National Highway Sector Scheme 31 for the Bridge Inspector Certification Scheme

Assessor Guidance Manual

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V1 42:2015/16	SCS		Amendments to Appendix B – Unit guidance
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V3.2 10:2023	DF-S	SC	Reformatted
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Contents

1. Introduction

This document is aimed at providing the Assessor with guidance for carrying out Bridge Inspector/Senior Bridge Inspector Interviews for this scheme.

It is not intended to be prescriptive and whilst available as an aid to the interview process, it is expected that the Assessor will make full use of the e-portfolio to identify which areas to focus their questioning.

The **Bridge Inspector Certification Scheme** consists of five Core Inspection Competencies and three optional Modular Material Competencies, which themselves each comprise of several 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.

2. The role of an Assessor

The main 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 by an external interview.

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

2.1 Assessor registration

New applicant Assessor Criteria:

Approval criteria	Evidence requirement
Industry experience for the scheme	Provide a competency-based Curriculum Vitae showing that the applicant has the relevant industry experience and knowledge Provide a written statement evidencing what you can bring to the role of a BICS Assessor
Must be a Certified Senior Bridge Inspector	Attend and pass an interview conducted by a Lantra approved Lead BICS Assessor Undertake a candidate interview under the supervision of the Lead Assessor showing competency as an Interviewer.

All Assessors will be expected to attend a standard-setting event (SSE) every three years to maintain their status as Lantra-approved Assessors, ensuring consistency across all Assessor decisions.

All assessors must be registered with Lantra.2.2 Assessor 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 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 (Bridge 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 the next steps
- Participate in Appeals, if required.

The e-portfolio review will be recorded on standard pro forma (see Appendix B). It is important to note that candidates should be assessed at a sub-competency level e.g. C1.1 and C1.2. There is no need to drill down to the lower level e.g. C1.1a, C1.1b, C1.2a and C1.2b.

Examples of e-portfolios of different standards can be found in Appendix C.

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.

2.3 The Role of the Lead Assessor

A Lead Assessor may be appointed by Lantra. 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 meeting the required standards.
- Assisting in Assessor Standardisation Events

3. Interviews

Overview

Once the Assessor has assessed and approved a candidate's e-portfolio, interviews will be arranged by Lantra in liaison with the Assessor and the candidate. It is important to note that candidates must pass both the e-portfolio review and the interview.

A typical interview is expected to take one and a quarter hours to complete and will be based, in part, on areas of the e-portfolio where further investigation/clarification of the candidate's competency is required.

Assessors are required to:

- Check on the author of the submission.
- Check that the knowledge and experience demonstrated by the candidate can be authenticated.
- Focus on any areas of concern highlighted by the reviewer.

Interviews must include robust questioning for the following areas, as these are **critical** to any bridge inspection:

- Health and safety
- Identifying defects
  - how to investigate
  - common causes
  - how to rectify
  - whom to refer to

The assessor is expected to consider the wider picture (across the five Core Competencies and relevant specialist modules), when questioning the candidate, also considering risk and giving a balanced view in their final report. Typical interview questions designed to assist the assessor have been included in a Question Bank (see Appendix D).

Each assessor should independently score the answer to each question as follows:

- 1 - Excellent
- 2 - Good
- 3 - Marginal
- 4 – Poor / not met standard

The scores should be reviewed immediately after the interview and the outcome recorded on a single standard proforma (see Appendix E) signed by both assessors. If necessary, the assessors' scores should be averaged.

An overall average score of 2.4 or less is required to achieve a pass. Any score of 4 for a single question constitutes an overall failure.

Guidance on the standard to be achieved for all sub-competencies, for the appropriate competency rating, is set out in Appendix F which should be read in association with the Scheme Manual.

Appendix A – Assessor written statement pro forma

Written statement (no more than 350 words per unit)	
Unit C1	**Introduction to Inspections**
Unit C2	**Structures Types and Elements / Behaviour of Structures**
Unit C3	**Inspection Process**
Unit C4	**Defects Descriptions and Causes**
Unit C5	**General Aptitude**
Unit MAS	**Masonry Bridges**
Unit CON	**Concrete Bridges**

Unit MET	Metallic Bridges

Appendix B - Bridge Inspector Certification Scheme

E-Portfolio Review Form

Bridge Inspector E-Portfolio ☐
Senior Bridge Inspector E-Portfolio ☐

Candidate: _____ Date Application Received: _____

Core Module	Standard Met (Senior Inspector/ Inspector /not met)	Justification of Decision
1		
2		
3		
4		
5		

MAS		
CON		
MET		

Standard Met	
Comments and general feedback for Inspector.	

Interview Questions

Core Module	Specific questions to be asked at interview (or none if very strong in the module)
1	
2	
3	
4	
5	
MAS	
CON	
MET	

Assessor Comments and Feedback for Lantra: *This summary **will not** be sent to the Candidate.*			
Recommendation: Interview	**Pass**	**Fail**	**Comments:**
Summary			
*This summary **will be** forwarded to the Candidate.*			
Strengths			
Weaknesses			
Assessor name:	**Signature:**	**Date:**	

Appendix C – Question Bank

These questions are designed to aid the Assessor with the interview and are not intended to be prescriptive or a definitive list.

BICS INTERVIEW QUESTIONS				
Competency	**Question No.**	**Candidate**	**Question**	**Model Answers**
C1 - Introduction to Inspections				
1.1	1	All	Tell me a little about your inspection experience and when you last undertook an inspection?	
1.1	2	All	Why is it important to undertake inspections?	
1.1	3	All	Can you give us an example of the difference between 'fit for purpose' and 'safe for use'?	
1.1	4	All	Why is it important for clients to understand the condition of their structural assets?	To plan for future maintenance, to prioritise maintenance work effectively, to gain an understanding of their financial liabilities
1.2	1	All	What is your understanding of BICS?	
1.2	2	All	How does the BICS differentiate between the roles of Inspector and Senior Inspector?	
1.2	3	All	What do you consider are the differences between SI and I?	
1.2	4	All	Why do you think it is important to be certified under BICS?	
1.2	5	SI Only	What do you feel is important to discuss with trainee inspectors when they are first introduced to the scheme?	
1.3	1	All	What are the main differences between a GI and a PI?	

1.3	2	All	What are the objectives of a **Principal** Inspection?	Capture of detailed condition of an asset; prioritisation of work required on asset; initial cost estimate of works required; benchmarking data for asset owner.
1.3	3	All	When might a Special Inspection be required?	
1.3	4	All	How does an Inspection for Assessment differ from a Principal Inspection?	
1.4	1	All	What standards are used directly in structural inspections?	CS450, CS455, CSS BCI, Inspection Manual for Highway Structures
C2 - Structure Types and Elements / Behaviour of Structures				
2.1	1	All	Can you give us a few examples of the **durability** elements on a bridge structure?	Paintwork / Finishes, Waterproofing, Movement Joints, Drainage
2.1	2	All	Can you give us a few examples of the **safety** elements on a bridge structure?	Access walkways, gantries, handrails, parapets, safety fences, surfacing, road markings
2.1	3	All	Can you give us a few examples of the common types of bridge construction in the UK?	Steel Truss, Steel / Concrete Composite, Pre-stressed Concrete, Post Tensioned Concrete, Arch Bridge, Cable Stayed Bridge, Suspension Bridge?
2.1	4	All	What form of structure is this? - SHOW PHOTO	
2.2	1	All	What is the typical function of a culvert?	Drainage structure which generally carries a watercourse underneath a highway/ embankment
2.2	2	All	What are the typical forms of culvert seen in the UK?	RC Box, Pipe, Corrugated Steel Pipe, Masonry Arch

2.3	1	All	Can you describe the load path for this structure? - SHOW PHOTO	
2.4	1	All	What are the advantages and disadvantages of concrete as a material?	
2.4	2	All	What are the advantages and disadvantages of steel as a material?	
2.5	1	SI Only	How might you identify wrought iron on a bridge without any as-built information?	
C3 - Inspection Process				
3.1	1	All	What is the standard frequency of PI's and GI's? How might a risk-based approach affect this?	PI (6 yr) GI (2 yr) on road bridges; relevant differences between authorities; RBA affects the frequency up or down (provide examples)
3.1	2	All	What main issues affect scheduling of inspections?	Location; current condition and safety concerns; ease of access; complexity; third party involvement; cost (budget); resource availability; seasonal influence; tidal influence; traffic management requirements
3.1	3	All	What issues might be considered in a risk-based approach to inspection?	consequence of failure; existing condition; structure type and durability; structural complexity; durability; structural redundancy; function
3.1	4	All	What systems or procedures have you used to monitor the progress of inspections against inspection schedules?	Work schedules; bridge management systems; emergency planning procedures; Gannt charts
3.2	1	All	What issues might you pick up on- site during an initial reccy?	Methods of access; location; access constraints; wider safety implications; topography; size of structure; external influences such as landowners; water levels; TM requirements; typical use of structure; vehicle parking

3.2	2	All	How do you plan for H&S when planning for a typical inspection job?	Risk assessment/method statements; identify and procure equipment; determine experience of resource/team size; desk study; health and safety file review; liaise with client re local knowledge
3.2	3	All	What type of information might be included in a method statement for inspection work?	Schedule; site location; access constraints; equipment use; scope of inspection; type of inspection; team size/details; emergency planning; other work activities in vicinity; reconnaissance findings/photos
3.2	4	SI only	What issues might you consider when resourcing inspection work?	Experience; cost; availability; involvement in similar inspections; succession management; team size requirements
3.2	5	All	What equipment would you typically use during a structure inspection?	Camera; PPE; survey/notebook; measuring equipment; MEWPs; ladders; lighting; signage/TM; masonry hammer; crack width gauge
3.2	6	All	What is the definition of a 'confined space' and what restrictions are in place for this type of work?	Definition set out in Confined Spaces Regulations or equivalent; typical examples; explosive/toxic atmospheres; reduced oxygen; free flowing solid. Restrictions: specific training requirements; experience/competence; special equipment (breathing apparatus; intrinsically safe equipment; gas monitors).
3.2	7	All	What are the main risks present during an inspection over water / over rail / over road / remote location / confined space? What would you do to control these risks?	Water: drowning; contamination; water borne diseases Rail: electrocution; train movement; tripping hazards Road: live traffic; errant vehicles; high vehicles; pedestrian thoroughfare Confined space: asphyxiation; explosive atmospheres; toxic atmospheres; access/egress; water; vermin

3.2	8	All	What PPE is likely to be needed for a typical inspection job?	High visibility clothing; hard hat; safety boots; gloves; lifejackets; safety glasses; harnesses (recue/fall prevention)
3.2	9	All	What access equipment might be used to inspect... (show pictures)	MEWP; tripod with man riding winch; boat
3.2	10	All	Discuss TM requirements for a motorway overbridge?	road space booking; TTRO; IPV; safety zones; temporary barriers; signage; speed restrictions
3.2	11	All	How might you go about arranging an inspection over rail? Over water? Navigation management? Rail management?	Rail: possessions; appointment of COSS; PTS training; specific PPE Water: liaise with navigation authority if applicable; boat use; roped access; non-standard scaffold; existing arrangements such as bridge gantries; moving bridges in open and closed state
3.2	12	All	How do previous inspection records and testing information feed into the inspection process?	Highlight areas of concern; facilitate deterioration modelling; information on hidden critical elements
3.3	1	All	What is the first thing you do when you get to site?	Park safely; dynamic risk assessment; check inspection is still safe to complete if conditions vary
3.3	2	All	Talk us through a typical inspection of a bridge?	Logical process described: site induction if needed; initial dynamic risk assessment - address safety concerns; make contact with property owners if affected; general walkover taking holistic view of the bridge; consider individual elements in order to ensure adequate inspection coverage; take adequate photos of elements/defects; investigate potentially hidden defects i.e. hammer tap; take measurements i.e. crack widths, defect extents; record notes; advise on safety issues with defects with asset owner.

