Temporary Works forum (AU)

Promoting best practice in the construction industry.

Temporary Works Procedural Control

GOOD PRACTICE GUIDELINE

TWfAU

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 WH&S Act 2011.

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.

TABLE OF CONTENTS

1.0 INTRODUCTION 1
1.1 Who are these guidelines for? 1
1.2 What are "Temporary Works"? 1
1.3 What is "Procedural Control"? 3
1.4 How to use this guidance 3
1.4.1 Client / Clients Representative 3
1.4.2 Permanent Works Engineer 4
1.4.3 Main Contractor / Contracting Partner (JV, Alliance, PPP, etc.) 4
1.4.4 Subcontractor 4
1.4.5 Temporary Works Engineer 4
2.0 TEMPORARY WORKS RISK 7
2.1 Failure of Temporary Works 7
2.2 Risk Categorisation 7
2.2.1 Consequence of failure 7
2.2.2 Design complexity 7
2.2.3 Execution criticality 8
2.3 Management of Risks 8
3.0 THE PRINCIPLES OF PROCEDURAL CONTROL 9
3.1 The key principles 9
4.0 KEY ROLES AND RESPONSIBILITIES 11
4.1 The Designated Individual (DI) 11
4.2 The Project Manager (PM) 11
4.3 The Temporary Works Co-ordinator (TWC) 12
4.4 The Temporary Works Supervisor (TWS) 13
4.5 Designers and Checkers 14
5.0 THE TEMPORARY WORKS FILE 15
5.1 Temporary Works Register (TWR) 15
5.2 Design Check Certificate (DCC) 15
5.2.1 Design Brief (Part 1) 15
5.2.2 Design Certificate (Part 2) 15
5.2.3 Check Certificate (Part 3) 16
5.2.4 Permit to Load (Part 4) 16
5.2.5 Permit to Unload (Part 5) 16

APPENDICES 17
Appendix A: Procedural Control Flow charts 18
A1 Organisational Duties – Flow chart 18
A2 Site Procedure – Flow chart 19
Appendix B: Role Appointment Letters 21
B1 The Temporary Works Co-ordinator (TWC) 22
B2 The Temporary Works Supervisor (TWS) 24
Appendix C: The Temporary Works Register (TWR) 26
Appendix D: Design Check Certificate (DCC) 27
Appendix E: Check Category 30

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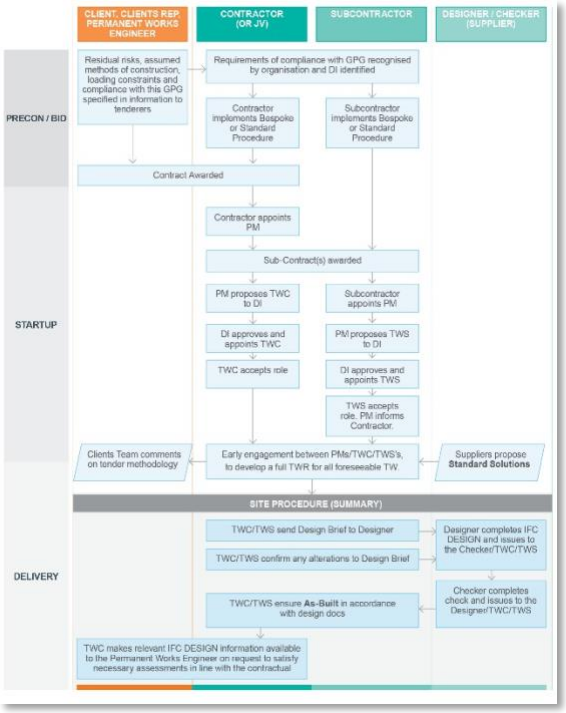
About the TWf

The Temporary Works forum (AU) is a special Community of Practice of Engineers Australia (EA). The TWf has been established to encourage open discussion on any matter related to Temporary Works, for the benefit of the Australian Construction Industry.

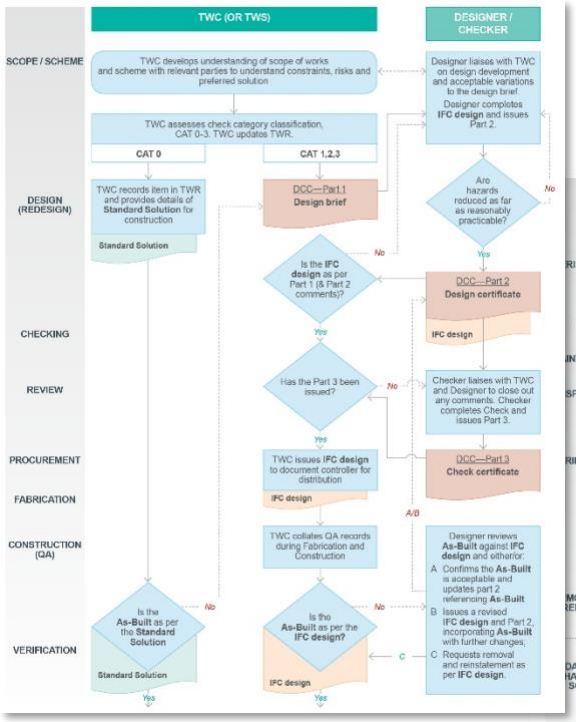
More information on the TWf can be found at https://twf.engineersaustralia.org.au/

