



## SCAFFOLDING SECTION

# SSFI TECHNICAL BULLETIN

## Importance of Bracing

When erecting any scaffold, some thought must be given to the bracing that will be required. A brace, in simple terms, is a structural member used to stiffen a structure. The bracing required for a particular scaffold will depend on the type of scaffold used and the manufacturer's design. There are some types of scaffolds where crossbracing is not required; however, the need for bracing, or "stiffening", of the scaffold structure is present for all scaffolds.

A triangle is the most rigid geometric shape. A square or rectangle without a diagonal brace will easily collapse. Imagine a cardboard box with the top and bottom flaps opened up. The box will become a parallelogram, or flatten, easily. The box will not retain its shape. Similarly, a single scaffold bay built with only horizontals connecting the legs will not be rigid. It could easily become a parallelogram.

Federal OSHA requires, in 29CFR1926.451(c)(3), that scaffold legs be plumb and braced to prevent swaying and displacement. This bracing is accomplished with a combination of horizontal and diagonal members. Also, on fabricated frame scaffolds, OSHA requires, in 29CFR1926.452(c)(2), that frames are braced by cross, horizontal or diagonal braces, or a combination thereof, which secure vertical members together laterally. The cross braces must automatically square and align vertical members so the scaffold stays plumb, level and square.

All scaffolds, whether fabricated frames, tube and coupler, system or Euro-style frames, need to be properly braced. As the OSHA regulations state, braces serve several purposes. They secure the vertical members (legs) together. They square and align the legs so the scaffold stays plumb. And they resist sway forces that result from horizontal loads imposed on scaffolds from wind and worker movement.

Fabricated frame scaffolds require the use of crossbraces. In addition to squaring and aligning the legs, they reduce the unbraced length of the leg, thereby giving the frame a higher load capacity than it would otherwise have. Tube and coupler scaffolds use continuous diagonal face bracing and transverse X-bracing for rigidity. System and Euro-style frame scaffolds are proprietary scaffold systems. The required bracing will be specified by the manufacturer.

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This Technical Bulletin was prepared by members of the SSFI Scaffolding Section. SSFI is a trade association comprising manufacturers of scaffolding, shoring, forming, and suspended scaffolding. The institute focuses on engineering and safety aspects of scope products.

This bulletin does not purport to be all-inclusive nor to supplant or replace other additional safety and precautionary measures to cover usual or unusual conditions. If this bulletin conflicts in any way with a state, local, federal or other government statute or regulation, said statute or regulation shall supersede this bulletin and it shall be the responsibility of each user to comply therewith. This bulletin has been developed as an aid to users of scaffolding equipment.

## Importance of Bracing

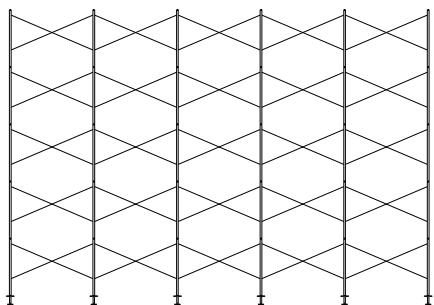
Removal of braces is a common occurrence on work sites to allow better access to the wall surface. On fabricated frame scaffolds, some crossbraces may be removed; however, removal of crossbraces will depend upon a number of factors, including the height of the scaffold, number of planked levels, number of active work levels, type and location of ties, among others. Check with the manufacturer or a qualified person before removing braces. Various bracing patterns can be used to leave every other bay open, but generally crossbraces must be left in place.

Tube and coupler, system and Euro-style frame scaffolds are braced differently than fabricated frame scaffolds. The number of crossbraces on the typical fabricated scaffold provides a level of redundancy that is not present on other types of scaffolds. Before attempting to remove braces on tube and coupler, system or Euro-style frame scaffolds, check with the manufacturer or a qualified person.

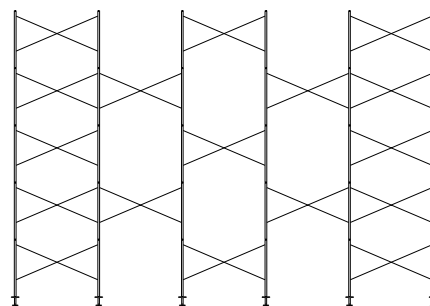
All scaffolds must be erected under the supervision of a competent person (29CFR1926.451(f)(7)). OSHA also requires, in 29CFR1926.454(b), that all persons involved in erecting scaffolds be trained in the correct procedures for erecting the type of scaffold in question. This will help to ensure that the scaffold will be erected according to applicable regulations and manufacturer's instructions. For more information, consult the latest editions of the following OSHA and ANSI standards.

- 29CFR1926, Subpart L (OSHA scaffold standards)
- ANSI A10.8

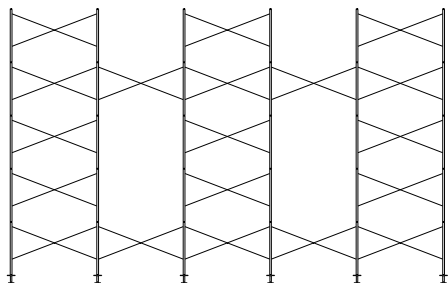
Fabricated frame scaffold crossbracing options:



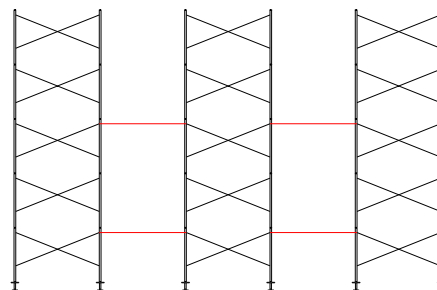
Full Bracing



Skip (Checkerboard) Bracing



Tower Bracing (with crossbraces)



Tower Bracing (with rails)