Chapter 4

Planning and design of temporary works

4.1 PLANNING FOR TEMPORARY WORKS

4.1.1 The requirement for temporary works arises from the permanent works design and method of building that design. The **permanent works designer** should be responsible to the **principal designer** for identifying temporary works.

> **8.3 Permanent works designers**
>
> **8.3.1** Permanent works designers should address the buildability of the permanent works and identify, and make provision for, any temporary works and temporary conditions required by their design and their assumed method of construction. This should include:

> **8.5 Principal designers**
>
> In relation to temporary works, the PD should ensure that:
>
> a) there is a coherent construction method which identifies all key temporary conditions and temporary works;

4.1.2 Once a coherent construction method has been agreed temporary works should be identified by those responsible for the pre-construction phase/stages or when scoping the works as set out in the table below.

Stage	What's involved	Who can be involved	Document Output
1. Identify	▪ Surveying/scoping ▪ Costs ▪ Method to be used ▪ Equipment needed ▪ Time required ▪ Populate temporary works register ▪ Invite sub-contractors to tender	▪ Designated Individual ▪ Pre-Construction Manager ▪ Pre-Construction TWC ▪ Contracts Manager ▪ Estimator ▪ Commercial Manager ▪ Procurement ▪ Project Lead ▪ Project TWC	▪ Construction phase plan ▪ Temporary works implementation plan ▪ Letters of appointment ▪ Temporary works register
2. Plan	▪ Appoint TWC & Deputy TWC ▪ Handover to Project TWC ▪ Nominate sub-contractor ▪ Appoint TWS (where required) ▪ **Develop Construction Phase Plan from Pre-Construction Information** ▪ **Develop temporary works implementation plan** ▪ Develop temporary works register ▪ Establish project files		

4.1 PLANNING FOR TEMPORARY WORKS

4.1.3 The client is responsible for providing pre-construction information with assistance from the principal designer.

3.8.1 Pre-construction information

Pre-construction information provides health and safety information needed by designers and contractors, who are bidding for work on the project or who have already been appointed, to enable them to carry out their duties. It also provides information to the principal designers and principal contractors in planning, managing, monitoring and co-ordinating the work of the project, and it will form the basis of the construction phase plan.

It is the client's duty to provide pre-construction information. For projects where there is more than one contractor the client should expect the principal designer to help them bring the pre-construction information together, help them identify what must be obtained and provide it to the designers and contractors.

4.1.4 The project lead/manager/contracts manager, working on behalf of the principal contractor or contractor is likely to be involved with developing the construction phase plan.

3.8.2 Construction phase plan

The principal contractor or contractor is responsible for the following.

- Preparing a construction phase plan, before the start of the construction phase, which is sufficient to ensure that the construction phase is planned, managed and monitored in such a way that construction work can be carried out without risk to health or safety, so far as is reasonably practicable, paying adequate regard to the pre-construction information provided by the designers.
- Throughout the project, reviewing, revising and refining the plan as often as is appropriate, so that it continues to be sufficient to fulfil the above requirement.

4.1.5 The headings and sub-headings covered in both the pre-construction information (PCI) and construction phase plan (CPP) are very similar. The purpose of each document and examples of **considerations for planning temporary works** are shown below:

PCI purpose, headings, and sub-headings	CPP purpose, headings, and sub-headings
Clients' considerations, existing restrictions and on-site risks and significant design and construction hazards. It is reasonable for client to provide information about:	Management of the works and arrangements for controlling significant site risks including and significant design and construction hazards. The principal contractor should have arrangements in place to control:
▪ The requirements for site hoardings	▪ Unauthorised access
▪ Adjacent land uses such as schools, raliway lines, highways	▪ Accomodating adjacent land use, planning permision and/or third party approvals
▪ Location of existing services particualrly those that are concealed	▪ Dealing with services and locating concealed services
▪ Ground conditions, underground structures or watercourses that might need use of plant	▪ Working in excavations and poor ground conditions
▪ Information on existing structures, stability, structural form, fragile or hazardous materials, anchorage points	▪ The stablity of structures while carrying out construction work, including temporary structures and existing unstable structures

4.1 PLANNING FOR TEMPORARY WORKS

4.1.6 When planning a construction project, arrangements should be in place to ensure **part 4 of the construction (design and management) regulations 'general requirements for all construction sites'** have been incorporated into the **construction phase plan** where those specific risks arise.

4.1.7 The construction phase plan should identify the arrangements in place to ensure **structures do not collapse** relating specifically to **Regulation 19 – stability of structures.**

Regulation 19 Stability of structures

(1) All practicable steps must be taken, where necessary to prevent danger to any person, to ensure that any new or existing structure does not collapse if, due to the carrying out of construction work, it—

(a) may become unstable; or
(b) is in a temporary state of weakness or instability.

(2) Any buttress, temporary support or temporary structure must—

(a) be of such design and installed and maintained so as to withstand any foreseeable loads which may be imposed on it; and
(b) only be used for the purposes for which it was designed, and installed and is maintained.

(3) A structure must not be so loaded as to render it unsafe to any person.

4.1.8 The PC's temporary works coordinator (PC's TWC) or sub-contractors' temporary works coordinator (SC's TWC) is likely to be involved with **developing** and **reviewing** the **temporary works implementation plan**. Note that the project lead/manager/contracts manager could also be appointed as the PC's TWC/SC's TWC.

14.1.2 The PC's TWC or TWC should ensure that a temporary works implementation plan is in place covering the erection/assembly, use, unloading and dismantling of the temporary works including what inspections, checks, hold points, permits and certification are required. This should include defining the regular inspections which are required during the use (loading) of the temporary works.

14.1.3 The implementation plan should be developed taking into account the site conditions, programme, original design brief and the construction phase plan and use of the drawings, specification and methodology supplied by the designer.

