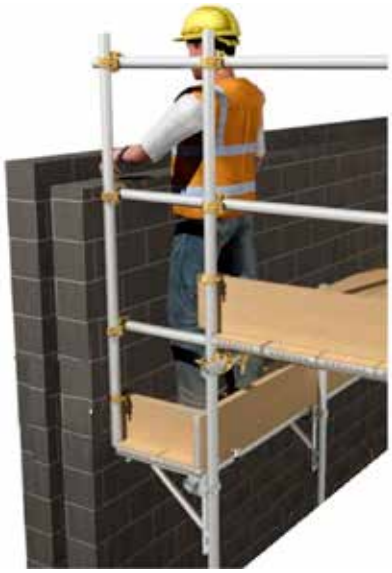
SG32:17

Provision of Extended and Telescopic Transoms and Board Brackets

NASC
National Access & Scaffolding Confederation

1. INTRODUCTION

This guidance is intended to provide an overview of the existing products and work methods available for providing an inside platform on scaffolding and information and instruction to ensure they are used correctly in order to prevent falls of objects and people. Clients, main contractors, users (e.g. bricklayers), designers, other interested parties and scaffold contractors should use this guidance and decide on the appropriate method for their works, taking into consideration the building work required to the façade and what permissible gap is required from the inside board to the façade (and if this gap needs a guardrail/toe board) as well as possible loadings.[1]



Note: The hierarchy for safe working at height is well defined within the Work at Height Regulations 2005. Falls of people or objects are hazards present within many construction related activities and are a major cause of accidents within the industry and it is important that clients, main contractors, designers, users and scaffold contractors plan their work and decide on the appropriate system and work method.

The width of the main platform can be extended by supporting inside boards, between the inner line of standards and the building. Several methods of supporting inside boards are available:

- *Extended transoms:* the transoms from the main platform can be made long enough to cantilever beyond the inner ledger to provide an extended platform at the working level;
- *Telescopic transom units* can be used, which allow the width of the inside board platform to be changed, or the platform to be removed, with the progress of the work;

[1] The pictorials in this guidance document have been taken from NASC Technical Guidance, TG20:13. Please also note some of the themes/topics detailed in this Safety Guidance are also repeated in SG28 and SG29.

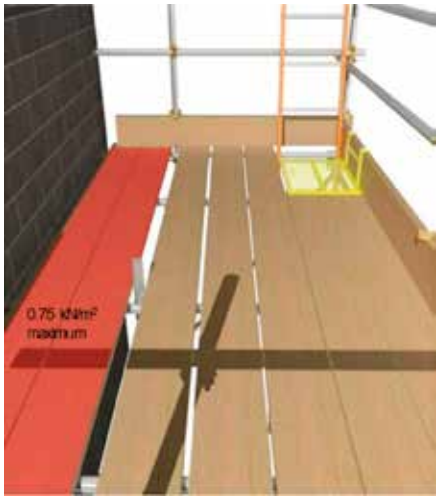
- *Inside-board brackets:* The inside platform can be supported by inside-board brackets, informally known as 'hop-up' or 'step-down' brackets, which allow the inner platform to be raised above or lowered below the main platform level.

2. INFORMATION ON METHODS

Inside board loading

When the scaffold platform is constructed with inside boards or inside-board bracket platforms, described in this document, the inside boards or platforms should only be loaded to a maximum of 0.75 kN / m^2. This allows for personnel to work on the platforms, with tools and light materials, but it does not allow materials to be stored on the boards.

As with the main platform, only two lifts of inside boards should be in service at any time per elevation of scaffolding. If it is necessary to fully load the inside platforms with the same load as the main platform, advice should be sought from a scaffolding designer following the guidance in the TG 20 Design Guide.



