

Dear Reader,

Date – 23/11/2018

**RE: PUBLIC CONSULTATION PERIOD**

**Temporary Works Procedural Control: Good Practice Guideline (GPG)**

The newly established Temporary Works forum (TWf) have developed the attached draft guidance document to the New Zealand Construction Industry, providing a consensus view on how to execute good procedural control of the risks posed by temporary works throughout their lifecycle. This approach is based heavily on international best practice, most notably Section 2 of the British Standard BS5975.

The GPG is now issued for public comment.

Any comments must be sent by email as per the format below. Only comments received in this format will be considered.

<i>Section reference</i>	<i>Page number</i>	<i>Current text</i>	<i>Proposed text</i>	<i>Reasoning for change/ reference</i>

Please send your comments by email to [twf@sesoc.org.nz](mailto:twf@sesoc.org.nz). The closing date is 07/01/2019.

When commenting on this GPG, please note:

- 1) This document is developed as a practical “good practice” guide for all PCBU’s working with or around temporary works. It is not a New Zealand Standard although we will be seeking endorsement from WorkSafe amongst other industry bodies.
- 2) Comments should either improve or maintain the documents ability to be relevant, practical, effective and scalable for all projects, for all contractors.
- 3) This document is intended to be complimentary and non-contradictory to other New Zealand Industry guidance.
- 4) If you return a comment but do not want the company you represent to be included on the “acknowledgements” page, please state this in your email.

We look forward to hearing from you.

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Ngā mihi nui,  
TWf Admin ([twf@sesoc.org.nz](mailto:twf@sesoc.org.nz))  
for and on behalf of the Temporary Works forum ([twf.sesoc.org.nz](http://twf.sesoc.org.nz))

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Temporary Works  
forum (NZ)

Promoting best practice in  
the construction industry.

# Temporary Works Procedural Control

GOOD PRACTICE GUIDELINE



This document offers a good practice guide on how to control risks posed by temporary works.

## KEY POINTS:

Duty holders have responsibilities to provide a safe workplace under the HSWA 2015.

Temporary works that are poorly controlled can lead to failures and potentially fatal events.

It is the duty of the appointed Temporary Works Co-ordinator to maintain a register of all temporary works and ensure they have been assessed by a competent person, in line with a written procedure.

The purpose of this document is to provide guidance of good practice on temporary works procedures.

This guidance has not been written as a definitive guide on how to design temporary works or where to find design guidance.



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## 1.0 INTRODUCTION

Where there are temporary works, there are hazards and risks associated with them.

The purpose of this document is to provide an industry approved guidance on how to control temporary works risks as far as is reasonably practicable.

These guidelines are written by New Zealand Contractors and Engineering Consultants for the New Zealand Construction Industry. It is based on recognised current international best practice (see TW17.037), as well as local conditions particular to the culture of Health and Safety Management and Construction in New Zealand.

All parties are expected to fulfil their duties as a PCBU in accordance with the Health and Safety at Work Act 2015 (HSWA).

### 1.1 Who are these guidelines for?

Generally all projects require temporary works in one form or another, this guidance is beneficial to control risks on each and every project where temporary works, or assessments of the temporary condition is required.

Under HSWA all PCBU's have a primary duty of care to ensure a place of work under their control is safe for workers and others. There are overlapping duties for Main Contractors, Sub-Contractors and Consultants.

The **Main Contractor** may not be directly responsible for the design, checking, construction or safe use of the temporary works on site, however they have an overarching duty to

provide a safe place of work. This will require that good procedural control of temporary works has been implemented throughout.

**Contracting partners** and **Sub-Contractors** also have a responsibility to ensure all self-performed temporary works are well considered and competent. This guidance provides a structure to ensure that all parties fulfil their responsibilities for temporary works.

Procedural control must be adequately resourced and supported by competent people relative to the complexity of the works.

**Consultants** involved in the planning, design, checking and inspection of temporary works should follow the processes set out in this document.

Anyone involved in the resourcing, support, assessment, development, procurement, management or execution of projects that require temporary works should be familiar with the use of this document.

### 1.2 What are “Temporary Works”?

Temporary works are defined in the British Standard BS5975 as:

***“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”***

Examples of temporary works are:



**Earthworks:** Support to trenches, excavations, temporary slopes and stockpiles.

**Structures:** Formwork, falsework, propping, façade retention, needling, shoring, edge protection, scaffolding, temporary bridges, site hoarding and signage, site fencing, cofferdams.

**Equipment and plant foundations:**

Tower crane bases, supports, anchors and ties for construction hoists and mast climbing work platforms, groundworks to provide suitable areas for plant erection, e.g. mobile cranes and piling rigs, mechanical equipment and special configurations bespoke to the project

Furthermore, a temporary works design can be categorised into 4 types of assessment, or a combination of several –

Type	Description	Common forms
<b>A</b>	Temporary structures, which do not form part of or are redundant after completion of the permanent works.	Hoardings, Fences and Gates. Site cabin foundations. Demolition methodologies. Underpinning design. Piling mats and Working Platforms. Mobile Crane outrigger assessments. Lifting Beams. Scaffolding. Backpropping and Dead shoring. Edge Protection / Screens. Temporary berms/batters/stockpiles. Shored excavations. Loading Gentries. Formwork and Falsework. Cantilever deck loading platforms. Hoists bases and ties. Tower Crane bases and ties.
<b>B</b>	Existing permanent structures, subject to construction live loadings or temporary effects.	Deconstruction methodologies Excavations adjacent basements or retaining walls.* Dewatering effects.* Heave effects.* Underpinning sequences to building foundations.* Resistance of facades to temporary fixings. Roofs, verandas or balconies supporting scaffolding.
<b>C</b>	New permanent structures, subject to construction live loadings or temporary effects.	Plant and storage on new floor slabs. Slabs subject to dead-shoring loads.* Retaining walls and capping beams before basement completion.*
<b>D</b>	Stability of incomplete new permanent structures, during the construction sequence.	Construction stage review/stability assessments for wind and seismic events.* RC core methodology. Early-striking of formwork. Reinforcement cage stability.

\* These assessments should be carried out in conjunction with the Clients Engineer (Permanent Works Engineer) where due diligence should already have been



*completed and/or analysis of the design model would provide more accurate and expedient results.*

**Temporary works do not include -**

- Temporary service diversions, (but would include temporary structures supporting them).
- Lifting plans (but would include the design of spreader beams, bespoke lifting devices, and working platforms to support plant).
- Traffic Management Plans (but would include the use of traffic barriers when not used in accordance with their specification).

It should also be noted, that while a contract may use a different definition of temporary works to control design responsibility and subsequent costs, this does not preclude those tasks from being subject to good procedural control.

### 1.3 What is “Procedural Control”?

For the purposes of this guidance, the term procedural control can be attributed to the procedure to which a PCBU manages the recognition, assessment and mitigation of risks posed by temporary works over their full lifecycle.

**The full lifecycle of a temporary works structure includes -**

identification, scope, scheme development, load determination, design, checking, review, procurement, fabrication, construction, verification, use, maintenance, inspection, adaption, changes in scope, redesign, interfaces with other structures, demolition and removal

**Section 2 of BS5975** covers the procedural control of temporary

works in the United Kingdom. The terminology used in this guidance is consistent with those used in BS5975.

This guidance discusses the principles that make up the **framework** of good procedural control. The framework can be implemented by the use of the **standard documents** found in the appendices, or used as a reference for the development of a **bespoke procedure** to the organisation or Project.

### 1.4 How to use this guidance

This guidance sets out the responsibilities between PCBU's to a Project that contribute to the development of well-considered temporary works, free from health and safety risks, as far as is reasonably practicable.

