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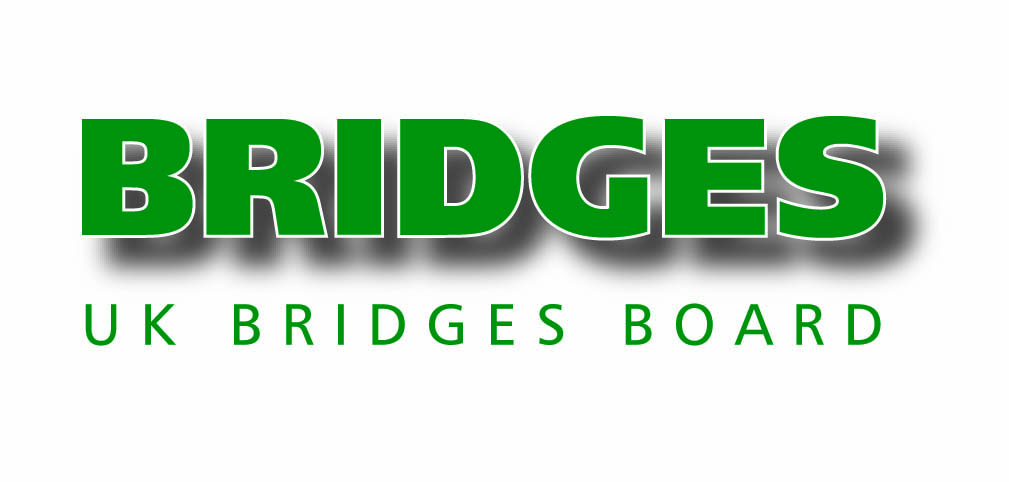
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National Highway Sector Scheme 31

for the

Bridge Inspector Certification Scheme

**Scheme Manual**



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# Foreword

This certification scheme for bridge inspectors, entitled ‘Bridge Inspector Certification Scheme’, has been jointly developed by the UK Bridges Board, Transport Infrastructure Ireland and the Bridge Owners Forum.

The certification scheme has been developed using a modular approach to enable flexibility. Modules, applicable to all industry sectors have been developed, but the structure is such that specific additional modules, to accommodate the requirements of different sectors, organisations, and bridge types can be added, as and when required.

The benefits of this scheme may include:

* An international scheme (UK and Ireland) which will be used by highways, waterways and railway asset owners.
* Proof of competence. This scheme will result in clarity of the experience and skills required by bridge inspectors, for Inspector and Senior Inspector grades. This will assist bridge owners with the specification of skills required, both internally and externally.
* Formalisation of knowledge and experience required by inspectors. This will result in effectively trained inspectors and hence improved levels of consistency in undertaking inspections, capturing defects, more informative and accurate inspection reports and better interpretation of results.
* The ability to better prioritise limited maintenance budgets as a result of greater consistency in the recommendations from bridge inspections.
* An increase in the profile/standing of bridge inspectors via the introduction of a nationally recognised scheme. The different levels of competence would also provide a structured path for career progression, which would assist in staff retention and long-term capture of vital knowledge.
* Transferrable skills - increased flexibility for organisations in moving inspection staff around and sharing them with other sectors.
* A structured approach to promote continued learning for bridge inspectors. Up to date developments and innovation within the industry can be identified where relevant for use in inspections.

Please note that where the term ‘bridge’ or ‘bridges’ appears in this Manual that is deemed to cover transport infrastructure assets within the boundaries of the highway or which otherwise materially affect it, and also structures within the domain of rail, light rail and waterway sectors. These typically include bridges, footbridges, cycleway bridges, bridleway bridges, accommodation bridges, masts, post and columns, gantries and ancillary structures, subways, underpasses, culverts, retaining walls and cantilever road signs.

1. Introduction

This document should be read by the following:

* Bridge owners
* Trainee/uncertified inspectors
* Experienced inspectors wishing to become certified or renew their certification
* Mentors
* Assessors
* Anyone specifying or procuring inspections services
* Training providers

This document will help you to understand the **Bridge Inspector Certification Scheme** and will provide guidance on your role and responsibilities, as well as those who are available to support you through your journey to become a certified Bridge Inspector or to retain your certification. This document also contains useful reference material and templates to assist you in satisfying the required competencies.

Routes to Certification

The route to becoming a certified Bridge Inspector, and retaining certification, involves three key phases, which are:

* **Phase 1 -** Achievement of the required knowledge and experience competencies, as outlined in the Core Inspection and Modular Material Competencies, by way of completing an e-portfolio.
* **Phase 2** - Successful demonstration of the required knowledge and experience competencies by way of an external review of the e-portfolio and an interview
* **Phase 3** - Continued consolidation/broadening of experience

There are two levels of certified Bridge Inspector which are:

* **Bridge Inspector (BI)**
* **Senior Bridge Inspector (SBI)**

The two roles have been developed to reflect the current roles and responsibilities commonly adopted within the bridge inspection community.

Both roles require certified inspectors to have the necessary competencies to undertake both detailed inspections, such as Principal Inspections, as well as General Inspections. The primary differences between the two competence requirements for a Senior Inspector (SI) and Inspector (I) are that a SI must be able to demonstrate broader experience of the relevant areas and of having supervised others as well. This is reflected in the Achievement Rating definitions.

* 1. Competencies

The **Bridge Inspector Certification Scheme** consists of five Core Inspection Competencies and three optional Modular Material Competencies, which themselves each comprise of a number of sub-competencies. Outline descriptions of the subject material for each Core and Modular Material Competency are detailed below.

The Modular Material Competency process was introduced as a change to the original scheme in response to trainee/uncertified inspectors who found it difficult to obtain the necessary experience in inspecting bridges constructed in all material types.

It will be necessary for a bridge inspector to pass the Core Inspection Competencies and at least one Modular Material Competency to become certified at the appropriate grade. If the bridge inspector has the necessary knowledge and experience, then it is possible for all three Modular Material Competencies to be reviewed at the same time.

The issued e-card will be endorsed with the Modular Material Competencies that have been passed by the bridge inspector at the appropriate grade.

* 1. Core Inspection Competencies

Unit C1 - Introduction to Inspections

This unit outlines the background to the importance of undertaking inspections. Fundamental to effective management is an inspection regime that provides timely, accurate and appropriately detailed information on asset condition and performance. The overall purpose of inspection, testing and monitoring is to check that structures are safe for use and fit for purpose and to provide the data required to support effective maintenance management and planning.

Unit C2 – Structures Types and Elements / Behaviour of Structures

This unit outlines common types of structures, their key elements and materials. It also covers background information and guidance on the fundamentals of structural behaviour, the basic principles of structural mechanics and material properties.

Unit C3 - Inspection Process

This unit outlines the fundamentals of the inspection process, including scheduling, planning, undertaking, reviewing and interpreting the results. It also includes consideration of environmental impacts, selection of appropriate access equipment, safe working practices and the significance of undertaking effective routine maintenance. In addition, it highlights the importance of accurate, reliable data capture and storage after the inspection. A candidate is also required to understand the purpose of undertaking testing and investigations, what this involves, the limitations, the outputs and any other relevant considerations.

Unit C4 - Defects Descriptions and Causes

This unit outlines the importance and requirements for describing and categorising defects that are applicable to all material types. Emphasis is placed on principal defects that are likely to be encountered.

Unit C5 - General Aptitude

This unit outlines the general aptitude skills required by an inspector.

* 1. Modular Material Competencies

Metallic

**Unit MET1 - Defects, Descriptions and Causes**

This unit outlines the importance and requirements for describing and categorising defects that are specific to metallic structures.

**Unit MET2 - Investigation and Testing**

This unit outlines the background to the range of different testing and investigation techniques available for metallic structures.

**Unit MET3 - Repair Techniques**

This unit outlines the importance of understanding the range of repair techniques available for metallic structures and materials.

Concrete

**Unit CON1 - Defects, Descriptions and Causes**

This unit outlines the importance and requirements for describing and categorising defects that are specific to concrete structures.

**Unit CON2 - Investigation and Testing**

This unit outlines the background to the range of different testing and investigation techniques available for concrete structures.

**Unit CON3 - Repair Techniques**

This unit outlines the importance of understanding the range of repair techniques available for concrete structures and materials.

Masonry

**Unit MAS1 - Defects, Descriptions and Causes**

This unit outlines the importance and requirements for describing and categorising defects that are specific to masonry structures.

**Unit MAS2 - Investigation and Testing**

This unit outlines the background to the range of different testing and investigation techniques available for masonry structures.

**Unit MAS3 - Repair Techniques**

This unit outlines the importance of understanding the range of repair techniques available for masonry structures and materials.