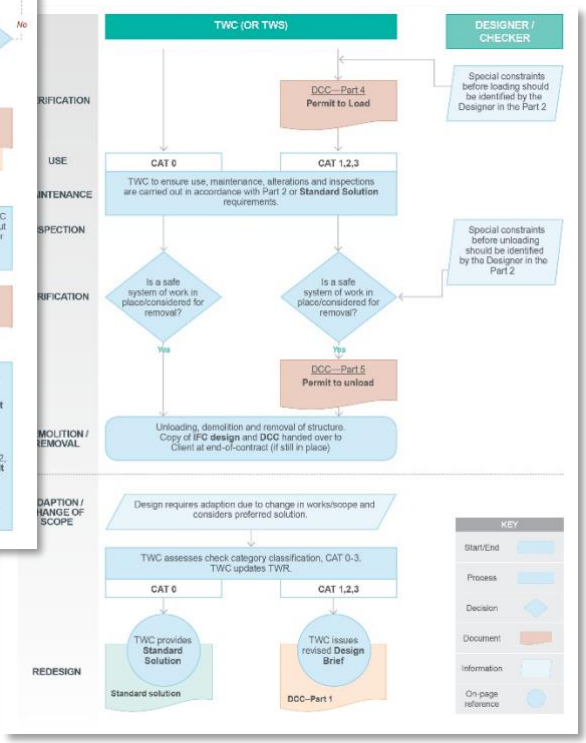
GLOSSARY

As-built	The package of works 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 deign of falsework" (BS5975:2019)
CPEng	Chartered Professional Engineer
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
FI	For Information
GPG	Good Practice Guidelines – supplied by Professional or Industry Bodies commonly used in Australia
H&S	Health and Safety
IFC	Issued For Construction
IFC Design	Issued For Construction design documentation, including Drawings, Specifications, Calculations, Risk Assessments and Method Statements.
OH&S Act	Occupational Health and Safety Act 2004
PCBU	Persons Conducting Business or Undertaking
PM	Project Manager
QA	Quality Assurance
TWC	Temporary Works Co-ordinator
TWS	Temporary Works Supervisor
TWR	Temporary Works Register
TW17.037	TWf (UK) publication - "Principles for the management of temporary loads, temporary conditions and temporary works during the construction process"
WH&S Act	Work Health and Safety Act 2011



Procedural Control described in this guidance can be represented by the flowcharts as found in the appendices.





1.0 INTRODUCTION

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

This guideline is written for the Australian 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 Australia.

There are many additional aspects that may need to be considered in line with other, highly specialised construction activities. The content of this document is intended to be complimentary to those activities.

All parties are expected to fulfil their duties as a PCBU in accordance with the WH&S Act and OH&S Act.

1.1 Who is this guideline 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 the WH&S Act and OH&S Act all PCBU's have a primary duty of care to ensure a place of work is safe for workers and others. There are overlapping duties for Clients, Main Contractors, Subcontractors and Consultants.

Clients commissioning projects with temporary works requirements should be aware of this document and have confidence that the downstream Consultants and Contractors implement these requirements.

The **Main Contractor** may not be directly responsible for the design, checking, construction or safe use of the temporary works on site, however it has 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 **Subcontractors** 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:

"providing an "engineered solution" that is used to support or protect either an existing structure or the permanent works during construction, or to support an item of plant or equipment, or the vertical sides or side-slopes of an excavation during construction operations on site or to provide access. It is used to control stability, strength, deflection, fatigue, geotechnical effects and hydraulic effects within defined limits."

Examples of temporary works are:

Earthworks: Support to trenches, excavations, temporary slopes, batters, berms 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, crawler cranes, mobile concrete pumps 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
A	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 Gantries. Formwork and Falsework. Cantilever deck loading platforms. Hoists bases and ties. Tower Crane bases and ties.
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. Temporary structures or plant loadings adjacent sensitive structure*
C	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.*
D	Stability of incomplete new permanent structures, during the construction sequence.	Construction stage review/stability assessments for wind and seismic events.* Construction staging for deep excavations. RC core methodology. Early-striking of formwork. Reinforcement cage stability.

** These assessments should be carried out in conjunction with the 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, and this does not preclude those packages 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 item 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 UK. 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** for an 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, Subcontractor, 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 Subcontractors 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, they should recognise:

- That decisions made in specifying the form of the build will determine the complexity of the temporary works required.
- Contractors that they appoint should have the adequate processes and competent people to ensure good practice is being implemented.

