Road Structures Inspection Manual

Part 4C: Condition State Guidelines and Photographs

Other Structures

dpti.sa.gov.au
@DPTI_SA @DPTISA

Government of South Australia
Department of Planning, Transport and Infrastructure

Road Structures Inspection Manual

Part 4C: Condition State Guidelines and Photographs – Other Structures
Department of Planning, Transport and Infrastructure, South Australia

For further information regarding DPTI Road Structures Inspection Manual please contact:

The Principal Engineer Structures
Road Assets Section
Level 4, 77 Grenfell Street
Adelaide SA 5000

www.dpti.sa.gov.au

RAMA Document No: RAMA-ST-PRC-048
Knet Document No: 14883411
Document version: 1.0 (13/12/2019)

Previously, this document was called the Bridge Inspection Manual.
First published in 2003 then revised in 2005, 2008 and 2019.

Disclaimer
Every effort has been made to supply complete and accurate information. This document is subject to continual revision and may change. It is the user's responsibility to check DPTI's website to ensure that the current version is being used.

This manual has been compiled based on material sourced from:

- **Department of Transport (Victoria), *VicRoads Road Structures Inspection Manual – 2018***
  © State Government of Victoria (Department of Transport, VicRoads) 2018
  <https://www.vicroads.vic.gov.au/business-and-industry/technical-publications/bridges-and-structures> used with permission
- **Department of Transport and Main Roads (Queensland), *Structures Inspection Manual***
  © State of Queensland (Department of Transport and Main Roads) 2016
  <https://www.tmr.qld.gov.au/business-industry/Technical-standards-publications/Structures-Inspection-Manual> licensed under <https://creativecommons.org/licenses/by/3.0/au/>
- **Main Roads Western Australia, *Inspection Guidelines Documents***
  © Western Australian Government 2012-2017
  <https://www.mainroads.wa.gov.au/BuildingRoads/StandardsTechnical/StructuresEngineering/Pages/Asset_Management.aspx#TOCh35> used with permission

and adjusted for South Australian conditions.

Feedback: Please send your feedback regarding this document to:
DPTI.bmu@sa.gov.au

TABLE OF CONTENTS

ROAD STRUCTURES INSPECTION MANUAL 1
PART 4C: CONDITION STATE GUIDELINES AND PHOTOGRAPHS 1
GANTRIES 1
70P - SUPPORT SYSTEMS – PRECAST CONCRETE 1
70C - FOOTINGS – CAST IN-SITU CONCRETE 3
70S - SUPPORT SYSTEMS – STEEL 5
71P - MAST – PRECAST CONCRETE 6
71S - COLUMNS – STEEL 7
72S - CANTILEVER ARMS OR GANTRY BEAMS – STEEL 9
73S - GANTRY TRUSS – STEEL 11
74S - HOLD DOWN BOLTS AND FITTINGS – STEEL 13
75C - GROUT OR MORTAR PAD BENEATH BASEPLATE – CONCRETE 15
75S - BASE PLATES AND GUSSETS – STEEL 17
76S - SIGN FACE SUPPORT STRUCTURE – STEEL 19
77S - ANCILLARIES (WALKWAYS, CABLE TRAYS, LADDERS) – STEEL 21
78 - TRAFFIC BARRIERS 22
RETAINING WALLS 23
80P - WALL FACING / PANELS – PRECAST CONCRETE 23
80C - WALL FACING / PANELS – CAST IN-SITU CONCRETE 25
80S - WALL FACING / PANELS – STEEL 27
80T - WALL FACING / PANELS – TIMBER 29
80O - WALL FACING / PANELS – OTHER 31
81P - COLUMNS – PRECAST CONCRETE 33
81C - COLUMNS – CAST IN-SITU CONCRETE 34
81S - COLUMNS – STEEL 36
81T - COLUMNS – TIMBER 39
81O - COLUMNS – OTHER 41
82P - BARRIERS – PRECAST CONCRETE 42
82S - BARRIERS – STEEL 44
83S - CONNECTIONS AND HORIZONTAL SUPPORTS – STEEL 46
83T - CONNECTIONS AND HORIZONTAL SUPPORTS – TIMBER 48
84O - DRAINAGE SYSTEM 50
NOISE WALLS, VISUAL SCREEN WALLS AND ARCHITECTURAL FEATURES 53
90P - WALL FACING / PANELS – PRECAST CONCRETE 53
90C - WALL FACING / PANELS – CAST IN-SITU CONCRETE 55
90S - WALL FACING / PANELS – STEEL 57
90T - WALL FACING / PANELS – TIMBER 59
90O - WALL FACING / PANELS – OTHER 61
91P - COLUMN SUPPORTS – PRECAST CONCRETE 64
91S - COLUMN SUPPORTS – STEEL 65
91T - COLUMN SUPPORTS – TIMBER 67
92C - FOUNDATION –CONCRETE (PRECAST OR CAST IN-SITU) 69
92S - FOUNDATION – STEEL 72
93S - HOLD-DOWN BOLTS, BASE PLATES AND FITTINGS – STEEL 74
94C - GROUT OR MORTAR PAD BENEATH BASEPLATE – CONCRETE 76

FERRY RAMPS 78
100C - RAMP SLAB – CONCRETE 78
101C - RAMP SHOULDER – CONCRETE 80
101O - RAMP SHOULDER – OTHER 82
102C - DEADMEN – CONCRETE 84
102S - DEADMEN – STEEL 86
103O - RAMP JOINTS – OTHER 88
104S - TRAFFIC BARRIERS – STEEL 89
CATTLE GRIDS 90
110C - ABUTMENT WALL – CONCRETE 90
111C - PIER WALL – CONCRETE 91
112C - GRID BASE SLAB – CONCRETE 92
113C - WINGWALL – CONCRETE 94
114S - GRID BAFFLE PLATES – STEEL 96
115S - GRID GIRDERS – STEEL 98
116S - GRID PACKERS – STEEL 100
117O - GRID RAILS – STEEL 102
118O - FENCE – OTHER 104
119O - BOUNDARY FENCE CONNECTION – OTHER 106
120 - APPROACH - OTHER 108
121 - APPROACH ROAD - OTHER 108
BUSWAY TRACK 109
130P - BUSWAY TRACK – PRECAST CONCRETE 109
131P - BUSWAY SLEEPERS – PRECAST CONCRETE 112
132C - BUSWAY PILES – CAST IN-SITU CONCRETE 115
133S - BUSWAY GUIDE RAILS – STEEL 117
134S - BUSWAY SUMP BUSTERS – STEEL / CONCRETE 119
TUNNELS 121
140C - TUNNEL WALL – CONCRETE 121
140S - TUNNEL WALL – STEEL 123
141C - TUNNEL PORTAL – CONCRETE 125
142C - TUNNEL ROOF – CONCRETE 127
143 - APPROACH, APPROACH ROAD, APPROACH BARRIER 129
144 - TRAFFIC SURFACE 129
145 - BASE SLAB 129
146O - CONSTRUCTION JOINTS – OTHER 130
147O - ADDITIONAL ELEMENTS – CONCRETE / STEEL / OTHER 132
148 - DRAINAGE SYSTEM 136

GANTRIES

70P - Support systems – precast concrete

This component defines the condition of precast concrete parapet barrier or other precast concrete support systems. The component shall be given a single rating only, and this rating should report the worst condition state applicable to the parapet or other support component.

Units
Each

Condition state 1 -Description	**Photo**
• The parapet is in good condition with possibly only a few fine cracks away from the hold down bolts and has not been damaged or displaced by vehicle impact.	 Concrete parapet support in good condition
Condition state 2 -Description	**Photo**
• The footing / parapet may have some minor spalling due to corrosion of reinforcement close to the surface. • There may be some fine cracking around the hold down bolts due to forces transferred through the bolts. • The parapet may have some minor damage or be displaced by less than 50mm as a result of vehicle impact.	Not available
Condition state 3 -Description	**Photo**
• The footing / parapet may have some moderate spalling due to corrosion of reinforcement close to the surface. • There may be some minor cracking around the hold down bolts due to forces transferred through the bolts. • The parapet may have some moderate damage or be displaced by more than 50mm as a result of vehicle impact.	Not available

Condition state 4 -Description	Photo
• There may be medium cracking or spalling due to corroding reinforcement. Small delaminations may exist with corroding steel having moderate section loss. • Structural cracking around the hold down bolts is minor but there may also be some moderate spalling associated with the bolt forces. • There may be some minor loss of bearing support. • The parapet may have vehicle impact damage around the hold down baseplate or have a protruding edge that could snag vehicles	Not available
Condition state 5 -Description	**Photo**
• There may be severe cracking or spalling due to corroding reinforcement. • Medium size delaminations may exist with corroding steel having more severe section loss. • Structural cracking and spalling around the hold down bolts, associated with the transferred bolt forces, is medium. • There may be substantial loss of bearing support. • The parapet may have suffered severe impact damage, particularly near the hold down baseplate or displacement that could cause snagging of the parapet or mast arm by traffic.	Not available

70C - Footings – cast in-situ concrete

This component defines the condition of the footings and should be included only if the top is visible. This component also includes cast-in-situ concrete parapet barrier support systems. The component shall be given a single rating only, and this rating should report the worst condition state applicable to the footing or support.

Units
Each

Condition state 1 -Description	**Photo**
• The footing / parapet is in good condition with possibly only a few fine cracks away from the hold down bolts.	 Spread footing in good condition
Condition state 2 -Description	**Photo**
• The footing / parapet may have some minor spalling due to corrosion of reinforcement close to the surface. • There may be some fine cracking around the hold down bolts due to forces transferred through the bolts. • Minor soil/vegetation build up around or partially covering footings.	 Footing partially covered by soil and vegetation
Condition state 3 -Description	**Photo**
• The footing / parapet may have some moderate spalling due to corrosion of reinforcement close to the surface. • There may be some minor cracking around the hold down bolts due to forces transferred through the bolts. • Moderate soil/vegetation build up around and covering footings.	 Transverse fracture in footing concrete

Condition state 4 -Description	Photo
• There may be medium cracking or spalling due to corroding reinforcement. • Small delaminations may exist with corroding steel having moderate section loss. • Structural cracking around the hold down bolts is minor but there may also be some minor spalling associated with the bolt forces. • There may be some minor loss of bearing support. There is no scour beneath the spread footing base.	 The concrete footing is severely cracked (VicRoads)
Condition state 5 -Description	**Photo**
• There may be severe cracking or spalling due to corroding reinforcement. • Moderate size delaminations may exist with corroding steel having more severe section loss. • Structural cracking and spalling around the hold down bolts, associated with the transferred bolt forces, is medium. • There may be substantial loss of bearing support. Spread footings may have been undercut by scour action.	 Footing is unsound due to severe anchor rod corrosion  The concrete footing is severely cracked and crushed (VicRoads)

70S - Support systems – steel

This component defines the condition of steel support systems in the immediate vicinity of the baseplate. The component shall be given a single rating only, and this rating should report the worst condition state applicable to the steel support area.

