



**TRANSPORT SCOTLAND (Agency of the Scottish Executive)  
TRUNK ROAD & BUS OPERATIONS (Bridges & Structures Team)  
TS INTERIM AMENDMENT No 36 – Structural Safety Reporting**

**SUMMARY**

This Interim Amendment provides guidance on structural safety reporting.



## 1. BACKGROUND

TS IA 36 provides guidance on structural safety reporting relating to Trunk Roads on the Transport Scotland Network.

The collation and dissemination of information relating to matters of structural concern is a vital element of achieving safe structures. The Standing Committee on Structural Safety (SCOSS) and their Confidential Reporting on Structural Safety scheme (CROSS), is interested in events where there have been failures, collapses or any concerns about any part of the construction process, on all of Transport Scotland's construction sites. SCOSS is also interested in reports relating to near misses, or observations relating to collapses where these have not been uncovered through formal investigation.

Reports are treated in complete confidence and all identifying features and names are removed before the data is reviewed by an independent panel of experts and comments are added. Comments are non-judgmental, and aim to help others learn from the reported event. CROSS will analyse the data and SCOSS will then use its influence with Industry, Institutions, and Government to effect changes where this is seen to bring sustainable benefit by improving structural safety. CROSS publishes quarterly Newsletters and maintains a data base of reports on [www.cross-structural-safety.org](http://www.cross-structural-safety.org), whilst SCOSS publishes a range of reports, topic papers and alerts on matters of concern. Further information about SCOSS/CROSS is provided in Annex A.

## 2. ACTION

Structural Safety events related to any Transport Scotland schemes or contracts should be reported via the CROSS [www.cross-structural-safety.org](http://www.cross-structural-safety.org) website. A sample report is produced in Annex B.

Reports do not have to be about current activities so long as they are relevant. Whenever an incident occurs, or a concern is felt, then it can be reported. Structural Safety Reporting is not a substitute for internal (Health & Safety, or other) reporting processes, though can be used in parallel. This scheme does not apply to Occupational Health and Safety issues.

The reports can be submitted by anyone within the Transport Scotland and its Supply Chain, involved in the building and civil engineering professions, including Structural and Civil Engineers. Reports will also be welcome from others, who have an interest in structural safety.

## 3. IMPLEMENTATION

This TS IA should be disseminated across all of the Transport Scotland supply chain. It should be used with immediate effect on all Transport Scotland Schemes and contracts.

## 4. FURTHER INFORMATION

If you have any queries about individual schemes, please contact the relevant Transport Scotland Unit Bridge Manager.



## Annex A: SCOSS/CROSS – Further Information

The Standing Committee on Structural Safety (SCOSS) is an independent body which has operated since 1976 by gathering information from general sources about structural failures and incidents, considering the reasons underlying these, and publishing sixteen biennial reports containing the findings. SCOSS is supported by the Institution of Civil Engineers, the Institution of Structural Engineers and Health & Safety Executive, to maintain a continuing review of building and civil engineering matters affecting the safety of structures.

The Confidential Reporting on Structural Safety (CROSS) was launched by SCOSS in 2005. It is a programme for collecting, analysing, and publishing concerns about the safety of structures. The purpose is to learn from the experiences of engineers and others, disseminate information from these experiences for the benefit of the public and those throughout the construction industry, influencing change in behaviour to prevent the same type of events happening again. CROSS Newsletters are sent to those who register on their web site; they will also be posted on the Highways Agency site.

Key features of the scheme are to be non-judgmental, to promote a positive attitude to learning from experience, to be seen by all sides of industry as impartial, to analyse and evaluate reports, to provide advice and guidance in Newsletters, to give feedback to industry and regulators, and to provide complete confidentiality for reporters.

The prime function of SCOSS is to identify in advance those trends and developments which might contribute to an increasing risk to structural safety. To that end, SCOSS interacts with the professions, industry and government on all matters concerned with design, construction and use of building and civil engineering structures.

An example of how the system operates is its handling of fixings' failures. A number of reports were received about collapses of heavy ceilings and other installations due to inadequate fixings. This has resulted in the Construction Fixings Association promoting a new BS Code of Practice for the use of anchors in safety critical applications. The drafting is due to commence in 2010. In addition, the fixings industry, in conjunction with SCOSS, is drafting a guide to ceiling fixings.

### Report Form

There is an online report form (<http://www.cross-structural-safety.org/submit-report/>) that can be used or there is a postal system for those who do not wish to use emails.

A report should give;

- a description of the event or concern
- if there was a failure then the cause of the failure if known
- lessons that could be learnt.

An example showing how an important message can be conveyed in a few paragraphs is given in Appendix B.

Further information about SCOSS/CROSS can be found at:

[www.scoss.org.uk](http://www.scoss.org.uk)

[www.cross-structural-safety.org](http://www.cross-structural-safety.org)

## **Annex B: Example Report, including CROSS Comments**

### **Bridge Counterweight failure**

A component failure on a lift bridge has resulted in a 22 tonne counterweight falling some 5.0m onto a public highway. The road was not open to traffic at the time and there were no injuries. The lift bridge is of the Dutch style with an overhead counterweighted frame and carries an unclassified road over a canal. The failed component was the connection between the counterweight and one of the longitudinal arms of the overhead frame. This had eight bolts passing through the arms of the frame into threaded holes in each endplate of the counterweight. Only the bolt heads were visible and it was not possible to ascertain the bolt condition through normal inspection procedures.

One of the principal connections failed as the bridge deck was going through its normal closing cycle. Investigations indicate that the bolts in this connection yielded in shear probably due to uneven distribution of load between bolts and fatigue due to cyclic loading. Once this connection gave way the other principal connection followed suit in a twisting manner as a number of its bolts yielded in tension. The secondary cross bracing connections also failed and the counterweight fell to the ground. Subsequent actions by the owner were to close all of its structures of a similar type and check them for hidden and inaccessible connections. Where these were found further investigations followed to ascertain the condition of the connections. In a couple of cases, where connections could not be immediately exposed, the bridges were kept out of service or alternative supports provided until the condition of the structures was assured.

### **CROSS Comments**

The issue is the importance of inspection to enable maintenance to be carried out. Accessibility for in service inspection is a basic requirement on any structure with moving parts. There is a fundamental difference between static structural engineering and cases where wear, vibration and fatigue are caused by mechanical movements. An ongoing theme at SCOSS is robustness and the possibility of the failure of one component leading to failure without warning. The issue is also addressed in the Institution of Structural Engineers report 'Practical guide to structural robustness and disproportionate collapse in buildings'.

**[The original report also included photographs.]**