



Temporary Works
forum

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The Construction (Design & Management) Regulations 2015 Principal Designer: Guidance on Temporary Works

1.0 Introduction

What role does the Principal Designer have in planning, managing, monitoring and coordinating temporary works design?

- 1.1 Within the Construction (Design and Management) Regulations 2015 (CDM 2015), temporary works designers (TWDs) are covered by the definition of 'designer' (see Paragraph 72 of the Legal Guidance, L153, *Managing health and safety in construction* (HSE)).
- 1.2 The Principal Designer (PD) must ensure that all designers comply with their duties, primarily under Regulations 9 and 10.
- 1.3 The Principal Designer has to take reasonable steps to ensure co-operation between all designers (of both permanent and temporary works), e.g. that arrangements are in place to confirm that designs are compatible.
- 1.4 The Principal Designer's role continues into the construction phase when design work is carried out. On a 'Design and Build' (D&B) project it will be common for the D&B Contractor to be appointed as both Principal Designer and Principal Contractor.
- 1.5 The Principal Designer should, at an early stage, discuss and agree with the Client their approach to the delivery of the role. Where the party delivering the Principal Designer role might change, this should include consideration of how any liaison and control established will be maintained.

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2.0 Permanent Works Design

The Principal Designer should, so far as is reasonably practicable:

2.1 Check that permanent works designers have considered the impact of their design in terms of health and safety during construction work.

2.1.1 Have the permanent works designers (PWDs) followed the 'general principles of prevention' (see Appendix 1, L153), by avoiding or reducing (so far as is reasonably practicable) the need for temporary works within their permanent design (including their documented suggested construction sequence)? Examples could include:

- Considering/providing pre-cast alternatives to reduce the amount of formwork and/or falsework;
- Removing the need for large shutter lifts (and its associated hazard of working at height);
- Designing stairs with handrails already fitted and/or easily fitted;
- Designing steelwork that is purposely designed to accommodate safety netting;
- Considering loadings and spatial requirements from temporary works within the permanent works design.

2.1.2 Other issues to be considered include (but are not limited to):

- Access and/or lifting arrangements (transporting large elements);
- Envisaged programming/sequencing of work;
- Advising others of any temporary instability of the permanent structure during its construction;
- How will temporary works arrangements be dismantled/removed following completion of that particular construction element, etc.;
- Considering and mitigating the temporary instability of large reinforcement cages during erection.



The ERIC approach to risk management

When considering risk reduction, designers may find it useful to consider the acronym 'ERIC'. This indicates the required actions and the required sequence of the designer's considerations.

Eliminate

- If you can eliminate an identified hazard, by taking a different design decision, you must.

Reduce

- The designer must reduce the remaining risks associated with the hazard, so far as is reasonably practicable.

Inform

- Provide information on these risks to the contractor (and other designers), or those using or maintaining the structure.

Control

- Providing the design does not change, and no other influence comes to bear, then the control of the risks on site during construction or maintenance are the responsibility of those undertaking the work.

- 2.1.3 Where the works are complex or specialised, designers should consider obtaining appropriate specialist advice from contractors or temporary works specialists.
- 2.1.4 Opportunities to reduce the need or cost for temporary works are likely to be dependent on contractual arrangements but there is often benefit to the project if Clients recognise the advantages of 'Early Contractor Involvement' (ECI).

Reviewing designs

When reviewing designs it may be useful to consider the following:

Complexity

- What are the difficult parts in the project? Has buildability been assessed in more detail in these parts, to avoid increased risk?

Repetitiveness

- What are the common and/or similar components in the design?
- Are these covered by the same 'typical' method statements, or are they 'bespoke'?

Construction process

- What options have been considered, e.g. pre-fabrication, modular construction, etc. (if applicable), and what are the associated benefits and risks?



Construction sequence

- What are the risks associated with each stage, i.e. slopes, propping, temporary bracing, etc.?
- Can the design be built?
- Does the nature of the design dictate the construction sequence (and, if so, is this clearly set out for the contractor)?

Equipment type

- Has equipment been adapted (and, if so) how? Are measures in place in case of lack of space, inconvenient work area(s), special weather conditions, etc.?

Environment

- Has access, adjacent structures and/or other construction site(s), high voltage apparatus above site, etc. been considered?

2.2 **Ensure that permanent works designers provide relevant information on their designs to inform the temporary works designers.**

2.2.1 It is important that permanent works designs should include information on any associated ‘significant risks’¹ which could impact the temporary works design. Examples could include:

- Design assumptions and suggested/assumed work methods;
- Assumed construction sequence(s);
- Unusual loadings arrangements/centre of gravity of precast or pre-formed elements;
- Requirements for specific levels of stiffness, or deflection limits, of the temporary works;
- Known unstable conditions during construction, etc.

2.2.2 Pre-construction information will also need to be provided relevant to the temporary works, e.g. ground conditions, details of existing structures, limits on loadings from or onto the permanent works, etc.