Units
Each

Condition state 1 -Description	**Photo**
• The support system is in good condition with minimal corrosion or loss of coating and no visible cracks in the vicinity of the baseplate and hold down bolts.	Not available
Condition state 2 -Description	**Photo**
• The support system may have some minor surface corrosion to the area and loss of coating in the baseplate area. • There are no visible cracks in the vicinity of the baseplate and hold down bolts.	Not available
Condition state 3 -Description	**Photo**
• The support system may have some moderate surface corrosion to the area and loss of coating in the baseplate area. • There are no visible cracks in the vicinity of the baseplate and hold down bolts.	Not available
Condition state 4 -Description	**Photo**
• The surface coating system may have broken down and some active corrosion may be present with significant rust spotting to the area and surface pitting. • There are no visible cracks in the vicinity of the baseplate and hold down bolts.	Not available
Condition state 5 -Description	**Photo**
• The coating system may have completely broken down. • There may be well advanced corrosion. • Any visible signs of cracking of the parent metal or welds shall be recorded and reported immediately. • Engineering inspection may be required to determine whether visible signs of cracks are confined to the coating system or are within the metal supporting component or welds.	Not available

71P - Mast – precast concrete This component includes all precast concrete high lighting masts.	Units **Linear metres**

Condition state 1 -Description	**Photo**
• The mast is in good condition with only minor fine cracking due to reinforcement corrosion. • There should be no flexural cracking in the mast.	Not available
Condition state 2 -Description	**Photo**
• The mast may have fine cracking or spalling due to corroding reinforcement. • Fine flexural cracking may be visible.	Not available
Condition state 3 -Description	**Photo**
• The mast may have minor cracking or spalling due to corroding reinforcement. • Minor flexural cracking may be visible.	Not available
Condition state 4 -Description	**Photo**
• Moderate cracking and spalling due to corroding reinforcement may be visible. • Minor to moderate flexural cracking may be present.	Not available
Condition state 5 -Description	**Photo**
• Severe cracking and spalling due to corroding reinforcement may be visible with advanced corrosion of the reinforcement. • Flexural cracking may be heavy. This should be recorded and reported immediately.	Not available

71S - Columns – steel

This component includes all columns and masts manufactured from steel plates, tubes or sections. This includes truss columns. The steel may be painted or galvanized and include any bracing or stiffeners between the columns.

Units
Linear metres

Condition state 1 -Description	**Photo**
• The paintwork is generally in good condition with only minor chalking, curling or peeling, but no metal exposure. • If dual columns, they are adequately braced or stiffened, and all connections are in good condition.	 Column is in good condition
Condition state 2 -Description	**Photo**
• Painted steelwork may have minor rust spotting to the surface area and the protective coating is losing effectiveness. • The columns may not be effectively braced or the connections may be slightly loose or corroded.	 Column has flaking paint and minor corrosion

Condition state 3 -Description	Photo
• Painted steelwork may have moderate rust spotting to the surface area and the protective coating is no longer effective. • The columns may not be effectively braced or the connections may be loose or corroded.	 Rust spotting on column (has been previously painted but rusting again)
Condition state 4 -Description	**Photo**
• Steelwork has medium corrosion and the paint system has failed with significant surface area rusted. • Surface pitting may be evident but section loss is minor. • Bracing may be ineffective or non-existent and connections may be heavily corroded or loose. • Surface damage due to collision impact may be evident but there is no deformation of the section.	 Steel mast has no visible damage but surface corrosion and peeling of coating is evident (VicRoads)
Condition state 5 -Description	**Photo**
• Steelwork is severely corroded with up moderate loss of section. • The paint system has completely failed requiring cleaning back to bright metal and repainting. • Nuts or bolts are severely corroded and possibly no longer functioning to full capacity. • Connections may be very loose or bracing may be missing or totally ineffective. • There may be visible evidence of cracking in the parent metal or welds. • Deformation of section due to collision impact damage is evident.	 Column wall was corroded through (VicRoads)

72S - Cantilever arms or gantry beams – steel

This component includes all the structural steelwork to support the large signs and light heads. The members could be constructed using plates, tubes or sections and include all bracing and stiffeners. The connections to the columns should also be considered as part of this component. The steelwork may be painted or galvanized for protection.

Units
Linear metres

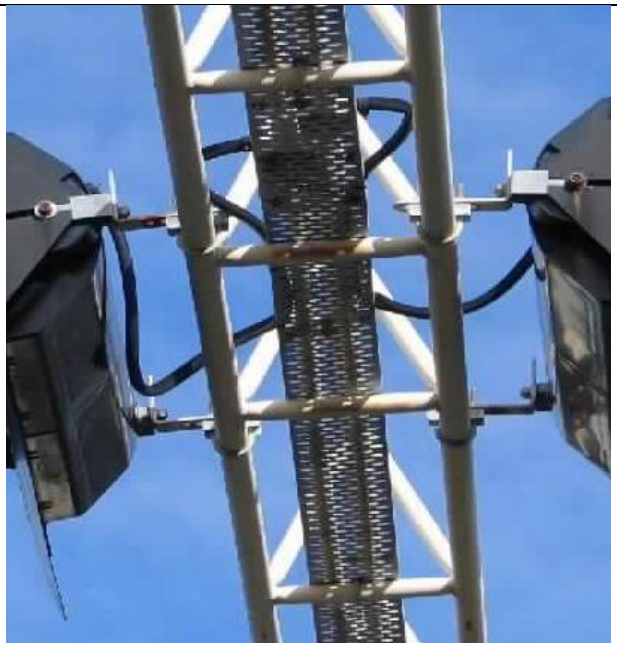
Condition state 1 -Description	**Photo**
• The paintwork is generally in good condition with only minor chalking, curling or peeling, but no metal exposure. • If dual arms, they are adequately braced or stiffened, and all connections are in good condition.	 Gantry arm is in good condition
Condition state 2 -Description	**Photo**
• Painted steelwork may have minor rust spotting to the surface area and the protective coating is losing effectiveness. • The arms may not be effectively braced or the connections may be slightly loose or corroded. • Connection bolts may be tight but too short and not fully threaded.	 Connector plates at top of column rusting

Condition state 3 -Description	Photo
• Painted steelwork may have moderate rust spotting to the surface area and the protective coating is no longer effective. • The arms may not be effectively braced or the connections may be loose or corroded.	 Large areas of paint peeling and flaking from horizontal member
Condition state 4 -Description	**Photo**
• Steelwork has medium corrosion and the paint system has failed with significant surface area rusted. • Surface pitting may be evident but section loss is only minor. • Bracing may be ineffective or non-existent and connections may be heavily corroded, loose or only half threaded.	 Significant corrosion and minor flaking on horizontal support member
Condition state 5 -Description	**Photo**
• Steelwork is severely corroded with moderate loss of section. • The paint system has completely failed requiring cleaning back to bright metal and repainting. • Connections may be very loose, missing or the bracing may be missing or totally ineffective. • There may be visible evidence of cracking in the parent metal or welds. This should be recorded and reported immediately.	Not available

73S - Gantry truss – steel

This component describes all steel trusses and includes all truss chords, verticals, diagonals, crossbraces and wind bracing. The component will also include the metal floor grillage for personnel to access the signs. The steelwork may be painted or galvanized for protection.

Units
Linear metres

Condition state 1 -Description	**Photo**
• The paintwork is generally in good condition with only minor chalking, curling or peeling, but no metal exposure. • The truss should be adequately braced or stiffened, and all connections should be in good condition.	 Steel truss in good condition
Condition state 2 -Description	**Photo**
• Painted steelwork may have minor rust spotting to the surface area and the protective coating is losing effectiveness. • The truss may not be effectively braced or the connections may be slightly loose or corroded. • Connection bolts may be tight but too short and not fully threaded.	 Rust spots on underside of truss members

Condition state 3 -Description	Photo
• Painted steelwork may have moderate rust spotting of the surface area and the protective coating is no longer effective. • The truss may not be effectively braced or the connections may be loose or corroded.	 Caps from lower chord connection missing and through bolts at top of column corroding
Condition state 4 -Description	**Photo**
• Steelwork has medium corrosion and the paint system has failed with significant surface area rusted. • Surface pitting may be evident but section loss is minor. • Bracing may be ineffective or non-existent and connections may be heavily corroded, loose or only half threaded.	 Rusted areas wide spread on truss members
Condition state 5 -Description	**Photo**
• Steelwork is severely corroded with moderate loss of section. • The paint system has completely failed requiring cleaning back to bright metal and repainting. • Connections may be very loose, missing or the bracing may be missing or totally ineffective. • There may be visible evidence of cracking in the parent metal or welds.	Not available

74S - Hold down bolts and fittings – steel

This component describes the connections of the columns and masts to the reinforced concrete footings and includes all hold down bolts and arrangements. In some cases, the levelling nuts if used can be observed below the baseplate. Steelwork may be painted or galvanized for protection.

Units
Each

Condition state 1 -Description	**Photo**
• The hold-down bolts and nuts are generally in good condition with no surface rust. • All connections are tight and in good condition, with full thread engagement by nuts. • Nuts and washers are present on all bolts.	 Hold down bolts and nuts in good condition
Condition state 2 -Description	**Photo**
• Hold-down bolts and nuts may have minor rust spotting to the surface area. Minor pitting may occur. • The connections may be slightly loose. • Connection bolts may be tight but too short and not fully threaded. Nuts may be loose, and washers may be absent.	 Top of footing anchor bolts corroding

Condition state 3 -Description	Photo
• Hold-down bolts and nuts may have moderate rust spotting to the surface area. Moderate pitting may occur. • The connections may be loose.	 Corrosion of bolts at base
Condition state 4 -Description	**Photo**
• Hold-down bolts and nuts have medium corrosion and the protective coating system has failed with significant surface area rusted. • Surface pitting may be evident but section loss is minor. • The connections may be moderately corroded, loose or only half threaded. One nut may be missing.	 Nuts on hold down bolts are only engaged over very short thread lengths
Condition state 5 -Description	**Photo**
• Hold-down bolts and nuts are severely corroded with moderate loss of section. • The paint system has completely failed. Bolts may be fractured and there may be visible evidence of cracking of bolts. • Multiple nuts may be missing or loose. • Fractured or cracked bolts must be recorded and reported immediately.	 Anchor rods below baseplate severely corroded

75C - Grout or mortar pad beneath baseplate – concrete

This component describes any grout or mortar pad beneath the steel baseplate, because it is a critical part of the performance the baseplate and holding down system. A 45° mitre around the baseplate perimeter may be present. In some cases, support blocks are used to provide for initial clamping prior to clamping against hardened grout. Where levelling nuts are provided under the baseplate, the grout or mortar pad may not be present nor required. This detail should be reported for an engineering review.

Units
Each

Condition state 1 -Description	**Photo**
• The pad completely fills the area beneath the baseplate, with no shrinkage. • The pad is sound with no cracking, spalling or other signs of deterioration. • When no pad is present beneath the steel base plate, there is no debris under the base plate.	 Mortar pad in good condition
Condition state 2 -Description	**Photo**
• The pad may have fine cracks or small gaps, but is generally sound and fills the area beneath the baseplate. • The 45° mitre around the baseplate perimeter may show cracking. • When no pad is present, there may be some debris under the base plate.	 Mortar pad has fine cracks

Condition state 3 -Description	Photo
• The pad may have moderate cracks or gaps, but is still generally sound and fills the area beneath the baseplate. • The 45° mitre around the baseplate perimeter may show minor cracking. • When no pad is present, there may be debris under the base plate.	 Gap in grout under base plate
Condition state 4 -Description	**Photo**
• The pad may be severely cracked or contain large gaps where it has spalled or not been installed thoroughly. • The 45° mitre around the baseplate perimeter may be detached for a significant section of perimeter length. • When no pad is present, the base plate may be covered with debris or vegetation.	 Mortar pad missing a large section of grout
Condition state 5 -Description	**Photo**
• The pad may be completely fractured or not present.	 No mortar pad under baseplate (not placed at time of construction)

75S - Base plates and gussets – steel

This component describes base plates, gusset plates and welds at the connection of column to the foundations. Steelwork may be painted or galvanized for protection. Assessment is for steel up to 100 mm above the top of any gussets.