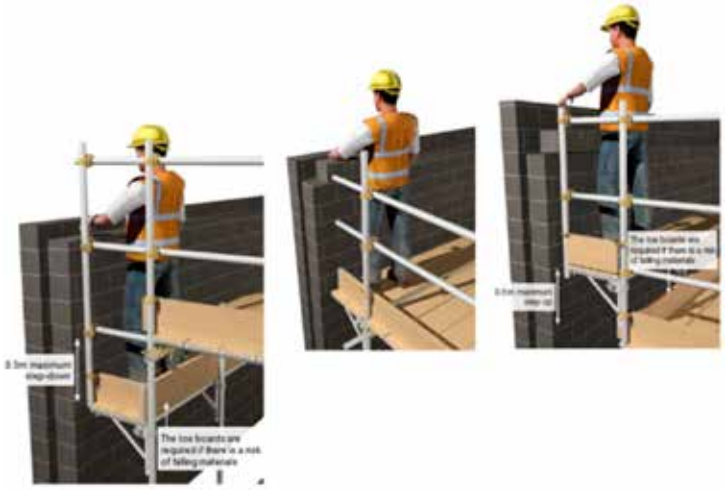
Selection of inside board supports

The most appropriate method of inside-board support is determined from the required use of the platform.

'Inside boards' supported by fixed transoms are used where the inner platform is at the same level as the main platform and is to remain in place throughout the lifetime of the lift. The transoms from the main platform are made long enough to allow one or two rows of boards to be placed to form an extended platform, as shown by the picture below.

In some circumstances the width of the inner platform needs to change with the progress of the work, for example where an inner platform is require during the construction of a timber-frame which is subsequently removed when building the outer brickwork. In these cases it is useful to consider the use of telescopic transom units, which allow the inner platform width to be easily changed or removed altogether.

Inner platforms may also be supported by inside-board brackets, as illustrated by the pictures below. A principal advantage of this method is that the platforms can be stepped upward or downward with the progress of the work.



The platform may be fixed initially in the step-down position, then raised to the level of the main lift, and finally raised to the step-up position. This working method allows a scaffold with 2.0 m lifts to be used for bricklaying and blockwork, instead of a traditional bricklayer's scaffold with 1.35 – 1.5 m lift heights, allowing the scaffold to be used for other purposes without first adapting it to provide walkthrough lifts.

If used in conjunction with telescopic transom units, the inside boards at the main platform level can be easily reinstated as the brackets are moved upwards or downwards through the scaffold with the progress of the works.

Inside boards on extended transoms

Inner platforms supported by fixed or telescopic transoms should be one or two boards wide. Wider platforms are possible, but they should be specially designed.

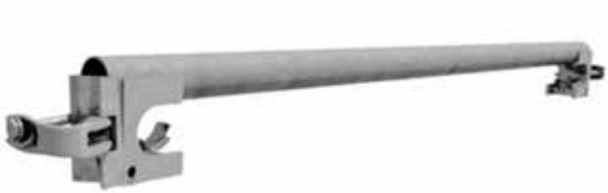
As with the main platform, the inside platform should be level with lapped boards only permitted at returns. It is usual practice to use board lengths that are consistent with those of the main platform, allowing the same board-bearing transoms to support the main platform boards and the inside boards. The spacing requirements for transoms are described in TG20 but typically are 1.2m apart.

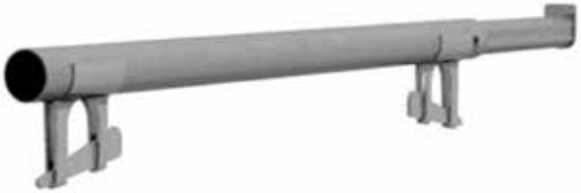
End guard rails and end toe boards should be sufficiently long to protect the inside boards at end frames, as shown by the pictures above.

If the accidental displacement of the inside boards is deemed to be a problem by the risk assessment, measures should be taken to hold them in place, as shown for example by the picture below.

Where prefabricated transom units are used (certified TG20 compliant by supplier or manufacturer), board supports are provided by non-structural intermediate transoms, which may be regular tubes and putlog couplers or prefabricated intermediate transom units as preferred.