1.4.2 Permanent Works Engineer

The principles of SiD practiced by the Permanent Works Engineer will require identification of a safe construction methodology and review of the design if exceptional risks are required to be managed by the Contractor.

The Permanent Works 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 Permanent Works 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 Subcontractor

The Subcontractor must also implement procedural control that aligns with the framework for all temporary works within their scope.

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

1.4.5 Temporary Works Engineer

For the purposes of this document, the Temporary Works Engineer is the 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 good understanding of this framework.

Duties of the Organisation

Client / Clients Representative	✓ To ensure the wider design team has applied the principles of **SiD during design development**. ✓ To ensure that the appointed **Main Contractor has procedural controls** in place to manage temporary works risk. ✓ With the help of the Permanent Works Engineer, identify which items require a particularly high level of independent **checking**. ✓ To ensure appropriate **professional services scopes** are developed to facilitate effective liaison between permanent and temporary works engineers to enable design compatibility. ✓ To consult with the Permanent Works Engineer on how risks to health and safety can be eliminated or minimised during reference design development. ✓ Provide the head contractor with any information they have in relation to the hazards or risks at, or in the vicinity of the workplace where the construction work will be carried out.

Duties of the Organisation

Permanent Works Engineer	✓ To consider the **temporary effects** of the construction on soil conditions or adjacent structure. ✓ To comply with their SID duties under the WH&S Act and OH&S Act including provision of the **SiD register** for all reasonably foreseeable residual risks to be managed by the Contractor. ✓ To engage openly with the Contractor throughout the bid and delivery stages to **assist the understanding** of particular temporary works requirements/interfaces. ✓ To **consider design alterations** to reduce construction risks as far as is reasonably practicable. ✓ To provide **allowable loading plans** for the permanent works to facilitate review of the construction live loading. ✓ To provide design constraints to the Main Contractor for the assessment of **secondary effects on the permanent works**. ✓ To provide **design constraints, parameters or assistance** to the Contractor in managing temporary effects to a level that is acceptable to the project. ✓ To provide **reasonable and timely responses** to the Contractor for the benefit of safer workplaces.
Main Contractor	✓ To **resource and support** all projects adequately. ✓ To either adopt the **framework** / standard documents (see appendices), or develop an organisationally approved and written **bespoke procedure**. ✓ To ensure all **Subcontractors** are aware of their duties towards managing temporary works and that their procedure is compatible. ✓ To ensure adequate **competency** checks have been carried out on staff who manage or assess temporary works. ✓ To **appoint a competent person** to assess temporary works and provide design to fulfil good procedural control. ✓ To seek advice on temporary works design and methodologies to allow for reasonable **provisions** to facilitate the project. ✓ To ensure **procedural control** of temporary works has been adequately implemented. ✓ To ensure **co-ordination across Subcontractors** for adjacent works has been adequately considered. ✓ To **programme** works such that Subcontractors in the same or adjacent workspaces do not raise risks associated with a congested site.
Subcontractor	✓ To **resource and support** all projects adequately. ✓ To either adopt the **framework** / standard documents (see appendices), or develop an organisationally approved and written **bespoke procedure**. ✓ To ensure **procedural control** of self-performed temporary works has been adequately implemented including the appointment of a competent person to the role of TWS

Duties of the Organisation

Temporary Works Engineer	✓ Where requested, provide reasonable **guidance on construction risks** and temporary work provisions required to complete the works. ✓ To **take direction** from the Temporary Works Co-ordinator and ensure all pertinent information provided has been considered. ✓ To provide a **competent assessment** of the temporary works and supply relevant design information, drawings and specifications to inform the construction. ✓ To abide by a **code of ethics** in their duty as a professional engineer.

2.0 TEMPORARY WORKS RISK

Risk is defined in ISO31000:2018 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 achieve their intended objective, 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, the permanent structure, as well as neighbouring structures. 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 and shared understanding between the various parties, including designers, contractors, Subcontractors, 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).

The reason for selection of the risk of Consequence of failure should be recorded so that the logic , assumptions and decision may be reviewed along with the design. In some cases , the risk assessment and categorisation of temporary works items may benefit from robust discussion with the Temporary Works Engineer, however, ultimate responsibility for category selection remains with the TWC.

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.

Summary of Appendix E: Design Check Category

Cat	Complexity	Independence of Checker
0	Standard Solution	May be another member of the site team.
1	Simple Design	May be another member of the designer's team.
2	Involved Design	Must be from a separate team and has not been consulted on the design development.
3	Complex or Innovative Design	Must be from a separate organisation.

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 recognised, up to date 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, staging and 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 Design 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 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 should be considered in the development of good procedural control of temporary works.

