MCLAREN CONSTRUCTION LTD
Policy & Procedures for Temporary Works

OBJECTIVES

To ensure appropriate arrangements are in place to design, plan and manage temporary works safely and that McLaren Construction meet the relevant legal requirements to effectively control and manage the risks. This policy & procedure aims to meet the requirements of British Standard BS 5975:2019 Code of Practice for Temporary Works Procedures and the Permissible Stress Design of Falsework (hereafter called The Standard).

SCOPE

This temporary works policy & procedure describes how the risks and hazards associated with temporary works are identified, classified and managed, and outlines MCL standards to plan, design, maintain, construct, use and dismantle temporary works. This policy & procedure also defines competency of key personnel managing this process.

DEFINITION AND OVERVIEW OF TEMPORARY WORKS

Temporary works can be described 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.

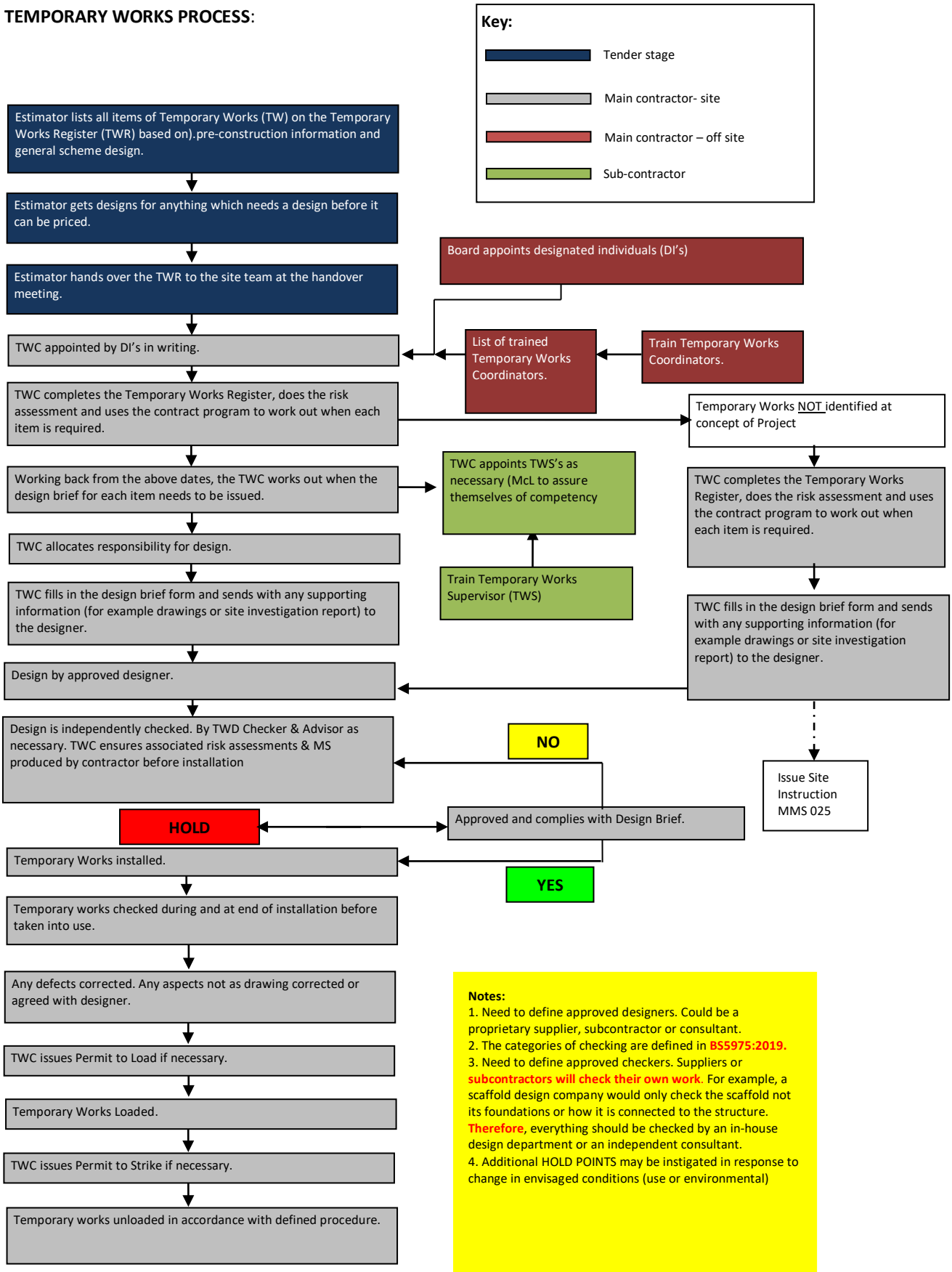
This description of temporary works includes, but is not limited to:

- Formwork for concrete construction,
- Falsework,
- Scaffolding
- Erection schemes,
- Cofferdams,
- Structural refurbishments and jacking,
- Façade retention schemes,
- Demolition,
- Temporary structures (including temporary bridges),
- Dewatering,
- Ground support (including sheet piling and other forms of support scheme),
- Open cut slopes,
- Trenching,
- Hoarding,
- Fencing,
- Public protection,
- Site cabins especially multi stacked and scaffold loading bays.
- Leading edge protection
- Hole and void protection

Temporary work also includes piling platforms, crane foundations and platforms to support mobile elevating work platforms (MEWPS), self loading lorries, large forklift trucks or telehandlers and site roads for heavy plant.

Note: Permanent works in an incomplete state (i.e. where permanent continuity is incomplete, or elements are not fully tied to a stable core) may be classified as Temporary Works. Use of permanent works to support temporary loading may also be considered temporary works.