4.1.9 The **temporary works implementation plan** should be developed throughout the planning and design phase and issued to all relevant parties involved in the implementation of the temporary works. The plan is likely to include:

a. letters of appointment/key personnel involved, i.e., TWC, TWS, TWD, TWDC, TW supplier
b. design brief/initial scoping risk assessment for selection of the equipment to be used
c. design certificate and output (if required)
d. design check certificate (if required)

e. risk assessment and method statement (RAMS) provided by sub-contractor/installer for erection and dismantling
f. review of RAMS by principal contractor
g. permit to use/bring into use/take out of use/dismantle
h. records of inspections

Note - This information may already exist within project filing but should be readily available to all and an easy assimilated format.

4.2 THE TEMPORARY WORKS REGISTER

4.2.1 The temporary works register should be populated during the pre-construction phase or when scoping works.

4.2.2 The temporary works register enables actions to be tracked for each item of temporary works on a project. It remains the responsibility of the **PC's TWC** to keep it up to date throughout the project.

6.2.1 The PC's TWC should ensure that a temporary works register is prepared and maintained throughout the project. The register should identify what temporary works are needed on the contract. The register, often commenced at tender stage in outline, is not expected to identify all the details of all the temporary works to be required. As the project progresses the register should be maintained as an "active document" and the PC's TWC should ensure that it is kept up to date.

6.2.2 Where a contractor has been appointed to manage their own temporary works the relevant TWC should also prepare and maintain a local temporary works register. The TWC should provide relevant information to the PC's TWC to enable the master temporary works register to be maintained. It should be provided each time it is updated and at a regular agreed interval. The register should be in a common format to allow incorporation of the TWC's data into the PC's TWC's master register for the project.

6.2.4 The register is an important management tool, and the company should have a process by which such registers are regularly audited. The auditing should be carried out by someone familiar with temporary works.

4.2.3 BS 5975 provides a list of headings that should be included in the register:

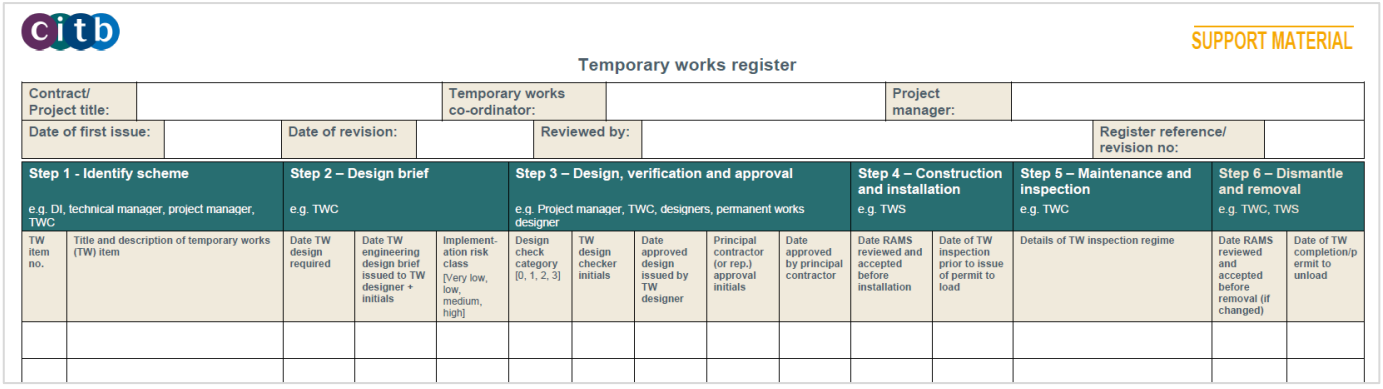
a) reference number and short description;
b) date design brief issued;
c) date required;
d) risk classification of temporary works (see Table 1);
e) designer (company and/or individual);
f) design checker (company and/or individual);
g) design check category;
h) date design completed;
i) date design checked/approved;
j) erection complete and checked with date of permit to load (bring into use);
k) date of permit to unload (take out of use) as necessary; and
l) third-party approvals.

4.2 THE TEMPORARY WORKS REGISTER

4.2.4 It may also be useful for the headings in your register to follow the **stages** or **steps** set out in the companies process that may be broken down into steps within each stage.

Stage or Step	Summary of actions required
1. Identify	Assess the activities that require temporary works and prepare temporary works register
2. Plan	Complete construction phase plan or method of works, temporary works implementation plan, develop the temporary works register and issue a design brief
3. Design	Issue a design brief to the temporary works designer
4. Check	Issue the temporary works design brief and design outputs to the design checker and assess the suitability of the proposed solution
5. Implement the build	Issue a design drawing or installation guide suitable to construct from, prepare method statement and issue permit to bring into use
6. Implement the removal	Prepare method statement and issue permit to take out of use

