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health and safety

# Hong Kong Construction week 2016

Design for Safety: A Temporary Works perspective

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# A Day in London





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# History

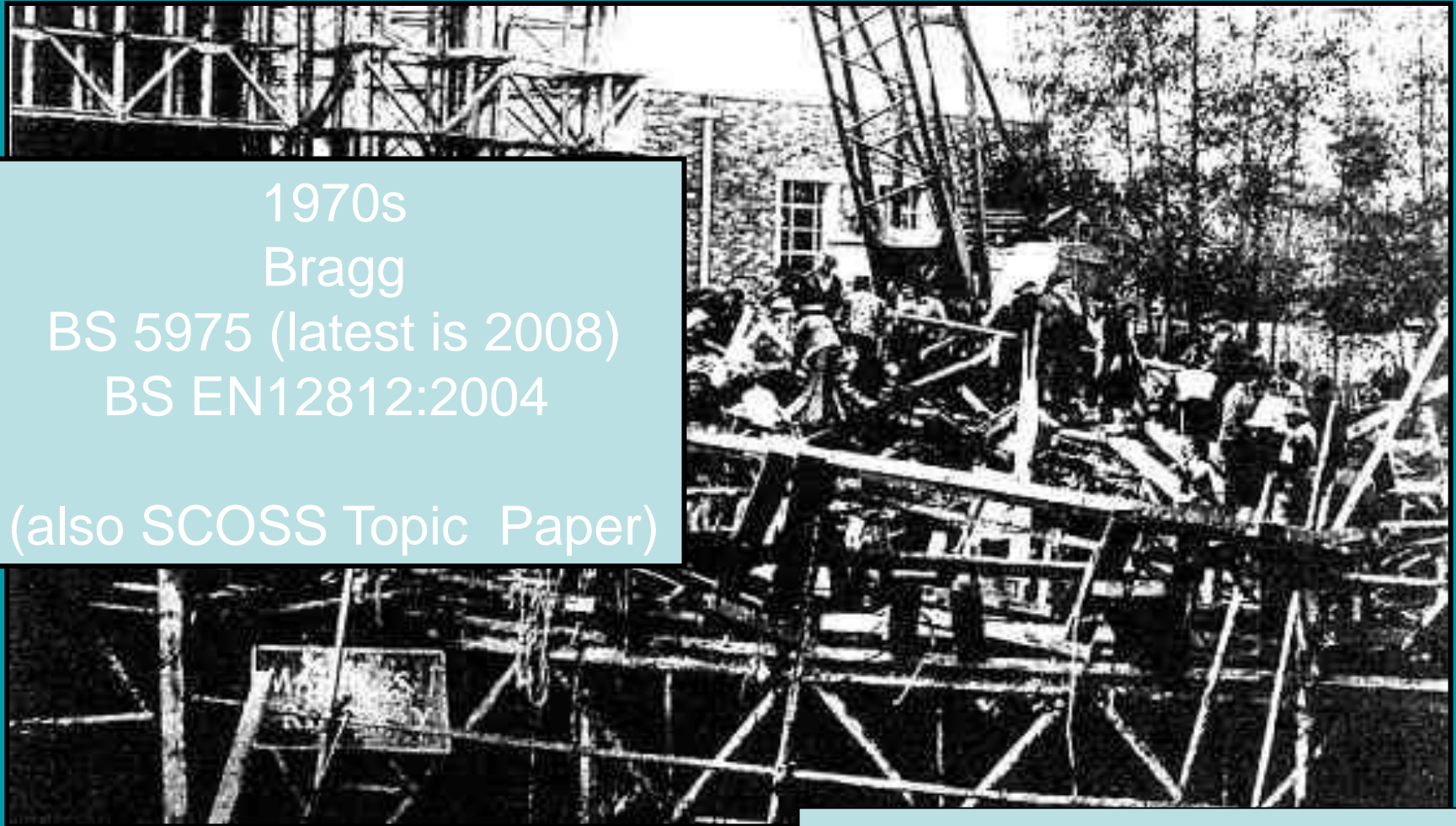
1970s

Bragg

BS 5975 (latest is 2008)

