Infrastructure Projects Southern

Best Practice

Managing Temporary Works

There have been recent instances where sites have not appreciated the requirements for managing Temporary Works, as they have not considered there to be any works that fall under this classification.

To assist in the understanding of when there may be temporary works you could ask yourself some simple questions:

1. Are you making alterations to the physical infrastructure not captured in the final design? Is there is a temporary condition you need to consider?

Examples could include:
Digging out a UTX to enable a cable route to cross the track. There may be risks associated with excavating a particular type of material to a particular depth, or risks associated with disturbing the track bed on a line that already has poor ballast support. This could lead to Critical Rail Temperature (CRT) issues.

Building up a ballast shoulder against existing cess support boards off the ends of a bridge. This allows the alignment of a cable route to be levelled before the boards are planned to be replaced – there may be risks associated with the additional surcharge on the existing support boards or the effective decrease in the height of the existing handrail.

Excavating along the back edge of a platform to replace a platform wall/foundation – if the fence along the excavation impinges on the passenger platform, you may create a pinch point that impacts on the ability of mobility impaired people to safely pass on the remaining platform width (these may be people with luggage/ people in wheelchairs/people with prams).

2. Could you be deviating from the final design, resulting in a temporary state? If a temporary condition could arise then you need to consider the arrangements for this to be managed.

Examples could include:
Replacing a long run of cable troughing – if the design shows an ‘indicative’ route the installer may decide to disturb the toe of a cutting along a short stretch of route to avoid an obstacle. This could result in the slope stability being impacted.

3. Could you be implementing a temporary work solution shown on the main design drawings? The assessment of how this is undertaken, the impact of ‘tweaks’ to suite site conditions and the provision of suitably qualified people to supervise the works needs to be undertaken.

Examples could include:
Design drawings may show a sequence of taking out and replacing rivets to a bridge to allow it to be strengthened under live traffic. However, if the contractor on site found that the majority of the existing rivets were corroded, there may not be sufficient structural integrity remaining to implement the planned staging.

The designer may specify a scaffold to access the area under a bridge supported from the ground underneath. The designer may not have had the buried services information or a record of ground conditions, so leaves the scaffold foundation as ‘to be designed on site to suit conditions’.

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An alternative scenario to the one mentioned above would be the designer specifying that the scaffold is suspended from the existing bridge structure and leaving the detailed calculations to the scaffold contractor. In this scenario, the scaffolding contractor may not be aware that the bridge itself will need to be assessed to ensure it has sufficient spare capacity to support the scaffold.

If you are undertaking <u>demolition</u> works, you may need to consider temporary works:
Temporary works may be used to provide support during temporary conditions, to ensure it does not lead to a structural failure incident. This type of structural support may be inside or outside the structure being demolished, or for purposes of protection in adjoining structures. Temporary works are also used to enable plant and personnel access and working platforms, to provide security fencing, site accommodation and welfare and will almost certainly provide critical support for the dismantling of individual elements within a structure.

Temporary works typically seen on demolition projects that may not be obvious include:
• Hoardings and site fencing
• Traffic and pedestrian barriers
• Site welfare and offices (including temporary units, as well as change of use of part of the structure to be demolished)
• Signage
• Ramps
• Exclusion zones
• Scaffolding
• Tower scaffolds and similar access systems
• Temporary stair and ladder access towers
• Support systems/propping
• Shores (flying and raking)
• Facade Retention Systems and party wall support
• Edge protection
• Tower crane bases
• Anchors and ties
• Working platforms used for cranes, high reach machines or drilling/piling rigs
• Support work to party walls, floors and excavations

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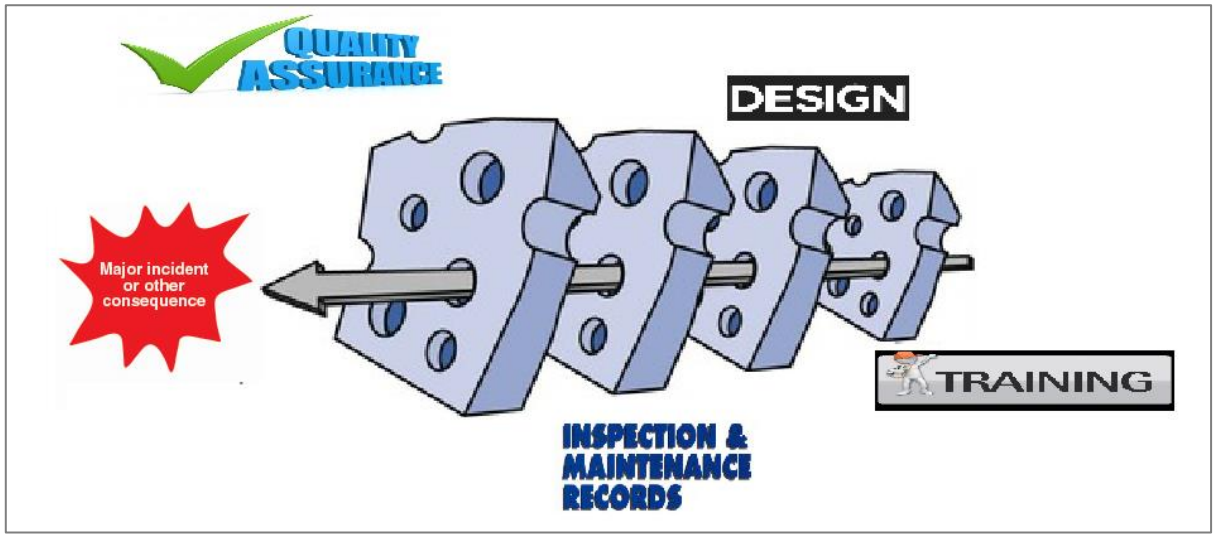
Barriers to preventing an incident:

A simple breakdown of the steps that should be considered, recognised as a 'Swiss cheese model', identifies the barriers that are put in place to prevent a hazardous event occurring.



Training:

- Network Rail, as the CDM Client, should ensure that everyone undertaking Principal Designer or Principal Constructor duties has the capability to do so.
- The Principal Designer and Principal Contractor should appoint organisations and individuals (designer or contractors) that have the capability to undertake their work in accordance with the CDM Regulations and covered by the Lifesaving Rules.
- The Principal Contractor should ensure a competent Temporary Works Coordinator is appointed to manage the temporary works requirements. A Temporary Works Register should be kept on site.
- The Construction Phase Plan (CPP) should list the requirement for temporary works. The Works Package Plans and Task Briefings should identify not only the requirements for the physical temporary works, but the requirements with regard to the capability of people involved in the design, installation, supervision, commissioning, inspection/monitoring, maintenance and removal.

Design:

- The Principle Designer should consider construction, operation, maintenance and removal as part of the design reviews. This would involve someone with suitable expertise looking at the project and deciding the best construction methodology – applying the general principles of prevention (and some common sense).
- The Principal Contractor should be handed over, as part of the Pre Construction Information, the hazards and risks. The Design Documents should highlight the hazards and risks, as well as specifying the temporary works requirements.

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- The Principal Designer and Principal Contractor should have ongoing dialogue regarding the design (remembering that Temporary Works Design should have been covered by the Principal Designer under their duties). If the Principal Contractor is appointed and asked to take on the Principal Designer's role, then the discharging of the duties would have been part of their requirement.
- The Temporary Works Coordinator should look at the design, construction, supervision, commissioning, monitoring and removal of any temporary work.

Inspection and Maintenance:

- The Principal Contractor/Contractor should carry out inspections, tests and maintenance associated with the planned temporary works as the works progress. This should form part of the Inspection and Testing Plan for the works.

Quality / Assurance:

- The DPE should capture, via the Engineering Appointments (in accordance with NR/L2/INI/02009), the arrangement for the Temporary Works Management.
- The DPE should ensure the Hazard Management process is in place for these works and is being actively managed to deal with emerging risks.
- NR/L2/CIV/003 is the Building and Civils Assurance Standard that asks, for specific circumstances, Temporary Works Designs to be submitted for Network Rail review and acceptance. Other disciplines have similar requirements (staging diagrams for Track and Signalling etc.).
- The DPE should look at the Inspection and Testing Arrangements for the site works to ensure they were adequate.

Discussion points:

- Can you think of any other barriers that could act as another layer in the Swiss Cheese Model?

- How effective do you think the barriers we have are (how big are the holes)?

- Are there behavioural issues that make these barriers less effective?

- What do you think your contribution is to the success or failure of these barriers?

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In summary, the key points relating to temporary works are:

- The works should have been planned in accordance with the requirements of CDM 2015.
- Contractors, in line with the industry Code of Practice (BS5975), should already have in place within their organisation the procedures and the suitably qualified individuals (Temporary Works Coordinators) to help them manage the risks that may arise from temporary works and to ensure that temporary works are captured in a Temporary Works Register.
- Network Rail should identify the Temporary Works and the Temporary Works Coordinator in our documentation (CPP).
- The Designated Project Engineer should capture the appointments in accordance with NR/L2/INI/02009 and the ECMP.
- NR/L2/CIV/003 outlines the requirements for the design of Temporary Works on Building and Civil Engineering Schemes. For disciplines such as Signalling, Track and Electrification the temporary works are captured as part of the technical deliverables that must be in place and accepted by Network Rail before the work commences (Staging Diagrams etc.).
- The Temporary Works Design should consider design, installation, supervision, commissioning, inspection/monitoring, maintenance, and removal.
- The Construction Phase Plan (CPP) should have listed the requirement for temporary works. The Works Package Plans and Task Briefings would have identified not only the requirements for the physical temporary works, but the requirements with regard to the capability of people involved in the design, installation, supervision, commissioning, inspection/monitoring, maintenance, and removal.

Further information:

Network Rail have produced a Safe By Design Guidance Note - Temporary Works and Buildability - that gives further guidance on this subject along with examples of what could go wrong.

There is also Temporary Works Forum Guidance that has been produced for the Construction Industry, aimed at Clients and Programme Managers.

Further information can also be obtained from:

Tom Hyland *IPS Lead Discipline Engineer for Building and Civils and co-author of the Guidance*
Mike Gray *Principal Construction Manager*
Rupert Randhawa *Head of Engineering*