3.3	3	All	How would you identify and record a defect during inspection?	Review previous reports/information; consider structural element as new and determine what has changed; Examples used? Importance of determining extent and severity.
3.3	4	All	How would you take a useful photograph on site?	Context: ability to identify the element; defect clarity from photograph; use macro view for close up detail of defects; use of equipment to establish scale i.e. steel tape/rule
3.3	5	All	What information would you look to include in a defects photograph?	Context: ability to identify the element; use of equipment to establish scale i.e. steel tape/rule; full extents of defect; date markings to support future inspections.
3.4	1	All	What information would you expect to see in a typical inspection report?	Structure description; location; previous inspection history; previous maintenance history; inspection method; inspection findings; conclusions; recommendations; defects photos; general arrangement drawing showing defect's locations; BCI proforma
3.4	2	All	How does the level of detail differ between a General Inspection Report and a Principal Inspection Report?	GI covers deterioration since the last PI or GI; PI covers a detailed snapshot of the structure and refers to previous defect/maintenance history
3.4	3	All	What are the potential implications of inaccurate defect reporting?	structural safety issues missed; incorrect valuation of asset leading to incorrect assessment of mitigation cost; ambiguity at future inspections
3.4	4	All	Can you describe the different ways in which defect findings can be communicated to your clients?	Report; photographs; direct communication
3.4	5	All	How does a defect of an urgent nature impact on reporting?	Defects may have safety implications that need raising in lieu of a written report so that interim measures can be adopted.

3.4	6	All	How would you determine 'severity' and 'extent' of a defect?	Severity: Refer to relevant defect's codes in BCI guidance. Provide examples of superficial and significant defects. Extent: refer extent to element types. BCI referencing of extent A to E. Practical assessment of extent i.e. hammer tap.
3.4	7	All	Can you explain the importance of 'signing off' an inspection report?	Effective QA. Agreement of findings with asset owner.
3.5	1	All	How do you determine deterioration in a particular defect?	Refer to previous findings, reports, etc. Investigation. Monitoring. Provide examples of effective monitoring. Failure of element.
3.5	2	SI Only	Can you give us an example, based on your own experience, of how you have used existing structure records to help determine the cause of a defect?	Specific reference to assessed capacity limitations and consequential in situ deterioration. Explain relevance of example. Investigation report findings. Root cause examples.
3.6	1	All	How is the information we report used by clients / asset owners?	Population of asset management systems. Feeding AMPs. Valuation of existing assets. Planning maintenance intervention. Decommissioning assets. Developing funding streams.
3.6	2	All	How do you think clients prioritise their bridge defects?	Safety critical, operational effectiveness, increased maintenance frequency, aesthetic/superficial.
3.6	3	All	How is inspection information used by clients to obtain the funding necessary to maintain their bridge stock?	Developing Asset Management Plans, providing evidence for funding i.e. LTPs, highlighting asset value, WLC, option studies, cost benefit analysis

3.6	4	SI Only	What is the mechanism by which clients obtain funding to maintain their bridge stock?	As above but more on funding streams: LTP settlements, heritage lottery funding, ERDF, Challenge Fund. Difference between capital and maintenance funding. PRN, Emergency, PFI, Exceptional Maintenance.
3.6	5	All	What is a bridge management system and what is it used for?	Register of fixed assets. Valuation of fixed assets. Evidence for funding application. Planned maintenance. Routine Maintenance. Maintenance history. Inspection history. Assessed capacity.
3.7	1	All	Why do you think it is important to undertake routine maintenance on structures?	
3.7	2	All	How can routine maintenance reduce the need for capital refurbishment works?	
3.8	1	All	How do you plan for H&S when planning for a typical inspection job?	Site reconnaissance. Risk Assessment. Method Statement. Dynamic Risk Assessment. Control measure identification. Hierarchy of risk control (ALARP). Team size/capability. Access difficulties. Provide specific examples of experience.
3.8	2	All	What type of information might be included in a method statement for inspection work?	Site location. Scope of inspection. Resources. Equipment needed. Emergency contact info. Date/hours of work. Site constraints. Access provision. Security arrangements.

3.8	3	SI only	What regulations dictate the use of risk assessments to protect a workforce?	
3.8	4	All	What is the definition of a 'confined space' and what restrictions are in place for this type of work?	Definition set out in Confined Spaces Regulations or equivalent; typical examples; explosive/toxic atmospheres; reduced oxygen; free flowing solid. Restrictions: specific training requirements; experience/competence; special equipment (breathing apparatus; intrinsically safe equipment; gas monitors).
3.8	5	All	What regulations cover access equipment for use in inspections, including MEWPs?	LOLER, PUWER, Confined Spaces Regulations
3.8	6	All	What H&S qualifications do you have relating to inspection work?	IPAF; PASMA; confined spaces; professional qualifications; PTS; boat handling; NEBOSH
3.8	7	SI only	How would you control the use of subcontractors in delivering elements of inspection of investigation work in terms of H&S?	Review RAMS; provide site constraints information; supervision on site; provide scope of work; procurement method; toolbox talks; site induction
3.8	8	SI only	Say you are managing the inspection of a bridge. How do you ensure the safety of all operatives involved in the inspection, including for any subcontracted works?	Review RAMS provided for adequacy; raise concerns in advance of inspection; dynamic risk assessment on first arrival; reconnaissance visit; toolbox talks; site induction; awareness training
3.9	1	All	How might you go about arranging TM for a typical inspection over road?	Check for suitable diversions; road closures; phasing; lane possessions

3.10	1	All	In what situations might testing be necessary?	
3.10	2	All	Have you ever recommended any testing works as a result of an inspection. If so, what tests did you recommend?	
C4 - Defects Descriptions and Causes				
4.1	1	All	Drawings on your own experience, what would you say is the main cause of the bridge defects you have encountered?	
4.1	2	All	What are the main causes of defects on bridge bearings?	
4.1	3	All	What causes corrosion in reinforced concrete?	
4.1	4	All	Why is it important to measure cracks in concrete elements when undertaking a Principal Inspection?	
4.1	5	All	How would you gain an understanding of the deterioration rate of a defect?	
C5 - General Aptitude				
5.4d	1	All	Have you ever challenged a situation or a decision that you disagreed with? Describe what happened.	

Masonry Bridges				
MAS.1	1	All	Can you describe some typical defects you are likely to see on a masonry arch bridge?	
MAS.2	1	All	What type of testing might be appropriate for a masonry arch bridge?	
MAS.3	1		Can you discuss some of the common repair techniques used on masonry structures?	
Concrete Bridges				
CON.1	1	All	Can you describe some of the typical defects you are likely to see on concrete bridge elements?	
CON.2	1	All	What would a carbonation test tell you?	
CON.3	1	All	Can you discuss some of the common repair techniques used on concrete?	
Metallic Bridges				
MET.1	1	All	Can you describe some of the typical defects you are likely to see on steel bridge elements?	
	2	All	You observe severe section loss to the bottom flange of a steel beam close to an abutment bearing. What are the implications of this in terms of the load carrying capacity of the bridge?	

	3	SI only	From a structural perspective, what is the main difference between wrought iron and cast iron?	
MET.2	1	All	In what situations might ultrasonic thickness testing be appropriate?	
MET.3	1	All	Can you discuss some of the common repair techniques used on steelwork?	

Appendix D - Bridge Inspector Certification Scheme

Interview Record

Candidate Name:		
Type of Inspector:	Bridge Inspector ☐ Senior Bridge Inspector ☐	
Date of Interview:		
Venue:		
Assessor Name:		
Assessor Signature		**Score Key: 1 - 4** 1 = Excellent 4 = Poor **Pass / Fail: Yes / No**
Date:		

Core Module No.: 1

Question1:	Response:	Score: 1 - 4
Question 2:	**Response:**	**Score: 1 - 4**

Core Module No.: 2

Question1:	Response:	Score: 1 - 4
Question 2:	**Response:**	**Score: 1 - 4**

Core Module No.: 3

Question1:	Response:	Score: 1 - 4
Question 2:	**Response:**	**Score: 1 - 4**

Core Module No: 4

Question1:	Response:	Score: 1 - 4
Question 2:	**Response:**	**Score: 1 - 4**

Core Module No.: 5

Question1:	Response:	Score: 1 - 4
Question 2:	**Response:**	**Score: 1 - 4**

Material Module: MAS

Question1:	Response:	Score: 1 - 4
Question 2:	**Response:**	**Score: 1 - 4**

Material Module: CON

Question1:	Response:	Score: 1 - 4
Question 2:	**Response:**	**Score: 1 - 4**

Material Module: MET

Question1:	Response:	Score: 1 - 4
Question 2:	**Response:**	**Score: 1 - 4**

Appendix E – Unit guidance

The following table has been provided as a guide only. The Assessor must verify that the candidate has achieved the appropriate rating against the 5 Core Competencies and the relevant Material Modules. Whilst the table shows achievement ratings A to P, please refer to the 'Required Rating' columns to identify achievement ratings for Bridge Inspector (BI) or Senior Bridge Inspector (SI).