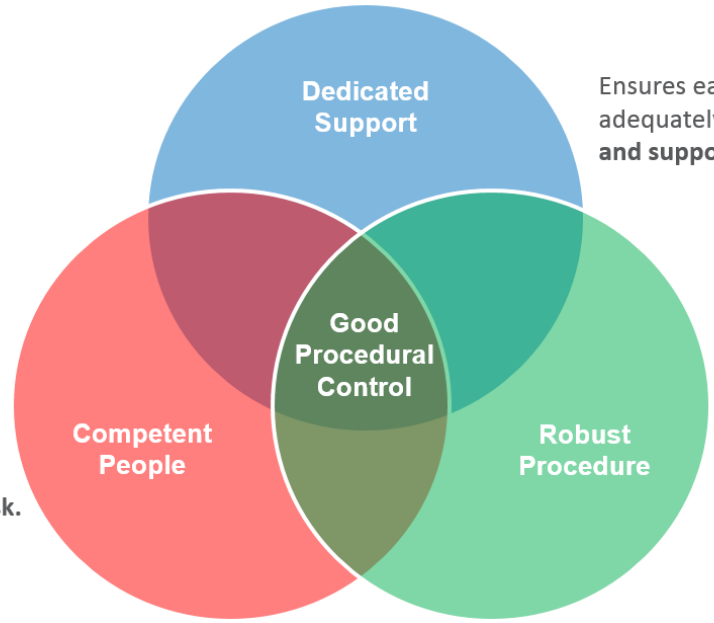
These principles can be categorised into 3 areas of focus:

Dedicated Support

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) **Early identification** of temporary works, critical sequences and residual risks inherent in the project.
3) Implementing a **document control system** and that the site is issued with correct drawings and specifications.

Competent People

4) Appointment of a **competent site team** that have the right combination of qualification, training and experience to the complexity of the project.
5) Appointment of a competent **Temporary Works Co-ordinator (TWC)**, responsible for ensuring execution of the temporary works procedure across the Project, or several projects.
6) 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 Subcontractor.
7) Appointment of a **Temporary Works Engineer 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.



Robust Procedure

9) A **Temporary Works Register** that records all temporary works items, or controlled sequences of work, utilised across the project.
10) A **Design Brief** that contains all pertinent information and constraints necessary to develop a comprehensive design solution or assessment.
11) A **Design Check Certificate** that schedules the documents included in a final design, signed by a suitably competent Designer and independent Checker.
12) To ensure that an **overall Design Check** has been carried out when there is interface of different designs or where a design is completed in parts by different designers.
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) **Monitoring including 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 should be considered an integral part of 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 WH&S Act and OH&S Act.

In smaller organisations and projects, one person may undertake multiple roles, except Designer and Checker must be separate as defined in Appendix E. Similarly, a person may have roles in procedural control across multiple projects within the organisation.

4.1 The Designated Individual (DI)

The DI would generally 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 should 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 competency of the proposed TWC/TWS.
d) To ensure each project site 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 organisation's specialist field; OR,
   - A minimum of 10 years working in an operational role for a Contractor in the same industry.

The DI does not need to be appointed by the organisation, but should 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 fulfils their duties. 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.
e) To discuss deviations from or non-conformances with the procedure taken by any TWS from the Subcontractor, 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 should 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 should only ever be one appointed TWC on a project at a time. If more than one TWC is appointed on a project their individual areas of responsibility shall be adequately defined to prevent gaps and overlaps.

