Temporary works is a widely used expression in the construction industry for an "engineered solution" used to support or protect 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, or to provide access.

WHAT ARE TEMPORARY WORKS?
What are Temporary Works?

- Site cabins/facilities
- Temporary Foundations
- Boardings
- Support to Excavations
- Sheet Piling
- Piling Platforms
- Tower crane Bases
- Cradles
- MEWPS
- Formwork
- Edge Protection
- Falsework
- Special Formwork
- Slipform
- Scaffolding
- Gantry
- Stairs = Temporary Access
- Mast climbers
- Permanent Formwork
- Alternative Access
- Propping and Support to Modified Structures
- Façade Retention
- CCTV Bases

What are Temporary Works?

- Hoists
- Loading Platforms
- Plant and Tools
- Temporary Protection
- Fans
- Screens/Wind Shields
- Temporary Bridges/Roads
- Cofferdams
- Rubbish Chutes
- Temporary Walkways
- Site De-Watering
- Temporary Fuel Storage
- Mobile Crane Bases
- Scaffold advertising
- Roped access
- Temporary roofs
- Back propping
- Lifting plans
- Loading/Unloading wagons
- Netting
- Free Standing Mastclimber
- Wheel washers
- Road Plates
Britain's worst construction accident in terms of fatalities 100 years ago.

Before the accident, a fully timbered deep excavation...
TEMPORARY WORKS - HISTORICAL PERSPECTIVE - 100 YEARS AGO

The report by W.W. Squire, dated 30th August 1909, gives a total of 38 fatalities.
TEMPORARY WORKS - HISTORICAL PERSPECTIVE - 50 YEARS AGO

Collapse of a scaffold falsework support tower - Barton Bridge, Manchester 19th February 1959. 4 workers fatally injured.
TEMPORARY WORKS - HISTORICAL PERSPECTIVE - 50 YEARS AGO

2nd accident - overturning of bridge beams - Barton Bridge, Manchester 31st December 1959.

2 workers received fatal injuries.

Evidence given at the Inquest:

- Scaffold not installed in accordance with the design drawings
- The design drawing was not a working drawing and only gave an indication of the structure
- Worn and corroded scaffold tubes had been used
- Lack of lateral bracing
- Design carried out by an "estimator/draughtsman" - not "passed" by an engineer
- Bulging of the scaffold noted but not acted upon
WHY DO COMPANIES HAVE TW PROCEDURES AND WHERE DID THEY COME FROM?


"On all sites the contractor must appoint a properly qualified TWC whose duties are to ensure all procedures are followed, all checks and inspections are carried out, and any changes authorised. Formwork/Falsework may not be struck without the permission of the TWC."
TEMPORARY WORKS - BS 5975


Code of practice for temporary works procedures and the permissible stress design of falsework
IF YOU REMEMBER NOTHING ELSE...

1. Check competencies in all roles.
2. Must have a register.
3. Design certification must be in place.
4. Permit to load/strike to be in place.
5. Records of Check, inspect, maintain.
6. Records of Change control.

WHY ARE TEMPORARY WORKS IMPORTANT?
ON AVERAGE 30% OF CONTRACT COSTS ARE TEMPORARY WORKS.

THE SECRET OF EFFECTIVE TEMPORARY WORKS IS...?
GOOD PLANNING AND CO-ORDINATION OF TEMPORARY WORKS AIDS:

- Improved Health and Safety.
- Reduced Costs.
- Quality.
- Programme.
- Client Satisfaction.
- Profit.

STAGES OF TEMPORARY WORKS

- Identify/Risk Assessment.
- Specification.
- Design.
- Procurement.
- Erected.
- Use/Inspect.
- Clean/Dismantle.
- Maintain.
COMMON PROBLEMS WITH TEMPORARY WORKS

• No planning or procedure.
• No design or poor design.
• Lack of competent contractor/developer.
• No temporary works equipment available.
• Inappropriate use of TW equipment or other non-TW equipment being used for the purpose of temporary works.

LEGAL RESPONSIBILITIES

Managing Temporary Works is important!!

Falls account for over 50% of fatal accidents in construction and over 70% of site accidents are related to temporary works.
LEGAL RESPONSIBILITIES – CONTRACT LAW

The main Contractor cannot subcontract responsibility for Safety.

