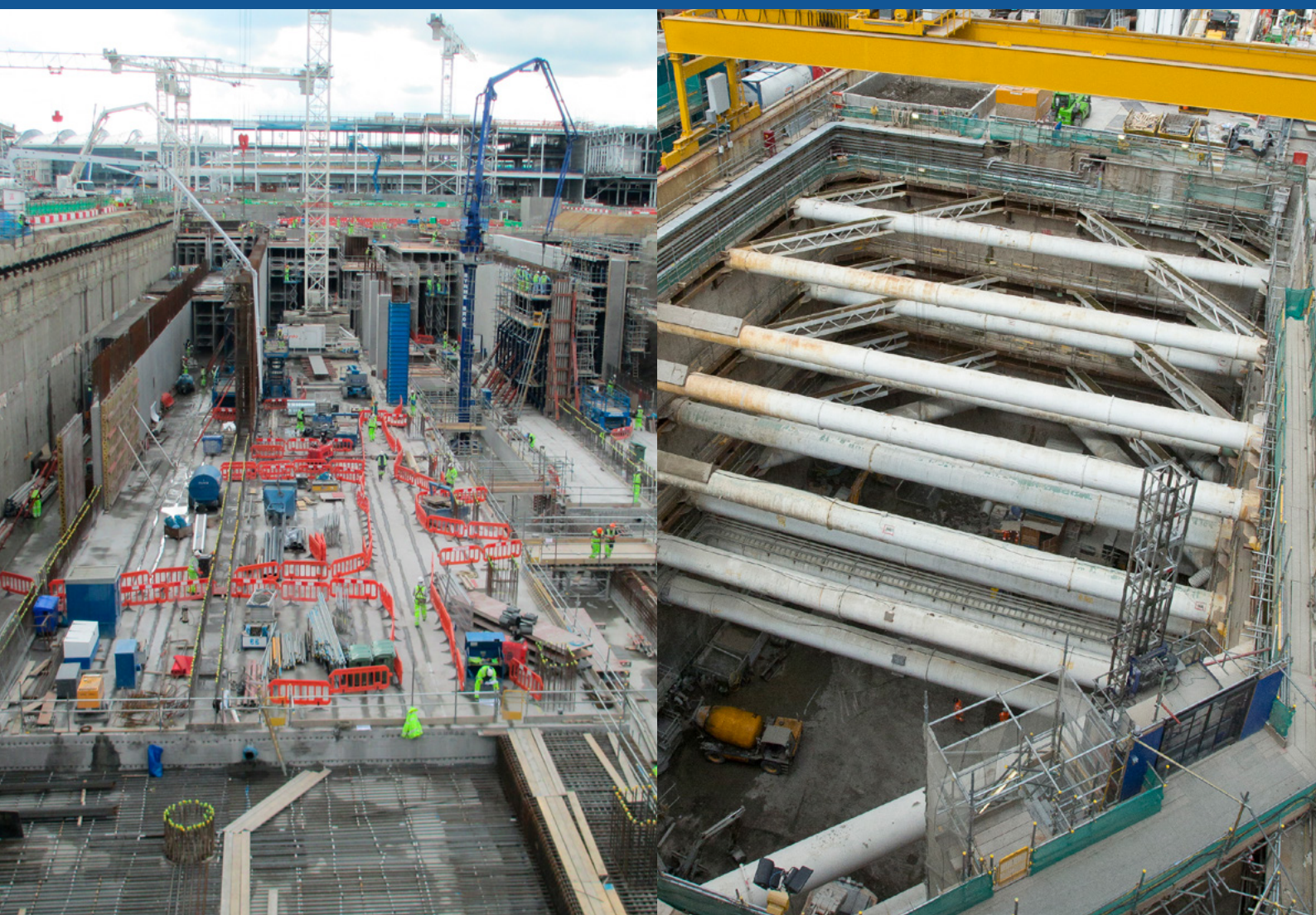


PAS 8811:2017

Temporary works – Major infrastructure client procedures – Code of practice



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Foreword

This PAS was sponsored by High Speed Two (HS2) Limited and the Temporary Works Forum (TWf). Its development was facilitated by BSI Standards Limited and it was published under licence from The British Standards Institution. It came into effect on 31 January 2017.

Acknowledgement is given to John Carpenter, consultant, as the technical author, and the following organizations that were involved in the development of this PAS as members of the steering group:

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The PAS process enables a code of practice to be rapidly developed in order to fulfil an immediate need in industry. A PAS can be considered for further development as a British Standard, or constitute part of the UK input into the development of a European or International Standard.