Units
Each

Condition state 1 -Description	**Photo**
• The steelwork and protective coating is generally in good condition with only minor chalking, curling or peeling, but no metal exposure or rusting. • All welds have no visible defects.	 Base plate and gusset are in good condition
Condition state 2 -Description	**Photo**
• Steelwork may have minor rust spotting to the surface area. Minor pitting may occur. • All welds have no visible defects.	 Corrosion starting on base plate

Condition state 3 -Description	Photo
• Steelwork may have moderate rust spotting of the surface area. Moderate pitting may occur. • All welds are sound and have no visible defects.	 Minor bend on gusset plate
Condition state 4 -Description	**Photo**
• Steelwork has medium corrosion and the paint system has failed with significant surface area rusted. • Surface pitting may be evident but section loss is minor. • Base plates may be buried in soil, debris or vegetation. • Paint cracking of paint coatings may occur on weld lines.	 Base plate is significantly rusted
Condition state 5 -Description	**Photo**
• Steelwork is severely corroded with moderate loss of section by pitting. • Base plates are buried in soil, debris or vegetation. • There may be visible evidence of cracking in the parent metal or welds, particularly at top of gussets. • This should be recorded and reported immediately.	 Base plate and gusset is severely corroded and there is a loss of cross section (VicRoads)

76S - Sign face support structure – steel

Units
Each

This item describes the connections of the sign face to the primary structural members and includes all hangers, framing and bracing. Steelwork may be painted or galvanised for protection.

Note:
Component No. 74S Hold down bolts and 75S Base plates and gussets should be used for the connection of a sign face support structure to a bridge structure.

Condition state 1 -Description	**Photo**
• The paint or galvanising system is generally sound with only minor chalking, peeling or curling, but with no exposure of metal. • All welds, bolts or rivets are in good condition with no movement of plates or sections in the element. • There is adequate clearance to the highway.	 All sign face support connections in good condition
Condition state 2 -Description	**Photo**
• Spot rusting of the paint or galvanising system is occurring and the protective coating system is losing effectiveness. • Minor rust spotting may have occurred but with no loss of section • All member lines are true. • All welds, bolts or rivets are in good condition with no movement of plates or sections in the element. Connection bolts may be tight but too short and not fully threaded.	 Minor corrosion to ends of threaded mounting rods
Condition state 3 -Description	**Photo**
• Spot rusting of the paint or galvanising system is occurring and the protective coating system is no longer effective. • Moderate rust spotting may have occurred but no loss of section has occurred. • All welds, bolts or rivets are in fair condition with no movement of plates or sections in the element. Connection bolts should still be tight but may be too short and not fully threaded. • There is adequate clearance to the highway.	 Sign clamp corrosion

Condition state 4 -Description	Photo
• Steelwork has moderate corrosion and the protective coating system has completely failed. Surface pitting may be evident but section loss minor. • Active corrosion is occurring in isolated areas, but no loss of section is occurring that will affect the strength of the member as a whole. • Some nuts and bolts may be corroding but most are still tight and no cracking of welds has occurred. • Bracing may not be fully effective and connections may be heavily corroded with isolated loose bolts. • There may be minor deviations in the member line and evidence of excessive deflection or movement under dead load or wind loading. • Surface damage due to collision impact may be evident but there is no deformation of the section. • There may be inadequate clearance to the highway and/or the clearance sign may be missing. • Minor surface corrosion is evident around the vent holes.	 Vertical tubes heavily rusted
Condition state 5 -Description	**Photo**
• Corrosion is well advanced and moderate loss of section has occurred, having a detrimental effect on the strength of the member. • Bracing may be ineffective or missing, allowing the support structure or sections thereof to visibly bow under dead loading or deflect noticeably under wind loads. • Permanent deflection of members or buckling or distortion of webs, flanges or stiffeners may be evident. • Gross deformation of members as a result of impact damage may have occurred. • Moderate to heavy surface corrosion is evident around the vent holes.	 Bottom 1/3 edge of sign detached from unistruts (difficult to see but visible movement of sign when trucks pass under)

77S - Ancillaries (walkways, cable trays, ladders) – steel

This item describes the ancillaries provided on the structure for access and security. Steelwork may be painted or galvanized for protection.

Units
Each

Condition state 1 -Description	**Photo**
• The paintwork is generally in good condition with only minor chalking, curling or peeling, but no metal exposure. • All connections are tight and in good condition. • Access equipment has been certified and is clearly labelled. • There are no tripping hazards, components are fully operational and all locking pins are in place and functional. • The equipment is secure and there is no evidence of unauthorised access such as graffiti or other vandalism.	 Walkway and railing in good condition
Condition state 2 -Description	**Photo**
• Painted steelwork may have minor rust spotting to the surface area and the protective coating is losing effectiveness. • The connections may be slightly loose or beginning to corrode. Connection bolts may be tight but too short and not fully threaded. • Access equipment has been certified and is clearly labelled. • There are no tripping hazards, components are fully operational and all locking pins are in place and functional. • The equipment is secure and there is no evidence of unauthorised access such as graffiti or other vandalism.	 Paint flaking from walkway and railing

Condition state 3 -Description	Photo
• Painted steelwork may have moderate rust spotting to the surface area and the protective coating is no longer effective. • The connections may be loose or beginning to corrode. Connection bolts should still be tight but may be too short and not fully threaded. • There are no tripping hazards, components are fully operational and all locking pins are in place and functional. • The equipment is secure and there is no evidence of unauthorised access such as graffiti or other vandalism.	Not available
Condition state 4 -Description	**Photo**
• Steelwork has medium corrosion and the paint system has failed with significant surface area rusted. Surface pitting may be evident but section loss is minor. • The connections may be moderately corroded, loose or only half threaded. • There are no tripping hazards, components are fully operational and all locking pins are in place and functional. • The equipment is secure and there is no evidence of unauthorised access such as graffiti or other vandalism.	Not available
Condition state 5 -Description	**Photo**
• Steelwork is heavily corroded with moderate loss of section. • The paint system has completely failed, requiring cleaning back to bright metal and repainting. • Connections may be very loose, missing or heavily corroded. • Equipment is unsafe, uncertified, insecure or damaged by vandalism or impact.	Not available

78 - Traffic barriers

Refer Component No 26

Units

Linear Metres

RETAINING WALLS

80P - Wall facing / panels – precast concrete

This element includes all wall facing systems and wall panels between columns consisting of precast concrete units, including crib headers, stretchers and blocks, keystones and other small interlocking block systems, large hollow and solid interlocking block systems, L and inverted T sections, facing panels and infills. The precast concrete units may be coloured and textured for aesthetic purposes, and may be used as a facade for aesthetic purposes with the true retaining wall hidden behind the facade.

For Reinforced Earth walls also refer Component No 8P.

Units
m^2 of exposed surface area

Condition state 1 -Description	Photo
• The wall facing system or wall panels have no cracking or spalling. • There may be minor dampness or efflorescence powder visible in a few locations. • Connections are tight. • There is no settlement, sliding, bulging or tilting of wall facing systems or wall panels.	 Precast concrete panels in good condition
Condition state 2 -Description	**Photo**
• The wall facing system or wall panels have fine cracking or spalling of no consequence. • Small sections of wall are showing dampness or efflorescence. • Connections are tight wall facing or wall panels are securely held in place. • There is no settlement, sliding, bulging or tilting of wall facing system or wall panels.	 Cracked stretcher

Condition state 3 -Description	Photo
• The wall facing system or wall panels have moderate cracking or spalling and may have exposure of reinforcement but no section loss. • Some sections of wall are showing dampness or efflorescence. • Connections are generally tight wall facing or wall panels are reasonably securely held in place. • There may be slight settlement, sliding, bulging or tilting of wall facing system or wall panels.	 Moderate spalling to crib wall stretcher
Condition state 4 -Description	**Photo**
• The wall facing system or wall panels have medium cracking and spalling due to corroding reinforcement. Exposed reinforcement may have moderate section loss in isolated areas. • Moderate sections of the wall have dampness or efflorescence. • Connections are loose. • There is minor settlement, sliding, bulging or tilting of wall facing systems or wall panels.	 Minor settlement evident in keystone wall
Condition state 5 -Description	**Photo**
• The wall facing system or wall panels have heavy cracking or spalling due to corroding reinforcement affecting both strength and serviceability. Exposed reinforcement may have significant section loss in isolated areas. • Dampness or efflorescence may be quite prevalent. • Connections have failed or are missing. • There is moderate settlement, sliding, bulging or tilting of wall facing systems or wall panels.	 Heavy spalling to crib header and stretchers with reinforcement exposed and broken

80C - Wall facing / panels – cast in-situ concrete

This element includes all wall facing systems and wall panels between columns consisting of cast in-situ concrete, including mass concrete, L and inverted T sections, sprayed concrete and infills. The cast in-situ concrete may be coloured and textured for aesthetic purposes.

Units
m^2 of exposed surface area

Condition state 1 -Description	Photo
• The wall facing system or wall panels have no cracking or spalling. • There may be minor dampness or efflorescence powder visible in a few locations. • There is no settlement, sliding, bulging or tilting of wall facing systems or wall panels.	 Shotcrete wall in good condition (prior to placement of precast facing panels)
Condition state 2 -Description	**Photo**
• The wall facing system or wall panels have fine cracking or spalling of no consequence. • Minor sections of wall are showing dampness or efflorescence. • There is no settlement, sliding, bulging or tilting of wall facing systems or wall panels.	 Concrete wall with fine crack of no consequence
Condition state 3 -Description	**Photo**
• The wall facing system or wall panels have moderate cracking or spalling and may have exposure of reinforcement but no section loss. • Some sections of wall are showing dampness or efflorescence. • There is slight settlement, sliding, bulging or tilting of wall facing systems or wall panels.	 Moderate spalling and exposed reinforcement

Condition state 4 -Description	Photo
• The wall facing system or wall panels have medium cracking and spalling due to corroding reinforcement. Exposed reinforcement may have moderate section loss in isolated areas. • Moderate sections of wall are showing dampness or efflorescence. • There is minor settlement, sliding, bulging or tilting of wall facing systems or wall panels.	 Medium cracking and spalling
Condition state 5 -Description	**Photo**
• The wall facing system or wall panels have heavy cracking or spalling due to corroding reinforcement affecting both strength and serviceability. Exposed reinforcement may have more severe section loss in isolated areas. • Dampness or efflorescence may be quite prevalent. • There is more moderate settlement, sliding, bulging or tilting of wall facing systems or wall panels.	 Revetment wall dislodged with large cracking and spalling (above) and separation at top of wall (below) 

80S - Wall facing / panels – steel

This element includes all wall facing systems and wall panels between columns manufactured from steel including rolled sections, plates and similar. The steel may be painted, galvanized, PVC coated or uncoated, and may be used as a facade for aesthetic purposes with the true retaining wall hidden behind the facade.

