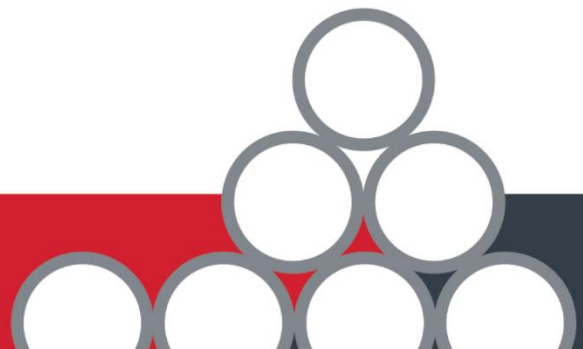




Scaffolding Erection Guide 2021



Introduction

This pamphlet is intended as reference for builders and other parties who intend to erect and use equipment hired or purchased from Smartscaff Pty. Ltd. More comprehensive information can be found in the Occupational Health & Safety (Plant) Regulations appropriate to your state and the latest issue Australian Standard "Guidelines for Scaffolding" AS/NZS4576. These documents contain the legal requirements for persons using and erecting scaffold equipment, and at all times take precedence over this pamphlet.

Who can erect scaffold equipment?

A properly constructed scaffold offers the best possible work environment for people working at heights. People erecting scaffold must be appropriately trained and supervised. Smartscaff therefore, recommends that all scaffolds are erected by persons holding a certificate of competency, however:

- For scaffolds with a working platform height of 4 metres or less, any physically sound person may erect a scaffold. • For scaffolds where a person or object can fall more than 4 metres the person erecting the scaffold must have a certificate of competency.
- As some scaffold components are quite heavy the physical capabilities of persons (erectors) erecting the equipment should always be taken into consideration.
- A minimum number of 2 people are required to erect a scaffold safely up to a height of 6 metres. Above 6 metres a crew size of 3 is recommended.

Identification of hazards – Australian Standards

As stated in the Australian National Scaffolding Standards – AS 4576:2020

Hazards that are commonly associated with scaffolding include, but are not limited to the following:

- Engaging in the erection and dismantling of the scaffold or access equipment
- Working over water
- Falls from heights
- Falling objects
- Manual handling
- Electricity
- Corrosive substances
- Volatile atmospheres
- Movement of cranes, vehicles and machinery
- Weak or unstable supporting structures or unstable ground conditions
- Stacking of equipment in unstable conditions
- High winds and storms
- Proximity to sources of radiation (eg. Mobile phone towers)
- Potential flammability of encapsulation.

Additional hazards identified by Smartscaff

- When erecting scaffold, the erector should not mix and match scaffold types unless the design has been subject to engineering.
- Hazards vary depending on state, ensure that you refer to the correct standards for the region and council the erection is taking place.
- Any scaffold over a height of 4M requires a design drawing and engineering. Smartscaff offers these services.
- Scaffold equipment should be checked for damages prior to use. Please contact us for more information.

