

Effective management of scaffolding to BS 5975: 2019



Published – September 2020

This TWF Guidance is available
as a free download from
www.twforum.org.uk

Document: TWf2020: 01

NOTE: If you need to print this document,
be aware that the pages
are prepared with alternate (even)
pages offset for your duplex
(double sided) printing.



**Temporary Works
forum**

Members of the Working Party

This guidance has been prepared by **Ben Beaumont** (48.3 / Richter Associates), **Ray Filip** (RKF Consult Ltd) and **David Thomas** (Temporary Works Forum).

Commentators included:	Ashley Daniels Ronan O'Driscoll Peter Pallett Matt Parker Steve Prower Stuart Salmon	Nuclear New Build - Part of EDF Energy Nuclear New Build - Part of EDF Energy Pallett TemporaryWorks Ltd Nuclear New Build - Part of EDF Energy NASC TR Scaffolding
Earlier contributions were also made by:	Robert Candy Ken Johnson Jonathan Leyland Jemma Quin Lachezar Slachev	The Scaffolding Association NASC Kaefer BAM Nuttall Ltd (now Kier) GKR Scaffolding

The Temporary Works Forum (TWf) gratefully acknowledges the contribution made by the authors, commentators and various contributors in the preparation of this guidance.

Classification of temporary works: 1.4.0

Synopsis

Scaffolding - whether 'tube and fitting' or a proprietary system - is an important item of temporary works. It is one that needs to be managed effectively. This guide provides advice on the temporary works management procedures required and highlights the need for all those involved to understand the roles, responsibilities and procedures from concept and procurement, through to its assembly, inspection, alteration and removal.

Disclaimer

Although the Temporary Works Forum (TWf) does its best to ensure that any advice, recommendations or information it may give either in this publication or elsewhere is accurate, no liability or responsibility of any kind (including liability for negligence) howsoever and from whatsoever cause arising, is accepted in this respect by the Forum, its servants or agents.

Readers should note that the documents referenced in this TWf Guide are subject to revision from time to time and should therefore ensure that they are in possession of the latest version.

Contents

To navigate to page - hover over an item below and 'click'. Return to contents by clicking on the 'Return to the contents' at the bottom of every page.

Section	Page	Section	Page
Synopsis	2	11.0 "Grey areas" of responsibility and common	
Disclaimer	2	challenges with scaffolding	15
Foreword	4	a) Planning and procurement.	15
1.0 Scope	4	b) Design.	16
2.0 Why scaffolding needs to be managed.	4	c) Erection, modification, use and	
3.0 Overview of legislation, regulations and		dismantling	16
industry best practice for scaffolding.	5	d) Handover and inspection.	16
4.0 Overview of organisational responsibilities		References	17
for managing temporary works (including		Bibliography	17
scaffolding)	5	BSI	17
4.3 Clients	6	NASC	17
4.8 Permanent works designer	6	NFDC	17
4.9 Principal Contractor (PC) and		Other	17
Contractor (C)	6	Useful websites	17
4.12 Scaffold sub-contractor.	6		
4.17 Scaffold designer and design checker.	7	APPENDIX 1	
5.0 Overview of people involved in managing		Overview of legislation, regulations and	
temporary works (including scaffolding)	7	industry best practice for scaffolding.	18
5.2 Designated Individual (DI)	7	Health and Safety at work Act 1974	18
5.3 Principal Contractor's Temporary Works		Provision and Use of Work Equipment	
Coordinator (PC's TWC)	7	Regulations 1998	18
5.4 Temporary Works Coordinator (TWC)	8	Lifting Operations and Lifting Equipment	
5.5 Temporary Works Supervisor (TWS).	8	Regulations 1998	18
6.0 Procedures for managing temporary works		Management of Health and Safety at Work	
(including scaffolding) to BS 5975: 2019.	8	Regulations 1999 (as amended 2006)	18
6.3 Managing temporary works (including		BS EN 12811-1: 213, Temporary Works	
scaffolding)	9	Equipment. Scaffolds. Performance	
a) Planning / pre-construction	9	Requirements and General Design	18
b) Upon award of contract	9	Work at Height Regulations 2005 (as	
c) Appointments	9	amended 2007)	18
d) Temporary works register.	9	TG20:13.	25
e) Selection of scaffolding solution		Construction (Design and Management)	
and bespoke design (if required)	9	Regulations 2015	18
f) Constructing the scaffold.	10	BS 5975:2019, Code of practice for	
g) Inspection, testing, use, modification		temporary works procedures and the	
and dismantling	10	permissible stress design of falsework	18
7.0 When a scaffolding needs designing.	11		
Examples of typical information required		APPENDIX 2	
in a scaffold design brief.	11	Suggested examples of "implementation	
8.0 Procedure for managing the design of		class" from BS 5975: 2019	19
scaffolding to BS 5975: 2019.	13		
a) Planning / pre-construction	13	APPENDIX 3	
b) Upon award of contract.	13	Example procedure flow chart for managing	
c) Design and design checking process	13	scaffolding	22
d) Other.	13		
9.0 Who can build, modify and dismantle		APPENDIX 4	
scaffolding	14	TG20:13 "eGuide" Summary	24
10.0 When scaffolding should be inspected	15		

Foreword

Scaffolding is a common occurrence on many construction projects for work at height, access or other purposes. The Temporary Works Forum (TWf) has recognised the need for guidance in this area and has provided this document for industry use.

If possible the need for work at height should be eliminated by using an alternative solution. However, this is often unavoidable and most construction projects involve some work at height, hence the need for scaffolding. By law an employer must provide a safe place of work, e.g. working platform with edge protection and a safe means of access, so as to manage the risks of falling from height. Scaffolding can be used for: construction access, support, maintenance, towers, bridging, shoring, loading bays, protection, demolition, inspection, façade retention, edge protection, falsework, roofing, offshore, temporary event seating, etc. and requires good planning and coordination to achieve an appropriate, practicable and cost-effective scheme. The need for scaffolding should be identified as early as possible during the pre-construction planning stage and should be considered by clients and designers (e.g. sufficient space for a scaffold to be provided, how can it be stabilised or the utilisation of permanent structures or foundations for the purposes of the scaffold).

1.0 Scope

This guide applies to organisations and individuals involved in specifying, procuring, designing, constructing and managing scaffold. Good management applies to all 'tube and fitting' scaffold as well as proprietary system scaffold. This could be in the form of free-standing scaffolds, independent tied scaffolds, putlog scaffolds, mobile towers and scaffold stairs, slung/ suspended scaffolds, mast climbing scaffolds, etc.

1.1 This guide recommends how temporary works such as scaffolding should be managed to comply with legislation, regulations and industry best practice standards. It is complementary to other existing guidance (see [Bibliography](#)).

1.2 The guide:

- highlights the need to understand the roles, responsibilities and procedures from concept and procurement, through assembly, inspection, alteration and finally to removal of scaffolding;
- covers scaffolding comprising 'tube and fitting' as well as proprietary system scaffolding;
- provides guidance on management procedures ranging from simple scaffolding for domestic clients through to complex scaffolds for commercial or infrastructure clients ([see Figure 1](#));
- emphasises the importance of competence and ensuring that scaffolding components are of the required quality.

2.0 Why scaffolding needs to be managed

Users of this guide should be in no doubt that all types of scaffolding are items of temporary works and need to be managed appropriately.

2.1 Scaffolding is an item of temporary works that needs to be managed appropriately in order to:

- comply with legislation, regulations and industry best practice standard;
- improve the assessment and understanding of the hazards (from identification, design, assembly, using and removal of scaffolding), so as to control and reduce the associated risks and accidents;
- ensure those involved understand their roles and responsibilities;
- ensure scaffolding is cost-effective and suitable (e.g. materials, loads) for its intended use;
- prevent unauthorised access or modification;
- reduce the chances that mistakes / omissions made and improve the chances of mistakes / omissions being spotted and dealt with effectively.



2.2 The Health and Safety Executive (HSE) can visit any project and may expect to see evidence of adequate and appropriate procedures for the management of temporary works. They have powers of enforcement and if you can't produce this evidence they may stop you working.

NOTE:

Other organisations such as the Office for Nuclear Regulation (ONR) or the Office of Rail and Road (ORR) have similar powers for projects within their scope.

3.0 Overview of legislation, regulations and industry best practice for scaffolding

The users of this guide should be familiar with all the relevant legal requirements, standards and industry best practice guidance.