Structural transom units have two integrated connections at each end: a band-and-plate style connection with the ledger and a coupler that connects to the standard, shown by the picture below left. A scaffold erected with prefabricated transom units should provide a structural transom unit at every pair of standards.

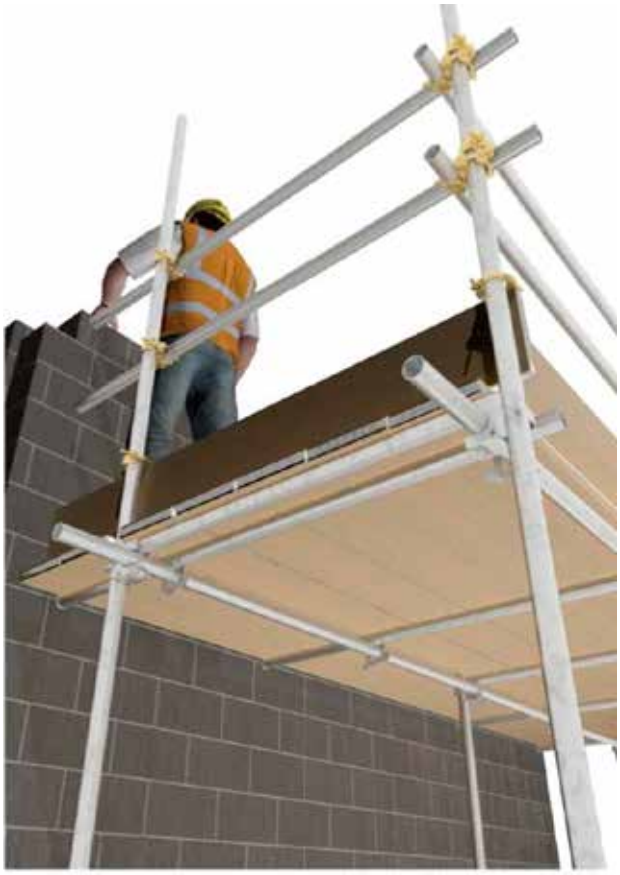




The boards that form the scaffold platform must be supported at each end and at intermediate points as described in TG20.

Board supports are provided by non-structural intermediate transoms, which may be regular tubes and putlog couplers or prefabricated intermediate transom units as preferred.

A typical intermediate transom unit is illustrated above right, which is an example of a telescopic extender transom that has an extendable section for the support of inside boards. Where inside boards are used, it is often necessary to place an intermediate transom near to the structural transoms to ensure that the inside boards are supported at each end and at their permitted spacing, as illustrated below.



Board Brackets

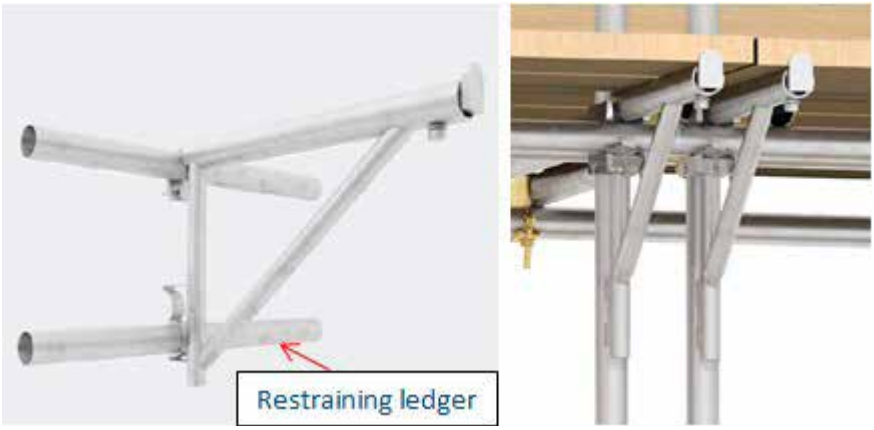
Inner platforms supported by prefabricated brackets can be used in cases where the platform is to be raised above or lowered below the main platform during the works.