TEMPORARY WORKS PROCESS:



Notes:
1. Need to define approved designers. Could be a proprietary supplier, subcontractor or consultant.
2. The categories of checking are defined in **BS5975:2019.**
3. Need to define approved checkers. Suppliers or **subcontractors will check their own work**. For example, a scaffold design company would only check the scaffold not its foundations or how it is connected to the structure. **Therefore**, everything should be checked by an in-house design department or an independent consultant.
4. Additional HOLD POINTS may be instigated in response to change in envisaged conditions (use or environmental)

ROLES, RESPONSIBILITIES AND COMPETENCY

DESIGNATED INDIVIDUALS (DI's)

The Designated Individual (DI) is the McLaren Group SHEQ Director who has been appointed by the Board of Directors and tasked with ensuring that the relevant appointments, below, are formally made and that the post holders are competent (as defined) to carry out their responsibilities. Ensure that resources are available to carry out the requirements of the works to be carried out. The DI is also responsible for ensuring that the policy is adhered to and that it is formally reviewed in line with the company Health and Safety Policy to ensure that it is workable, legally compliant and fit for purpose.

The DI is responsible for ensuring that any organisations that McLaren employ or recommend being employed have adequate temporary works procedures if they are designing, carrying out and/or managing temporary works.

TEMPORARY WORKS COORDINATOR (TWC)

Competency and training requirements

The TWC is likely to be a Site Manager or Senior Site Engineer **and must provide evidence of the following by** way of competency **and training.**

All those managing temporary works on behalf of McLaren should have, as a minimum,

a) An understanding of procedures. outlined in Section 2 of BS: 5975:2019 British Standard;
b) The specific procedures for the organisation for whom the person works
c) The risk management aspect associated with the management of temporary works;
d) Technical knowledge relevant to both the role and the complexity of the work; and
e) Practical knowledge relevant to the complexity of the work.

Technical and practical knowledge training should be related to the role and depend on the scale and specialisation of the works. The depth of knowledge varies from general awareness training through to courses for detailed temporary works design and identification and, rectification of defects in temporary works. Certain projects might require job-specific technical training (e.g. railway work, demolition, airports, tunnelling): where required, this should be established at an early stage of the project.

AND

- Successfully completed formal training (or equivalent)
- Successfully completed a recognised safety qualification (CITB or IOSH or equivalent)
- Will hold a Professional Qualification - Degree / HND in Civil / Structural Engineering.
- Previous experience (minimum of 3 years) as a TWC on a project of equivalent size and complexity.

Although a Chartered Civil or Structural Engineering qualification is desirable, the numbers with these qualifications and with experience of the co-ordination of temporary works, is unlikely to be enough to provide cover for all projects. The key attributes of a competent TWC are in order of priority,

1. Relevant experience
2. Formal TWC training and
3. Professional qualifications
4. TWCs should have the competence and authority to be effective.

Responsibilities TWC:

- Co-ordinate all temporary works activities;
- Ensure that the various responsibilities have been allocated and accepted; (appoint a Temporary Works Supervisor (TWS) where the TWC feels they require assistance and work with the TWS's where they have been appointed as part of any subcontract package on site).

- Ensure that a design brief is prepared, with full consultation to ensure all relevant information is included and correct in accordance with the actual situation on site;
- Ensure that any residual risks, identified at the design stage, assumed methods of construction or loading constraints identified by the designer of the permanent works are included in the design brief;
- Ensure that a satisfactory temporary works design is carried out;
- Ensure that a design check is carried out in accordance with The Standard and this policy; checking for concept, structural adequacy and compliance with the brief.
- Where appropriate, ensure that the design is made available to other interested parties, e.g. the Principal Designer or the designer of the permanent works.
- Register or record the drawings, calculations and other relevant documents relating to the final design;
- Ensure that those responsible for on-site supervision receive full details of the design, including any limitations and guidance notes associated with it and prepare a specific method statement;
- Ensure that the checks are made at appropriate stages in accordance with the flow chart of this policy
- Ensure that any proposed changes in materials or construction are checked against the original design and appropriate action taken;
- Ensure that any agreed changes, or corrections of faults, are correctly carried out on site;
- Ensure that during use of the temporary works all appropriate maintenance is carried out;
- After final check, issue formal permission to load/bring into use if this check proves satisfactory;
- When it has been confirmed that the permanent structure has attained adequate strength, issue formal permission to dismantle the temporary works and specify any relevant sequence;
- Ensure that the temporary works is dismantled in accordance with a defined procedure.
- Work in conjunction with the Temporary Works Designer (TWD) and seek advice from the McLaren Construction Temporary Works Design Checker & Advisor (TWDC) on technical matters for which the TWC is not competent.
- The TWC must ensure that the designer has produced a complete design including foundations.
- The PC's temporary works co-ordinator retains overall responsibility for the temporary works on the site

Splitting large / complex projects

The British Standard BS 5975:2019 accepts flexibility for particularly technical or logistically complex projects. It would be unrealistic to give one individual responsibility for all temporary works on a very large or complex project.

A project or site can be split into more than one well-defined area and a Principle Contractor's TWC can be appointed for each area. Each individual PC's TWC should be responsible for all the temporary works in the area allocated to them, irrespective of which organisation carries out the temporary works in the area.
The principle remains that only one PC's TWC should be responsible for a specific area at any one time. The interfaces should be clearly established and a lead PC's TWC should be appointed to manage the interfaces between the areas.

THE TEMPORARY WORKS DESIGNER (TWD)

The TWD is likely to be either an external consultant acceptable to the sector/contracts management and approved by MCL or a supplier or subcontractors design office, which is part of the approved supply chain, acceptable to line management (note that ultimate design responsibility remains with McLaren).

The TWD must be able to evidence the following **competency** by way of competency to satisfy themselves and the person who appoints them:

- Experienced and qualified structural Engineer (Professional Engineering Qualification or equivalent) with relevant design experience

Or

- Qualified Technician (HND in Civil / Structural Engineering) with experience in a relevant specialist field (e.g. formwork, scaffold or ground support)

Responsibilities TWD

- Produce a conforming design – which satisfies all the requirements of the design brief

- Produce detailed documents – comprehensive and easily understood by those using them.
- Provide resolutions to technical queries.
- Design changes - as requested by the TWC
- An appreciation of the effects of the temporary works on the permanent works.
- Design notes to highlight all critical stages of construction and necessary checks.
- To conform to codes of practice and design standards appropriate to the works.
- To produce safe, economic design within the timescale of the programme.
- To liaise fully with the TWC to resolve any queries.
- To consult recognised specialists when required to expedite the design, as agreed with the TWC.
- To liaise with the Principal Design
- To advise the TWC of any risks (erection, use, dismantling) not obvious to a competent contractor.
- To design out risk as far as reasonably practicable and communicate residual risks that remain.