3.1 There is much legislation, guidance and industry best practice. These include (but are not limited to):

- Health and Safety at Work Act etc. 1974 [1]
- Construction (Design and Management) Regulations 2015 (CDM2015) [2]
- Management of Health and Safety at Work Regulations 1999 [3]
- Work at Height Regulations 2005 [4]
- Provision and Use of Work Equipment Regulations 1998 [5]
- Lifting Operations and Lifting Equipment Regulations 1998 [6]
- BS 5975: 2019, Code of practice for temporary works procedures and the permissible stress design of falsework [7]
- BS EN 12811-1: 2013, Temporary works equipment. Scaffolds. Performance requirements and general design [8]
- TG20:13, Good Practice Guidance for Tube & Fitting Scaffolding [9]

3.2 An overview of each of these is presented in [Appendix 1](#).

4.0 Overview of organisational responsibilities for managing temporary works (including scaffolding)

All organisations are required to have appropriate policies and procedures in place to comply with the law and industry standards. They should be competent organisations, have adequate resources and be appropriately insured. Insurance should be kept up-to-date.

Any organisation employing another organisation to undertake temporary works, e.g. scaffolding sub-contractors and designers, should take

reasonable steps to check they are competent (i.e. have the necessary skills, knowledge, experience and capability to construct, manage and/or design the work).

TG20:13 states clearly that BS 5975 should be followed for all scaffolds.

4.1 Every organisation involved in temporary works (e.g. clients, contractors, designers, equipment suppliers) should have an auditable procedure for the management of temporary works. These should follow the recommendations made in BS 5975: 2019 and be relevant to the type of work the organisation is responsible for. The procedure should ensure that the hazards and risks associated with scaffolding are identified, classified and controlled. It should cover the design, assembly, use and dismantling and include all relevant forms and provide an audit trail. The procedure should also include the appointment of competent persons.

4.2 A summary of the overall sequence for managing scaffolding is:

- **Planning**
For commercial projects the need for scaffolding should be identified at planning / tender stage.
- **Design and design checking**
If a scaffold is required a standard solution¹ may be suitable or, if not suitable, a bespoke design and design check is required ([see Section 7](#)).
- **Installation**
A scaffold should be erected by competent operatives ([see Section 8](#)). There must be a safe means to erect the scaffold on site, with task-specific risk assessment(s) and method statement(s) (RAMS).
- **Inspection**
Prior to use a scaffold requires inspection by a competent person for adequacy. It may require regular mandatory inspections throughout its use.
- **Use**
Safe means of access to the working area is required and operatives need to be briefed in any limitations of use.
- **Modification and dismantling**
There must be a safe means of modifying and dismantling a scaffold by competent operatives; with task specific risks assessments and method statements.

¹Work at Height Regulations 2005 (Schedule 3, Part II, Additional requirements for scaffolding): 7. 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.

Clients

- 4.3** Clients, i.e. organisations that may engage and use scaffolding, could include:
- Principal Contractors (PCs) and/or contractors for commercial new-build, refurbishment, demolition, housing, etc.
 - Owners of commercial properties or infrastructure for maintenance, repairs, etc.
 - Consulting engineers or architects, e.g. for access to carry out inspections on structures, etc.
 - ‘Domestic client’ - or tradesperson working for a domestic client - on their property, e.g. for maintenance.
- 4.4** Generally, domestic clients are not expected to carry out the same duties as those placed on commercial clients. Their duties are passed to the professionals they employ (e.g. architects, contractors).
- 4.5** CDM2015 requires that commercial clients ensure they select and appoint competent organisations (e.g. a principal designer and, on projects with more than one contractor, a principal contractor) and allocate sufficient time and resource to ensure the work can be carried out without risks to health or safety.
- 4.6** If commercial clients are directly involved in temporary works (including scaffolding) they should have an auditable procedure for the management of temporary works that follows the recommendations of BS 5975: 2019.
- 4.7** Some clients (e.g. Network Rail) have their own procedures for temporary works. These are intended to protect their assets if a scaffold is built on or near their property. They may impose additional requirements on contractors and designers relating to loads or safety measures and there is an extra level of approval by the client’s representative. These requirements need to be understood and allowed for in terms of programme, costs, supervision levels, etc.

Permanent works designer

- 4.8** CDM2015 (Regulation 9) requires permanent works designers to take into account the general principles of prevention² and eliminate risk wherever possible (e.g. eliminate any work at height and hence the need for scaffolding). Where this is not possible scaffolding may be required and the principal designer and designer have a duty to ensure scaffolding can be facilitated in a safe and efficient way without undue risk or complexity.

Principal Contractor (PC) and Contractor (C)

- 4.9** For commercial projects the PC/C has an overall duty for the safe execution of all works on site. This includes scaffolding. They should have an auditable procedure for the management of temporary works that follows the recommendations made in BS 5975: 2019. However, some of the responsibility may be delegated to specialist sub-contractors who are deemed competent to coordinate their own temporary works, e.g. scaffold sub-contractor or scaffold designer.
- 4.10** In this case, the sub-contractors’ procedures should be reviewed and approved for use on the project by the PC. However, the PC should be pro-active in monitoring performance and managing the interfaces between different sub-contractors.
- 4.11** The PC is normally responsible for organising permits, road closures, pavement licences, etc. to allow a scaffold to be erected, used, altered or dismantled and for managing interfaces.

Scaffold sub-contractor

- 4.12** Scaffold sub-contractors should have an auditable procedure for the management of temporary works (specifically for managing scaffolding) that follows the recommendations made in BS 5975: 2019 and provide evidence of their competency to carry out the work.
- 4.13** On larger projects their procedure may be approved by the PC for use on the project. If they do not have their own approved procedure they should adopt the PC’s procedure. The PC then manages the overall scaffolding package. However, the PC’s procedure is unlikely to be bespoke to scaffolding so may require amendment. Also, the PC’s site team may not have the expertise to manage adequately the scaffolding package.
- 4.14** It is reasonable for the scaffold sub-contractor to be made aware of the requirements of the PC’s procedure as part of the tender.
- 4.15** The scaffold sub-contractor should have a recorded training scheme. They should be able to demonstrate that they have competent supervision to direct scaffolding operations on site (e.g. CISRS Scaffold Supervisor card plus industry recognised supervisory qualification such as SSSTS) and are working within their capabilities.

²Sometimes referred to as ‘ERIC’ – Eliminate, Reduce, Inform and Control

- 4.16** Scaffolding contactors should also:
- have appropriate employers' liability, public liability and professional indemnity (if designing) insurances in place;
 - ensure management, supervision and operatives have received relevant training;
 - have access to a competent scaffold designer, or when using a standard solution (e.g. a TG20 compliance sheet or a system scaffold manufacturers' standard solution) have the knowledge to use and manage them correctly;
 - ensure all scaffold equipment deliveries are undertaken in a safe manner with proof of operator competence, certification and lift plans as necessary.

Scaffold designer and design checker

- 4.17** The scaffold designer and the design checker may be part of the scaffold sub-contractors organisation or external. They both have the same duties under CDM2015 as permanent works designers and need to be sufficiently competent in designing / checking scaffolding and have appropriate professional indemnity insurance.
- 4.18** The CDM requirement to eliminate risk wherever possible remains when someone other than a scaffold designer selects a standard solution for scaffolding (e.g. TG20 compliance sheet or system scaffold manufacturer's manual). Where the risk cannot be eliminated the designer must highlight any significant residual risks.
- 4.19** There should be an auditable procedure for the management of temporary works (specifically for designing / checking the design of scaffolding) that follows the recommendations made in BS 5975: 2019 and be able to provide evidence of their competency to carry out the work.
- 4.20** The procedure can be approved by the PC for use on the project. If they do not have their own procedure they should adopt the procedure of the PC and expect the PC to manage the overall scaffolding design package.
- 4.21** It is reasonable for the scaffold designer to be made aware of the requirements of the PC's procedure as part of the tender process.
- 4.22** Depending on the category of the design check required the checker may be part of the same organisation that carried out the scaffold design or external (see BS 5975: 2019, Table 2).
- 5.0** **Overview of people involved in managing temporary works (including scaffolding)**
- 5.1** Refer to BS 5975: 2019 [7] and TWf's Competencies of the TWC [10] (under revision) for further information and guidance on roles and responsibilities.