Unlike inner platforms supported by transoms, which may be one or two boards wide, a platform supported by brackets should be two boards wide if it is to be offset from the main platform, to provide sufficient width.

Some brackets provide an extending section that allows a third board to be accommodated across the width of the platform. Such brackets may be used within TG 20 compliant independent scaffolding provided that the inner platform at a maximum of one lift is so extended per elevation of scaffolding. The remaining inside platforms should be up to two boards wide unless design advice is obtained.

A maximum of one inner platform may be raised above or lowered below the main platform, per elevation of scaffolding, to a maximum offset of 0.5 m. If it is necessary to offset more platforms at the same time, or to offset by a greater amount, a scaffolding designer should be consulted.

Often the inside boards will be supported with telescopic transoms when the inner platform is at the main level, as the design of some brackets is such that they may only be fixed in the step-up or step-down position.



The inside platform should be level, with lapped boards only permitted at returns, and adjacent boards should be butted and supported. This requires a bracket to be fixed at each board end, plus at intermediate points to support the boards at their target spans.

The construction method for a platform supported by inside-board brackets depends on the type of bracket being used. Some brackets connect to the scaffold ledgers, for example as shown by the pictures above, so they may be installed at the required positions and spacing.

Other types of bracket are attached to the standards, so in these cases it is necessary to provide additional standards or puncheons at the inner face of the scaffold to support the additional board-bearing brackets.

Alternatively, brackets incorporating a connection for a restraining ledger may be used, as shown in the picture above left. The restraining ledger prevents the rotation of the brackets and allows transoms to be provided between bracket positions to support the boards at their target spans. Proprietary board transoms may also be used for this purpose if preferred.

Edge protection for inner platforms (see section 4. for further information)

The ends of inner platforms must be protected with guard rails and, unless justified by the risk assessment, toe boards. If the inner platform is only to be used at the level of the main working lift, the end guard rails and toe boards should be sufficiently long to protect the main and inner platforms, as shown by the pictures below.

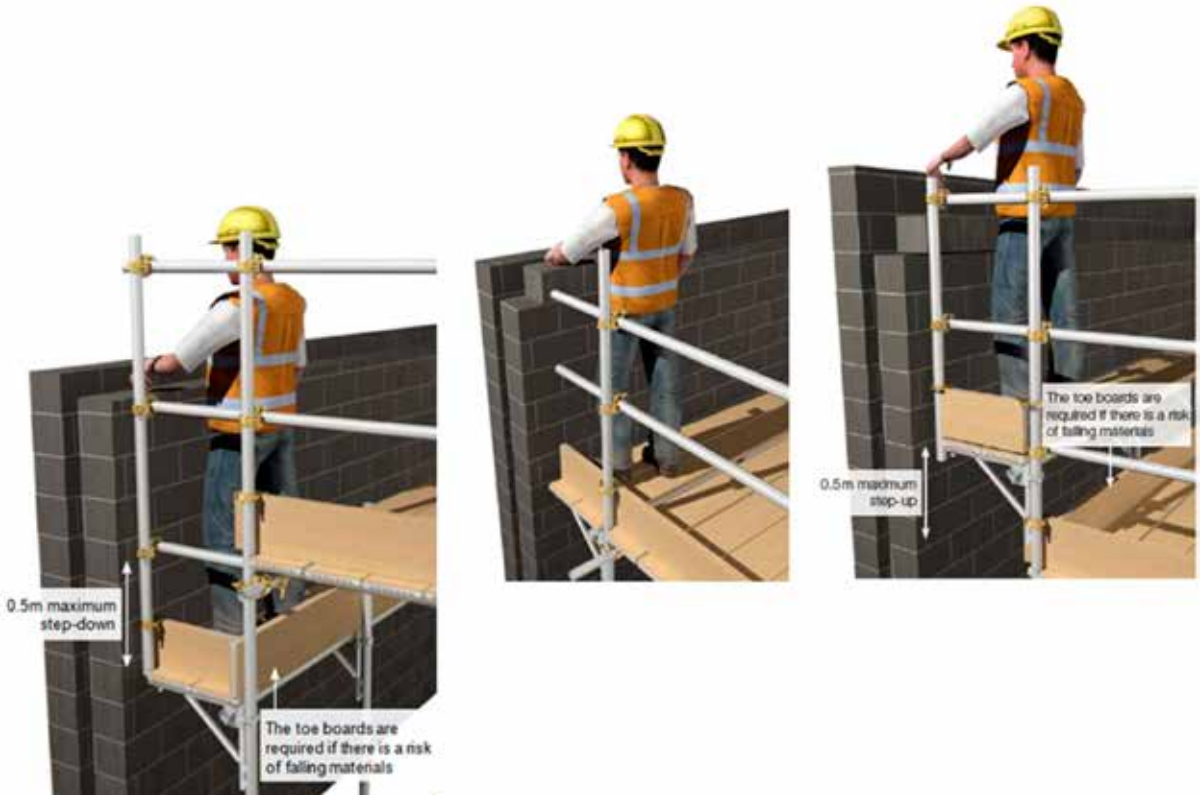
If the inner platform is to be raised above or lowered below the main lift it is necessary to provide additional guard rails to protect the end frames. As required by the Work at Height Regulations 2005 (WAHR), a guard rail is required at least 950 mm above the inner platform and no unprotected vertical gaps may exceed 470 mm.