THE TEMPORARY WORKS DESIGN CHECKER (TWDC)

The Temporary Works Design Checker must be independent of the Temporary Works Designer.

In all cases of Category ''3'' temporary works, will be checked by an independent structural engineer appointed by McLaren Construction Ltd.

In the case of Category ''2'' temporary works, the TWDC role may be undertaken by any competent person independent of the designer appointed by MCL management

In all cases of Category ''1'' temporary works, the check may be carried out by another member of the design team.

In all cases of Category ''0'' temporary works, the check may be carried out by another member of the site or design team.

(See appendix 2 for explanation of categories)

The qualifications, duties and authority of the TWDC are like the TWD. The responsibility of the TWDC is to verify the design and confirm that to the TWC. In addition to this, the TWC may call upon the TWDC to advise on any technical matters regarding the design, checking or maintenance of temporary works for which independent (to the designer) technical advice is required by the TWC on behalf of McLaren Construction.

THE TEMPORARY WORKS SUPERVISOR (TWS)

This individual is appointed either by the TWC/DI, to assist them where deemed necessary on projects that are complex or extensive (with respect to temporary works), or by a subcontractor to supervise their temporary works.

The TWS is likely to be a general or trades foreman, engineer or site supervisor **who can** evidence the following **competency** to the person appointing them:

- Is health and safety trained – able to spot potential hazards associated with temporary works appropriate to the job (CITB or IOSH or equivalent)
- Has acknowledged relevant experience of the construction method.
- Is technically able – can understand the drawings and methods involved with experience of construction supervision on site.
- Previous experience as a TWS on a project of equivalent size.

Responsibilities TWS

- Liaise with the TWC to ensure any modifications to the scheme or differences from the envisaged conditions (use or environmental) are drawn to the attention of the designer.
- To ensure safe working methods are always used – especially during erection, use and dismantling of temporary works.

- To ensure good standards of workmanship with careful attention to detail.
- To supervise erection, loading and removal in the correct sequence and that appropriate permits have been issued (to load/dismantle etc.) at the appropriate times before key operations.
- To activate the checking procedures called for by the design and the contract.
- To organise the works to meet the programme.
- To ensure the temporary works is installed, used and dismantled in accordance with temporary works design.
- To carry out weekly inspections of the temporary works and other inspections as necessary following adverse weather conditions.
- To ask for more detail from the TWC if not completely sure of what is required.
- To recognise the authority of the TWC and carry out his/her instructions.
- Not to change any details of method unless with the written agreement of the TWC.

- To recognise the limitation of their own experience and only supervise work they understand.

REQUIREMENTS AND PROCEDURES

McLaren appoints a sub-contractor

Where McLaren appoints a sub-contractor to provide the labour, and the equipment to be used for the temporary works, but retains the management role for the temporary works, the contractual relationship changes.

The sub-contractor should manage their own work and should appoint TWS(s) to assume day-to-day responsibility.
The sub-contractor's TWSs should report to the MCL's TWC on all temporary works matters.
The management, design and control of the temporary works, along with any other temporary works on the site, should remain with McLarens TWC.

In all instances the TWC will be the first point of contact between the designer and the site team.

All temporary works must be properly specified, designed, checked, constructed, maintained and dismantled by competent personnel. Temporary works designed or erected by subcontractors should use the same procedure as would be employed by MCL and this will specifically be written into subcontract contract requirements.

The Designated Individuals will ensure that all key appointments made for each project are done in conjunction with the relevant project manager or most senior person on a project who is then responsible for implementing the procedure to control temporary works.

The following appointments are required.

- The Temporary Works Co-ordinator(s) TWC

- The Temporary Works Designer(s) TWD

- The Temporary Works Design Checker(s) TWDC

- The Temporary Works Supervisor(s) TWS

All temporary works should be identified at tender stage. The estimator will then form the temporary works register "TWR" (SAF-57) and the register will be passed to the site team for the construction phase to be maintained throughout the duration of the project. Where the temporary works are complex, the estimator will request the assistance of a TWC to ensure that all key temporary works have been accounted for.

All personnel appointed to carry out duties under this policy should be made aware of and acknowledge their duties and responsibilities. They will be formally appointed in writing and sign to accept their responsibilities.

All temporary works should be categorised according to the risk it imposes on the public, site personnel, property or the reputation of MCL.

Three categories are identified: Category 3 (High risk) and Category 2 (Medium risk) and Category 1 /0 (Low risk). See, Appendix 2, Table 1-Categories of Design Check on Page 18 for guidance on appropriate classification and Appendix 3 Table 2 for Temporary Works category examples rating on Pages 19 and 20.

The DI will ensure that the appointed TWC has adequate knowledge of the operations to be carried out, including the methods and techniques required, the hazards likely to be encountered, the risks involved, and the controls required for the satisfactory and safe construction of works.

It is essential that those involved with temporary works at any stage in the process are fully aware of their duties and responsibilities. These must be clearly defined by the DI when they formally appoint the individuals concerned in writing.

Subcontractor's personnel may be appointed as TWS. However, when appointing trade contractor's staff MCL project management must assure themselves as to the competence of the individual in relation to, the role they are expected to fulfil. Competence requirements must be provided to the DI to make the appointment. Once appointed, individuals must be formally briefed on their responsibilities and the content of this policy and procedure.

It will normally be the case on large projects that the TWC and TWS are based on site. However, on medium sized and small projects the individuals may be appointed on a visiting basis. In the latter cases the Project Manager or Senior Person will assess the specific requirements for temporary works before making appropriate appointments.

On large projects it may be necessary to appoint several TWS's. These are an extra set of eyes and ears ONLY for the TWC. All responsibility will lie with the TWC (only one TWC per unique project).

PROCEDURAL CONTROL

Clients' procedures

All clients initiating construction projects where temporary works are involved should have in place a procedure to define their duties in relation to the management of temporary works and assist the PC in controlling any temporary works.