* 1. Existing Inspectors

It is anticipated that the majority of existing inspectors will be able to demonstrate adequate competence to meet the requirements of the Core Inspection Competencies and Modular Material Competencies by utilising their experience to date, or they may only need to supplement their skills in a number of targeted areas. The Competencies have not been designed to ‘catch you out’ but to ensure that you have the necessary skills to undertake your role effectively and consistently. If an inspector has limited experience in inspecting one particular material type, then they may apply for certification to cover the other material types where they have more experience.

* 1. People to Help You

People who can support you in achieving the skills and experience required to satisfy the Core inspection and Modular Material Competencies include your Mentor, who may be a colleague employed by the same Company or a different Company, if appropriate, as well as the Scheme Administrator.

Each of them fulfils a different role and they will support your review of your personal experience, as well as assisting you in the planning of your continuing professional development, so as to meet the necessary competence requirements.

1. Scheme Parties
   1. Different Roles

The **Bridge Inspector Certification Scheme** has a number of different parties who undertake complementary roles. These roles include:

* Bridge/Uncertified Inspector
* Mentor
* Employer
* Assessor
* Scheme Administrator
  1. Roles and Responsibilities

Trainee/Uncertified Inspector

The role of the trainee/uncertified Inspector is to ensure that he/she fully understands, and is able to demonstrate, the competence requirements of the Core Inspection Competencies and the selected Modular Material Competencies and maintains the required competence levels, whilst continuing to undertake bridge inspections under supervision.

The responsibilities of a trainee/uncertified Inspector are to:

* Familiarise themselves with the competences laid down in the Core Inspection and Modular Material Competencies
* Understand the achievement ratings required to satisfy the Core Inspection and Modular Material Competencies
* Have an overview of the operation of the **Bridge Inspection Certification Scheme**
* Complete the **Bridge Inspection Certification Scheme** e-portfolio
* Identify Competencies requiring further knowledge/experience
* In conjunction with a Mentor (if assigned by the employer), outline a development action plan to achieve the outstanding competencies
* Organise regular meetings with Mentor (if assigned by the employer) to review progress
* Submit e-portfolio and accompanying evidence to Lantra
* Undertake appropriate advance preparation and attend external **Bridge Inspection Certification Scheme** interview (arranged by Lantra)
* Undertake relevant continuing professional development and record it accordingly
* Undertake reassessment at appropriate time to maintain certified inspector status

Employer / Mentor

The role of the Employer is to proactively support a trainee/uncertified Inspector and to facilitate the opportunities for him/her to gain the knowledge and experience necessary to achieve the required competence levels. It is assumed that a trainee/uncertified Inspector’s Mentor will usually be an experienced colleague from the same organisation. Although the role of Mentor is encouraged it is not a mandatory requirement.

The responsibilities of an Employer are:

* Appoint (internally or externally) an appropriate Mentor for the trainee/uncertified Inspector

The responsibilities of a Mentor are:

* Undertake an initial meeting with Inspector to provide an overview of the **Bridge Inspection Certification Scheme**
* Assist trainee/uncertified Inspector with completing the e-portfolio
* Review trainee/uncertified Inspector’s initial evidence of knowledge/experience to date
* Support trainee/uncertified Inspector with the drafting of an outline development action plan to achieve the outstanding competences
* Attend regular review meetings with trainee/uncertified Inspector to check on progress
* Undertake internal review of trainee/uncertified Inspector’s completed e-portfolio
* Support trainee/uncertified Inspector with advance preparation for external interview
* Provide on-going support/guidance to Inspector post certification.

Assessor

The role of the Assessor is to review and verify whether a trainee/uncertified Inspector can demonstrate the competencies laid down in the Core Inspection and Modular Material Competencies. This will be undertaken through a review of the evidence presented in the candidate’s submitted e-portfolio and the external interview.

The responsibilities of an Assessor are:

* Review submitted e-portfolio and verify whether sufficient evidence has been provided to demonstrate that the competencies laid down in the Core Inspection and Modular Material Competencies have been satisfied
* Undertake an interview with the candidate
* Confirm whether a candidate has met the requirements to achieve certified Inspector status. (Inspector or Senior Inspector, as appropriate)
* Provide feedback to Lantra for unsuccessful candidates, outlining areas where they have failed to demonstrate adequate competence
* Undertake appeals and re-examination interviews, if required (Lead Assessor only).

Scheme Administrator

The role of the Administrator is to maintain the **Bridge Inspector Certification Scheme** and to advise and support the candidates through the certification process.

The responsibilities of the Administrator are to:

* Maintain website for the scheme
* Maintain scheme templates and update as necessary
* Process submitted completed e-portfolios and allocate Assessor
* Arrange external interviews
* Issue e-cards to successful candidates
* Forward feedback to unsuccessful candidates
* Arrange re-examination/appeals, as required
* Maintain database
* Liaise with selected stakeholders and undertake 6 monthly reviews as required and report recommendations to UKBB.

1. Inspector Levels and Competencies
   1. Inspector Levels

Certification via the **Bridge Inspector Certification Scheme** can be awarded at one of two levels (see definitions):

* Inspector
* Senior Inspector

There are different attributes for each level which need to be demonstrated through the capture of evidence and an external interview. Deciding which level is most appropriate for you will depend upon your experience to date and your current role. This decision will most likely be taken following discussions with your Employer/Mentor. He/she should be able to advise you on the most suitable route, in light of your current experience and the experience you will realistically be able to gain in the near future.

* 1. Competencies

As outlined in Section 1.2, the scheme consists of five Core Inspection Competencies and three Modular Material Competencies each containing the necessary sub-competencies required for achieving inspector certification (see Table One). Details of the assessment criteria for each sub-competency at both Inspector levels are detailed in Appendix One. The required achievement rating to satisfy the competency adequately depends upon the inspector level you wish to attain. Further details on the achievement ratings are given in the following section.

* 1. Achievement Ratings

### The achievement rating describes the level of knowledge and experience required for a specific level. There are four ratings, which are listed below:

* **A** – Awareness
* **K –** Knowledge
* **E** – Experience
* **P –** Proficiency

### The first two ratings demonstrate the level of theoretical knowledge which you require in order to satisfy the competency requirements, whilst the latter two require a candidate to have had appropriate practical experience, in conjunction with the theoretical knowledge, in order to satisfy the competency requirements.

Detailed descriptions of the nature of the skills required to satisfy each of the achievement ratings are detailed in Table Two.

Table One – Core Competencies

|  |  |
| --- | --- |
| **Ref** | **Competency Description** |
| **Unit C1** | **Introduction to Inspections** |
| **C1.1** | **Purpose of Inspections** |
| **C1.2** | **Inspector Roles, Responsibilities and Competences** |
| **C1.3** | **Inspection types** |
| **C1.4** | **Codes of Practice** |
| **Unit C2** | **Structures Types and Elements / Behaviour of Structures** |
| **C2.1** | **Bridges** |
| **C2.2** | **Other Structure Types** |
| **C2.3** | **Structural Mechanics** |
| **C2.4** | **Properties of Common Construction Materials** |
| **C2.5** | **Properties of Specialist Construction Materials** |
| **Unit C3** | **Inspection Process** |
| **C3.1** | **Scheduling Inspections** |
| **C3.2** | **Planning and Preparing for Inspections** |
| **C3.3** | **Performing Inspections** |
| **C3.4** | **Recording Inspection Findings** |
| **C3.5** | **Interpreting Inspection Findings** |
| **C3.6** | **Maintenance Planning Process** |
| **C3.7** | **Importance of Routine Maintenance** |
| **C3.8** | **Obligations of Current Health and Safety Legislation** |
| **C3.9** | **Other Skills** |
| **C3.10** | **The Testing Process** |

|  |  |
| --- | --- |
| **Unit C4** | **Defects Descriptions and Causes** |
| **C4.1** | **Principal Causes of Defects** |
| **C4.2** | **Defects in Miscellaneous Materials** |
| **Unit C5** | **General Aptitude** |
| **C5.1** | **Practical Aptitude** |
| **C5.2** | **Working with people** |
| **C5.3** | **Communication skills** |
| **C5.4** | **Personal skills** |
| **C5.5** | **Management / Supervision** |
| **Unit MAS** | **Masonry Bridge** |
| **MAS.1** | **Defects Descriptions and Causes** |
| **MAS.2** | **Investigation and Testing** |
| **MAS.3** | **Repair Techniques** |
| **Unit CON** | **Concrete Bridge** |
| **CON.1** | **Defects Descriptions and Causes** |
| **CON.2** | **Investigation and Testing** |
| **CON.3** | **Repair Techniques** |
| **Unit MET** | **Metallic Bridge** |
| **MET.1** | **Defects Descriptions and Causes** |
| **MET.2** | **Investigation and Testing** |
| **MET.3** | **Repair Techniques** |

* 1. Table Two – Achievement Ratings

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

* 1. Theoretical v Experience

It is appreciated that a number of the competencies can be achieved solely through background reading and/or courses. These are the areas where it is felt that the skill required does not necessitate practical experience but is adequately achieved by a candidate extending his/her theoretical knowledge. However, there are areas where practical experience is deemed to be necessary to successfully achieving the required level of competence. Consequently, competencies requiring achievement ratings of ‘E’ or ‘P’ compel a candidate to demonstrate practical experience or proficiency in order to satisfy the competency.