The standard documents have been provided to enable any Main Contractor, Sub-Contractor, or other PCBU, to apply the principles of good procedural control without the need of developing a bespoke procedure.

Any additions or alterations to the framework must be capable of aligning with the standard documents in this guidance.

Contracting partners or Sub-contractors who adopt a procedure other than their own or the use of the standard documents on a project, should receive supplementary training, particularly on those details that differ from the standard documents. Adopting a partner's procedure does not negate the duty to implement the GPG framework.

#### **1.4.1 Client / Clients**

##### **Representative**

According to the principles of Safety in Design (SiD), decisions that are made by the Client during design development will have a downstream effect on the site constraints, options for construction methodology and inferred temporary works.

While the Client may not directly control the temporary works, the decisions made in specifying the form of the build will determine the complexity of the temporary works required.

#### **1.4.2 Clients Engineer (Permanent Works Engineer)**

The principles of SiD practiced by the Clients Engineer will require consideration of the construction methodology and review of the design if exceptional risks are required to be managed by the Contractor.

The Clients Engineer would not be expected to have a temporary works procedure or policy to implement on a project, but would be expected to have a working knowledge of this guidance and how the execution of their role can have a significant effect on the development of competent temporary works.

On request and when suitable, the Clients Engineer may also provide design and checking services of the permanent works in the temporary condition, or provide bespoke temporary works solutions.

#### **1.4.3 Main Contractor / Contracting Partner (JV, Alliance, PPP, etc.)**

By definition, the procedural control implemented on a project must be

managed by the Main Contractor responsible for the workplace. This guidance is provided to inform the development of this procedure.

This procedure may either be the framework contained within this document, or a bespoke procedure that aligns with it.

#### **1.4.4 Sub-Contractor**

The Sub-Contractor should also implement procedural control that aligns with the framework for all temporary works within their scope.

It is the responsibility of the Sub-Contractor to ensure all relevant and pertinent information to the delivery of temporary works has been provided to the Main Contractor.

#### **1.4.5 Consulting Engineer**

For the purposes of this document, the Consulting Engineer is an independent party who provides design and/or checking services for the temporary works. They will be expected to take direction from the Temporary Works Co-ordinator during the development of a scheme, accept the design responsibility and have a working knowledge of the correct use of the Design Check Certificate.

## Duties of the Organisation

	Planning / Bid Stage	Delivery Stage
<b>Client / Clients Rep.</b>	<ul style="list-style-type: none"> <li>✓ To ensure the Clients Engineer has applied the principles of <b>SiD during design development</b>.</li> <li>✓ To ensure that the appointed <b>Main Contractor has procedural controls</b> in place to manage temporary works risk.</li> <li>✓ With the help of the Clients Engineer, specify which items require a particularly high level of independent <b>checking</b>.</li> </ul>	
<b>Clients Engineer</b>	<ul style="list-style-type: none"> <li>✓ To consider the <b>temporary effects</b> of the construction on soil conditions or adjacent structure.</li> <li>✓ To provide the <b>SiD register</b> of reasonably foreseeable residual risks to be managed by the Contractor.</li> <li>✓ To engage openly with the Contractor throughout the bid and delivery stages to <b>assist the understanding</b> of particular temporary works requirements/interfaces.</li> <li>✓ To <b>consider design alterations</b> to reduce construction risks as far as is reasonably practicable.</li> <li>✓ To provide <b>allowable loading plans</b> of the existing permanent works to facilitate review of the construction live loading.</li> <li>✓ To provide design constraints to the Main Contractor for the assessment of <b>secondary effects on the permanent works</b>.</li> </ul>	<ul style="list-style-type: none"> <li>✓ To provide <b>design constraints, parameters or assistance</b> to the Contractor in managing temporary effects to a level that is acceptable to the project.</li> <li>✓ To provide <b>reasonable and timely responses</b> to the Contractor for the benefit of safer workplaces.</li> <li>✓ To ensure that all <b>Contractors are aware of their duties</b> towards procedural control.</li> </ul>
<b>Main Contractor</b>	<ul style="list-style-type: none"> <li>✓ To <b>resource and support</b> all projects adequately.</li> <li>✓ To either adopt the <b>framework</b> / standard documents (see appendices), or develop an organisationally approved and written <b>bespoke procedure</b>.</li> </ul>	<ul style="list-style-type: none"> <li>✓ To ensure <b>procedural control</b> of temporary works has been adequately implemented.</li> <li>✓ To ensure <b>co-ordination across sub-contractors</b> for adjacent works has been adequately considered.</li> </ul>

## Duties of the Organisation

	Planning / Bid Stage	Delivery Stage
	<ul style="list-style-type: none"> <li>✓ To ensure all <b>Sub-Contractors</b> are aware of their duties towards managing temporary works and that their procedure is compatible.</li> <li>✓ To ensure adequate <b>competency</b> checks have been carried out on staff who manage or assess temporary works.</li> <li>✓ To <b>appoint a competent person</b> to assess temporary works and provide design to fulfil good procedural control.</li> <li>✓ To seek advice on temporary works design and methodologies to allow for reasonable provision to facilitate the project.</li> </ul>	<ul style="list-style-type: none"> <li>✓ To programme works such that Sub-Contractors in the same or adjacent workspaces do not raise risks associated with a congested site.</li> </ul>
<b>Sub-Contractor</b>	<ul style="list-style-type: none"> <li>✓ To <b>resource and support</b> all projects adequately.</li> <li>✓ To either adopt the <b>framework</b> / standard documents (see appendices), or develop an organisationally approved and written <b>bespoke procedure</b>.</li> </ul>	<ul style="list-style-type: none"> <li>✓ To ensure <b>procedural control</b> of temporary works has been adequately implemented.</li> </ul>
<b>Consulting Engineer (Temporary Works)</b>	<ul style="list-style-type: none"> <li>✓ Where requested, provide reasonable guidance on construction risks and temporary work provisions required to complete the works.</li> </ul>	<ul style="list-style-type: none"> <li>✓ To <b>take direction</b> from the Temporary Works Co-ordinator and ensure all pertinent information provided has been considered.</li> <li>✓ To provide a <b>competent assessment</b> of the temporary works and supply relevant design information, drawings and specifications to inform the construction.</li> <li>✓ To abide by a <b>code of ethics</b> in their duty as an Engineer.</li> </ul>



## 2.0 TEMPORARY WORKS RISK

Risk is defined in ISO31000:2009 as:

***“the effect of uncertainty on objectives”***

Temporary works vary in their nature and can be provided to enable the execution of simple, involved and complex objectives. When temporary works do not perform, the consequences can be **significant effects on cost, quality, programme and H&S.**

The best way to manage these risks and effectively reduce the uncertainty of the performance of temporary works, is through the execution of good procedural control.

### 2.1 Failure of Temporary Works

Any failure of temporary works may lead to collapse of the temporary works and/or the permanent structure. In addition, any failure of a permanent structure which is in a temporary condition but self-supporting can be just as catastrophic. Both could lead to **death or serious injury, as well as loss of time and money.**

In most cases temporary works and temporary condition failures are foreseeable and could be prevented by proper consideration when planning, erecting, installing, loading, using or dismantling the temporary works through the use of a robust procedure.

Investigations into incidents, including collapses, have identified that a lack of co-ordination between the various parties, including designers, contractors, sub-

contractors, trades and equipment suppliers contributed significantly or critically to the failure.

### 2.2 Risk Categorisation

In order to ensure that the risks associated with temporary works are assessed appropriately, there are three risk factors which should be considered (after TWf2014: 02).

All three risk factors should be considered by the TWC when assessing a scheme and identifying the competency required of the designer and the check category required (see Appendix E).