The arrangements in the pictures below are typical, and protect operatives while working at both platform levels and while traversing between them. A puncheon is typically provided to support the end toe board and guard rails.

Longitudinal toe boards may also be required where there is a risk of falling materials.

If the inner platform is stepped downward, toe boards may be placed to prevent materials from falling onto the main platform below, as shown by the picture on the left below. Where the platform is stepped upward, a toe board may be placed at the gap between the main platform and the inner platform, as shown by the picture on the right below. This prevents materials falling from the main platform to the platform below.

A TG 20 compliant inner platform may be raised or lowered by a maximum of 0.5 m without seeking design advice.



Closure of Inner Gap (between inside boards and façade)

Ideally inside boards should finish as close to the façade as possible to prevent debris falling down the gap. Where a gap is required for building works (e.g. for operatives carrying out rendering), the risk of material falling from the scaffold down the inside face should be assessed and control measures put in place where required by the risk assessment.

If required by the risk assessment, this gap may be closed by such methods as:

(a) Basing out the scaffold closer to the façade so that the gap is minimised to an agreed suitable distance;

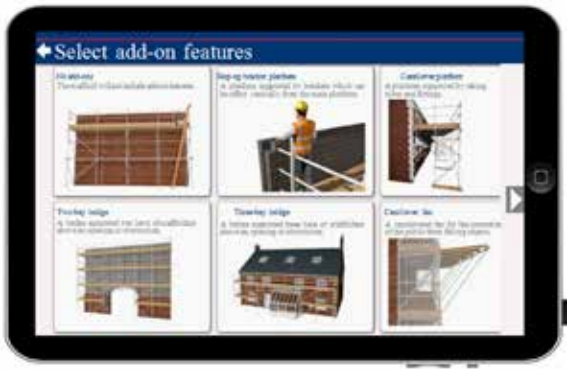
(b) Basing out the scaffold further from the façade with the installation of a double guardrail and toeboards to the inside line (so that trades can work on the façade behind guardrails);

(c) The inner board placed at a suitable distance from the façade and gap between this inner board and the other inside board or main boarded platform covered by plywood cut to size and secured in place.

3. TG20 COMPLIANCE SHEETS

TG20 compliant inner platforms

TG 20 compliance sheets for independent scaffolding with inside boards are provided in the TG Operations Guide, with further compliance sheets including those for inside-board bracket platforms provided in the TG 20 e Guide. Independent scaffolding can include add-ons, as described in TG20:13, including inside-board brackets



TG20 compliance sheets for independent scaffolding with inside boards are provided within the guide, with further compliance sheets including those for inside-board bracket platforms provided in the TG20 eGuide.