Relationship with other publications

This PAS is one of two BSI PAS publications sponsored by HS2 and the TWf and can be used in conjunction with PAS 8812, *Temporary works – Application of European Standards in design – Guide*, which gives guidance on the application of European Standards in the design of temporary works in the UK for practitioners in the fields of structural and geotechnical temporary works design.

This PAS complements, and is intended to be used in conjunction with, BS 5975, *Code of practice for temporary works procedures and the permissible stress design of falsework*, expanding areas where there is limited information provided for client requirements.

BS 5975, *Code of practice for temporary works procedures and the permissible stress design of falsework* is the main UK standard for temporary works. However, major infrastructure clients can follow the recommendations in this PAS in addition to the general procedural controls for other duty holders that underpin the temporary works industry, as recommended in BS 5975:2008+A1:2011, Section 2.

Use of this document

It has been assumed in the preparation of this PAS that the execution of its provisions will be entrusted to appropriately qualified and experienced people, for whose use it has been produced.

For the purposes of this PAS, the terms and definitions given in the Construction (Design and Management) Regulations 2015 and BS 5975, *Code of practice for temporary works procedures and the permissible stress design of falsework* apply.

Presentational conventions

The provisions of this PAS are presented in roman (i.e. upright) type. Its recommendations are expressed in sentences in which the principal auxiliary verb is "should".

Commentary, explanation and general informative material is presented in italic type, and does not constitute a normative element.

The word "may" is used to express permissibility and the word "can" is used to express possibility, e.g. a consequence of an action or an event.

Spelling conforms to *The Shorter Oxford English Dictionary*. If a word has more than one spelling, the first spelling in the dictionary is used (e.g. "organization" rather than "organisation").

Contractual and legal considerations

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

Compliance with a PAS cannot confer immunity from legal obligations.

0 Introduction

Procedural controls for temporary works are covered in BS 5975:2008+A1:2011, Section 2 and are widely used across the industry. Whilst this standard provides the basis for contractors' procedures for temporary works, it does not provide explicit guidance for clients. Consequently, client organizations have tended to develop individual requirements resulting in a variety of approaches which have created confusion and complexity particularly with respect to approval and compliance, with adverse impact on administrative costs and programme. At an industry workshop (held at BSI on 28 February 2014), it was widely recognized that standardizing, streamlining and clarifying infrastructure clients' procedures would provide significant benefits to the industry in terms of cost, time and safety. This PAS is intended for use by all major infrastructure clients and may be used to inform other clients.

This PAS arises from the above concerns and specifically the work of High Speed Two (HS2) Limited and the Temporary Works Forum (TWf). HS2 is committed to the implementation of the UK HM Treasury *Infrastructure Cost Review* – 2010 [1] and 2014 [2] and the Institution of Civil Engineers Industry Standards Group report, *Specifying Successful Standards* (July 2012) [3], which recommended updating and defining standards.

It is understood that technical committee B/514/26, Falsework is revising BS 5975 to cover client procedures. The recommendations of this PAS will be taken into account in the development of that revision, however on publication of the revision of BS 5975, the future of this PAS will be reassessed with a view to ensuring there is no overlap of scope between the two documents.

HS2 is keen for this document to be used industry-wide and hence ensured that the industry was represented by the steering group.

1 Scope

This PAS gives recommendations on major infrastructure client procedures for all temporary works and temporary conditions of permanent works during construction. It covers processes, roles, responsibilities and competences, and provides example pro forma documentation.

The aim of this PAS is to establish a unified approach to client involvement in temporary works across all stages (e.g. defining requirements, procurement, installation, use and removal of temporary works structures) and eliminate unnecessary procedures and conflicts in order to achieve clarity and minimize delays during compliance and approvals processes and other necessary procedures.

This PAS is designed to complement BS 5975, *Code of practice for temporary works and the permissible stress design of falsework* with the same aim of controlling risk and ensuring adequate procedures. It concentrates on those client activities which are not covered by BS 5975.

This PAS does not cover the contractual responsibilities of clients, suppliers or contractors. Where there are relevant existing standards or industry documents, this PAS refers to these. It is not the intention of this PAS to replicate existing material.

This PAS supports the principle of making it clear at which points it is good practice for the client to actively stipulate procedures and/or processes in temporary works, and/or the design of temporary works.