#### 2.2.1 Consequence of failure

The consequences of failure risk is an assessment of what could happen if the temporary works were to fail entirely or in part. This can vary significantly for the same temporary works solution in different circumstances. For example, the failure of a formwork shutter would have radically different consequences if it was suspended over a major state highway when compared to a green field site.

(Reference to Table 3.1)

#### 2.2.2 Design complexity

The risk associated with the complexity of a temporary works solution can vary significantly. At the lower end of the scale, simple designs can be safely designed using industry best practice. More complex systems however may only be assessable using and understanding sophisticated analysis and design software. It should be noted that design complexity can be driven by the structural form, load environment, geotechnical conditions or a combination.

### **2.2.3 Execution criticality**

Execution risk relates to the susceptibility of the temporary works solution to failure due to issues relating to use, workmanship and/or materials. Systems reliant on critical design details, methodologies, specific loading sequences or those with inherent instability would have a high execution risk. Many issues relating to execution criticality can be mitigated at the design stage through robust design incorporating suitable redundancy.

## **2.3 Management of Risks**

All parties involved in projects which require temporary works must first seek to eliminate risks to health and safety. Where risks cannot reasonably be eliminated risks must be minimised in accordance with the hierarchy of control.

The implementation of robust procedural control of temporary works is critical to the management and minimisation of the associated risks.

The level of Consequence of Failure Risk, with explanation, should be given in the Temporary Works Brief. This information will be important to the TWC, and to the temporary works design, design verification, procurement and operations teams.

Designers (both temporary works designers and permanent works designers) have the opportunity to eliminate and minimise risks and inefficiencies by design. Where temporary works are required, the design should be developed to minimise the categories of

Consequence of Failure Risk and Execution Risk.

Those on site have the opportunity to eliminate and minimise risks by practical means such as; ensuring quality control and good workmanship and by implementing health and safety controls in accordance with the hierarchy of control.

Ground risks are often unknown and significant. Robust and relevant ground investigations have been proven to highlight areas of concern, assess geotechnical risk and to determine suitable design parameters.

### 3.0 THE PRINCIPLES OF PROCEDURAL CONTROL

Each project that requires temporary works, should implement temporary works procedural control (standard or bespoke). An effective temporary works procedure should be written and fulfil the framework as laid out in this guidance.

#### 3.1 The key principles

There are 22 key principles that must be considered in the development of good procedural control of temporary works.

- 1) Identification of the **Designated Individual (DI)** in the organization. This person is responsible for providing adequate training, resources and assessment of organisational project staff competency towards procedural control.
- 2) Appointment of a competent **Temporary Works Co-ordinator (TWC)**, responsible for ensuring execution of the temporary works procedure across the Project, or several projects.
- 3) Appointment of a competent **Temporary Works Supervisor (TWS)**, responsible to a package of works across a project determined by the TWC. The TWS may be appointed by either the Main Contractor, or the Sub-Contractor.
- 4) **Early identification** of temporary works, critical sequences and residual risks inherent in the project.
- 5) A **Temporary Works Register** that records all temporary works items, or controlled sequences of work, utilised across the project.
- 6) A **Design Brief** that contains all pertinent information and constraints necessary to develop a comprehensive design solution or assessment.
- 7) Appointing a **Designer (or Competent Assessor)** to assess each item and declare the design/scheme meets the requirements of the design brief.
- 8) Appointment of a **Design Checker** to provide a review of the proposal against the design brief that is sufficiently independent to the Designer, as determined by the consequence of failure, design complexity and execution criticality.
- 9) A **Design Check Certificate** that schedules the documents included in a final design, signed by a suitably competent Designer and independent Checker.
- 10) To ensure the interface of different designs or where a design is completed in parts by different designers, that an **overall Design Check** has been carried out.
- 11) Appointment of a **competent site team** that have the right combination of qualification, training and experience to the complexity of the project.
- 12) Implementing a **document control system** and that the site is issued with correct drawings and specifications.
- 13) The use of **correct and current drawings**, specifications and design documentation across the site.
- 14) The use of **correct materials and equipment** in accordance with the design.
- 15) Briefing the site team on the job specific **method statement** and relevant hazards to the proposed construction works.

- 16) To check any assumptions taken in the development of the design, is consistent with the **reality of the site** conditions encountered.
- 17) Inspection and QA that the as-built structure is competent and in accordance with the drawings and other design outputs.
- 18) **Periodic Inspection** of the temporary works in accordance with the Designers requirement.
- 19) To ensure sequences and checks have been completed before proceeding past **critical hold points**. These may be in the form of Permits to Load/Unload.
- 20) To ensure a **safe method to dismantle** has been considered in line with any comments by the Designer.
- 21) To ensure there are methods in place to collate any feedback on the scheme and to **disseminate any lessons learned** to appropriate parties.
- 22) A method to **close the scheme** in the register.

Good procedural control is only achievable if the right balance of support, people and procedure are provided to a project.

These deliverables can be further represented by two flow charts (see Appendix A) that provide further context towards the execution of **organisational duties** and the **site procedure**.

These flow charts have been designed to be used in accordance with the complimentary **site procedure templates** found in the appendices of this document. These templates have been provided to prompt further discussion and must be considered an integral part of good procedural control.

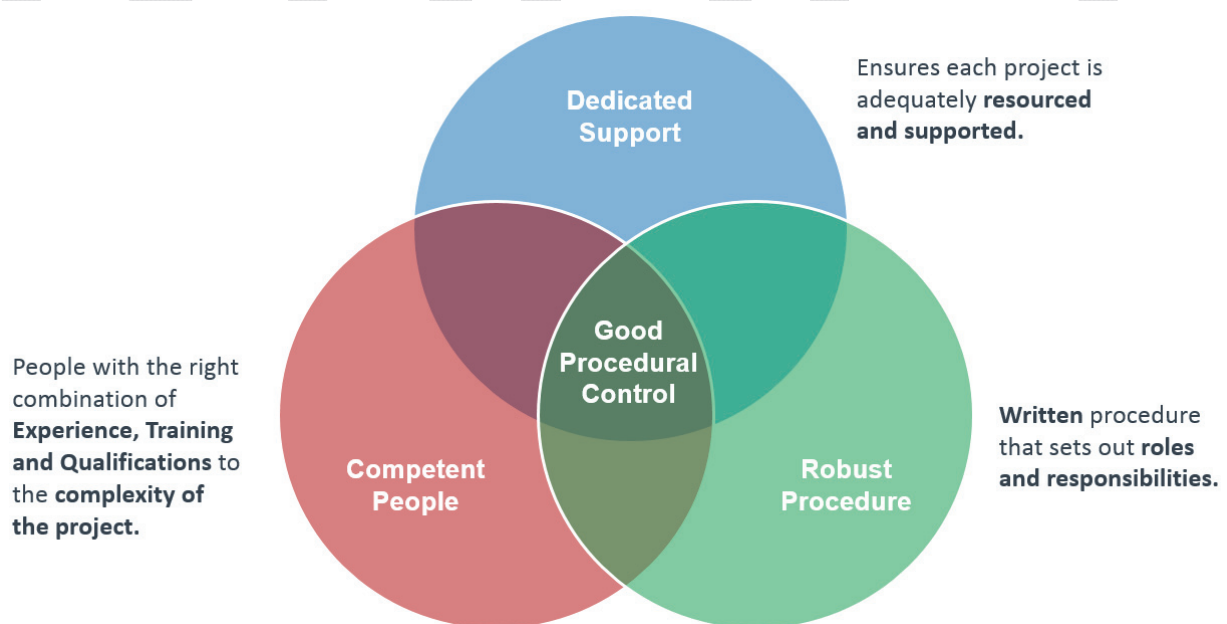


Figure 1: Good procedural control



## 4.0 KEY ROLES AND RESPONSIBILITIES

The duties described below are particular to the procedural control of temporary works and should be considered complementary to all other duties towards the HSWA.

