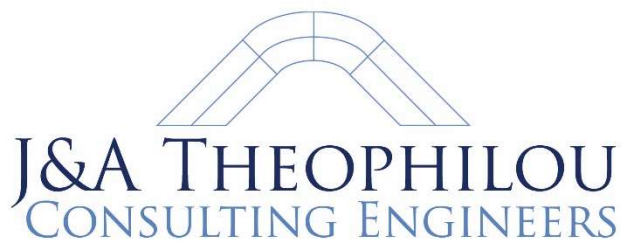


# Management of Temporary Work Designs Procedure

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Author Name and Position	Artemis Theophilou, Director



J&A Theophilou Consulting Engineers (UK) Ltd

46-48 East Smithfield, London E1W 1AW

## 1. Introduction

Temporary works are engineered solutions that are implemented during the construction phase of a project. The allocation of responsibilities, the interfaces and communication between the various dutyholders tends to be a major issue in temporary works, due to the multiplicity of actions normally required.

The present procedure was developed to ensure that within the consultancy the duties and responsibilities relating to temporary work designs are clearly specified. It also specifies the interaction and communication with other dutyholders. Finally, competence requirements are also specified.

## 2. Objectives

The objectives of this procedure are the following:

1. To specify the procedure for the management of the temporary work designs.
2. To allocate the responsibilities for the management of the temporary work designs, and specify the interfaces with other dutyholders.
3. To set out the training requirements for engineers developing designs and carrying out design checks.

## 3. Scope

The principles included in the present procedure are applicable to the development of all temporary works designs undertaken by the consultancy. All temporary work designs are carried out in accordance to the BS 5975:2008+A1:2011 and the Construction (Design and Management) Regulations 2015.

## 4. Duties and Responsibilities

### 4.1. Director

The Director of the consultancy has the overall duty for the temporary work design management. He is responsible for the development and revision of the procedure for the management of the temporary works design, and its correct execution. He is responsible for ensuring that the Design Engineers and Checking Engineers fulfil the competence requirements. He is also responsible for ensuring that sub-consultants carrying out and temporary work designs have adequate temporary work design management procedures.

### 4.2. Design Engineer

Design Engineers are responsible for developing designs that reflect the agreed design brief. Typical components of a design are the design statement (including calculations and sketches), the drawings, the technical specifications, the design risk assessment, and where necessary a designer's method statement for the temporary works scheme. All designs shall be in accordance to the applicable standards and codes of practice. The Design Engineers are also

responsible for communicating the design to the other dutyholders through the Temporary Works Coordinator.

#### 4.3. Checking Engineer

Checking Engineers are responsible for reviewing the produced designs. The Checking Engineers should not have involvement in the design process. They can only be consulted by the Design Engineers to the degree specified in Table 1. Designs should be approved only if they are compliant to the applicable standards, and all risks have been sufficiently mitigated and communicated. Upon approving a design, the Checking Engineer signs a design check certificate. A typical template for the design check certificate is included in Appendix A.

## 5. Procedures

### 5.1. Design brief

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

The brief should include all data relevant to the design of the temporary works. It is important that it is prepared early to allow sufficient time for all subsequent activities i.e. design, design check, procurement of equipment and construction/erection of the scheme.

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 it is likely that a large amount of information will need to be collated before design work can commence or a programme for the construction of the temporary works can be drawn up.

The information required might need to be obtained from various sources, and might include data from earlier site operations or details of existing structures. Certain information might be of direct relevance to both the permanent works designer and the temporary works designer, such as site investigation information or where the temporary works affect or take support from the permanent works.

The following indicates the type of information that might be required for the preparation of the brief:

- a) details of the organizations involved in the design of the scheme and their respective responsibilities,
- b) appropriate drawings of the permanent works,
- c) appropriate clauses from the specification for the permanent works,
- d) statement of any requirement to design the temporary works in accordance with a particular standard or guidance document,

- e) information on any significant risk associated with the design of the permanent works,
- f) programme for the construction of the permanent works,
- g) programme for the various phases of the design, design check, any external approvals, and procurement and erection of the temporary works,
- h) the timing for the removal of the temporary works in relation to the ability of the permanent works to be self-supporting,
- i) any requirements for access onto, under, or around the permanent works,
- j) requirements for access for erection, maintenance, use and dismantling of the temporary works and for other site activities,
- k) any requirements for public access, for example a requirement to keep a public footpath open,
- l) equipment and materials available for use in the temporary works,
- m) proposals for any moving and re-use of temporary works,
- n) environmental information such as the location, altitude and topography of the site, the distance from the nearest sea, rainfall, water levels and current velocities,
- o) site investigation data and reports relating to the areas under and adjacent to the foundations of the temporary works; this should include information on all underground and over-head services,
- p) any limitations on the staged construction of the works due to positioning of construction joints, sequence of separate pours, rate of successive pours, timing of post-tensioning and removal of supports,
- q) any requirements for pre-cambering or residual camber,
- r) loads that may be induced in the temporary works by permanent works that have been completed, such as the application of staged post-tensioning, load re-distribution and any movements of significance including any settlements or deflections that can be anticipated from the permanent works as load is progressively increased,
- s) any limitations stated by the designer of the permanent works on the position and extent of loads imposed by the temporary works onto elements of the permanent works which have been constructed such as loads imposed by successive floors of multi-storey construction onto lower floors or loading of permanent foundations required to support the temporary works,
- t) any limitations on the positioning of loads from temporary works over underground services or adjacent to excavations or retaining walls forming part of the permanent works,

- u) proposals for the protection of the temporary works, including its foundations, against disturbance or impact,
- v) limitations imposed by various authorities in relation to working within or adjacent to railways, highways, water-courses, etc.,
- w) any environmental constraints placed on the site by the local authority or other body, for example a requirement by the local authority to limit noise to certain hours of the day,
- x) details of obstructions that might preclude or influence the position of the temporary works.