figure 1 – CITB Form template - example of a temporary works register



citb

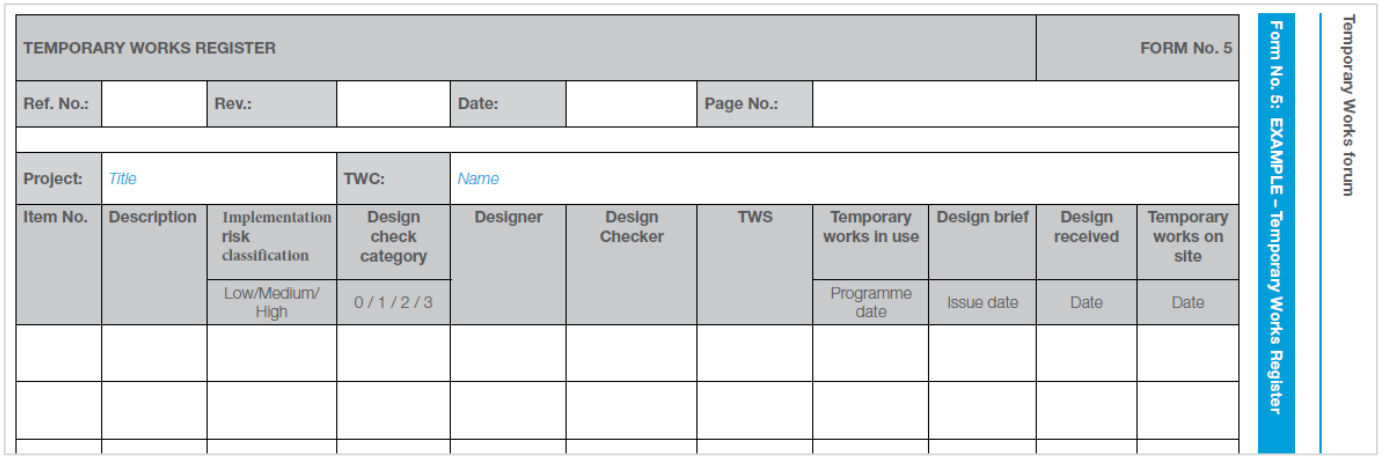
SUPPORT MATERIAL

Temporary works register

Contract/ Project title:		Temporary works co-ordinator:		Project manager:	
Date of first issue:		Date of revision:		Reviewed by:	
				Register reference/ revision no:	

Step 1 - Identify scheme e.g. DI, technical manager, project manager, TWC		Step 2 – Design brief e.g. TWC			Step 3 – Design, verification and approval e.g. Project manager, TWC, designers, permanent works designer					Step 4 – Construction and installation e.g. TWS		Step 5 – Maintenance and inspection e.g. TWC	Step 6 – Dismantle and removal e.g. TWC, TWS	
TW item no.	Title and description of temporary works (TW) item	Date TW design required	Date TW engineering design brief issued to TW designer + initials	Implement-ation risk class [Very low, low, medium, high]	Design check category [0, 1, 2, 3]	TW design checker initials	Date approved design issued by TW designer	Principal contractor (or rep.) approval initials	Date approved by principal contractor	Date RAMS reviewed and accepted before installation	Date of TW inspection prior to issue of permit to load	Details of TW inspection regime	Date RAMS reviewed and accepted before removal (if changed)	Date of TW completion/permit to unload

figure 2 – TWf Form template - example of a temporary works register



TEMPORARY WORKS REGISTER										FORM No. 5
Ref. No.:		Rev.:		Date:		Page No.:				
Project:	*Title*		TWC:	*Name*						
Item No.	Description	Implementation risk classification	Design check category	Designer	Design Checker	TWS	Temporary works in use	Design brief	Design received	Temporary works on site
		Low/Medium/ High	0 / 1 / 2 / 3				Programme date	Issue date	Date	Date

Form No. 5: EXAMPLE – Temporary Works Register

Temporary Works forum

4.3 THE DESIGN BRIEF

4.3.1 The are 3 steps to achieving a **'certified design'**. The **first step** is to ensure a **design brief** is prepared.

Step	Document	Action	Clause
1	**Design Brief**	**Issued by TWC to TWD**	**13.2 [All Categories]**
2	Design Certificate	Issued by TWD to TWC	13.7.5 [Cat (1)(2)(3)]
3	Design Check Certificate	Issued by TWDC to TWC	13.7.5 [Cat (1)(2)(3)]

4.3.2 The **PC's TWC** is responsible for ensuring a design brief is prepared which adequately covers the actual site conditions.

11.2.3 Duties of the PC's TWC

The PC's TWC should:

d) ensure that a design brief is prepared (see 13.2) with consultation within the project team and that it is both adequate and in accordance with the actual situation on site;

e) ensure that any other temporary works in the vicinity are referenced in the design brief;

f) ensure that any residual risks, identified at the design stage, assumed methods of construction or loading constraints identified by the PWD are included in the design brief;

g) ensure that the design brief is issued to the TWD for a satisfactory temporary works design to be carried out;

4.3.3 In relation to other contractors, the PC's TWC should:

11.2.4 Duties of the PC's TWC in relation to other contractors

11.2.4.1 In relation to other contractors, the PC's TWC should:

d) define the interfaces between the contractor's works and those of the PC or other contractors to establish which design briefs should be provided to the PC's TWC for approval before issue to the relevant TWD;

e) receive copies of the relevant design briefs produced by the contractor's TWC and confirm there are no adverse effects on any other works (including temporary works) which might be planned;

11.2.4.2 The PC's TWC should ensure that a contractor's proposals for temporary works do not adversely affect/are not adversely affected by other construction works including other temporary works.

4.3.4 The **SC's TWC** is responsible for ensuring a design brief is prepared which adequately covers the actual site conditions that have no adverse effects on other works that they may not necessarily be responsible for.

11.3.3 Duties of the TWC

The duties of the TWC should include to:

a) co-ordinate the temporary works activities of their organization;

4.3 THE DESIGN BRIEF

i) ensure that a design brief is prepared (see 13.2) with consultation within the project team, is adequate, and is in accordance with the actual situation on site;

j) where required, provide copies of any design briefs prepared and submit to the PC's TWC and receive confirmation there are no adverse effects on the temporary works which might be planned;

4.3.5 The design brief should be prepared before design work is started.

13.2 Design brief

13.2.1 A design brief should be prepared to serve as the basis for subsequent decisions, design work, calculations, drawings and design checks. All concerned with the construction should contribute towards the preparation of the brief.

13.2.2 The brief should include all data relevant to the design of the temporary works including residual risks introduced by the methodology chosen by the site team or by the PWD. It should be prepared early enough to allow sufficient time for all subsequent activities, i.e. design, design check, procurement of equipment and construction/erection of the scheme.