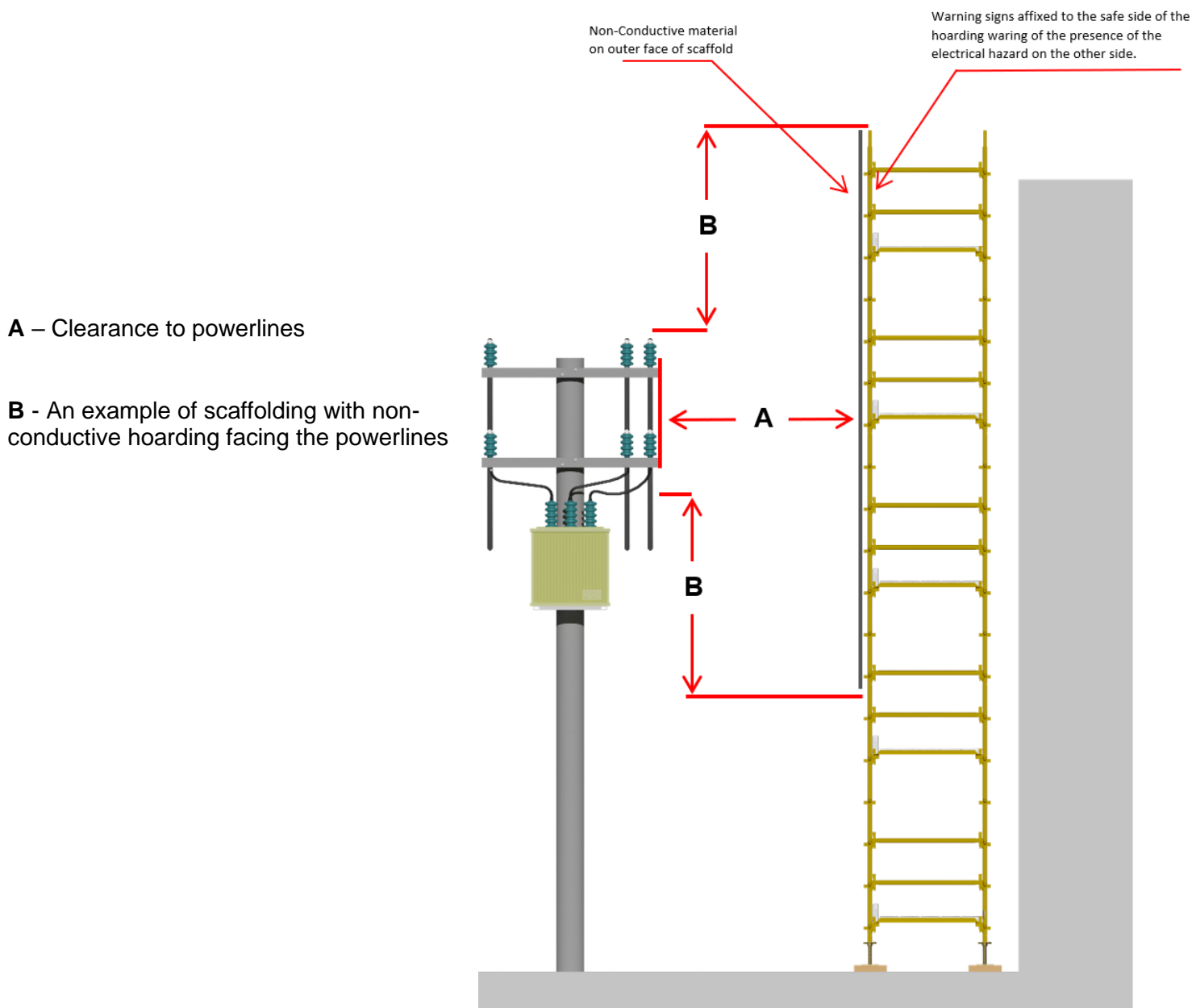
Proximity to Powerlines

As stated in the Australian National Scaffolding Standards – AS 4576:2020 - Section 3.2 Powerlines are a potential hazard to persons erecting, working from or in the vicinity of a scaffold.

Contact the electricity supply authority for information be erecting, using and dismantling scaffolding in close proximity to powerlines. For voltages of 11Kv or less “close proximity” is typically a minimum clearance of 4m between powerlines and the adjacent scaffolding but may vary depending on the electricity supply authority requirements.

The fitting on non-conductive materials on the outer face of the scaffold adjacent to power lines may be required by the electricity supply authority. metallic fixings should not protrude through the face of the non-conductive material towards the powerlines.

NOTE Allow for sag sway of the powerline when assessing a minimum clearance distance. The minimum distance is distance between the scaffold and any part of the powerlines.



