

**CONSTRUCTION SAFETY DESIGN  
SOLUTION #4  
DESIGN CATEGORY:  
ENVELOPE/INTERIOR  
HAZARDS: FALLS FROM  
STRUCTURAL STEEL**



This design solution reduces the risk of serious falls from structural steel during the construction of a building. Falls from structural steel can result in death or serious injury – about 36 fatalities per year [BLS, 2008] are reported.

**SOLUTION**

Designers can specify features that make it safer and easier to erect structural steel. For example, hanging connections should be avoided. Safety seats at column connections would eliminate this by providing support for girders during the connection process.

Perimeter safety cables should be installed as soon as the metal decking has been installed. Specifying holes in columns at 42 inches plus or minus 3 inches and 21 inches above each floor slab make it easy to install cable or wire perimeter cables.



Specify holes in columns at 21 and 42 inches above the floor slab. This design feature makes it easy to install cable or wire perimeter cables.



Design safety seats (see arrow) at column connections. The safety seats eliminate hanging connections making the connection process easier.

## **BACKGROUND INFORMATION**

### Applicable US Safety Regulations

#### OSHA Construction standards

1926.760(a)(1) Except as provided by paragraph (a)(3) of this section, each employee engaged in a steel erection activity who is on a walking/working surface with an unprotected side or edge more than 15 feet above a lower level shall be protected from fall hazards by guardrail systems, safety net systems, personal fall arrest systems, positioning device systems or fall restraint systems.

1926.760(a)(2) On multi-story structures, perimeter safety cables shall be installed at the final interior and exterior perimeters of the floors as soon as the metal decking has been installed.

1926.760 (3) Perimeter safety cables shall meet the criteria for guardrail systems in 1926.502.

### Other Applicable Design Guidelines:

National Institute of Steel Detailing and Steel Erectors Association of America. *Detailing Guide for the Enhancement of Erection Safety*. 2001. [www.nisd.org](http://www.nisd.org) and [www.seaa.net](http://www.seaa.net).

## **OTHER CONSIDERATIONS**

- Shop welded connections should be specified whenever possible instead of bolts or field welds to avoid dangerous positions during erection.
- For bolted beam connections, provide an extra hole into which a spud wrench or other object can be inserted to provide continual support for the beam during installation of the bolts
- Be familiar with the physical constraints for making connections. Try to avoid tight spaces and provide ample room for tools used in making connections.

*Through the OSHA Alliance Program's Construction Roundtable, the Roundtable participants developed this product for informational purposes only. It does not necessarily reflect the official views of OSHA or the U.S. Department of Labor.*