BS EN12812:2004

(also SCOSS Topic Paper)



Loddon Viaduct collapse 1972

# What are Temporary Works ?

An 'engineered solution' used to

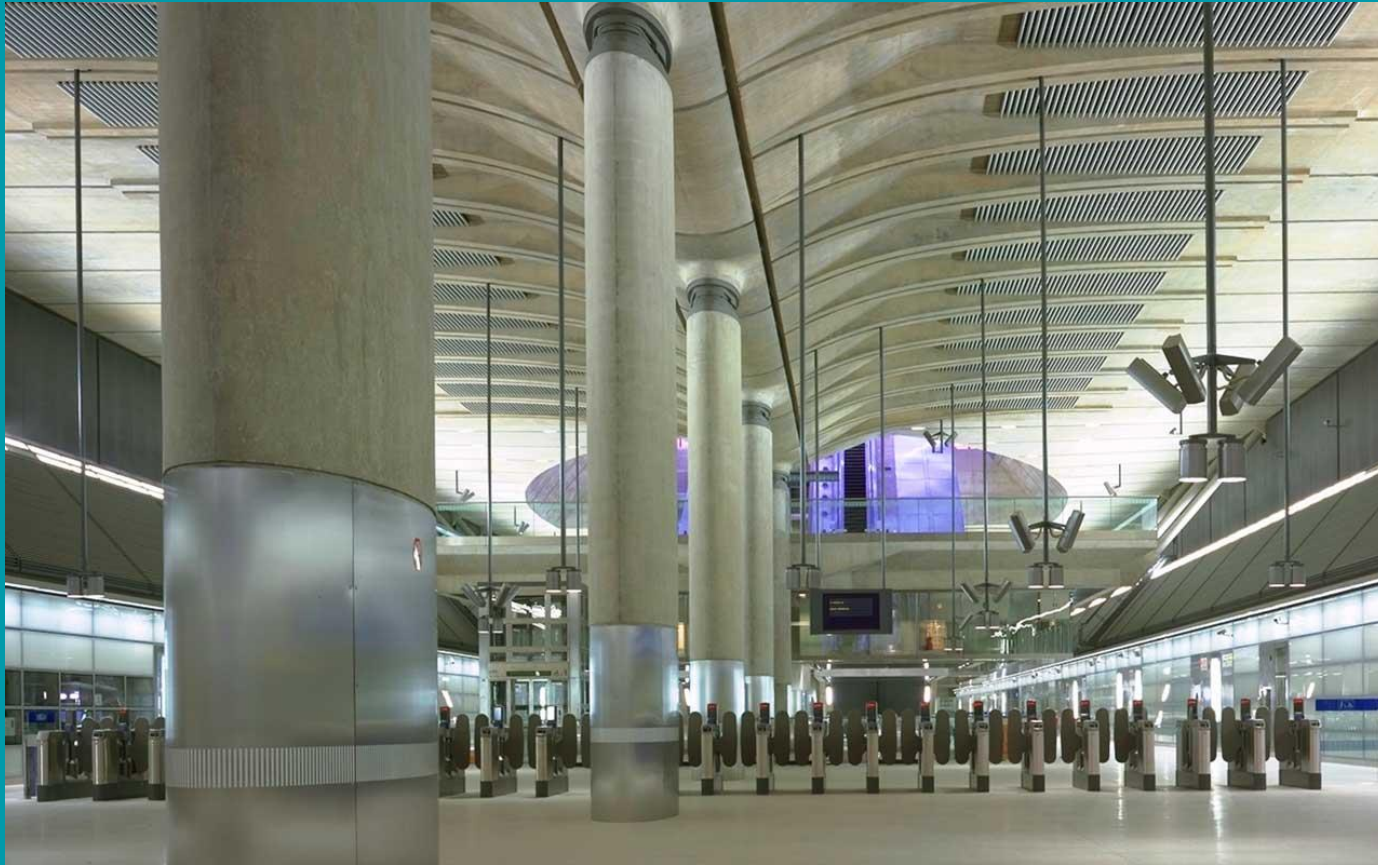
- Support or protect an existing structure or the permanent works during construction
- Support an item of plant or equipment
- Support an excavation
- Provide access