### 4.1 The Designated Individual (DI)

The DI would generally be expected to be the most senior person in the organisation with a responsibility towards the management of temporary works. This may be a Chief Engineer, Senior Engineering Manager, Operations Director, or National H&S Manager with responsibilities across the organisation. They should also have the authority to enforce the use of the procedure.

The DI should be an employee of the organisation. However, if these duties are contracted out to a Consultant, it remains the responsibility of the organisation to ensure the role of the DI is adequately fulfilled.

The DI can only assess the competency of appointed persons that work for the same organisation.

#### Duties

- a) To ensure resources are readily accessible across the organisation towards the execution of procedural control in line with the GPG framework.
- b) To ensure supplementary training is provided if a bespoke procedure is implemented.
- c) To assess the minimum competency of the proposed TWC/TWS.
- d) To ensure each project has been audited at least once inside the

first 3 months of site establishment.

#### Minimum competency

- 1) Competent in the GPG framework and any written bespoke procedure implemented by the organisation.
- 2) As well as:
  - A minimum of 5 years working in an operational role in the organisations specialist field; OR,
  - A minimum of 10 years working in an operational role for a Contractor in the same industry; OR,
  - A Chartered Engineer

The DI does not need to be appointed by the organisation, but must be readily identifiable within the organisation to which they have duties to.

### 4.2 The Project Manager (PM)

This role is occupied by the person responsible for the operation of the site and delivery of the contract (or sub-contract).

#### Duties

- a) To fulfil the role of TWC/TWS until such time that one has been appointed.
- b) To nominate a TWC/TWS to the DI for approval as soon as practicable.
- c) To ensure the appointed TWC/TWS has been approved by the DI.
- d) To ensure the TWC/TWS is discharging their duties as per their appointment letter.
- e) To ensure the TWC/TWS has the authority to enforce the procedure and has been provided sufficient time and resource to adequately implement the procedure.

- f) To discuss diversions from the procedure taken by any TWS from the Sub-Contractor, and if necessary formally request further evidence that the TWS is fit for the role.

#### **Minimum competency**

- 1) Competent in the GPG framework and any written bespoke procedure implemented by the organisation.

The PM does not need to be formally appointed to this role under these guidelines, but must be readily identifiable within the project to which they have duties.

### **4.3 The Temporary Works Co-ordinator (TWC)**

The TWC must be competent in the written procedure and hold relevant qualifications and experience appropriate to the complexity of the project.

There will only ever be one appointed TWC on a project at a time.

**The TWC has the authority in line with this GPG to stop works if the requirements of the procedure have not been adequately executed.**

#### **Type 1 Duties (common to TWC/TWS)**

- a) To be the first point of contact between the Designer and the site team.
- b) To use reasonable care and judgement in determining design complexity and Category of checking required (in accordance with Appendix E).
- c) To ensure all concerned with the construction have contributed towards the preparation and

- issue a design brief (Cat 1-3) in sufficient time.
- d) To ensure all standard solutions (Cat 0) are well supported with adequate information to enable robust construction.
- e) To consider the proposed construction sequences and where necessary, engage a designer to review stability of the structure in the temporary condition.
- f) To manage the interfaces between all temporary works tasks and retain an overview of the full scope of works.
- g) To appoint a Designer who has the correct level of competency to the complexity of the works.
- h) To ensure a design certificate has been signed and received from the Designer.
- i) To ensure a check certificate has been signed and received from the Checker.
- j) To ensure all comments from the Checker have been closed out by the Designer.
- k) To ensure those responsible for on-site supervision have received full details of the design and any guidance notes, limitations or residual risks and these have been incorporated in the specific method statement.
- l) To compare conditions experienced on site during construction with those assumed in the design.
- m) To inspect the structure during and after construction to ensure the as-built is as per the FC design.
- n) To collate any QA and procurement records to ensure the as-built is as per the FC design.

- o) To liaise with the Designer for acceptance of any diversions from the design.
- p) To issue a Permit to Load.
- q) To ensure inspections and maintenance are carried out in accordance with the FC design and Design Certificate.
- r) To issue a Permit to Unload (if required).
- s) To inform the DI if they are under undue pressure from site management to achieve production by circumventing the procedure.

#### **Type 2 Duties (specific to TWC)**

- t) To co-ordinate all temporary works activities.
- u) To keep the TWR up to date.
- v) To provide access to all information relevant to a design.
- w) To forward the FC design documentation to the document controller and/or the Clients Engineer for review and distribution.
- x) To liaise with the TWS and respond in a timely manner so as not to affect the design programme.

#### **Minimum competency**

- 1) Trained in the requirements of the GPG.
- 2) Should have sound engineering judgement and a recent history of site based project management/engineering.
- 3) Relevant skills, qualifications, training and experience to the complexity of the works.
- 4) Good understanding of risks associated with temporary works.
- 5) Preferably a Chartered Engineer on a complex project.

## **4.4 The Temporary Works Supervisor (TWS)**

The TWS is considered a similar role to the TWC but still requires overarching approval from the TWC, to ensure compliance with the written procedure has been met. They must take direction from the TWC towards implementing the procedure in a timely manner.

A TWS may be required by the Project where:

- The size of the project necessitates more than one person co-ordinating temporary works for the Contractor across the project; OR
- There is a need for a Sub-contractor to self-perform their own temporary works tasks as part of their scope of works. In this situation, the TWS will be appointed by the DI for the Sub-Contractor.

#### **Duties (as well as TWC-Type1 Duties)**

- a) To assist the TWC in keeping the TWR up to date.
- b) To forward Parts 1-5 and FC design documents to the TWC as they are issued/received.
- c) To liaise with TWC and respond in a timely manner so as not to affect the design programme set by the TWC.

#### **Minimum competency**

- 1) Trained in the requirements of the GPG.
- 2) Should have sound engineering judgement and a recent history of site based project management/engineering.
- 3) Relevant skills, qualifications, training and experience to the complexity of the works.

- 4) Good understanding of risks associated with temporary works.

#### 4.5 Designers and Checkers

The Designer and Checker will be contracted to carry out their roles by either the Contractor (TWC/TWS) or the Sub-Contractor (TWS) as part of:

- A Consultancy services agreement, OR
- A Supply agreement, OR
- An Employment agreement with the Contractor/Sub-Contractor.

There is no appointment record necessary as part of this procedure as it is assumed:

- An agreement is in place and that services are not being provided free of charge, for information only or without acceptance of design responsibility.
- The Designer and Checker have the authority to represent their organisation.
- The Designer and Checker is competent in their field of practice (and assessed as such by their employer).
- The Designer and Checker know the limits of their competency and have sought expert advice where necessary.

- The Checker is suitably independent of the Designer, as defined by the check category.

Some suppliers will offer design services for information only and refuse to accept any design responsibility. If the Designer refuses to issue FC drawings then the design must not be used and another Designer must be engaged.

##### Minimum Competency

- 1) All Designers will be assessed as competent by their Employer
- 2) The complexity of the design and compliance with National design standards and Good Practice Guides will determine the minimum requirement of the Designers experience and qualifications.
- 3) Relevant experience in the determination of risk categorisation to the task.
- 4) A practical knowledge of local conditions that have an effect on the design.
- 5) If in doubt, all signatures should be by a Chartered Engineer.



## 5.0 THE TEMPORARY WORKS FILE

All documentation developed that evidence good procedural control should be kept in a centralised file. The format (soft or hard copy) should be agreed between the DI and PM during the start-up phase of the project.

The file should be kept as current as is practicable and will be used to form the basis of any audits or investigations carried out on the project.

