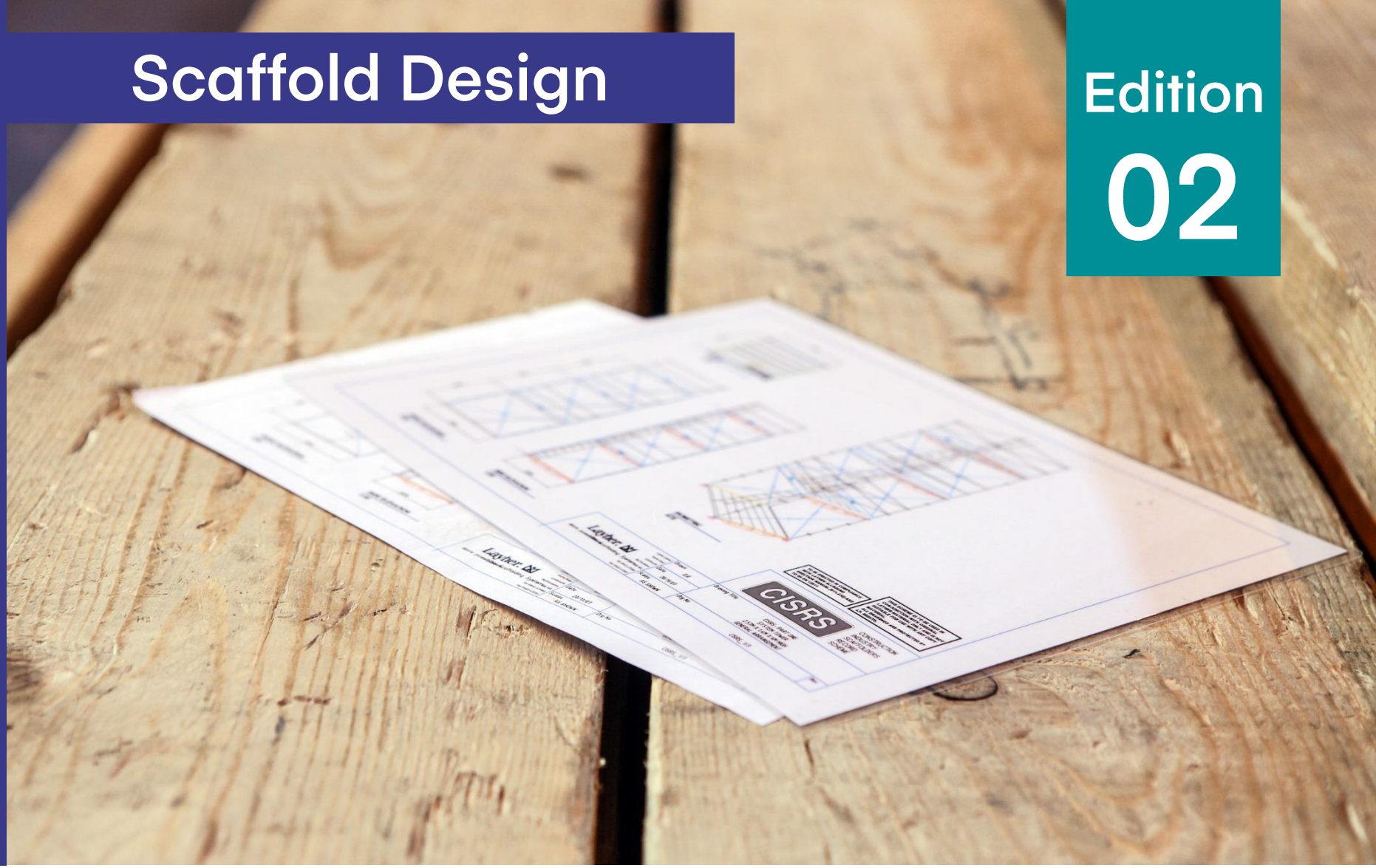
The Scaffold Standard

Scaffold Design

Edition 02



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Why Should Scaffolds be Designed?

The Work at Height Regulations 2005 contain explicit requirements in relation to scaffolding.

Schedule 3, Part 2 of the Regulations, titled 'Additional Requirements for Scaffolding' states, "Strength and stability calculations for scaffolding shall be carried out unless: -

a) a note of the calculations, covering the structural arrangements contemplated, is available; or

b) it is assembled in conformity with a generally recognised standard configuration..."

This effectively gives those erecting the scaffold two options: -

1. Have the scaffold designed by calculation, or
2. Construct the scaffold in accordance with a known standard. (A generally recognised standard configuration)

What is a Generally Recognised Standard Configuration?

A generally recognised standard configuration can be interpreted as being an authoritative document that specifies how a scaffold should be constructed to ensure that it remains safe throughout erection, use and dismantling.

There are many different types of generally recognised standard configurations, but the most commonly known and accepted are: -

- TG20:13 for tube and fitting scaffolding
- Manufacturer's instructions for system scaffolds
- Manufacturer's instructions for aluminium scaffolds

In short, if a scaffold is constructed in accordance with the most appropriate standard, then it will be legally compliant and one of the easiest ways to achieve this is by working to a TG20 compliance sheet which can be found within Chapter 3 of TG20's Operational Guide or be generated for an extended scope of structures by the TG20 eGuide.

What if a Scaffold Cannot be Built to a Generally Recognised Standard Configuration?

In many situations, it is possible to construct scaffolding entirely to the most appropriate standard configuration and since the introduction of TG20:13, which significantly increased the number of 'standard'

scaffolds, the requirement for design input has decreased. However, in situations where the scaffold is non-complex in configuration but contains a smaller complex element, design advice should be sought to
ensure that the complex (or 'non-standard') element does not compromise the rest of the structure. It should be noted that TG20's eGuide also contains the ability to include 'add-on' features that would previously have required design advice.