Units
m^2 of exposed surface area

Condition state 1 -Description	Photo
• No corrosion or deterioration on paint system or galvanising of wall facing system or wall panels. • Connections are tight. • There is no settlement, sliding, bulging or tilting of wall facing systems or wall panels.	 Steel sheet wall façade in good condition
Condition state 2 -Description	**Photo**
• The wall facing system or wall panels have light spot rusting to the surface area and the paint system or galvanising is losing effectiveness. • Connections are tight. • There is no settlement, sliding, bulging or tilting of wall facing systems or wall panels.	 Rolled sections with spot rusting to up to 5% of the surface area and the galvanising is no longer effective (VicRoads)

Condition state 3 -Description	Photo
• The wall facing system or wall panels have minor spot rusting to the surface area and the paint system or galvanising is no longer effective. • Connections are generally tight. • There is slight settlement, sliding, bulging or tilting of wall facing systems or wall panels.	Not available
Condition state 4 -Description	**Photo**
• The wall facing system or wall panels paint system or galvanising has failed with moderate rusting to the surface area but any minor corrosion is having minimal effect on strength or serviceability. • Connections are loose. • There is only minor settlement, sliding, bulging or tilting of wall facing systems or wall panels.	Not available
Condition state 5 -Description	**Photo**
• The wall facing system or wall panels has advanced corrosion with loss of section affecting both strength and serviceability. • Connections have failed or are missing. • There is substantial settlement, sliding, bulging or tilting of wall facing systems or wall panels.	 Plates with advanced corrosion with loss of section affecting strength and substantial bulging between columns (VicRoads)

80T - Wall facing / panels – timber

This element includes all wall facing systems and wall panels between columns manufactured from timber including timber crib headers, stretchers and blocks, sleepers, sawn logs and similar. The timber may be treated or untreated.

Units
m^2 of exposed surface area

Condition state 1 -Description	Photo
• The wall facing system or wall panels have only minor weathering at the edges or minor damage elsewhere. • There is no settlement, sliding, bulging, shrinking or tilting of wall facing systems or wall panels.	 Sleepers with minor weathering at the edges (VicRoads)
Condition state 2 -Description	**Photo**
• The wall facing system or wall panels have moderate weathering at the edges but away from the connections, or moderate damage elsewhere. • There is no settlement, sliding, bulging shrinkage or tilting of wall facing systems or wall panels. • Minor sections of wall are showing dampness, mould, moss and fungi growth	 Timber crib headers, stretchers and blocks with moderate weathering at the edges but away from the connections between components (VicRoads)

Condition state 3 -Description	Photo
• The wall facing system or wall panels have medium weathering at the edges but may also have minor weathering affecting the connections. • There is minor settlement, sliding, bulging shrinkage or tilting of wall facing systems or wall panels. • Moderate sections of wall are showing dampness, mould, moss and fungi growth	 Weathered and tilted timber crib headers and stretchers
Condition state 4 -Description	**Photo**
• The facing system or wall panels have moderate weathering affecting the connections. • There is moderate settlement, sliding, bulging, shrinkage or tilting of wall facing systems or wall panels. • Significant sections of wall are showing rot, moss and fungi growth	 Timber crib wall elements bowed and misplaced in several locations
Condition state 5 -Description	**Photo**
• The facing system or wall panels have severe weathering affecting the connections, or have severe damage elsewhere. • There is substantial settlement, sliding, bulging, shrinkage or tilting of wall facing systems or wall panels. • Rot, moss and fungi growth on timber is quite prevalent.	 Wooden stretchers displaced from timber crib wall

80O - Wall facing / panels – other

Units
m^2 of exposed surface area

This element includes all wall facing systems and wall panels between columns consisting of granular fill between crib wall headers, gabion fill, masonry (brick or natural stone with mortar) and geotextile (where observable). These may be used as a facade for aesthetic purposes with the true retaining wall hidden behind the facade.

It shall include any buttresses and brick columns which protrude out from the face of retaining wall.

For Reinforced Earth walls also refer Component No 8O.

Condition state 1 -Description	**Photo**
• The crib retaining wall granular fill is not affected by volume loss. • The gabion fill material is not affected by weathering or volume loss. • The masonry is not affected by cracking or loss of mortar, or weathering or loss of brick or natural stone. • The geotextile is not affected by weathering. • There is no settlement, sliding, bulging or tilting of wall facing systems or wall panels.	 Gabion wall in good condition
Condition state 2 -Description	**Photo**
• The crib retaining wall granular fill is affected by small volume loss. • The gabion fill material is affected by small volume loss. • The masonry has minor weathering, cracking or loss of mortar or stones. • The geotextile has only minor weathering. • There is no settlement, sliding, bulging or tilting of wall facing systems or wall panels.	 Minor loss of fill in crib wall

Condition state 3 -Description	Photo
• The crib retaining wall granular fill is affected by minor volume loss. • The gabion fill material is affected by minor volume loss. • The masonry has moderate weathering, cracking or loss of mortar or stones. • The geotextile has moderate weathering. • There is minor settlement, sliding, bulging or tilting of wall facing systems or wall panels.	 Top of gabion basket torn open
Condition state 4 -Description	**Photo**
• The crib retaining wall granular fill is affected by moderate volume loss. • The gabion fill material is affected by moderate volume loss or moderate weathering. • The masonry has medium weathering, cracking or loss of mortar or stones, or minor loss of bricks. • The geotextile has medium weathering. • There is moderate settlement, sliding, bulging or tilting of wall facing systems or wall panels.	 Gabion wall deflected outward
Condition state 5 -Description	**Photo**
• The crib retaining wall granular fill is affected by severe volume loss. • The gabion fill material is affected by severe volume loss or weathering. • The masonry has severe weathering, cracking or loss of mortar. Significant loss of bricks and stones may have occurred which accentuate other damage. • The geotextile has severe weathering. • There is substantial settlement, sliding, bulging or tilting of wall facing systems or wall panels.	 Crib retaining wall granular fill with severe volume loss (VicRoads)

81P - Columns – precast concrete

This element includes all precast reinforced concrete piles or columns, driven or bolted in place, to support the wall panels.

Units
Each

Condition state 1 -Description	**Photo**
• The columns are in good condition with no cracking or spalling. • There is no change in the slope of the columns due to differential movement, and the wall panels are securely held in place.	Not available
Condition state 2 -Description	**Photo**
• The columns are in good condition with only minor cracking or spalling of no consequence. • There is no change in the slope of the columns due to differential movement, and the wall panels are securely held in place.	Not available
Condition state 3 -Description	**Photo**
• The columns are in fair condition with moderate cracking or spalling of little consequence. • There is minimal change in the slope of the columns due to differential movement, and the wall panels are securely held in place.	Not available
Condition state 4 -Description	**Photo**
• The columns are generally in fair condition with medium cracking and spalling due to corroding reinforcement. • Exposed reinforcement may have moderate section loss in isolated areas. • There is minor change in the slope of the columns due to differential movement, and the wall panels are securely held in place.	Not available
Condition state 5 -Description	**Photo**
• The columns are in poor condition with heavy cracking or spalling present due to corroding reinforcement. • Exposed reinforcement may have more severe section loss in isolated areas. • There may be substantial changes in the slope of the columns due to differential movement, and the wall panels may be slipping out from the columns.	Not available

81C - Columns – cast in-situ concrete

This element includes all bored piles, continuous flight auger (CFA) piles and similar used to form a retaining wall or to support the wall panel system. These piles are installed and then exposed by excavation.

Units
Each

Condition state 1 -Description	Photo
• The columns have no cracking or spalling. • There may be minor dampness or efflorescence powder visible in a few locations. • There is no tilting of columns. • There is no differential movement between columns, and the wall panels are securely held in place by the columns.	 As-new columns prior to installation of facing panels  Columns with no cracking or spalling (VicRoads)
Condition state 2 -Description	**Photo**
• The columns have fine cracking or spalling of no consequence. • Minor sections of the wall showing dampness or efflorescence. • There is no tilting of columns. • There is no differential movement between columns, and the wall panels are securely held in place by the columns.	 Columns with fine cracking of no consequence (VicRoads)

Condition state 3 -Description	Photo
• The columns have minor cracking or spalling of little consequence. • Moderate sections of the wall showing dampness or efflorescence. • There is slight tilting of columns. • There is slight differential movement between columns, and the wall panels are securely held in place by the columns.	Not available
Condition state 4 -Description	**Photo**
• The columns have moderate cracking and spalling due to corroding reinforcement. Exposed reinforcement may have moderate section loss in isolated areas. • Dampness or efflorescence may be quite prevalent. • There is minor tilting of columns. • There is minor differential movement between columns, and the wall panels are securely held in place by the columns.	Not available
Condition state 5 -Description	**Photo**
• The columns have heavy cracking or spalling due to corroding reinforcement affecting both strength and serviceability. Exposed reinforcement may have more severe section loss in isolated areas. • Dampness or efflorescence may be quite prevalent. • There is substantial tilting of columns. • There is substantial differential movement between columns, and the wall panels may not be securely held in place by the columns.	Not available

81S - Columns – steel

This element includes all steel sheet piling and steel columns, driven or bolted in place, to support the wall panel system. The steel may be painted, galvanized or uncoated, and may be used a facade for aesthetic purposes with the true retaining wall hidden behind the facade.

Units
Each

Condition state 1 -Description	**Photo**
• The uncoated sheet piles have surface minor surface rust to the entire surface area but no loss of section. • The column paint system or galvanising is good condition and not affected by rusting or corrosion. • There is no tilting of columns. • There is no differential movement between columns, and the wall panels are securely held in place by the columns.	 Columns with galvanising not affected by rusting or corrosion and with no tilting or differential movement
Condition state 2 -Description	**Photo**
• The uncoated sheet piles have surface rusting to the entire surface area but any corrosion is slight and of no consequence • The columns have light spot rusting to the surface area and the paint system or galvanising. Corrosion may be visible on the flanges but is minor and of no consequence. • There is no tilting of columns. • There is no differential movement between columns, and the wall panels are securely held in place by the columns.	 Steel post with light corrosion starting

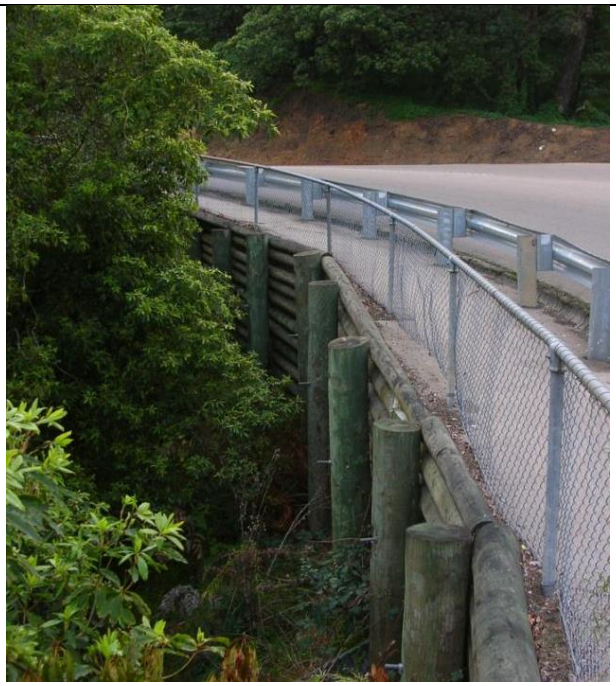
Condition state 3 -Description	Photo
• The uncoated sheet piles have surface rusting to the entire surface area but any corrosion is minor and of little consequence • The columns have minor spot rusting to the surface area and the paint system or galvanising. Corrosion may be visible on the flanges but is still minor and of little consequence. • There is slight tilting of columns. • There is slight differential movement between columns, and the wall panels are securely held in place by the columns.	Not available
Condition state 4 -Description	**Photo**
• The uncoated sheet piles have surface rusting to the entire surface area but is having minimal effect on strength and serviceability • The column paint system or galvanising has failed with moderate rusting to the surface area. Moderate corrosion may be visible on the flanges but is having minimal effect on strength or serviceability. • There is minor tilting of columns. • There is minor differential movement between columns, and the wall panels are securely held in place by the columns.	 Columns with paint system that has failed with moderate spot rusting to the surface area and moderate corrosion on flanges (VicRoads)

Condition state 5 -Description	Photo
• The sheet piles have surface rusting to the entire surface area and corrosion is advanced with loss of section affecting both strength and serviceability. • The columns have advanced corrosion with loss of section affecting both strength and serviceability. • There is substantial tilting of columns. • There is substantial differential movement between columns, and the wall panels may not be securely held in place by the columns.	 Sheet piles with advanced corrosion with loss of section affecting both strength and serviceability (VicRoads)

81T - Columns – timber

This element includes all timber piles or columns, driven or bolted in place, to support the wall panel system. The timber may be treated or untreated.