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

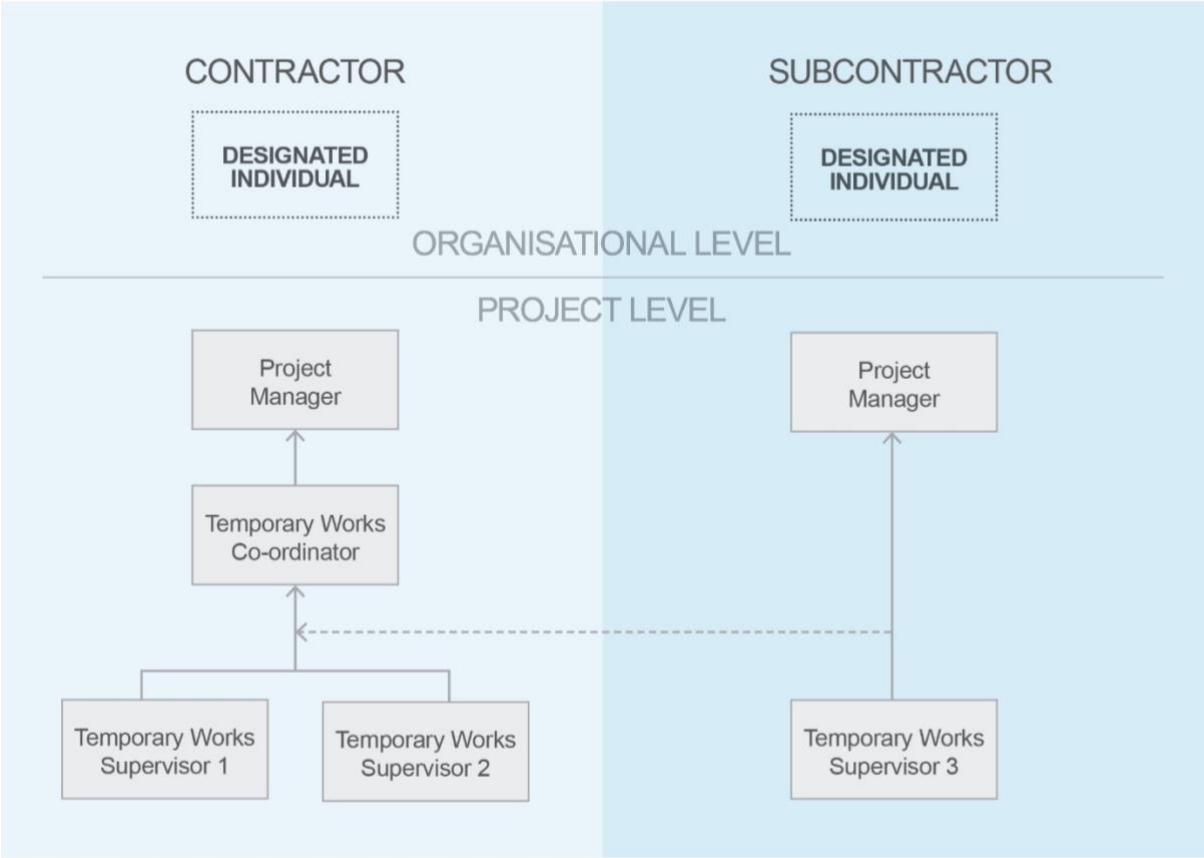
Type 1 Duties (common to TWC/TWS)

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 the stability of the structure in the temporary condition or arrange with the Client to engage the Permanent Works Engineer to undertake this review if more appropriate
f) To manage the interfaces between all temporary works packages 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 temporary works during and after construction to ensure the as-built is as per the IFC design. In complex temporary works situations, it may be more appropriate to involve the Temporary Works Engineer in the inspection.
n) To collate any QA and procurement records to ensure the as-built is as per the IFC 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 IFC 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 IFC design documentation to the document controller and/or the Permanent Works 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 Subcontractor to self-perform their own temporary works packages as part of their scope of works. In this situation, the TWS will

be appointed by the DI for the Subcontractor.

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 IFC 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 Subcontractor (TWS) as part of:

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

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 IFC drawings, then the design should not be used.

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 Designer's experience and qualifications.
3) Relevant experience in the determination of risk categorisation to the package.
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) **IFC design** documentation for each DCC completed.
5) Details of any **standard solutions** used on the project

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, should 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 Package. A Package may contain 1 or more different temporary works items or assessments covered by the IFC 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 (IFC design) as a result of the design procedure including details of the PCBU taking design responsibility for the structure.

IFC 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 IFC 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, legible and must be available from either the Designer or Checker on request by the TWC/TWS.

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:

- Concept.
- Design loadings.
- Structural adequacy.
- Local failure does not lead to a progressive collapse.
- 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 temporary works against the IFC 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 temporary works and whether relevant permanent load paths are complete and of sufficient strength to take loads otherwise taken by the removed item.