5.2 Designated Individual (DI)

- Every organisation (including scaffold sub-contractors and designers) involved in temporary works (including scaffolding) should appoint a senior person (e.g. technical director) to be responsible for establishing and maintaining a suitable procedure for their work, which is periodically reviewed, updated, audited and that adequate resources are made available to control the procedure (i.e. appoint competent persons).
- The DI should ensure the procedure is approved by the board of directors or board director; and is distributed and audited periodically.
- If an organisation undertakes multiple roles (e.g. scaffold sub-contractor undertakes scaffold design) their DI should establish and maintain separate procedures for each role (see BS 5975: 2019, Clause 6.1.1.8).
- A DI should ensure that any organisation they employ as a sub-contractor or supplier has adequate temporary works procedures and is competent. Where a contractor wishes to manage their own temporary works the PC's DI should approve these procedures for use on the project.

5.3 Principal Contractor's Temporary Works Coordinator (PC's TWC)

- The PC's TWC is a management role with ultimate responsibility (where there is more than one temporary works coordinator) for coordinating all temporary works on a project. They should ensure the PC's temporary works procedure is being implemented on the project.
- The PC's TWC should be an employee of the PC, be appointed by PC's DI and is responsible to the PC's DI for temporary works.
- They should be competent in the types of temporary works present on that project and have completed TWC training.
- The PC's TWC should be appointed formally, accept the responsibilities and have sufficient time / resource to carry out the role.
- They should be familiar with BS 5975: 2019 and their own company's procedure.
- The PC's TWC must have the authority to stop work if it is not satisfactory and the authority to sign permits (see BS 5975: 2019, Table 1 (and Appendix 2)).

- They need to ensure (e.g. by inspection and audit) that any temporary works coordinator / temporary works supervisor is operating to the agreed temporary works procedure.
- They should manage any “grey areas” of responsibility / interfaces between different contractors ([see Section 11](#)).

5.4 Temporary Works Coordinator (TWC)

- Every project involving temporary works should have a TWC (a PC’s TWC where there is more than one contractor managing temporary works) and is a management role with responsibility for coordinating temporary works on a project. They should ensure their temporary works procedure is being implemented.
- The TWC should be an employee of the PC/C. On larger more complex projects they may be an employee of a sub-contractor (e.g. scaffold sub-contractor) whose procedures have been approved for use on the project. They are appointed by their organisation’s DI and are responsible to their organisation’s DI for temporary works. They should liaise closely with the PC’s TWC if one is present.
- They should be competent in the types of temporary works they are being asked to coordinate. If responsible for scaffolding they should have completed formal TWC training with an emphasis on scaffolding.
- The TWC should be formally appointed, accept the responsibilities and have sufficient time / resource to carry out the role.
- They should be familiar with BS 5975: 2019 and their company’s temporary works procedure.
- A TWC must have authority to stop work if it is not satisfactory and the authority to sign permits (see BS 5975: 2019, Table 1 ([and Appendix 2](#))).
- They need to ensure (e.g. by inspection and audit) that any TWS is operating to the agreed procedure.
- They should manage any “grey areas” of responsibility / interfaces between different contractors ([see Section 11](#)).
- In relation to scaffolding this role is generally carried out by contracts or project managers.

5.5 Temporary Works Supervisor (TWS)

- Some projects choose to appoint TWSs to assist the PC’s TWC/ TWC with specific duties (e.g. ensuring temporary works are built correctly or inspections). This is a “hands on / practical” site supervisory role.

- TWSs are generally employed by sub-contractors (e.g. scaffold sub-contractor). They are appointed by their organisation’s DI and are responsible to the PC’s TWC/ TWC.
- They should be competent in the types of temporary works they are being asked to supervise (e.g. scaffolding) and should have completed formal TWS training with an emphasis on scaffolding.
- They should ensure that scaffold is being assembled, modified and dismantled correctly; request or carry out inspections; check that the actual site conditions reflect any design assumptions.
- TWSs should be formally appointed, accept the responsibilities and have sufficient time / resource to carry out the role.
- They should be familiar with BS 5975: 2019 and their company’ temporary works procedure.
- They must have the authority to stop work if it is not satisfactory and where necessary (and within their capabilities) be given limited authority to sign permits; generally for lower risk scaffolds (see BS 5975: 2019, Table 1 ([and Appendix 2](#))).
- In relation to scaffolding the role is generally carried out by scaffolding site supervisors.

NOTE:

The PC’s TWC / TWC is the point of contact between all parties for issues relating to temporary works. It is preferable for the PC’s TWC / TWC not to have day-to-day responsibility for site progress and they do not have to have any design experience. Deputies for all roles should be provided to cover for absence.

6.0 Procedures for managing temporary works (including scaffolding) to BS 5975: 2019

All scaffolding is temporary works and the hazards should be assessed and eliminated where possible. Where this is not possible the risks need to be managed. Familiarity with legal requirements and the recommendations made in BS 5975: 2019 is essential to ensure the scaffold is identified, planned, designed, checked, assembled, inspected, used, modified, maintained and dismantled correctly.

BS 5975: 2019 is not a legal requirement and you don’t have to follow its recommendations for controlling scaffolding. However, you may need to justify that what you are doing is as least as good as it is the only detailed document on the management of temporary works.

- 6.1 This section highlights the procedures required to manage scaffolding ([see Appendix 3, Flowchart](#)).

6.2 BS 5975: 2019 has three fundamental principles:

- 1) All organisations have a duty to manage and control their work.
- 2) The contractor is responsible for building the permanent works and all associated temporary works.
- 3) One person should take overall responsibility for managing the temporary works; known as the PC's TWC or TWC and every project should have one.

Managing temporary works (including scaffolding)**6.3** The main items that should be included in any procedure for managing temporary works (including scaffolding) are:**a) Planning / pre-construction**

- Every organisation involved in temporary works should appoint a senior person to act as DI to establish and maintain a temporary works management procedure.
- Where possible, the need for scaffolding (especially non-standard solutions) should be identified by the client, PD and permanent works designers.
- If possible, sub-contractors (such as scaffold sub-contractors or designers) should be vetted and their policies and procedures reviewed and, if appropriate, approved for use on the project by the DI of the potential PC/C. Many have lists of approved suppliers and sub-contractors.
- The scaffold sub-contractor or scaffold designer may be asked to provide outline information; such as price, timescale, etc. for tender purposes. Permissions may also need to be sought (e.g. from neighbours or obtaining pavement licences).

b) Upon award of contract

- The PC should be formally appointed. In turn, a scaffold sub-contractor and (if required) scaffold designer may be appointed formally.
- Determine which organisations' procedures should be used for managing the scaffolding. This should be determined by the scale and complexity of the scaffolding. If the scaffold sub-contractor's procedures have been approved they can be used; if not the PC's procedures must be adopted by the scaffold sub-contractor for use on the project.

c) Appointments

- Each organisation's DI should - as required - appoint in writing competent individuals (e.g. PC's TWC, TWC and/or TWS), with a list of responsibilities and duties. The individuals

should accept the appointments.

- The PC's TWC should be employed by the PC and is required if sub-contractors' procedures have been approved for use on the project.
- A TWC should be employed by the contractor (on projects with a single contractor) or by a sub-contractor (e.g. scaffold sub-contractor) whose procedures have been approved for use on the project.
- A TWS, if required, is generally employed by sub-contractors (e.g. scaffold sub-contractor).

d) Temporary works register

- The PC's TWC / TWC should maintain a master temporary works register with the various scaffolds on a project being added as the work progresses. The register may be started pre-construction with significant items being identified.
- The hazards should be assessed and the risks for each different item of scaffolding should be classified (known as 'implementation risk' in BS 5975: 2019, Table 1) as "very low, low, medium or high" (see [Appendix 2](#) for examples). The class determines the level of procedure required to manage the risks. The hazards should be reviewed and measures provided to manage the risks.

NOTE:

From [Figure 1\(a\)](#) the scaffold can be treated as 'very low' or 'low' risk and is likely to be a pre-designed standard solution requiring a minimal level of procedure to manage the risks. From [Figure 1\(b\)](#) the scaffold can be treated as 'high' risk and requires a bespoke design and a significant level of procedural control.

e) Selection of scaffolding solution and bespoke design (if required)

- If a standard solution is selected by a competent person then no further design is required for the scaffold; but the selection of the detail should be confirmed by another competent person (and, for 'tube and fitting' scaffolds a TG20 compliance sheet provided). It may be necessary to provide a design for the interface around the scaffold, e.g. foundations and ties.
- For non-standard solutions a bespoke design is required (in conjunction with manufacturers' specifications and data sheets) and a scaffold designer and design checker appointed.