The client's procedure should ensure client-appointed contractors are informed that they should provide their procedure to the PC's DI for approval before undertaking the management of their own temporary works and should work to the PC's procedure if approval is not given. In addition, the contractor should be informed that the contractor's TWC should work under the direction of the PC's TWC where temporary works' interfaces must be managed.

Clients' appointing contractors other than PC's

Where the client directly appoints a contractor, other than the PC, where temporary works are involved in the contract, the contractual obligations and responsibilities should be carefully considered, detailed and communicated. Although the client is responsible for the contractor, the PC's DI should have ultimate control of the management of all temporary works on the project, although the PC has no contract with the contractor.

Clients' Designated Individual (DI)

Clients should establish and maintain a procedure to control those aspects of temporary works (and associated risks) for which they have responsibility or can constrain or influence. The senior person responsible is defined as the client's DI

Refer to BS: 5795:2019 standard for detailed information on client procedures.

Designers' Procedures

Designers should have the qualifications, skills, knowledge and experience required to carry out the design and co-ordination roles and the passing/receiving of information relevant to any temporary works. Design organisations should verify the competence of both designers and checkers of temporary works within their organisation.

Designers should address the buildability of permanent works, temporary works, their interfaces, their proposed methods of construction and any related design assumptions.

Designers should apply the general principles of prevention to the identified risks and highlight any residual risks. Appropriate and proportionate information about the residual risks should be provided to those who need it.

Designers' Designated Individual (DI)

Organisations carrying out permanent and/or temporary works designs should have a DI to ensure that a procedure suitable to their organization is in place and managed. The designers' DI should establish a procedure describing how the main items for which the designer has responsibility should be managed.

Permanent works designers

Permanent works designers should address the buildability of the permanent works and identify, and make provision for, any temporary works and temporary conditions required by their design and their assumed method of construction.

Temporary Works Designers

TWDs and TWDCs (temporary works design checkers) should confirm that the design details and outline methodologies are accurately translated into the design output, and that the design follows appropriate engineering principles. This includes any assumed construction methods, sequences, temporary works requirements, and loads to be either imposed on or supported by the permanent works.
TWDs and TWDCs should confirm that the design output adequately describes the design in a design check certificate or other suitable form of record.

Lead designers (in relation to temporary works design)

Where a temporary works scheme involves design contributions from more than one designer, one of the designers should undertake the role of lead designer and manage the design interfaces. The name of the nominated lead designer should be recorded. The lead designer for a temporary works scheme might not necessarily be the principal designer. On completion of the design, a single design certificate should be issued.

Principal Designers

In relation to temporary works, the PD should ensure that:

a) There is a coherent construction method which identifies all key temporary conditions and temporary works;
b) The finally agreed construction method, sequence and temporary works are not deleterious to the permanent works design;
c) Designers follow the recommendations of the relevant clauses within the British Standard
d) They share information with designers, and the PCs TWC that might influence the design of temporary works or the selection of construction methods;
e) Designers take account of the construction phase plan;
f) They retain appropriate information relating to temporary works that would be required for the health and safety file; this should include information on construction method or sequence including associated temporary works which might impact on future maintenance or deconstruction; this information should be obtained from the PC's TWC; and,
g) They carry out the domestic client's duties with respect to temporary works, where these have been transferred to the principal designer. Refer to BS: 5795:2019 standard for detailed information on designers' procedures.

Contractors procedures

Organisational interfaces

When work is being carried out by different organizations, the organizational interfaces can be manifested on site as physical interfaces between different phases of the scheme, e.g. it is common for one organisation to prepare and provide the foundations upon which another subsequently erects the main temporary works structure.

The physical interface in this example is particularly critical, but in all cases the physical constraints and interface conditions should be clearly defined, and the work procedures adopted should take account of these interfaces.

The TWC should manage these interfaces and retain an overview of the whole scheme to ensure each step of the procedure is completed and does not adversely affect the scheme.

Details of the interfaces should be included in the construction phase plan.

When work is being carried out on several small sites, a TWS with an appropriate level of authority may be appointed for each individual site, under the overall responsibility of a single TWC.

Contractors are appointed by clients, or by other contractors to carry out the works. Where there is more than one contractor appointed by the client, one contractor should be appointed PC. In all cases the contracting organization's procedures should recognize that, whatever the method of
procurement, the PC has ultimate responsibility for the safe execution of all temporary works on site.

The contractor's procedure should cover the management of any temporary works and include measures for ensuring that the roles of a TWC and TWS are carried out by competent individuals.

If the contractors' procedures are deemed not acceptable by the PC's DI, then they should work to the temporary works procedures of the PC.

Contractors designated individual (DI)

All contractors involved in temporary works (PCs, sub-contractors and those appointed by clients and third parties) should appoint a DI to ensure that a procedure suitable to their organisation is used to control those aspects of temporary works (and associated risks) for which the contractor is responsible. In addition, the DI should verify the competence of the individuals to be appointed as TWC. The DI should ensure the proposed TWC has a full understanding of the procedure and their specific responsibilities.

The PC's DI should have ultimate responsibility for the temporary works procedures on the project so that, although other contractors are required to appoint their own DIs, any other DIs are aware of the responsibilities and procedural requirements of their contracts. Where contractors are appointed either by the PC or by the client or by a third party, the PC's DI should ensure that contractors' temporary works procedures are satisfactory

Commercial Process / Order process

The following process must be adhered to when placing an order for any Temporary Works Scheme / Package:

- The specification for the Temporary Works should be prepared for the works.
- The Temporary Works design should be prepared. This should include the calculations and a design drawing.
- The above must be issued to the TWC and entered into the Temporary Works Register.
- Once the category of TW is agreed (Cat 0/1/2/3) the TWC must obtain an independent check for the design information where required.
- The above documents should then be provided to the nominated contractor to enable a quote to be provided.
- A review of the quote should be undertaken to ensure that the Specification and Description correspond to the quote provided.
- Once the quote is found to be acceptable, place order and agree start date, the SAF003 Pre-Commencement Workshop date must also be agreed.
- Once the contractor arrives on site SAF029 Temporary Works Design Check/Permit to Load/Strike is issued to the contractor.

