TRANSPORT SCOTLAND INTERIM AMENDMENT 46/26

STRUCTURES INSPECTOR COMPETENCIES AND CERTIFICATION

Summary
This Interim Amendment provides details on the competencies required for structures inspectors and their certification.

Instructions for Use
This document supplements the requirements of CS 450, The Inspection of Highway Structures, and takes immediate effect.

Structures Inspectors Competencies and Certification

1. Background

1.1 One of the fundamental activities at the disposal of bridge owners to ensure their assets are safe for use and fit for purpose is inspection. Inspections assist organisations to check that bridges and other structures are safe for use and fit for purpose and provide the correct data required to support effective maintenance management and planning. It is therefore critical that inspections provide organisations with information in which they can have full confidence.

1.2 Generally bridge inspection practices in the UK have been highly successful and helped ensure safe and serviceable networks. This being largely due to the skill and experience of inspection staff. However, studies have identified a lack of consistency in inspection reporting, while the use of asset management plans and decision support tools have created a greater need for better quality inspection data, both in terms of consistency and accuracy. International, high-profile bridge collapses in the United States, Canada and China have highlighted the importance of rigorous inspection routines.

1.3 The need for formal training has been widely discussed at various forums, not only to address issues such as those mentioned above, but also to help raise the profile and importance of inspectors at a time when many organisations are aware of dwindling numbers of inspection staff. CS 450 'Inspection of Highway Structures', places a responsibility on the Supervising Engineer to assess the suitability of the qualifications and experience of prospective inspectors before engaging them. However, there has been a lack of guidance on the qualities or competencies that are required and it has been up to the individual to determine their own criteria for suitability.

1.4 A range of major bridge owners in the UK and Ireland have now produced a set of competence requirements which outline the required awareness, knowledge, experience and proficiency in areas relevant to the bridge inspection and reporting process.

2. Action

2.1 These requirements are in addition to the requirements stated in CS 450, The Inspection of Highway Structures. Where the term 'bridge' or 'bridges' appears in this TSIA that is deemed to cover structures within the boundaries of the Trunk Road or which otherwise materially affect it, and also structures within the domain of rail and waterway sectors that are maintained by Transport Scotland. These typically include: bridges, footbridges, culverts, retaining walls, gantries, masts, large signs and other structures within the scope of CS 450.

2.2 Personnel wishing to undertake inspections on structures owned or maintained by Scottish Ministers must be able to demonstrate the level of competence for the role which they are proposing to undertake. Three categories of inspector are considered appropriate: Associate Inspector, Inspector and Senior Inspector. These recognise different skills and experience of inspectors and requirements for the future. Different levels of competencies are prescribed for Associate Inspectors (AI) Inspectors (I) and Senior Inspectors (SI). These competencies are defined in the certification scheme manual (see Appendix A of this document). The primary differences between the competence requirements are that an Associate Inspector can inspect simple, low risk structures and a Senior Inspector must be able to demonstrate broader experience and proficiency of the relevant areas and have evidence of having advised others.

2.3 For an Associate Inspector, a knowledge based test must be completed successfully. For Inspector or Senior Inspector a comprehensive package of evidence, which demonstrates achievement of the competence requirements, must be assessed by an independent assessor. The assessor shall undertake a review of the evidence presented and, if this is acceptable, a face to face interview shall be undertaken to confirm that the candidate is suitable and they would become a 'certified' Inspector or Senior Inspector. Once assessed, a further review of experience and knowledge would be undertaken at regular intervals, if deemed necessary by Transport Scotland. Whilst completing the knowledge test or compiling their evidence prior to submission and examination by an assessor the Associate Inspector, Inspector or Senior Inspector will be regarded as a 'trainee inspector' and their role will be limited as set out below.

2.4 The assessor shall be a person who has had their competencies reviewed and examined by a relevant quality assured independent organisation and the certification shall be issued by, or on behalf of, that organisation.

