows how monorail systems can be installed along a building profile. They can be used to suspend work platforms.



Figure 4 Gantry systems can be designed to maintain atriums and skylights.

## BACKGROUND INFORMATION

OSHA 1926 Subpart L-Scaffolds

[http://www.osha.gov/pls/oshaweb/owadisp.show\\_document?p\\_table=STANDARDS&p\\_id=10916](http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=10916)

ANSI/ASSE A10.8 Safety Requirements for Scaffolding

Scaffold and Access Industry Association SAIA <http://www.saiaonline.org/AboutSIA>

N.C. Department of Labor Occupational Safety and Health Division

<http://www.nclabor.com/osha/etta/indguide/ig38.pdf>

## **OTHER CONSIDERATIONS**

- When it is not possible to provide tying points or other permanent features, allow sufficient room in the design so that outriggers or buttresses can be used to secure the scaffold.
- Try to provide as much information regarding material weights to the contractor. This will make it easier for the contractor to control the load on the scaffold system.
- Consider potential scaffold loads when designing parapet walls and structural steel.
- Consider designing permanent tie back anchors that can be used to secure building maintenance systems and boatswain chairs. The anchors can be wall mounted, flush, or “U” mounted, and can be designed to reduce architectural visibility.

## **LIFE CYCLE SOLUTION BENEFITS**

Permanent, reusable tying points and other building features provide a life cycle benefit because they can be used when scaffolding is needed for future repairs and maintenance.

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