* 1. Specialist Material Modules

In addition to the Core Inspection Competencies, a candidate will be required to satisfy the competency requirements in at least one Modular Material Competency in order to become a certificated inspector. Some bridge owners may require Inspectors to satisfy the competence requirements of more than one material competency.

1. Scheme Operation Trainee/Uncertified Inspector
   1. Getting Started

The **Bridge Inspector Certification Scheme** requires the trainee/uncertified inspector to provide proof of competence against the Core Inspection Competencies and at least one Modular Material Competency by completing their e-portfolio and supplying the relevant evidence.

It is expected that your employer will be committed to providing support, expanding your knowledge and expertise through enabling you to undertake suitable work experience, appropriate training, as well as providing you with Mentor(s) support on an individual basis. Similarly, you will be committed to work to the best of your abilities, through planning and capturing your competence records, arranging regular meetings with your Mentor and ensuring that your continuing professional development (CPD) is maintained.

It is not a requirement to attend training courses. However, these may be of some use for a new trainee to gain knowledge or for a more experienced inspector to supplement their knowledge. You should learn through direct experience of working in teams, both in the office and on site. You will also have the opportunity to develop your knowledge and understanding in discussion with your colleagues and in regular reviews with your Mentor (if allocated by your employer).

The achievement of becoming, and remaining, a Certified Inspector through the **Bridge Inspector Certification Scheme** can be broken down into three phases. These phases are now outlined in more detail below:

* 1. Phase 1 – Achievement of Competencies

Initial Administration

The initial tasks involved in embarking on the **Bridge Inspector Certification Scheme** include the following activities:

* Agreement with your Employer
* Registration with the Scheme Administrator (Lantra)
* Allocation of Mentor (optional)
* Review of experience to date
* Decision as to which Certification Route is most appropriate (i.e. Inspector or Senior Inspector) and for which material type(s)
* Completion of e-portfolio
* CV and a summary of structures work on in the last 12 months
* Submission of e-portfolio to Scheme Administrator (Lantra).

Previous Relevant Experience

Relevant experience gained prior to embarking on the **Bridge Inspector Certification Scheme** can be recorded as evidence towards achievement of the Competencies. This may be particularly relevant to many of those who have been carrying out inspections for some time. As a priority, it is prudent to familiarise yourself with the content of the Competencies in order that you can decide where you may need additional support and further learning.

Once you have undertaken an initial review of the Competencies and the assessment criteria, the next step is to record the relevant evidence from your experience in the e-portfolio, in order that it can be reviewed by your Mentor (if required). It is envisaged that your Mentor (optional) will assist you in undertaking this task.

Completion of E-Portfolio

It is essential to record adequate evidence in your e-portfolio to demonstrate that you have the necessary skills to meet each Competency. Specific and personalised evidence is important. The e-portfolio will be assigned to you by Lantra and will be accessible on receipt of payment (see www.bridge-inspectors.com).

Once you have completed your e-portfolio in all of the relevant Competencies, and they have been checked by your Mentor (optional) as demonstrating the required attainment level, you and your mentor will agree whether you are ready to submit your e-portfolio to Lantra for review. On submission of the e-portfolio, Lantra will appoint an Assessor to undertake a review of the completed e-portfolio.

* 1. Phase 2 – External Review

E-Portfolio Sign-Off

In order for the Assessor to be able to sign off your e-portfolio, they need to see evidence that you have the necessary skills listed in the assessment criteria at the required achievement rating. As explained in section 3.3, achievement rating levels ‘A’ and ‘K’ require theoretical knowledge, which can be achieved through background reading or through courses etc., whereas achievement rating levels ‘E’ and ‘P’, require you to have had practical experience. Appropriate evidence needs to be provided for all relevant rating levels. Successful completion and sign off of the e-portfolio by an assessor is mandatory in order to progress to external interview.

If you are unsuccessful in satisfying the requirements of the external Assessor at e-portfolio sign-off stage, there is the opportunity of re-submitting the e-portfolio at a later date.

External Interview

All candidates who wish to become certified via the **Bridge Inspector Certification Scheme** will be required to have an external interview with two Lantra approved Assessors. An interview will only be offered on achieving successful sign off of the e-portfolio. The interview will consist of a range of questions in order that the Assessors can satisfy themselves that you have the necessary competencies. The level of competence required will depend upon which certification level (i.e. either Inspector or Senior Inspector) you have submitted your application for.

Certification

If you successfully demonstrate that you have the required competencies for your chosen certification level, you will then be awarded certified inspector status. Each candidate will receive a Lantra e-card clearly stating the achieved inspector status (i.e. either Inspector or Senior Inspector) for each material type and the time period for which it is valid.

If you are unsuccessful in satisfying the requirements of the external Assessors at interview stage, there is the opportunity to apply to be re-interviewed at a later date. The route to a second interview would be dependent on the feedback received from the Assessors. Appeals can be made on an administration basis only and not on technical content.

* 1. Phase 3 – Continued Consolidation/Broadening of Experience

CPD

Achievement of Certified Inspector status is not the end of your journey. You are required to maintain a record of your Continuing Professional Development (CPD) in order to demonstrate how you are keeping up-to-date and maintaining your levels of competence (see Appendix Two).

Renewal Process

***Annual Re-Registration***

There is a requirement for the Certified Inspector/Senior Inspector to renew their registration annually. On or before annual re-registration in April, Lantra will request evidence of up-to-date CPD and the annual registration fee will be applied.

***Term of Certification***

Certification will last for a period of 3 years at which point your e-card will expire. Certified Inspectors/Senior Inspectors must renew their certification via Lantra by:

* Providing up to date CPD within e-portfolio for review by Lantra (see Appendix Two)
  + Lantra checks currency of CPD prior to annual renewal of membership
  + Assessor reviews relevance of CPD
* Re-assessment interview (if required)

1. Scheme Operation - Employer
   1. Mentor Assignment

The role of an Employer is to proactively support a trainee/uncertified Inspector and to facilitate opportunities for him/her to satisfy the required competencies and hence achieve certified status. The primary means by which this may be implemented is through the allocation of an appropriate Mentor to the trainee/uncertified Inspector.

Initial responsibilities of a Mentor are to assist a trainee/uncertified inspector with the completion of their e-portfolio, undertake a review and capture their experience to date and subsequently draft an outline action plan to assist the trainee with understanding how they can achieve the outstanding competencies.

* 1. Progress Monitoring

The role of the Mentor is to attend regular meetings arranged by the trainee/uncertified to review progress. Progress will be monitored through discussions with the trainee in conjunction with reviews of their e-portfolio. The Mentor will be responsible for providing constructive feedback on the trainee’s submitted material, so as to guide them for e-portfolio submission and interview.

* 1. Mentor Review

A Mentor will provide feedback to the trainee/uncertified for the competencies at the appropriate level and confirm that the trainee is ready to undertake an external review by a Lantra approved Assessor.

* 1. Post Certification Support

A Mentor’s role does not finish once the candidate successfully achieves certified status since, if they have achieved Certified Inspector status, they may wish to progress to Senior Inspector in due course. Even those of you who have achieved Senior Inspector status still require on-going support to ensure that they are regularly challenged to question their own on-going competence levels. Previous bridge collapses clearly highlight that the industry cannot afford to become complacent with regards to the competence of bridge inspectors.

1. Scheme Operation - Assessor
   1. **The Role of an Assessor**

The main role of the Assessor is to assess the suitability of candidates to become Certified Inspectors. They will fulfil this role through undertaking a review of the evidence presented to them in the candidate’s e-portfolio, prior to a ’face-to-face’ or ‘on-line’ interview with the candidate.

Assessors must meet the requirements of the Scheme Administrator (Lantra) and the technical standard requirements as set by the **Bridge Inspector Certification Scheme**.

* 1. Assessor Registration

All assessors must be a certified Senior Bridge Inspector, attend and pass a short interview arranged by Lantra with a Lantra approved Assessor.

All Assessors will be expected to attend a standard setting event (SSE) every three years in order to maintain their competence and their status as a Lantra approved Assessor ensuring there is consistency across all assessor decisions.