- PC's TWC/ TWC should ensure an adequate design brief is provided (see Section 7 for when scaffolds need a bespoke design and design brief information and Section 8 for design procedures).
- Bespoke designs require an appropriate category of design check (see BS 5975: 2019, Table 2) and a design check certificate issued. External approval may also be required, e.g. when adjacent / on Network Rail assets.
- TWC along with other members of the site team should review the design proposals to ensure the design brief has been met and consider practical issues such as buildability and providing control measures for residual risks.

f) Constructing the scaffold

- Method statements and risk assessments (RAMS) should be carried out and recorded for every scaffold, considering the hazards associated with its assembly, use, removal, loading, consequences of failure, location and interface with other items of temporary works or permanent works. Many scaffold projects are similar but it is not acceptable to use a risk assessment from a previous site. Each project is slightly different and you need to ask "What's different about the hazards and risks for this location and job?"
- RAMS should be reviewed by the PC's TWC / TWC and measures provided on site to manage the risks.
- The PC's TWC/ TWC should ensure that all relevant licences, permissions, etc. are in place to allow the scaffold to be built.
- The PC should provide site induction, check the competence of scaffolders and brief them in the methodology and risks.
- Preliminary proof testing of intrusive ties should be carried out in accordance with the requirements of the design.
- All scaffold equipment should be inspected for compliance and quality prior to use.
- Any on site changes / modifications (departures from standard solution or design drawings) that need to be made to the scaffold should be communicated via the PC's TWC / TWC to the designer for checking and approval.

NOTE:

It is common that during the build of a scaffold a part of the design doesn't quite

'fit' or 'work' and it's common for the site team to make changes to keep the works progressing. This should be avoided as those making the changes then take on design responsibility themselves (see CDM2015). The correct procedure is that the PC's TWC/ TWC should be notified and they should communicate with the designer to seek approval for any changes that need to be made.

g) Inspection, testing, use, modification and dismantling

- Once the scaffold has been built and any necessary testing carried out (e.g. testing anchors), it should be formally inspected by a competent person and the inspection recorded. A handover certificate is provided and it has become good practice to provide a scaffold tag control system. The handover certificate does not include responsibility or inspection of foundations and these will need to be assessed separately.
- Permit-to-load/ -use/ -work can then be issued for more complex scaffolds (these would generally not be required for scaffolds classified as 'very low' risk). The temporary works procedure should stipulate who can sign permits (see BS 5975: 2019, Table 1 (and [Appendix 2](#))).
- During its use the scaffold requires statutory periodic inspections (see [Section 10](#)) and for long term scaffolds a maintenance schedule should also be prepared.
- If any alterations need to be made to scaffold during the project the TWC should ensure that appropriate procedures are in place to provide RAMS, seek approval from the designers and that any alterations are made by competent scaffolders.

NOTE:

All scaffold should be designed. Changes on site can often take what was previously a standard solution outside the scope of said solution, i.e. a compliance sheet would not cover the amended state. The scaffold designer should always be consulted, even if this is just to update and re-confirm the standard solution.

- Once the scaffold is no longer required RAMS should be prepared for its removal and a permit-to-strike/ -remove issued. The temporary works procedure should stipulate who can sign permits (see BS 5975: 2019, Table 1 (and [Appendix 2](#))). Competent scaffolders should be used to remove the scaffold.

NOTE:

It is not acceptable for the scaffold removal method statement to simply state: “removal is reverse of installation”. A detailed removal sequence should be provided (e.g. sequence in which the order and number of ties and bracing should be removed).

6.4 For very large or very complex projects or schemes (e.g. Hinkley Point C or HS2) the management procedures and structures can be adapted to suit the site-specific hazards, risks, competencies, scale, etc. that are relevant to such a project. This may involve some departures from the recommendations made in BS 5975 and/or contractors having to adhere to the clients’ specific procedures and standards. Management and operatives may also require specific competencies to work on such projects. Similarly, it should be recognised that very small and simple projects (e.g. routine maintenance or inspection of housing or utilities) may choose to simplify the management procedures.

7.0 When a scaffolding needs designing

Scaffold designs should conform to BS EN 12811-1 which specifies general design standards. It is a requirement of the Work at Height Regulations 2005 that unless a scaffold is assembled to a generally recognised standard configuration (for example, as specified on an applicable TG20:13 compliance sheet for ‘tube and fitting’ scaffolds or manufacturer’s guidance for system scaffolds), then a bespoke design is required.

7.1 If the proposed scaffold is outside the range of a standard solution then the scaffold should be designed by bespoke calculations by a competent person to ensure it has adequate strength, rigidity and stability whilst it is being assembled, inspected, used, altered, maintained or dismantled. The design must be such that safe erection and dismantling techniques can be employed. The HSE has published a “Scaffold Checklist”³ [11] that indicates the types of scaffolding that require a bespoke design.

7.2 The TG20:13 “eGuide” [12] (see Appendix 4) enables different scaffolding arrangements and features of scaffolding to be considered, producing a compliance sheet pertinent to the required structure, arrangements and features. Any ‘tube and fitting’ scaffolding that is beyond the standard solutions as defined in TG20, or the compliance of which cannot be qualified with a corresponding compliance sheet produced from the “eGuide,” should be designed by a competent designer. Some contractors

have prepared their own standard solutions for scaffolding outside the recommendations of TG20, which they use commonly. These arrangements should be supported by calculations, drawings, RAMS, etc. with limitations on use and foundations stated clearly.

7.3 Non-standard scaffolding should be identified at tender stage, along with its implementation risk class (see BS 5975: 2019, Table 1 (and Appendix 2)) so additional budget and time is allowed for design and design checking (see design check categories in BS 5975: 2019, Table 2).

7.4 The PC’s TWC/ TWC should ensure a design brief is provided to the designer. The designer must be able to demonstrate their competence in designing scaffolding and an appropriate level of professional indemnity insurance. These records should be kept as evidence for any subsequent audits and for any disputes.

7.5 The design process and the designation of category of design check should be carried out by a competent person and may be a collaborative process.

7.6 The scaffold designer produces the design which should include calculations, drawings and any critical methodology for assembly, modification and/or removal; in addition, any additional specific testing, inspection or maintenance that may need to be carried out and highlight residual risks (i.e. risks the designer has not been able to eliminate during the design process). Incomplete designs and “grey” areas in responsibility (see Section 11) need to be identified and generally the principal contractor may have to take measures to resolve these issues.

7.7 TG20 compliance sheets only apply to TG20-compliant tubes, fittings, beams, etc. and are not suitable for scaffolds using structural aluminium tubes

Examples of typical information required in a scaffold design brief

- Name and contact details of TWC and timescale for when completed design is required.
- Elevations, sections and plans at each level, of structure to be built, inspected or modified.
- Any phasing requirements for the construction, use or removal of the scaffolding. This may include where scaffold materials are stored during erection and dismantling and where the materials need to be moved from/to and conditions change during this time.
- Site location (for determining wind data) and length of time that the scaffold is required.

³<https://www.hse.gov.uk/construction/safetytopics/scaffoldinginfo.htm#>

- Any preferred dimensions (or limitations on dimensions) such as height, length, width, number of lifts, number of boarded platform and size of platforms.
- Allowable ground bearing pressures or allowable loads on slabs / floors (if available) to determine foundation options and any restrictions on positioning of scaffold standards.
- Any residual risks highlighted by the permanent works designer that may affect the scaffolding.
- Preferred options for access. Is there a requirement for pedestrian walkways to be used by members of the public?
- Purpose of the scaffold including anticipated loading for specific trades and if brick-guards, netting or sheeting may be required.
- Foreseeable restrictions, e.g. from adjacent structures, power lines or positioning of standards. Also any site specific restrictions that may affect the scaffolder's safe system of work.
- Is access required through the scaffold, i.e. provision of open bays or bridged sections?
- Cranage lifting limitations if sections are to be prefabricated and lifted into position.
- Foundation details including allowable bearing pressures and hazards at ground level such as services or trenches which need to be bridged.
- Does the scaffolding rely on an existing structure or building for support or stability (and are there any loading restrictions) or is it required to be freestanding?
- Preferred tie locations.
- Scaffold implementation risk classification (BS 5975: 2019, Table 1) and category of design check (BS 5975: 2019, Table 2).
- Additional protective measures such as fans or vehicle impact barriers.
- Whether loadings bays are required. Location and anticipated loading, i.e. what is being placed onto the scaffold and by what means?
- Does lifting equipment or rubbish chutes need to be attached to the scaffold?
- Whether the scaffolding may be subject to unusual loads, e.g. vibrating machinery, suction from passing trains, flowing water (scour and debris impact considerations)?
- What design output is required e.g. calculations, CAD drawings, BIM, etc.