TRAINING

MCL are committed to providing appropriate training which will enable all Project Managers / Site Managers and Senior Engineers to manage Temporary Works to meet the relevant legal requirements and effectively manage the risk. Training requirements are identified in the SHE-Training Policy & Procedure SHE010.

TEMPORARY WORKS REGISTER

The TWC will maintain an up-to-date register of all the items of Category 3, 2, 1 and 0 temporary works on the site with each item classified as defined below (See Appendix 1). The preferred format for the Temporary Works Register is attached at the end of this policy/procedure. As a minimum the Temporary Works Register should identify the following.

- Short description of temporary Works
- Designer / Design Brief Number
- Category of temporary works
- TWC / TWS Initials
- Date of design check / Design Checker
- Date design approved
- Date Temporary Works erected/handed over
- Permit to Load – Date
- Permit to Strike – Date

The purpose of the TW register is to ensure that each item of temporary works, whether originating within MCL or from a subcontractor, is formally identified, designed, checked, installed, and dismantled in accordance with company requirements.

The register shall be established by the pre-contract management team in conjunction with the estimating team prior to contract commencement. The register will be updated as necessary by the TWC throughout the duration of the contract.

CONCEPT AND DESIGN BRIEF

THE CONCEPT

The Project Manager will establish the concept of the temporary works and carry out a risk assessment in conjunction with the TWC and TWS following full consultation with the TWD as to the preferred method of construction, the choice of materials or systems, plant and labour and any access problems which may exist.
The nature and scope of the permanent works will also be a major consideration in the choice of scheme – particularly any stated sequence of working or time related restrictions called for in the Contract. It is important therefore that the permanent works design engineer and the relevant Statutory Bodies are consulted where appropriate during the formulation of the concept to prevent adoption of unacceptable methods and materials.

THE DESIGN BRIEF

A design brief is a vital part of the design process and is a document used to convey information from the site team to the Temporary Works Designer about the temporary works requirements and the site conditions and constraints. The quality of information (level of detail, accuracy and completeness) will have an impact on the efficiency and safety of the design. When preparing a design brief the author should provide as much relevant information as possible. A temporary works design brief sheet (SAF058) should be used in conjunction with the guidance notes (SAF058a) to assist this process.

The TWC is responsible for ensuring an adequate design brief is prepared and issued to the TWD. The TWC should liaise with the TWD throughout the design process to ensure correct information is provided and updated as necessary. The TWC should ensure that site specific and unusual risks and constraints are brought to the attention of the TWD.

The full details of the permanent works, site ground conditions, possible change to ground conditions (e.g. after rain), adjacent overhead or underground services and any other relevant information, should form a

complete statement of the working performance required of the temporary works and the circumstances affecting it.

The design brief should also include a control programme, which will define who provides what and when and show concurrent activities that may affect the structural integrity temporary works.

At all stages, from the design brief to dismantling of the temporary works, it is necessary to check that the information being used is correct and that the work is carried out as specified. Changes in the requirements of the design brief should be recorded therein as well as being incorporated into the design and drawings.

As specialist equipment suppliers accept virtually no responsibility for the use of equipment on sites, attention should be given to the physical and functional interfaces between these suppliers and any temporary works controlled by MCL.

In the UK, the Health and Safety aspects of design need to be communicated to and where necessary discussed with, the Principal Designer so far as to:

- Avoid or reduce risks arising from any interaction with the work of others involved in design and planning.
- Enable information to be incorporated into the Health and Safety file.

Emphasis should also be placed on the fact that all communication must be channelled through the Temporary Works Co-ordinator, who is authorised to apply and progress the requirements of the brief and the programme.

Design Brief Checklist:

- Drawings of permanent works, including relevant specifications or requirement to design in accordance with a standard.
- Soil and ground water conditions (provide geotechnical reports where available) & other site investigation data including any limitations by relevant authorities.
- Details of site conditions, including services, adjacent structures and access.
- Preferred methods of construction and dismantling.
- Available materials, equipment and plant.
- Loads, including impact.
- Control programme including timing for removal of TW in relation to ability of permanent works to be self supporting.
- Acceptable tolerances.
- Proposed size of tower crane and/or piling rig proposed.
- Information on any significant risk associated with the design of permanent works

See Appendix 4 for 'Temporary Works Design Brief' form (SAF-58) and Appendix 5 'Temporary Works Design Brief Requirements – Guidance' (SAF-58a). Also see pages 27 and 28 of BS 5975:2019 giving suggested information for design briefs.

DESIGN

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

RISK CHECKLIST

During the preparation of a temporary works design, the Temporary Works Designer should assess the risks associated with his design. (This is also a requirement of CDM Regulations 2015). Any residual risks should be identified and communicated to the project team. Residual risks, should, where practicable, be recorded on the design drawings. The project team or subcontractor should prepare a project or task specific risk assessment and, where appropriate, a

method statement for all temporary works items including the general construction risks together with the residual risks identified by the TWD.

The following list is not exhaustive.

- Risk to persons from collapsing structures (falling onto)
- Risk to persons falling from collapsing structures (fall from)
- Risk to persons being struck by falling materials
- Risk of excavation collapse
- Risk of persons falling into poorly guarded excavations
- Risk of plant / equipment damage rising from the above.
- Risk to persons handling equipment (manual handling injuries)

HAZARD IDENTIFICATION AND RISK ASSESSMENT

The hazards associated with temporary works are usually those of collapse and/or the failure of the equipment in place. These failures occur mainly as a result of.

- Lack of effective communication
- Poor design
- Use of unsuitable or insufficient materials and equipment
- Lack of knowledge and inexperience of persons involved in temporary works design and/ or erection/maintenance.
- Failure to execute the temporary works in accordance with the design drawings, specification or sequence.

Causes of failure can fall into several well-defined areas;

- Inadequate design brief or failure to carry out proper investigation of ground conditions, services or adjacent structures.
- Incorrect estimation of loads to be supported.
- Design error, or loading programme changed after design completed.
- Inadequate maintenance
- Inadequate detailing and/or execution of points of load transfer.
- Inadequate horizontal and/or diagonal bracing to resist lateral loads.
- Inadequate foundations.
- Unauthorised changes to an approved temporary works design.