Unit C1 – Introduction to Inspections

C1.1 – Purpose of Inspections

Assessment Criteria	Achievement Rating				Required Rating	
	A	K	E	P	BI	SI
a) Demonstrate knowledge of the purpose of inspections by outlining the importance of undertaking inspections.	Awareness of the importance of inspections.	Knowledge of the importance of inspections.	N/A	N/A	K	K
b) Demonstrate knowledge of the purpose of inspections by explaining the terms safe for use and fit for purpose	Awareness of the terms safe for use and fit for purpose.	Knowledge of the terms safe for use and fit for purpose.	N/A	N/A	K	K

C1.2 – Inspector Roles, Responsibilities and Competences

Assessment Criteria	Achievement Rating				Required Rating	
	A	K	E	P	BI	SI
a) Demonstrate knowledge of the roles, responsibilities and competencies of an inspector by describing the two inspector roles and their associated responsibilities.	Awareness of the two inspector roles as defined under the scheme.	Knowledge of the two inspector roles and responsibilities as defined under the scheme.	N/A	N/A	K	K
b) NOT USED						

C1.3 – Inspection Types

Assessment Criteria	Achievement Rating				Required Rating	
	A	K	E	P	BI	SI
a) Demonstrate knowledge of different inspection types by describing the objectives of the different types of inspection relevant to your industry sector	Awareness of the different types of inspection.	Knowledge of the different types of inspection.	N/A	N/A	K	K

b) Demonstrate knowledge of different inspection types by explaining the importance of an appropriate inspection regime including the function of cyclic inspections	Awareness of the importance of an appropriate inspection regime	Knowledge of the importance of an appropriate inspection regime by highlighting the function of cyclic inspections	N/A	N/A	K	K
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	Awareness of special inspections.	Knowledge of special inspections.	N/A	N/A	K	K

C1.4 – Codes of Practice

Assessment Criteria	Achievement Rating				Required Rating	
	A	K	E	P	BI	SI
a) Demonstrate knowledge of codes of practice and associated guidance relevant to the inspection of structures e.g., the Inspection Manual for Highway Structures	Awareness of codes of practice and associated guidance relevant to the inspection of structures e.g., the Inspection Manual for Highway Structures	Knowledge of codes of practice and associated guidance relevant to the inspection of structures e.g., the Inspection Manual for highway Structures	N/A	N/A	K	K

Unit C2 – Structure Types and Elements

C2.1 – Bridges

Assessment Criteria		Achievement Rating				Required Rating	
		A	K	E	P	BI	SI
a) Demonstrate knowledge and experience or proficiency, as appropriate, in the use and understanding of span form and construction material	In relation to cyclical inspections, show awareness of bridge types and understand how bridges are classified by; construction, material and span.	Describe examples of; construction form, construction material and span form. Describe a tied arch, trough deck or cable-stayed bridge. Provide the candidate with a photograph and discuss.	Discuss the types of bridges personally inspected. For example. concrete, masonry and steel. Identify the differences between a simply supported and continuous deck.	Discuss leading an inspection for different types of bridge construction and be able to explain to others. Identify the significance of hidden parts and components of a structure.		E	P
b) Demonstrate knowledge and experience or proficiency, as appropriate, in the use and understanding of Major Bridge elements, superstructure, substructure, safety	Be aware of major bridge elements: Superstructure, Substructure, safety elements, durability	Show knowledge of the importance of major bridge elements: superstructure, substructure, safety elements, durability	Experience shows the importance of major bridge elements: superstructure, substructure, safety elements, durability elements	Identify the critical relationships between major bridge elements: superstructure, substructure, safety elements, durability elements and ancillary		E	P

elements, durability elements and ancillary elements.	elements and ancillary elements.	elements and ancillary elements.	and ancillary elements.	elements and be able to explain to others		
c) Demonstrate knowledge and experience or proficiency, as appropriate, in the use and understanding of Primary and Secondary deck element type.	Be aware of what a bridge deck entails	Show an understanding of the difference between primary and secondary decks. Give examples of each deck type	Show from experience the differences between primary and secondary deck types.	Know all primary and secondary deck types and be able to explain to others	E	P
d) Demonstrate knowledge of key bridge components by describing the function and importance of water management services.	Show awareness of what kind of systems are used in water management.	Know the difference between drainage and waterproofing. Explain other ways of drainage, for example, slopes to take water away. Explain different types of drainage; Internal, external and subsurface.	N/A	N/A	K	K
e) Demonstrate knowledge of key bridge components	Awareness of types of utilities and how	Knowledge of types of utilities and how	N/A	N/A	K	K

by describing the function and importance of utilities, private services and lighting.	they may interact with bridges.	they may interact with bridges. Discuss how the bridge structure is affected by; Utilities, private services, signs and lighting. Discuss the accuracy of available utility information.				

C2.2 - Other Structure Types

Assessment Criteria	Achievement Rating				Required Rating	
	A	K	E	P	BI	SI
a) Demonstrate knowledge and experience of other structure types by describing the form and inspection of different types of culverts	Be aware of the definition and purpose of a culvert. Be aware culverts are broken down	Name and show an understanding of 4 typical culvert structural forms, i.e. pipe, box,	Discuss the experience of inspecting different culvert structural forms.	N/A	E	E

	into elements when inspected.	portal/frame and slab.				
b) Demonstrate knowledge and experience of other structure types by describing the form and inspection of different types of subway	Show awareness of the definition and purpose of a subway.	Name and show an understanding of various subway types. Be able to name and explain the purpose of the elements that make up a subway	Discuss the experience of inspecting different subway types.	N/A	E	E
c) Demonstrate knowledge and experience of other structure types by describing the form and inspection of different types of retaining wall.	Be aware of the definition and purpose of a retaining wall. Be aware retaining walls are broken down into elements when inspected.	Name and show understanding of at least 3 typical structural forms of retaining walls, i.e. gravity, cantilever on foundation embedded.	Discuss the experience of inspecting different structural forms of retaining walls. Discuss the planning and advising of inspecting different structural forms of retaining walls.	N/A	E	E
d) Demonstrate knowledge of different types of sign/signal gantries	Be aware of the definition and purpose of sign/signal gantry.	Name and show understanding of typical structural forms of sign/signal gantries, i.e. truss or	N/A	N/A		

	Be aware sign/signal gantries are broken down into elements when inspected.	beam gantries that are cantilevered, or that span the carriageway. Name at least 4 elements of a sign/signal gantries. Appreciate the importance of base connection element			K	K
e) Demonstrate knowledge of different types of mast	Be aware of the definition and function of mast. Be aware masts can be broken down into elements when inspected.	Explanation of the behaviour of a mast. Appreciate the importance of base connection element.	N/A	N/A	K	K

C2.3 –Structural Mechanics

Assessment Criteria	Achievement Rating				Required Rating	
	A	K	E	P	BI	SI
a) Demonstrate knowledge of structural behaviour by describing the loadings that structures are subjected to.	Be aware of what the loading's structures are subjected to, i.e. 'live' and 'dead' loads.	Clearly distinguish between 'live' and 'dead' loads and supply examples. Knowledge of other loadings, e.g. thermal forces. Ability to demonstrate those defects on critical elements that would pose an immediate risk of collapse or loss of serviceability.	N/A	.N/A	K	K
b) Demonstrate knowledge of structural behaviour by describing load paths within a structure.	Show awareness of tension, compression and torsion.	Distinguish between concentrated and distributed loads.	N/A	.N/A		

	Show awareness of the importance of different loadings i.e. soil loadings.	Knowledge of punching stress and spreading of load. Understanding of truss behaviour. Show knowledge of tension, compression and torsion by giving examples. Demonstrate knowledge of defects linked to load path regions e.g. danger of buckling in compression or fracture in tension. Define a load path and understanding the load transition mechanism, e.g. loads are typically transmitted through			K	K

		the shortest path in the direction of gavity: beam > bearing > support > foundation > soil				
c) Demonstrate knowledge of structural behaviour by describing modes of failure in different structure types and elements	Be aware of various modes of failure that a structure can be subjected to.	How will these failures manifest themselves in the structures inspected. Provide examples of different modes of failure. Assessor to provide photographic defect examples to candidate and discuss.	N/A	N/A	K	K
d) Demonstrate knowledge of structural behaviour by describing a structures response to loading.	Understand that concrete is good in compression and steel is good in tension.	Be familiar with the terms that are essential to describe response of material to loads. These include: force, stress,	N/A	N/A		

	Show awareness of other materials.	deformation, strain, creep, fatigue, thermal effects, ductility and brittleness. Understand that structures respond to forces such as thermal expansion/ contraction. Show an understanding of stress-strain relationship including elastic and plastic behaviour, yield stress, tensile strength, compressive strength and toughness.			K	K

C2.4 –Properties of Common Construction Materials

Assessment Criteria	Achievement Rating				Required Rating	
	A	K	E	P	BI	SI
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	Be aware that different materials behave in different ways. Be familiar with the typical properties of primary materials. Be familiar with the typical properties of secondary materials.	Demonstrate an understanding of how material properties influence the safety and functionality of the specific component and/or the whole structure.	N/A	N/A	K	K
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
c) Demonstrate knowledge of the properties of PRE -STRESSED CONCRETE (PRE-TENSIONED and POST-TENSIONED) and how it influences the safety,					K	K

durability and functionality of a specific component and the whole structure						
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
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
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

C2.5 –Properties of Specialist Construction Material

Assessment Criteria	Achievement Rating				Required Rating	
	A	K	E	P	BI	SI
a) Demonstrate awareness of the properties of WROUGHT IRON and how it influences the safety, durability and functionality of component and the whole structure	Be familiar with the typical properties of specialist primary materials and what these materials are.	N/A	N/A	N/A	A	A
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
c) Demonstrate awareness of the properties of ALUMINIUM and its ALLOYS and how it influences the safety, durability and functionality					A	A

of component and the whole structure						
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
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
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

Unit C3 – Inspection Process

C3.1 – Demonstrate experience of Scheduling Inspections

Assessment Criteria	Achievement Rating				Required Rating	
	A	K	E	P	BI	SI
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	Be aware of the factors which are considered in a risk-based approach: existing condition, expected rate of deterioration, consequence of failure, structural complexity, structural redundancy, function of structure.	Explain how the factors could influence inspection frequency.	Give examples of having made decisions to change inspection intervals based on risk.	Demonstrate experience of successful delivery of risk-based inspections or having advised others how to undertake a risk-based approach to inspections.	E	P
b) Demonstrate knowledge and experience or proficiency, as appropriate, of scheduling inspections by describing the planning for and use of confined	Show awareness of access restrictions and means of Special Access including MEWPs, Underbridge Units,	Demonstrate knowledge of when such access requirements would	Give examples of having scheduled inspections which require such access requirements and a range of examples	Demonstrate experience of having advised others or approved inspection programmes which	E	P

space techniques, specialist equipment, road space booking, track possessions, waterways access, major events etc	confines space apparatus boat, CCTV, boat, rope access in addition to those mentioned in title block.	need to be employed.	which show how access issues have been overcome.	require a wide range of Special Access.		
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	Be aware of the need to record actual progress against original programme. Show awareness of reasons why a programme may fall behind (e.g. inadequate resources, ambitious initial programming, third party influences).	Show knowledge of methods used to rectify a work package that is behind programme (e.g. additional resources, change of resources)	Give examples of having managed and delivered an inspection programme, and examples of rectifying a late programme.	Demonstrate experience of managing inspection programmes and having advised others regarding delivery of inspection programmes and rectifying late programmes.	E	P

