

Structures Inspection Manual (SIM)

Amendment Register

September 2016

Part	Section/Appendix	Change Type	Description of change
All	Structures Inspection Manual	Amendment	This manual replaces the Bridge Inspection Manual and builds on state-wide procedures for inspection and condition rating. It includes changes to inspection scope and frequency, documentation, data management and accreditation levels to reflect developments in both the department's current methods and national/international best practice. The following details the clauses and appendices that have been updated.
Part 1	1 - Objectives	Amendment	<ul style="list-style-type: none"> Additional reference to Hazard Registers added to objectives.
	3.1 – Asset types		<ul style="list-style-type: none"> Scope of assets covered by manual updated to include other significant highway structures.
	3.1 – Asset Types		<ul style="list-style-type: none"> Definition of 'major' culverts updated.
	Figure 1		<ul style="list-style-type: none"> Structures Asset Management Framework updated to reflect current operational plans and management activities.
	5.1 – General Accountabilities		<ul style="list-style-type: none"> Accountabilities updated to reflect current organisational structure and position accountabilities.
	5.2 – Overview of Responsibility for WHS Inspections		<ul style="list-style-type: none"> Updated to reflect changes in legislation and current practice.
	7 – Inspection Requirements		<ul style="list-style-type: none"> Scope, procedures, inspector accreditation, frequencies and data recording requirements all moved to Part 3 – Procedures. Purpose of Level 3 inspection expanded to include categories for asbestos identification/verification, underwater access, fracture critical/low redundancy structures, complex/unique structures, known/suspected deficiencies and confined space inspection.
Part 2	All	Amendment	<ul style="list-style-type: none"> Figures describing deterioration mechanisms moved into body text rather than included as Appendix at end of Part.
	1 - Introduction		<ul style="list-style-type: none"> Introduction to Part 2 added.
	2.2.1 Corrosion of Reinforcement		<ul style="list-style-type: none"> Section expanded and figures updated.
	2.2.1.2 – Chloride Ingress		<ul style="list-style-type: none"> Section on chloride ingress added.
	2.2.2 – Alkali-aggregate Reaction		<ul style="list-style-type: none"> Section expanded and figures updated.
	2.2.3 - Cracking		<ul style="list-style-type: none"> Section expanded and figures updated.
	2.2.4 – Spalling		<ul style="list-style-type: none"> Figures updated
	2.2.5 – Delamination		<ul style="list-style-type: none"> Section expanded and figures updated.
	2.2.6 – Surface Defects		<ul style="list-style-type: none"> Section expanded and figures updated.
	2.2.7 – Scaling		<ul style="list-style-type: none"> New section added.
	2.2.8 - Disintegration		<ul style="list-style-type: none"> New section added.
	2.2.9 - Fire		<ul style="list-style-type: none"> New section added.