- It is important to select a TG20 compliance sheet that is appropriate for the required type of inner platform, as the maximum safe height of the scaffold may be influenced by it.
- Inside board platforms supported by cantilevered board-bearing transoms may be one or two boards wide.
- A maximum of one inner platform may be raised or lowered per elevation of scaffolding, to a maximum of 0.5m above or below the working platform.
- Inner platforms should only be lightly loaded to 0.75kN/m^2, which is sufficient to support personnel and tools but not the storage of materials. Only two inner platforms may be loaded at any time, per elevation of scaffolding, following the guidance in TG20.

Design advice should be sought if inner platforms of other dimensions or loading are required.

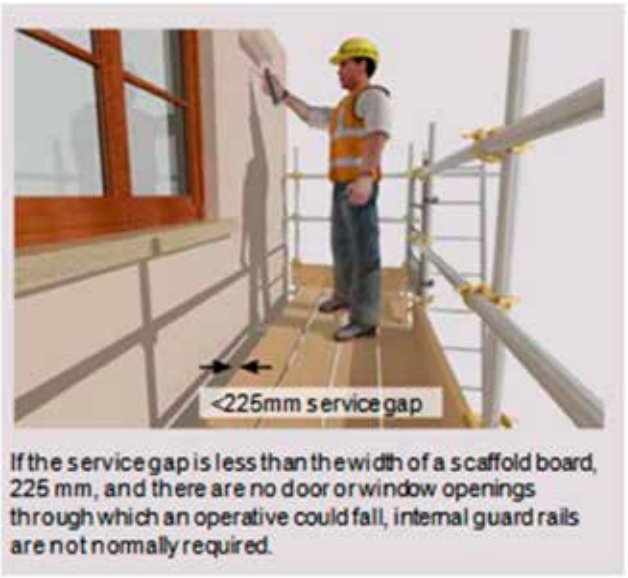
4. INTERNAL EDGE PROTECTION

Edge protection is required at the outer face and the end faces of the scaffold, but it is sometimes necessary to also provide edge protection at the inner face.

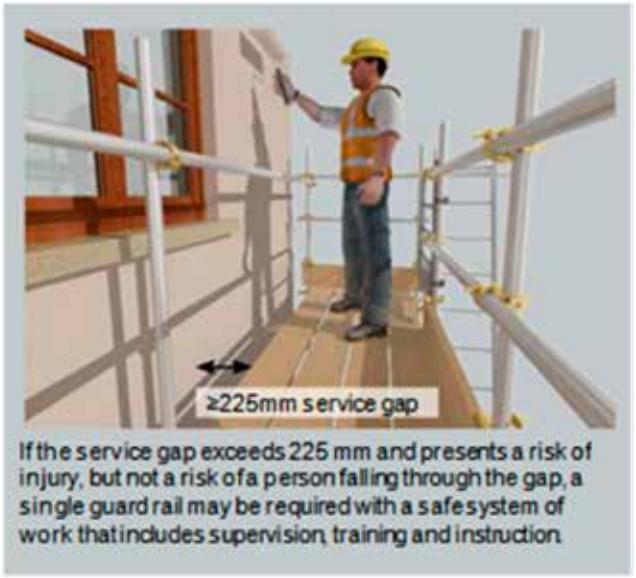
The *Work at Height Regulations* require physical edge protection to be provided where personnel or materials could fall and cause injury.

The requirement for internal edge protection depends on the size of the *service gap*: the gap between the inner edge of the scaffold platform and the building, as illustrated below.

However, because the installation of complete internal edge protection can impede or even prevent certain types of work, a safe system of work, following a risk assessment, may be used in place of some or all internal protection. If the client requests that internal edge protection is not installed this must be recorded on the scaffolding handover certificate.



