



Scaffolding

Part 6: Metal tube-and-coupler scaffolding — Deemed to conform to AS/NZS 1576.1



AS 1576.6:2020

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- Engineers Australia
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Preface

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee BD-036, Scaffolding, to supersede AS/NZS 1576.6—2000, *Scaffolding, Part 6: Metal tube-and-coupler scaffolding—Deemed to comply with AS/NZS 1576.3*.

After consultation with stakeholders in both countries, Standards Australia and Standards New Zealand decided to develop this Standard as an Australian Standard rather than an Australian/New Zealand Standard.

The objective of this Standard is to provide tabulated geometrical limits and guidance which, when applied to tube and coupler installations, would ensure conformance to requirements of AS/NZS 1576.1.

This edition includes the following technical changes from the previous edition:

- (a) The height of scaffolding that is covered, as specified by the Scope, has been reduced from 33 m to 30 m top working platform height.
- (b) The requirements for both facade and birdcage scaffolds have been revised.

This Standard includes a commentary on some of the clauses. The commentary directly follows the relevant clause, table or figure, is designated by "C" preceding the clause number and is printed in italics in a box. The commentary is for information and guidance and does not form part of the Standard.

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Australian Standard®

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Section 1 Scope and general

1.1 Scope and exclusions

1.1.1 Scope

This Standard specifies requirements for unsheeted metal tube-and-coupler scaffolding that does not exceed 30 m in height to top working platforms deemed to conform to the performance requirements of AS/NZS 1576.1 for light, medium and heavy duty loads.

1.1.2 Exclusions

This Standard does not apply to —

- (a) prefabricated (modular) scaffolds (see AS 1576.3);
- (b) scaffolding installations that require specific engineering design to establish the strength of any part of the scaffold or the adequacy of the supporting structure; and

NOTE Examples of scaffolding installations that require a specific engineering design are access openings, cantilever scaffolds, catch platforms (fans), drilled-in anchors, trusses and tube-and-coupler scaffolds that support any form of screening (e.g. chain-wire mesh, fabricated-mesh panels, plastic sheeting, plywood, shade cloth).

- (c) scaffold components used as temporary edge protection (see AS/NZS 4994.1) where they do not form part of the scaffold.

1.2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document.

NOTE Documents referenced for informative purposes are listed in the Bibliography.

AS 1892.1, *Portable ladders, Part 1: Performance and geometric requirements*

AS/NZS 1163, *Cold-formed structural steel hollow sections*

AS/NZS 1576.1, *Scaffolding, Part 1: General requirements*

AS/NZS 1576.2, *Scaffolding, Part 2: Couplers and accessories*

AS 1576.3, *Scaffolding, Part 3: Prefabricated and tube and coupler scaffolding*

AS/NZS 1577, *Scaffold decking components*

AS/NZS 2269, *Plywood—Structural*

1.3 Definitions

For the purpose of this Standard, the definitions given in AS/NZS 1576.1 and those below apply.

1.3.1**may**

indicates the existence of an option

1.3.2.**reveal tie**

scaffolding assembly used in compression within a reveal to secure a scaffold to a structure

1.3.3**shall**

indicates that a statement is mandatory

1.3.4**should**

indicates a recommendation

1.35**uplift**

lifting of one end of a plank, caused by a downward force being applied to the other end of the plank

1.4 Duty classification

The duty classification of working platforms shall conform to AS/NZS 1576.1. Duty live loads shall include impact forces and the weight of persons, materials, debris, tools and equipment.

The following duty classifications and minimum widths of working platforms shall apply:

- (a) *Light duty* — A load of 225 kg (including a single concentrated load of up to 120 kg) per bay, per working platform level and a working platform width of not less than 450 mm.
- (b) *Medium duty* — A load of 450 kg (including a single concentrated load of up to 150 kg) per bay, per working platform level and a working platform width of not less than 675 mm.
- (c) *Heavy duty* — A load of 675 kg (including a single concentrated load of up to 200 kg) per bay, per working platform level and a working platform width of not less than 900 mm.

NOTE The number of working platform levels allowed will depend on the type of scaffold, bay size and the height of the scaffold. Table 3.3 and Table 3.4 indicate the duty and number of working platform levels for steel tube installations and aluminium tube installations respectively.

Section 2 Components

2.1 Tubes

2.1.1 Steel tubes

Steel tubes shall —

- (a) be manufactured by the electric resistance weld process (ERW);
- (b) have a minimum yield strength of 250 MPa and shall conform to AS/NZS 1163;
- (c) have a nominal outside diameter of 48.3 mm; and
- (d) have a nominal wall thickness of 4.0 mm (a galvanized tube with a nominal wall thickness of 3.2 mm may be used).

2.1.2 Aluminium tubes

Aluminium tubes shall have —

- (a) a minimum yield strength of 240 MPa;
- (b) a nominal outside diameter of 48.4 mm; and
- (c) a nominal wall thickness of 4.47 mm.

2.1.3 Mixing of tubes

Steel tubes and aluminium tubes shall not be mixed in the one scaffold, except for guardrails, midrails or other members that have an independent structural function.