The supporting surface

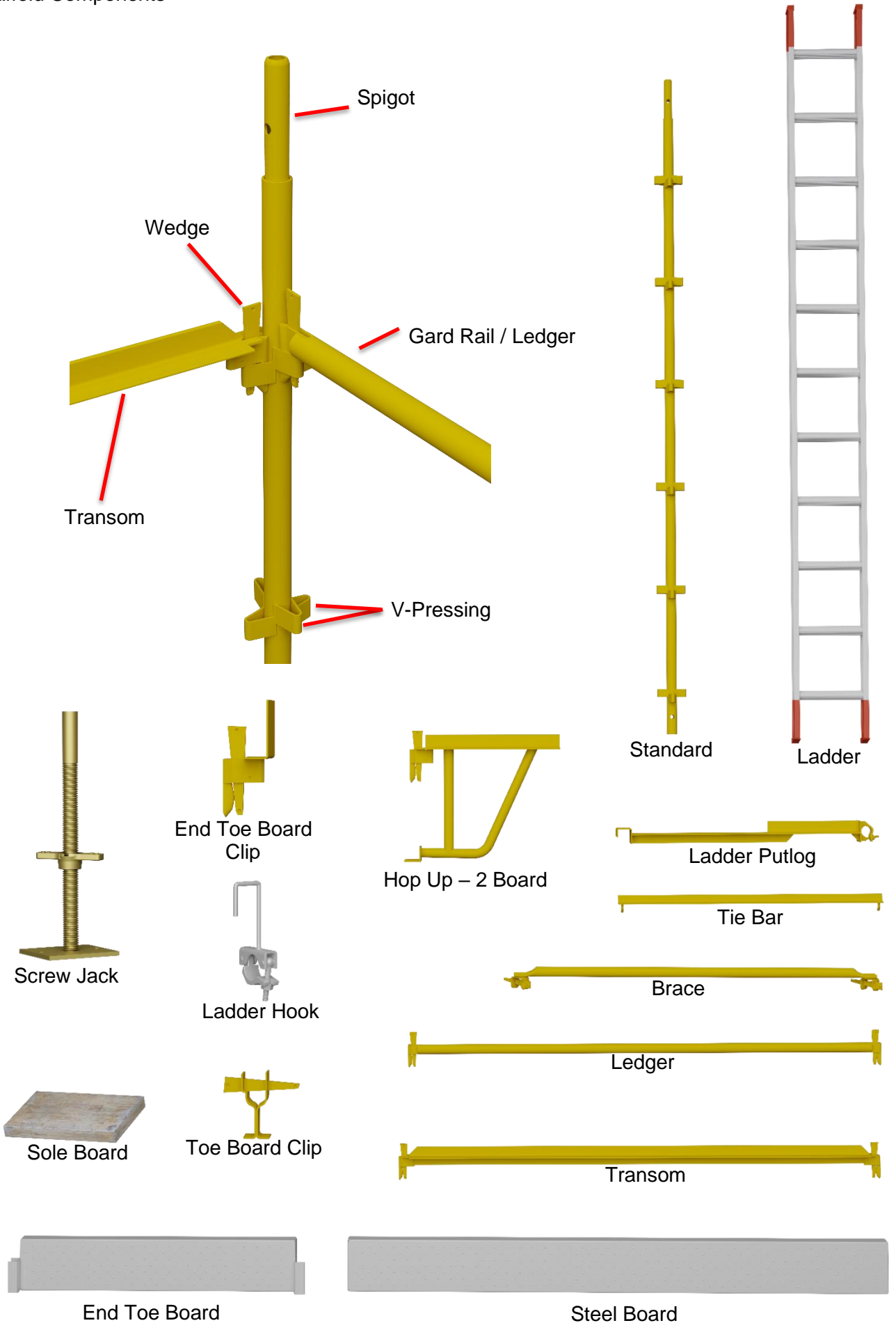
The ground or structure on which a scaffold is to be erected must be adequate to carry and distribute the loads imposed at each standard (vertical member) and of the whole loaded scaffold. The following measures are recommended to ensure that the supporting surface is suitable.

- Compact any ground or excavation which has been back filled.
- Always place the standards on sole boards not less than the size of a timber scaffold plank – 220 mm wide.
- The standards (vertical members) must always be placed on a base jack or base plate.
- Seek expert advice if the scaffold is to be erected on top of a suspended slab, balcony, roof or similar surface. The method of calculating loads imposed on the supporting surface at each standard is described in detail in "Guidelines for Scaffolding". A soil test may be required in certain circumstances.