13.2.3 The preparation of the brief might involve relatively little work for the smaller scheme, but for major work such as the construction of a large bridge or deep excavation a large amount of information might be needed; the TWC should ensure that sufficient and comprehensive information is collated before design work can commence or a programme for the construction of the temporary works can be drawn up (see Annex G).

13.2.5 The TWD should be provided with a design brief, irrespective of whether they are from the construction organization or not.

4.3.6 There is no specific format for the design brief however BS5975 does provide a list of information that should be considered when preparing the brief for any type of structure. **Refer to the clause for the full list.**

13.2.4 The following information should be taken into account for inclusion in the preparation of the brief:

a) details of the organizations involved in the design of the scheme and their respective responsibilities, including the name and contact details of the PC's TWC, the TWC or both as appropriate;

b) appropriate details of the permanent works in an agreed format;

Figure 1 – example design brief

Temporary Works Procedure: SAMPLE – TWf2019: 03 **Temporary Works forum**

Form No. 6: EXAMPLE – Design Brief

DESIGN BRIEF					**FORM No. 6**
Design Brief No.	*Refer to item in TW Register*			**Relevant drawings and documentation:**	
Title: *Excavation support to install drainage between MH1 and MH2*					
Site contact:	*Name (TWC)*				
Drawings		**Format**			
Stage	**Quantity**	**.pdf**	**.dwg**		
Preliminary	*4*	*Y*	*Y*		
Construction	*6*	*Y*	*Y*		
Issue calculations (circle):		*Y*	*N*		
Design check required (circle):		*Y*	*N*		
Design check category (circle):		*0* *1*	*2* *3*		
Issued to: *Equipment supplier/ TWD, etc.*					
Prepared by: *TWC*				**Date:**	
Item	**Yes**	**No**	**Implementation risk classification:**		
Design certificate	*X*		High	Medium	Low
Design check certificate	*X*			*X*	
Design check(s) to be undertaken by:	*Name and contact details:*				
Preliminary scheme for site review (circle):				Yes	
Construction issue drawings (circle):				Yes	
Date required by:				NOTE: Do not say "ASAP".	

4.4 DESIGN GUIDANCE AND OUTPUT

4.4.1 The are 3 steps to achieving a **'certified design'**. The **second step** is engaging with a competent designer to prepare suitable and sufficient **design output** based on the agreed **design brief**.

Step	Document	Action	Clause
1	Design Brief	Issued by TWC to TWD	13.2 [All Categories]
2	**Design Certificate and Output**	**Issued by TWD to TWC**	**13.7.5 [Cat (1)(2)(3)]**
3	Design Check Certificate	Issued by TWDC to TWC	13.7.5 [Cat (1)(2)(3)]

4.4.2 General duties of temporary works designers are as follows:

8.4 Temporary works designers

8.4.1 General

8.4.1.1 TWDs and TWDCs (temporary works design checkers) should confirm that the design details and outline methodologies are accurately translated into the design output, and that the design follows appropriate engineering principles. This includes any assumed construction methods, sequences, temporary works requirements, and loads to be either imposed on or supported by the permanent works.

4.4.3 Designers should use the design brief as the basis for their design. Any queries should be resolved with/through the PC's TWC or SC's TWC before design work commences.

13.3 Design guidance

13.3.1 Those responsible for the design of a temporary works scheme should base their design on the previously agreed design brief (see 13.2).

13.3.2 If the designer is not able to fully accommodate the requirements of the design brief, then any proposed modifications should be drawn to the attention of the PC's TWC or TWC as appropriate, as soon as the changes are identified and the design brief amended.

13.3.4 The TWD should identify, from the design brief and associated information, the various loads that act on the temporary works together with the combinations in which they are considered and with what stiffness the temporary works should resist them.

4.4.4 The temporary works designer should consider the following:

13.3.10 For each temporary works design, the designer should take into account:

a) the structural strength and stiffness of the individual members and their connections to transmit the applied forces safely including any p-delta or feedback effects;

b) the lateral stability of both individual members and the structure as a whole;

c) the resistance to overturning or rotational failure of the temporary works structure;

d) positional stability; and

e) the effects on the permanent works and its surroundings.

13.3.11 Software should be used with caution to ensure all appropriate checks are carried out.

13.3.12 Temporary works systems should be designed with regard to ease and safety of erection and dismantling. TWDs and suppliers should provide guidance on the implementation of their design.

13.3.13 Detailing of the temporary works structure should be such that any local failure within it does not lead to the progressive collapse of the whole.

4.4.5 The following are regulations stating what is required by the **temporary works designer** as specified in law, i.e., their statutory duties.

a. Regulation 9 and 10 of the CDM regulations set out duties placed on designers. These include the duty to eliminate, reduce or control foreseeable health and safety risks throught the design process that may arise during construction work or during maintenance or using a facility or building once it is built.

> *(2) When preparing or modifying a design the designer must take into account the general principles of prevention and any pre-construction information to eliminate, so far as is reasonably practicable, foreseeable risks to the health or safety of any person—*
>
> *(a) carrying out or liable to be affected by construction work;*
> *(b) maintaining or cleaning a structure; or*
> *(c) using a structure designed as a workplace.*
>
> *(3) If it is not possible to eliminate these risks, the designer must, so far as is reasonably practicable—*
>
> *(a) take steps to reduce or, if that is not possible, control the risks through the subsequent design process;*
> *(b) provide information about those risks to the principal designer; and*
> *(c) ensure appropriate information is included in the health and safety file.*
>
> *(4) A designer must take all reasonable steps to provide, with the design, sufficient information about the design, construction or maintenance of the structure, to adequately assist the client, other designers and contractors to comply with their duties under these Regulations.*

b. Regulation 19 of the CDM regulations places additional duties on temporary works designers in relation to the **'general Requirements for All construction sites'** that relate to arrangements that must be in place in the **construction phase plan**.