NOTE For example, standards support load in conjunction with other standards and with spur braces, so groups of these elements should be of the same material. A jointed vertical standard assembly will accumulate load down a load path; so the material should be consistent throughout to ensure predictable structural action, unless specific engineering design has been applied.

2.2 Couplers and accessories

Couplers and accessories shall be in accordance with AS/NZS 1576.2.

2.3 Scaffold planks

Scaffold planks shall be in accordance with AS/NZS 1577.

2.4 Soleplates

On surfaces such as compacted soil or gravel, soleplates shall be —

- (a) positioned under the baseplates; and
- (b) large enough and configured so that sufficient bearing area is created to spread the load from the baseplate to the supporting surface to prevent subsidence or damage to that surface.

NOTE Timber scaffold planks used as soleplates should not include excessive longitudinal splits.

Section 3 Independent scaffold

3.1 Standards

Standards shall —

- (a) be founded on baseplates;
- (b) be vertical;
- (c) extend to the full height of the scaffold;
- (d) be spaced as specified in [Table 3.1](#);
- (e) be joined with end-to-end couplers; and
- (f) not have joints that occur —
 - (i) in longitudinally or transversely adjacent standards in the same lift;
 - (ii) in the same standard in adjacent lifts;
 - (iii) more than once between adjacent ledgers; or
 - (iv) more than 300 mm from a ledger.

Table 3.1 — Maximum spacing of standards for independent or birdcage tube-and-coupler scaffolds

Duty classification (see AS/NZS 1576.1)	Tube material	Maximum longitudinal spacing of standards mm Bay length	Maximum transverse spacing of standards mm Bay width	Minimum clear dimension mm (see AS/NZS 1576.1)
Heavy duty	Steel	1800	1200	900
	Aluminium	1800	1200	
Medium duty	Steel	2400	1800	675
	Aluminium	2100	1800	
Light duty	Steel	3000	2700	450
	Aluminium	2400	2100	

NOTE 1 The material specifications for steel and aluminium tube are stated in [Clauses 2.1.1](#) and [2.1.2](#) respectively. Further information on calculations is given in commentaries to [Tables 3.3](#) and [3.4](#).

NOTE 2 The maximum width is set to limit the bending moment of the putlogs of which there are typically two per bay (the imposed action for bending being 2/3 of the duty action for each putlog, applied as four point bending, with loads at 1/4 span from supports; and the deflection of the putlogs to less than 30 mm when the concentrated load for the duty action is applied at midspan).

NOTE 3 The maximum length is set to limit deflection of the ledgers to less than 30 mm when 85 % of the concentrated load for the duty is applied at midspan. The use of 85 % reflects the putlog's support reaction where the imposed load is 15 % of putlog span from the ledger providing such support reaction.

3.2 Ledgers

3.2.1 General

Ledgers shall —

- (a) be fixed to each standard in a longitudinal row with right-angle couplers;

- (b) be horizontal; and
- (c) extend to the full length of the scaffold.

Base lift ledger shall be fitted as close to the supporting surface as practicable, but not more than 500 mm from that surface. The distance between vertically adjacent ledgers shall be nominally 2000 mm.

If base lift ledgers and transoms are omitted, the appropriate reduction in either maximum scaffold height or the number of allowed working levels shall be as specified in [Clause 3.9](#).

3.2.2 Joints

Joints shall be made with joint pins or sleeve type end-to-end couplers.

Joints shall not be located —

- (a) in horizontally or vertically adjacent ledgers in the same bay;
- (b) in the same ledger in adjacent bays;
- (c) more than once between adjacent standards;
- (d) in the end bays of a scaffold; or
- (e) more than 300 mm from a standard.

NOTE Internal joint pins used in tubes of different wall thicknesses or in tubes produced by the ERW process are incapable of resisting tensile forces in the joint.

3.3 Transoms

Where transoms are used to fix transversely adjacent standards, they shall be —

- (a) full length tubes without joints;
- (b) horizontal;
- (c) fixed to each standard with right angle couplers; and
- (d) fixed as close as practicable to the node point of each ledger and standard.

Base lift transom shall be fitted as close to the supporting surface as practicable, but not more than 500 mm from that surface. The distance between vertically adjacent transoms shall be nominally 2000 mm.

If base lift transoms and ledgers are omitted, the appropriate reduction in either maximum scaffold height or the number of allowed working levels shall be as specified in [Clause 3.9](#).

3.4 Longitudinal bracing

The outside row of standards in the scaffold shall be provided with longitudinal bracing that —

- (a) extends from the base of the scaffold to its full height;
- (b) is provided in both end bays of every scaffold run;
- (c) is arranged —
 - (i) across the longitudinal plane of the bays, forming diagonal bracing (see [Figure 3.1](#)); or
 - (ii) up a bay, forming parallel bracing (see [Figure 3.2](#)); or

- (iii) up a bay, forming heel-and-toe bracing (see [Figure 3.3](#));
- (d) has any brace in sections joined by lapping or splicing; and
- (e) is fixed, as close as practicable to the node points at every crossing, to —
 - (i) the standard crossed with a swivel coupler; or
 - (ii) the transom crossed with a right-angle coupler.