The design brief should be provided to the Design Engineer.

When the design has been completed the design brief should be provided to the organization / individual who is to carry out the design check.

## 5.2. Design

Those responsible for the design of a temporary works scheme should base their design on the previously agreed design brief. It should be noted, however, that it may become necessary to accommodate alterations or modifications to the design when, for example, the final details of the permanent works are known, or experience is gained during the construction of the temporary works. The designer may not be able to fully accommodate the requirements of the design brief and any proposed modifications should be drawn to the attention of the Temporary Works Coordinator as soon as the changes are identified.

The preparation of design calculations, drawings and specifications should be undertaken in a manner similar to the procedures (including checking) applied to the design of permanent works. They should define such points as: requirements for foundations, positions of components, the nature of connections to other components, limitations for loading, and sequence of operations. The CDM Regulations require that any designer provides adequate information about any significant risk associated with the design, e.g. a list of residual hazards. There is also a requirement to co-ordinate the work with that of others in order to improve the way in which risks are managed and controlled. This may include the use of suggested construction sequences. For complex schemes it is recommended that the temporary works designer briefs the site team on the key elements and hazards identified during the design process.

The temporary works designer should identify, from the design brief and associated information, the various loads that will act on the structure together with the combinations in which they will be considered. In addition, the relevant British Standards or other documents used in the design process should be identified. This information should be summarized separately from the design calculations in order that it can be available to the checker. For complex schemes the information may be presented in the form of a “design statement” which

may also include: an idealised structure, method(s) of analysis, and the version of computer software, if any, used.

Temporary works should be designed in accordance with recognized engineering principles. The design should take into account the variability of materials, workmanship, site conditions and construction tolerances.

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

The permanent works designer can be expected to have considered the buildability of the structure. The overall design should have taken account of the methods of construction and the space required for the temporary works. The permanent works designer should provide the relevant information – particularly the significant risks involved in its construction. The temporary works designer should take this information into account in the preparation of the design.

### 5.3. Design Check

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 checker and his remoteness or independence from the temporary works designer should be greater where new ideas are incorporated or the temporary works are complex.

Design checks should be undertaken in accordance with one of the categories given in Table 1.

For categories 2 and 3, the checker should carry out the check without reference to the designer's calculations using only the design brief, design statement, drawings and specification and associated information not produced by the designer.

In certain situations it may be necessary to apply different categories of check to different parts of a design. For example if a proprietary supplier is carrying out a falsework design assumed to be fixed at the head, the check on the falsework would be category 1 but the check that the structure is able to resist the applied horizontal load may be category 2.

On completion of the design and design check, a certificate should be issued for all categories, confirming that the design complies with the requirements of the design brief, the standards/technical literature used and the constraints or loading conditions imposed. The certificate should 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 Temporary Works Coordinator should include this certificate.

Category	Scope	Comment	Independence of checker
0	Restricted to standard solutions only, to ensure the site conditions do not conflict with the scope or limitations of the chosen standard solution.	This applies to the use of standard solutions and not the original design, which will require both structural calculation and checking to category 1, 2 or 3, as appropriate.	Because this is a site issue, the check may be carried out by another member of the site or design team.
1	For simple designs. These may include: formwork; falsework (where top restraint is not assumed); needling and propping to brickwork openings in single storey construction.	Such designs would be undertaken using simple methods of analysis and be in accordance with the relevant standards, supplier's technical literature or other reference publications.	The check may be carried out by another member of the design team.
2	On more complex or involved designs. Designs for excavations, for foundations, for structural steelwork connections, for reinforced concrete.	Category 2 checks would include designs where a considerable degree of interpretation of loading or soils' information is required before the design of the foundation or excavation support or slope.	The check should be carried out by an individual not involved in the design and not consulted by the designer.
3	For complex or innovative designs, which result in complex sequences of moving and/or construction of either the temporary works or permanent works.	These designs include unusual designs or where significant departures from standards, novel methods of analysis or considerable exercise of engineering judgement are involved.	The check should be carried out by another organization.

Table 1. Categories of design check.

## 6. Competence Requirements

Engineers undertaking the preparation of designs and the checking of designs should have adequate training and professional experience. Training is substantiated through a course on the Construction (Design and Management) Regulations 2015. Training requirements can be waived if Engineers demonstrate acceptable performance in as design engineers for a period of at least one year. Professional experience is substantiated through the Chartered Engineer title, and membership at Member level to the Institution of Civil Engineers, or the Institution of Structural Engineers.

## 7. Monitoring Compliance with Procedure

The present procedure will be monitored by the Director in various ways. This includes periodic auditing of the prepared designs and design checks. Such audits could be random or project-specific.

## 8. References

- Construction (Design and Management) Regulations 2015.
- British Standard Institute, British Standard 5975:2008+A1:2011, Code of practice for temporary works procedures and the permissible stress design of falsework.



## Appendix A. Design Check Certificate Template

**J&A Theophilou  
Consulting Engineers (UK) Ltd**

Temporary Works  
Design Check Certificate

Design details			
Project name		Design brief ref.	
Project ref.		Design check category	
Design engineer		Temporary works	
Design organization			

Design scheme title			
Design scheme drawings and documents			
Standards, codes of practice, industry specifications, and health and safety guidelines used in the check			
Checking engineer's comments			

I hereby confirm that reasonable professional skills and care have been dedicated in checking of the design. The design is compliant to the relevant British and European standards, codes of practice, industry specifications, and health and safety guidelines.			
Checking engineer			
Signature		Date	