Units
Each

Condition state 1 -Description	**Photo**
• The columns have only minor splitting with no edge rot or pipe rot. • There is no tilting of columns. • There is no differential movement between columns, and the wall panels are securely held in place by the columns.	 Columns with minor splitting (VicRoads)
Condition state 2 -Description	**Photo**
• The columns have minor splitting or edge rot with no pipe rot. • There is no tilting of columns. • There is no differential movement between columns, and the wall panels are securely held in place by the columns.	 Columns with minor splitting and edge rot (VicRoads)

Condition state 3 -Description	Photo
• The columns have moderate splitting or edge rot with minimal pipe rot. • There is slight tilting of columns. • There is slight differential movement between columns, and the wall panels are securely held in place by the columns.	Not available
Condition state 4 -Description	**Photo**
• The columns have medium splitting and edge rot and may have moderate pipe rot but any deterioration is having minimal effect on strength or serviceability. • There is minor tilting of columns. • There is minor differential movement between columns, and the wall panels are securely held in place by the columns.	 Column with moderate pipe rot (VicRoads)
Condition state 5 -Description	**Photo**
• The columns have extensive splitting, edge rot and pipe rot severely affecting both strength and serviceability. • There is substantial tilting of columns. • There is substantial differential movement between columns, and the wall panels may not be securely held in place by the columns.	 Columns with substantial tilting (VicRoads)

81O - Columns – other This element includes all mortared masonry or stone columns and buttresses supporting the retaining wall facing panels.	Units **Each**

Condition state 1 -Description	**Photo**
• The column is in good condition with no cracking, no loss of mortar, bricks or stones, and has maintained its slope and level.	Not available
Condition state 2 -Description	**Photo**
• The column is in good condition but has minor cracking or loss of mortar. • Minor settlement or slope changes may be present.	Not available
Condition state 3 -Description	**Photo**
• The column is in fair condition but has moderate cracking or loss of mortar. • Moderate settlement or slope changes may be present.	Not available
Condition state 4 -Description	**Photo**
• The column is generally in fair condition with medium cracking or loss of mortar. • Medium settlement or slope changes may be present. • Minor loss of bricks or stones may have occurred which are of no consequence.	Not available
Condition state 5 -Description	**Photo**
• The column is in poor condition with heavy cracking or loss of mortar. • Extensive settlement or slope changes may be present. • Loss of bricks or stones may have occurred which accentuate the other damage. • The column may no longer be providing adequate support to the facing panels.	Not available

82P - Barriers – precast concrete

This element includes all precast reinforced concrete barriers fixed to the retaining wall.

Units
Linear metres

Condition state 1 -Description	**Photo**
• The barriers have no cracking or spalling. • No accident damage is visible.	 Traffic safety barrier with no deterioration or accident damage
Condition state 2 -Description	**Photo**
• The barriers have fine cracking or minor spalling of no consequence. • Accident damage is slight and of no consequence.	 Traffic safety barrier with minor accident damage (VicRoads)

Condition state 3 -Description	Photo
• The barriers have minor cracking or spalling of little consequence. • Accident damage is minor and of little consequence.	 Minor cracking and spalling to traffic safety barrier
Condition state 4 -Description	**Photo**
• The barriers have moderate cracking and spalling due to corroding reinforcement. • Accident damage has only a minor effect on strength or serviceability.	 Traffic safety barrier with moderate spall
Condition state 5 -Description	**Photo**
• The barriers have heavy cracking or spalling due to corroding reinforcement affecting both strength and serviceability. • Accident damage has a severe effect on strength and serviceability. • Retaining walls within the clear zone but with no traffic safety barrier, or a substandard traffic safety barrier, should be classified in this condition state. • Retaining walls within 3 m of a footpath and below footpath level but with no pedestrian barrier should be classified in this condition state.	 Pedestrian barrier at top of wall dismantled due to heavy cracking and spalling affecting both strength and serviceability (VicRoads)

82S - Barriers – steel

This element includes all steel barriers fixed to the retaining wall.

Units
Linear metres

Condition state 1 -Description	**Photo**
• The barrier paint system or galvanising is not affected by rusting or corrosion. • Bolting or joint support is tight. • No accident damage is visible.	 W-beam barrier at top of wall in good condition
Condition state 2 -Description	**Photo**
• The barrier has light spot rusting to the surface area and the paint system or galvanising. • Bolting or joint support is tight. • Accident damage or vandalism is minor and has no impact on performance of barrier.	 Barrier rail bent but no impact on performance

Condition state 3 -Description	Photo
• The barrier has minor spot rusting to the surface area and the paint system or galvanising. • Bolting or joint support is generally tight. • Accident damage or vandalism is minor and has little impact on performance of barrier.	 Minor damage to fence with little impact on performance
Condition state 4 -Description	**Photo**
• The barrier paint system or galvanising has failed with moderate rusting to the surface area but any minor corrosion is having minimal effect on strength or serviceability. • Bolting or joint support is loose. • Accident damage has only a minor effect on strength or serviceability.	 Pedestrian fence with moderate surface rusting, hole in mesh and bent top rail but with only a minor effect on both strength and serviceability
Condition state 5 -Description	**Photo**
• The barrier has advanced corrosion with loss of section affecting both strength and serviceability. • Bolting or joint support has failed or is missing. • Severe accident damage affecting the strength and serviceability. • Retaining walls within the clear zone but with no traffic safety barrier, or a substandard traffic safety barrier, should be classified in this condition state. • Retaining walls within 3 m of a footpath and below footpath level but with no pedestrian barrier should be classified in this condition state.	 Corrosion and bolt sheared at joint of barrier top rail

83S - Connections and horizontal supports – steel

This element includes all steel hold down bolts and arrangements, including base and connecting plates, all steel horizontal, vertical or diagonal struts, braces, stiffeners and walers attached to columns, all connections, and all exposed tiebacks and anchor heads. The steel may be painted, galvanized or uncoated.

Units
Each

Condition state 1 -Description	**Photo**
• The connections and supports paint system or galvanising is not affected by rusting or corrosion. • Bolted connections are tight. • Welds are sound.	 Stiffeners with galvanising not affected by rusting or corrosion (VicRoads)
Condition state 2 -Description	**Photo**
• The connections and supports have light spot rusting to the surface area. • Bolted connections are tight. • Welds are sound.	 Hold down bolts and connecting plates with light spot rusting to the surface area and the galvanising is no longer effective (VicRoads)

Condition state 3 -Description	Photo
• The connections and supports have minor spot rusting to of the surface area. • Bolted connections are generally tight.	 Bolt protruding from wall mounting bracket
Condition state 4 -Description	**Photo**
• The connections and supports paint system or galvanising have failed with moderate spot rusting to the surface area but any minor corrosion is having minimal effect on strength or serviceability. • Bolted connections are loose. • Welds have cracked with minor loss of effectiveness.	 Exposed anchor heads with spot rusting to the surface area with minimal effect on strength or serviceability (VicRoads)
Condition state 5 -Description	**Photo**
• The connections and supports have advanced corrosion with loss of section affecting both strength and serviceability. • Bolted connections have failed or are missing. • Welds have failed.	 Waler with advanced corrosion with loss of section affecting both strength and serviceability. Welds to columns have failed (VicRoads)

83T - Connections and horizontal supports – timber

This element includes all timber horizontal, vertical or diagonal struts, braces, stiffeners and walers attached to columns. The timber may be treated or untreated.

Units
Each

Condition state 1 -Description	**Photo**
• The connections and supports have only minor splitting with no edge rot or pipe rot. • Bolted connections are tight.	 Walers and struts with no splitting, edge rot or pipe rot (VicRoads)
Condition state 2 -Description	**Photo**
• The connections and support have minor splitting or edge rot with no pipe rot. • Bolted connections are tight.	 Stiffeners with minor splitting (VicRoads)

Condition state 3 -Description	Photo
• The connections and support have moderate splitting or edge rot with slight pipe rot. • Bolted connections are generally tight.	Not available
Condition state 4 -Description	**Photo**
• The connections and supports have medium splitting and edge rot and may have minor pipe rot but any deterioration is having minimal effect on strength or serviceability. • Bolted connections are loose.	 Brace with moderate edge rot and minor pipe rot (VicRoads)
Condition state 5 -Description	**Photo**
• The connections and supports have extensive splitting, edge rot and pipe rot severely affecting both strength and serviceability. • Bolted connections have failed or are missing.	 Struts with extensive pipe rot. Timber strut block bolted connections have failed (VicRoads)

84O - Drainage system

This element includes all surface and subsurface drainage above, through and below the retaining wall including kerb, channel, pits, drainage pipes, wingwalls, endwalls, energy dissipators, weep holes, subsurface drain flush-out risers, subsurface drainage pipes, subsurface draatter outlets, and waterways.