The level of design input required will vary depending upon the type of scaffold and the level of required deviation, but this can often be confirmed quickly and easily by a competent Design Engineer.

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It is good practice to ensure that all variations and their approvals are documented as this ensures traceability throughout the lifecycle of the scaffold.

Scaffold Design Calculations

It should be noted that where there is a legal requirement for a 'scaffold design', this means that the calculations that prove the integrity of a scaffold must be provided and does not refer to a drawing or sketch. However, it is common practice for Design Engineers to supplement their calculations with a design drawing as this is a simple way of communicating their requirements to those tasked with erecting the scaffolding structure they have designed.

What Should a Scaffold Design Drawing Look Like & What Detail Should it Contain?

To ensure the design drawing accurately conveys the Design Engineer's requirements, the following detail should be included: -

There are no hard and fast rules that dictate the level of detail that should be included in a design drawing and in reality, some design drawings are scant on detail and do not adequately portray what is required, leaving Scaffolders to second-guess specific requirements and defeats the entire design objective.

- Engineer's name
- Drawing revision status, number and date
- Site address
- Scaffold dimensions, including bay lengths and lift heights etc
- Tie requirements – including tie variety, tie configuration, frequency and required test loading etc
- Maximum number of 'working' lifts
- Leg loads
- Couplers to be used
- Detail of inherent hazardous situations during the build

It should be noted that Scaffolders generally prefer 2 dimensional drawings that show plan views, elevations, sections and details of complex or important elements.

Design Checking

Third party Engineer checks of 'basic' scaffolds constructed in accordance with a TG20:13 compliance sheet (see image overleaf) or basic design will not normally be required. However, BS5975:2008 (Code of Practice for Temporary Works Procedures) recommends that design checks be carried out in greater depth as the complexity of the design increases and this may extend to a full design review for those scaffolds that are highly complex in nature.

The Design Brief

In almost all situations, it is important that the client (or the agency acting on behalf of the client) is involved in specifying what is required and this is often referred to as a 'design brief'.

For non-complex scaffolds, this process is usually very simple, but for more complex jobs, for example a hanging scaffold supported by an existing structure, this process will become more involved as the complexity increases and should include the provision of all necessary information relating to design requirements.

Handover and Inspection of Scaffolds

As with all scaffolds, the completed scaffold must be inspected prior to handover. More information on handover is available in issue one of The Scaffold Standard.

The Scaffold Standard

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Further Reading

HASAWA 1974
The Work at Height Regulations 2005
TG20:13 – A Comprehensive Guide to Good Practice for Tube & Fitting Scaffolding (NASC)
BS5975:2008 - Code of Practice for Temporary Works Procedures and the Permissible Stress Design of Falsework
www.nasc.org.uk
Health & Safety Executive – Scaffold Checklist

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NASC SIMIAN RISK GROUP
SCAFFOLDING SAFETY AND TRAINING EXPERTS

With support from:

Independent scaffolding

A tied independent scaffold with 2.0 m maximum lift heights, clad with permeable debris-netting, assembled from tubes and fittings.

Design height

- ✓ Maximum height: 20.0 m to the top lift.

Maximum loading

- ✓ One lift loaded, plus one lift 50% loaded, per façade to a maximum of: 2.0 kN/m²;
- ✓ Inside boards loaded to a maximum of 0.75 kN/m² at the working lift;
- ✓ Foundation design leg load (for the client): 16.28 kN.

Ties

- ✓ 1 x 1.9 kN (very light duty) tie per 16.0 m²;
- ✓ Max. 4.0 m between tie lines (tied at alternate lifts);
- ✓ Max. 4.0 m horizontal distance between vertical tie lines;
- ✓ Tied at the top lift at ledger-braced standards.

Location

Suitable for sites with a wind factor of 20.0 (low wind exposure), during any season.

Add-on features

- ✓ A gin wheel may be used to lift a maximum of 50 kg.

Design advice may be required if any add-on features not stated on this compliance sheet are attached to the scaffold.

Criteria

To be erected as a TG20 compliant tied independent scaffold as described in TG20:13 chapter 06:

- ✓ 3 – 5 main boards and up to 1 inside board wide;
- ✓ Maximum lift height: 2.0 m;
- ✓ Maximum bay length: 2.0 m;
- ✓ Maximum transom spacing: 1.2 m;
- ✓ The scaffold will be fully or partially clad with high permeability debris-netting;
- ✓ Boarded at any number of lifts;
- ✓ Tied to an impermeable façade (no significant openings);
- ✓ Façade braced in every elevation, one set per six bays;
- ✓ Ledger braced at alternate standards and at end frames;
- ✓ Double guard rails and toe boards at boarded lifts (triple permitted at top);
- ✓ Single guard rails at unboarded lifts;
- ✓ Internal edge protection provided where required;
- ✓ Tied in accordance with TG20:13 chapter 07. Tie tubes may be connected only to the inner face of the scaffold.

Sign-off

Contract no:		Client:	
Company:	Simian Risk Group	Scaffold reference:	
NASC membership no (1):		Site reference:	Risley, Warrington WA3 6FW, UK
Name:		Signature:	
Position:		Date:	16/08/2017
Notes:			

(1) Use of this NASC document does not infer NASC membership. Go to www.nasc.org.uk to confirm membership. Illustrations are indicative.

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Feedback:

Briefing Acknowledgement

Name	Date	Signed

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