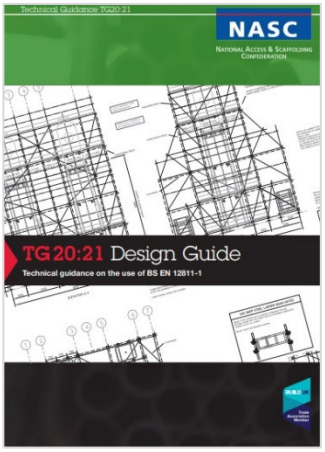
> *(1) All practicable steps must be taken, where necessary to prevent danger to any person, to ensure that any new or existing structure does not collapse if, due to the carrying out of construction work, it—*
>
> *(a) may become unstable; or*
> *(b) is in a temporary state of weakness or instability.*
>
> *(2) Any buttress, temporary support or temporary structure must—*
>
> *(a) be of such design and installed and maintained so as to withstand any foreseeable loads which may be imposed on it; and*
> *(b) only be used for the purposes for which it was designed, and installed and is maintained.*
>
> *(3) A structure must not be so loaded as to render it unsafe to any person.*

4.4 DESIGN GUIDANCE AND OUTPUT

4.4.6 The following are examples of design standards and technical guidance.

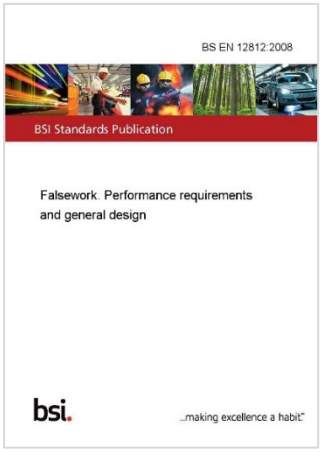
13.3 Design guidance

13.3.3 The TWD should choose the appropriate design standards and other technical guidance.



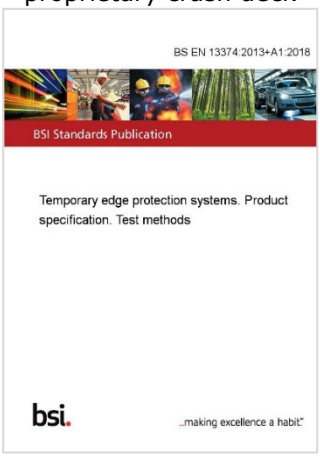
TG20:21 covers the design of tube and fitting scaffolding. It provides additional technical guidance on BS EN 12811

BS EN 12811 covers all scaffolding, access equipment including trestle systems and proprietary crash deck

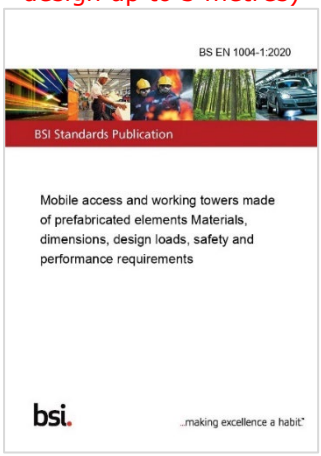


BS EN 12812 covers falsework design over 3 metres (BS5975 Section 3 covers the falsework design up to 3 metres)

BS EN 1065 covers open and covered thread adjustable telescopic steel props which are intended for use in construction



BS EN 13374 requirements for temporary edge protection for use during construction or maintenance of buildings and other structures



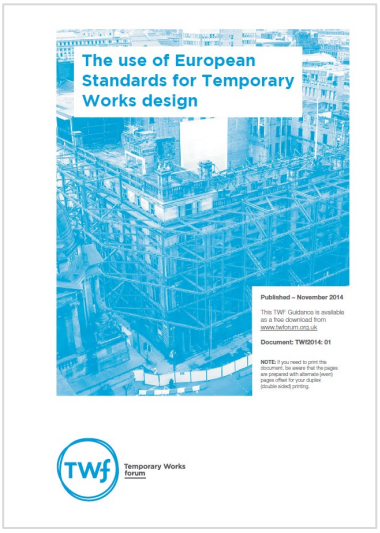
BS EN 1004 applies to mobile access towers made of prefabricated elements with a height up to 12m indoors and up to 8m outdoors

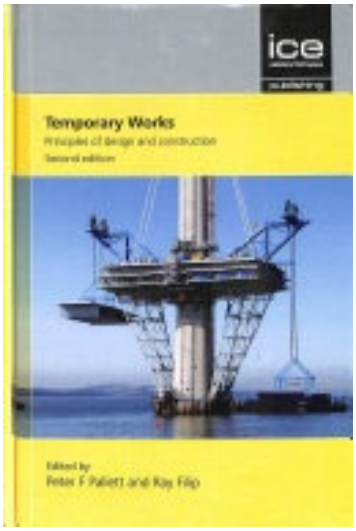
BS EN 14653 covers manually operated hydraulic shoring systems comprising prefabricated equipment to support sheeting to the sides of excavations

BS EN 13331 covers metallic trench lining systems assembled completely from purpose made prefabricated components

4.4 DESIGN GUIDANCE AND OUTPUT

4.4.7 The following documents provide a source of reference for the British Standard's (BS's) and Euro Norms (EN's) that are applicable to temporary works systems.





PAS 8812 provides guidance on the application of European standards to the design of temporary works and aimed at structural and geotechnical designers of temporary works, procurers, local authorities and safety, quality and compliance managers. It aims to establish a unified approach to design during the construction process for temporary works.