C3.2 – Planning and Preparing for Inspections

Assessment Criteria	Achievement Rating				Required Rating	
	A	K	E	P	BI	SI
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	PI Reports, GI (RI) Reports, Underwater Inspection reports, Special Inspection Reports, Inventory records, Assessment Reports, as-built drawings, photos, design calculations. Show awareness of the information contained in such records.	Existing records identify when structural changes (widening, strengthening, replacement components) were made, and inspection reports identify the nature and extent of defects. An inspector needs to know whether a defect is historic or active, and the rate of deterioration. The previous report is used to help in this manner.	Give examples of using existing structures records in the context of bridge inspections, in particular the previous inspection report.	Demonstrate experience of having advised others regarding the importance of existing records and having advised others of the benefits of using the previous report in a current inspection.	E	P
b) Demonstrate knowledge and experience or	Be aware that structures records	In addition to 'A', inspection reports	Give examples of where the validity of	Demonstrate experience of	E	P

proficiency, as appropriate, of planning and preparing for inspections by explaining the importance of challenging the validity of existing structure records, if appropriate	may be incorrect due to inadequate record-keeping.	may be inaccurate due to incorrect judgement calls by previous inspectors.	existing records has been challenged and describe the outcome of the challenge.	having advised others to challenge existing records and give examples of where the challenge was successful.		
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	Show awareness of why structures are load-rated.	Demonstrate knowledge of how an Assessment Report can be used when planning an inspection (condition of critical elements can be inspected and changes in condition and dimensions can be recorded).	Give examples of when and how assessment reports were used in the planning of inspections.	Demonstrate experience of having advised others of the importance of the structure's current assessed capacity.	E	P
d) Demonstrate knowledge and experience or proficiency, as appropriate, of planning and preparing for inspections by explaining the different type	Awareness of Third-Party notifications including railway, waterway, local authority, road authority,	Display knowledge of the processes involved in giving notifications and securing permission to access site.	Give examples of notifications which were required in gaining access to site for inspections.	Demonstrate experience of having advised others of the processes involved in giving	E	P

of notifications that may be required prior to gaining access	landowners, some of which may require permits.			notifications and securing permission to access site for inspections		
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	Awareness of the need for a reconnaissance to identify parking arrangements, need for special access or TM, general access and egress to/from bridge, safety requirements, water levels, third party influences (e.g. landowners).	Knowledge of how to use the info gathered during a site reconnaissance.	Give examples to show experience of undertaking site reconnaissance and using the info to plan inspections. Describe the implications of not undertaking reconnaissance.	Demonstrate experience of advising others of the advantages of reconnaissance and give examples of where decisions were made to employ or not employ reconnaissance.	E	P
f) Demonstrate knowledge and experience or proficiency, as appropriate, of planning and preparing for inspections by explaining the process of planning any testing that	Show awareness of destructive and non-destructive testing and the need to plan testing with a specific aim to	Show knowledge of the need for a well-considered test-plan which follows current testing standards and aims to gather sufficient information first time. Testing is	Give examples of test-plans which have been implemented on a range of structures, including: the suite of concrete tests such as cover meter	Demonstrate experience of planning tests on common materials (concrete, masonry, steel) and structures of complexity, or	E	P

may be required as part of an inspection	gather particular information.	targeted for specific reasons with the aim of gathering specific information. The test-plan identifies the number, type and location of specific tests. The test-plan identifies risks which might arise during testing and includes mitigation measures for such risks. Test-plans may require approval from Clients. Access and specific H&S considerations need addressing.	surveys, half-cell potential testing, chloride, carbonation, sulphate testing; ultrasonic thickness gauge test & paint thickness test; NDT using Ground Penetrating Radar, sonar, ferroscan.	having advised others in compiling test-plans, or having approved test-plans which others have prepared. Test plans have included the objectives of the tests and details of type, number and location of tests.		
g) Demonstrate knowledge and experience or proficiency, as appropriate, of planning and preparing for inspections by describing the use of PPE,	Show awareness of the basic range of equipment for the four items listed. Items 3 and 4 to include short and	Display knowledge of circumstances under which the range of equipment would be used.	Give examples of having used the range of equipment listed.	Demonstrate experience of having advised others of the need	E	P

data recording equipment, measuring or inspection equipment	long measuring tapes, handheld electronic distance measurement devices, hammer, measuring callipers or vernier scales, crack width gauge, dumpy level and staff, ultrasonic thickness gauge.			to use such equipment.		
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	Show awareness of the need for method statements, the typical H&S considerations for inspections and circumstances where risk assessments are necessary.	Display knowledge of the content of an inspection method statement (location, access constraints, equipment required, resources, emergency planning), H&S considerations (H&S file review, access & TM, equipment use, OH lines and other services, PPE) and use of risk	Give examples of having prepared method statements and risk assessments which show that the factors in 'A' and 'K' have been considered and adequately addressed.	Demonstrate experience of having approved method statements and risk assessments or advised others how to prepare them.	E	P

		assessments (work over water, at height, on railway, on road, confined space)				
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	Show awareness of the dangers of asbestos and the risk to ecology including bats, badgers, birds, fish arising from inspection processes.	Display knowledge of dangers of asbestos and the risk to ecology including bats, badgers, birds, fish arising from inspection processes. (Vegetation removal, use and location of access plant)	Give examples of having addressed environmental considerations in inspection planning.	Demonstrate experience of having advised others in addressing environmental considerations in inspection planning.	E	P
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	Show awareness of the dangers of asbestos and the risk to ecology including bats, badgers, birds, fish arising from inspection processes.	Display knowledge of dangers of asbestos and the risk to ecology including bats, badgers, birds, fish arising from inspection processes. (Vegetation removal,	Give examples of having addressed environmental considerations in inspection planning.	Demonstrate experience of having advised others in addressing environmental considerations in inspection planning.	E	P

impact on bats, badgers, birds and watercourses etc		use and location of access plant)				
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	Show awareness of the need to seek advice for unusual situations	Display knowledge of the typical circumstances where expert advice might be required e.g. for bearings, expansion joints, testing requirements etc.	Give examples of where expert advice has been sought on a particular topic	Demonstrate experience of having advised others on when expert advice might be required	E	P

C3.3 –Performing Inspections

Assessment Criteria	Achievement Rating				Required Rating	
	A	K	E	P	BI	SI
a) Demonstrate knowledge and experience or proficiency, as appropriate, of the practical approach to performing an inspection by describing the key aspects	Be aware that not all structures are available to be inspected at all times and give 3 examples.	Show knowledge of instances where restricted hours may be imposed on the inspection process.	Give examples of when restricted hours were imposed on a number of inspections and explain the reasons			

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		Access to a structure which carries or crosses rail traffic may be restricted, e.g. road over rail bridge may be restricted to night-time possessions. Implications: Permit to Work required, PTS training, additional safety concerns associated with night-time working. Also, busy road bridges may require restricting to off-peak inspections if TM is required. Other reasons for restricted hours include tidal, weather and environmental restrictions. Other examples include	and implications of the constraints Give examples of effective management of an inspection site Give examples of how potential safety critical defects were escalated	Demonstrate experience of having advised others of the need for restricted hours working when undertaking inspections. Display broad experience of inspecting during restricted hours. Demonstrate experience of having advised thers regarding the effective management of an inspection site		E	P

		the need to inspect when a bridge is under load e.g. monitoring the effects of dynamic loading or abnormal loads .					

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	Give 3 examples of typical defects in different structure types.	Show knowledge that new road restraint systems are tested (EN1317) and that parapets, safety barriers, connections, transitions and terminals need to be to Standard. Have knowledge of the significance of height, setback, working width for road systems and the need for pedestrian restraint. Show knowledge of typical defects in different structure types.	Demonstrate experience of having identified substandard road restraint systems during inspections. Demonstrate experience of typical defects in different structure types	Demonstrate broad experience of identifying substandard road restraint systems during inspections. Demonstrate experience of having advised others regarding typical defects in different structure types.		E	P

C3.4 – Recording Inspection Findings

Assessment Criteria	Achievement Rating				Required Rating	
	A	K	E	P	BI	SI
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	Be aware that standard proforma are used by various bridge owners for recording inventory and inspection data and give an example of one such proforma.	Show knowledge of data and inspection forms commonly used by a bridge owner. Understand that such forms require to be well-considered at draft stage given they need to include for all inspection recording scenarios.	Demonstrate experience of having used standard data and inspection forms commonly used by a bridge owner. State how you addressed any instances where the proforma did not contain appropriate fields for recording particular information.	Demonstrate broad experience of using standard data and inspection forms commonly used by a bridge owner. Demonstrate experience of having advised others to use standard data and inspection forms commonly used by a bridge owner.	E	P
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	Be aware of the need for accurate reporting and the implications of inaccurate reporting for bridge managers.	Understand that inaccurate reporting may lead to incorrect judgement calls by an inspector and recording of inappropriate elemental condition	Demonstrate experience of addressing inaccurate reporting and describe what steps were taken to	Demonstrate experience of addressing inaccurate reporting. Demonstrate experience of advising others	E	P

of locations, type, severity, extent and cause		ratings, which can lead to inappropriate overall structure condition ratings. Bridge managers rely on consistent reporting standards and accurate reporting to make informed decisions on spending limited budgets. Understand that inaccurate reports may lead to a safety critical defect being missed with implications for structural safety.	rectify the inaccurate reports.	how to correct inaccurate reports and describe the steps taken to rectify inaccurate reports, giving examples.		
c) Demonstrate knowledge and experience or proficiency, as appropriate of the inspection recording process by explaining the level of detail to be	Be aware of the different levels of recording detail required of the different inspection types.	Show understanding of the level of detail required when recording during a GI (RI), PI and Special Inspection. Know that a PI	Demonstrate experience of undertaking GI (RI) and PI for a range of bridge types and demonstrate experience of using	Demonstrate broad experience of undertaking GI (RI) and PI for a range of bridge types.	E	P

recorded depending upon the type of inspection		records details of the defects found including type, location, extent, severity and cause. Know that a Special Inspection may target a particular defect and may involve in depth on-site and lab testing to offer confidence in the cause of the defect and estimates of remaining service life, as well as recommended courses of action. Show understanding of the level of detail required in other Special Inspection Reports e.g. PTSI, underwater inspection, SI for assessment.	different levels of detail in each type of inspection report, and an understanding of the level of detail required in a Special Inspection as highlighted in 'K'.	Demonstrate experience of having advised others in undertaking GI (RI) and PI for a range of bridge types. Demonstrate experience of undertaking or approving Special Inspection reports including an appreciation of the level of detail required.		

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	Be aware of the hazards caused by low height bridges	Demonstrate knowledge of the hazards caused by low height bridges and the need to record clearances at a principal inspection	Demonstrate experience of having recorded height clearances at an inspection	Demonstrate experience of having advised others regarding the height clearance measuring process	E	P
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	Explain what is meant by a 'signing off' process.	Know that 'signing off' demonstrates that a report has been checked by an individual of appropriate grade and offers the company and the Client confidence given an approval process has been followed and a quality management system adhered to. This is likely to limit errors in reporting and improve Client satisfaction.	Demonstrate experience of implementing a 'signing off' process for a range of inspections and highlight any instances where the approval process identified shortcomings in the reporting and confirm what was done to address this.	Demonstrate broad experience of acting in the 'sign off' role for a range of inspections. Demonstrate experience of having advised others to utilise a 'signing off' process for a range of inspections.	E	P

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	Be aware of the need for accurate reporting and the implications of inaccurate reporting for bridge managers.	Understand that inaccurate reporting may lead to incorrect judgement calls by an inspector and recording of inappropriate elemental condition ratings, which can lead to inappropriate overall structure condition ratings. Bridge managers rely on consistent reporting standards and accurate reporting to make informed decisions on spending limited budgets. Inaccurate reports may result in bridge managers making decisions which offer poor value.	Demonstrate experience of addressing inaccurate reporting and describe what steps were taken to rectify the inaccurate reports.	Demonstrate experience of addressing inaccurate reporting. Demonstrate experience of advising others how to correct inaccurate reports and describe the steps taken to rectify inaccurate reports, giving examples.	E	P