Bay Loadings



Basic Scaffold Components



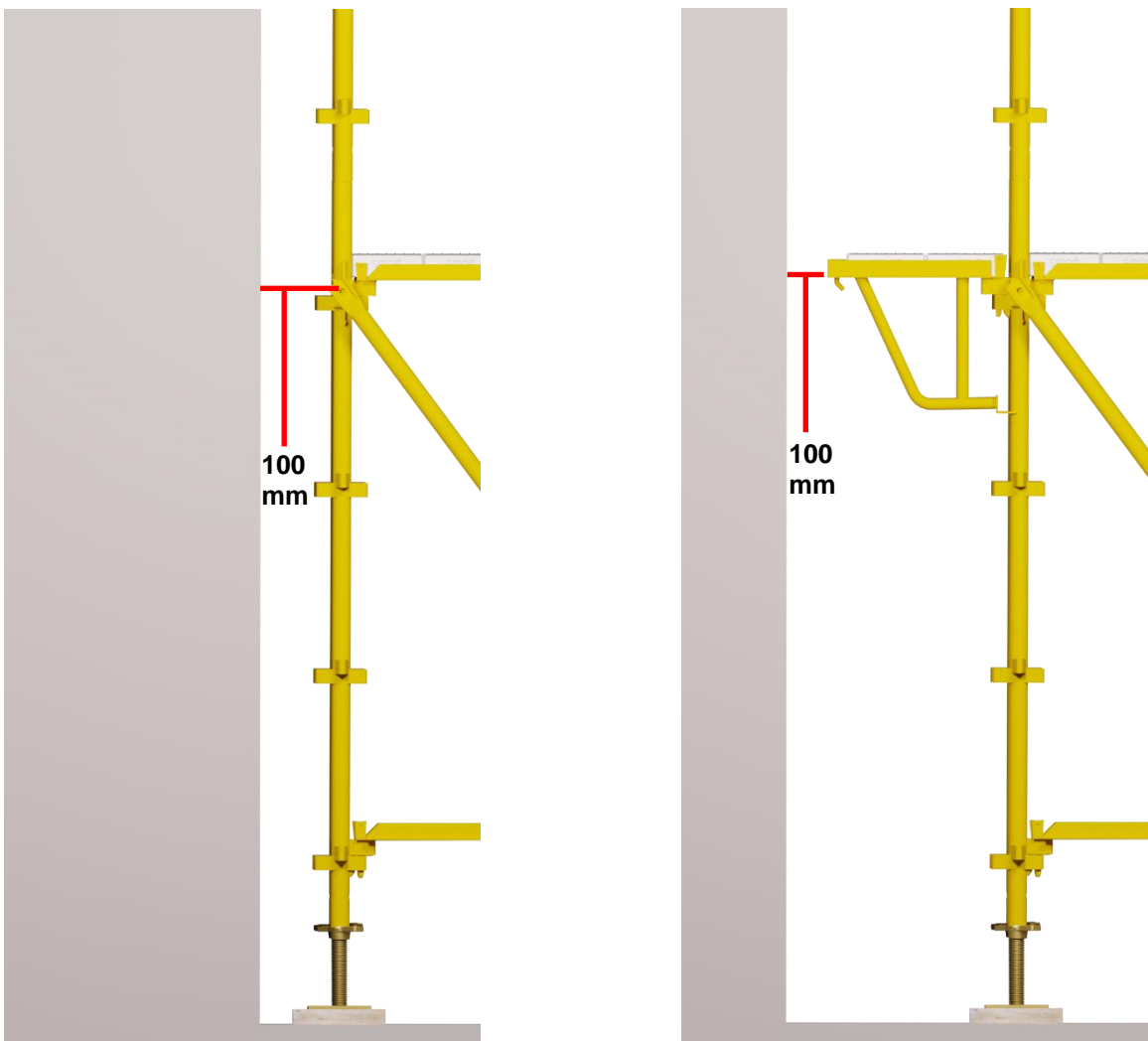
Erection Procedure

Ensure that the following tasks are carried out prior to erection of the scaffold.

- Establish whether the persons erecting the scaffold require a certificate of competency.
- Identify risks and hazards – see “ ” section.
- Take appropriate precautionary measures and install any necessary barricading etc.
- Obtain permits from local councils and power authorities.
- Make sure that the public are isolated from the work area and protected from any potential hazard.
- Check with your local WorkCover Authority or Statutory bodies to establish whether they have issued guidelines or advice pertaining to “Fall Prevention for Scaffolders”. If so, incorporate the advice into your safe work procedure.