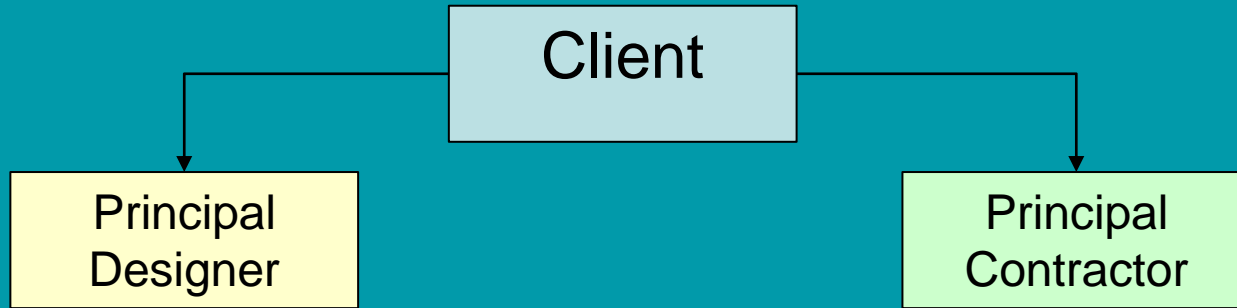
# What are temporary works?

Characteristic	Perm Works	Temp Works
In serviceability stress levels	Low	High
Robustness	High	Low
Ratio live/dead load	Typically 50:50	Typical 10:1
Duration of use	60 years plus	Days/weeks/ months
Structural interdependence	Stand alone	Supported/ brace on structure which itself influx
Planning	Widely negotiated, takes years	Quick, under production pressure
Published work, training, teaching & research	£billion industry	£million industry