CDM
ACOP 43 ‘Clients’ must make sure that,
“…designers, contractors and other team members that they propose to engage are competent (or work under the supervision of a competent person) …”

ACOP 116 ‘Designers’ include:
“…temporary works engineers, including those designing auxiliary structures, such as formwork, falsework, façade retention schemes, scaffolding, and sheet piling …”

ACOP 150 ‘CDM co-ordinators’ must:
“… give suitable and sufficient advice and assistance to Clients in order to help them to comply with their duties, in particular...
...the duty to appoint competent designers …”

ACOP 104
“...The design of temporary works, such as falsework, formwork and scaffolding, falls within the scope of CDM 2007. CDM co- ordinators have to take reasonable steps to ensure co-operation between permanent and temporary works designers, in particular to ensure that arrangements are in place to ensure that designs are compatible and that the permanent works can support any loadings from temporary works...”
TEMPORARY WORKS - WHAT THE LAW SAYS -
THE SMALL PRINT

CDM Regulations 2007 and the ACOP specifically mention temporary works:

• "Structure" means....
  "any formwork, falsework, scaffold...." (Reg 2(1))

• "Designers therefore include:...
  temporary works engineers" (para 116)

• "Construction phase plans - Arrangements for controlling safety issues for the category of operations - including temporary structures. CDM 2007 (para 51)"

• "The terms of temporary works for the category of Contractors should be..."
  "to have a temporary works designer appointed within the construction work employer's project team..." (para 91)

• "The design of temporary works falls within the scope of CDM2007."

CDM(C)'s have to take reasonable steps to ensure co-operation between permanent and temporary works designers, etc. (para 104)

CDM2007 Regulation 4 (competence):
  competence required of all those with a role to discharge in the planning, design and execution of temporary works

Regulations 5 & 6 (co-operation and co-ordination):
  co-operation and co-ordination of activities including temporary works, incumbent on all involved

Regulation 10 (client's duty to provide information):
  provision by client of pre-construction information (e.g. ground conditions, structural drawings)

Regulation 11 (duties of designers):
  avoidance of foreseeable risk arising from preparing or modifying designs

Regulation 13 (duties of contractors):
  planning, management and monitoring of construction work

Regulation 18 (additional duties of designers): provision of information to the CDM co-ordinator (CDM(E))
TEMPORARY WORKS - WHAT THE LAW SAYS

Regulation 20 (duties of CDM(C)s):
all reasonable steps to ensure designers comply with their duties and to ensure cooperation between designers and principal contractors in relation to any design or design change.

Regulation 22 (duties of the principal contractor):
planning, managing and monitoring the construction phase.

Regulation 28 (stability of structures):
any support or temporary structure must be designed, installed and maintained so as to withstand foreseeable loads.

Regulation 29 (demolition or dismantling):
planning and recording of arrangements.

Regulation 31 (excavations):
planning and execution.

Regulation 32 (cofferdams and caissons):
design, planning and execution.

Regulation 36 (temporary traffic management):
on any part of the highway any temporary traffic management design should be designed to incorporate the Principles of Chapter 8.

TEMPORARY WORKS – WHY THE HSE ARE INTERESTED

What is HSE doing?
Encouraging industry to control the risk by:
• Increasing awareness of the importance of managing temporary works effectively
• Supporting specialist temporary works events
• Checking on contractors' management arrangements for temporary works
• Checking on the competence of those doing temporary works management & design
“The management of temporary works in the construction industry”.

What sort of questions might the HSE ask?
DESIGN AND CHECK – BS5975 – SECTION 9

- Has the work been 'designed'?
- Has the design been independently checked?
- What checks have been made to ensure that the works have been installed in accordance with the design?
- What involvement has the CDM had?

TEMPORARY WORKS PROCEDURE?

- Who is the named TWC?
- What is their background?
- Do you have a TW register?
- Is there a design brief?
What the HSE have been finding?

TEMPORARY WORKS - COMMON PROBLEMS

• Lack of adequate lateral stability
• Inadequate foundations
• Overloading
• Inappropriate parts being used
• Poorly designed (if at all)
• Poorly constructed
TEMPORARY WORKS - COMMON PROBLEMS

• Workforce not competent for tasks required
• Don't appreciate the true force of wind
• No investigation of existing conditions (ground, services, structural condition etc)
• Changes made ad hoc
• General lack of control, management and supervision

WHAT'S NEW IN THE CODE:
- Categorization of Temporary Works
- Design briefs
- Appointment of TWS as well as TWC
- Design certificates
TEMPORARY WORKS – GUIDANCE TW PROCEDURE (FROM BS 5975)

• Appointment of a Temporary Works Coordinator (TWC)
• Completion and Maintenance of a Temporary Works Register
• Preparation of Design Briefs for Elements Identified in Register
• Production of Temporary Works Design
• Independent checking of the temporary works design
• Pre-erection/Instillation of Materials & Components
• Supervision of Erection/Installation of Temporary Works
• Inspection & Check of Temporary Works Prior to use
• Approval - Permit to Load - (Temporary Works Loaded)
• Approval to Demote following Checks - Permit to Dismantle
• Temporary Works Dismantled and Signed Off