Units
Each

Condition state 1 -Description	**Photo**
• The drainage system is not affected by blockages. • The drainage system is not affected by structural failure. • The drainage system is not affected by vertical settlement or horizontal displacement. • No erosion or scour is evident.	 Weep holes with no blockages, no structural failure, and no erosion evident (VicRoads)
Condition state 2 -Description	**Photo**
• The drainage system has blockages causing small loss of capacity. • Concrete components have fine cracking or spalling of no consequence, steel components have light spot rusting to the surface area. • Vertical settlement and horizontal displacement of drainage system components is minor and of no consequence. • Erosion or scour is minor and of no consequence.	 Drainage channel with only minor blockages (VicRoads)

Condition state 3 -Description	Photo
• The drainage system has blockages causing minor loss of capacity. • Concrete components have minor cracking or spalling of little consequence, steel components have minor spot rusting to the surface area. • Vertical settlement and horizontal displacement of drainage system components is moderate and of little consequence. • Erosion or scour is moderate and of little consequence.	 Drain filled with soil and debris
Condition state 4 -Description	**Photo**
• The drainage system has blockages causing moderate loss of capacity. • Concrete components have moderate cracking and spalling due to corroding reinforcement, steel components have moderate rusting to the surface area and moderate corrosion. • Vertical settlement and horizontal displacement of drainage system components is moderate and water is leaking from the drainage system. • Erosion or scour has a moderate effect on strength or serviceability.	 Drainage channel and sump blocked by vegetation growth causing loss of capacity

Condition state 5 -Description	Photo
• The drainage system has severe blockages causing a loss of drainage system effectiveness. • Concrete components have heavy cracking or spalling affecting both strength and serviceability, steel components have advanced corrosion with loss of section affecting both strength and serviceability. • Vertical settlement and horizontal displacement between drainage system components is severe causing a loss of drainage system effectiveness. • Erosion or scour has a severe effect on strength and serviceability.	 Severe loss of fill caused by inadequate drainage at top of wall (due to runoff from adjoining property), affecting strength and serviceability of wall 

NOISE WALLS, VISUAL SCREEN WALLS AND ARCHITECTURAL FEATURES

90P - Wall facing / panels – precast concrete

This component includes all precast concrete wall units used for noise walls, visual screen walls and architectural features.

Units
m^2 of exposed surface area

Condition state 1 -Description	Photo
• The components are in good condition with no damage visible. • There may be minor dampness or efflorescence powder visible in a few locations. • No separation or relative movement between units is apparent.	 Precast noise wall panels in good condition.
Condition state 2 -Description	**Photo**
• There may be a few small cracks or spalls due to corroding reinforcement. • Dampness or efflorescence may be a little more prevalent. • There is no separation or relative movement between units.	 Small crack and sealant pulling away at panel joint
Condition state 3 -Description	**Photo**
• There may be a minor cracks or spalls due to corroding reinforcement. • Dampness or efflorescence may be prevalent. • There may be small separations or relative movement between units, up to 10 mm.	 Spalling at edge of noise wall panel

Condition state 4 -Description	Photo
• Moderate cracking or spalling may be present due to corroding reinforcement or pressure on the units at the support corners. • Exposed reinforcement may have moderate section loss in isolated areas. • Dampness or efflorescence may be quite prevalent. • There is only minor separation or relative movement between units up to 20 mm. • Connections may be slightly loose or there may be partial separation from the supporting column.	 Corroding reinforcement in end of noise wall panel
Condition state 5 -Description	**Photo**
• Severe cracking or spalling may be present due to corroding reinforcement or pressure on the units at the support corners. • Exposed reinforcement may have more severe section loss in isolated areas. • Dampness or efflorescence may be quite prevalent. • There is moderate separation or relative movement between units of greater than 20 mm. • Connections may be completely loose with separation from the supporting column.	 Severe cracking and spalling of precast panel (VicRoads)

90C - Wall facing / panels – cast in-situ concrete

This component includes all cast in-situ concrete walls used for noise walls, visual screen walls and architectural features.

Units
m^2 of exposed surface area

Condition state 1 -Description	Photo
• The components are in good condition with no damage visible. • There may be minor dampness or efflorescence powder visible in a few locations. • Wall slopes are true to line with no separation of the cast sections.	 Cast-insitu concrete with no visible damage (VicRoads)
Condition state 2 -Description	**Photo**
• There may be a few minor cracks or spalls due to corroding reinforcement. • Dampness or efflorescence may be a little more prevalent. • There is no separation or relative movement between cast sections.	 Minor crack in noise wall with no movement observed (VicRoads)

Condition state 3 -Description	Photo
• There may be a minor cracks or spalls due to corroding reinforcement. • Dampness or efflorescence may be prevalent. • There may be small separations or relative movement between cast sections, up to 10 mm.	Not available
Condition state 4 -Description	**Photo**
• Moderate cracking or spalling may be present due to corroding reinforcement. • Exposed reinforcement may have moderate section loss in isolated areas. • Dampness or efflorescence may be quite prevalent. • There is only minor separation or relative movement between cast sections up to 20 mm.	Not available
Condition state 5 -Description	**Photo**
• Severe cracking or spalling may be present due to corroding reinforcement. • Exposed reinforcement may have more severe section loss in isolated areas. • Dampness or efflorescence may be quite prevalent. • There is moderate separation or relative movement between cast sections of greater than 20 mm.	Not available

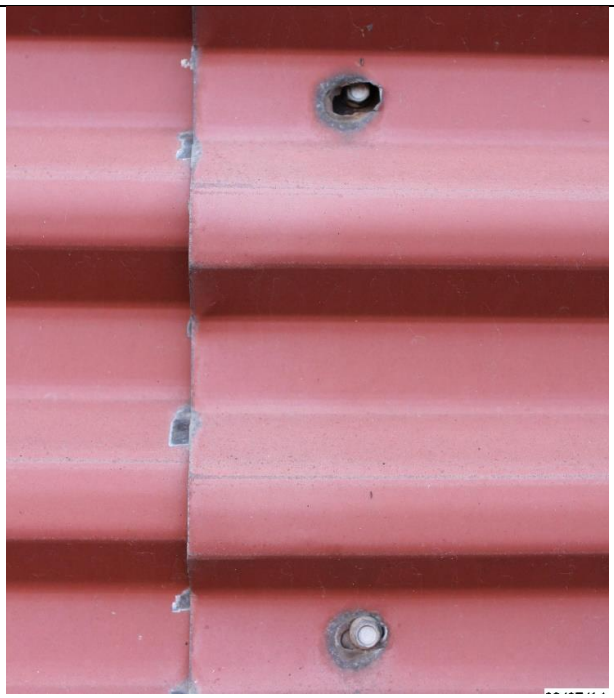
90S - Wall facing / panels – steel

This component describes the cladding on the wall and includes the cladding as well as the fixing bolts, clips or welds within this cladding. Steelwork may be painted or galvanized for protection. The cladding may be made from flat steel, steel troughing or other pressed design.

Note, light pressed metal screens are assessed under Component no 90O.

Units
m^2 of exposed surface area

Condition state 1 -Description	**Photo**
• The paint system is generally sound with only minor chalking, peeling or curling, but with no exposure of metal. • All welds, bolts or rivets are in good condition with no movement of plates or sections in the component.	 Weathering steel visual screen wall in good condition (Note, rusted appearance due to alloy additions forming an impervious oxide layer to provide corrosion resistance to the steel plate)
Condition state 2 -Description	**Photo**
• Light spot rusting of the paint system to the surface area is occurring and the paint system is losing effectiveness. • No corrosion of the section has occurred. • All welds, bolts or rivets are in good condition with no movement of plates or sections in the component.	Not available
Condition state 3 -Description	**Photo**
• Minor spot rusting of the paint system to the surface area is occurring and the paint system is no longer effective. • Slight corrosion of the section may have occurred. • All welds, bolts or rivets are generally in good condition with minimal movement of plates or sections in the component.	Not available

Condition state 4 -Description	Photo
• Some surface pitting may be present with active corrosion occurring in isolated areas but no loss of section area has occurred which would affect the strength of the member. • The paint system has broken down with moderate rust spotting and surface pitting. • Nuts and bolts may be corroded but are still tight and no cracking of welds has occurred. • Riveted plates may have minor movements of 2 to 5 mm but rivets are generally sound.	 Nuts on fixing bolts only engaged on very short thread lengths
Condition state 5 -Description	**Photo**
• Corrosion is well advanced and loss of section has occurred having a detrimental effect on the strength of the member, i.e. a flange may be badly corroded over a sizeable length. • There may be some cracking of the welds between the plates. • Rivets or bolts may be severely corroded and no longer carrying full load or functioning as intended. • Rivets may be broken or missing allowing excessive movement of plates. • The paint system has completely broken down.	 Surface pitting and section loss around connections has resulted in loss of support for corrugated steel (VicRoads)

90T - Wall facing / panels – timber

This component includes all timber panel walls used for noise walls, visual screen walls and architectural features and includes connections to the column supports.

Units
m^2 of exposed surface area

Condition state 1 -Description	Photo
• The timber panels are in good condition with no or only minor weathering at the edges or minor damage elsewhere. • Connections to the columns are tight and adequate to transfer all loads due to wind.	 Timber panels in good condition (VicRoads)
Condition state 2 -Description	**Photo**
• The walls are in good condition with only minor weathering at the edges but away from the connections, or minor damage elsewhere. • Slight settlement or slope changes may be present. • Connections may be slightly loose but having little or no effect on the panel support.	 Weathering of timber panels at the edges and connections slightly loose (VicRoads)

Condition state 3 -Description	Photo
• The walls are in fair condition with only medium weathering at the edges but may also have minor weathering affecting the connections. • Minor settlement or slope changes may be present. • Connections may be loose but having little effect on the panel support.	Not available
Condition state 4 -Description	**Photo**
• The walls are generally in fair condition with moderate settlement or slope changes present. • The timber panels may have moderate weathering affecting the connections, or have moderate damage elsewhere. • Connections may be loose allowing movement of the panels away from the supports.	 Minor weathering of timber at edges. Connections are loose allowing panels to move (VicRoads)
Condition state 5 -Description	**Photo**
• The walls are in poor condition with extensive settlement or slope changes present. • The timber panels may have extensive weathering at the edges affecting the connections, or have significant damage elsewhere. • Connections may be lost or completely loose allowing excessive movement of the panels away from the supports or the panels to be free at one end.	 Connections are completely lost allowing excessive movement of panel (VicRoads)

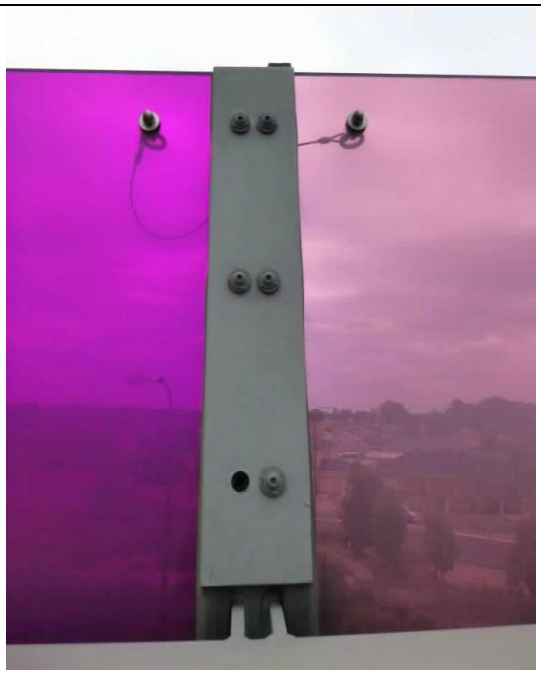
90O - Wall facing / panels – other

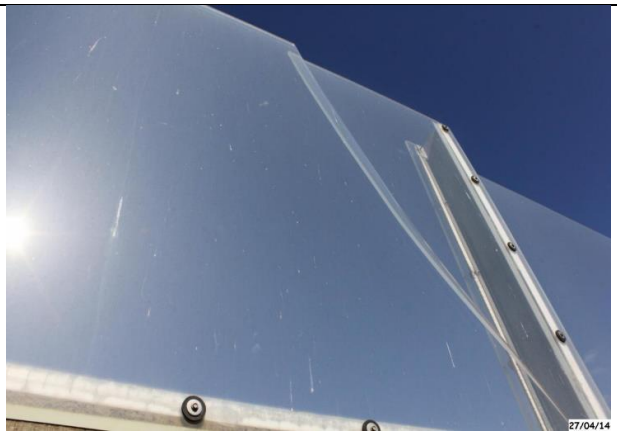
This component includes all other materials used for noise walls, visual screen walls and architectural features, and includes any the fixing bolts, clips or weld connections to the column supports.