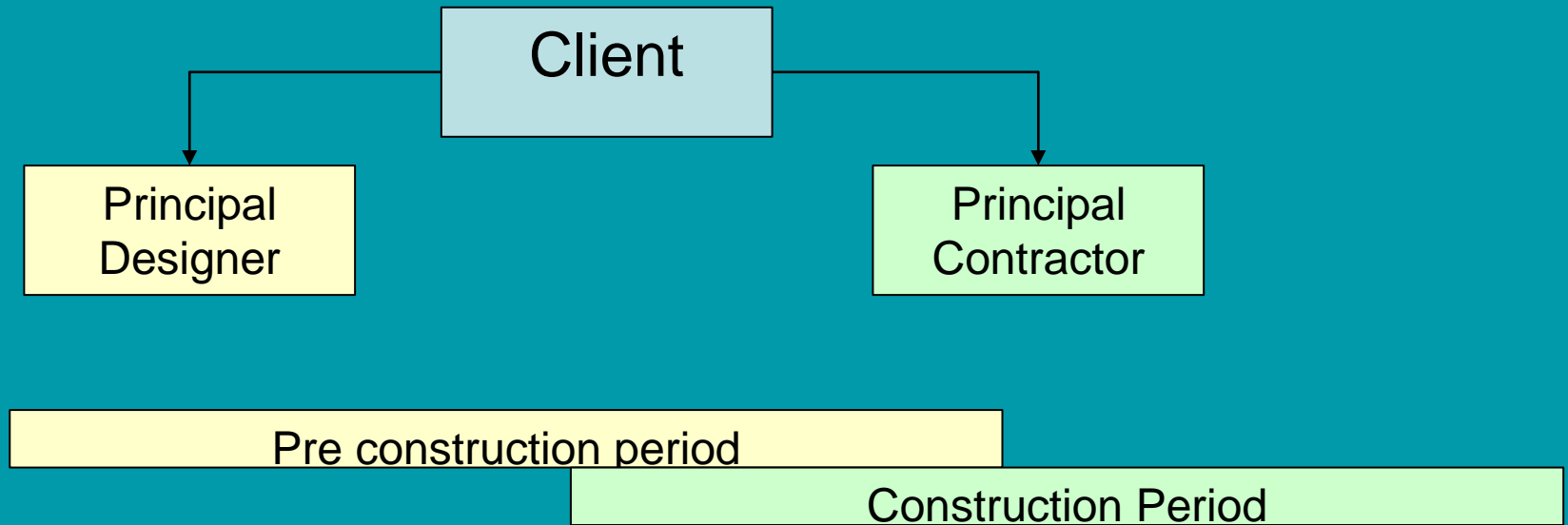
# The Canary Wharf experience



# CDM 2015 & temporary works design team

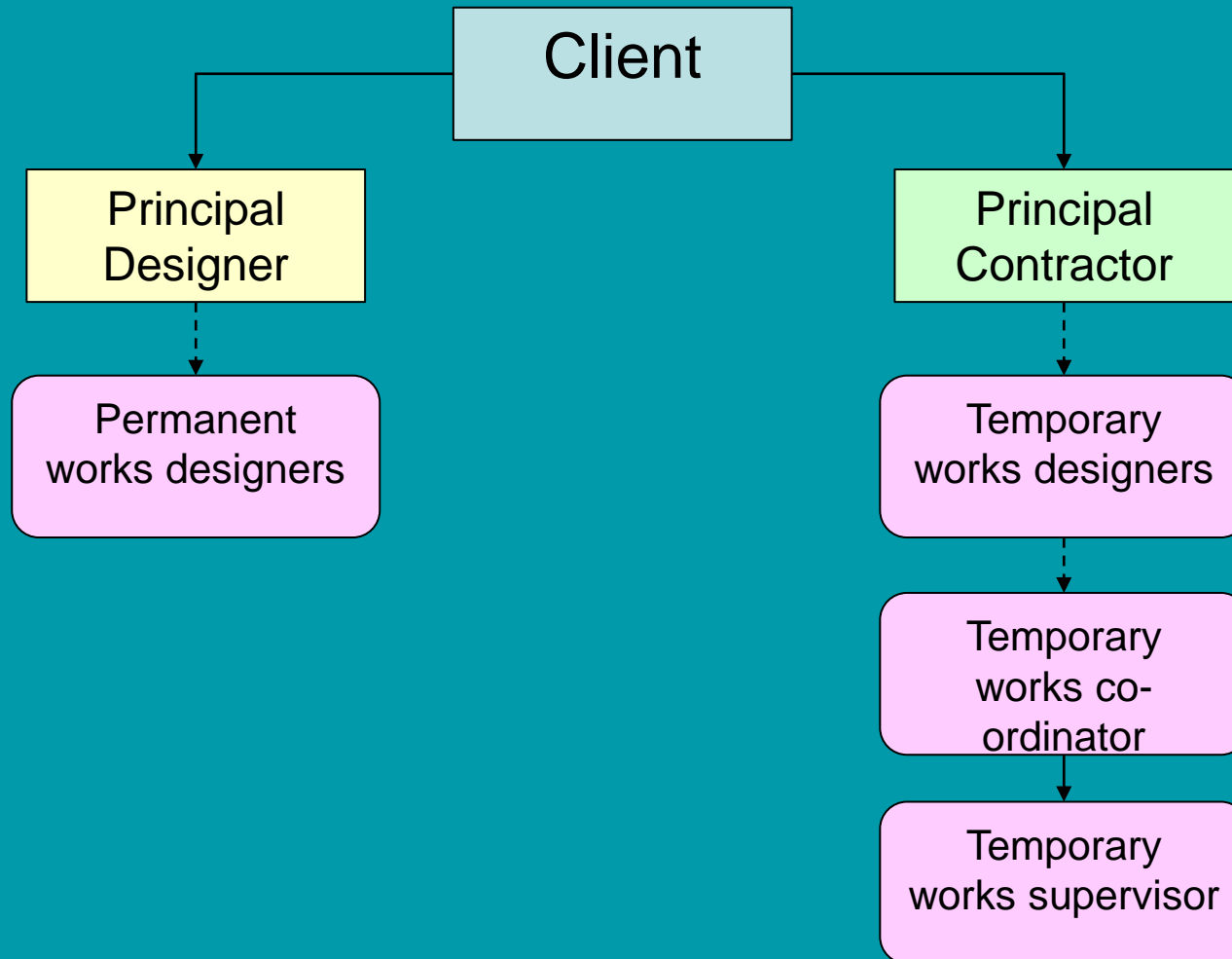