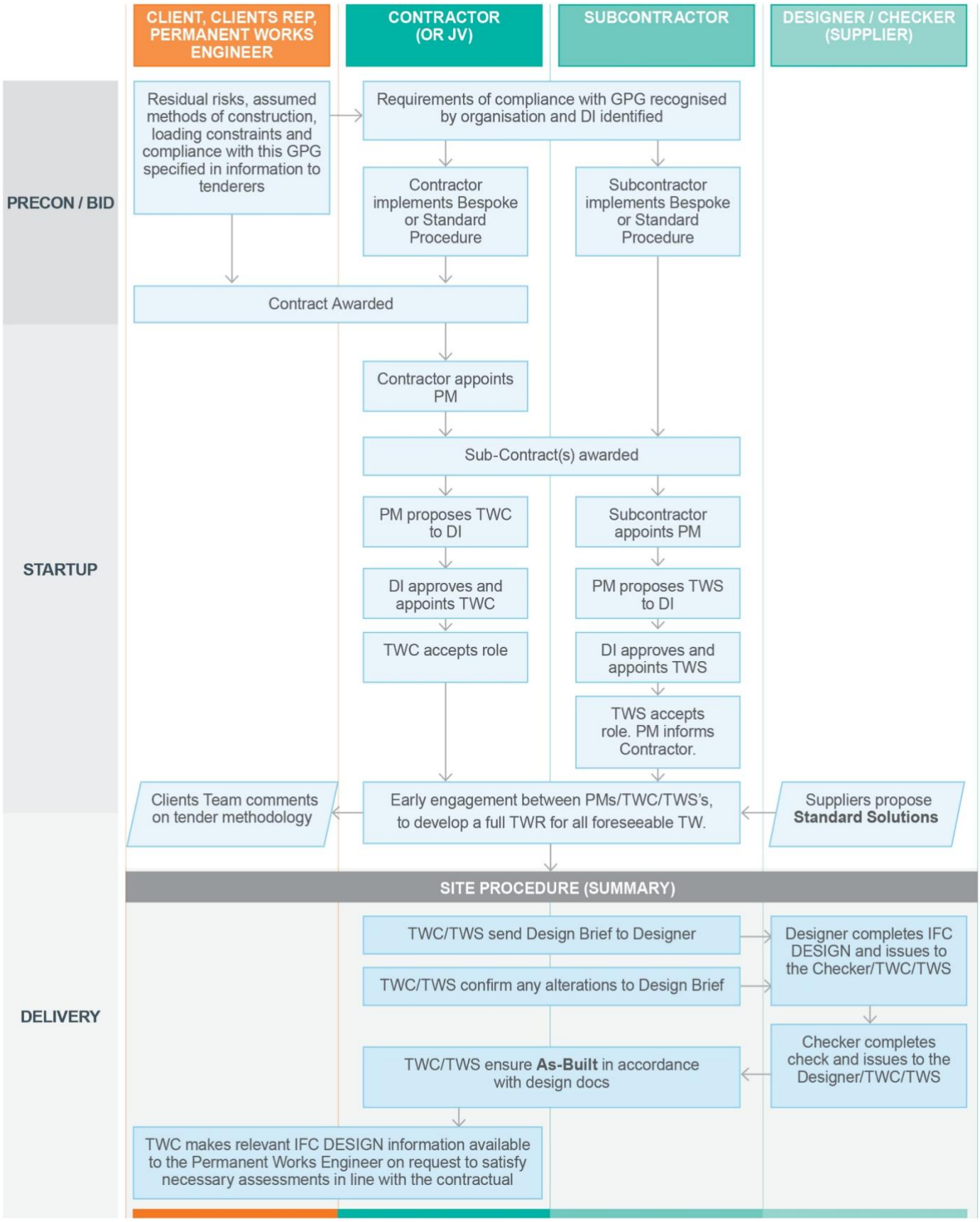
APPENDICES

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.

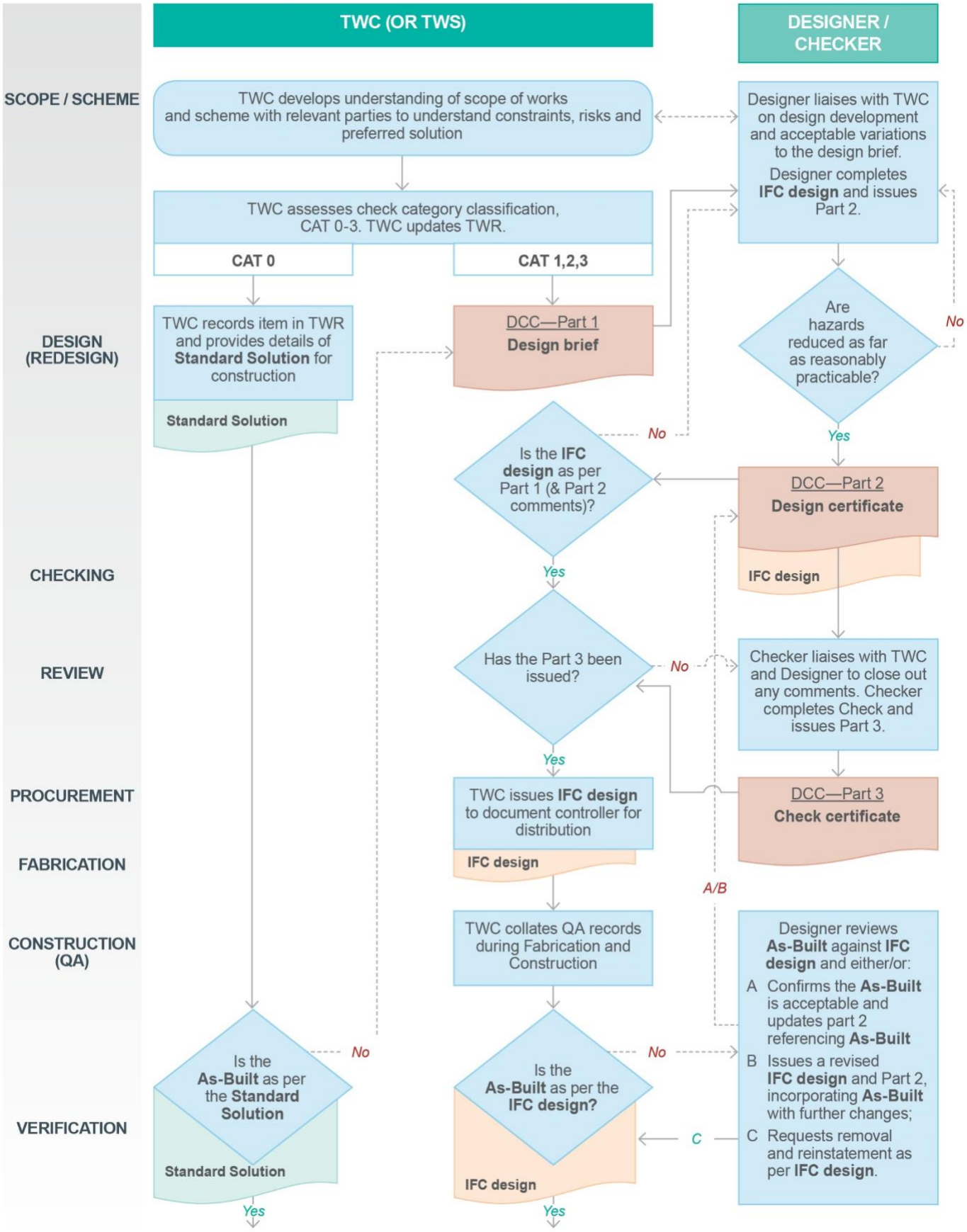
Appendix A: Procedural Control Flow charts