CHECKING AND INSPECTION OF TEMPORARY WORKS

Checking and inspection are essential at every stage of temporary works from initial concept, through design stage, to erection, use and dismantling. The result of all inspections and checks will be recorded in writing and action taken to correct any faults. The recording of this will be by use of the Site Safety and Environmental Inspection Report (SAF007).

CHECKING

All category 3 and category 2 (see Appendix 2) designs must undergo a formal check to ensure that the brief has been met, the design complies with current codes and standards and that the design complies with current legislation. In addition, the check should address issues of buildability (including maintenance and dismantling) efficiency, robustness and interaction with other concurrent activities. All category 3 temporary works must be checked by an independent structural engineer appointed by MCL and all category 2 temporary works should be checked by someone who is suitably competent and experienced.

Once the Temporary Works Design Checker is satisfied that a design is fit for purpose, he should complete a Temporary Works Check Certificate or other certificate to confirm his acceptance of the design. This certificate should specify drawings or documents which have been checked together with any information used to carry out the check. If

a design is subsequently revised a new Temporary Works Certificate should be issued for the revised drawings or documents. The TWC must ensure that they have a valid certificate for each item of category 3 and category 2 temporary works before they are brought to into use.

SITE INSPECTIONS

Installation Checks

Site inspections will be carried out in a systematic manner with reference to checklists wherever practicable. Alternatively, a marked-up drawing should be produced. Return inspections to verify the correction of faults will follow the same systematic routine to check every feature that could have altered in the intervening period.

Care should be taken to ensure that in addition to the obvious technical load bearing properties of the temporary works, the safety of the people involved in them is assured. The adequacy of access ways and working platforms and their edge protection measures must be paramount considerations.

Statutory requirements must be met at all stages of the process.

The Temporary Works Designer and Temporary Works Co-ordinator must agree suitable hold points at which formal inspections should take place. In any event, **all temporary works should be inspected prior to loading.** In some instances, intermediate formal inspections may be necessary, for example following the installation of a frame in a cofferdam.

In addition to ensuring that the layout of the 'as constructed temporary works' is in accordance with the drawings and specification the TWS/TWC should ensure the following.

- Materials are checked in accordance with the specification and are undamaged (delivery notes should be checked, and attention should be paid to ensure that the correct grade of material is used)
- Test certificates are current.
- When erected members are correctly adjusted and all joints are tight.
- All packing shims and wedges are tight and secure.
- Locking devices, bracing and ties are in place.
- Any site testing specified has been carried out and the results are as specified and circulated to the RWD and TWDC.
- Components supplied are genuine products (untested copies or counterfeit products must not be used)

At each hold point and prior to loading a Permit to Load (SAF029) should be completed and signed by the TWC following an inspection by the TWS, prior to moving to the next stage of construction (see Appendix 6).

Weekly Inspections

In addition to hold point inspections, formal inspections should be carried out once the temporary works is in service to ensure there is no deterioration. The frequency of these inspections should be agreed between the

TWD and TWC. Generally, inspections should occur at a minimum frequency of once per week, but this may need to be changed depending on the risks. All inspections should be recorded on a Weekly Inspection Report form which should be held in the temporary works file or on a tag fixed to the temporary works (similar to a scafftag) All defects should be reported to the Project manager or his appointed representative within 24hours of the inspection being carried out. Any defects should be addressed and re-inspected. Inspections should not only consider the condition of the equipment but also the compliance with the temporary works design. If conditions have changed (i.e. loading changed, design life extended or ground conditions have changed) these should be referred to the TWD for further consideration and formally recorded on SAF07 Weekly Inspection Report Form.

Inspections following adverse weather or adverse events.

Further inspections should be carried out following any period of adverse weather which may affect the temporary works (e.g. heavy rain could affect ground supports or foundations and strong wind could affect falsework and

scaffolds). These inspections should also be recorded on a Weekly Inspection Report or on a tag fixed to the temporary works. All defects should be reported to the Project manager or his appointed representative within 24 hours of the inspection being carried out. Any defects should be addressed and re-inspected.

Inspection of excavations.

Excavations are considered high risk due to the possibility of damage to any ground support or changes to ground conditions. Regulation 22 of CDM 2015 makes specific requirements concerning the need to carry out inspections at the start of each shift and after any event likely to affect strength or stability. Please also refer to the Excavations Policy & Procedure (SHE014) for more detail.

Dismantling of Temporary Works.

Prior to dismantling of any temporary **works,** the TWC must ensure that the permanent works is able to be self-supporting. This will require the TWC to check that there is **ample** permanent works in place, that the permanent works has achieved the appropriate strength and that any temporary loading condition has been considered as part of the permanent works or temporary works design. Care should be taken to avoid locking in loads. In most cases the permanent works designers should be consulted.

SPECIAL REQUIREMENTS FOR TOWER CRANES, PILING RIGS, MOBILE CRANES, CRAWLER CRANES, CONCRETE PUMPS, SELF LOADING LORRIES, MEWPS, FORKLIFT TRUCKS AND TELEHANDLERS.

Tower Cranes including self-erect tower cranes.

Tower cranes and self erect tower cranes are high risk and as such are category 3 temporary works. These cranes should only be procured from approved suppliers. Tower crane foundations should be checked and certified by an appointed structural engineer who will then issue an approval certificate which will be recorded in the temporary works register. This certificate contains information about the type and set-up of the crane. Before the crane is erected, the certificate should be countersigned by the TWC to confirm compliance and design. The TWC in signing the form is also confirming that the required concrete strength has been achieved, holding down arrangements are correct, formation / piles are correct and construction details are in accordance with the design.

Piling rigs, mobile cranes, crawler cranes, concrete pumps, self-loading lorries, MEWPS, forklift trucks and telehandlers.