TWf2014:01 provides general guidance to the temporary works designer, and others such as clients, PD's and contractors on the application of EN's (and BS's) to temporary works.

ICE Temporary Works - Principles of design and construction provides an authoritative and comprehensive guidance on temporary works for practising engineers working for a contractor or builder, or a design consultant, or those intending to gain the technical elements of skill needed to perform effectively in these roles.

4.4.8 To ensure the strength and stability of any temporary works structure, there are **three fundamental aspects** that need to be considered. These are:

Foundations	the ability of the ground to carry the loads transmitted from the temporary works structure without failure or excessive deformation or settlement
Structural integrity	the ability of the temporary works structure itself to carry and transmit loads to the ground via the foundations without failure of the structural elements, including fixings and connections (e.g. by buckling, bending, shear, tension, torsion) and without excessive deflection
Stability	the ability of the temporary works structure to withstand horizontal or lateral loading without sway, overturning or sliding failure (stability may be inherent in the temporary works structure itself or provided by an existing structure, e.g. the permanent works or a structure being demolished) there will also be projects where the temporary condition of the permanent works will require temporary works to ensure stability.

4.4 DESIGN GUIDANCE AND OUTPUT

4.4.9 Designers should provide adequate information to enable the **design output** to be checked for suitability prior to procuring and building the solution.

13.6 Design output

13.6.1 Sufficient and appropriate information should be provided by the TWD to ensure that the temporary works scheme can be checked and implemented correctly.

8.1.4 Designers should:

c) clearly communicate the design, in accordance with any agreed format, to the PC's TWC, or TWC where appropriate. The design output includes the residual risks associated with the design; any hold points required by the designer, and which criteria allow their release; limitations of the use of the design and/or an outline methodology on how the temporary works should be constructed (where this is not obvious to a competent contractor); and data required by other designers interfacing with this design, for example loads on foundations; and

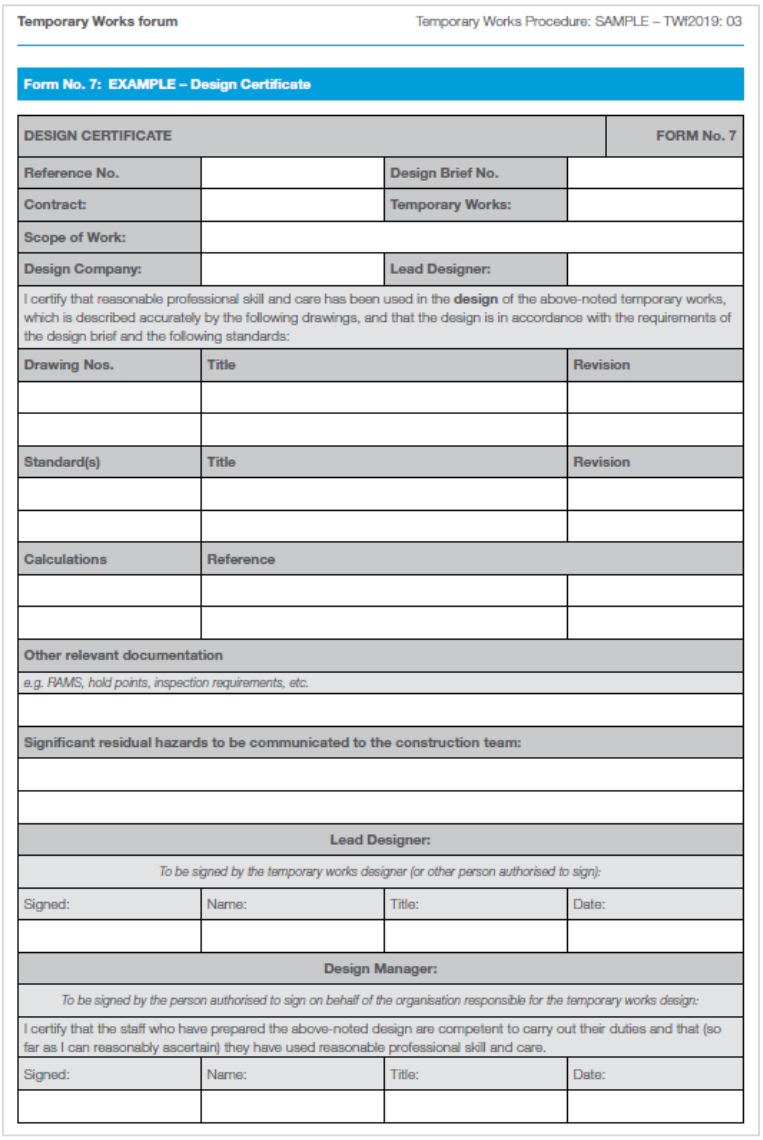
8.4.1.2 TWDs and TWDCs should confirm that the design output adequately describes the design in a design check certificate or other suitable form of record (see **13.7.5**).

8.4.1.3 Where the category of design check is not specified by the contractors' procedures or the client, the TWD, in consultation with the TWC, should advise the minimum category of design check (see **13.7**).

4.4.10 Designers may issue a design check certificate for category 1, 2 and 3 but this will depend upon company procedures. Figure 1 shows an example of a 'design check certificate'.

13.7.5 On completion of the design and design check, a certificate should be issued for Category 2 and Category 3 checks and, depending on the organization's procedures, might also be required for a Category 1 check. The certificate should confirm that the design conforms to the requirements of the design brief, state the standards/technical literature used and list the constraints or loading conditions imposed. The certificate should state the category of check and identify the drawings/sketches, specification and any methodology that are part of the design and it should be signed by the designer and design checker. The package of information issued to the TWC should include this certificate.