Fig 2. Examples of scaffold structures that would require bespoke design and significant procedural control

8.0 Procedure for managing the design of scaffolding to BS 5975: 2019

Scaffold designers should have a DI and a procedure for the management of temporary works. They should have the qualifications, skills, knowledge, experiences and insurances to carry out the work and should ensure any sub-contract designers they employ are also equally capable. They need to take into account the general principles of prevention, usually recorded in a 'designer's risk assessment'; summed up in the acronym 'ERIC'. If they are unable to eliminate risks they need to provide appropriate and proportional information about significant residual risks. Scaffold designs need to be formally checked by an equally competent design checker.

8.1 The main items that should be addressed and included in the scaffold designer's temporary works procedure include:

a) Planning / pre-construction

- Appoint a senior person to act as DI to establish and maintain a temporary works design procedure.
- The need for scaffolding (especially non-standard solutions) should be identified by the client, PD and permanent works designers. The scaffold designer may be asked to provide outline design information, price, timescale, etc. for tender purposes.
- If possible sub-contractors (such as scaffold designers) should be vetted and their policies and procedures reviewed and if appropriate approved for use on the project by the DI of the potential PC/C. Many have lists of approved suppliers and sub-contractors.

b) Upon award of contract

- The scaffold designer (and design checker) should be formally appointed and may ask for their temporary works design procedure to be approved by the PC/C DI for use on the project. If not the scaffold designer needs to operate to the procedures being used on site.
- All the scaffold designers' communication (relating to scaffolding), should be through the PC's TWC/ TWC. They should not commence formal design works until a design brief has been issued and has been reviewed for completeness.

c) Design and design checking process

- The scaffold designer should review the design brief and request any additional information. The design process should not commence until the designer has received all the relevant information.

- The scaffold designer should carry out and record a designer's risk assessment (following the general principles of prevention) and ensure they provide a practicable design having considered all foreseeable loading, consequences of failure and buildability for assembly, use and removal. They must highlight any significant residual risks from their design.
- They should eliminate where possible, any residual risks highlighted by the permanent works designer.
- The designer, in conjunction with the PC's TWC / TWC, determines the appropriate category of design check (see BS 5975: 2019, Table 2). The PC's TWC / TWC should ensure that an appropriate category of design check is undertaken and that a design check certificate is issued.
- They should ensure the appropriate level of design output is provided to the site including (but not limited to):
 - (i) design calculations can be made available to prove the structural strength and stability of the scaffold;
 - (ii) assumed equipment to be used, e.g. tubes (3.2mm or 4mm), class of clips, boards, etc.;
 - (iii) need for supplementary couplers;
 - (iv) critical items such as assumed sequence for assembly, alteration or removal, etc.;
 - (v) need for testing, specific inspections or maintenance requirements;
 - (vi) loading limitation on use of platforms ([see Figure 3](#));
 - (vii) leg loads so foundations can be assessed / designed;
 - (viii) type of ties, location and classification, viz. light duty (3.5kN), standard (6.1kN), heavy duty (12.2kN);
 - (ix) drawings, BIM information;
 - (x) appropriate residual risk information.

d) Other

- Highlight areas they are not taking responsibility for, e.g. foundations or adequacy of structure for tie loads.

Figure 3(a) – Load classes for access and working scaffold made from tubes and fittings

Load Class	Designation	Duty	Likely use of platform	Uniformly distributed load on platform kN/m ²	Max. number of platforms in use (udl kN/m ²)	Max. bay length m	Max. spacing board transoms	Max. number of boards	Width class
1	1-3-0	Inspection and very light duty	Inspection, light cleaning and access	0.75	One full (0.75) and One 50% (0.375)	2.7(1)	1200	3	W06
	1-4-0							4	W08
	1-4-1							4 + 1	W12
2	2-4-0	Light duty	Plastering, painting, stone, glazing and pointing	1.5	One full (1.5) and One 50% (0.75)	2.4	1200	4	W09
	2-5-0							5	W09
	2-4-1							4 + 1	W12
	2-5-1							5 + 1	W12
3	3-5-0	General purpose	General building work, including brickwork, window and mullion fixing, rendering and plastering	2.00 (inside boards 0.75)	One full (2.00) and One 50% (1.00)	2.1	1200	5	W09
	4 + 1							W09	
	4 + 2							W12	
	5 + 1							W12	
	5 + 2							W12	
4	4-5-0	Heavy duty	Masonry work, concrete block work, and very heavy cladding	3.00 (inside boards 0.75)	One full (3.00) and One 50% (1.50)	1.8	900	5	W09
	4-4-1							4 + 1	W09
	4-4-2							4 + 2	W12
	4-5-1							5 + 1	W12
	4-5-2							5 + 2	W12

Note: ⁽¹⁾ Note that the TG20 compliant scaffolds defined in the Operational Guide and eGuide are limited to 2.4m bays, but 2.7m bays may be achieved by special design

Source: TG20:13 Design Guide (Table 2.1)

Figure 3(b) – Load classes for access and working scaffold made from tubes and fittings

A scaffold is designed to support:	
Dead loads	Self-weight (e.g. tubes, boards, fittings)
Live loads	Imposed loading (e.g. people or material storage)
Environmental loads	e.g. Wind (depends on exposure conditions and whether netting or sheeting is added). <i>NOTE: This would include wind uplift if a scaffold roof was added (kentledge may be necessary).</i>
Dynamic loads	e.g. Suction due to passing trains or vibration due to machinery

- 9.0 Who can build, modify and dismantle scaffolding**
- 9.1** Scaffold sub-contractors should have appropriate policies, procedures and systems in place to comply with the law, regulations and standards; along with the capabilities, resources and staff to deliver the work to the required standard and in the required timescale. PAS91 [13] is a commonly used standard pre-qualification questionnaire.
- 9.2** A scaffold should not be erected, altered or dismantled unless there is adequate supervision by a competent and experienced person taking into account the complexity of the work and the levels of training and competence of the scaffolders involved.

- 9.3** All employees should be competent for the type of scaffolding they are building and should have appropriate training to the type and complexity of scaffolding they are working on. Any trainee scaffolders should work under the supervision of a trained and competent scaffolder. Details of the relevant expertise of scaffolders and advanced scaffolders - including details of which types of scaffolding they are deemed competent to build - are available from Construction Industry Scaffolders Record Scheme (CISRS) [14].
- 9.4** Good practice guidance has been produced for the safe erection of scaffolding (see [Bibliography](#)).
- 9.5** Scaffolding should be rigid, built of sound materials, on good foundations and be well secured or stabilised.

- 9.6** In public places scaffolds should be well lit or have warning lights at base (unless there are specific reasons not to do this), measures to prevent unauthorised access, public protection measures and warning notices displayed and means to prevent access on incomplete scaffolds.
- 9.7** All system scaffolds used on site must conform to the relevant standard BS EN 12810 [15] or BS EN 12811 [16]. At least one scaffolder must have successfully completed the relevant CISRS System product training and they should supervise other members of the assembly gang to assemble, modify and dismantle the scaffold.
- 10.0** **When scaffolding should be inspected**
- 10.1** The Work at Height Regulations 2005 [4] require that scaffolding should be inspected by a competent person with a combination of knowledge, training and experience appropriate for the type and complexity of scaffolding. The frequency of inspection is as follows:
- straight after assembly or before first use confirmed in the initial inspection report or handover certificate;
 - after any circumstances that could affect strength or stability, e.g. high winds;
 - after any alterations or modifications;
 - at intervals not more than every 7 days.
- 10.2** The inspection report should note any defects which should then be dealt with. The person carrying out the inspection must provide a report to the client within 24 hrs and the client should keep the reports safe until the construction work is completed and then for 3 months afterwards.
- 10.3** The PC's TWC / TWC should ensure that any physical inspections of critical components (as specified by the designer) are carried out; especially if the scaffold is to be in use for a long time or has complex installations, e.g. long-spanning beams or cantilevers.
- 10.4** When a scaffold is complete, a competent representative of the scaffold sub-contractor (and often customer) should inspect the scaffolding for compliance with regulations, codes of practice and the design and then complete a handover certificate (for example, SG35, Handover of scaffolding structures [17]) and give a copy to the client. The handover certificate can be considered to be the first inspection and an entry should be made in the scaffolding register. Scaffolding handover certificates are not a legal requirement but are useful for scaffolding companies and clients as it provides useful information on loading and other limitations. A 'warning sign' is a legal requirement where the scaffolding is unsafe or incomplete; a physical means of preventing access onto the scaffolding should also be provided. Once the scaffolding is complete it is considered industry good practice to provide a 'tag' (with useful information to those using the scaffolding).
- 10.5** Lightweight mobile towers can be erected, moved, inspected, modified, dismantled and used by a competent person holding a recognised qualification that specifically includes mobile towers. Mobile towers must be inspected as often as necessary to ensure safety. The law requires that they are inspected after assembly, after modifications and before use and thereafter at intervals not exceeding every 7 days, or after any event likely to have affected strength or integrity. They do not need to be inspected if the tower is moved at the same site.
- 11.0** **"Grey areas" of responsibility and common challenges with scaffolding**
- 11.1** There may be "grey areas" of responsibility and common challenges that need to be addressed, managed and/or coordinated. These include:
- Planning and procurement**
 - Hazards should be identified and the general principles of prevention applied to determine whether there is an alternative to work at height involving a scaffold? If not, has the scaffold been identified and properly planned from tender stage? The scope of scaffolding should be assessed by a competent person.
 - Who is procuring the scaffold? Have they checked that the scaffold sub-contractor and scaffold designer have appropriate insurance to cover public liability, employers' liability and professional indemnity insurance?
 - All organisations that manage scaffolding should meet the recommendations of BS 5975: 2019. The PC should have suitable procedures but may choose to make arrangements to allow a scaffold sub-contractor to manage its own work using their own procedures, if they can demonstrate conformity (see [Sections 4.12 to 4.16](#)).
 - When are RAMS required (for erection, use and dismantling) and who provides them?