C3.5 –Interpreting Inspection Findings

Assessment Criteria	Achievement Rating				Required Rating	
	A	K	E	P	BI	SI
a) Demonstrate knowledge or knowledge and experience, as appropriate, of the interpretation of inspection findings by describing factors which affect whether a structure is 'safe for use' and/or 'fit for purpose'.	Be aware of the terms "safe for use" and "fit for purpose" i.e. "fit for purpose" to reflect changes in use of structures.	Provide examples of "safe for use" and "fit for purpose" relevant to structural performance	Be able to discuss the difference between "safe for use" and "fit for purpose". Refer to examples from own experience. Discuss consequences of failure within examples cited.	N/A	K	E
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.	List typical existing records that might assist an inspector in identifying the significance of structural defects i.e. Assessment Reports, Special Investigation, Structural monitoring, accident data, aerial images,	Discuss the importance of such documentation relevant to the inspection process.	Provide an example of a how a desk study has led to identifying a root cause of a specific defect on a structure e.g. Assessment Report that highlights capacity limitations leading to failure of load bearing elements.	N/A	K	E

	previous inspection reports.					
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.	Show awareness of a range of maintenance works.	Demonstrate knowledge of a range of maintenance works on different bridge types. [More detailed knowledge is required in the material modules]	Demonstrate experience of having recommended maintenance works in an inspection report.	N/A	K	E

C3.6 –Maintenance Planning Process

Assessment Criteria	Achievement Rating				Required Rating	
	A	K	E	P	BI	SI
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.	Be aware of the main findings obtained from an inspection. Be able to describe a typical inspection report. List other information that could typically be held for a given structure.	Be able to identify what information held for a structure can complement an inspection and vice versa. Describe the process of a desk study. List information typically held on a structure asset management system.	N/A	N/A	A	K
b) Demonstrate awareness or knowledge, as appropriate, of maintenance planning processes by explaining the importance of having up-to-date comprehensive data of the condition of a structure with respect to its input to maintenance planning.	List benefits of having up to date condition data for structures. Identify the problems that might arise when information is not up to date. List issues that may be considered by a	Describe the relationship between condition data held on a structure and how this helps to develop a maintenance plan for that structure. Describe the importance of	N/A	N/A	A	K

	bridge owner when planning maintenance activity.	"extent" and "severity" in prioritising planned maintenance. Describe how an inspector might typically prioritise defects i.e. safety critical, operational effectiveness, increased maintenance frequency, aesthetic/superficial				
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	Show awareness of bridge management prioritisation methods	Demonstrate knowledge of bridge management prioritisation methods and how the inspection condition rating process can affect such methods. Provide examples of different funding streams and what	N/A	N/A	A	K

		maintenance work this may typically cover.				
d) Demonstrate awareness or knowledge, as appropriate, of maintenance planning process by describing the use of a bridge management system.	Describe the basic structure and content of a bridge management system	Describe the basic structure and content of a bridge management system and broadly describe the benefits of having one. Discuss what output is typically expected from a bridge management system and how it is used.	N/A	N/A	A	K

C3.7 – Importance of Routine Maintenance

Assessment Criteria	Achievement Rating				Required Rating	
	A	K	E	P	BI	SI
a) Demonstrate knowledge of the importance of routine maintenance by explaining the need to undertake routine maintenance	Show awareness of the importance of undertaking maintenance	Demonstrate knowledge of the type of activities associated with routine maintenance and the consequences to the structure if such maintenance is not carried out	N/A	N/A	K	K
b) Demonstrate knowledge of the importance of routine maintenance by describing the need to balance essential and preventative maintenance works.	Show awareness of examples of essential and preventative maintenance works	Demonstrate knowledge of the type of maintenance works designated as essential and preventative and how these might be balanced	N/A	N/A	K	K

C3.8 – Obligations of Current Health and Safety Legislation

Assessment Criteria	Achievement Rating				Required Rating	
	A	K	E	P	BI	SI
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.	Awareness of the need to: • Be aware of current health and safety legislation. • Demonstrate a positive attitude towards health and safety. • Work safely and secure the compliance of subordinates. • Work to risk assessments and method statements	Understands how to: • Keep up to date with current health and safety legislation and best practice, e.g. newsletters, toolbox talks, briefings. • Demonstrate a positive attitude towards health and safety. • Work safely and secure the compliance of subordinates. • Develop, implement, and alter as necessary risk assessments and method statements.	Provide examples where you have: • Kept up to date with current health and safety legislation and best practice. • Demonstrated a positive attitude towards health and safety. • Worked safely and secured the compliance of subordinates. • Developed, implemented, and altered as necessary risk assessments and method statements.	Describe how you have helped an Inspector to either: • Keep up to date with current health and safety legislation and best practice. • Demonstrate a positive attitude towards health and safety. • Work safely and secure the compliance of subordinates; and • Develop, implement, and altered as necessary risk assessments and method statements	E	P

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.	List current health and safety legislation and describe how it applies to inspection and maintenance work. Explain how a Method Statement and Risk Assessment would be used to carry out a typical inspection. Describe user groups that may be affected by ongoing inspection work.	Describe how risk control might benefit members of the public and others affected by the works. Describe the content of a typical Method Statement and Risk Assessment. Describe the benefits of having a Method Statement and Risk Assessment for a typical inspection. Knowledge of the hierarchy of risk control. Define ALARP. Describe the importance of near miss/accident reporting.	Provide evidence of having compiled a Method Statement and Risk Assessment for inspection work. Describe the content of a typical Method Statement and Risk Assessment. Provide examples of risk controls developed for specific inspection activities i.e. on roads, over/in water, on the rail network, at height, etc.	As E and provide evidence of having advised others on suitable content of Method Statements and Risk Assessments with specific reference to the public and others who may be affected by the work activities.	E	P
c)Demonstrate knowledge and experience or proficiency, as appropriate,	List current health and safety legislation and	Describe how risk control might benefit those actually	Provide evidence of having compiled a Method Statement	As E and provide evidence of having advised others on	E	P

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.	describe how it applies to inspection and maintenance work. Explain how a Method Statement and Risk Assessment would be used to carry out a typical inspection. Describe key parties involved in the work that may be affected.	carrying out the works. Describe the content of a typical Method Statement and Risk Assessment and how this is communicated to the works team. Describe the benefits of having a Method Statement and Risk Assessment for a typical inspection. Knowledge of the hierarchy of risk control. Define ALARP. Describe the importance of near miss/accident reporting.	and Risk Assessment for inspection work. Describe the content of a typical Method Statement and Risk Assessment. Provide examples of risk controls developed for specific inspection activities i.e. on roads, over/in water, on the rail network, at height, etc.	suitable content of Method Statements and Risk Assessments with specific reference to those actually carrying out the works.		
d) Demonstrate knowledge and experience or proficiency, as appropriate, in the application of Health	List current health and safety legislation and describe how it	Describe how risk control might benefit those actually	Provide evidence of having compiled a Method Statement and Risk	As E and provide evidence of having advised others on suitable content of	E	P

and Safety legislation by explaining the need to prepare and implement effective method statements and risk assessments.	applies to inspection and maintenance work. Explain how a Method Statement and Risk Assessment would be used to carry out a typical inspection. Describe key parties involved in the work that may be affected.	carrying out the works. Describe the content of a typical Method Statement and Risk Assessment and how this is communicated to the works team. Describe the benefits of having a Method Statement and Risk Assessment for a typical inspection. Knowledge of the hierarchy of risk control. Define ALARP. Describe the importance of near miss/accident reporting.	Assessment for inspection work. Describe the content of a typical Method Statement and Risk Assessment. Provide examples of risk controls developed for specific inspection activities i.e. on roads, over/in water, on the rail network, at height, etc.	Method Statements and Risk Assessments with specific reference to those actually carrying out the works.		
e) Demonstrate knowledge and experience or proficiency, as appropriate, in the application of Health	List the different types of PPE available for undertaking typical	List the different types of PPE available for undertaking typical	Provide examples of PPE used on specific inspection activities based on	As E but with evidence of having advised others on	E	P

and Safety legislation by describing a range of personal protective equipment (PPE) utilised for undertaking inspections	inspection work and how this relates to and controls specific risks on site. List what H&S legislation/regulations specifically cover the need for PPE i.e. HSWA (1974) and Personal Protective Equipment at Work Regulations (1992)	and specialist inspection work and how this relates to and controls specific risks on site.	own experience and what risks this equipment controlled. Describe the significance of PPE in the hierarchy of risk control i.e. PPE is essential for inspection work, but isolation/reduction of the risk should first be considered.	the need and suitability of PPE.		
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.	Define a safe system of work and when this is needed for inspection work.	Describe the content of a typical safe system of work and how this relates to a Method Statement and Risk Assessment. Describe how a safe system of work is typically communicated on site.	Provide evidence of having applied a safe system of work on site.	Provide evidence of having written and applied a safe system of work on site. Provide evidence of having communicated a safe system of work on site i.e. staff briefings, induction, etc.	E	P

g) Demonstrate knowledge and experience or proficiency, as appropriate, of having dealt with utilising access equipment	Show awareness of the different types of access equipment	Demonstrate knowledge of the different types of access equipment and the certification required to be able to safely deploy	Provide evidence of having worked with different types of access equipment using the appropriate health and safety protocols	Provide evidence of having advised others regarding the selection and use of appropriate access equipment	E	P
h) Demonstrate knowledge and experience or proficiency, as appropriate, of having dealt with moving on foot alongside live carriageways	Highlight specific risks associated with each activity listed.	Demonstrate knowledge of the specific risks and controls for each activity listed.	Provide examples from own experience of having identified and managed specific risks associated with each activity listed.	As E and provide evidence of having advised others on associated risks and risk control for each activity.	E	P
i) Demonstrate knowledge and experience or proficiency, as appropriate, of having dealt with accessing and exiting from traffic management	Highlight specific risks associated with each activity listed.	Demonstrate knowledge of the specific risks and controls for each activity listed.	Provide examples from own experience of having identified and managed specific risks associated with each activity listed.	As E and provide evidence of having advised others on associated risks and risk control for each activity.	E	P
j) Demonstrate knowledge and experience or proficiency, as appropriate, of having dealt with working at height	Highlight specific risks associated with each activity listed.	Demonstrate knowledge of the specific risks and controls for each activity listed.	Provide examples from own experience of having identified and managed specific risks	As E and provide evidence of having advised others on associated risks	E	P

			associated with each activity listed.	and risk control for each activity.		
k) Demonstrate knowledge and experience or proficiency, as appropriate, of having dealt working adjacent to water	Highlight specific risks associated with each activity listed.	Demonstrate knowledge of the specific risks and controls for each activity listed.	Provide examples from own experience of having identified and managed specific risks associated with each activity listed.	As E and provide evidence of having advised others on associated risks and risk control for each activity.	E	P
l) Demonstrate knowledge and experience or proficiency, as appropriate, of having dealt working adjacent to railways	Highlight specific risks associated with each activity listed.	Demonstrate knowledge of the specific risks and controls for each activity listed.	Provide examples from own experience of having identified and managed specific risks associated with each activity listed.	As E and provide evidence of having advised others on associated risks and risk control for each activity.	E	P
m) Demonstrate knowledge and experience or proficiency, as appropriate, of having dealt with toxic substances, for example, lead in paint	Highlight specific risks associated with each activity listed.	Demonstrate knowledge of the specific risks and controls for each activity listed.	Provide examples from own experience of having identified and managed specific risks associated with each activity listed.	As E and provide evidence of having advised others on associated risks and risk control for each activity.	E	P
n) Demonstrate knowledge and experience or proficiency, as appropriate,	Highlight specific risks associated with each activity listed.	Demonstrate knowledge of the specific risks and	Provide examples from own experience of having identified	As E and provide evidence of having advised others on	E	P

of having dealt with lone working		controls for each activity listed.	and managed specific risks associated with each activity listed.	associated risks and risk control for each activity.		
o) Demonstrate knowledge and experience or proficiency, as appropriate, of having dealt with night working	Highlight specific risks associated with each activity listed.	Demonstrate knowledge of the specific risks and controls for each activity listed.	Provide examples from own experience of having identified and managed specific risks associated with each activity listed.	As E and provide evidence of having advised others on associated risks and risk control for each activity.	E	P
p) Demonstrate knowledge and experience or proficiency, as appropriate, of having dealt with working with confined spaces	Highlight specific risks associated with each activity listed.	Demonstrate knowledge of the specific risks and controls for each activity listed.	Provide examples from own experience of having identified and managed specific risks associated with each activity listed.	As E and provide evidence of having advised others on associated risks and risk control for each activity.	E	P