Figure 1 – example design certificate



Temporary Works forum — Temporary Works Procedure: SAMPLE – TWf2019: 03

Form No. 7: EXAMPLE – Design Certificate

DESIGN CERTIFICATE			FORM No. 7
Reference No.		Design Brief No.	
Contract:		Temporary Works:	
Scope of Work:			
Design Company:		Lead Designer:	

I certify that reasonable professional skill and care has been used in the **design** of the above-noted temporary works, which is described accurately by the following drawings, and that the design is in accordance with the requirements of the design brief and the following standards:

Drawing Nos.	Title	Revision

Standard(s)	Title	Revision

Calculations	Reference	

Other relevant documentation

e.g. RAMS, hold points, inspection requirements, etc.

Significant residual hazards to be communicated to the construction team:

Lead Designer:

To be signed by the temporary works designer (or other person authorised to sign):

Signed:	Name:	Title:	Date:

Design Manager:

To be signed by the person authorised to sign on behalf of the organisation responsible for the temporary works design:

I certify that the staff who have prepared the above-noted design are competent to carry out their duties and that (so far as I can reasonably ascertain) they have used reasonable professional skill and care.

Signed:	Name:	Title:	Date:

4.4.11 Design alterations should be notified to the designer who should check the proposals against the original design and design brief. Significant changes should be referred to the design checker.

13.9 Alterations

13.9.1 Changes in the requirements of the design brief should be recorded in writing, with reference to the original design brief, and issued to the designer. The designer should check the proposals against the certified design and incorporate the requirement for these alterations into the design and drawings (see also 20.2). If there is no significant change to the design, the designer should confirm the acceptability of the proposals to the appropriate TWC.

13.9.2 Any alterations to the temporary works, proposed by the site team, should be referred to the PC's TWC or TWC as appropriate, who should contact the TWD for incorporation of the change into the design.

13.9.3 Where the designer considers that the alteration is significant, the alteration should be referred to the design checker. Any revised design or design check documentation should be recertified when considered appropriate by the PC's TWC or TWC as appropriate.

4.5 THE DESIGN CHECKING PROCESS

4.5.1 The are 3 steps to achieving a **'certified design'**. The **third step** is engaging with a competent designer checker who is independent from the originator of the design to check the design for **compliance with the design brief**.

Step	Document	Action	Clause
1	Design Brief	Issued by TWC to TWD	13.2 [All Categories]
2	Design Certificate and Output	Issued by TWD to TWC	13.7.5 [Cat (1)(2)(3)]
3	**Design Check Certificate**	**Issued by TWDC to TWC**	**13.7.5 [Cat (1)(2)(3)]**

4.5.2 Below summaries the role and duties of the **PC's TWC** in relation to design checking.

11.2.2 Role of the PC's TWC

11.2.2.11 The role of the PC's TWC should not include a responsibility for carrying out any design or design checking of temporary works.

11.2.3 Duties of the PC's TWC

The PC's TWC should:

h) ensure that a design check is carried out by someone who was not involved in the original design (see 13.7);

11.2.4 Duties of the PC's TWC in relation to other contractors

11.2.4.1 In relation to other contractors, the PC's TWC should:

f) for relevant designs, receive copies of the design output, design and design check certificates prior to implementation of the contractor's temporary works; and

4.5.3 Below summaries the role and duties of the **SC's TWC** in relation to design checking.

11.3.2 Role of the TWC

11.3.2.3 The role of the TWC should not include a responsibility for carrying out any design or design checking of temporary works.

11.3.3 Duties of the TWC

The duties of the TWC should include to:

m) receive copies of the design output, design and design check certificates prior to implementation of the temporary works and, where required, provide evidence to the PC's TWC that the design and checking has been carried out;

4.5.4 The purpose of the design checking process is to ensure the **design output meets the requirements of the design brief**. The purpose of the design checking process **IS NOT** an opportunity for the design checker to re-design.

4.5 THE DESIGN CHECKING PROCESS

13.7 Design check

13.7.1 Prior to the commencement of the construction work, the proposed temporary works design should be checked for concept, adequacy, correctness and compliance with the requirements of the design brief. This check should be carried out by a competent person or persons, independent from those responsible for the design. The ability of the TWDC and their remoteness or independence from the TWD should be greater where new ideas are incorporated or the temporary works are complex.

13.7.2 When the design has been completed, or is advanced to an appropriate stage, the design brief should be provided to the organization/individual who is to carry out the design check, together with the relevant design statement, drawings and specification and associated information. The responsibility for stating the independence of the design check category should be established at an early stage as it can affect the level and quantity of design output. It should require input/advice from the designer. The check category is unlikely to be known at the time of writing the original register, but should be included when determined.

4.5.5 The following provides guidance on the interpretation of **table 2 'the categories of design check in temporary works':**