These flow charts should be used in accordance with the Good Practice Guideline.

A1 Organisational Duties – Flow chart



A2 Site Procedure – Flow chart



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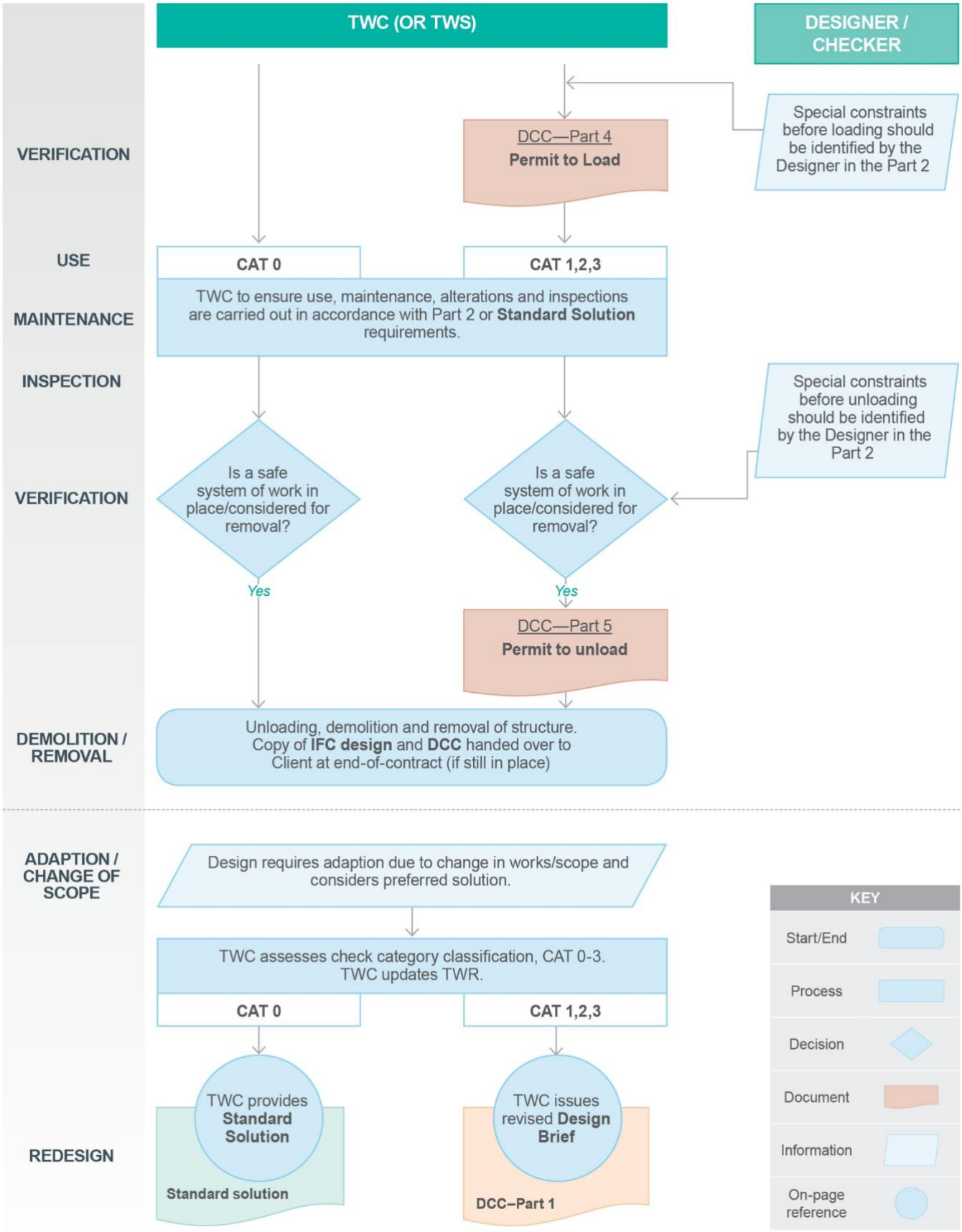
TWC (OR TWS)
DESIGNER / CHECKER
VERIFICATION
DCC—Part 4
Permit to Load
Special constraints before loading should be identified by the Designer in the Part 2
USE
CAT 0
CAT 1,2,3
MAINTENANCE
TWC to ensure use, maintenance, alterations and inspections are carried out in accordance with Part 2 or Standard Solution requirements.
INSPECTION
Special constraints before unloading should be identified by the Designer in the Part 2
VERIFICATION
Is a safe system of work in place/considered for removal?
Is a safe system of work in place/considered for removal?
Yes
Yes
DCC—Part 5
Permit to unload
DEMOLITION / REMOVAL
Unloading, demolition and removal of structure. Copy of IFC design and DCC handed over to Client at end-of-contract (if still in place)
ADAPTION / CHANGE OF SCOPE
Design requires adaption due to change in works/scope and considers preferred solution.
TWC assesses check category classification, CAT 0-3. TWC updates TWR.
CAT 0
CAT 1,2,3
REDESIGN
TWC provides Standard Solution
Standard solution
TWC issues revised Design Brief
DCC–Part 1
KEY
Start/End
Process
Decision
Document
Information
On-page reference