# CDM 2015 & temporary works design team

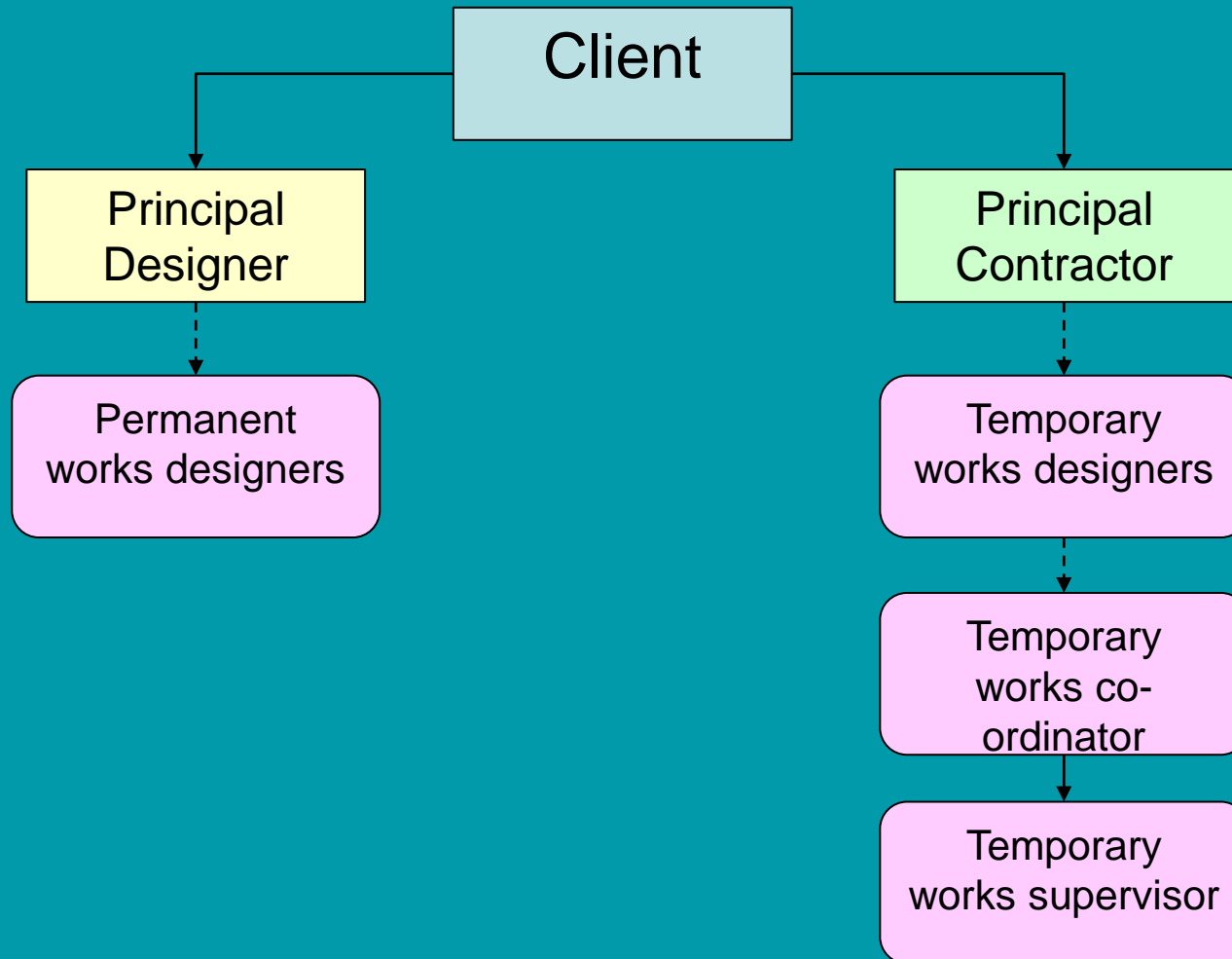




# CDM 2015 & temporary works