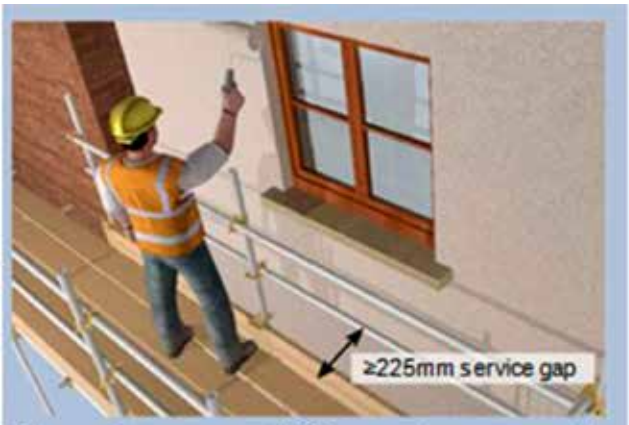
If the service gap is less than the width of a scaffold board, 225 mm, and there are no door or window openings through which an operative could fall, internal guard rails are not normally required.



If the service gap exceeds 225 mm and presents a risk of injury, but not a risk of a person falling through the gap, a single guard rail may be required with a safe system of work that includes supervision, training and instruction.

The picture on the left shows a gap less than the width of a board, whereas the picture on the right show a gap of approximately one board's width (225mm). Please note that a gap larger than 225m needs very careful risk assessing.

It may also be prudent for the client/main contractor/user to put in place a Permit to Work system when a single guardrail is used.



If the service gap exceeds 225 mm and a person could fall or suffer injury, double guard rails should be installed unless alternative arrangements are made to control the risk of falling personnel or materials as described earlier. Inner toe boards may be required for material retention subject to the risk assessment, although materials should not usually be stacked at the inner face.

If an operative is required to work from an inner platform where the service gap exceeds 225 mm and presents the risk of injury, double guard rails should be provided at the inner platform edge connected with puncheons. Alternatively, a safe system of work must be employed that includes a full body harness and restraint lanyard to prevent the operative falling from the inside open edge, unless another suitable means of protection is determined from the risk assessment.

5. TYPICAL PROBLEMS

The following are typical problems with using board brackets and similar:

- Incorrectly erected (e.g. not level);
- Scaffold boards spanning too far between supports (with risk of boards snapping);
- Service gap too large (the gap between the scaffold platform's inside edge and the building facade);
- Lapped boards (with no butt joints);
- Potential for people or materials falling from the inside boards to the adjacent main platform;
- Restricted/narrow access for men and materials;
- Incorrect usage e.g. overloading potentially resulting in slippage/failure;
- Extended transoms which are too short so that boards topple off the end of transoms;
- Insufficient platform width for task (minimum 2 boards wide when above and below the main platform).

6. PLANNING

Before commencing work at height that involves the installation of inside boards and brackets, it is essential to consider the client's requirement for the use of the inside platform and the foreseeable specific hazards arising from the work in providing them.

Note: When inside board brackets are used, it is common for them to be removed and re-positioned progressively lift by lift as the work progresses. If the brackets are used in this manner inside edge protection may need to be provided to prevent falls through the gap between the scaffold main platform and the building or structure (please see the earlier pictorials and the section on internal edge protection).

The user-trades' Risk Assessment/Method Statements (RAMS) may not take into account interfacing with other trades. A meeting involving the Principal Contractor, the trade using the inside platform and the scaffold provider should establish the sequence of works and any protection or exclusion that needs to be in place before works continue. The planning should establish the controls necessary to minimise the risk of falling objects and materials from the board bracket platform and the main scaffold, taking into consideration the distances men or materials could fall and the people at risk.

The scaffold contractor's RAMS should take account of the risk of falling objects or personnel from the inside board platform. Control measures must be in place to prevent injuries from falling objects or personnel. It is recommended the areas above and below are excluded from other persons and works during the erection, shifting and dismantle of inside platforms.

For scaffolds erected using tube and fittings, 'compliant scaffolds' are defined in accordance with the Load Classes shown in TG20, which gives the maximum spacing of scaffold board supports and the loadings. If scaffolds are required that are outside these limits, they must be designed. In order to reduce the risk of

tripping, sufficient inside board brackets should be used to support the boards along their length and at their ends to remove the need to lap boards (with the exception of returns).