NOTE 1 *This PAS is intended to complement the requirements of the Construction (Design and Management) Regulations 2015 (CDM 2015) [4] in respect of client duties in order to promote improved working practices and industry initiatives.*

NOTE 2 *This PAS reflects the beneficial influence clients and major infrastructure third parties are able to bring to bear on project outcomes, by adopting common procedures and terminologies and setting standards and expectations with regard to temporary works.*

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

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

3 Terms and definitions

For the purposes of this PAS, the terms and definitions given in the Construction (Design and Management) Regulations 2015 [4], BS 5975 and the following apply.

3.1 client

person for whom a project is carried out

NOTE According to CDM 2015 [4], the main duty for clients is to make sure their project is suitably managed and that these arrangements are maintained and reviewed.

3.2 client site inspector

competent person appointed by the client during the construction phase to monitor the execution of the temporary works on site

3.3 client-specified hold point

stage in the temporary works process where the client specifies that no further progress is to be made by the principal contractor without the client's agreement

NOTE 1 A client-specified hold point is separate from any hold point specified by the temporary works coordinator (TWC) (e.g. permit to load).

NOTE 2 A client-specified hold point might arise, for example, where the temporary works affect a client or third party asset outside the control of the principal contractor.

3.4 competency

3.4.1 competent organization

organization with sufficient skills, knowledge and experience of the specific tasks to be undertaken and demonstrating organizational capability, with regards to its approach to the well-being of persons affected by its undertaking

NOTE 1 Typically competency can be demonstrated by compliance with PAS 91, Construction prequalification questionnaires, or similar means.

NOTE 2 CDM 2015 [4] refers to "organizational capability".

3.4.2 competent person

person with sufficient skills, knowledge and experience of the specific tasks to be undertaken, and the risks which the work will entail:

- to enable them to carry out their duties in relation to the project;
- to recognize their limitations; and
- to take appropriate action in order to prevent harm to those carrying out construction work, or those affected by the work

NOTE 1 Modified from BS 5975 to align with CDM 2015 [4].

NOTE 2 Further guidance is provided in 6.1 and Clause 7.

3.5 design and design check certificates

3.5.1 design and design check certificate

certificate, signed by the designer and the design checker, certifying that the design meets the design brief and, where provided, the design statement

3.5.2 design check certificate

certificate, signed by the design checker, certifying that the design meets the design brief and, where provided, the design statement

3.6 design brief

document including all data and requirements relevant to the design of the temporary works

NOTE 1 Based on text from BS 5975:2008+A1:2011, 8.2.

NOTE 2 For further clarification of what these requirements might be, see BS 5975:2008+A1:2011, 8.1 to 8.6.

3.7 design check

evaluation of the design to determine whether it conforms with the design brief and can be expected to provide a safe engineered solution

NOTE 1 Based on text from BS 5975:2008+A1:2011, 3.10.2.

NOTE 2 This is different to an execution check, which is an on site inspection to determine whether the temporary works have been constructed in accordance with the design (see BS 5975:2008+A1:2011, 3.10.1).

3.8 design statement

document outlining the design requirements, the means by which the design will be developed, the assumptions, method of analysis, and other controls, including the potential to affect/impact operational infrastructure

NOTE 1 A design statement, written by the temporary works designer, might be requested by the client, or the TWC, for the more complex schemes (e.g. where the TWC believes that such a statement would add clarity for those undertaking the checks or for a peer review).

NOTE 2 Based on text from BS 5975:2008+A1:2011, 9.1.3.

NOTE 3 The design statement may be combined with the design brief so as to minimize the number of documents, so long as client-requested information is readily discernible.

NOTE 4 The design statement also includes specific reference to any temporary works elements which are proposed to be left in place.

NOTE 5 The design statement is referred to by some clients as "approval In principle", "conceptual design statement" or "statement of design intent".

3.9 designated individual

senior person within organization involved in temporary works, responsible for establishing, implementing and maintaining a procedure for the control of temporary works for that organization

NOTE Based on text from BS 5975:2008+A1:2011, 6.3.1.

3.10 major infrastructure client

client responsible for the construction, maintenance or repair of built infrastructure, either on a national or regional scale, or which is outside the normal procedural or funding mechanisms

NOTE 1 A major infrastructure client might be public, a private sector organization, or a mixture of the two charged with similar duties.

NOTE 2 Examples of major infrastructure clients on a national or regional scale include Highways England, Network Rail, LUL, utilities, and energy providers.

NOTE 3 Examples of major infrastructure clients outside the normal procedural and funding mechanisms include HS2, Thames Tideway and Crossrail.

3.11 peer review

review of the temporary works undertaken by independent person(s), and separate from a design check

NOTE 1 The review scope is determined by the party sponsoring it, but including any client requirements, and might include the concept, design, methodology, inspection and test plan as considered necessary.