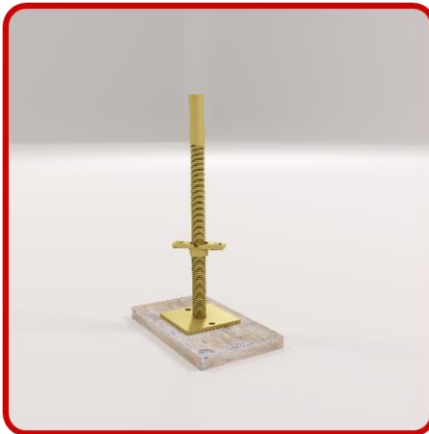
“Basing Out” the scaffold Each erector will require a scaffold hammer, a scaffold "key", a ruler or tape measure, a small magnetic spirit level and a leather belt and "frogs" to carry these tools. It should be noted that the following procedure is much easier and therefore safer using a three person crew.

- Level the ground and/or clear the area on which scaffold is to be erected of any debris.
- Determine the point at which to start building the scaffold (placement of the first standard). This will normally be at the high point of any slope.
- Establish how far from the building or structure the inside standards have to be placed. Note – the maximum allowable gap between the building or structure and the edge of the working platform is 200 mm however we recommend a gap of 100mm. Look up to ensure that there are no obstructions and that the scaffold will not encroach on the local electrical guidelines.



**1**

Place a sole board on the ground ensuring that it bears evenly along its full length.

**2**

Place an adjustable base jack (jack) into position on the middle of the sole board.

**3**

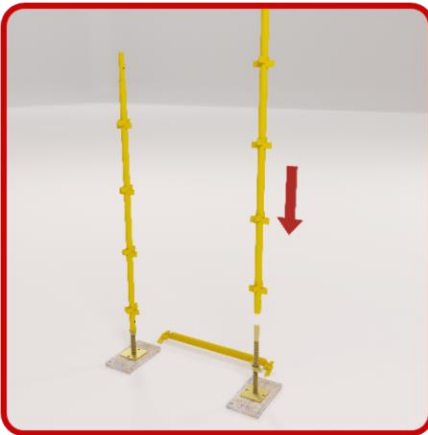
Place a 2m standard (vertical member) on the jack. This will be the ("Inside" standard).

**4**

While one person holds the first standard upright, a second member of the crew lays a 1200mm transom (horizontal plank support) at 90 degrees to the building from the base of the first standard. This gives the scaffold its width.

**5**

The second member of the crew then places a sole board and jack into position - use the transom length to judge the distance.

**6**

Place a 3m standard onto the jack. This is the ("Outside" standard) which extends up vertically 1 metre higher than the inside standard to allow for a handrail.

**7**

While one person holds the two standards vertically (one standard in each hand), the second person places the transom into the bottom "v" pressing (connection point) of each standard.

**8**

This will create an "H" type arrangement. Ensure that the lower "v" pressings are on the inside face of the standard.



9

The second person then places a ledger (horizontal spacing member) into the bottom "v" pressings of each standard at 90 degrees to the transom. The ledger gives the scaffold bay its length



10

The second person then places the third sole board and jack into position using the ledger as a guide for the length.



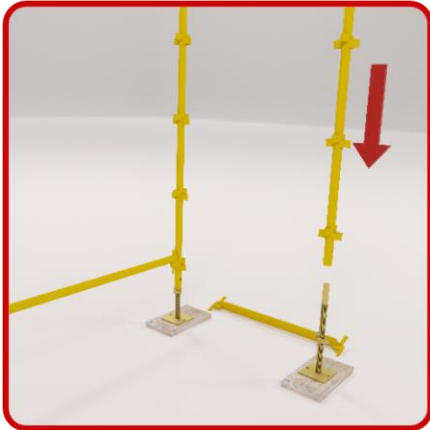
11

Using a 2m standard, place it onto the jack. Whilst one person holds the standard's plumb, the second person carefully raises the end of the ledger and locates it in the appropriate "v" pressing on the third standard. The scaffold should now free stand supporting itself.



