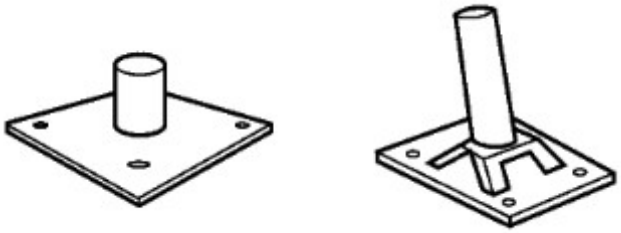
SCAFFOLD & ACCESS INDUSTRY ASSOCIATION

IMPORTANCE OF BASEPLATES – CANADIAN EDITION

Supported scaffolds require baseplates to evenly distribute all loads (Dead, Live, Environmental, etc.) from the scaffold onto the ground or supporting surface, ensuring stability and preventing sinking or shifting. Without baseplates, the scaffold could potentially overload the supporting surface which might result in settlement or the scaffold becoming unstable, posing significant safety risks to workers and the structure.

In Canada, the requirement for scaffolds to have base plates is typically outlined in **provincial occupational health and safety regulations** rather than a single national regulation. Standard CSA Z797-23: Code of Practice for Access Scaffolds Section 5.7, while not regulatory, is often referenced in provincial regulations. It specifies that scaffolds must be erected on proper foundations, such as base plates, to ensure stability and safety. Provincial and territorial regulations define requirements for the use of base plates for scaffolding to ensure stability and load distribution. These are regulatory requirements. Examples of this are in Ontario Regulation 213/91, WorkSafe BC Regulation Part 13, Alberta Occupational Health and Safety Code Part 23 (to name a few provinces).

There are two things required below each scaffold leg: 1) a base plate, and 2) sill or other adequate firm foundation.



See Figure 1 for graphic of what a typical base plate looks like:

Q: Why are base plates required? Why can't I just put a plywood pad directly below the leg without a base plate?

A: The regulations require that the footing shall be level, sound, rigid, and capable of supporting the loaded scaffold without settling or displacement. The only way to prevent settling or displacement is to make sure the load is spread out over a large enough area. Putting a leg directly on a plywood pad or wood sill will focus all the scaffold load onto a very small area and cause the leg to bite or sink into the wood. This is known as settling and must be avoided as it will pull the assembly out of plumb.

The calculations shown on the following page for a system scaffold leg sitting directly on a plywood pad show that even with a structural grade of plywood, the allowable leg load on the plywood is only ~1.55 kN (~349 lbs) when wet or ~1.94 kN (436 lbs) when dry. Such a load is much less than the scaffold's capacity and less than the loading typically imposed. This is the total load; dead load of the scaffold and platform and the imposed live load. The crosssectional area of a typical scaffold leg is typically 453 mm2 (0.702 in2) (see calculations on the following page). This provides a very small contact area between the bottom of the scaffold leg and the plywood. The leg will crush the wood fibers and cut into the plywood creating an indentation in the plywood and undesirable movement in the scaffold. Using a base plate will distribute the leg load to a much larger area, typically about 150 mm x 150 mm (6" by 6"), or 22,500 mm2 (36 in2).

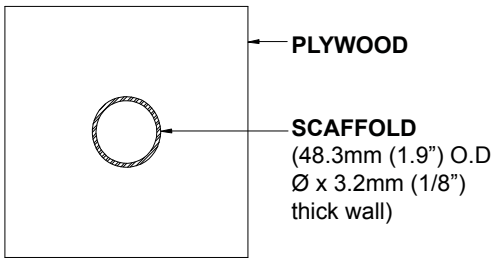
Placing a scaffold leg directly onto a concrete slab is also not allowed. The compressive strength of concrete is generally in the 20-35 mPa (3000 – 5000 psi) range. Using an average of 27.5 mPa (3990 psi), the allowable load capacity in imperial calculations of a scaffold leg on concrete would be 27.5 mPa x 453 mm2 (3990 psi x 0.70 in2) = 12.5 kN (2,810 lbs). While this is much greater than a scaffold leg on plywood, it is still significantly less than the typical capacities of scaffold legs.

Always use base plates or screw jacks with base plates on all scaffolds. Scaffolds built on concrete slabs will generally not need a sill but scaffolds built on the ground (whether asphalt, grass, backfill, etc.) will require a mud sill.

Q: How big must the mud sill be?

A: It must be large enough to support the scaffold load without settling. Considerations for determining sill size should include maximum anticipated loading, the supporting material, levelness of the surface, and anticipated moisture conditions for the full duration of the scaffold service. Check with a qualified person if necessary.

Plywood Calculations
Assume Douglas Fir Plywood - 6-ply
Thickness 18.5mm



From CanPly Association Design Specification:
Compressive Resistance Perpendicular to Face (normal to plane of panel):
Qr =ϕQp Ab
where:
ϕ= 0.95
Qp = qp (KD KS KT)
qp = Specified strength capacity in bearing normal to plane of panel = 4.5 mPa
KD = Load duration factor =1.0 for standard-term load duration
KS = Service condition factor = 0.8 for wet use; 1.0 for dry use (MC < 16%)
KT = Treatment factor = 1.0 for untreated plywood
Ab = Bearing area (mm2 or ft2)

Scaffold Leg Area: Ab= (D2−d2) × π/4

Parameter	Metric	Imperial
Tube OD (D)	48.3 mm	1.90 in
Wall Thickness	3.2 mm	1/8 in
Tube ID (d)	41.9 mm	1.65 in
Bearing Area (Ab)	453 mm²	0.702 in²

Max. Allowable Load on Plywood: Qr = φ × Qp × Ab

Parameter	Metric	Imperial
ϕ	0.95	0.95
Qp(DRY) = qp (KD KS KT)	4.5 mPa(1.0 x 1.0 x 1.0) = 4.5 mPa	653 psi (1.0 x 1.0 x 1.0) = 653 psi
Qp(WET) = qp (KD KS KT)	4.5 mPa(1.0 x 1.0 x 0.8) = 3.6 mPa	653 psi (1.0 x 1.0 x 0.8) = 522 psi
Qr(DRY)	0.95 x 4.5 mPa x 453 mm² = 1,940 N ≈ 1.94 kN	0.95 x 653 psi x 0.702 in² = 436 lbs
Qr(WET)	0.95 x 3.6 mPa x 453 mm² = 1,550 N ≈ 1.55 kN	0.95 x 522 psi x 0.702 in² = 348 lbs

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