NOTE 2 Developed by the Standing Committee on Structural Safety (SCOSS) and adopted on the more complex schemes (see SCOSS, Independent review through peer assist and Appointment of independent reviewer through peer assist [5]).

NOTE 3 See also 5.6.

3.12 permanent works designer PWD

designer of the permanent works, engaged by either the client or a contractor

3.13 robustness

the ability of a structure to withstand events like fire, explosions, impact or the consequences of human error, without being damaged to an extent disproportionate to the original cause.

[SOURCE: BS EN 1991-1-7:2006+A1:2014, 1.5.14]

NOTE 1 This applies to all stages of the construction, use and dismantling of a temporary works structure and any permanent works affected.

NOTE 2 For temporary works situations it is likely that impact and human error will be the most relevant events.

3.14 significant risk

risk that is not likely to be obvious to the principal contractor or temporary works designer, that is unusual, or that is likely to be difficult to manage effectively

NOTE 1 Based on definition from HSE Guidance on CDM 2015 L153, Glossary [6].

NOTE 2 Significant risks are separate from the categorization used in BS 5975:2008+A1:2011, Table 1 for checking. Significant risks are generally applicable to the higher categories, but not necessarily so.

3.15 temporary works

parts of the works that allow or enable construction of, protect, support or provide access to, the permanent works and which might or might not remain in place at the completion of the works

[SOURCE: BS 5975:2008+A1:2011, 3.40]

NOTE 1 Examples of temporary works are given in Table 1 (reproduced from PAS 8812). The groups indicated in the first column relate to PAS 8812 and are not used in this PAS.

NOTE 2 The TWf Client's guide to temporary works [7] suggests the following addition to the definition: "states of the permanent works which are temporary, loading conditions of the permanent works during construction or project execution which not envisaged in the permanent condition, structures in states of modification or demolition".

Table 1 – Groups of temporary works

Group	Sub-group	Examples
Group 1	Falsework	Support to a partially completed structure (e.g. in situ and precast concrete, steelwork during assembly) Propping Façade retention Needling Flying shores Gantries/cantilever Service bridges Structures providing stability during construction, alteration or demolition
	Formwork	Vertical (wall and column) Soffits Sloping Arches Cantilever soffits Permanent formwork
	Simple advancing falsework/ formwork	Formwork travellers (horizontal) Climbing formwork (vertical) Advancing/launching formwork
	Access	Tied scaffolds Freestanding scaffolds Gantries Special scaffolds (e.g. underslung scaffolds)
	Protection	Hoardings Protection fans Temporary roofs

Table 1 – Groups of temporary works (*continued*)

Group	Sub-group	Examples
Group 2	Geotechnical	Trench and excavation support Tower crane bases Piling/crane mats Retaining walls Earthworks Foundations Cofferdams Horizontal and inclined propping Underpinning Ground anchors Haul/site roads
Group 3	Vehicle and pedestrian bridges and related works	Temporary bridges Propping trafficked bridges
Group 4	Underground	Tunnels/headings Shafts Chambers Tunnelling thrust pits
Group 5	Marine temporary works	Temporary quay walls Dolphins Access jetties Floating plant
Group 6	Other temporary structures	Bridge launching Heavy lift systems Moving of structures Protection decks Structural support to cranes or other lifting devices Erection gantries Hydraulic equipment Jacking

[SOURCE: PAS 8812:2016, Table 1]

3.16 temporary works coordinator TWC

competent person with responsibility for the coordination of all activities related to the temporary works

[SOURCE: BS 5975:2008+A1:2011, 3.41]

3.17 temporary works design checker

independent person appointed to undertake a design check

NOTE The degree of independence depends upon the category of design check (see Clause 5).

3.18 temporary works lead design checker

competent designer appointed where more than one temporary works design checker is involved, with the responsibility for ensuring that the design check has considered overall structural robustness at all stages and all interfaces and interactions between designers have been adequately covered

NOTE 1 This role requires a specific brief and is normally fulfilled by one of the temporary works design checkers. It may be carried out by the TWC, if a competent designer.

NOTE 2 This role relates to coordination of technical design issues. General coordination is the responsibility of the TWC.

NOTE 3 This role is introduced specifically to ensure that the design is robust at interfaces and at any intermediate stages.

3.19 temporary works designer TWD

designer of the specified temporary works or an identified part of it

3.20 temporary works lead designer

competent designer, appointed when there is more than one temporary works designer, with the responsibility for ensuring that the overall design is structurally robust at all stages and that all interfaces between designers have been adequately considered

NOTE 1 This role requires a specific brief and is normally fulfilled by one of the temporary works designers. It may be carried out by the TWC, if a competent designer.