12

Lay a 1.2m transom at 90 degrees to the building from the base of the third standard. Place the fourth sole board and adjustable base jack (jack) into position.



13

Place the fourth standard into position on the jack. (Use a 3m standard for the outside of this scaffold).



14

While one person supports and holds the standard vertically, the other person inserts the second transom into the lower "v" pressing.



15

Attach the second ledger into place to complete a rectangle. A scaffold bay is defined by its length and width. This is a 2.4m x 1.2m bay

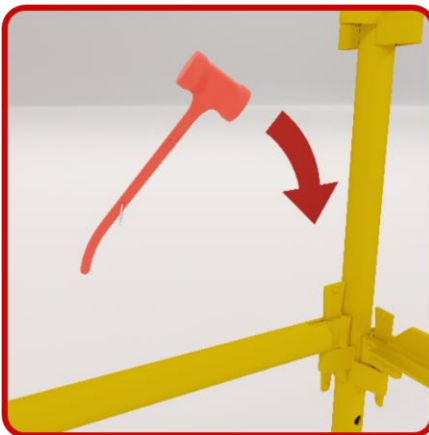


16

Place a spirit level on the first transom and wind the second jack up or down until the transom is level

**17**

Repeat the previous step in the corner of the third and fourth jack until the scaffold is level.

**18**

Attach the components together using a suitable hammer. Knock the wedges of the ledgers and transoms firmly into the "v" pressings on the standards. Do not use excessive force. You have now erected one "bay" of scaffold. Make sure the "bay" is parallel to the building and is "square" – adjust as required.

**19**

Place two more transoms at each end of the bay. They should be in the fourth "v" pressing from the ground. Each set of "v" pressings are spaced approx. 500mm apart. This will give us a 1.5m lift in the scaffold, (the vertical distance between the ledgers and transoms).

**20**

Attach the next two ledgers into place (the fourth "v" pressing from the ground) using a hammer, knock the wedges in on both the ledger and transoms. You have now erected the first "lift" of scaffold. The effective top working platform is 2 metres above the supporting surface.

**21**

Attach a diagonal cross brace (end brace) across the end of the scaffold, starting from the lowest "v" pressing.

**22**

The working platform is created by placing a full set of steel planks on and between the transoms. Place 5 scaffold boards into the bay with the ends of the boards held securely in place by the transom (never lap steel boards that are not designed with the purpose of lapping spans).

**23**

A double handrail (guardrail) should be fixed to the standards on any side of the working platform from which a person could fall. Attach ledgers to the next two sets of "v" pressings above the working deck. If the end of the scaffold bay is not against a building and a person could fall, the inside standard must be extended to allow handrails to be fitted across the end of the bay. See steps 10, 11 & 12 in "Providing Access to the Working Platform"

**24**

Insert a steel plank of the appropriate size on its side to form a toe board (kick board) immediately underneath all handrails. Use toe board clips or some other suitable means of fixing the plank into place. (The lower edge of the kick board must sit on the transom at each end).



25

Attach a diagonal (Face) brace between the standards on the handrail side (outside) of the scaffold. Normally the brace would be attached to the lowest "v" pressing to the ground but in this case start one "v" pressing up from the bottom. (This will allow us to add the ladder tower).



26

Repeat steps 9 to 24 as many times as required to base out the length of your scaffold. (Step 21 is only required at each end of the scaffold. Step 25, face bracing, should be completed on the first bay then every third bay).



Providing Access to the Working Platform

The Australian Standard AS1576:1 states that – "Safe access and egress from all working platforms shall be provided. Such access shall take the form of stairways, access ways, ladders and other means". This guide deals with the use of ladders only. For information regarding stair access systems, please consult our technical office. Access towers should be located in the scaffold in such a way that it is not necessary for someone using the scaffold to walk more than 15 metres to an access tower or other means of access and egress. As a "rule of thumb" it is advisable to locate the access tower halfway along the length of any run of scaffold. The recommended bay size for access towers is 2.4m x 1.2m. The procedure is as follows.