3.0 Temporary Works Design

The Principal Designer should, so far as is reasonably practicable:

¹ **significant risks:** not necessarily those that involve the greatest risks, but those (including health risks) that are not likely to be obvious, are unusual, or likely to be difficult to manage effectively [see L153, Glossary].



3.1 Check that there are arrangements for controlling temporary works

3.1.1 The Client is required to make suitable arrangements for managing the project so that health, safety and welfare is secured, e.g. the people and organisations they appoint have the skills, knowledge and experience (and the organisational capability) to manage temporary works issues.

What this could look like in practice

A Client decides to specify that the recommendations in Section 2 of BS5975, BS 5975:2008+A1:2011, *Code of practice for temporary works procedures and the permissible stress design of falsework*, be part of his contract - in particular, the requirement for the contractor to appoint a Temporary Works Coordinator (TWC). He decides, as part of the tender process, to make enquiries about the capability of the tendering contractors to manage temporary works issues.

3.1.2 There is no requirement in CDM 2015 for the Principal Designer to review the adequacy of the Construction Phase Plan. However, they should check that the Principal Contractor has suitable arrangements for preparing temporary works designs, e.g. has a Temporary Works Co-ordinator (TWC) been appointed? These arrangements are likely to be detailed or referenced within the Construction Phase Plan.

3.2 Ensure that there is an appropriate process for designer co-ordination and co-operation when there is interaction between temporary works and permanent works.

3.2.1 The identification of the various temporary works designers within what can be a complex network of organisations is important, as it affects communication routes and the Principal Designer's ability to co-ordinate the health and safety aspects of the design work. The Principal Designer should recognise the need to discuss these aspects at an early stage with the Client, and particularly before the appointment of the Principal Contractor.

3.2.2 The interface and understanding between all designers (of both permanent works and temporary works), must be clearly understood by all relevant parties (including with proprietary suppliers).

3.2.3 The Principal Designer will need to set out how there will be liaison with and between the various temporary works designers. Where



the scale or complexity of the works warrants it, this should include: design co-ordination workshops; attendance at site progress meetings; etc. The level of input from the Principal Designer is likely to vary depending on the complexity of the project. Liaison is likely to be through the Principal Contractor and, specifically, their Temporary Works Co-ordinator.

- 3.2.4 The Principal Designer should have an understanding of the methodology being used by TWDs for identifying risks in their designs. As designers, they have a legal duty to provide relevant information to the Principal Designer, e.g.:
- What are the loadings from the temporary works (and can they be supported by the permanent works)?
 - Have other significant residual risks been identified?
- 3.2.5 The Principal Designer should ask questions about how temporary works designers have accounted for the ‘general principles of prevention’ in their design (within the limitations of their design brief).
- 3.2.6 Arrangements should be made to ensure that permanent works designs and temporary works designs are compatible. Such arrangements could be defined in the project brief. Alternatively, the Principal Designer could briefly record these arrangements following discussions with the Principal Contractor.
- 3.2.7 PWDs should take account of buildability (also known as *construction method engineering*) within their designs. They should consider incorporating features within their permanent works design to facilitate not only safer construction, but also safer operation and maintenance. The ability to modify their designs to suit buildability may also, dependent on contractual arrangements, allow the scale and/or complexity of temporary works to be reduced (or, indeed, eliminate the need for it altogether). Accordingly, there is likely to be a benefit to the project if Clients recognise the advantages of ‘ECI’.

Example:

After consultation - through ‘Early Contractor Involvement’ with a Contractor’s temporary works designer - the PWD opted to show some features in its permanent works drawings (and BIM model) that would facilitate safer construction, e.g. fixing inserts, shear load connectors, additional reinforcement, etc.



3.2.8 In some instances, design changes may be necessitated by value engineering during the construction phase or, less desirably, driven later by unforeseen circumstances. Where such changes lead to revision of construction methods, sequencing and temporary works the appropriate steps must be undertaken to ensure adequate risk assessment and design of the revised proposals.

3.3 Request information from temporary works designers to be included in the Health & Safety File

- 3.3.1 On some projects it may be necessary to include information relating to temporary works in the Health & Safety File. Examples could include:
- When a temporary works item is left in the permanent works (e.g. sacrificial sheet piles);
 - When the temporary works used were critical to interim structural stability;
 - Information on temporary works (including temporary stability) that may assist someone subsequently working on or altering, removing, and/or demolishing the structure.

Principal Designer: Summary

A Principal Designer is a designer appointed by the Client in projects involving more than one Contractor. It can be an organisation or an individual with sufficient knowledge, experience and ability to carry out the role.

The Principal Designer's main role is to:

- Plan, manage, monitor and coordinate health and safety in the pre-construction phase of a project. This includes:
 - identifying, eliminating or controlling foreseeable risks;
 - ensuring designers carry out their duties.
- Prepare and provide relevant information to other duty holders.
- Provide relevant information to the Principal Contractor to help them plan, manage, monitor and coordinate health and safety in the construction phase.

Based on Table 1, L153 (HSE)



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