Safety Issues
Sills

Tech Tip

Start with the sill.

All too frequently we see scaffolds placed directly on the ground without the use of base plates and sills. Common sense should tell us that doing so is not safe, as the scaffold leg or post could sink into the ground, and the scaffold could tip or fall over.

Placing scaffold legs or posts directly on wood sills or concrete blocks is also not a safe alternative. Scaffold legs or posts are constructed of thin wall tubing that will sink into the wood and crack it or will cause a cinder block to crack and break when heavy loads or shock loads are imposed on the scaffold leg.

Using Base Plates

Supported scaffolds, with the exception of Tube & Clamp scaffold, should be erected using base plates with screw jacks to level the scaffold (Tube & Clamp scaffold requires base plates only). Using base plates will provide some scaffold support; however, used by themselves are not the sole answer. Base plates should also be used in combination with sills.

Scaffolds are used for a variety of purposes, and ground conditions vary. As a result, there are no hard and fast universal rules governing all ground or foundation situations.

Soil for instance, especially top soil, is made up largely of organic matter which is unstable, often contains large amounts of water and is very compressible. Scaffold legs or posts, on the other hand, have a very small surface area. Even scaffold legs or posts equipped with base plates will sink into a soft surface.

To prevent this from happening, always erect stationary scaffolds on both base plates (preferably with screw jacks to level the scaffold) and sills to further distribute the scaffold weight and load to the foundation.

The unknown in this equation is how big and how thick to make the sills for proper scaffold support.

Sill Design

Actual sill design will depend upon the foundation's ability to support the scaffold load (known as soil bearing capacity) and the rated scaffold load capacity.

The ground's bearing capacity is measured in pounds per square foot (psf) and will vary depending upon composition (soil makeup), weather conditions, time of year, location and length of time the scaffold will be in place (special consideration should be given for wood sills left in place over long periods of time). Foundation bearing capacities range from 500 psf for soft soil to more than 8,000 psf for hard-pan and concrete.

Scaffold design leg load capacities will vary depending upon the type of scaffold used. As an example, the rated load capacity of welded frame scaffold ranges from 2,000 to 3,000 pounds per leg, depending upon their height and configuration. Tube & Clamp scaffold can support as much as 3,000 pounds per post, and Systems™ Scaffold can support as much as 8,000 pounds per post when braced at each node point (horizontal attachment point) in both directions.

If both the scaffold load capacity and ground bearing pressure are known, the required sill area and thickness needed to support the scaffold load can be determined.

Ground Considerations

Unfortunately, the ground bearing capacity is not always known, therefore judgments must be made. This makes sill selection more difficult. The chart on the next page is provided to help you choose the proper sill size and thickness based on various ground bearing pressures.

The chart assumes that the scaffold will be erected on solid ground. If the scaffold is erected over vaults on elevated slabs, floors, roofs, etc., reshoring from below the supporting surface may also be required. In these cases, contact a person qualified in reshoring before erecting the scaffold. When sills are used, to be effective, they must be centered under the base plates and toe nailed to the base plates to prevent possible dislodgment.

SAFWAY®

Scaffold Leg Load	Sill Type	Allowable Ground Bearing Pressure pounds per square foot (psf)			
		500 psf mud/organic silt, unprepared fill	**3,000 psf** sand/silty sand/clayey sand/ silty gravel/clayey gravel/ stiff clay/ firm, inorganic silt	**4,000 psf** hard, dry clay	**5,000 psf** gravel/very compact mix of clay, sand and gravel
500 lbs./leg	Plywood	¾" x 12" x 12"	¾" x 7" x 7"	¾" x 7" x 7"	¾" x 7" x 7"
	Lumber	1½" x 9¼" x 16"	1½" x 9¼" x 10"	1½" x 9¼" x 10"	1½" x 9¼" x 10"
1,500 lbs./leg	Plywood	Not Recommended	1½" x 9" x 9"	¾" x 7" x 7"	¾" x 7" x 7"
	Lumber	1½" x 9¼" x 46"	½" x 9¼" x 17"	1½" x 9¼" x 17"	1½" x 9¼" x 17"
2,400 lbs./leg	Plywood	Not Recommended	2¼" x 11" x 11"	1½" x 10" x 10"	1½" x 9" x 9"
	Lumber	Contact Engineering	1½" x 9¼" x 27"	1½" x 9¼" x 27"	1½" x 9¼" x 27"
3,000 lbs./leg	Plywood	Not Recommended	3" x 12" x 12"	2¼" x 11" x 11"	1½" x 10" x 10"
	Lumber	Contact Engineering	1½" x 9¼" x 34"	1½" x 9¼" x 34"	1½" x 9¼" x 34"
4,000 lbs./leg	Plywood	Not Recommended	3¾" x 14" x 14"	3" x 12" x 12"	2¼" x 11" x 11"
	Lumber	Contact Engineering	3" x 9¼" x 23"	3" x 9¼" x 23"	3" x 9¼" x 23"

2¼" Plywood = 3 Sheets of ¾"

1½" Plywood = Double ¾"

3" Lumber = Double 1½"

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