b) Design

- When does a scaffold need a bespoke design and when is a standard solution appropriate? The guidance in [Section 7](#) should be followed.
- How is the decision made to use a “standard solution”? Which detail is appropriate and who makes and checks this decision?
- Who is responsible for putting together a design brief?
- Who is competent to design scaffolding and who is competent to check the design (plus the degree of independence of design checker)?
- Who is responsible for designing and/or assessing the adequacy foundations or ties?

c) Erection, modification, use and dismantling

- Who is competent to build, modify, inspect and dismantle scaffolding? Do they have relevant CISRS cards? The guidance in [Section 9](#) should be followed.
- How to ensure the scaffold is not interfered with or accessed by unauthorised people?
- How to ensure the quality of the materials and workmanship?
- Which party is responsible for providing access and foundations beneath the scaffold?
- How is stability of the scaffold to be achieved?
- What are the effects of adding signage, netting or sheeting?
- Which party is responsible for ensuring that any ties are installed correctly and carrying out testing if necessary?

NOTE:

When the scaffold is tied to a structure with mechanical or resin anchors, beams clamps, box ties or through ties, it relies on the strength of the structure to provide stability. The selection of type of tie and positioning are critical to allow work to be carried out without clashes and drilled ties into brickwork, masonry or suspect concrete should be “pull-tested” (how many test and loading should be determined by design and risk assessment) before the scaffold is used.

d) Handover and inspection

- If the scaffold is incomplete, has unauthorised access been prevented?
- Foundations and ties need to be assessed and inspected separate to the handover of the scaffold.
- Has a handover certificate been provided and is a tag system in place?
- If the scaffold is to be in use for a long time, what monitoring or maintenance is required?
- If the scaffold is in a public area or next to infrastructure, what extra precautions and permissions are required?
- What records (evidence) need to be kept?
- If a scaffold is built inside the boundary of a domestic or commercial property, then a licence is not required. However, if any part needs to go on the road or pavement then a licence from the local authority should be obtained.
- Scaffold systems are often copied and can come from less than reputable sources. Types of system scaffold should not be mixed in the same structure.
- Does the scaffold require additional protection measures, e.g. vehicle impact barriers for traffic impact?
- Who is responsible for ensuring pedestrian walkways are provided with adequate lighting (where appropriate)?
- **How to ensure loading limits are effectively communicated on site (most site operatives do not understand what a “kilonewton” (kN) is (see [Figure 3](#)) and who ensures the scaffold does not become overloaded.**

This guide recognises there are many different solutions to the challenges listed above depending on complexity, location etc. The project team should determine the most appropriate solution.

References

- [1] Health and Safety at Work Act etc. 1974
- [2] Construction (Design and Management) Regulations 2015
<http://www.legislation.gov.uk/ukxi/2015/51/contents/made>
<https://www.hse.gov.uk/pubns/priced/l153.pdf>
- [3] Management of Health and Safety at Work Regulations 1999 (amended 2006)
<http://www.legislation.gov.uk/ukxi/1999/3242/contents/made>
<http://www.legislation.gov.uk/ukxi/2006/438/regulation/2/made>
- [4] Work at Height Regulations 2005 (as amended 2007))
<http://www.legislation.gov.uk/ukxi/2005/735/contents/made>
<http://www.legislation.gov.uk/ukxi/2007/114/contents/made>
- [5] Provision and Use of Work Equipment Regulations 1998
<http://www.legislation.gov.uk/ukxi/1998/2306/contents/made>
<https://www.hse.gov.uk/pubns/priced/l22.pdf>
- [6] Lifting Operations and Lifting Equipment Regulations 1998
<http://www.legislation.gov.uk/ukxi/1998/2307/contents/made>
<https://www.hse.gov.uk/pubns/priced/l113.pdf>
- [7] BS 5975: 2019, Code of practice for temporary works procedures and the permissible stress design of falsework (BSI), <https://shop.bsigroup.com>
- [8] BS EN 12811-1: 2013, Temporary works equipment. Scaffolds. Performance requirements and general design (BSI), <https://shop.bsigroup.com>
- [9] TG20:13, Good Practice Guidance for Tube & Fitting Scaffolding (NASC), <https://nasc.org.uk>
- [10] Competence of TWC, TW11.027, Rev F (TWf) (under revision)
<https://twforum.connectedcommunity.org/viewdocument/competencies-of-the-twc-tw11027>
- [11] Scaffold checklist (HSE)
<https://www.hse.gov.uk/construction/safetytopics/scaffoldinginfo.htm#> (viewed 29th May 2020)
- [12] TG20:13 “eGuide” (NASC), <https://nasc.org.uk>
- [13] PAS91: 2013 + A1: 2017, Construction prequalification questionnaires (BSI), <https://shop.bsigroup.com>
- [14] Construction Industry Scaffolders Record Scheme (CISRS), <http://cisrs.org.uk>
- [15] BS EN 12810-1: 2003, Facade scaffolds made of prefabricated components (BSI), <https://shop.bsigroup.com>
 - Part 1, Product specifications
 - Part 2, Particular methods of structural design
- [16] BS EN 12811, Temporary works equipment.
 - Part 1 (2003): Scaffolds. Performance requirements and general design
 - Part 2 (2004): Information on materials
- [17] SG35, Handover of scaffolding structures (NASC)

Bibliography

BSI

BS EN 1004: 2004, Mobile access and working towers made of prefabricated elements. Materials, dimensions, design loads, safety and performance requirements
BS EN 13374:2013+A1:2018, Temporary edge protection systems. Product specification. Test methods
BS 5974: 2017, Planning, Design, Setting Up and Use of Temporary Suspended Access Equipment

NASC

SG4:15, Preventing Falls in Scaffolding Operations
SG6:15, Manual Handling in the Scaffolding Industry
SG9:15, Use, Inspection and Maintenance of Lifting Equipment and Accessories for Lifting in Scaffolding
SG30:17, Management of Road Haulage for the Scaffolding Contractor
TG4:19, Anchorage Systems for Scaffolding
TG17:15, Identification of EN74-1 Couplers

NFDC

Demolition Scaffolding, DRG 107: 2014
Video, Scaffold in the demolition industry
<https://bit.ly/3582ZPY>

Other

CAP 609, General information booklet (CISRS) (<http://cisrs.org.uk/wp-content/uploads/2018/01/cap609-general-information-booklet.pdf>)
HSG65, Managing for health and safety (HSE) (<https://www.hse.gov.uk/pubns/priced/hsg65.pdf>)
Temporary Works: Principles of Design and Construction, 2nd Edition (ICE), Peter F Pallett & Ray Filip (2019), ISBN 978-0-7277-6338-9

Useful websites

Access Industry Training Scheme (AITS)
<https://access-its.org>
Construction Fixings Association (CFA)
<https://www.the-cfa.co.uk>
Construction Industry Training Board (CITB)
<https://www.citb.co.uk>
Health and Safety Executive (HSE)
<https://www.hse.gov.uk>
National Access & Scaffolding Confederation (NASC)
<https://nasc.org.uk>
National Federation of Demolition Contractors (NFDC)
<https://demolition-nfdc.com>
Scaffolding Association (SA)
<https://scaffolding-association.org>
Temporary Works Forum (TWf)
<https://www.twforum.org.uk>

Appendix 1: Overview of legislation, regulations and industry best practice for scaffolding

Health and Safety at Work etc. Act 1974

Employers have duties to:

- a. provide a safe system of work, a safe place of work and safe equipment (including scaffolding);
- b. protect employees and the general public to prevent injury and death;
- c. ensure competent organisations and people should be employed (including scaffold sub-contractor and designer);
- d. carry out risks assessments and take steps to eliminate or control these risks and then inform workers fully about all potential hazards associated with the work.