The horizontal distance between intermediately braced panels in any lift shall not exceed three bays.

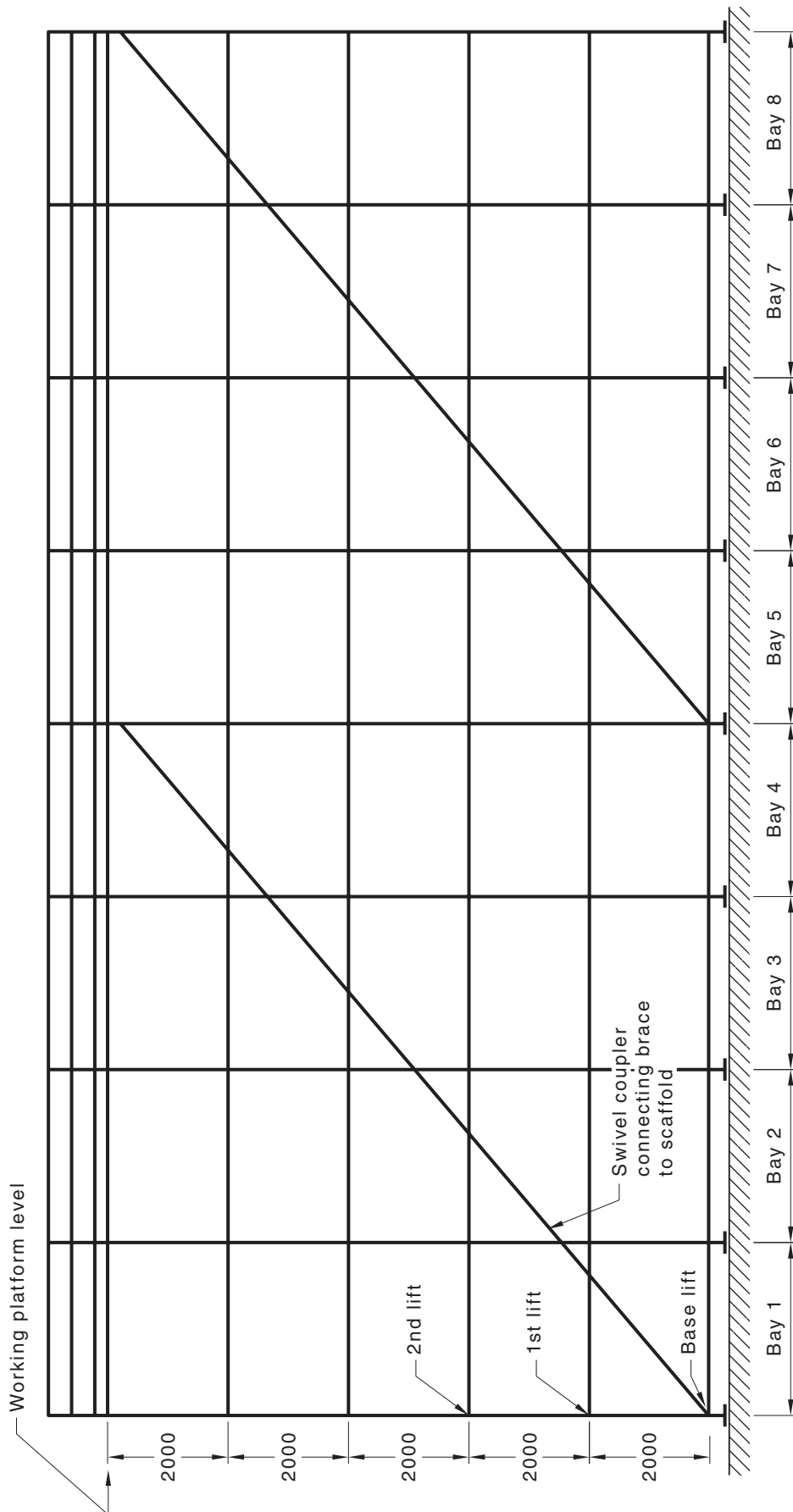
NOTE A typical brace against a slope is illustrated in [Figure 3.4](#).

3.5 Transverse bracing

Each end of the scaffold shall be provided with transverse bracing in each lift (see [Figure 3.5](#)) that —

- (a) extends from the base of the scaffold to its full height;
- (b) is arranged across the transverse plane of the bay, forming diagonals; and
- (c) is fixed, as close as practicable to the node points at every crossing, to —
 - (i) the standard crossed with a swivel coupler (see [Figure 3.6](#)); or
 - (ii) the ledger crossed with a right-angle coupler (see [Figure 3.6](#)).

Dimensions in millimetres



NOTE 1 Longitudinal braces are most effective at 45°.

NOTE 2 Edge protection at lower working platforms omitted for clarity.

Figure 3.1 — Typical diagonal bracing of tube-and-coupler scaffolding