2.5 All three Inspector roles require Inspectors to have the necessary competencies to undertake Principal Inspections, General Inspections, and Acceptance Inspections. Inspections for Assessment, Special Inspections and Monitoring Inspections should be undertaken by personnel with the specialist expertise and experience relevant to the purpose of the inspection and it is expected that these personnel will be accompanied by a certified Inspector or certified Senior Inspector.

2.6 The acceptance of inspections on AMPS and the Supervising Engineer duties shall be undertaken by organisations or personnel authorised by Transport Scotland.

2.7 The following are the requirements of Transport Scotland for the suitability of personnel undertaking inspections:

a) Personnel undertaking inspections shall have achieved the competencies required as set out in the scheme manual (see Appendix A of this document) and achieved certification, except as in b) below;

b) Trainee Inspectors may assist certified Associate Inspectors, Inspectors or certified Senior Inspectors; however their numbers and role shall be limited. For a small or medium structure which requires a 1 or 2 person inspection team to complete the inspection a Trainee Inspector may accompany a certified Associate Inspector, Inspector or Senior Inspector but cannot undertake an inspection on his/her own. For the inspection of a more complex or larger structure the certified Inspectors and Senior Inspectors may be supplemented by Trainee or Associate Inspectors who can make up to 25% of the team which are on site throughout the inspection. This is intended to balance the requirement for experienced personnel and requirements for training;

c) Associate Inspectors may undertake inspections on his/her own but the type of structure shall generally be limited to Category 0 and 1 structures as defined in CG 300. The structures which can be inspected by an Associate Inspector are set out in AMPS and may be subject to review and updating.

d) It is recognised that junior engineers/technicians can gain useful experience by being involved in bridge inspections, although this may form a small part of their workload. This experience can be gained by observing the work being undertaken by the certified Inspector(s);

e) For complex structures, where unusual elements or load paths exist, a certified Senior Inspector with the relevant competencies should lead and undertake the inspection. Such structures are likely to have one or more of the following features :

i. Skews greater than 25^0;
ii. Unconventional or novel design aspects;
iii. Half-joints, hinge-joints or post-tensioning;
iv. Any individual span exceeding 50m;
v. History of unresolved foundation problems, significant structural defects, or significant safety issues, or subject to CS 470 interim measures;
vi. Moveable bridges;
vii. Scour susceptibility;
viii. Moveable inspection access gantries, gantry rail and gantry support systems;
ix. Suspension systems (e.g. cable stayed, or suspension bridges); and
x. Retaining walls greater than 6m in height.

f) For structures of uncommon materials, such as laminated timber or fibre composite materials, certified Inspectors with knowledge and experience of those materials and the mechanisms of deterioration shall only be used.

3. Bridge Inspector Certification Scheme

3.1 In order to streamline the process of reviewing and examining the competencies of prospective inspectors the 'Bridge Inspector Certification Scheme' (BICS) has been developed. This has been jointly developed by the UK Bridges Board and the Transport Infrastructure Ireland (previously Irish National Roads Authority) and has been overseen by a steering group of asset owners, including ADEPT, Department for Transport, National Highways, London Bridges Engineering Group, London Transport Asset Management Board, Transport Infrastructure Ireland, Transport for London and Transport Scotland. The scheme is being administered by LANTRA and will become National Highways Sector Scheme 31.

3.2 The scheme considers seven core competencies which are applicable to the role of inspectors in all sectors and three material modules. Core modules of the scheme, which address these requirements, are detailed in the guidance available. Material modules can be completed for one, two or all three material types. Further modules, which address specific areas of interest, may be developed and included as additional specialist modules, as required by different sectors or organisations.