Provision and Use of Work Equipment Regulations 1998

Employers have duties to ensure equipment they own, have control over or hire (this includes scaffolding equipment) is:

- a. suitable for the intended use;
- b. safe for use, maintained in safe condition and inspected to check correct installation and for deterioration;
- c. used only by people who have received adequate information, instruction and training?

Lifting Operations and Lifting Equipment Regulations 1998

Employers have duties when an item is to be raised or lowered (including scaffolding components) by lifting equipment (whether owned by them or not) to ensure all lifting operations (e.g. loading, offloading or moving scaffold components with a crane or lorry loader) involving lifting equipment are:

- a. properly planned by a competent person;
- b. appropriately supervised and carried out in a safe manner;
- c. subject to periodic thorough examinations, carried out by a competent person and records kept.

Management of Health and Safety at Work Regulations 1999 (as amended 2006)

Employers have duties to:

- a. make a suitable and sufficient assessment of the risks to the health and safety of employees (Reg. 3(1));
- b. follow the principles of prevention to control the risks identified by the risk assessment (Reg. 4);
- c. continually assess and manage the risks to their employees and others arising from their work activities;
- d. ensure health and safety of the workplace, including making suitable arrangements for emergencies;
- e. train their employees and health surveillance where appropriate.

BS EN 12811-1: 2013, Temporary Works Equipment. Scaffolds. Performance Requirements and General Design

This specifies the performance requirements, methods of structural and general design for access and working scaffolds.

Work at Height Regulations 2005 (as amended 2007)

Applies to any workplace at height where there is a risk of a fall liable to cause personal injury. Employers have duties to ensure any work at height (if it cannot be avoided) is:

- a. properly planned to prevent falls or minimise distance and consequence of falls (use correct equipment);
- b. supervised and carried out by competent persons;
- c. strength and stability calculations must be carried out unless the scaffold is assembled in conformity with a generally recognised standard configuration and BS EN 12811 is recognised as being a standard configuration.

TG20:13

This sets out good practice guide for 'tube and fitting' scaffolds with guidance on range of standard structures and design guidance. It shows how 'tube and fitting' scaffolding should be built to conform to BS EN 12811.

Construction (Design and Management) Regulations 2015

Applies to the whole construction process on all construction projects, from concept to completion:

- a. Commercial clients have duties to make suitable arrangements for managing a project – appointing duty holders (Principal Designer and Principal Contractor), ensuring sufficient time and resource are allocated, preparing and providing relevant information. Domestic clients normally transfer their duties to the principal contractor (for projects with more than one contractor) or contractor for single contractor projects.
- b. Principal designers have duty to plan, manage and coordinate health and safety in pre-construction phase. Including identifying, eliminating or controlling foreseeable risks and ensuring designers carry out their duties.
- c. Designers (permanent works and temporary works) have duties to eliminate, reduce or control all foreseeable risks that may arise during construction, use and maintenance of a structure.
- d. Principal contractors have duties to plan, manage and coordinate health and safety in the construction phase of a project. This includes liaising with clients, preparing the construction phase plan, organising cooperation between contractors and coordinating their work. The Principal Contractor cannot subcontract their responsibility for health and safety.
- e. All practicable steps must be taken to prevent danger to any person and to ensure any part of a structure does not collapse and can withstand any foreseeable loading (this includes scaffolds; see regulation 19).

BS 5975: 2019, Code of practice for temporary works procedures and the permissible stress design of falsework

Applies to the management of all temporary works (including scaffolding) and recommends control procedures to be adopted by all organisation including clients, designers, contractors and equipment suppliers, etc.

Appendix 2: Suggested examples of “implementation class” from BS 5975: 2019

NOTE: This appendix is intended as a guide only and the hazards associated with each scaffold should be risk assessed on its own merits considering the type of scaffold, its use, location, consequences of failure, etc. Each organisation should determine what minimum level of procedural control is appropriate for each implementation class based on a risk assessment and BS 5975: 2019, Table 1.

Figure A2: Suggested examples of “implementation class” from BS 5975: 2019



Risk
<p>Very Low</p> <ul style="list-style-type: none"> • Standard solution low height system tower scaffold for light loading • TWC discretion to be used if item is to be included on temporary works register • Built by competent persons and is within the limits of the manufacturers’ instructions • Simple RAMS required based on manufacturers’ instructions • Simple assessment of foundation required • Tower to be built and used on a flat sound surface • Design brief, designer and further calculations not required. • Permit-to-load not required • Tower requires formal inspection • Used by competent operatives who have been trained in loading and use limitations



<p>Low</p> <ul style="list-style-type: none"> • Tube and fitting for brickwork, domestic extension, and often with scaffold roof for weather protection • Scaffold to be loaded with significant quantity of bricks or roof tiles • Scaffold structure should be added to temporary works register • Competent designer should be appointed to consider wind loading on scaffold roof • Design brief to be provided and design calculations need to be checked • RAMS required and built by competent persons who have been briefed • Formal inspection and handover certificate required. Foundation assessment required • Permit-to-use/ -load required: may be signed by TWC or TWS • Statutory inspections required • Formal maintenance regime unlikely as not in use for prolonged period • RAMS and permit-to-dismantle/ -remove required: may be signed by TWC or TWS

Appendix 2: *Continued*Figure A2: Suggested examples of “implementation class” from BS 5975: 2019 – *Continued***Risk****Medium**

- Suspended tube and fitting scaffold above a river to carry out repairs on historic structure
- To be identified and planned from tender stage
- Scaffold to be loaded with stone and required for a significant period of time
- Location and consequences of failure add to the risk
- Scaffold structure should be added to temporary works register
- Competent designer should be appointed to design scaffold
- Design brief to be provided and design calculations need to be checked
- Scaffold standards working in tension and supplementary / check fittings are likely
- Scaffold relies on historic structure for support and stability so structural engineer needs to assess structure and ties need to be pull tested (probably all ties need to be tested)
- Comprehensive RAMS required as there are significant risks when scaffold in being built so additional safety measures are required for the team building and using the scaffold
- Built by competent persons (advanced scaffolder) who have been briefed
- Formal inspection and handover certificate required.
- ITPs to be provided
- Permit to use / load required - could be signed by PC's TWC or TWC
- Statutory inspections required
- Formal maintenance regime likely as in use for prolonged period
- RAMS and permit-to-dismantle/ -remove required: may be signed by PC's TWC or TWC

Appendix 2: Continued

Figure A2: Suggested examples of “implementation class” from BS 5975: 2019 – Continued