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	2.3.1 - Corrosion		<ul style="list-style-type: none"> Section expanded and figures updated. Reference to phenomenon of Sulphate Reducing Bacteria added.
	2.3.2 – Protective Coatings		<ul style="list-style-type: none"> Protective coatings moved into ‘Steel’ section, expanded and figures updated. Additional sub-section on weathering steel added.
	2.3.3 – Permanent Deformations		<ul style="list-style-type: none"> Figures updated.
	2.3.6 – Fire Damage		<ul style="list-style-type: none"> New section added.
	2.3.7 – Impact damage		<ul style="list-style-type: none"> New section added.
	2.4.2 - Termites		<ul style="list-style-type: none"> Figures updated.
	2.4.3 – Marine organisms		<ul style="list-style-type: none"> Figures updated.
	2.6 – Fibre Reinforced Polymers		<ul style="list-style-type: none"> New section on FRP added.
	3.3.3.2 – Plywood decking		<ul style="list-style-type: none"> Section added.
	3.4 – Other Structure Types		<ul style="list-style-type: none"> Section added to cover additional structure types as noted below.
	3.4.1 – Box Culverts		<ul style="list-style-type: none"> Section moved and updated.
	3.4.2 – Pipe Culverts		<ul style="list-style-type: none"> Section moved and updated, includes precast concrete and buried corrugated metal.
	3.4.3 – Large Traffic Management Signs (LTMS)		<ul style="list-style-type: none"> Section added.
	3.4.4 – Retaining Walls		<ul style="list-style-type: none"> Section added.
	3.5.6 - Vegetation		<ul style="list-style-type: none"> Section expanded.
3.5.7 – Waterway Scour	<ul style="list-style-type: none"> Section expanded and figures updated. 		
Part 3	1.1 - Levels of Inspection	Amendment	<ul style="list-style-type: none"> Purpose of all levels of inspection updated as per Part 1.
	1.2 - Safety		<ul style="list-style-type: none"> Updated to reflect changes in legislation and current practice.
	1.3 – Component designation		<ul style="list-style-type: none"> Section pared back and reference made to relevant Appendices.
	1.4 – Manual Updates		<ul style="list-style-type: none"> New section to reflect BCMAM commitment to update manual at least every 12 months and advising process for providing feedback. Reference to Advice Notes removed as will no longer be utilised.
	2.3 – Extent of Inspections		<ul style="list-style-type: none"> List of excluded components expanded/clarified.
	2.4 – Inspection Frequency		<ul style="list-style-type: none"> Inspection frequency moved from Part 1. Frequency of inspection for additional structure types added.
	2.6 - Inspection Procedure		<ul style="list-style-type: none"> Additional inspection requirements for retaining structures and LTMS and gantries added.
	2.7 – Structural Inventory Data		<ul style="list-style-type: none"> Procedures for verification of inventory data added.
	2.9 – Post-flood inspection		<ul style="list-style-type: none"> Additional section added on post-flood inspection requirements.
	2.10 – Post-earthquake inspection		<ul style="list-style-type: none"> Additional section added on post-earthquake inspection requirements.
	2.11 – Post-tsunami inspection		<ul style="list-style-type: none"> Additional section added on post-tsunami inspection requirements.

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	3.3.2 – Specialist access		<ul style="list-style-type: none"> New section clarifying requirements/justification for specialist access.
	3.3.3 – Additional requirements		<ul style="list-style-type: none"> New section identifying additional requirements beyond scope of 'normal' level 2 inspection. E.g. timber drilling, asbestos identification or additional inspection requirements determined through Level 3 inspection.
	3.3.4 - Exclusions		<ul style="list-style-type: none"> New section formally listing excluded components. Includes updated reference to potential confined spaces.
	3.4 – Inspection Frequency		<ul style="list-style-type: none"> Inspection frequency moved from Part 1. Frequency of inspection for additional structure types added. Initial inspection requirements for new structures added. Frequency of ultrasonic testing changed. Confined space inspection frequencies added.
	3.6.3 - Inspection		<ul style="list-style-type: none"> Obsolete components and sacrificial components required to be recorded as exceptions.
	3.7 – Data transfer		<ul style="list-style-type: none"> Data transfer requirements updated to reflect current practice/technology.
	3.8 – Condition rating		<ul style="list-style-type: none"> Section updated to include compilation of component inventory, modifications, groups, components and condition state criteria all in one section.
	3.8.2.1 - Modification		<ul style="list-style-type: none"> Definitions for modifications updated.
	3.8.3.3 – Structure condition assessment		<ul style="list-style-type: none"> Procedures for reporting structure assessed in CS5 added.
	3.10 – Timber drilling		<ul style="list-style-type: none"> Section updated to reflect current practice including timber drilling locations, plugging of holes, additional drilling requirements if decay detected, snipe depth measurement, undersized girders, approved alternatives to drilling.
	3.11 – Scour Survey		<ul style="list-style-type: none"> Section updated to reflect current practice including location of scour measurements and procedures for measurement following any rehabilitation works.
	3.12 – Ultrasonic Testing		<ul style="list-style-type: none"> Additional section outlining requirements for ultrasonic testing of steel trough decks and buried corrugated metal culverts.
	4 – Level 3 inspections		<ul style="list-style-type: none"> Section extensively reworked and expanded to reflect additional categories of Level 3 inspection. Additional categories include: <ul style="list-style-type: none"> Asbestos identification Asbestos verification Underwater inspection Fracture critical/lack of redundancy Sub-standard load rating Complex/unique structures Known/suspected deficiencies' Confined spaces
	4.2 – Detailed structural engineering inspection		<ul style="list-style-type: none"> Procedure for recording updated condition rating of structure/components in BIS following Level 3 inspection added.