3.3 Within the scheme the route to becoming a certified Associate Inspector, Inspector or Senior Inspector involves five key stages

Stage 1 – Enrolment on the BICS as a Trainee Inspector and either undertake a knowledge test (Associate Inspector) or obtain an e-portfolio (Inspector or Senior Inspector). Note the term 'Trainee Inspector' is a scheme term and is not intended to diminish the status of current inspectors who may be very experience;)
Stage 2 – Achievement of the knowledge test to become an Associate Inspector;
Stage 3 – For Inspector or Senior Inspector, achievement of the required level (awareness, knowledge, experience and proficiency) of competencies, as outlined in the Core Modules as a minimum and populate the e-portfolio accordingly (Additional competencies may be added);
Stage 4 – For Inspector or Senior Inspector, successful review of completed e-portfolio and external interview to achieve Certification

Stage 5 – For all grades of inspector, continued consolidation/broadening of experience for additional competencies and to maintain registration.

3.5 The Bridge Inspector Certification Scheme has the Administrator as detailed below:

Lantra Awards,
Lantra
Stoneleigh Park
Coventry
Warwickshire
CV8 2LG

3.6 For registration of interest in the scheme and to register go to:

http://www.bridge-inspectors.com

4. Existing Structures Inspectors

4.1 There are a significant number of existing inspectors who have extensive knowledge and experience of structures' inspections. It is critical to the bridge community that these highly valued inspectors are not 'lost' through the introduction of the certification scheme. With their knowledge and experience, demonstration of meeting the required competencies should be readily achievable. In BICS, this may be facilitated through support and guidance from a mentor.

4.2 Where there are shortcomings in the awareness, knowledge, experience or proficiency in some of the modules this may require some targeted additional experience or training. There are training courses currently available which can be used to supplement a Trainee Inspector's knowledge and assist in meeting the competence requirements. However, participation in formal learning courses is not mandatory to attain scheme certification.

5. Further Information and Contacts

5.1 Appendix A has details of the competence requirements and the level of attainment to be expected for Inspectors and Senior Inspectors. Further information may be obtained from:

Lee Waters
Bridges Asset Manager
Transport Scotland
5th Floor
177, Bothwell Street,
Glasgow.
G2 7ER

Email: lee.waters@transport.gov.scot

5.2 Details of how these competencies can be certified via the BICS are available on: https://www.lantra.co.uk/news-events/lantra-launches-improved-bridge-inspector-certification-scheme

5.3 The Inspection Manual for Highway Structures, Volumes 1 & 2, (ISBN 0115506381 & ISBN 0115527982), is a useful guide which covers many aspects of the required competencies.

5.4 For details of mutual recognition of other standards see GD 101 'Introduction to the Design Manual for Roads and Bridges' (DMRB 0.1.2).

Appendix A

Core Competence Requirements

The core competencies are set out as seven 'headline' competencies and sub-competencies together with the level of competency in terms of Awareness (A), Knowledge (K), Experience (E), Proficiency (P).

Core Competencies

C1 – Structural Mechanics
C2 – Planning and Preparing for Routine Bridge Inspections
C3 – Health and Safety
C4 – Inspection Reporting
C5 – Identifying and Understanding Defects
C6 – Interpersonal Skills, Behaviours and Communication Skills
C7 – Access Requirements

Modular Material Requirements

There are three material units with sub-competencies. Candidates can apply for certification in one, two or all three materials. These are:

- Masonry
- Concrete
- Metallic

Achievement Ratings

The required achievement rating to satisfy the competence adequately depends upon the inspector level to be attained.

Achievement Rating		**Description**	
A	**Awareness**	General **understanding** of the unit requirement, including an **appreciation** of its relevance.	*These apply to **theory** only*
K	**Knowledge**	Knowledge and understanding of the unit requirement with an ability to **demonstrate** its relevance/application.	
E	**Experience**	Knowledge, understanding and **experience** of undertaking the unit requirement.	*These apply to **practical application**, as well as theory*
P	**Proficiency**	Knowledge, understanding and **experience** of undertaking the unit requirement and **competent to advise others.**	

Further details about the certification scheme and competence requirements are given in the scheme manual. Please visit https://www.lantra.co.uk to download a copy of the Bridge Inspector Certification Scheme Manual.