design team



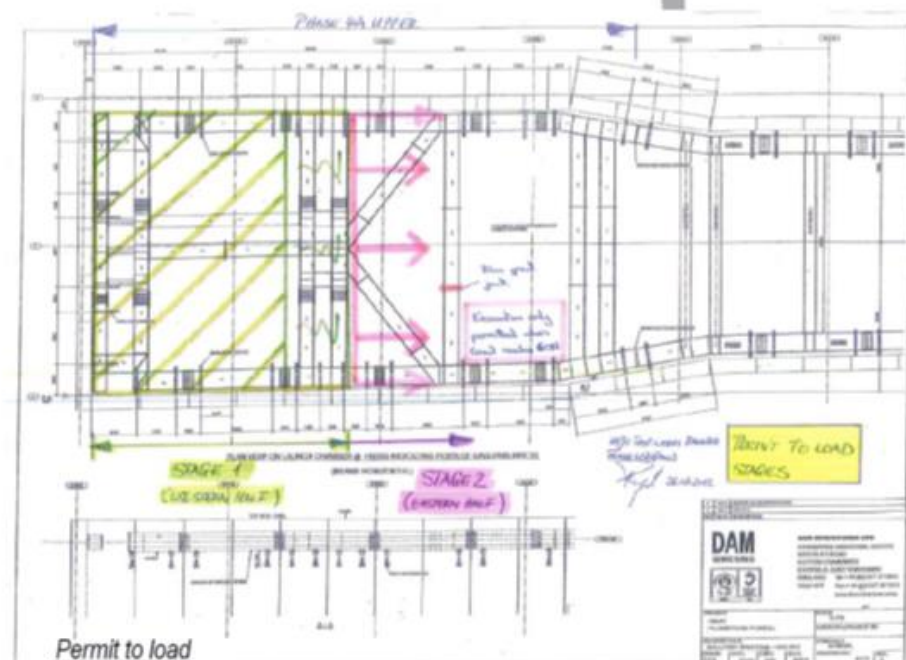
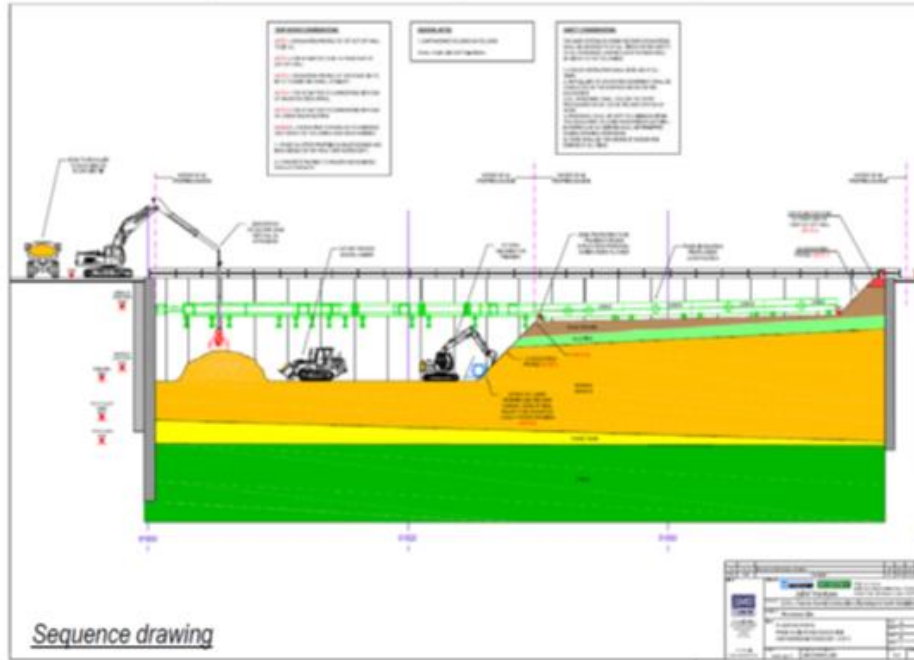
# CDM 2015 & temporary works design team