The stability of mobile cranes, piling rigs, crawler cranes, concrete pumps, self-loading lorries, MEWPS, forklift trucks and telehandlers are dependent on the ground conditions under the tracks, wheels or outriggers. The stability of the above equipment is the responsibility of the Crane Coordinator / Appointed person. As part of his duties he is responsible for planning the use of the above plant and preparing lift plans with input from a

competent engineer for technical issues. These plans should include a proper assessment of the bearing pressures and the safe bearing of the ground. The TWC and Crane Coordinator / Appointed person should consider if a crane / piling platform is required a what load spreading devices are needed. Piling platforms/mats
and the use of large cranes (Mobile cranes foundations up to 250 T including highway assessment) are
Category 1 temporary Works and require checking by an appointed structural engineer. It should be noted that some concrete pumps, self-loading Lorries and large telehandlers can have out rigger loads equivalent to a
large crane and should therefore be considered as high risk. As such larger cranes (Mobile cranes foundations over 250 T including highway assessment) are Category 2 temporary Works.

LEGISLATION / GUIDANCE

- Construction (Design & Management) Regulations 2015
- Working at Height Regulations 2005
- Provision and Use of Work Equipment Regulations 1998
- Lifting Operations and Lifting Equipment Regulations 1998
- Management of Health & Safety at Work Regulations 1999

- Personal Protective Equipment at Work Regulations 1992
- BS 5975:2019 Code of Practice for Temporary Works Procedures and the Permissible Stress Design of Falsework
- BS EN 13374:2013+A1:2018 Temporary edge protection systems
- TG20:13 a comprehensive guide to good practice with tube and fitting scaffold
- British Concrete Pumping Association (BCPA) Manual of pumped concrete practice.
- HS (G) 151 Protecting the Public – Your next move.
- TW For Hoardings a guide to good practice 2012
- EPF A guide to the selection and use of temporary edge protection systems
- CPA STIG Safety in shoring the proprietary shoring and piling equipment manual
- Federation of Piling Specialists Temporary works

MONITORING & REVIEW

Monitoring

Monitoring procedures will include:

- Statutory Inspections required under the Construction (Design & Management) Regulations 2015.
- Statutory Inspections required under the Lifting Operations & Lifting Equipment Regulations 1998.
- Formally recorded site Weekly Inspections

Review

Review of SHE005 Temporary Works Policy & Procedure will be carried out at:

- Management Review Meetings
- Bi-Monthly SHEQ Steering Group Meetings.
- Site Progress Meetings.
- Annual review of company policies and procedures.

Appendix 1

TEMPORARY WORKS REGISTER (SAF-57)

Project Name					**TWC Name**					
Contract No	**M**				**Project SOS Date**					
Ref	**Description**	**Cat**	**Drawing No & Approval Date**	**TW Design Brief No (SAF029)**	**TW Design Check Approval Received Design Checker Details**	**RAMS Ref No**	**Contractor Undertaking Temp Works**	**Permit to Load Start date**	**Permit to Strike date**	**Comments**

TWC – Temporary Works Co-ordinator
TWS – Temporary Works Supervisor

Category 0 = standard solutions – compatibility with site conditions check only
Category 1 = simple design – check can be another member of the design team
Category 2 & 3 = require a fully independent design and checking process

Appendix 2

Table 1 **Categories of design check**

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

Appendix 3

Table 2 **Temporary Works category examples**

Temporary works designs are sometimes categorised to indicate the complexity/simplicity of the specific temporary works structure and the potential risk. See below for an example:

Category	Example
0	• Access scaffolds • Excavations < 1.2m deep, no adjacent services/foundations • False work < 3 metres high, on flat ground, no specific hazards • Formwork > 0.45m < 3 m high • Needling to doorways< 900 mm • Proprietary Edge protection. • Minor wooden access ramps for small plant and pedestrian access • Standard Heras fencing
1	• All other Access Scaffolding and stairs • Embedded lifting anchors and sockets • Excavations that pose a significant risk • False work higher than >3m <6m high • Formwork for walls and columns > 3m < 6m metres high • Hoardings and vehicle access gate supports • Hoist bases and restraints • Loading and access gantries • Loading docks and hoist run off platforms • Needles and propping to brickwork openings • Pile Mat • Untied access stairs outside the manufactures guidance • Signage over 2m in height • Steelwork frame temporary bracing • Temporary office structures not bridging the highway • Temporary propping, guying and support of permanent works members during erection • Temporary roads, bridges and barriers • Temporary roofs and weather proofing • Tower cranes ties • Assessment of plant and material loads on slabs • Mobile cranes foundations up to 250 T including highway assessment • Movement of equipment and material across areas in excess of the published permanent works loading • Preston Platforms (Cantilevered access decks)
2	• All False work> 6m height • All Slip form, climbing and jump form • Cofferdams • Façade retention • Simple tower crane bases • Demolition stability assessment • Mobile cranes foundations over 250 T including highwav assessment • Simple jacking operations • Suspended Piling Platforms • Suspended platforms for excavators and other heavy plant
3	• Complex tower crane bases • Complex demolition stability assessments • Temporary office structures bridging the highway • Jacking structures under or over railways & London Underground (LUL) • Complex jacking operations • Works adjacent to highways requiring an Approval In Principle (AIP) category 3 check from the highways authority. le excavation adjacent to highways deeper than 14m • Works adjacent to railways requiring NR, LUL approval

A “standard solution”, as identified in Table 1, category 0, is an arrangement for which the basic design work has already been carried out and is presented in a tabular or similar form, and for which no further calculations are required.

Appendix 4

Temporary Works Design Brief Form: **SAF058 Temporary Works Design Brief**

TEMPORARY WORKS DESIGN BRIEF			
CONTRACT NAME AND No:			
Description of Temporary Works:			
Location of Temporary Works:			
If this Design Brief is for an amendment to an existing SAF029 Temporary Works Design Check / Permit to Load / Strike the SAF029 must be attached to this document.			
Temporary Works Co-ordinator			
Design Brief Prepared by:		Date:	
Method of Delivery (email etc)			
Referenced Documents:			
Special Design Considerations / Restraints / Loading / Sequencing / Site Conditions (Give as much detail as possible)			
Preferred solutions / Material (Specify as necessary)			
Design Deliverables / Checking / Approval Requirements (Add and delete as appropriate)			
Design Required by:	Date:		
Construction to start:	Date:		
Issue to	Ref	Originator	Date
Authorised by:		Date:	

Appendix 5 - Temporary Works Design Brief Requirements – Guidance (SAF-58a)

The following checklist provides an indication of the type and scope of information which should be **considered and** included as appropriate within the design brief. It follows the headings on Form SAF-58.