NOTE 2 This role relates to coordination of technical design issues. General coordination is the responsibility of the TWC.

NOTE 3 This role is introduced specifically to ensure that the design is robust at interfaces and at any intermediate stages.

3.21 temporary works register

tabular document listing all temporary works items associated with the project and the key issues relevant to each item

NOTE 1 This might include a short description, type classification, category of design check, date required, date accepted, designer and design checker.

NOTE 2 The register is the responsibility of the TWC [see BS 5975:2008+A1:2011, 7.2.5b)].

3.22 temporary works pre-construction schedule

schedule of anticipated temporary works with significant risks compiled by the permanent works designer and passed to the principal contractor as part of the pre-construction information

NOTE This can only be complete to the extent that the permanent works designer has the necessary information at the time of compilation.

3.23 temporary works supervisor TWS

competent person who is responsible to, and assists, the temporary works coordinator

[SOURCE: BS 5975:2008+A1:2011, 3.42]

NOTE In the majority of instances, each TWS is appointed by the DI of the organization constructing the specific temporary works item.

3.24 third party

party, independent of the project, whose procedures have to be followed, and approvals obtained, to temporary works proposals affecting their assets, users or their land ownership

NOTE An example of a third party would be a highway authority, affected by a new rail structure over their asset, required as part of the client's project, or a government department or foreign embassy.

4 Client management of temporary works

4.1 General

NOTE 1 The client procedures described in this PAS do not conflict with, and are subordinate to, the specific legal obligations given in CDM 2015 [4] and complement the roles of others described in BS 5975.

NOTE 2 The TWf clients' guide [7] states: "In defining the role of the client, CDM 2015 gives a useful starting point. First, these Regulations set out legal duties. More than that, they give an understanding of best practice which if acted upon will deliver not only health and safety, but also economy, speed and good quality".

4.1.1 In cases where the client does have specific requirements for type N temporary works (see Table 2), these should be followed.

NOTE Whilst normally there are no client requirements for type N temporary works (see Table 2), clients do expect the contractor to use their own engineering assurance procedures and to follow BS 5975.

4.1.2 The client should declare any required procedures, standards and requirements which impinge on temporary works matters at the earliest opportunity.

NOTE 1 These might include, for example, timescales, sequences, approvals and design standards.

NOTE 2 Normally the earliest opportunity is the tender or negotiation stage for either permanent works designers or contractors.

NOTE 3 It is important that the client recognizes that they have appointed a contractor to manage temporary works, and does not introduce unnecessary additional requirements.

4.1.3 The client should identify an individual in the client organization to act as the designated individual (DI).

4.1.4 The DI's responsibilities should include establishing, implementing and maintaining a procedure for the client's involvement in temporary works. This procedure should include:

- a) allocation of responsibility for each of the provisions of this PAS to competent persons in the client organization;
- b) a process for deciding whether an action from this PAS is implemented (e.g. the appointment of site inspectors);

- c) identification of, and minimum competencies for, those authorized to sign/acknowledge submissions and certificates as set out in Annex A, including alternative agreed nominees.

4.1.5 Documented records of responsibilities allocated, instructions given and actions taken (see 4.1.8) should be maintained.

4.1.6 The client should not allow the modification of its procedures, standards and requirements (see 4.1.2) by their representatives and local staff.

4.1.7 Client procedures should include for any temporary works which it is subsequently proposed by the contractor to leave in place.

4.1.8 The client should include all required procedures and standards which require action or compliance by other parties, for example permanent works designers or contractors, in its contracts with those parties.

4.1.9 Where the client has an established procedure or wishes to implement the use of another party's procedures, the client should have in place a structured plan for assessing and minimizing discrepancies between their procedures, BS 5975 and this PAS.

NOTE 1 The TWf clients' guide [7], Table 1: Sequence of project execution from the perspective of temporary works, provides a useful schedule of actions for client information.

NOTE 2 It is important that required procedures and standards are written such that they have regard to clarity of purpose, predictability and project efficiency, whilst maintaining safety, and minimize unnecessary requirements which do not add value to the project or improve health and safety.

4.1.10 Client procedures should include any requirements or restrictions on the use of electronic signatures, scanned signatures, scanned documents containing signatures, and original inked signatures on submissions and certificates.

4.1.11 The client should require in the construction contract that this PAS is applied by the principal contractor to any sub-contracting (for design or construction), in respect of temporary works.