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.

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 should only ever be one appointed TWC on a project at a time. If more than one TWC is appointed on a project their individual areas of responsibility shall be adequately defined to prevent gaps and overlaps.

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 the stability of the structure in the temporary condition, or arrange with the Client to engage the Permanent Works Engineer to undertake this review if more appropriate.
f) To manage the interfaces between all temporary works packages 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 temporary works during and after construction to ensure the as-built is as per the IFC design. In complex temporary works situations, it may be more appropriate to involve the Temporary Works Engineer in the inspection.
n) To collate any QA and procurement records to ensure the as-built is as per the IFC 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 IFC 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 IFC design documentation to the document controller and/or the Permanent Works 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 Subcontractor 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 Subcontractor.

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 packages 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 temporary works during and after construction to ensure the as-built is as per the IFC design.
n) To collate any QA and procurement records to ensure the as-built is as per the IFC 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 IFC 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 IFC 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:

Project Name:		Contract Ref.	
Temporary Works Co-ordinator:		Date:	

Appendix C: The Temporary Works Register (TWR)

To be completed by the TWC with the PM and any appointed TWS.

Package No:	Package Title:	TWC/TWS:	Check Cat 0/1/2/3	Designer:	Checker:	DCC ref/rev:	Date of issue:					
							IFC DES target:	Design Brief:	Design Cert:	Check Cert:	PTL:	PTU:

Project Name:		**Contract Ref.**	
Package Title:		**Check Cat:**	
Package No:		**DCC ref/rev:**	

Appendix D: Design Check Certificate (DCC)

Design Brief (Part 1)

To be completed by the TWC/TWS responsible.

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

Project Name:		**Contract Ref.**	
Package Title:		**Check Cat:**	
Package No:		**DCC ref/rev:**	

Design Certificate (Part 2)

To be completed by the Designer

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

Check Certificate (Part 3)

To be completed by the Checker.

Company Name:		
Check Calc ref:		
Design Codes:		
Comments:		
Checkers Name:		**Signature:**
Qualifications:		
Job Title:		**Date:**

Project Name:		**Contract Ref.**	
Package Title:		**Check Cat:**	
Package No:		**DCC ref/rev:**	

Permit to Load (Part 4)

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

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

TWC/TWS Name:		**Signature:**
Qualifications:		
Job Title:		**Date:**

Permit to Unload (Part 5)

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

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

TWC/TWS Name:		**Signature:**
Qualifications:		
Job Title:		**Date:**

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	Complexity and Risk	Scope	Independence of Checker	Examples
0	Standard Solutions.	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.
1	Simple Designs. Low to Medium risk	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. Sheeted Scaffold / 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. Proprietary precast lifting eyes
2	Involved Designs. High risk. (or where failure may have a major impact on public safety)	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.
3	Complex or Innovative Designs. 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. Lifeline assets as defined by the Client.

TWf
AU