As a minimum, the Temporary Works File should contain

- 1) Records of all **appointed persons** to TWC/TWS on the project.
- 2) The current **Temporary Works Register**.
- 3) **Design Check Certificates** issued (Parts 1-5).
- 4) **FC design** documentation for each DCC completed.
- 5) Details of any **standard solutions** used on the project

Furthermore, the file may also contain notable correspondence with relevant parties, QA documentation, inspection records, maintenance, audits and improvement notices issued by/to the project.

The standard documents in the appendices are provided as a template for good practice. Alternatives that achieve the same intent may be used as a substitute.

### 5.1 Temporary Works Register (TWR)

A register of all temporary works items, or controlled sequences of

work, must be maintained throughout the duration of the project.

A template of the TWR (standard procedure) can be found in the appendices.

### 5.2 Design Check Certificate (DCC)

The DCC provides a summary of the information issued, considered and certified for each Temporary Works Task. A Task may contain 1 or more different structures or assessments covered by the FC design with design responsibility covered by one Designer and one Checker.

A template of the DCC (standard procedure) can be found in the appendices. Use of equivalent documents, formats, producer statements or bespoke design statements can substitute for Part 1, 2 and 3.

#### 5.2.1 Design Brief (Part 1)

The Design Brief provides a written record of the information provided by the TWC to the designer to consider in the development of the design.

#### 5.2.2 Design Certificate (Part 2)

Provides a schedule of the output documentation (FC design) as a result of the design procedure including details of the PCBU taking design responsibility for the structure.

#### FC design (documentation)

All information produced by the Designer and pertinent to construction should be issued to the TWC/TWS, stamped "For Construction" and recorded on the Part 2.

This information may include:

- Drawings
- Sketches
- Specifications

- Designers Risk Assessment
- Method Statement
- Email clarification/confirmation
- Calculations (for Type B, C and D assessments)

It is the FC design information listed in the Part 2 that the Checker reviews, comments, discusses and confirms as part of their works.

### **Standard Solutions**

When a standard solution (Cat 0) is proposed, a bespoke design is not required. As such, the TWC will not need to complete a Design Brief, or engage a designer. It should be noted however, that those who select and authorise the use of a standard solution, will assume the design responsibility towards that structure.

### **Calculations**

Standard solutions (Cat 0) should be used in accordance with the supplied guidance, methodology or specification. Calculations would not be expected for a standard solution.

All Cat 1-3 designs should be supported by calculations that are clear and legible.

Type A assessments can often be at short notice and/or require reworking of the calculation pack. As such, it is not expected for the calculations to be issued with the FC design, but rather must be available from either the Designer or Checker on request by the TWC/TWS.

Type B, C and D assessments will not necessarily require Drawings, sketches or Method Statements to enable safe execution of the works and as such the Design Certificate should be adequately detailed to confirm extent of assessment.

### **5.2.3 Check Certificate (Part 3)**

Includes details of the PCBU undertaking the check responsibility for the structure.

#### **Checking**

The check must be carried out by someone who is sufficiently independent in accordance with Appendix E.

The check must include validation of:

- 1) Concept.
- 2) Design loadings.
- 3) Structural adequacy.
- 4) Local failure does not lead to a progressive collapse.
- 5) Compliance with the design brief.

For Cat 0&1 checks, the designer may supply the checker with a copy of the calculations to assist the expediency of the check.

For Cat 2&3 checks, calculations must not be provided to the checker so as not to unduly influence the independence and good judgement of the checker. Both parties may discuss and provide extracts of calculations to help to understand any diversions in theory so as to reach an agreement for alterations/acceptance.

### **5.2.4 Permit to Load (Part 4)**

Provides a hold point for review of the AS-BUILT structure against the FC design and whether any variations are critical to the design.

### **5.2.5 Permit to Unload (Part 5)**

Provides a hold point to consider the effect of removal of the structure and whether relevant permanent load paths are complete and of sufficient strength to take loads otherwise taken by the removed item.

## APPENDICES

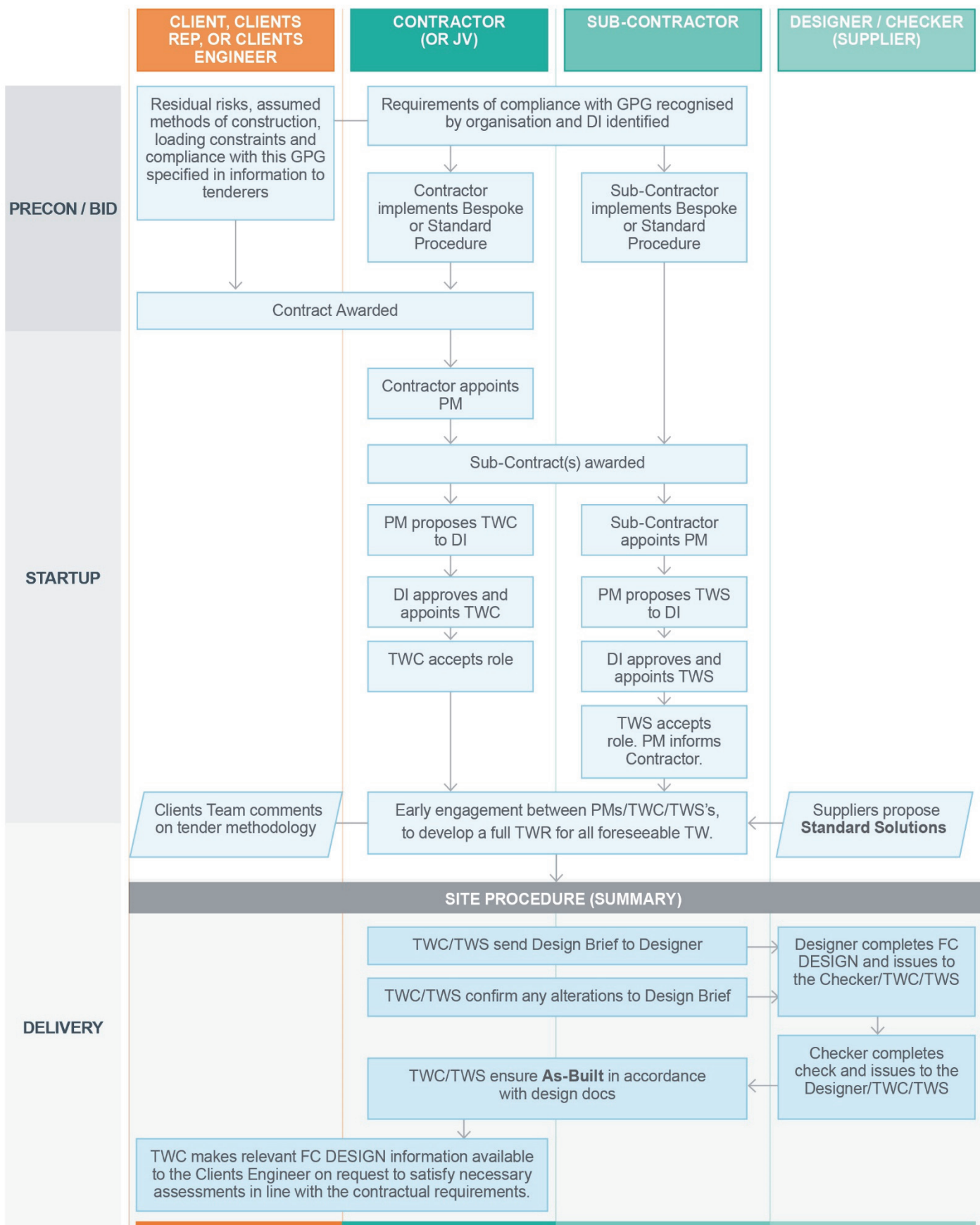
The appendices of this guidance are commonly referred to as the **Standard Documents**. The use of these standard documents in line with the GPG framework would constitute good procedural control.