Responsibilities

The responsibilities of a Bridge Inspector Assessor include the following key tasks:

* Review the e-portfolio submitted by the candidate and verify whether sufficient evidence has been provided to demonstrate that the competencies laid down in the scheme have been achieved to the appropriate level
* Ensure that all evidence is clearly documented and precise
* Undertake an interview with the candidate (see Lantra QA process)
* Confirm whether a candidate has met the requirements to achieve certified Inspector status (Inspector or Senior Inspector, as appropriate)
* Provide a written report on the outcome of the assessment (see Lantra QA process)
* Lantra to feedback report outcomes to candidates. Where candidates have been unsuccessful the report will identify where they have failed to demonstrate adequate competence and advise next steps
* Participate in Appeals, if required.

All assessment records must be retained by Lantra for 7 years. Lead Assessors and Lantra retain the right to review and counter check any assessment reviews.

Additional responsibilities of a Bridge Inspector Assessor:

* Maintain up to date knowledge of the industry
* Provide evidence of updated CPD at annual re-registration.

Guidelines

Additional advice is given in the Assessor Guidance document which is issued to all Assessors as part of the Standardisation Event.

* 1. The Role of the Lead Assessor

The role of the Lead Assessor, in addition to the above criteria, is to support Lantra in the following activities:

* Assisting with scheme documentation
* Appointing Assessors
* Ensuring Assessors are supported in meeting the required standards
* Assisting in Assessor Standardisation Events
* Scheme Operation – Scheme Administrator
  1. Administration

The role of the Scheme Administrator is to maintain the **Bridge Inspection Certification Scheme** and to ensure that all parties fulfil their roles and are provided with the necessary tools to do so. The role is currently undertaken by **Lantra**.To summarise, the Scheme Administrator is responsible for the administrative tasks involved in ensuring the smooth running of the scheme.

The primary day-to-day tasks include:

* Maintenance of website for the scheme
* Maintenance of scheme templates
* Processing of submitted e-portfolios
* Appointment of Assessors
* Allocation of Assessor activity
* Arranging of external interviews
* Production and forwarding of Inspector and Senior Inspector e-cards to successful candidates
* Forwarding feedback to unsuccessful candidates
* Arranging re-examination/appeals, as required
* Maintenance of BICS database
* Maintenance of scheme manuals and sector scheme document
* Secretariat for BICS Committee
  1. Continuous Improvement

In conjunction with those tasks listed in Section 7.1 above, the Administrator and the BICS Committee are responsible for regularly challenging the processes involved in running the scheme to ensure that any necessary improvements are acted upon. The Administrator is responsible for implementing any improvements/amendments and for ensuring that any associated documentation is updated accordingly.

* 1. Liaison with the UK Bridges Board (UKBB)

A further role for the Administrator involves liaison with selected stakeholders and the organisation of periodic reviews, as required, to report recommendations to the UKBB. These may lead to subsequent updates needing to be published. It is the role of the Administrator to ensure that these are undertaken.

* 1. Assessors Register Owner

In order to allocate suitable Assessors to candidates the Scheme Administrator shall own and maintain the Assessors Register. The information which shall be recorded includes:

* Names of individuals who have successfully completed the Assessor Standardisation Event
* Details of the number of ‘shadowed’ interviews which an individual has undertaken
* Notification from Lead Assessor of a trainee Assessor having successfully completed his ‘trial period’. This will be the individual’s registration date.
* Date of refresher training required for each registered Assessor.
  1. Inspectors Database

The Scheme Administrator shall ensure that the Certified Inspector Database is maintained at all times.

1. Definitions

**Achievement Rating** This is the level of knowledge (and experience, if appropriate), required to satisfy a defined competency.

**Administrator** This is the body which is responsible for the day-to-day running and maintenance of the Bridge Inspection Certification Scheme.

**Assessor** This is the individual who verifies whether a Trainee Inspector can demonstrate the required competence levels, through a review of their submitted e-portfolio and an external interview.

**Competence** Thisis the attainment of knowledge skills and abilities at a level of expertise sufficient to be able to perform in an appropriate work setting.

**Core Inspection Competencies** These are the Competencies which are deemed to be fundamental to attaining Bridge Inspector Certification.

**Employer** This is the person or company who commits to supporting a Trainee Inspector, both technically and financially through the process for becoming certified under the Bridge Inspection Certification Scheme.

**E-Portfolio** This is the tool used to capture details of the knowledge and experience attained in order to satisfy the required Achievement Rating.

**Lead Assessor** This is the individual who oversees or ‘shadows’ an Assessor during their ‘trial period’, before they become registered. This individual assists the Administrator in the operation of the Scheme

**Inspector** Both certified Inspectors and Senior Inspectors are expected to demonstrate the necessary competencies to undertake Principal Inspections, General Inspections, and Acceptance Inspections

**Mentor** This is the individual who supports a Trainee Inspector on a ‘one-to-one’ basis.

**Modular Material Competencies** These are the material competencies at least one of which is deemed to be fundamental to attaining Bridge Inspector Certification

**Senior Inspector** Senior Inspectors are expected to have more experience and have inspected a broader range of structures; they are also expected to have advised others on the inspection process, recording of findings, causes of defects and recommendations for repairs.

**Specialist Competencies** These are Competencies which are deemed not to be mandatory in order to become a Certified Inspector, but which may be required by some bridge owners. They include, typically, industry specific knowledge, specialist material knowledge and/or experience and specialised access requirements.

**Trainee/Uncertified Inspector** This is the title given to an inspector prior to attaining certification.

1. Abbreviations

**ACoP** Approved Code of Practice

**ADEPT** Association of Directors of Environment, Economy, Planning and Transport

**BICS** Bridge Inspector Certification Scheme

**CPD** Continuing Professional Development

**DfT** Department for Transport

**I** Inspector

**LoBEG** London Bridges Engineering Group

**MEWP** Mobile Elevated Working Platform

**NRA** National Roads Authority (Ireland)

**PPE** Personal Protective Equipment

**SI** Senior Inspector

**TfL** Transport for London

**TI** Trainee Inspector

**TRL** Transport Research Laboratory

**TSA** Thaumasite Sulphate Attack

**UKBB** UK Bridges Board

**UKRLG** UK Roads Liaison Group

Appendix One: Core Modules – Unit Guidance

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| **C1 Introduction to Inspections** | | |  | |  | |  |
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| **Ref** | **Outcome / Skill** | | | | | | | | **I** | **SI** |
| **C1.1** | **Purpose of Inspections** | | | | | | | |  |  |
| 1.1. a | Demonstrate knowledge of the purpose of inspections by outlining the importance of undertaking  Inspections | | | | | | | | K | K |
| 1.1. b | Demonstrate knowledge of the purpose of inspections by explaining the terms safe for use and fit for purpose | | | | | | | | K | K |
| **C1.2** | **Inspector Roles, Responsibilities and Competences** | | | | | | | |  |  |
| 1.2. a | Demonstrate knowledge of the roles, responsibilities and competencies of an inspector by describing the two inspector roles and their associated responsibilities | | | | | | | | K | K |
| 1.2. b | NOT USED | | | | | | | |  |  |

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| **C1.3** | **Inspection Types** |  |  |
| 1.3. a | Demonstrate knowledge of different inspection types by describing the objectives of the different types of inspection relevant to your industry sector | K | K |
| 1.3. b | Demonstrate knowledge of different inspection types by explaining the importance of an appropriate inspection regime including the function of cyclic inspections | K | K |
| 1.3.c | Demonstrate knowledge of different inspection types by describing the different types of special inspections, their function and the factors that typically initiate their use | K | K |
| **1.4** | **Codes of Practice** |  |  |
| 1.4. a | Demonstrate knowledge of codes of practice and associated guidance relevant to the inspection of structures e.g., the Inspection Manual for Highway Structures | K | K |

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| **C2 Structure Types and Elements** | |
| **C.2.1** | **Bridges** | |  |  |
| 2.1. a | Demonstrate knowledge and experience or proficiency, as appropriate, in the use and understanding of Span form and construction material | | E | P |
| 2.1. b | Demonstrate knowledge and experience or proficiency, as appropriate, in the use and understanding of Major Bridge elements, superstructure, substructure, safety elements, durability elements and ancillary elements. | | E | P |
| 2.1.c | Demonstrate knowledge and experience or proficiency, as appropriate, in the use and understanding of Primary and Secondary deck element type. | | E | P |
| 2.1. d | Demonstrate knowledge of key bridge components by describing the function and importance of water management services. | | K | K |
| 2.1. e | Demonstrate knowledge of key bridge components by describing the function and importance of utilities, private services and lighting | | K | K |