Units
m^2 of exposed surface area

Condition state 1 -Description	Photo
• The walls are in good condition with no cracking, no loss of mortar, bricks or stones, and has maintained its slope and level. • The Perspex, fibre glass or light pressed metal section screens are in good condition and well held in place.	 Light pressed metal visual screen wall in good condition

Condition state 2 -Description	Photo
• The walls are in good condition but have minor cracking or loss of mortar. • Minor settlement or slope changes may be present. • The Perspex, fibre glass or light pressed metal section screens may have lost some of the flexible filler at the connections, or the connections may be slightly loose or have fine cracking at the corners. • There may be slight accident damage of no concern.	Not available

Condition state 3 -Description	Photo
• The walls are in fair condition but have moderate cracking or loss of mortar. • Moderate settlement or slope changes may be present. • The Perspex, fibre glass or light pressed metal section screens may have lost some of the flexible filler at the connections, or the connections may be loose or have minor cracking at the corners. • There may be minor accident damage of little concern.	 Missing bolt in visual screen connection to support
Condition state 4 -Description	**Photo**
• The walls are generally in fair condition with moderate cracking or loss of mortar. Medium settlement or slope changes may be present. • Minor loss of bricks or stones may have occurred which are of little consequence. • The Perspex, fibre glass or light pressed metal panels may have lost flexible filler at the connections, or the connections may be loose. • The Perspex may have minor splits of no great concern. The panels may be bent or buckled but not serious enough to require replacement. • Panels may have moved or suffered moderate accident damage and may be only have partial supported at one of the ends.	 Moderate cracking in acrylic panel (VicRoads)

Condition state 5 -Description	Photo
• The walls are in poor condition with severe cracking or loss of mortar. • Extensive settlement or slope changes may be present. • Loss of bricks or stones may have occurred which accentuate the other damage. • The Perspex, fibre glass or light pressed metal panel connections may be completely loose. • The panels may have large splits, cracks or have torn away. • There may be no physical support at one end of the panel.	 Perspex panel has large split and will eventually break away (VicRoads)

91P - Column supports – precast concrete

This component includes all precast reinforced concrete piles or columns, driven or bolted in place, to support the wall panels.

Units
Each

Condition state 1 -Description	**Photo**
• The columns are in good condition with no cracking or spalling. • There is no change in the slope of the columns due to differential movement, and the wall panels are securely held in place.	Not available
Condition state 2 -Description	**Photo**
• The columns are in good condition with only minor cracking or spalling of no consequence. • There is no change in the slope of the columns due to differential movement, and the wall panels are securely held in place.	Not available
Condition state 3 -Description	**Photo**
• The columns are in fair condition with moderate cracking or spalling of little consequence. • There is slight change in the slope of the columns due to differential movement, and the wall panels are fairly securely held in place.	Not available
Condition state 4 -Description	**Photo**
• The columns are generally in fair condition with medium cracking and spalling due to corroding reinforcement. • Exposed reinforcement may have moderate section loss in isolated areas. • There is minor change in the slope of the columns due to differential movement, and the wall panels are generally securely held in place.	Not available
Condition state 5 -Description	**Photo**
• The columns are in poor condition with severe cracking or spalling present due to corroding reinforcement. • Exposed reinforcement may have more severe section loss in isolated areas. • There may be substantial changes in the slope of the columns due to differential movement, and the wall panels may be slipping out from the columns.	Not available

91S - Column supports – steel

This component includes all steel piles or columns, driven or bolted in place, to support the wall panels. Steelwork may be painted or galvanized for protection.

Units
Each

Condition state 1 -Description	**Photo**
• The steel columns are in good condition with no loss of paintwork or corrosion evident. • There is no change in the slope of the columns due to differential movement, and the wall panels are securely held in place.	 Steel columns in good condition (VicRoads)
Condition state 2 -Description	**Photo**
• The steel columns are in good condition with only minor loss of paintwork and light rust spotting of the surface area. • Minor corrosion may be visible on the flanges. • There is no change in the slope of the columns due to differential movement, and the wall panels are securely held in place.	 Galvanised coating on visual screen support post deteriorating

Condition state 3 -Description	Photo
• The steel columns are in sound condition with minor loss of paintwork and minor rust spotting of the surface area. • Moderate corrosion may be visible on the flanges. • There is slight change in the slope of the columns due to differential movement, and the wall panels are fairly securely held in place.	Not available
Condition state 4 -Description	**Photo**
• The steel columns are in fair condition with moderate loss of paintwork and rust spotting of the surface area. • Medium corrosion may be visible on the flanges. • There is minor change in the slope of the columns due to differential movement, and the wall panels are generally securely held in place.	Not available
Condition state 5 -Description	**Photo**
• The steel columns are in poor condition with significant loss of paintwork and rusting of the surface area. • Severe corrosion may be visible on the flanges. • There are substantial changes in the slope of the columns due to differential movement, and the wall panels may be slipping out from the columns.	Not available

91T - Column supports – timber

This component includes all timber piles or columns, driven or bolted in place, to support the wall panels.

Units
Each

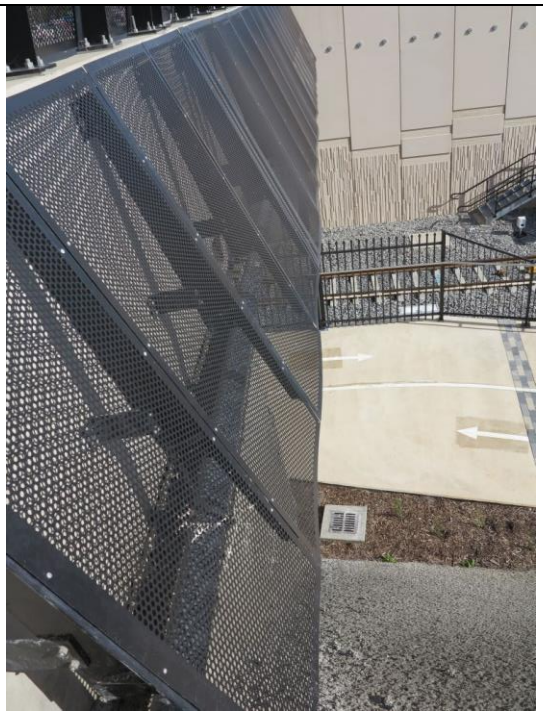
Condition state 1 -Description	Photo
• The columns are in good condition with no splitting or edge rot. • There is no change in the slope of the columns due to differential movement, and the wall panels are securely held in place.	 Columns in good condition (VicRoads)
Condition state 2 -Description	**Photo**
• The columns are in good condition with only minor splitting or edge rot, but the columns are sound with no pipe rot. • There is no change in the slope of the columns due to differential movement, and the wall panels are securely held in place.	 Timber column has minor splitting (VicRoads)

Condition state 3 -Description	Photo
• The columns are in fair condition with moderate splitting or edge rot, but the columns are generally sound with minimal pipe rot. • There is slight differential movement between columns, and the wall panels are securely held in place by the columns.	Not available
Condition state 4 -Description	**Photo**
• The columns are generally in fair condition with medium splitting and edge rot. • They may have moderate pipe rot up to 35 % but any deterioration is having minimal effect on strength or serviceability. • There may be minor slope difference between columns but the wall panels are securely held in place.	Not available
Condition state 5 -Description	**Photo**
• The columns are in poor condition with extensive splitting, pipe rot and edge rot significantly affecting the strength of the member. • There may be substantial changes in the slope of the columns due to differential movement, and the wall panels may be slipping out from the columns.	 Timber column has split and no longer provides any structural support to noise attenuation wall (VicRoads)

92C - Foundation –concrete (precast or cast in-situ)

This component includes all cast in-situ reinforced concrete foundations or barrier walls which support the noise walls, visual screen walls and architectural features. If the foundation is hidden below fill then this component should not be used.

Units
Linear metres

Condition state 1 -Description	Photo
• The foundations or barrier walls are in good condition with no cracking or spalling. • There are no indications of settlement of the foundations.	 The precast barrier walls (behind the screen) are in good condition with no cracking or spalling  Cast in-situ foundation in good condition

Condition state 2 -Description	Photo
• The foundations or barrier walls are in good condition with only minor cracking or spalling of no consequence. • There are no indications of settlement of the foundations.	 Minor cracking in concrete foundation
Condition state 3 -Description	**Photo**
• The foundations or barrier walls are in good condition with moderate cracking or spalling of little consequence. • There may be indications of slight settlement of the foundations.	 Moderate cracking in barrier supporting noise wall
Condition state 4 -Description	**Photo**
• The foundations or barrier walls are generally in fair condition with medium cracking and spalling due to corroding reinforcement. • Exposed reinforcement may have moderate section loss in isolated areas. • There may be signs of minor settlement of the foundations.	 Large spall in barrier supporting noise wall

Condition state 5 -Description	Photo
• The foundations or barrier walls are in poor condition with severe cracking or spalling present due to corroding reinforcement. • Exposed reinforcement may have significant section loss in isolated areas. • There may be significant settlement of the foundations.	 Severe cracking and spalling and failed sealant on concrete barrier supporting precast noise wall panels

92S - Foundation – steel This component defines all types of steel vehicle barrier used to support noise walls, visual screen walls and architectural features.	Units **Linear metres**

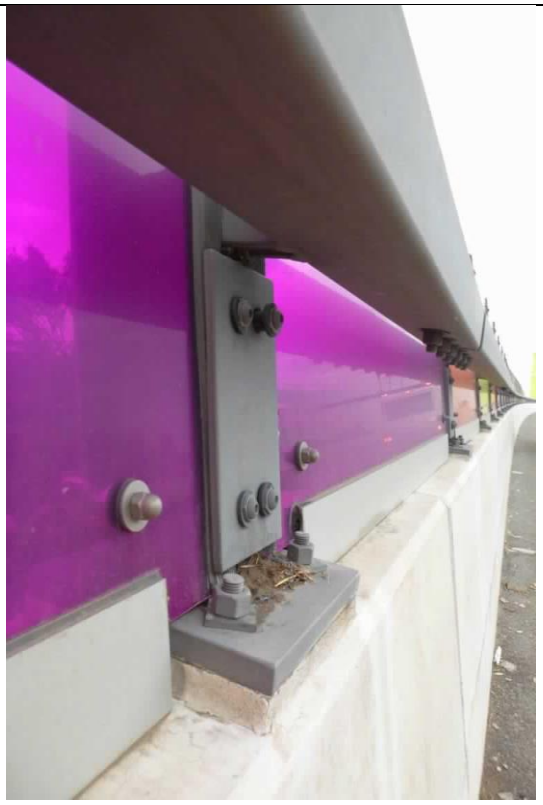
Condition state 1 -Description	**Photo**
• The paint or galvanising is generally in good condition with no rusting or corrosion. • The posts supporting the rails are in good condition. • The connections joining the noise attenuation or visual screen wall to the steel vehicle barrier are also in sound condition. No accident damage is visible.	Not available
Condition state 2 -Description	**Photo**
• Light spot rusting has formed to the surface area and the paint system is losing effectiveness. • Posts may have spot rusting but bolting or joint support is tight. • The connections joining the noise attenuation or visual screen wall to the steel vehicle barrier are also in sound condition. • Any accident damage or vandalism is minor and of no consequence.	Not available
Condition state 3 -Description	**Photo**
• Minor spot rusting has formed to the surface area and the paint system is no longer effective. • Posts may have spot rusting but bolting or joint support is generally tight. • The connections joining the noise attenuation or visual screen wall to the steel vehicle barrier are generally in sound condition. • Any accident damage or vandalism is minor and of little consequence.	Not available

Condition state 4 -Description	Photo
• The paint system has failed with moderate surface rusting but any minor corrosion is having minimal effect on the strength or serviceability. • Posts may also have corroding areas and loose hold down bolts. • Bolts holding down rails or rail joint support or the connection of the noise attenuation or visual screen wall to the vehicle barrier may be a little loose. • Accident damage has only had a minor effect on strength or serviceability of the railing.	Not available
Condition state 5 -Description	**Photo**
• Corrosion is advanced with loss of section affecting both strength and serviceability. • Posts may be badly corroded, become quite loose in their grouted anchorage or bolting, or heavily cracked and spalled concrete. • Rails may have broken away at their joints. • The connections joining the noise attenuation or visual screen wall to the steel vehicle barrier may have become loose, corroded, fractured or missing. • Accident damage is severe with loss of railing.	Not available

93S - Hold-down bolts, base plates and fittings – steel

This component describes the connections of the noise walls, visual screen walls or architectural features or columns to the foundations and includes all hold down bolts and arrangements, including base and connecting plates. Steelwork may be painted or galvanized for protection.