DRAFT

## Appendix A: Procedural Control Flow charts

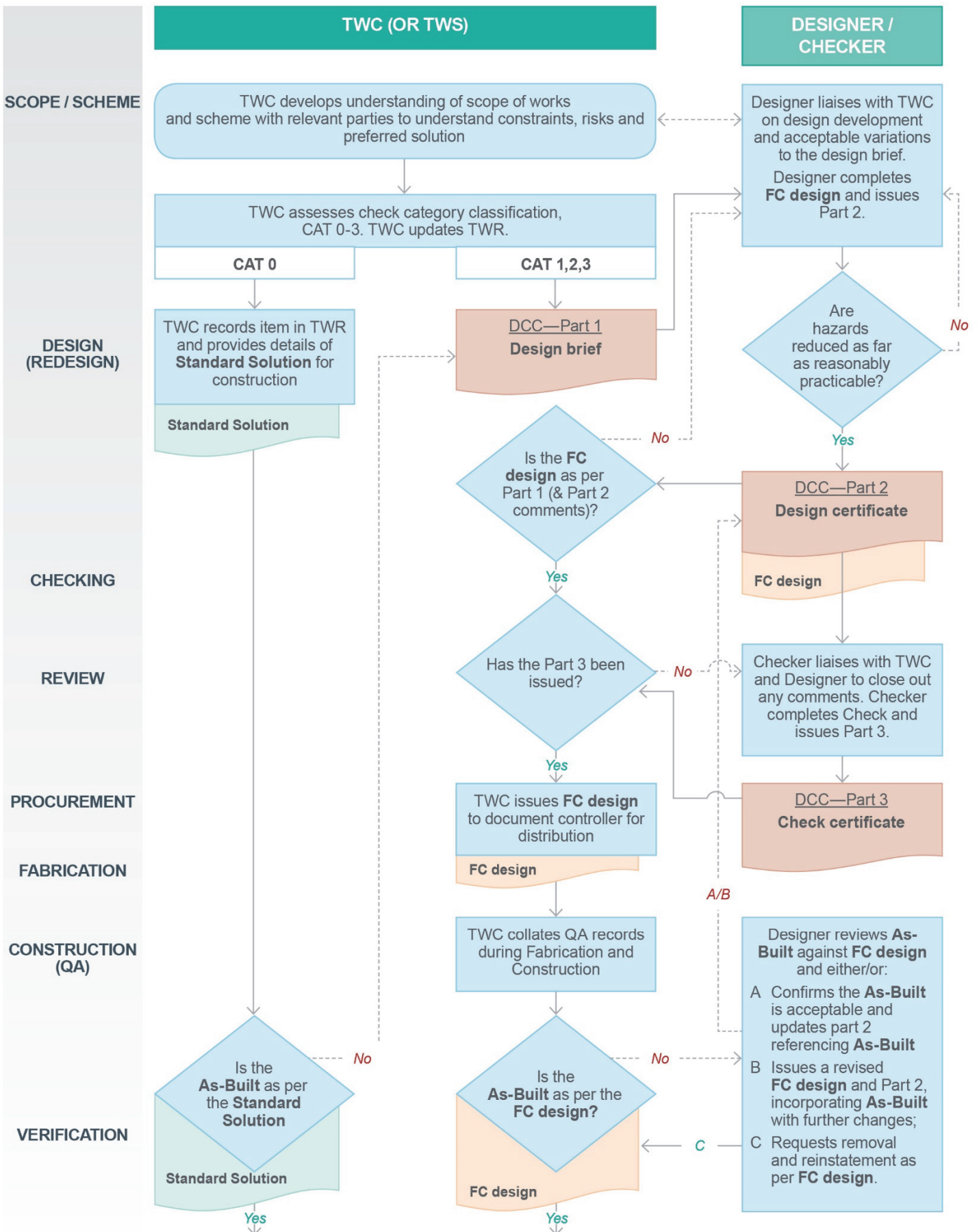
These standard documents should be used in accordance with the Good Practice Guideline.

### A1 Organisational Duties – Flow chart



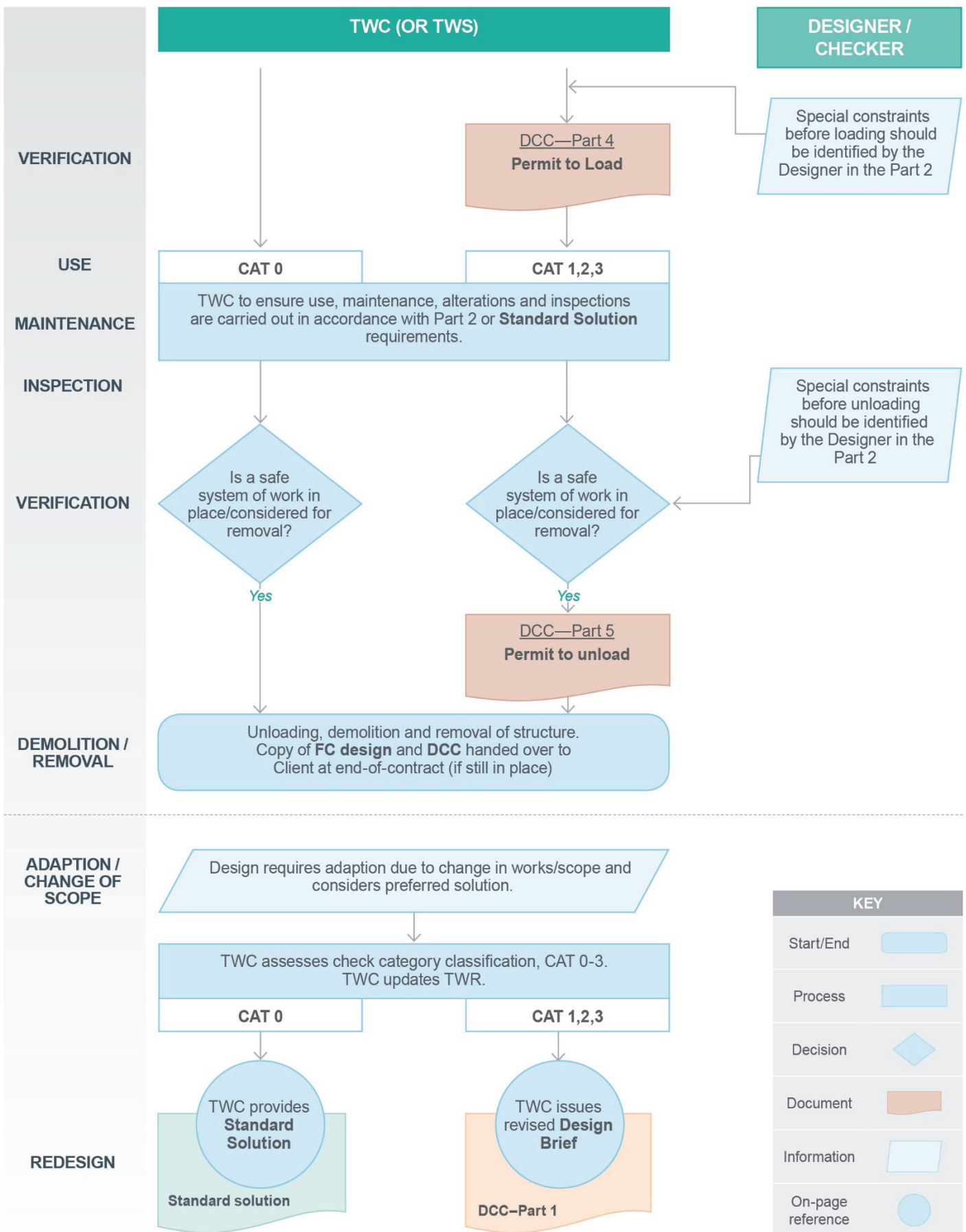


## A2 Site Procedure – Flow chart



(Cont.)