Reference Documents:

Specification

- Identify Contract-Specific amendments
- Where a full specification is available for inspection. **Draw attention** to the relevant clauses.

Drawings

- A Schedule & copies of fully dimensioned current General Arrangement Drawings of the relevant permanent works
- Contract drawings showing plan of ground and foundation areas beneath and adjacent to area to be supported, contours and/or cross sections showing ground level variations, access areas both below and adjacent to the work
- Position of statutory authority equipment, services etc.
- MCL / Historical / record drawings.

Other

- Site investigation data and reports relating to the area under and adjacent to the temporary works, including any data on rainfall, water levels, etc. collected for the design of the permanent works.
- Information of site conditions found by trial holes, excavation, observation or discussion with local people.
- Investigation of sources which might affect the site by altering soil properties, scour, flooding or the creation of additional loads.
- Contamination report and site observations
- SHEQ Plan **any information** supplied by designers.
- Extract from Construction Programme

Special design considerations/ Restraints/ Loading/ Sequencing/ Site Conditions

- Photographs of site if possible
- Maximum loading applied including any loads to be applied to permanent works while temporary works in place and any surcharge loading adjacent to excavations or trenches.
- Clearances required by statutory authorities, service providers or their agents, from roads, railway lines, power lines, etc.
- The maximum loading that may be applied to any permanent works from the temporary works.
- Details of redistribution of loads in the permanent works before temporary works removed.
- Exposure to wind load.
- Site access issues, if any, & access, storage areas required on and adjacent to the temporary works including loading and spoil heaps.
- Condition and stability of adjacent structures.
- Availability of water supply and discharge points (especially relevant for excavations).
- Clearances required by statutory authorities, service providers & their agents, from roads, railway lines, power lines, etc.

Preferred Solutions/Material

Could include:

- Sequence and timing of loading including proposals for reuse of any parts of the temporary works.
- Position of construction joints.

- Limits to absolute and differential settlements.
- Sequence and timing of post tensioning.
- Method of pouring concrete and type of concrete.
- Temporary supports of long duration to be incorporated and protected.
- Temporary works materials available on site
- Plant to be used
- Any loads to be applied to the permanent work before the temporary works are removed.
- Loads which will be applied to the temporary works during construction from plant, stacking & handling of materials.
- Any significant redistribution of loading in the permanent works before the temporary works are removed.
- Exposure to wind for assessment of wind loads.
- Details of all temporary works components available to the contract
- The problems of access to and about the site.
- The requirements for access and working platforms associated with the temporary works.

v) Design Deliverables / Checking / Approval Requirements

- Design programme
- Report
- Calculations
- Detailed construction drawings
- Reinforcement schedules
- Inspection and Test Plan
- Specifications
- As-built drawings
- Designer's risk assessment
- Category 0 / 1 / 2 / 3 check required (designer to arrange)
- Design certificates
- Check certificates
- CV's of designers and checkers for MCL approval
- Project-specific SHEQ Plan
- Copy of consultant's generic design control procedure & other relevant procedures

Appendix 6

SAF029 Temporary Works Design Check / Permit to Load / Strike

TEMPORARY WORKS DESIGN CHECK / PERMIT TO LOAD / STRIKE				
CONTRACT NAME AND No:				
Description of Temporary Works:				
Location of Temporary Works:				
PART 1 - DESIGN CHECK				
1.	Temporary Works Design carried out by:			
2.	Independent Check (Calculations & Drawings) submitted to		Date:	
3.	Drawings:			
	Drawing No	Date	Status	
Issued By: (TWC Details/Company)			**Method of Transmission:**	
Signed:			**Date:**	
Received By: (Name/Company)				
Signed:		**Date:**		
Independent Design Check				
Checked By				
Signed				
Qualifications				
Company		Date:		
Details of any specific inspection requirements to be undertaken:				
Independent Consultancy Check (If Category 3)				
Checked By				
Signed				
Qualifications				
Company		Date:		
I certify that, in my opinion, the erection proposals and proposed temporary works details specified in the schedule at item 3 relating to the construction of the above project are satisfactory for the proper discharge of responsibilities for the safe temporary works design elements of the works and for their safe execution and removal (if applicable) in accordance with the drawings and specification and without detriment to the related permanent Works.				

TEMPORARY WORKS DESIGN CHECK / PERMIT TO LOAD / STRIKE					
CONTRACT NAME AND No:					
Description of Temporary Works:					
Location of Temporary Works:					
PART 2 - PERMIT TO LOAD					
1.	Temporary Works Co-ordinator:				
2.	Site Supervisor responsible for Temporary Works Erection:				
3.	Drawings issued to site supervisor:				
	Drawing No's:				
4.	Method Statement issued to site supervisor:				
	Method Statement Reference No. / Rev.				
5.	Details of departures from drawings (departure must be reviewed by the original designer):				
Departure		Authorised By		Date	
The Temporary Works detailed above have been erected in accordance with the above drawings and are now ready for checking by the Temporary Works Co-ordinator.					
Site Supervisor Name:					
Signed:		**Date:**		**Time**	
The Temporary Works have been checked and I confirm that they are in accordance with the design details. I am familiar with the design restraints that have been imposed on the loading of these temporary works and have passed them to the site supervisor in charge.					
Permission is given to load the temporary works with**:** (please specify)					
Temporary Works Co-ordinator Name:					
Signed:		**Date:**		**Time**	
Received by Name:					
Signed:		**Date:**		**Time**	

TEMPORARY WORKS DESIGN CHECK / PERMIT TO LOAD / STRIKE	
CONTRACT NAME AND No:	
Description of Temporary Works:	
Location of Temporary Works:	
PART 3 – PERMIT TO STRIKE	
I certify that the item of Temporary Works has been inspected and supporting handover documentation has been received confirming that it is no longer required, and it can be removed. The works have now met the required specification and design criteria to form the permanent solution / structure. The relevant contractor has produced a site-specific RAMS for the striking of the Temporary Works. This document has been approved for use.	
Issued By:	
Signed:	**(Temporary Works Co-ordinator):**
Received By:	**(Site Supervisor):**
Signed:	**Date:** **Time:**