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| **C2.2** | **Other Structure Types** |  |  |
| 2.2. a | Demonstrate knowledge and experience of other structure types by describing the form and inspection of different types of culvert | E | E |
| 2.2. b | Demonstrate knowledge and experience of other structures types by describing the form and inspection of different types of subway | E | E |
| 2.2.c | Demonstrate knowledge and experience of other structures types by describing the form and inspection of different types of retaining wall | E | E |
| 2.2. d | Demonstrate knowledge of ancillary structures by describing different types of signs/signal gantries | K | K |
| 2.2. e | Demonstrate knowledge of ancillary structures by describing different mast types | K | K |

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| **C2.3** | **Structural Mechanics** |  |  |
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| 2.3. a | Demonstrate knowledge of structural behaviour by describing the loading that bridges are subjected to | K | K |
| 2.3. b | Demonstrate knowledge of structural behaviour by describing the load paths within a structure | K | K |
| 2.3.c | Demonstrate knowledge of structural behaviour by describing modes of failure in different structure types and elements | K | K |
| 2.3. d | Demonstrate knowledge of structural behaviour by describing structure responses to loading | K | K |

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| **C2.4** | **Properties of Common Construction Materials** |  |  |
| 2.4. a | Demonstrate knowledge of the properties of CONCRETE and how it influences the safety, durability and functionality of a specific component and the whole structure | K | K |
| 2.4. b | Demonstrate knowledge of the properties of REINFORCED CONCRETE and how it influences the safety, durability and functionality of a specific component and the whole structure | K | K |
| 2.4.c | Demonstrate knowledge of the properties of PRE -STRESSED CONCRETE (PRE-TENSIONED and POST-TENSIONED) and how it influences the safety, durability and functionality of a specific component and the whole structure | K | K |
| 2.4. d | Demonstrate knowledge of the properties of STEEL and how it influences the safety, durability and functionality of a specific component and the whole structure | K | K |
| 2.4. e | Demonstrate knowledge of the properties of MASONRY and how it influences the safety, durability and functionality of a specific component and the whole structure | K | K |
| 2.4. f | Demonstrate knowledge of the properties of TIMBER and how it influences the safety, durability and functionality of a specific component and the whole structure | K | K |

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| **C2.5 Properties of Specialist Construction Materials** | |  | |
| 2.5. a | Demonstrate awareness of the properties of WROUGHT IRON and how it influences the safety, durability and functionality of component and the whole structure | A | A |
| 2.5. b | Demonstrate awareness of the properties of CAST IRON and how it influences the safety, durability and functionality of component and the whole structure | A | A |
| 2.5.c | Demonstrate awareness of the properties of ALUMINIUM and its ALLOYS and how it influences the safety, durability and functionality of component and the whole structure | A | A |
| 2.5. d | Demonstrate awareness of the properties of ADVANCED COMPOSITES and how it influences the safety, durability and functionality of component and the whole structure | A | A |
| 2.5. e | Demonstrate awareness of the properties of ASPHALT and how it influences the safety, durability and functionality of component and the whole structure | A | A |
| 2.5. f | Demonstrate awareness of the properties of ABSESTOS and how it influences the safety, durability and functionality of component and the whole structure | A | A |

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| **Unit C3 Inspection Process** | |  |  |
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| **Ref** | **Outcome / Skill** | | | | **I** | **SI** |
| **C.3.1** | Scheduling Inspections | | | |  | |
| 3.1. a | Demonstrate knowledge and experience or proficiency, as appropriate, of scheduling inspections by describing knowledge and use of relevant documentation which sets out the frequency of inspections including the use of a risk-based approach | | | | E | P |
| 3.1. b | Demonstrate knowledge and experience or proficiency, as appropriate, of scheduling inspections by describing the planning for and use of confined space techniques, specialist equipment, road space booking, track possessions, waterways access, major events etc | | | | E | P |
| 3.1.c | Demonstrate knowledge and experience or proficiency, as appropriate, of scheduling inspections by describing the use of methods to monitor progress of inspections against schedules | | | | E | P |
| **C.3.2** |  | | | |  | |
| 3.2. a | Demonstrate knowledge and experience or proficiency, as appropriate, of planning and preparing for inspections by explaining the function, importance and use of existing structure records and in particular the previous inspection report | | | | E | P |
| 3.2. b | Demonstrate knowledge and experience or proficiency, as appropriate, of planning and preparing for inspections by explaining the importance of challenging the validity of existing structure records, if appropriate | | | | E | P |
| 3.2.c | Demonstrate knowledge and experience or proficiency, as appropriate, of planning and preparing for inspections by explaining the importance of the current assessed capacity of the structure | | | | E | P |
| 3.2. d | Demonstrate knowledge and experience or proficiency, as appropriate, of planning and preparing for inspections by explaining the different type of notifications that may be required prior to gaining access | | | | E | P |
| 3.2. e | Demonstrate knowledge and experience or proficiency, as appropriate, of planning and preparing for inspections by explaining what further information may need to be determined from a pre-inspection site visit | | | | E | P |
| 3.2. f | Demonstrate knowledge and experience or proficiency, as appropriate, of planning and preparing for inspections by explaining the process of planning any testing that may be required as part of an inspection | | | | E | P |
| 3.2. g | Demonstrate knowledge and experience or proficiency, as appropriate, of planning and preparing for inspections by describing the use of PPE, data recording equipment, measuring or inspection equipment | | | | E | P |
| 3.2.h | Demonstrate knowledge and experience or proficiency, as appropriate, of planning and preparing for inspections by describing the use and importance of method statements, risk assessments and health and safety in relation to undertaking inspections | | | | E | P |
| 3.2. i | Demonstrate knowledge and experience or proficiency, as appropriate, of planning and preparing for inspections by explaining the need to minimise impact on the environment | | | | E | P |
| 3.2. j | Demonstrate knowledge and experience or proficiency, as appropriate, of planning and preparing for inspections by describing the identification and implementation of appropriate working practices or mitigation measures to reduce the impact on bats, badgers, birds and watercourses etc | | | | E | P |
| 3.2. k | Demonstrate knowledge and experience or proficiency, as appropriate, of planning and preparing for inspections by explaining the need to seek expert advice, if necessary | | | | E | P |
| **C3.3** | **Performing Inspections** | | | |  |  |
| 3.3. a | Demonstrate knowledge and experience or proficiency, as appropriate, of the practical approach to performing an inspection by describing the key aspects of performing an inspection, including the impact of restricted working hours, the importance of good housekeeping, communication protocols and the need to escalate potential safety critical defects | | | | E | P |
| 3.3. b | Demonstrate knowledge and experience or proficiency, as appropriate, of a range of typical defects for different structure types by describing defects in bridges, culverts, retaining walls, road restraint systems | | | | E | P |
| **C.3.4** | **Recording Inspection Findings** | | | |  |  |
| 3.4. a | Demonstrate knowledge and experience or proficiency, as appropriate of the inspection recording process by describing the different methods used for recording defects including the use of a data capture and inspection proforma | | | | E | P |
| 3.4. b | Demonstrate knowledge and experience or proficiency, as appropriate of the inspection recording process by describing the importance of recording the defect accurately in terms of locations, type, severity, extent and cause | | | | E | P |
| 3.4.c | Demonstrate knowledge and experience or proficiency, as appropriate of the inspection recording process by explaining the level of detail to be recorded depending upon the type of inspection | | | | E | P |
| 3.4. d | Demonstrate knowledge and experience or proficiency, as appropriate of the inspection recording process by describing the importance of recording headroom clearances at an appropriate inspection | | | | E | P |
| 3.4. e | Demonstrate knowledge and experience or proficiency, as appropriate of the inspection recording process by describing your understanding of the responsibility associated with preparing and signing reports | | | | E | P |
| 3.4. f | Demonstrate knowledge and experience or proficiency, as appropriate of an element condition rating system and discussing how the accuracy of reporting can affect overall structure condition performance indicators as well as condition rating | | | | E | P |
| **C3.5** | **Interpreting Inspection Findings** | | | |  |  |
| 3.5. a | Demonstrate knowledge or knowledge and experience, as appropriate, of the interpretation inspection findings by describing factors which affect whether a structure is safe for use and or/fit for purpose | | | | K | E |
| 3.5. b | Demonstrate knowledge or knowledge and experience, as appropriate, of the interpretation of inspection findings by explaining the need to utilise existing records to help interpret defects | | | | K | E |
| 3.5.c | Demonstrate knowledge or knowledge and experience, as appropriate, of the interpretation of inspection findings by describing a range of maintenance works that are commonly recommended following an inspection | | | | K | E |