(Cont.)



## **Appendix B: Role Appointment Letters**

These appointment letters set out the duties and minimum competencies of each role with specific duties towards the execution of good procedural control. Should a Contractor decide to implement the Standard Procedure, these appointment letters should be used to record the appointment of the person to that role.

DRAFT

## **B1 The Temporary Works Co-ordinator (TWC)**

The TWC must be competent in the written procedure and hold relevant qualifications and experience appropriate to the complexity of the project.

There will only ever be one appointed TWC on a project at a time.

**The TWC has the authority to stop works should they be unsatisfied that all requirements of the procedure have been adequately executed.**

### **Type 1 Duties (common to TWC/TWS)**

- a) To be the first point of contact between the Designer and the site team.
- b) To use reasonable care and judgement in determining design complexity and Category of checking required (in accordance with Appendix E).
- c) To ensure all concerned with the construction have contributed towards the preparation and issue a design brief (Cat 1-3) in sufficient time.
- d) To ensure all standard solutions (Cat 0) are well supported with adequate information to enable robust construction.
- e) To consider the proposed construction sequences and where necessary, engage a designer to review stability of the structure in the temporary condition.
- f) To manage the interfaces between all temporary works tasks and retain an overview of the full scope of works.
- g) To appoint a Designer who has the correct level of competency to the complexity of the works.
- h) To ensure a design certificate has been signed and received from the Designer.
- i) To ensure a check certificate has been signed and received from the Checker.
- j) To ensure all comments from the Checker have been closed out by the Designer.
- k) To ensure those responsible for on-site supervision have received full details of the design and any guidance notes, limitations or residual risks and these have been incorporated in the specific method statement.
- l) To compare conditions experienced on site during construction with those assumed in the design.

- m) To inspect the structure during and after construction to ensure the as-built is as per the FC design.
- n) To collate any QA and procurement records to ensure the as-built is as per the FC design.
- o) To liaise with the Designer for acceptance of any diversions from the design.
- p) To issue a Permit to Load.
- q) To ensure inspections and maintenance are carried out in accordance with the FC design and Design Certificate.
- r) To issue a Permit to Unload (if required).
- s) To inform the DI if they are under undue pressure from site management to achieve production by circumventing the procedure.

### **Type 2 Duties**

- t) To co-ordinate all temporary works activities.
- u) To keep the TWR up to date.
- v) To provide access to all information relevant to a design.
- w) To forward the FC design documentation to the document controller and/or the Clients Engineer for review and distribution.
- x) To liaise with the TWS and respond in a timely manner so as not to affect the design programme.



**Minimum competency**

- 1) Trained in the requirements of the GPG.
- 2) Should have sound engineering judgement and a recent history of site based project management/engineering.
- 3) Relevant skills, qualifications, training and experience to the complexity of the works.
- 4) Good understanding of risks associated with temporary works.
- 5) Preferably a Chartered Engineer on a large complex project.

If this guidance is used as the standard procedure, TWC to complete.	
Name:	Signature:
Title:	Date:

TWC approved by the Designated Individual (signed by the DI or PM)	
Name:	Signature:
Title:	Date:

## B2 The Temporary Works Supervisor (TWS)

The TWS is considered a similar role to the TWC but still requires overarching approval from the TWC, to ensure compliance with the written procedure has been met. They must take direction from the TWC towards implementing the procedure in a timely manner.

A TWS may be required by the Project where:

- The size of the project necessitates more than one person co-ordinating temporary works for the Contractor across the project; OR
- There is a need for a Sub-contractor to self-perform their own temporary works solutions as part of their scope of works. In this situation, the TWS will be appointed by the DI for the Sub-Contractor.

### Type 1 Duties (common to TWC/TWS)

- a) To be the first point of contact between the Designer and the site team.
- b) To use reasonable care and judgement in determining design complexity and Category of checking required (in accordance with Appendix E).
- c) To ensure all concerned with the construction have contributed towards the preparation and issue a design brief (Cat 1-3) in sufficient time.
- d) To ensure all standard solutions (Cat 0) are well supported with adequate information to enable robust construction.
- e) To consider the proposed construction sequences and where necessary, engage a designer to review stability of the structure in the temporary condition.
- f) To manage the interfaces between all temporary works tasks and retain an overview of the full scope of works.
- g) To appoint a Designer who has the correct level of competency to the complexity of the works.
- h) To ensure a design certificate has been signed and received from the Designer.
- i) To ensure a check certificate has been signed and received from the Checker.
- j) To ensure all comments from the Checker have been closed out by the Designer.

- k) To ensure those responsible for on-site supervision have received full details of the design and any guidance notes, limitations or residual risks and these have been incorporated in the specific method statement.
- l) To compare conditions experienced on site during construction with those assumed in the design.
- m) To inspect the structure during and after construction to ensure the as-built is as per the FC design.
- n) To collate any QA and procurement records to ensure the as-built is as per the FC design.
- o) To liaise with the Designer for acceptance of any diversions from the design.
- p) To issue a Permit to Load.
- q) To ensure inspections and maintenance are carried out in accordance with the FC design and Design Certificate.
- r) To issue a Permit to Unload (if required).
- s) To inform the DI if they are under undue pressure from site management to achieve production by circumventing the procedure.

### Type 2 Duties

- t) To assist the TWC in keeping the TWR up to date.
- u) To forward Parts 1-5 and FC design documents to the TWC as they are issued/received.
- v) To liaise with TWC and respond in a timely manner so as not to affect the design programme set by the TWC.

**Minimum competency**

- 1) Trained in the requirements of the GPG.
- 2) Should have sound engineering judgement and a recent history of site based project management/engineering.
- 3) Relevant skills, qualifications, training and experience to the complexity of the works.
- 4) Good understanding of risks associated with temporary works.
- 5) Preferably a Chartered Engineer on a large complex package of works.

If this guidance is used as the standard procedure, TWS to complete.	
Name:	Signature:
Title:	Date:
TWS approved by the Designated Individual (signed by the DI or PM)	
Name:	Signature:
Title:	Date:





<b>Project Name:</b>		<b>Contract Ref.</b>	
<b>Task Title:</b>		<b>Check Cat:</b>	
<b>Task No:</b>		<b>DCC ref/rev:</b>	

## Appendix D: Design Check Certificate (DCC)

### Design Brief (Part 1)

To be completed by the TWC/TWS responsible.

