



**TRANSPORT SCOTLAND (Agency of the Scottish Executive)
TRUNK ROAD & BUS OPERATIONS (Bridges & Structures Team)
TS INTERIM AMENDMENT No 42 – Temporary Cover Plates over Bridge Expansion
Joints**

SUMMARY

This Transport Scotland Interim Amendment (TS IA) highlights the issues to be considered when using temporary cover plates.

1. BACKGROUND

This interim amendment draws attention to potential issues when using temporary metallic cover plates over damaged or failed bridge expansion joints. Recently such a plate, being used by another bridge owner, was dislodged resulting in a serious accident. A proprietary cover plate was used to temporarily provide a running surface over a damaged expansion joint, to allow traffic to continue to use the road, and avoid the need for prolonged lane closures. This plate failed in service resulting in a taxi and a motorcycle crashing into it, causing physical damage to the taxi and serious injuries to the motorcyclist. This TS IA identifies some of the engineering and other operational issues that should be assessed when these plates are being considered, and to ensure that appropriate technical approval certification is in place.

2. ACTION

Steel plates deflect and deform under loading. The amount of this deformation will depend on a number of factors like the application of load, the thickness of the plate, the span, the support, etc. The application of dynamic loads will induce variable conditions that designers should take account of in their design. It is important that sufficient scrutiny is given to the design and maintenance of any temporary works, such as cover plates. There are at least two proprietary systems for temporary cover plates currently on the UK market, and bespoke designs have also been used.

Designers and Contractors should consider a number of factors when assessing the requirements of temporary cover plates for expansion joints. This list is not exhaustive and designers should satisfy themselves that they have taken account of relevant design factors.

Operational issues

- The potential for the plate to cause an obstruction (bump/step/ramp) on the approach and transition to the coverplate
- The need for a speed restriction and enforcement (eg angle of plate edge to direction of travel, geometry of site, behaviour of traffic, the need to keep noise down).
- The need for a weight restriction (suitable for HGVs or cars only), at the site, and how it impinges on the local traffic flows.
- Identify and specify any additional requirements for pedestrians, equestrians, cyclists, motorcyclists.
- Plan the work to minimise the period that the plate is in place
- Consider changes to noise levels that may result, and their effect on the local environment
- Consider drainage issues and how the installation of the plate will affect these.

Engineering issues (design and installation)

- Avoid bumps, steps and ramps in the transition between road surface and coverplate
- Ensure the plate has adequate skid resistance, on its running surface.
- Ensure that the plate covers the full lane width affected and there are no gaps between the road surface and the plate or between adjacent plates.
- Ensure that the plate is suitable for the design loads and the timescale for which it will be in place

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- Ensure that the plate will carry the loads without excessive deflection/displacement, and that the effects of deflection/displacement under the design loads are taken account of both in the plate and the required temporary works.
- Ensure that the fixings and their connection to the road surface are adequate for the traffic speed and loads – particularly the substrate for the fixing, and the robustness of the system under cyclic loading, and to facilitate periodic removal and replacement where required
- Consider the noise levels arising from the use of the coverplate and ensure any mitigation measures such as speed or weight restrictions are put in place
- Ensure that drainage issues, and ponding or icing issues are addressed
- Ensure design requirements and any assumptions made for the coverplate, its fixings and the road are clearly set out
- When specifying a cover plate, consider fabrication, transportation and installation issues
- Confirm the condition and profile of the carriageway surfacing has been allowed for in the design.
- Consider if weather conditions during installation will require different procedures. This may be temperature limits on fixings, extending waiting times or if the design parameters are exceeded, etc.
- Specify a maintenance and inspection regime for cover plate
- Ensure that the effects of regular removal and replacement of the cover plate if required to facilitate repair of the overspanned expansion joint are taken into account.
- Ensure that manufacturer's special requirements are met
- Ensure that the coverplate and fixings are installed by competent personnel

Maintenance and inspection of temporary cover plates

- Procedures for inspection and maintenance of the coverplate and its fixings should be set out.
- Requirements for inspection and maintenance of the coverplate and its fixings should be minimised
- Cover plates and their fixings are inspected by suitable qualified/knowledgeable people
- Inspection intervals of the cover plate and fixings should be specified
- Any defects are reported and rectified quickly.

Investigation of the existing bridge

- Checks should be carried out to ensure that the load from the cover plate and the overspanned damaged expansion joint does not adversely affect the existing structure
- Sufficient investigation is carried out to identify that any anchorages can be safely installed to the required depth, will transfer loads without damage, and can be removed and the existing structure reinstated

3. TECHNICAL APPROVAL CERTIFICATION

Those areas of Temporary works, such as cover plates, are normally arranged and managed by Operating and DBFO Companies and may not have been covered by separate formal technical approval in the past.

Operating and DBFO Companies and Contractors are reminded that these types of Temporary Works are covered by BD 2/12 'Technical Approval of Highways Structures' which sets out the appropriate procedure.

Temporary Cover Plates are a Type P proposal and the appropriate category must be agreed with Transport Scotland Bridges Section. (BD 2/12 Clause 4.6(ii)). For Type P proposals, the Category must be 2 or 3, unless a lower Category has been agreed with the Transport Scotland Bridges Section.

These provisions apply to any temporary measures intended to allow live carriageways to be operational until permanent repair/replacement of expansion joints can be undertaken. This includes plates placed directly over joints, which may or may not be hinged, and other solutions like buried plates covered by pavement surfacing.

4. IMPLEMENTATION

Operating Companies and DBFO Companies already have a responsibility to design temporary works and provide appropriate solutions, and to provide the required necessary certification. No additional costs are anticipated.

This TS IA should be implemented on all schemes, where these types of plates are to be used, with immediate effect.

5. FURTHER INFORMATION

If you have any questions regarding the use or content of this document, please contact the relevant Transport Scotland Unit Bridge Manager or Major Bridges Manager.