The main point is that the Temporary Works Register needs to be clear on the following major points:

• What
• Where
• How
• Who
• When
• Why
CODE OF PRACTICE FOR TEMPORARY WORKS PROCEDURES AND...THE DESIGN OF FALSEWORK

- Discusses procedures and communication (in addition to technical matters).
- Lists main items for which responsibility should be established.
- Identifies the main tasks of the Temporary Works Co-ordinator and Supervisor.
- Requires “Designated individual” for “every organisation involved in TW”.

PROCEDURES (6.3.1)

- Procedures for control of TW.
- Ensuring effective control procedures.
PROCEDURES (6.3.1.2)

- Responsibilities to be allocated.
- Responsibilities clearly defined.
- All instructions clear and complete.
- Documented records maintained.

RESPONSIBILITIES (6.3.1.3)

- Appointment of TWC.
- Appointment of TWS.
- Authority of TWS.
- Preparation of design brief.
- Design (drawings, calcs, spec, risk assessment, sequence if required).
- Design check.
- Procurements of materials to designer’s spec.
- Control of erection, use, maintenance & dismantling.
- Checking of erected TW, in stages if required.
- Permit to load/dismantle (if required).
TEMPORARY WORKS CODE OF PRACTICE

Procedures:
Temporary Works Co-ordinator

BS 5975 2008+A1:2011

The appointment of a TWC should be the first operation in a chain of events culminating in the construction of a temporary works scheme.

RESPONSIBILITIES OF TWC (7.2)

• Responsible to “designated individual”.
• 1st point of contact between designer and site team.
• Procedures to be implemented on site.
• To ensure design implemented in accordance with drawings & spec.
• TWC to have authority to stop work if not satisfactory.
ACTIVITIES OF TWC

• Co-ordinate all TW activities.
• TW register is established & maintained.
• Responsibilities allocated & accepted.
• Design brief is prepared.
• Satisfactory design carried out.
• Design check carried out.
• Maintain register of drawings, calcs, etc.

ACTIVITIES OF TWC

• Design fully issued to site supervisors.
• Checks made at appropriate stages.
• Any changes approved by designer.
• Any changes or remedial works correctly carried out.
• All appropriate maintenance carried out.
• Issue permit to load.
• Issue permit to unload.
• Safe system of work in place for dismantling.
• TWS’s comply with procedures.
Before erection commences, the temporary works design should be independently checked for:

- Design concept
- Strength and structural adequacy
- Compliance with the design brief

Recommendations on the independence of the checker are given in BS 5975.
DESIGN BRIEF

- All concerned with construction should contribute (8.1).
- All data relevant to design (8.2).
- Size of brief suitable for size/complexity of scheme (8.3).
**DESIGN BRIEF (8.4)**

- Design of permanent works.
- Designer’s Risk Information.
- Programme for design, erection, loading and removal.
- Proposed equipment.
- Site information.
- Permanent works, info and specification.

**DESIGN PROCESS**

- Start with design brief.
- Co-ordinate with TWC as design develops.
- Co-ordinate with PW designer as required.
- Co-ordinate with checker (?)

**DESIGN CHECK**

- Categories 0 – 3.
- Based on complexity of design.
ROLE OF TWC

TEMPORARY WORKS DESIGNERS

SITE STAFF

LOCAL AUTHORITY STATUTORY UNDERTAKINGS

SUB-CONTRACTORS

SITE STAFF

CLIENT DESIGN TEAM

CDM CO-ORDINATOR

PARTY WALL SURVEYORS
TEMPORARY WORKS CO-ORDINATOR

Responsibilities:

• Co-ordinate all TW activities.
• Communicate with all parties involved.
• Ensure design briefs are prepared.
• Ensure TW are designated and checked.
• Ensure TW are erected/used/dismantled in accordance with the documentations.
• Issue permits to load/dismantle.
• Keep records.
• Trained and competent person on site to oversee TW procedure.
• Identify temporary works requirements.
• Plan/program temporary works.
• Obtain designs and seek approvals.
• Check method statements and risk assessments.
• Complete temporary works register.
• Check competence of TWS.

When Things Go Wrong
Our Services

- TWC/TWS training
- Design Appreciation training
- TWC provision to contractors and clients
- Site Inspections and Audits
- TW Design and CAT3 Checking

ANY QUESTIONS?