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| **3.6** | **Maintenance Planning Process** |  |  |
| 3.6. a | Demonstrate awareness or knowledge, as appropriate, of maintenance planning processes by explaining how the data captured from inspections compliments other information held for a structure | A | K |
| 3.6. b | Demonstrate awareness or knowledge, as appropriate, of maintenance planning processes by explaining the importance of up-to-date and comprehensive data on the condition of a structure with respect to its input to maintenance planning. | A | K |
| 3.6.c | Demonstrate awareness or knowledge, as appropriate, of maintenance planning process by describing how defects are managed to identify future maintenance works, based on priority | A | K |
| 3.6. d | Demonstrate awareness or knowledge, as appropriate, of maintenance planning process by describing the use of a bridge management system. | A | K |
| **C3.7** | **Importance of Routine Maintenance** |  |  |
| 3.7. a | Demonstrate knowledge of the importance of routine maintenance by explaining the need to undertake routine maintenance | K | K |
| 3.7. b | Demonstrate knowledge of the importance of routine maintenance by describing the need to balance essential and preventative maintenance works. | K | K |

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| **C3.8** | **Obligations of Current Health and Safety Legislation** |  | |
| 3.8. a | Demonstrate knowledge and experience or proficiency, as appropriate, in the application of Health and Safety legislation by describing legislation and codes of practice that are relevant to the inspection of structures. | E | P |
| 3.8. b | Demonstrate knowledge and experience or proficiency, as appropriate, in the application of Health and Safety legislation by explaining the need to minimise health and safety risks to the public and others who may be affected by the inspection work activities. | E | P |
| 3.8.c | Demonstrate knowledge and experience or proficiency, as appropriate, in the application of Health and Safety legislation by explaining the need to minimise health and safety risk to those actually carrying out the works. | E | P |
| 3.8. d | Demonstrate knowledge and experience or proficiency, as appropriate, in the application of Health and Safety legislation by explaining the need to prepare and implement effective method statements and risk assessments. | E | P |
| 3.8. e | Demonstrate knowledge and experience or proficiency, as appropriate, in the application of Health and Safety legislation by describing a range of personal protective equipment (PPE) utilised for undertaking inspections | E | P |
| 3.8. f | Demonstrate knowledge and experience or proficiency, as appropriate, in the application of Health and Safety legislation by describing the use of managing and applying safe systems of work. | E | P |
| 3.8. g | Demonstrate knowledge and experience or proficiency, as appropriate, of having dealt with utilising access equipment | E | P |
| 3.8.h | Demonstrate knowledge and experience or proficiency, as appropriate, of having dealt with moving on foot alongside live carriageways | E | P |
| 3.8. i | Demonstrate knowledge and experience or proficiency, as appropriate, of having dealt with accessing and exiting from traffic management | E | P |
| 3.8. j | Demonstrate knowledge and experience or proficiency, as appropriate, of having dealt with working at height | E | P |
| 3.8. k | Demonstrate knowledge and experience or proficiency, as appropriate, of having dealt working adjacent to water | E | P |
| 3.8. l | Demonstrate knowledge and experience or proficiency, as appropriate, of having dealt working adjacent to railways | E | P |
| 3.8.m | Demonstrate knowledge and experience or proficiency, as appropriate, of having dealt with toxic substances, for example, lead in paint | E | P |
| 3.8. n | Demonstrate knowledge and experience or proficiency, as appropriate, of having dealt with lone working | E | P |
| 3.8. o | Demonstrate knowledge and experience or proficiency, as appropriate, of having dealt with night working | E | P |
| 3.8. p | Demonstrate knowledge and experience or proficiency, as appropriate, of having dealt with working with confined spaces | E | P |
| **C3.9** | **Other Skills** |  |  |
| 3.9. a | Demonstrate knowledge of traffic management and relevant reference material e.g. Chapter 8 | K | K |

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| **C.3.10** | **The Testing Process** |  |  |
| 3.10a | Demonstrate knowledge of the need for and purpose of testing when it becomes appropriate | K | K |
| 3.10. b | Demonstrate knowledge of the different testing techniques that can be utilised to investigate structural arrangement and hidden defects | K | K |
| 3.10.c | Demonstrate knowledge of the different testing techniques that can be utilised to investigate distortion and movement | K | K |
| 3.10. d | Demonstrate knowledge of the different testing techniques that can be utilised to investigate deterioration rate | K | K |
| 3.10. e | NOT USED |  |  |
| 3.10. f | Demonstrate knowledge of the different testing techniques that can be utilised to investigate material properties | K | K |
| 3.10. g | Demonstrate knowledge of the different testing techniques that can be utilised to investigate deterioration cause or potential | K | K |
| 3.10.h | Demonstrate knowledge of what is required to develop an effective testing programme by explaining how to set objectives of testing | K | K |
| 3.10. i | Demonstrate knowledge of what is required to develop an effective testing programme by explaining how to monitor and supervise testing | K | K |
| 3.10. j | NOT USED |  |  |
| 3.10. k | Demonstrate knowledge of what is required to develop an effective testing programme by explaining how test results are evaluated and recommendations made for corrective actions | K | K |
| 3.10. l | Demonstrate knowledge of investigation processes by describing the use of trial holes etc. | K | K |
| 3.10.m | Demonstrate awareness of the procurement processes for engaging specialist services | A | A |

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| **Unit C4** | |  |  |
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| **Ref** | **Outcome / Skill** | | | | **I** | | **SI** | |
| **C4.1** | **Principal Causes of Defects** | | | |  | |  | |
| 4.1. a | Demonstrate knowledge and experience or proficiency, as appropriate, by describing defects caused by inadequate structural capacity | | | | E | | P | |
| 4.1. b | Demonstrate knowledge and experience or proficiency, as appropriate, by describing defects caused by substandard clearance etc. | | | | E | | P | |
| 4.1.c | Demonstrate knowledge and experience or proficiency, as appropriate, by describing defects caused by naturally occurring damage e.g., scour | | | | E | | P | |
| 4.1. d | Demonstrate knowledge and experience or proficiency, as appropriate, by describing defects caused by accidental or deliberate damage | | | | E | | P | |
| 4.1. e | Demonstrate knowledge and experience or proficiency, as appropriate, by describing defects caused by loss of functionality of structural elements e.g. bearings, drainage, expansion joints etc. | | | | E | | P | |
| 4.1. f | Demonstrate knowledge and experience or proficiency, as appropriate, by describing defects caused by failure of water management systems | | | | E | | P | |
| 4.1. g | Demonstrate knowledge and experience or proficiency, as appropriate, by describing defects caused by implications of deterioration | | | | E | | P | |
| 4.1.h | Demonstrate knowledge of the issues that cause collapses or structure closures | | | | K | | K | |
| **C4.2** | **Defects in Miscellaneous Materials** | | | |  | | | |
| 4.2. a | Demonstrate awareness or knowledge, as appropriate, of defects that occur on other materials including advances composites | | | | A | | K | |
| **Unit C5**  **General Aptitude** | | | | | |
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| **Ref** | **Outcome / Skill** | | | | | **I** | | **SI** | |
| **C5.1** | **Practical Aptitude** | | | | |  | |  | |
| 5.1a | Demonstrate experience or proficiency, as appropriate, in working with a practical aptitude by providing examples of showing excellent attention to detail | | | | | E | | P | |
| 5.1. b | Demonstrate experience or proficiency, as appropriate, in working with a practical aptitude by providing examples of the ability to make sound and prudent judgements | | | | | E | | P | |
| 5.1.c | Demonstrate experience or proficiency, as appropriate, in working with a practical aptitude by providing examples of working to deadlines | | | | | E | | P | |
| 5.1. d | Demonstrate experience or proficiency, as appropriate, in working with a practical aptitude by providing examples of appreciating the limits of one’s own ability and scope of knowledge | | | | | E | | P | |
| **C5.2** | **Working with people** | | | | |  | |  | |
| 5.2. a | Demonstrate experience or proficiency, as appropriate, in working with people by providing examples of having worked successfully in a team | | | | | E | | P | |
| 5.2. b | Demonstrate experience or proficiency, as appropriate, in working with people by providing examples of having engaged successfully with third parties and the general public | | | | | E | | P | |