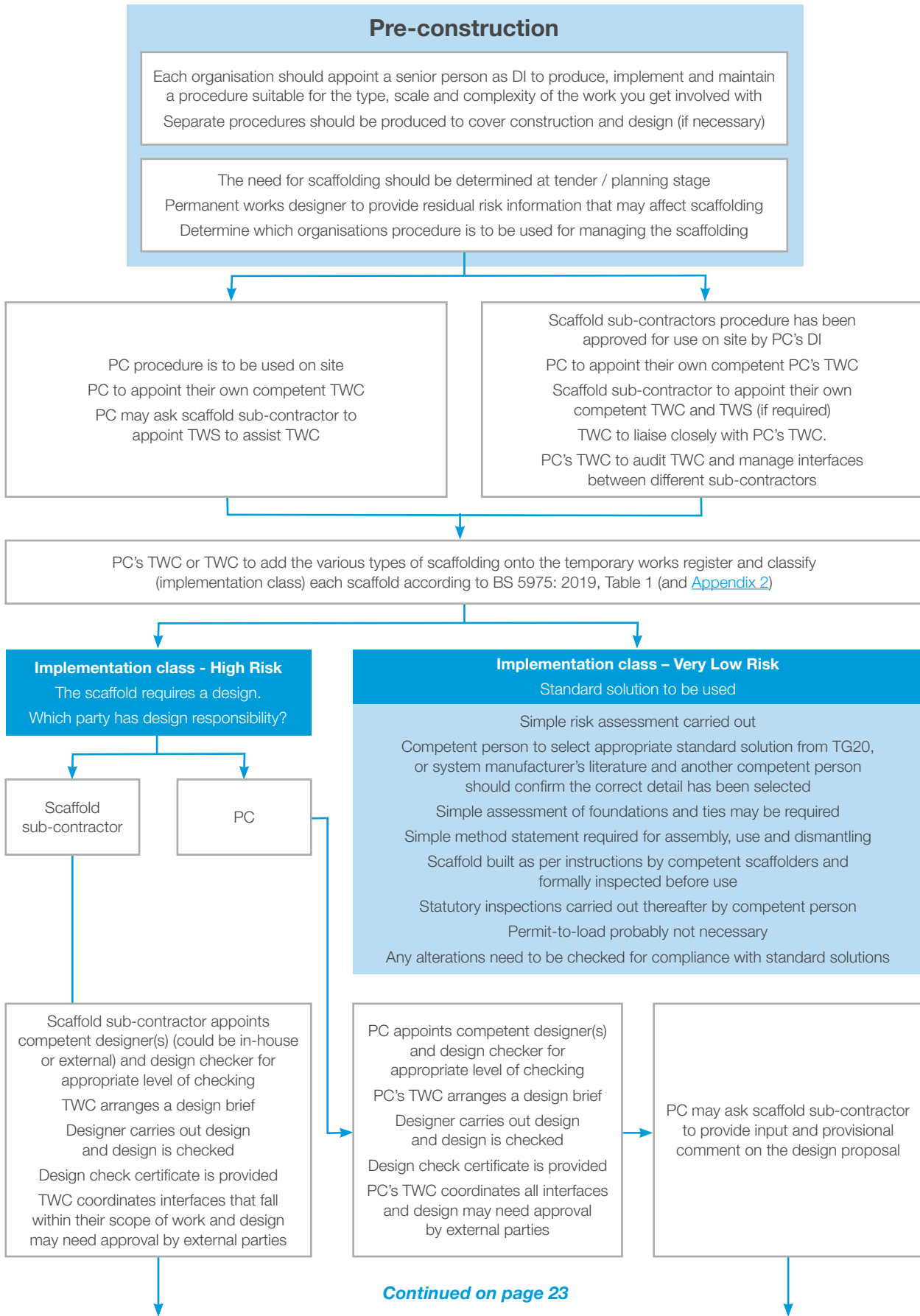
Risk

High

- Massive scaffold structure used as falsework for constructing new bridge
- Significant planning required from tender stage
- Scaffold heavily loaded by concrete, live loading, plant loading, wind loading, etc.
- Consequences of failure would be catastrophic with potential for multiple deaths and massive financial implications
- Scaffold structure should be added to temporary works register
- Multiple interface issues to coordinate by PC's TWC
- Concrete, live loading and plant loading should be calculated by temporary works engineer
- Competent designer should be appointed to design scaffold falsework based on loading provided by others. Scaffold designer to provide leg loads. Geotechnical engineer to design foundations
- Multiple design briefs to be provided and design calculations need to be independently checked. PC to carry out an overall assessment of the scheme
- External approval by structural engineer/ client's representative likely
- Multiple RAMS required as there are significant risks when scaffold in being built so additional safety measures required for the team building and using the structure
- PC's TWC to introduce multiple hold points and multiple permits at various stages during the construction and loading of the structure
- Built by competent persons (advanced scaffolder) who have been briefed
- Structure to be inspected by someone competent in inspecting scaffold falsework structures
- Permits-to-use/ -load required: signed by PC's TWC
- Statutory inspections required
- Formal maintenance regime likely as in use for prolonged period
- RAMS and permit-to-dismantle/ -remove required: signed by PC's TWC
- Figure A2: Suggested examples of “implementation class” from BS 5975: 2019

Appendix 3: Example procedure flow chart for managing scaffolding

Figure A3: Example procedure flow chart for managing scaffolding



Appendix 3: Example procedure flow chart for managing scaffolding – *Continued*

Figure A3: Example procedure flow chart for managing scaffolding – *Continued*



Appendix 4: TG20:13 “eGuide” Summary

- A4.1** The NASC TG20:13 eGuide is supplied in a suite with a copy of TG20:13, Guide to Good Practice for Tube and Fitting Scaffolding (<https://nasc.org.uk/shop/>). It is a computer-based tool for selecting standard scaffolding solutions using traditional tube and fitting materials.
- A4.2** It is possible to enter details of the proposed structure by providing definitive information of what is required, i.e. height and width and its location in the UK, to produce a standard solution in the form of a ‘compliance sheet’. The compliance sheet provides erection details for the standard solution and constraints under which the structure should be erected to remain compliant with the standard solution.
- A4.3** If the details that are entered fall outside the scope and constraints of a standard solution, then a bespoke design is required for the scaffold.
- A4.4** The compliance sheet provides some output data for tie loading and maximum leg loads in standards, which are to be used in the assessment of the interface around the scaffold and supporting structure, e.g. the maximum leg load can be used for the design of foundations.
- A4.5** The following input information is required when using the eGuide to select a standard solution and generate a compliance sheet:
- Type of scaffold: independent, interior birdcage, lift shaft tower, chimney stack access, free-standing tower, tied putlog or tied tower.
 - The height of the scaffold and required lift height (2.0m or 3.0m).
 - Width, board configuration, type of transom (standard or transom unit) and tube type (BS EN 39 Type 4 or 3.2mm High Tensile S355).
 - Imposed load on the working platform (0.75 to 3.00 kN/m²).
 - Cladding type (netting, brick guards, or sheeting).
 - Additional options including two and three bay bridges, pavement lifts, protection fans, internal hop-up brackets, loading bay and ladder access tower.
 - The immediate surroundings: country, city, town or woodland, sea.
 - The exact site location (i.e. postcode) and seasonal factors for the calculation of the ‘wind factor’.
- A4.6** The compliance sheet detailing the standard solution is based on the input information. There are sections at the end to insert additional project information, including the name and signature for the checker.
- A4.7** A standard solution provided by a compliance sheet is likely to require only a Category 0 or Category 1 check (see BS 5975: 2019, Table 2). This involves checking that the requirements of the design brief have been met, and the information relevant for the site and the specific use have been correctly applied in the production of the compliance sheet.
- A4.8** Anyone producing a compliance sheet and selecting a standard solution has design responsibilities under CDM2015 and should ensure that they have correctly executed these responsibilities. This includes assessment and elimination of hazards wherever possible and where residual hazards remain, mitigation of associated risk through effective control measures. Design decisions and any requirement to implement control measures should be communicated to the project team to ensure they are executed correctly and managed effectively on site.
- A4.9** An example of a TG20:13 compliance sheet for an independent access scaffold has been provided in this guide for reference only (see [Figure A4.1](#)).

Figure A4.1 – Sample compliance sheet (independent scaffolding)



With support from:



Independent scaffolding

A tied independent scaffold with 2.0 m maximum lift heights, clad with sheeting, 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): 17.23 kN.

Ties

- ✓ 1 x 4.01 kN (standard 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.

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.

Location

Suitable for sites with a wind factor of 21.8 (low wind exposure), during any season.

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 sheeting;
- ✓ 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;
- ✓ Single guard rails at unboarded lifts;
- ✓ Internal edge protection provided where required;
- ✓ Tied with tie tubes connected to the inner and outer faces of the scaffold in accordance with TG20:13 chapter 07;
- ✓ Structural butting transoms at every ledger-to-standard intersection, except where a tie to the outer face is provided.

Sign-off

Contract no:	1234-Sample	Client:	Temporary Works Forum
Company:	Sample copy produced for the TWF	Scaffold reference:	Sample Independent Scaffold
NASC membership no (1):	NASC	Site reference:	Century Way, Leeds LS15 8GB, UK
Name:	Mr A. Sample	Signature:	
Position:	Project Manager	Date:	04/08/2020
Checker name (2):	Mr B. Sample	Checker signature:	
Notes:	This has been produced as a sample for the Temporary Works Forum with permission of the NASC. Reference only.		

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

(2) The checker is responsible for reviewing the input information.



**Temporary Works
forum**

Chairman: Tim Lohmann, CEng, FICE, FStructE
Secretary: David Thomas, CEng, FICE, CFIOSH, MInstRE

The Temporary Works Forum is a not for profit company (7525376) registered address (c/o Institution of Civil Engineers)
1 Great George St. London SW1P 3AA. Correspondence address: 31, Westmorland Road , Sale, Cheshire, M33 3QX

www.twforum.org.uk