3.9 'Other Skills'

Assessment Criteria	Achievement Rating				Required Rating	
	A	K	E	P	BI	SI
a) Demonstrate knowledge of traffic management and	Show awareness of application of traffic management and	Describe traffic management considerations and constraints when	N/A	N/A	K	K

relevant reference material, for example, Chapter 8.	how this facilitates inspection work	planning inspection work. Demonstrate knowledge of relevant reference material i.e. Chapter 8 Traffic Signs Manual. Describe provision of suitable traffic management for a typical inspection				

C3.10 – The Testing Process

Assessment Criteria	Achievement Rating				Required Rating	
	A	K	E	P	BI	SI
a) Demonstrate knowledge of the need for and purpose of testing when it becomes appropriate	Is aware that testing is used as part of a toolkit of measures used to determine and monitor the condition and/or movement of structures	Demonstrate knowledge of testing techniques that can be used to: • Determine structural arrangements and finding hidden defects. • Measure/monitor distortion and movement • Determine material properties. • Detect deterioration activity. • Measure/monitor deterioration rate • Determine the cause or potential for defects and deterioration	N/A	N/A	K	K
b) Demonstrate knowledge of the different testing techniques that can be utilised to investigate structural arrangement and hidden defects					K	K
c) Demonstrate knowledge of the different testing techniques that can be utilised to investigate distortion and movement					K	K
d) Demonstrate knowledge of the different testing techniques that can be utilised to investigate deterioration rate					K	K

e) NOT USED						
f) Demonstrate knowledge of the different testing techniques that can be utilised to investigate material properties					K	K
g) Demonstrate knowledge of the different testing techniques that can be utilised to investigate deterioration cause or potential					K	K
h) Demonstrate knowledge of what is required to develop an effective testing programme by explaining how to set objectives of testing					K	K
i) Demonstrate knowledge of what is required to develop an effective testing programme by explaining how to monitor and supervise testing					K	K

j) NOT USED						
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
l) Demonstrate knowledge of investigation processes by describing the use of trial holes etc.					K	K
m) Demonstrate awareness of the procurement processes for engaging specialist services					A	A

Unit C4 – Defects Descriptions and Causes

C4.1 –Principal Causes of Defects

Assessment Criteria	Achievement Rating				Required Rating	
	A	K	E	P	BI	SI
a) Demonstrate knowledge and experience or proficiency, as appropriate, by describing defects caused by inadequate structural capacity	Awareness of the principal causes of defects	Demonstrate knowledge and understanding of the causes, mechanisms and consequences of: • Inadequate structural capacity • Substandard clearance etc. • Naturally occurring damage e.g. scour • Accidental or deliberate damage	Discuss examples where principal defects were observed. Assessor to provide photographs for discussion.	Discuss significance of the defect and possible corrective and / or preventative action. Demonstrate having advised others on principal causes of defects	E	P
b) Demonstrate knowledge and experience or proficiency, as appropriate, by describing defects caused by substandard clearance etc					E	P
c) Demonstrate knowledge and experience or proficiency, as appropriate, by describing defects caused by naturally					E	P

occurring damage e.g. scour		• Structural materials deterioration • Structural elements functionality e.g. bearings, drainage, expansion joints etc. Failure of water management systems Demonstrate with examples that visible defects can be the result of a combination of factors which may have affected the structure over many years.				
d) Demonstrate knowledge and experience or proficiency, as appropriate, by describing defects caused by accidental or deliberate damage					E	P
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
f) Demonstrate knowledge and experience or proficiency, as appropriate, by describing defects caused by failure of water management systems					E	P
g) Demonstrate knowledge and experience or proficiency, as appropriate,					E	P

by describing defects caused by implications of deterioration						
h) Demonstrate knowledge of the issues that cause collapses or structure closures					K	K

C4.2 – Defects in Miscellaneous Materials

Assessment Criteria	Achievement Rating				Required Rating	
	A	K	E	P	BI	SI
a) Demonstrate awareness or knowledge, as appropriate, of defects that occur on other materials including advances composites	Show awareness of defects in timber, advanced composites and other miscellaneous materials	Demonstrate knowledge of defects in timber, advanced composites and other miscellaneous materials	N/A	N/A	A	K

Unit C5 – General Aptitude

C5.1 –Practical Aptitude

Assessment Criteria	Achievement Rating				Required Rating	
	A	K	E	P	BI	SI
a) Demonstrate experience or proficiency, as appropriate, in working with a practical aptitude by providing examples of showing excellent attention to detail	Awareness of the need to pay attention to detail while preparing, undertaking and reporting inspections	Demonstrate knowledge and understanding of the level of detail appropriate to facilitate decision making about asset condition, defects and corrective / preventative action and to the various designations of inspections	Provide examples of structures observed, including photographs, sketches and annotations illustrating the level of detail recorded	Discuss a situation where an Inspector's attention to detail fell short of the required standards and what you did to put right the situation.	E	P
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	Awareness of the need to make sound and prudent judgements while preparing, undertaking and reporting inspections	Demonstrate knowledge and understanding of the available sources of information and what criteria should be applied to support the decision-making	Discuss examples where sound and prudent judgements were made with reference to applicable standards and other sources of information.	Discuss examples where guidance has been offered to Inspectors to help them make sound and prudent judgements.	E	P

		process, including reference to applicable standards.	Discuss situations where you would need to or have sought assistance from a more experienced colleague	Discuss examples of situations where you have felt it necessary to directly contact a structure owner about the condition of a structure. Discuss examples where you have felt it important to undertake further works outside of the confines of your contractual obligations and how this was done .		
c) Demonstrate experience or proficiency, as appropriate, in working with a practical aptitude by providing examples of working to deadlines	Awareness of working to a programme to achieve deadlines	Demonstrate knowledge and understanding of the key elements of a programme to achieve deadlines,	Discuss examples where you have seen deadlines be achieved by balancing time, cost and quality or by the allocation of	Discuss examples where you have ensured deadlines are achieved by balancing time, cost and quality or by allocating	E	P

		especially with regards to: • Balancing time, cost and quality • Managing roles and responsibilities within a team Understand the constraints put upon inspection, e.g. H&S, traffic management, shared sites, etc. and how these need to be accommodated in order to achieve the requirements of the inspection	responsibilities to team members	responsibilities to team members		

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	Awareness of the limitations of one's own capability and scope of knowledge Understanding the actions to be taken where you feel you are reaching the limits of your knowledge.	Demonstrate knowledge of the factors that might influence someone not recognising their own capability and scope of knowledge, e.g. • Not recognising it as important • Not wanting to appear • deficient in knowledge • Peer pressure • Wanting to get the job done	Provide an example where you recognised the limitations of your own capability and scope of knowledge and what action you took as a result	Provide an example where you recognised the limitations of a team members capability and scope of knowledge and what action you took as a result. Discuss a situation where you feel/felt you would need/needed to call upon others for assistance.	E	P

Unit C5.2 Working with people

Assessment Criteria	Achievement Rating				Required Rating	
	A	K	E	P	BI	SI
a) Demonstrate experience or proficiency, as appropriate, in working with	Awareness of the needs of other team members and how	Demonstrate knowledge of the importance of:	Provide examples where you have	Provide examples where you have led an effective team.	E	P

people by providing examples of having worked successfully in a team	your actions can have a positive or negative affect on them. Awareness of the needs of other wider stakeholders (clients, members of the public, other contractors, etc.) and how your actions can have a positive or negative affect on them	• Establishing viewpoints • Effective communication • Appreciating the contribution you are expected to make. • Being proactive when dealing with others • Remaining calm under pressure	worked effectively as part of a team. Provide examples where you have come into contact with other stakeholders and have handled the situation effectively	Provide examples where you have come into contact with other stakeholders and the actions you have taken to manage the situation effectively		
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

Unit C5.3 Communication skills

Assessment Criteria	Achievement Rating				Required Rating	
	A	K	E	P	BI	SI
a) Demonstrate experience or proficiency, as appropriate, in communication skills, by	Awareness of the need to:	Demonstrate knowledge of how to:	Provide examples where you have:	Describe how you have helped an Inspector to either:	E	P

providing examples of the interpretation of drawings and reports	• Interpret drawings and reports. • Draw clear sketches. • Write reports. • Communicate verbally in a clear and comprehensive way. • Communicate findings from an inspection. • Have IT skills.	• Interpret drawings and reports. • Draw clear sketches. • Write reports. • Communicate verbally in a clear and comprehensive way. • Communicate findings from an inspection. • Use a range of IT packages including (word processing, image editing, email, industry / company specific software)	• Interpreted drawings and reports. • Drawn clear sketches. • Written reports • Communicated verbally in a clear and comprehensive way. • Communicated findings from an inspection. • Used a range of IT packages including (word processing, image editing, email, industry / company specific software)	• Interpret drawings and reports. • Draw clear sketches. • Write reports. • Communicate verbally in a clear and comprehensive way. • Communicate findings from an inspection; or • Use a range of IT packages including (word processing, image editing, email, industry / company specific software)		
b) Demonstrate experience or proficiency, as appropriate, in communication skills, by providing examples of clearly drawn sketches					E	P
c) Demonstrate experience or proficiency, as appropriate, in communication skills, by providing examples of written reports					E	P
d) Demonstrate experience or proficiency, as appropriate, in communication skills, by providing examples of IT skills.					E	P
e) Demonstrate experience or proficiency, as appropriate, in communication skills, by providing examples of					E	P

being able to communicate verbally in a clear and comprehensive manner						
f) Demonstrate experience or proficiency, as appropriate, in communication skills, by providing examples of how findings from an inspection have been communicated					E	P