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| **C5.3** | **Communication skills** |  |  |
| 5.3. a | Demonstrate experience or proficiency, as appropriate, in communication skills, by providing examples of the interpretation of drawings and reports | E | P |
| 5.3. b | Demonstrate experience or proficiency, as appropriate, in communication skills, by providing examples of clearly drawn sketches | E | P |
| 5.3.c | Demonstrate experience or proficiency, as appropriate, in communication skills, by providing examples of written reports | E | P |
| 5.3. d | Demonstrate experience or proficiency, as appropriate, in communication skills, by providing examples of IT skills. | E | P |
| 5.3. e | Demonstrate experience or proficiency, as appropriate, in communication skills, by providing examples of being able to communicate verbally in a clear and comprehensive manner | E | P |
| 5.3. f | Demonstrate experience or proficiency, as appropriate, in communication skills, by providing examples of how findings from an inspection have been communicated | E | P |
| **C5.4** | **Personal skills** |  |  |
| 5.4. a | Demonstrate experience or proficiency, as appropriate, in personal skills by providing examples of self-motivation | E | P |
| 5.4. b | Demonstrate experience or proficiency, as appropriate, in personal skills by providing examples of determining and setting priorities. | E | P |
| 5.4.c | Demonstrate experience or proficiency, as appropriate, in personal skills by providing examples of making decisions. | E | P |
| 5.4. d | Demonstrate experience or proficiency, as appropriate, in personal skills by providing examples of having the confidence to challenge a situation/decision, if necessary. | E | P |
| **C5.5** | **Management/Supervision** |  |  |
| 5.5. a | Demonstrate knowledge or proficiency, as appropriate, of management and supervision skills by providing examples of the ability to manage and motivate teams | K | P |
| 5.5. b | Demonstrate knowledge or proficiency, as appropriate, of management and supervision skills by providing examples of the ability to advise and present recommendations to senior staff / clients | K | P |
| 5.5.c | Demonstrate knowledge or proficiency, as appropriate, of management and supervision skills by providing examples of identifying the resources required for an inspection and the costs involved | K | P |
| 5.5. d | Demonstrate knowledge or proficiency, as appropriate, of management and supervision skills by providing examples to ensure that an inspection complies with the appropriate contractual legal requirements | K | P |

Module 1 Masonry Bridges

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| **MAS.1 Defects, Descriptions and Causes** | |
| **MAS.1.1 Masonry Defects** | |
|  | | | | |
| **Ref** | **Outcome / Skill** | | **I** | **SI** |
| MAS.1.1. a | Demonstrate knowledge and experience or proficiency, as appropriate, of a range of defects in masonry structures caused by structural distress | | E | P |
| MAS.1.1. b | Demonstrate knowledge and experience or proficiency, as appropriate, of a range of defects in masonry structures caused by the nature of the material | | E | P |
| MAS.1.1.c | Demonstrate knowledge and experience or proficiency, as appropriate, of a range of defects in masonry structures caused by external agents e.g. frost attack, vegetation, erosion | | E | P |
| MAS.1.1. d | Demonstrate knowledge and experience or proficiency, as appropriate, of a range of defects in masonry structures caused by accidental or deliberate damage | | E | P |
| MAS.1.1. e | NOT USED | |  |  |
| MAS.1.1. f | Demonstrate knowledge and experience or proficiency, as appropriate, of a range of defects in masonry structures caused by unsympathetic maintenance techniques | | E | P |

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| **MAS.2** | **Investigation and Testing** | I | SI |
| **MAS.2.1** | **Common Testing Techniques** |  |  |
| MAS.2.1. a | Demonstrate knowledge of common testing techniques by describing delamination surveys | K | K |
| MAS.2.1. b | NOT USED |  |  |
| MAS.2.1.c | Demonstrate knowledge of common testing techniques by describing acoustic emission | K | K |
| MAS.2.1. d | Demonstrate knowledge of common testing techniques by describing coring | K | K |
| **MAS.3** | **Repair Techniques** |  |  |
| **MAS.3.1** | **Repair techniques for masonry structures** |  |  |
| MAS.3.1. a | Demonstrate knowledge of the principal repair techniques for masonry structures. Knowledge to include (but not limited to) the use of repointing/brickwork repairs | K | K |
| MAS.3.1. b | Demonstrate knowledge of the principal repair techniques for masonry structures. Knowledge to include (but not limited to) the use of sprayed concrete to soffit | K | K |
| MAS.3.1.c | Demonstrate knowledge of the principal repair techniques for masonry structures. Knowledge to include (but not limited to) the use of retrofitting of reinforcement | K | K |
| MAS.3.1. d | Demonstrate knowledge of the principal repair techniques for masonry structures. Knowledge to include (but not limited to) the use of anchors (e.g. grouted, radial etc.) | K | K |
| MAS.3.1. e | Demonstrate knowledge of the principal repair techniques for masonry structures. Knowledge to include (but not limited to) the use of concrete saddle/relieving slabs | K | K |
| MAS.3.1. f | Demonstrate knowledge of the principal repair techniques for masonry structures. Knowledge to include (but not limited to) the use of stitching (short tie bars spanning cracks) | K | K |

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| **Module 2**  **Concrete Bridges** | |
| **CON.1** | **Defects Descriptions and Causes** | | **I** | **SI** |
| **CON.1.1** | **Concrete Defects** | |  |  |
| CON.1.1. a | Demonstrate knowledge and experience or proficiency, as appropriate, of a range of defects in concrete structures caused by structural distress | | E | P |
| CON.1.1. b | Demonstrate knowledge and experience or proficiency, as appropriate, of a range of defects in concrete structures caused by the nature of the material | | E | P |
| CON.1.1.c | Demonstrate knowledge or knowledge and experience of a range of defects in concrete structures caused by external agents e.g. thaumasite sulphate attack (TSA) | | K | E |
| CON.1.1. d | Demonstrate knowledge and experience or proficiency, as appropriate, of a range of defects in concrete structures caused by reinforcement corrosion | | E | P |
| CON.1.1. e | Demonstrate knowledge and experience or proficiency, as appropriate, of a range of defects in concrete structures caused by accidental or deliberate damage | | E | P |
| CON.1.1. f | NOT USED | |  |  |
| CON.1.1. g | Demonstrate knowledge and experience or proficiency, as appropriate, of a range of defects in concrete structures caused by construction defects | | E | P |
| CON.1.1.h | Demonstrate knowledge and experience or proficiency, as appropriate, of a range of defects in concrete structures caused by repair systems | | E | P |
| CON.1.1. i | Demonstrate knowledge and experience or proficiency, as appropriate, of a range of defects in concrete structures caused by the use of protective coatings | | E | P |
| CON.1.1. j | Demonstrate knowledge and experience or proficiency, as appropriate, of a range of defects in concrete structures caused by minor defects which generally only affect the visual appearance of the concrete | | E | P |
| CON.1.1. k | Demonstrate knowledge or knowledge and experience, as appropriate, of defects that can occur in prestressed concrete | | K | E |
| CON.1.1. l | Demonstrate knowledge or knowledge and experience, as appropriate, of defects that can occur in post-tensioning systems | | K | E |
| **CON.2** | **Investigation and Testing** | |  |  |
| **CON.2.1** | **Common Testing Techniques Concrete** | |  |  |
| CON.2.1. a | Demonstrate knowledge of common testing techniques by describing cover surveys | | K | K |
| CON.2.1. b | Demonstrate knowledge of common testing techniques by describing the use of crack width gauges | | K | K |
| CON.2.1.c | Demonstrate knowledge of common testing techniques by describing delamination surveys | | K | K |
| CON.2.1. d | Demonstrate knowledge of common testing techniques by describing half-cell potential surveys | | K | K |
| CON.2.1. e | Demonstrate knowledge of common testing techniques by describing carbonation tests | | K | K |
| CON.2.1. f | Demonstrate knowledge of common testing techniques by describing coring | | K | K |
| CON.2.1. g | Demonstrate knowledge of common testing techniques by describing tests for chloride/sulphate/alkali content | | K | K |
| CON.2.1.h | Demonstrate knowledge of common testing techniques by describing the use of strain gauges | | K | K |
| **CON.3** | **Repair Techniques** | |  |  |
| **CON 3.1** | **Repair Techniques for Concrete Structures** | |  | |
| CON.3.1. a | Demonstrate knowledge of the principal repair techniques for concrete structures. Knowledge to include (but not limited to) the use of materials used for repairs (e.g., sprayed concrete, hand-applied cementitious mortars, epoxy resins etc) | | K | K |
| CON.3.1. b | Demonstrate knowledge of the principal repair techniques for concrete structures. Knowledge to include (but not limited to) methods for inhibiting corrosion (e.g. cathodic protection, impregnation surface treatments) | | K | K |
| CON.3.1.c | Demonstrate knowledge of the principal repair techniques for concrete structures. Knowledge to include (but not limited to) strengthening methods (e.g. plate bonding, composite column wrapping etc). | | K | K |