When erecting, altering or dismantling inside board brackets, consideration must be given to the provision of adequate safe systems of work to prevent the fall of persons or objects through any excessive internal gaps (please also see the information on edge protection in this guidance). In instances of excessive service gaps, guardrails and toe boards may be required to be installed between the inside board and the building face. However, there may be circumstances where, because of the nature of the work, toe boards would have to be continuously removed and replaced. In these cases, it is permissible to have a safe system of work that uses alternative arrangements to control risk from falling objects and people as identified within the risk assessment.

Note: Consultation is necessary with the other trades to ensure ease of access for workers and their materials between the inside board platform and the main working platform.

When setting out the scaffold, consideration should be given as to whether additional inside standards will be needed to attach the brackets to, or if puncheons will be used and moved with progress of the works i.e. raised lift by lift (additional standards may affect other following trades using the scaffold).

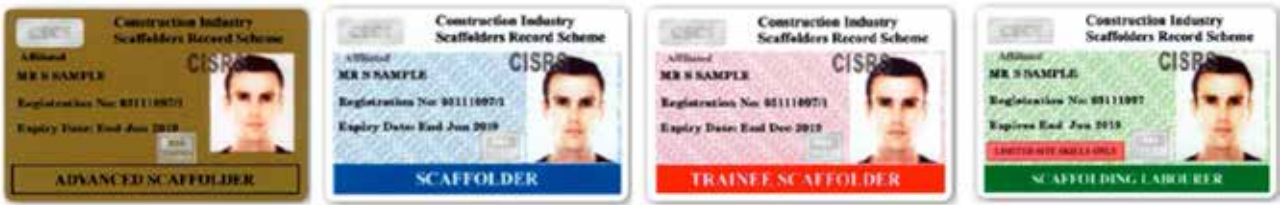
As stated before, the maximum loading on the inside platform is 0.75 kN/m^2; where additional loading is required, or there are potential loadings issues, refer to a scaffold designer.

7. TECHNICAL

1. In some instances, where the scaffold falls outside of the scope for basic scaffolds, the inside board brackets and extended transoms used on the same level as the main platform, may be required to carry the full imposed load for the class of scaffold being erected. For all details relating to fully loaded inside boards refer to TG20 or consult a designer;
2. Where a system scaffolding cantilevered bracket is used, the manufacturer's erection guidelines and technical data sheets (which gives recommended loadings) must be adhered to;
3. The manufacturer's data for the inside board brackets will give information on loadings. This is the bracket fitting loading only and not the load which can be imposed on the inside board platform;
4. Rigid corners can be formed by using proprietary or specially made square corner bays or, if this is not possible, these can be erected using the 'fly past' method. It is important to make sure that the two adjacent runs are firmly connected at each level and there is no possibility of the board brackets moving outward.

8. COMPETENCY

To erect, alter and dismantle inside board brackets, the operative should receive suitable and sufficient training and instruction. The movement of the brackets, if necessary, will require alterations to the scaffold and this also can only be carried out by a CISRS scaffolder (or a trainee under the supervision of an advanced scaffolder or scaffolder).



Note: Labourers are only authorised to manual handle material in order to assist the scaffolder and must not erect, modify or dismantle scaffolding.

9. REFERENCES

Legislation

- The Health and Safety at Work Act 1974;
- Construction (Design and Management) Regulations 2015;
- The Management of Health and Safety at Work Regulations 1999;
- Work at Height Regulations 2005.

Guidance

- NASC Guidance Documents, including the following:
  - SG4 Preventing falls in scaffolding operations;
  - SG7 Risk Assessment & Method Statements;
  - SG9 Use, Inspection & Maintenance of Lifting Equipment and Accessories for Lifting in Scaffolding;
  - SG10 Use of Brickguards;
  - SG29 Internal edge protection on scaffold platforms;
  - TG20 Operational Guide/Design Guide.