Part	Section/Appendix	Change Type	Description of change
Appendices	Appendix A – Inspection Forms/Samples		<ul style="list-style-type: none"> • Level 1 form updated to new template and LTMS added • New Level 1 samples included. • Level 2 form updated to new template. • Scour survey form updated to record rehabilitation works. • New Level 2 samples added. • Structure Inventory verification forms added • Structure design verification forms added • Post-flood inspection checklist added • Ultrasonic survey template for steel trough decks added.
	Appendix B – Standard Component Schedule		<ul style="list-style-type: none"> • Standard component schedule updated to include additional components for ID plates, external strengthening/post tensioning, culvert base slab/pipe invert along with a further 13 components for retaining walls and LTMS. • Component matrix updated to reflect additional components. • Significance rating of all principal culvert components increased to 4. • Figures B1 – B9 added (these were previously included at the end of Part 3, but not in an appendix)
	Appendix C – Standard Component Identification Schedule		<ul style="list-style-type: none"> • Minor errors in original figures amended. • Minor amendments to existing figures. • Seven additional figures to illustrate new components.
	Appendix D – Standard Component Condition State Guidelines		<ul style="list-style-type: none"> • Component 1C updated. • Component 2C updated. • Component 2T updated. • Component 3S added. • Component 3P updated. • Component 3C updated. • Component 4P updated. • Component 4C updated. • Component 14S updated. • Component 20P updated. • Component 20C updated. • Component 20T updated. • Component 21S updated. • Component 21P updated. • Component 21C updated. • Component 22P updated. • Component 22C updated. • Component 22T updated. • Component 22O added. • Component 23S updated. • Component 24S updated. • Component 25P updated. • Component 25C updated. • Component 27C updated.

Part	Section/Appendix	Change Type	Description of change
	Appendix D – Standard Component Condition State Guidelines (cont)		<ul style="list-style-type: none"> • Component 27T updated. • Component 29P updated. • Component 31C updated. • Component 32C updated. • Component 42O updated. • Component 50C updated. • Component 51P updated. • Component 51C updated. • Component 52P updated. • Component 52C updated. • Component 54S updated. • Component 54P updated. • Component 54C updated. • Component 54T updated. • Component 55C updated. • Component 56P updated. • Component 56C updated. • Component 56T updated. • Component 56O updated. • Component 57C updated. • Component 58C updated. • Component 59C updated. • Component 60C added. • Component 60P updated. • Component 71C updated. • Component 71O updated. • Component 72S updated. • Component 72P updated. • Component 72C updated. • Component 72T updated. • Component 72O updated. • Component 73S/O added. • Component 74S added. • Component 74O added. • Component 80P updated. • Component 81P updated. • Component 81C updated. • Component 82P updated. • Component 83P updated. • Component 83C updated. • Component 83O updated. • Component 84P updated. • Component 84C updated. • Component 85C added. • Component 85O added. • Component 91C added. • Component 92S added.

Part	Section/Appendix	Change Type	Description of change
	Appendix D – Standard Component Condition State Guidelines (cont)		<ul style="list-style-type: none"> • Component 92S added. • Component 93S added. • Component 94S added. • Component 95S added. • Component 96S added. • Component 97S added. • Component 98S added. • Component 99O added. • Component 100S added. • Component 100P added. • Component 100C added. • Component 100T added. • Component 100O added. • Component 101S added. • Component 101P added. • Component 101C added. • Component 101T added. • Component 101O added. • Component 102P added. • Component 102C added. • Component 103S added.
	Appendix E – Inspector Accreditation Appraisal Procedure		<ul style="list-style-type: none"> • Procedure updated to reflect current practice.
	Appendix F – Management of defective and sub-standard bridges		<ul style="list-style-type: none"> • Updated to new template.
	Appendix G – Breakdown of complex and non-standard structures		<ul style="list-style-type: none"> • Updated to new template.
	Appendix H - Example of Additional Requirements for Special and Unique Structures		<ul style="list-style-type: none"> • Previous Appendix H (Advice Notes Register) deleted. • New Appendix with example of additional requirements to be considered for special and/or unique structures.