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| **Module 3**  **Metallic Bridges** | |
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| **MET.1** | **Defects Descriptions and Causes** | | **I** | **SI** |
| **MET.1.1** | **Steel Defects** | |  |  |
| MET.1.1. a | Demonstrate knowledge and experience or proficiency, as appropriate, of a range of defects in steel structures caused by structural distress | | E | P |
| MET.1.1. b | Demonstrate knowledge and experience or proficiency, as appropriate, of a range of defects in steel structures caused by the nature of the material | | E | P |
| MET.1.1.c | Demonstrate knowledge and experience or proficiency, as appropriate, of a range of defects in steel structures caused by accidental or deliberate damage | | E | P |
| MET.1.1. d | Demonstrate knowledge and experience or proficiency, as appropriate, of a range of defects in steel structures caused by fabrication errors e.g. welds of poor quality | | E | P |
| MET.1.1. e | Demonstrate knowledge and experience or proficiency, as appropriate, of a range of defects in steel structures caused by material corrosion | | E | P |
| MET.1.1. f | NOT USED | |  |  |
| MET.1.1. g | Demonstrate knowledge of defects associated with protective systems | | K | K |
| MET.1.1.h | Demonstrate knowledge of defects associated with closed members | | K | K |
| MET.1.1. i | Demonstrate knowledge of defects associated with corrugated steel buried structures | | K | K |
| MET.1.1. j | Demonstrate knowledge of defects associated with a whole system, for example, steel beams with jack arches | | K | K |
| **MET. 1.2** | **Defects in Miscellaneous Materials** | |  |  |
| MET.1.2. a | Demonstrate knowledge of defects that occur in cast iron | | K | K |
| MET.1.2. b | Demonstrate knowledge of defects that occur in wrought iron | | K | K |
| MET.1.2.c | Demonstrate knowledge of defects that occur in aluminium | | K | K |
| MET.1.2. d | Demonstrate knowledge of defects that occur in wire rope | | K | K |
| **MET.2** | **Investigation and Testing** | |  |  |
| **MET.2.1** | **Common Testing Techniques Metallic** | |  |  |
| MET.2.1. a | Demonstrate knowledge of common testing techniques by describing delamination surveys | | K | K |
| MET.2.1. b | Demonstrate knowledge of common testing techniques by describing the use of strain gauges | | K | K |
| MET.2.1.c | Demonstrate knowledge of common testing techniques by describing the use of ultrasonic testing | | K | K |
| MET.2.1. d | Demonstrate knowledge of common testing techniques by describing the use of paint film thickness measurements | | K | K |
| **MET.3** | **Repair Techniques** | |  | |
| **MET.3.1** | Repair Techniques for Metal Structures | |  | |
| MET.3.1. a | Demonstrate knowledge of the principal repair techniques for metal structures. Knowledge to include (but not limited to) the use of member replacement | | K | K |
| MET.3.1. b | Demonstrate knowledge of the principal repair techniques for metal structures. Knowledge to include (but not limited to) the use of repairs by plating | | K | K |
| MET.3.1.c | Demonstrate knowledge of the principal repair techniques for metal structures. Knowledge to include (but not limited to) the use of epoxy resins, polyurethanes and other protective coating systems | | K | K |

Appendix Two:

Continuing Professional Development

Once an Inspector or Senior Inspector are certified, their certification is automatically renewed annually (subject to receipt of the annual subscription). After 3 years there is a formal review and renewal process in place, as detailed below.

Inspectors are advised that re-certification is dependent on evidence that they are maintaining inspection activity known as Frequency of Practice. In addition, they will maintain their appropriate training credentials and Continuing Professional Development (CPD). To evidence this, Inspectors and Senior Inspectors should continue to record all Frequency of Practice and CPD on their registered e-portfolio as a training record https://bics.skills-plus.net/. It is recommended that this log of Frequency of Practice and CPD is updated regularly.

*Training Record = Frequency of Practice + Continuing Professional Development*

What is CPD?

CPD is a term that covers all manner of learning activities that are undertaken to build on and improve skills, knowledge, and behaviours. It enables an Inspector or Senior Inspector to continue in their role and to provide opportunities for further career development.

Within BICS, CPD enables Inspectors of all levels to collect and record practical learning throughout their working lives, shows commitment to the industry and ensures that individuals keep abreast of developments within the industry.

CPD also promotes continued practice within the field of structural inspection to ensure the practical skills required of inspectors are not lost or diminished. This would be particularly important for certified inspectors who take career breaks, enter new roles, or deliver inspection related work as part of a broader engineering role.

**What are the benefits of CPD?**

**Individual Benefits**

* It enables development of knowledge and skills, as well as to identify areas for further development.
* It demonstrates a commitment to your profession or work.
* It provides an opportunity to keep abreast of developments within bridge inspection and demonstrates continuing competency and knowledge.

**Employer Benefits**

* CPD provides reassurance to clients that staff within a company are competent and knowledgeable, committed to their own development and are keeping up with the latest developments within the industry.
* It also provides an employer with evidence of development and assisting with career progression and advancement.

**Recording CPD**

To gain the maximum benefit from CPD, it is important it is recorded, as this will allow Inspectors to reflect on what has been learnt and how it can be incorporated into work Improvements. CPD should be recorded as part of a training record within the dedicated section on the BICS e-portfolio https://bics.skills-plus.net/ using the template as shown below.

One day of CPD is equivalent to 6 hours of related learning/experience and the Inspector may accrue this in full days or part days as appropriate. With exception classroom training where this extends over at least one full day of 6 hours or greater, is only equivalent to one day of CPD.

The BICS scheme places significant importance on the maintenance of inspection skills. Failure to provide evidence of Frequency of Practice and CPD will result in certification being withdrawn and may affect inspectors work requirements. Reactivation of BICS certification at a later date, will be subject to a further interview and a fee.

**Formal 3-year review**

Inspectors and Senior Inspectors should maintain a training record, and evidence of continued active involvement with structure inspections. This should regularly be updated on their BICS e-portfolio https://bics.skills-plus.net/.

At the 3-year anniversary of certification the training record including Frequency of Practice and CPD for the preceding 3 years will be formally reviewed by LANTRA, with the assistance of a BICS registered assessor if appropriate. It is recommended that inspectors seek endorsement from their Inspection Manager or other Senior Manager, to confirm that the submitted evidence is correct and appropriate. An email confirmation from the senior person should be appended to the e-portfolio https://bics.skills-plus.net/.

**Training Record**

The training record comprising Frequency of Practice and CPD should provide evidence and details of the ongoing skills maintenance undertaken by the Inspector or Senior Inspector. This will generally be a mix of attendance at formal training courses, self-learning and on the job experience.

**Re-certification Criteria**

* + An average minimum of 25 days (150 hours) of Frequency of Practice and 5 days CPD is required per year
  + The Frequency of Practice record should consist of evidence of structural inspections undertaken, or planned and overseen, particularly identifying Health and Safety aspects
  + CPD evidence should also be provided including relevant training and/or courses attended and appropriate qualifications obtained or renewed

Inspectors applying for renewal of BICS certification with less CPD than recommended will be considered but will be subject to a more detailed review.

It would be expected that Senior Inspectors evidence would show a greater emphasis on inspection of complex or large structures and planning, management and oversight of other inspections and inspection programmes.

Some examples have been provided below of CPD activities, but this list is not exhaustive:

**Programming, Planning & Preparing for Inspections (Frequency of Practice)**

* + Production and review of Risk Assessments and Method Statements (RAMS)
  + Programming Inspections
  + Procuring specialist equipment and/or contractors (access, welfare, roped access etc.)
  + Pre site desk study (review of record drawings, previous inspections etc.)

**Undertaking Bridge Inspections (Frequency of Practice)**

* + Pre site briefings
  + General / Principal / Special Inspections
  + Inspection write ups – Principal inspection reports, Bridge Condition Indicator forms, recommendations

**Activities to improve and expand knowledge (CPD)**

* Attend training courses, industry talks, webinars, presentations, discussions
* Independent study
* Shadowing of colleagues
* Obtaining additional relevant qualifications or renewal of training credentials
* Employer reviews undertaken on site or in the office

Given the requirement for specific H&S and Developing Practice related CPD, below are some more specific examples of CPD and again these lists are not exhaustive

**CPD Proposed Activities**

***H&S***

Risk Assessments

Method Statements

Permit to Work preparation and use i.e. Working at Height, Confined Spaces

Task Briefing Sheets

Highways Safety Passport

NEBOSH

PTS

IPAF Certification

PASMA Certification

Confined Spaces Entry/Awareness Training

Specific Site Inductions (Construction and other managed sites)

Toolbox talks

Training delivery i.e., planning safe site visits, working at height, excavations

Suggesting improvements to existing safe systems

Team management – pre-site and during delivery, health screening, etc

COSS/SWL role

IRATA Certification

Commercial Diving Operations Certification

Boat handling i.e., RYA Level 4

“Don’t Walk By” submissions

Company research i.e., sub-contracted access

Traffic Management planning and control

Lessons Learned Control

Incident investigation i.e., bridge strikes, safety incidents

Safety and wellbeing moments

First Aid Training

***Developing Practice***

Remote inspection techniques

New bridge management systems

Handheld inspection reporting

Developing materials i.e., FRP

New products and markets

New/developing repair techniques

Conferences/exhibitions (related)