<b>Description of the Task:</b> (Scope, Sequencing, Constraints, Obstructions, Residual risks, Access/Egress, Protection, Equipment/Material, Moving, Re-Use, Environmental, Deflection criteria)			
<b>Site sketches:</b>			
<b>Duration:</b>			
<b>Design Loadings:</b>			
<b>Relevant Project Specs (and clauses):</b>			
<b>Relevant Project Drawings:</b>	File name:	Revision:	Title:
<b>Other relevant Temporary Works:</b>			
<b>Geo Report:</b>			
<b>Services plan:</b>			
<b>Target issue date (see TWR):</b>	Preliminary / For Approval		
	FC DESIGN		
<b>TWC/TWS Name:</b>			<b>Signature:</b>
<b>Qualifications:</b>			
<b>Job Title:</b>			
			<b>Date:</b>

<b>Project Name:</b>		<b>Contract Ref.</b>	
<b>Task Title:</b>		<b>Check Cat:</b>	
<b>Task No:</b>		<b>DCC ref/rev:</b>	

## Design Certificate (Part 2)

*To be completed by the Designer*

<b>Company Name:</b>			
<b>FC DESIGN</b> <b>Drawings, Sketches,</b> <b>Specifications,</b> <b>Method Statements:</b>	File name:	Revision:	Title:
<b>Calculation ref:</b>			
<b>Design Codes:</b>			
<b>Additional comments to Design Brief agreed with TWC/TWS:</b> <b>(Compliance testing, Load constraints, Inspection freq, Maintenance req.)</b>			
<b>PTL required?</b>	Yes / No	<b>Designer to verify?</b>	Yes / No
<b>PTU required?</b>	Yes / No	<b>Designer to verify?</b>	Yes / No
<b>Designers Name:</b>	<b>Signature:</b>		
<b>Qualifications:</b>			
<b>Job Title:</b>			
	<b>Date:</b>		

## Check Certificate (Part 3)

*To be completed by the Checker.*

<b>Company Name:</b>			
<b>Check Calc ref:</b>			
<b>Design Codes:</b>			
<b>Comments:</b>			
<b>Checkers Name:</b>	<b>Signature:</b>		
<b>Qualifications:</b>			
<b>Job Title:</b>			
	<b>Date:</b>		

<b>Project Name:</b>		<b>Contract Ref.</b>	
<b>Task Title:</b>		<b>Check Cat:</b>	
<b>Task No:</b>		<b>DCC ref/rev:</b>	

### **Permit to Load (Part 4)**

*To be completed by the TWC/TWS responsible and issued to the Site Supervisor.*

<b>Have the Part 2 and Part 3 certificates been signed?</b>		Yes / No
<b>Have the drawings been issued For Construction?</b>		Yes / No
<b>Have any comments from the Checker been resolved?</b>		Yes / No / N/A
<b>If required, have relevant QA documents been returned and design strengths achieved?</b>		Yes / No / N/A
<b>Has the structure been inspected by the TWC/TWS?</b>		Yes / No
<b>If required, has the Inspection and Test plan been updated to allow for scheduled inspections to the temporary structure?</b>		Yes / No / N/A
<b>If required, have any exclusion zones been setup in accordance with the design?</b>		Yes / No / N/A
<b>Is the TWC satisfied that the structure has been built in accordance with the design drawings listed in the DCC?</b>		Yes / No / N/A
<b>Are site personnel aware of any loading restrictions and are they marked clearly?</b>		Yes / No / N/A
<b>If required, has the Designer verified the structure is ready to be loaded?</b>		Yes / No / N/A
<b>If required, have any approvals from the Clients Engineer been granted?</b>		Yes / No / N/A
<b>Is this permit time limited? If Yes, provide expiry.</b>		Yes / No _____
<b>Comments/constraints:</b>		
<b>TWC/TWS Name:</b>		<b>Signature:</b>
<b>Qualifications:</b>		
<b>Job Title:</b>		
		<b>Date:</b>

### **Permit to Unload (Part 5)**

*To be completed by the TWC/TWS responsible and issued to the Site Supervisor.*

<b>Has the Designer specified a permit to unload is required?</b>		Yes / No
<b>Has the Designer verified the structure is ready to be unloaded?</b>		Yes / No / N/A
<b>Will the removal of the temporary works load another structure?</b>		Yes / No
<b>Is that structure complete and capable of taking the loads?</b>		Yes / No
<b>If required, have any approvals from the Clients Engineer been granted?</b>		Yes / No / N/A
<b>Have details of any dismantle sequence been communicated to the Site Supervisor?</b>		Yes / No / N/A
<b>Is this permit time limited? If Yes, provide expiry.</b>		Yes / No _____
<b>Comments/constraints:</b>		
<b>TWC/TWS Name:</b>		<b>Signature:</b>
<b>Qualifications:</b>		
<b>Job Title:</b>		
		<b>Date:</b>

## Appendix E: Check Category

The Table below provides guidance to the TWC on what level of Check is generally suitable to a design. This does not cover all temporary works provisions and it is expected that the TWC exercises good care and judgement to determine the check category.

Cat	Risk Rating	Scope	Independence of Checker	Examples
<b>0</b>	Low risk (in nature with no interface with the public)	Restricted to standard solutions only.  This applies to the use of standard solutions defined by a Good Practice Guide or standard equipment used as per the manufacturer's recommendations.  A DCC and calculation is not required.	Because this is a site issue, the check may be carried out by another member of the site or design team.	Basic Access Scaffolds and Platforms.  Excavations of less than 1.2m not adjacent to services or foundations.  Proprietary edge protection  Minor wooden access stairs and ramps for pedestrian access.  Standard Mesh Panel Fencing.  Proprietary Cantilever Loading Platforms.  Proprietary Lifting beams.
<b>1</b>	Medium risk (or have an interface with the public)	For simple designs.  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.	All other access scaffolds and stairs.  Scaffold loading bays.  Temporary hoardings and access gates.  Excavations of 1.2m to 5m deep.  Piling Mats and Working Platforms.  Mobile Crane outrigger assessments.  Hoist bases and ties.  Formwork and Falsework up to 3m in height.  Loading and site side access gantries.  Signage over 2m in height.  Temporary access roads.  Vehicle impact barriers.  Stage 1 and Stage 2 Basement Propping.  Site side temporary office structures.  Steel frames/bracing providing lateral stability to structure.  Temporary berms and cuttings.
<b>2</b>	High risk (or where failure may have a major impact on public safety)	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.	Simple Tower Crane bases.  Mobile Crane RC foundations.  Formwork and Falsework over 3m in height.  Façade Retention.  Bespoke Cantilever Loading Platforms  Bespoke Lifting beams.  Temporary Bridges.  Excavations of over 5m or including ground anchors.  Bespoke edge protection.
<b>3</b>	Very high risk (where failure would be significant)	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.	Complex Tower Crane bases.  Temporary structures spanning over the footpath and/or roadway.  Works adjacent to Highways requiring the issue of Producer Statements.



## Appendix F: Glossary

AS-BUILT	the structure as it has been constructed. Evidenced by Survey, QA records, sketches and/or photographs.
BS5975	British Standard for the Code of practice for temporary works procedures and the permissible stress design of falsework (BS5975:2008+A1:2011)
CPEng	Chartered Professional Engineer
CMEngNZ	Chartered Member of Engineering New Zealand
DCC	Design Check Certificate
DCC/Part 1	Design Brief
DCC/Part 2	Design Certificate
DCC/Part 3	Check Certificate
DCC/Part 4	Permit to Load
DCC/Part 5	Permit to Unload
DI	Designated Individual
FA	For Approval (design stage)
FC	For Construction (design stage)
FC DESIGN	For Construction design documentation including Drawings, Specifications, Calculations, Risk Assessments and Method Statements.
FI	For Information only (design stage)
GPG	Good Practice Guidelines – supplied by Professional or Industry Bodies commonly used in New Zealand
HSWA	Health and Safety at Work Act 2015
H&S	Health and Safety
PCBU	Persons Conducting Business or Undertaking
PM	Project Manager
Task	A package of design and or assessment items that is required to enable a construction activity as per the design brief.
TWC	Temporary Works Co-ordinator
TWS	Temporary Works Supervisor
TWR	Temporary Works Register
QA	Quality Assurance
STANDARD SOLUTION	An “off-the-shelf” detail that can be used safely with minimal interpretation and no further engineering design required. Must be supported by drawings, calculations or guidance issued by a reputable Supplier, Designer or Industry body.
TW17.037	TWf (UK) publication - “Principles for the management of temporary loads, temporary conditions and temporary works during the construction process”



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