# Temporary Works Process

- Appointment of a Temporary Works Co-ordinator (TWC)
- Preparation of an adequate design brief.
- Production of a temporary works design (including a design risk assessment and a designer's method statement where appropriate).
- Independent checking of the temporary works design.
- Issue of a design/design check certificate, if appropriate.
- Pre-erection inspection of the temporary works materials and components

# BULK EXCAVATION (1)



## Case study 1 – Control of excavation depth.

Sequence drawings were produced for each stage of excavation, in accordance with the temporary propping design. The drawings clearly detailed excavation depth, batter positions, cut volumes, suitable plant and necessary lifting operations. These drawings were then approved by the Temporary Works Coordinator and a permit to load issued.

The site engineer must then ensure that the excavation depths and batter positions are maintained to avoid over-excavation.



Applied excavation profile



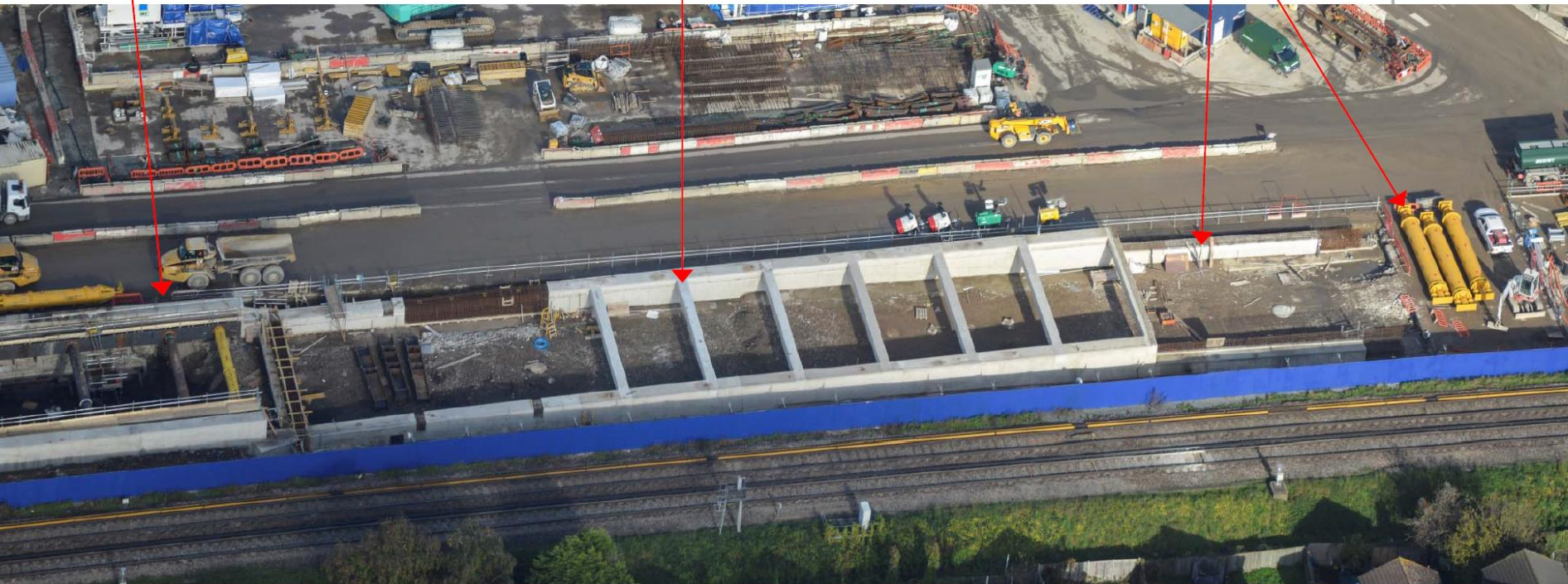
# PROPPING (1)