**1**

We need to erect a ladder bay on the rear of the scaffold. Place a 1.2m long transom into the bottom "v" pressing of the outer standard halfway along the length of the run of scaffold

**2**

Place the sole boards and jacks immediately under the free end of each transom

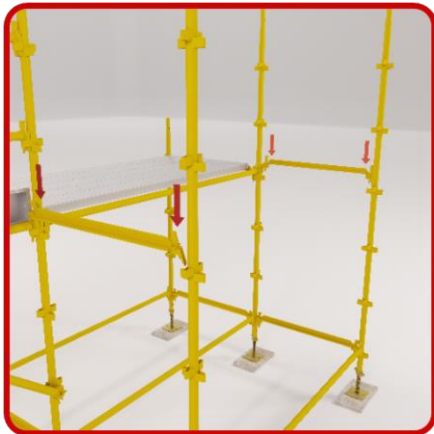
**3**

Place a 3m standard on each jack. Attach the transoms to the lower "v" pressings - the 3m standards will allow for handrails at the same height as the working deck.



4

Place a 2.4m ledger into the lower "v" pressing and level 4 the bay by adjusting the outside jacks.



5

Attach the next two transoms into position (at the same height as the transoms on the main scaffold).



6

Attach a 2.4m ledger at the same level. Ensure all wedges are knocked in securely.



7

Attach a ladder tower putlog over the two upper ledgers at the working platform height. Use a 1.2m board between the transom and the transom end on the ladder tower putlog to obtain the correct distance for its final position.



8

Place the second 1.2m steel plank between the transom and the angle seating of the ladder tower putlog. Tighten the nut on the ladder tower putlog making sure that the steel planks cannot move laterally.



9

Place three 2.4m steel planks on top of and between the two transoms and over flat section of the ladder tower putlog. You have now created the first "landing" in the ladder tower bay.



10

Fix a double handrail to the outer edges of the landing using 1.2m and 2.4m ledgers. Place the upper hand rails in first.



11

Fix toe boards immediately below all handrails. Once rotated into position, ensure end toe board drop down to sit in the transom.

**12**

An end toe board clip can be used to secure a kick board on the outer side of the scaffold. Attach an end toe board clip using a hammer to locate the wedge.

**13**

Insert a steel board between two end toe board clips.

**14**

Attach a brace to the face of the access bay. On a larger scaffold an end brace should also be attached to one end of the ladder bay.

**15**

The senior erector must now lower a 3.6m ladder into the penetration in the ladder bay landing. Particular care should be taken when handling aluminum ladders – if the ladder has to be stood on end, the risk of accident from contact with power lines is greatly increased as are the risks associated with high winds. The ladder should now be secured against movement in any direction using ladder clips or drop forged doubles to connect the stiles of the ladder to the scaffold ledgers. The pitch of the ladder should be not less than 1:4 and not more than 1:6. The ladder should extend at least 900mm and not more than 1800mm above the landing.



The scaffolding is now ready to be extended to better suit the perimeter of the building. Handrails are required on all exposed edges to prevent falls. The working platform can be loaded to its maximum evenly distributed safe working load of 650kg per bay (the rectangular area between 4 adjacent standards) per working platform – provided the supporting surface is adequate (see item 3 above). Please note that we recommend that no more than 2 working platforms per bay of scaffolding be loaded at any one time. If you wish to use and load multiple working platforms please contact our drawing office for technical advice and guidance.

Increasing the height of the Scaffold

The person or persons (erectors) carrying out this procedure should hold a current scaffold certificate as outlined in "Who can erect scaffold equipment" and be properly trained and supervised. During the erection or dismantling process the erectors must observe and adhere to the following key points.

- When working aloft erectors must work off fully planked out bays of scaffolding - (temporary working platforms).
- They must place a single guardrail 1 metre above the temporary working platform as soon as is practicable during the erection process. This handrail must be left in position for the lifetime of the scaffold.
- They must access each temporary working platform from a properly constructed access tower.
- They must raise and lower materials using a "Rope & Wheel" or by the manual handling method known as "handballing". Whichever method is used, erectors must at all times work from a minimum of a fully planked temporary working platform which has fall protection on all sides.