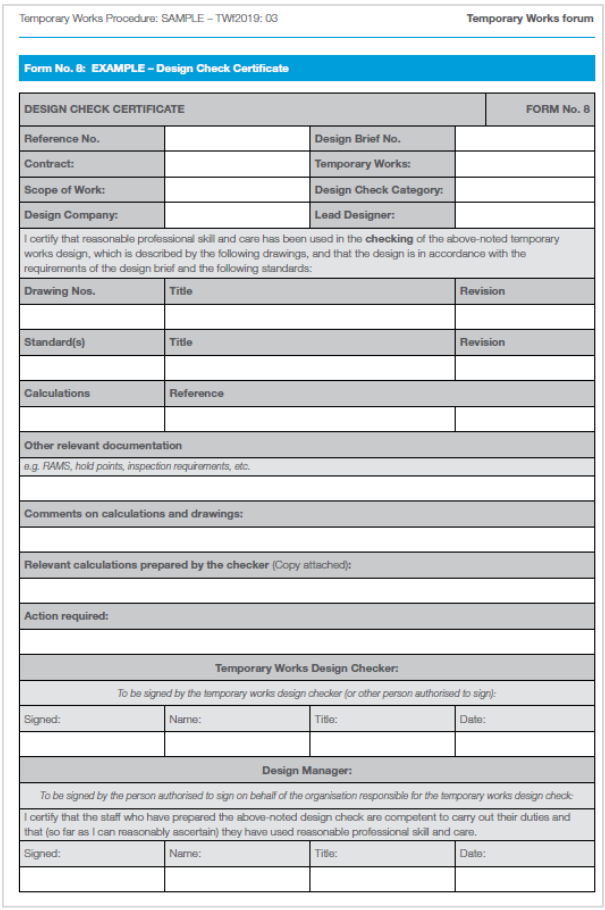
Category	Scope
0	Restricted to standard solutions only, to ensure the site conditions do not conflict with the scope or limitations of the chosen standard solution. These may include standard trench boxes.
1	For simple designs. These may include: formwork; falsework; needling and propping to brickwork openings in single storey construction.
2	On more complex or involved designs. Designs for excavations including excavation support using sheet piles, for foundations, for structural steelwork connections, for reinforced concrete. Designs where stability is obtained by restraint at the top of the temporary works (e.g. top restrained falsework).
3	For complex or innovative designs, which result in complex sequences of moving and/or construction of either the temporary works or permanent works. It also includes basement excavations and tunnels.

Examples	Who can carry out the check?
	**Category 0** - A competent [experienced] person on the same project who is familiar with the structure and its limitations in use
	**Category 1** - Another designer from the same practice and in the same office who may be working on the same project
	**Category 2** - Another designer from same design practice BUT NOT on the same project [another office]
	**Category 3** - Another designer from a different practice, organisation or legal entity [own liability insurances]

4.5.6 For Cat 1, 2 and 3 a design check certificate should be issued once the design checker is satisfied that the design output is satisfactory to allow the temporary works to be built.

> **13.7.5** On completion of the design and design check, a certificate should be issued for Category 2 and Category 3 checks and, depending on the organization's procedures, might also be required for a Category 1 check. The certificate should confirm that the design conforms to the requirements of the design brief, state the standards/technical literature used and list the constraints or loading conditions imposed. The certificate should state the category of check and identify the drawings/sketches, specification and any methodology that are part of the design and it should be signed by the designer and design checker. The package of information issued to the TWC should include this certificate.

Figure 1 – example design check certificate



Temporary Works Procedure: SAMPLE – TWf2019: 03 **Temporary Works forum**

Form No. 8: EXAMPLE – Design Check Certificate

DESIGN CHECK CERTIFICATE			FORM No. 8
Reference No.		**Design Brief No.**	
Contract:		**Temporary Works:**	
Scope of Work:		**Design Check Category:**	
Design Company:		**Lead Designer:**	

I certify that reasonable professional skill and care has been used in the **checking** of the above-noted temporary works design, which is described by the following drawings, and that the design is in accordance with the requirements of the design brief and the following standards:

Drawing Nos.	**Title**	**Revision**
Standard(s)	**Title**	**Revision**
Calculations	**Reference**	

Other relevant documentation

e.g. RAMS, hold points, inspection requirements, etc.

Comments on calculations and drawings:

Relevant calculations prepared by the checker (Copy attached):

Action required:

Temporary Works Design Checker:

To be signed by the temporary works design checker (or other person authorised to sign):

Signed:	Name:	Title:	Date:

Design Manager:

To be signed by the person authorised to sign on behalf of the organisation responsible for the temporary works design check:

I certify that the staff who have prepared the above-noted design check are competent to carry out their duties and that (so far as I can reasonably ascertain) they have used reasonable professional skill and care.

Signed:	Name:	Title:	Date:

4.5.7 The design checker should not sign the design check certificate until they are satisfied that the design output meets the requirements of the design brief and/or until such time as queries have been resolved.

> **13.8 Resolution of queries raised by the design checker**
>
> **13.8.1** In all categories of check the design checker should withhold signature of the design check certificate until they are completely satisfied that the design output contains all necessary information to allow the temporary works to be constructed without the site team having to develop it further. In addition the design checker should be satisfied that the design output is in accordance with the requirements of the design brief and has been produced in accordance with recognized engineering principles, relevant British Standards and other appropriate specialist guidance.

CHAPTER 4 - FURTHER READING AND REFERENCES

Further information can be found from the sources shown below. Viewing this page online will enable 'click to follow link' to external content from the underlined text. Hold down 'Ctrl' and 'Click to follow the link' to open the page.

4.1 BS5975

4.2 Construction (Design and Management) Regulations https://www.legislation.gov.uk/uksi/2015/51/contents

4.3 CITB GE700 companion website https://www.citb.co.uk/standards-and-delivering-training/health-and-safety-publications-and-support-materials/ge700-companion-content/

4.4 HSE Books https://www.hse.gov.uk/pubns/books/index-catalogue.htm

4.5 CITB GE700 Book A Chapter 03

4.6 CITB Temporary works companion content https://www.citb.co.uk/standards-and-delivering-training/health-and-safety-publications-and-support-materials/temporary-works-companion-content/

4.7 TWF Information Sheet TWf2019:03 https://www.twforum.org.uk/home

4.8 CITB Temporary works companion content https://www.citb.co.uk/standards-and-delivering-training/health-and-safety-publications-and-support-materials/temporary-works-companion-content/

4.9 HSE Books L153 https://www.hse.gov.uk/pubns/books/index-catalogue.htm

4.10 The British Standards Institution (BSI) https://www.bsigroup.com/en-GB/standards/

4.11 TWF Information Sheet TWf2014:01 https://www.twforum.org.uk/home

4.12 ICE Temporary Works - Principles of design and construction https://www.icevirtuallibrary.com/