Unit C5.4 Personal skills

Assessment Criteria	Achievement Rating				Required Rating	
	A	K	E	P	BI	SI
a) Demonstrate experience or proficiency, as appropriate, in personal skills by providing examples of self-motivation	Awareness of the need to: • Be self-motivated. • Decide and set priorities. • Make decisions and to have confidence to challenge a situation/decision if necessary. • Know one's own limitations	Demonstrate knowledge of how to: • Be self-motivated. • Decide and set priorities. • Make decisions and to have confidence to challenge a situation/decision if necessary. • Know one's own limitations	Provide examples where you have had to: • Be self-motivated on a regular or sustained basis. • Decide and set priorities in a range of situations. • Make decisions and to and challenge a situation/decision if necessary. • Act in response to knowing your own limitations.	Describe how you have helped an Inspector to either: • Be self-motivated on a regular or sustained basis. • Decide and set priorities in a range of situations. • Make decisions and to and challenge a situation/decision if necessary; or • Act in response to knowing your own limitations	E	P
b) Demonstrate experience or proficiency, as appropriate, in personal skills by providing examples of determining and setting priorities.					E	P
c) Demonstrate experience or proficiency, as appropriate, in personal skills by providing examples of making decisions.					E	P
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

Unit C5.5 Management / Supervision

Assessment Criteria	Achievement Rating				Required Rating	
	A	K	E	P	BI	SI
a) Demonstrate knowledge or proficiency, as appropriate, of management and supervision skills by providing examples of the ability to manage and motivate teams	Awareness of the need to: • Manage and motivate teams. • Advise and present recommendations to others. • Identify resources required for an inspection. • Ensure that an inspection complies with the appropriate contractual and legal requirements.	Understands how to: • Manage and motivate teams. • Advise and present recommendations to others. • Identify resources required for an inspection. • Ensure that an inspection complies with the appropriate contractual and legal requirements.	Provide examples where you have: • Managed and motivated teams • Advised and presented recommendations to others. • Identified resources required for an inspection. • Ensured that an inspection complies with the appropriate contractual and legal requirements.	Describe how you have helped an Inspector to either: • Manage and motivate teams. • Advise and present recommendations to others. • Identify resources required for an inspection; or • Ensure that an inspection complies with the appropriate contractual and legal requirements.	K	P
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
c) Demonstrate knowledge or proficiency, as appropriate, of management and					K	P

supervision skills by providing examples of identifying the resources required for an inspection and the costs involved						
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

Masonry Bridges Module

MAS.1 Defects, Descriptions and Causes

Assessment Criteria	Achievement Rating				Required Rating	
MAS.1.1	A	K	E	P	I	SI
Masonry Defects						
a) Demonstrate knowledge and experience or proficiency, as appropriate, of a range of defects in masonry structures caused by structural distress	Show awareness of defects associated with structural distress.	Demonstrate knowledge of the causes and consequences of: • Impact loading / changed load (Cracking or crushing of masonry, loose masonry, distortion or bulging arches • Skew construction (Cracking or crushing of masonry in obtuse corner or skew arch and / or diagonal cracks in barrel) • Parapet failure (Cracking or displacement) • Spandrel wall in distress (Lateral displacement) • Differential movement of structure	Discuss examples where defects caused by structural distress were observed, including photographs and annotations	Discuss significance of the defect and understand causes and possible corrective and / or preventative action	E	P

b) Demonstrate knowledge and experience or proficiency, as appropriate, of a range of defects in masonry structures caused by the nature of the material.	Be aware of variety and lack of homogeneity in masonry structures.	Demonstrate knowledge of the material characteristics of masonry and the potential for variation.	Discuss examples of different material and construction applications of masonry in bridges and typical defects likely to be found.	Demonstrate detailed understanding of material characteristic and how these affect the performance and long-term durability of structures. Demonstrate how material defects or breakdown has led to loss of stability in masonry structures/elements	E	P
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	Be aware of defects associated with defects instigated by external agents	Demonstrate knowledge of the causes and consequences of: • Penetration or absorption of water and chemical action (Ring separation, loss of bedding mortar, deterioration to voided chambers, degradation to masonry cracking and eroding of joints)	Discuss examples where defects instigated by external agents were observed, including photographs and annotations	Discuss significance of the defect and understand causes and possible corrective and / or preventative action	E	P

		• Freeze thaw damage (Spalling masonry and fracturing of components) • Vegetation (Masonry degraded by cracking and eroding the mortar joints leading to progressive failure of masonry)				
d) Demonstrate knowledge and experience or proficiency, as appropriate, of a range of defects in masonry structures caused by accidental or deliberate damage	Show awareness of defects caused by accidental or deliberate damage	Demonstrate knowledge of defects caused by accidental or deliberate damage. (Damage to spandrel wall or arch ring, hazard below from debris, loss of containment)	Discuss examples of defects caused by accidental or deliberate damage	Explain what actions to take when advising an Inspector that has discovered accidental or deliberate damage	E	P
e) NOT USED						
f) Demonstrate knowledge and experience or proficiency, as appropriate, of a range of defects in masonry structures caused by	Show awareness that masonry structures can be repaired /strengthened with non-	Demonstrate knowledge of defects caused by unsympathetic maintenance techniques	Demonstrate experience of undertaking inspections of masonry structures where unsympathetic	Demonstrate a wide range of experience of inspecting strengthening elements on masonry structures, including the use of	E	P

unsympathetic maintenance techniques	masonry components		maintenance techniques have been used	unsympathetic maintenance techniques		

MAS.2 Investigation and Testing

Assessment Criteria	Achievement Rating				Required rating	
MAS.2.1	A	K	E	P	I	SI
Common Testing Techniques						
a) Demonstrate knowledge of common testing techniques by describing delamination surveys	Show awareness of common testing techniques.	Demonstrate knowledge of common testing by describing: • Delamination surveys • Use of acoustic emission • Use of coring methods	N/A	N/A	K	K
b) NOT USED						
c) Demonstrate knowledge of common testing techniques by describing acoustic emission					K	K
d) Demonstrate knowledge of common testing techniques by describing coring					K	K

MAS.3. Repair Techniques

Assessment criteria	Achievement Rating				Required rating	
MAS 3.1	A	K	E	P	I	SI
Repair techniques for masonry structures						
a) Demonstrate knowledge of the principal repair techniques for masonry structures including the use of repointing/brickwork repairs	Show awareness of repointing techniques and materials that could be used.	Demonstrate knowledge of the depth of repointing, the preparation process and the different methods e.g. hand applied mortar, gun applied specialist materials.	N/A	N/A	K	K
b) Demonstrate knowledge of the principal repair techniques for masonry structures including the use of sprayed concrete to soffit	Show awareness of the re-casing of brickwork techniques on walls and soffits.	Demonstrate knowledge of the use of re-casing techniques Demonstrate knowledge of the use of sprayed concrete			K	K
c) Demonstrate knowledge of the principal repair techniques for masonry structures	Show awareness of				K	K

including the use of retrofitting of reinforcement	the use of sprayed concrete Show awareness of crack repair techniques and where they would be appropriate, in walls, arch intrados, abutments. Show awareness of strengthening options for masonry arch structures.	Demonstrate knowledge of stitching across cracks, materials and methods. Demonstrate knowledge of defects that indicate that strengthening may be required and the practicalities of strengthening options including retrofitted reinforcement, relieving slabs etc. Assessor to provide photographs to candidate for discussion.				
d) Demonstrate knowledge of the principal repair techniques for masonry structures including the use of anchors (e.g. grouted, radial etc)					K	K
e) Demonstrate knowledge of the principal repair techniques for masonry structures including the use of concrete saddle/relieving slabs					K	K
f) Demonstrate knowledge of the principal repair techniques for masonry structures including the use of stitching (short tie bars spanning cracks)					K	K

Concrete Bridges Module

CON.1 Defects, Descriptions and Causes

Assessment Criteria	Achievement Rating				Required Rating	
CON.1	A	K	E	P	I	SI
Concrete Defects						
a) Demonstrate knowledge and experience or proficiency, as appropriate, of a range of defects in concrete structures caused by structural distress	Show awareness of what structural distress is and an appreciation of defects associated with it	Demonstrate knowledge of the causes and consequences of: • Surface damage • Indication of wetness • Staining • Cracking • Spalling • Secondary reinforcement exposed. • Primary reinforcement exposed. • Structural damage	Discuss examples of where defects caused by structural distress were observed, including photographs and annotations	Discuss significance of these defects and demonstrate ability to advise others	E	P
b) Demonstrate knowledge and experience or proficiency, as appropriate,	Show awareness of the nature of concrete	Demonstrate knowledge of the positive and negative	Discuss examples where the nature of the material	Discuss significance of these defects and	E	P

of a range of defects in concrete structures caused by the nature of the material		characteristics that concrete has, especially with regard to: • Strength and durability in compression • Weakness in tension • Versatility • Low maintenance • Affordability • Fire resistance	played a part in an observed defect, including photographs and annotations	demonstrate ability to advise others		
c) Demonstrate knowledge and experience or proficiency, as appropriate, of a range of defects in concrete structures caused by external agents e.g. thaumasite sulphate attack (TSA)	Show awareness of the risks posed by external agents indicated through: • Spalling • cracking	Demonstrate knowledge of the causes and consequences of: • Carbonation • Chloride attack • Early age thermal movements • Freeze thaw • Alkali-silica reaction • Thaumasite attack	Discuss examples where defects caused by external agents were observed, including photographs and annotations	Discuss significance of these defects and demonstrate ability to advise others	E	P
d) Demonstrate knowledge and experience or	Show awareness of the risks posed by	Demonstrate knowledge of the	Discuss examples of reinforcement	Discuss significance of this defect and	E	P

proficiency, as appropriate, of a range of defects in concrete structures caused by reinforcement corrosion	reinforcement corrosion	cause and effect of reinforcement corrosion	corrosion, including photographs and annotations	demonstrate ability to advise others		
e) Demonstrate knowledge and experience or proficiency, as appropriate, of a range of defects in concrete structures caused by accidental or deliberate damage	Show awareness of defects caused by accidental or deliberate damage	Demonstrate knowledge of the cause and effect of accidental or deliberate damage e.g. accidents, fire and vandalism	Discuss examples of accidental or deliberate damage, including photographs and annotations	Discuss significance of this defect and demonstrate ability to advise others	E	P
f) NOT USED						
g) Demonstrate knowledge and experience or proficiency, as appropriate, of a range of defects in concrete structures caused by construction defects	Show awareness that defects can arise by the way that a structure is constructed	Demonstrate knowledge of basic concrete construction. Demonstrate knowledge of the causes and consequences of: • Bad quality construction • Inadequate reinforcement cover • Excessive water cement ratio • Honeycombing	Discuss examples of construction defects, including photographs and annotations	Discuss significance of this defect and demonstrate ability to advise others	E	P