## Case study 1 – Design optimisation

D-wall panels extended to receive waling beam for upper propping. This eliminated the need to cast-in steel stanchions which posed design and construction concerns.

Permanent reinforced concrete props to be incorporated into roof slab, these eliminated all temporary propping throughout phase 3.

Re-design of capping beam reinforcement to receive hydraulic props directly and eliminate steel waling beams.



# Specifying construction sequence

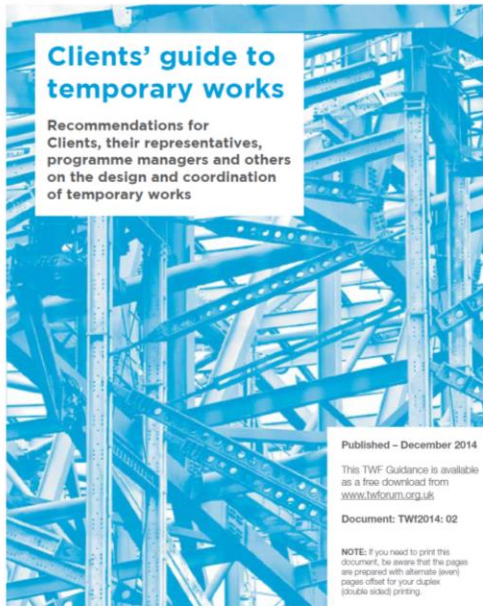




# Specifying construction sequence



# Sources for guidance





# Sources for guidance

Infrastructure Projects	Date: Nov-12
Guidance Note – Early Focus on Temporary Works and Buildability	Issue: 1


Infrastructure Projects – Building & Civils Project Engineering Discipline

## Safe by Design

### Guidance Note: Early Focus on Temporary Works and Buildability

Prepared By

 Date: 13/11/12

Name: Tom Hylahd  
Job title: Programme Engineering Manager, Wessex Route

Endorsed By

 Date: 13/11/2012

Name: Paul Clark  
Job title: Head of Engineering, Central Region

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everyone  
home safe  
every day

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# Sources for guidance



Design Guide  
CON508  
Temporary works

**SID**

**Support where it's needed**

It is tempting for designers to ignore temporary works on their projects – they are, after all, the responsibility of the contractor. But why not help minimise the hazards associated with them?

Temporary works are provided during a project either for the purpose of access, or as support until design strengths have been achieved. Designers sometimes ignore temporary works, thinking that they are the responsibility of contractors.

While this is true legally, that does not mean designers play no role in helping to safeguard against the dangers associated with temporary works. By integrating features into your design that make temporary works safer, you can help minimise their hazards.

More importantly, by staying mindful of the needs of contractors when it comes to constructing temporary works, you can be sure to specify a design that is practicable to build. Without such care, you could design a project that is impossible to build without subjecting the workforce to unnecessary danger.

**Life outside the tick box.**

[www.bidsiteguidance.com/guide](https://www.bidsiteguidance.com/guide)

# Good Temporary Works Design

- Simple and safe to fabricate, erect, use and remove
- Each is a single, fully co-ordinated design
- Robust and are sufficient as structures
- Safe access is incorporated
- Designer's intent is communicated fully and without ambiguity
- Basis of each design is clear so that the impact of changed circumstances can be understood

# And Health in design ....?

**WE ARE ALL PART OF AN INDUSTRY  
WHICH MAKES HISTORY**