The recommended, and maximum, lift height for each and every lift above the "first lift" is 2 metres. The maximum height is stipulated so as to guarantee that the standards are capable of supporting the maximum safe working load of the scaffold which is 650kg per bay (Heavy Duty). Additionally each 2 metre lift is a potential working platform along which the average size person has sufficient headroom to walk without stooping. In the "Basing Out" procedure, the suggested size for the "outside standards" was 3000 and the suggested height for the "first lift" was 1.5 metres. The "splice" in a standard is the joint where two standards are connected. Using this method the height of the splice will never be more than 1.3 metres above the temporary working platforms, provided that all lifts are of the recommended height of 2 metres. If adopted, this configuration will eliminate the occurrence of a "high splice" in the standards. This in turn makes the erection process easier and contributes to the safety of the erectors.

The procedure is as follows.

- "Splice" a 2 metre standard on top of all existing standards in the scaffold. If it is intended to extend the height of the scaffold more than one 2 metre lift, it is recommended that 3 metre standards are used.
- Fix ledgers and transoms in the "v" pressings 2 metres above the existing working platform to create the next 2 metre lift.
- A diagonal cross brace should be fixed to each end of the scaffold between the "Outside" and "Inside" standards and on the access tower. End braces should run continuously from the bottom "v" pressing on a standard to the top working lift of the scaffold.
- Diagonal face braces should be fixed to the end bay of the scaffold and at least every third bay along the scaffold including the access tower. Face braces should also run continuously from the bottom "v" pressing on a standard to the top working lift of the scaffold.
- The scaffold should now be fixed to the building or structure using tube and double couplers to create a series of "Positive Ties".

Fall Prevention for Scaffolders

Since the introduction of the Victorian “Occupational Health & Safety Act (Prevention of Falls) Regulation 2003”, the Victorian WorkCover Authority has issued a guidance note to all Principals and Scaffold Contractors relating to the prevention of falls for scaffolders. We recommend that the document be viewed in full by visiting the Victorian WorkCover Authority's web site on <http://www.workcover.vic.gov.au>. The guidance note applies to all independent scaffolds erected on or after 1st January 2006. The Queensland WorkCover authority has addressed this subject in its document “Scaffold Advisory Standard 2004”. This is recommended reading for our customers in Queensland. Our customers in other states of Australia should consult their local authority for guidance prior to developing a safe work procedure for their scaffold erectors. The Safe Work Procedure described below incorporates the recommendations of the Victorian WorkCover Authority's guidance note “Fall Prevention for Scaffolders”

- Working from the existing working platform, place a full set of steel planks in each bay of the newly created lift.
- Placing and leaving a full deck of steel planks in each lift ensures that the scaffolders always have a full set of planks on which to work thereby eliminating the risk of a fall through the scaffold (Internal Fall).
- Sufficient ledgers, and if necessary, standards, are raised at the access towers to install the handrails and toe boards on the newly created temporary working platform. The first priority in the next phase of the erection procedure is to provide a handrail for the erectors to prevent a fall out of the scaffold (External Fall). The process by which this is achieved is as follows.

Sequential Installation of Handrails

Working from the access tower out along the fully decked platform, place a standard (if necessary) in the first standard point. A ledger is then installed to the second "v" pressing up from the working platform, (a height of 1 metre).

- The process is repeated in each individual bay until there is a single handrail to the outside standards of each bay of scaffold and at the ends. When there is a risk of falling more than 2 metres into the building or structure a handrail should be installed on the inside standards using the same method.
- If a platform is to be used as a working platform, a double handrail and toe board should also be installed.
- The landing in the access tower is to be completed by installing the ladder, steel planks and toe boards. If the height of the scaffold is to be further extended, repeat this procedure, always ensuring that bracing and ties are secured at the earliest possible opportunity during the erection process.

Conclusion

The Occupational Health & Safety Act (Plant Regulations) legally govern the use and erection of scaffold equipment. The process requires a certain level of expertise and knowledge. Smartscaff Pty. Ltd. employs a highly trained team of professional operations managers, draftsmen and engineers. As a valued customer you are encouraged to contact us whenever you require advice regarding the correct use of our products, or access to our drafting and design facilities.

Please contact one of our sales staff on 1300 772 233 for further details.