		• Shutter movement				
h) Demonstrate knowledge and experience or proficiency, as appropriate, of a range of defects in concrete structures caused by repair systems	Show awareness of the purpose of repair systems and the defects associated with them	Demonstrate knowledge of the causes and consequences of defects in repair systems	Discuss examples of defects in repair systems, including photographs and annotations	Discuss significance of this defect and demonstrate ability to advise others	E	P
i) Demonstrate knowledge and experience or proficiency, as appropriate, of a range of defects in concrete structures caused by protective coating	Show awareness of the purpose of protective coatings and the defects associated with them	Demonstrate knowledge of the causes and consequences of defects in protective coatings	Discuss examples of defects in protective coatings, including photographs and annotations	Discuss significance of this defect and demonstrate ability to advise others	E	P
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	Show awareness of defects which generally only affect the visual appearance of concrete	Demonstrate knowledge of the causes and consequences of: • Staining • Dripping water • Icicles • Moss / algae • Iron pyrites staining	Discuss examples of where minor defects were observed, including photographs and annotations	Discuss significance of this defect and demonstrate ability to advise others	E	P
k) Demonstrate knowledge or knowledge and experience, as appropriate,	Show awareness of what prestressed concrete is and the	Demonstrate knowledge of how pre-stressed	Discuss examples of defects in	N/A	K	E

of defects that can occur in prestressed concrete	defects that can occur in it. Understand that there is a difference between pre and post tensioned pre-stressed concrete	elements are constructed. Show an understanding of the causes and consequences of: • Low cover • Creation of voids • Ingress of water and chlorides • Corrosion • Creep and shrinkage	prestressed concrete			
l) Demonstrate knowledge or knowledge and experience, as appropriate, of defects that can occur in post-tensioning systems	Show awareness of what post-tensioning systems are and the defects that can occur in them	Demonstrate knowledge of the causes and consequences of defects in post-tensioning systems	Discuss examples of defects in post tensioned concrete	N/A	K	E

CON.2 Investigation and Testing

Assessment Criteria	Achievement Rating				Required Rating	
CON.2.1	A	K	E	P	I	SI
Common Testing Techniques						
a) Demonstrate knowledge of common testing techniques by describing cover surveys	Show awareness of cover surveys	Demonstrate knowledge of the use and application of cover surveys	N/A	N/A	K	K
b) Demonstrate knowledge of common testing techniques by describing the use of crack width gauges	Show awareness of the use of crack width gauges	Demonstrate knowledge of the use and application of crack width gauges	N/A	N/A	K	K
c) Demonstrate knowledge of common testing techniques by describing delamination surveys	Show awareness of the use of delamination surveys	Demonstrate knowledge of the use and application of delamination surveys	N/A	N/A	K	K
d) Demonstrate knowledge of common testing techniques by describing half-cell potential surveys	Show awareness of the use of half-cell potential surveys	Demonstrate knowledge of the use and application of half-cell potential surveys	N/A	N/A	K	K

e) Demonstrate knowledge of common testing techniques by describing carbonation tests	Show awareness of the use of carbonation tests	Demonstrate knowledge of the use and application of carbonation tests	N/A	N/A	K	K
f) Demonstrate knowledge of common testing techniques by describing coring	Show awareness of the use of coring techniques	Demonstrate knowledge of the use and application of coring techniques	N/A	N/A	K	K
g) Demonstrate knowledge of common testing techniques by describing tests for chloride/sulphate/alkali content	Show awareness of tests to determine chloride/sulphate/alkali content	Demonstrate knowledge of the use and application of tests for chloride, sulphate and alkali content	N/A	N/A	K	K
h) Demonstrate knowledge of common testing techniques by describing the use of strain gauges	Show awareness of the use of strain gauges	Demonstrate knowledge of the use and application of strain gauges	N/A	N/A	K	K

CON 3. Repair techniques

Assessment Criteria	Achievement Rating				Required rating	
	A	K	E	P	I	SI
CON 3.1 Repair techniques for Concrete structures						
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)	Show awareness of options available for repair and where they would be most appropriately applied. Show awareness of what a repair would achieve, i.e. why should it be recommended. Crack filling/sealing – this would be a low-cost option but not always needed or the correct solution. Hand applied repair material – appropriate	Demonstrate knowledge of the deterioration processes of concrete and how defects arise. Explain which cracks would benefit from filling/sealing and what this may achieve. Demonstrate knowledge of the work required for the preparation and repair of a damaged area. Knowledge of when a hand applied repair would be appropriate.	N/A	N/A	K	K
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

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).	for local areas of repair, awareness of preparation details and drawbacks. Where hand applied techniques may not be appropriate awareness of the alternatives. Show awareness of strengthening options that may been applied to a concrete structure.	Some knowledge of options for materials. Demonstrate knowledge of sprayed concrete, cathodic protection and the areas where they could be applied would be expected. Demonstrate knowledge of strengthening techniques and how they may be identified.			K	K

Metallic Bridges Module

MET.1 Defects, Descriptions and Causes

Assessment Criteria	Achievement Rating				Required Rating	
MET.1	A	K	E	P	I	SI
.1 Metallic Defects						
a) Demonstrate knowledge and experience or proficiency, as appropriate, of a range of defects in steel structures caused by structural distress	Show awareness of what structural distress is in a metallic structure	Demonstrate knowledge of the causes and consequences of: • Buckling • Weld tears • Fractures • Major strike damage including flange tears. • Failure of discrete bearings	Discuss examples of where defects caused by structural distress were observed, including photographs and annotations	Discuss significance of these defects and demonstrate ability to advise others	E	P
b) Demonstrate knowledge and experience or proficiency, as appropriate, of a range of defects in steel structures caused by the nature of the material	Show awareness of defects associated with the nature of the material	Demonstrate knowledge of the causes and consequences of: • Ductile strength • Vulnerability to corrosion	Discuss examples of where defects caused by the nature of the material were observed, including photographs and annotations	Discuss significance of these defects and demonstrate ability to advise others	E	P

c) Demonstrate knowledge and experience or proficiency, as appropriate, of a range of defects in steel structures caused by accidental or deliberate damage	Show awareness of defects associated with accidental or deliberate damage	Demonstrate knowledge of the causes and consequences of a strike to a structure	Discuss examples of where defects caused by accidental or deliberate damage were observed, including photographs and annotations	Discuss significance of these defects and demonstrate ability to advise others	E	P
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	Show awareness of fabrication errors	Demonstrate knowledge of the causes and consequences of poor-quality welds and missing rivets or bolts	Discuss examples of where defects caused by poor quality welds and /or missing rivets and bolts were observed, including photographs and annotations	Discuss significance of these defects and demonstrate ability to advise others	E	P
e) Demonstrate knowledge and experience or proficiency, as appropriate, of a range of defects in steel structures caused by material corrosion	Show awareness of external agents that pose a risk to metal structures	Demonstrate knowledge of the causes and consequences of corrosion of any unprotected metal surface in the presence of water and	Discuss examples of where defects caused by material corrosion were observed, including photographs and annotations	Discuss significance of these defects and demonstrate ability to advise others	E	P

		oxygen including bi-metallic corrosion				
f) NOT USED						
g) Demonstrate knowledge of defects associated with protective systems	Show awareness of the purpose of protective systems and an appreciation of the defects associated with them	Demonstrate knowledge of the causes and consequences of defects on protective coating systems	N/A	N/A	K	K
h) Demonstrate knowledge of defects associated with closed members	Show awareness of the geometry of structural members that would suggest hidden internal surfaces. Show awareness that there are additional issues with inspecting closed structures including difficulty of access, safety, etc	Demonstrate knowledge of the construction of closed members including an understanding of typical defects. Have knowledge of remote and man entry methods of inspections including an understanding of their strengths and weaknesses	N/A	N/A	K	K
i) Demonstrate knowledge of defects associated with	Show an awareness of the function and form	Demonstrate knowledge of how components in buried	N/A	N/A	K	K

corrugated steel buried structures	of different buried structures.	structures are assembled and protected. Have knowledge of the agents acting upon these elements and the likely deterioration / damage they are susceptible to and how this can lead to instability and lack of function				
j) Demonstrate knowledge of defects associated with a whole system, for example, steel beams with jack arches	Show awareness that the overall function of the structure depends on the individual sections. Be aware of the most significant elements in terms of integrity, stability and durability.	Demonstrate knowledge of how the various elements work together to allow the structure to work as a whole. Understand how this knowledge can be used to rate the significance of deterioration in certain elements	N/A	N/A	K	K

Assessment Criteria	Achievement Rating				Required Rating	
MET.1.2	A	K	E	P	I	SI
Defects in Miscellaneous Materials						
a) Demonstrate knowledge of defects in cast iron	Show awareness of defects found in cast iron	Demonstrate knowledge of defects found in cast iron including pitting, cracking and brittle failure	N/A	N/A	K	K
b) Demonstrate knowledge of defects in wrought iron	Show awareness of defects found in wrought iron	Demonstrate knowledge of defects found in wrought iron including connection failure, cracks around holes, lamination and poor-quality welds	N/A	N/A	K	K
c) Demonstrate knowledge of defects in aluminium	Show awareness of defects found in aluminium	Demonstrate knowledge of defects found in aluminium including stress corrosion cracking, oxidisation, bi-metallic corrosion	N/A	N/A	K	K
d) Demonstrate knowledge of defects in wire rope	Show awareness of defects found in wire rope	Demonstrate knowledge of corrosion in strands, internal corrosion, anchor failure	N/A	N/A	K	K

MET.2 Investigation and Testing

Assessment Criteria	Achievement Rating				Required Rating	
MET.2.1	A	K	E	P	I	SI
Common Testing Techniques						
a) Demonstrate knowledge of common testing techniques by describing delamination surveys	Show awareness of delamination surveys	Demonstrate knowledge of the use and application of delamination surveys	N/A	N/A	K	K
b) Demonstrate knowledge of common testing techniques by describing the use of strain gauges	Show awareness of the use of strain gauges	Demonstrate knowledge of the use and application of strain gauges	N/A	N/A	K	K
c) Demonstrate knowledge of common testing techniques by describing the use of ultrasonic testing	Show awareness of the use of ultrasonic testing	Demonstrate knowledge of the use and application of ultrasonic testing	N/A	N/A	K	K
d) Demonstrate knowledge of common testing techniques by describing the use of paint film thickness measurements	Show awareness of the use of paint film thickness measurements	Demonstrate knowledge of the use and application of paint film thickness measurements	N/A	N/A	K	K

MET.3 Repair Techniques

Assessment Criteria	Achievement Rating				Required rating	
MET 3.1	A	K	E	P	I	SI
Repair techniques for Metal structures						
a) Demonstrate knowledge of the principal repair techniques for metal structures. Knowledge to include (but not limited to) the use of member replacement	Show awareness of the use of member replacement Show awareness of repair techniques e.g. by straightening, plating of girder elements. Show awareness of different protective systems and the requirements for metal preparation. Note the importance of curing the source of the defect, e.g.	Demonstrate knowledge of repair techniques e.g. by plating of girder elements Demonstrate knowledge of the potential for metal coatings to exist below paint finishes and the different recommendations for repair that may apply. Knowledge of potential risks with removal of old paint systems. Knowledge of where welding of repairs may not be appropriate.	N/A	. N/A	K	K
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
c) Demonstrate knowledge of the principal repair techniques for metal structures. Knowledge to include (but not limited to) the use of epoxy resins,					K	K

polyurethanes and other protective coating systems.	leaking joint. Note potential issues with overcoating existing systems. Show awareness of how corrugated metal structures may be repaired. Show awareness of the criticality of fastenings and methods of replacement. Show awareness of different metal parapet materials and limited options for repair.	Knowledge of the typical details of a corrugated metal structure and the limited scope for repairs. Knowledge of the typical fixing details used. Knowledge of challenges of repair of galvanized and aluminium sections.				