Units
Each

Condition state 1 -Description	**Photo**
• The paintwork is in good condition with no metal exposure. • All connections are tight and in good condition.	 Steel base plates, nuts and bolts connections in sound condition (VicRoads)
Condition state 2 -Description	**Photo**
• Painted steelwork may have light rust spotting to the surface area and the protective coating is losing effectiveness. • The connections may be slightly loose or beginning to corrode.	 Loose bolt on visual screen connection

Condition state 3 -Description	Photo
• Painted steelwork may have minor rust spotting to the surface area and the protective coating is no longer effective. • The connections may be loose or have minor corrosion.	 Loose hold down bolt in visual screen wall base plate
Condition state 4 -Description	**Photo**
• Steelwork has moderate corrosion and the paintwork has failed with moderate surface area rusted. • Some surface pitting may be evident but section loss is minimal. • Connections may be moderately corroded or loose.	 Baseplate bent at corner over missing edge of mortar pad
Condition state 5 -Description	**Photo**
• Steelwork is severely corroded with significant section loss and the paint system has completely failed. • Connections may be very loose or heavily corroded.	Not available

94C - Grout or mortar pad beneath baseplate – concrete

This component describes any grout or mortar pad beneath the steel baseplate, because it is a critical part of the performance the baseplate and holding down system. Where levelling nuts are provided under the baseplate, the grout or mortar may not be present nor required. This detail should be reported for an engineering review.

Units
Each

Condition state 1 -Description	**Photo**
• The mortar pad completely fills the area beneath the baseplate, is sound with no drummy sound, cracking, spalling or other signs of deterioration.	 Mortar pad in good condition, although some staining from the baseplate
Condition state 2 -Description	**Photo**
• The mortar pad may have fine cracks or small gaps, but is generally sound and fills the area beneath the baseplate.	 Minor crack in mortar pad beneath baseplate

Condition state 3 -Description	Photo
• The pad may have moderate cracks or gaps, but is still generally sound and fills the area beneath the baseplate.	 Moderate crack in urban art mortar pad but still sound
Condition state 4 -Description	**Photo**
• The mortar pad may be severely cracked or only contain large gaps, where it has spalled or not been installed thoroughly.	 Severe cracking and spalling with a large section of mortar pad missing
Condition state 5 -Description	**Photo**
• The mortar pad may be completely fractured or not present.	Not available

FERRY RAMPS

100C - Ramp slab – concrete

This component defines cast in-situ concrete ferry ramp slabs and includes the transition from the road surface to the slab and any settlement of the slab that may have occurred.

Ramp slabs may also be supported by piles at the river end of the slab however these are not visible and therefore cannot be inspected.

Units
m^2 of exposed surface area

Condition state 1 -Description	Photo
• The transition between the road and ramp slab is smooth with no level difference, rutting, bumps, depressions cracking or potholes. • Ramp slabs are in good condition with only minor cracking and have not settled.	 Ramp slab in good condition
Condition state 2 -Description	**Photo**
• The approaches to the ramps may have settled slightly but the transition is generally smooth with minor rutting, bumps, depressions, potholes or some minor cracking. • Ramp slabs are in good condition with only minor rutting, cracking and spalling. • The slab may have settled slightly but level differences between slab sections are minor.	 Minor differential settlement at top of ramp
Condition state 3 -Description	**Photo**
• The approaches to the ramps may have settled further with a moderate level difference within 1m of the ramp slab. • Ramp slabs are in fair condition with moderate rutting, cracking and spalling. Any exposed reinforcement may be lightly corroded but there is no section loss. • The slab may have settled further with moderate level differences between slab sections.	 Slab has significant surface erosion and loss of concrete fines but no sign of distress or reinforcement corrosion

Condition state 4 -Description	Photo
• Settlement of approaches to the ramps has advanced further with a significant level difference within 1m of the ramp slab. • Ramp slabs are in poor condition with medium rutting, cracking and spalling. Exposed reinforcement may be corroded and showing some minor section loss. • The slab may have settled further with significant level differences between slab sections.	 Slab has large longitudinal and transverse cracks
Condition state 5 -Description	**Photo**
• Settlement of approaches to the ramps is pronounced with a substantial level difference within 1m of the ramp slab. • Ramp slabs are in very poor condition with severe cracking and spalling and exposed reinforcement is corroded and may be showing moderate section loss. • The slab may have settled dramatically with substantial level differences between slab sections.	 Substantial cracking with areas of concrete surface broken out

101C - Ramp shoulder – concrete

This component defines cast in-situ concrete ramp shoulders, including those shoulders comprising stone pitching with a concrete overlay.

Units
m^2 of exposed surface area

Condition state 1 -Description	Photo
• Ramp shoulders are in good condition with only minor cracking and have not settled.	 Shoulder in good condition (stone pitching with concrete overlay)
Condition state 2 -Description	**Photo**
• Ramp shoulders are in good condition with only minor cracking and spalling. • The shoulder may have settled slightly but level differences between the shoulder sections or the ramp slab are minor.	 Shoulder with minor settlement between concrete sections

Condition state 3 -Description	Photo
• Ramp shoulders are in fair condition with moderate cracking and spalling. Any exposed reinforcement may be lightly corroded but there is no section loss. • The shoulder may have settled further with moderate level differences between the shoulder sections or the ramp slab.	 Moderate cracking and settlement
Condition state 4 -Description	**Photo**
• Ramp shoulders are in poor condition with medium cracking and spalling. Exposed reinforcement may be corroded and showing some minor section loss. • The shoulder may have settled further with significant level differences between the shoulder sections or the ramp slab.	 Large cracks and spalling with exposed reinforcement in some areas
Condition state 5 -Description	**Photo**
• Ramp shoulders are in very poor condition with severe cracking and spalling and exposed reinforcement is corroded and may be showing heavy section loss. • The shoulder may have settled dramatically with substantial level differences between the shoulder sections or the ramp slab.	 Concrete slab panels between the spear arms have settled substantially, causing the ramp slab edge to spall off exposing reinforcement which is corroding

101O - Ramp shoulder – other

This component defines ferry ramp shoulders comprising any material other than concrete. Stone pitching shoulders with a concrete overlay should be assessed under Component No 101C.

Units
m^2 of exposed surface area

Condition state 1 -Description	Photo
• The shoulders are generally in good condition with only minor fine cracks in the mortar between stones, with no loss of mortar between the stones.	 Stone pitching in generally good condition

Condition state 2 -Description	Photo
• The shoulder may have a number of fine cracks in the mortar but no cracking of the stones. There may be minor loss of mortar of no concern. • The shoulder may have settled slightly but level differences between the shoulder sections or the ramp slab are minor.	 Shoulder in sound condition with some cracks in the mortar

Condition state 3 -Description	Photo
• The shoulder may have a number of minor cracks in the mortar and fine cracking of the stones. There may be minor loss of mortar of no concern. • The shoulder may have settled further with moderate level differences between the shoulder sections or the ramp slab. • The shoulder may not be visible, beneath a layer of soil or vegetation.	 Shoulder not exposed due to layer of soil and vegetation
Condition state 4 -Description	**Photo**
• Moderate cracking of the mortar or moderate mortar loss. • Loss of stone material may be occurring in some places. • The shoulder may have settled further with significant level differences between the shoulder sections or the ramp slab.	 Stone pitching shoulder covered by layer of topsoil, with significant level difference to ramp slab (note spall at joint in edge of ramp)
Condition state 5 -Description	**Photo**
• Severe cracking of the mortar or heavy loss of mortar may be occurring in the shoulder. • There may be heavy loss of stone material from the shoulder. • The shoulder may have settled dramatically with substantial level differences between the shoulder sections or the ramp slab.	 Large area of pitching has broken out

102C - Deadmen – concrete

This component defines the concrete blocks that are used to anchor the ferry cables and includes:

- any concrete pile or spread footings (where visible)
- any steel collars or brackets used as guides for the ferry cables.

Units
Each

Condition state 1 -Description	**Photo**
• The deadman is in good condition with only minor cracking due to shrinkage or corroding reinforcement. • There is no cracking due to differential settlement of footings or scouring under spread footings. • The steel paint system is in good condition with only minor chalking, peeling or curling, but with no exposure of the metal.	 Concrete deadman in good condition
Condition state 2 -Description	**Photo**
• There is minor cracking or spalling due to corroding reinforcement or differential settlement of footings. • There is no scour beneath the spread footing base. • Light spot rusting of the paint system is occurring to the surface area of the steel collar or brackets.	 Concrete deadman with cable through holes, minor spalling at both edges due to cable wear

Condition state 3 -Description	Photo
• Moderate cracking or spalling due to differential settlement may have occurred. • Moderate to severe cracking or spalling due to corroding reinforcement or ASR may be evident. There is minor loss of reinforcement section. • Minor surface rusting to the steel collar or brackets and minor corrosion and pitting in areas but no loss of section area has occurred	 Moderate spalling to corner of deadman, with corroded reinforcement visible
Condition state 4 -Description	**Photo**
• Medium cracking or spalling due to differential settlement may have occurred. • Medium to severe cracking or spalling due to corroding reinforcement or ASR may be evident. There is moderate loss of reinforcement section. • There is no scour beneath the spread footing base. • Moderate surface rusting to the steel collar or brackets and moderate corrosion and pitting in areas but no loss of section area has occurred.	 Significant spalling of deadman with corroded reinforcement exposed. Moderate surface rusting to steel cable guide
Condition state 5 -Description	**Photo**
• Deadmen are severely cracked and spalled due to differential settlement of foundations. • There may be advanced reinforcement corrosion, with more severe loss of section and associated cracking and spalling. • Spread footings may have been undercut by scour action. • Corrosion of the steel collar or brackets is well advanced having a detrimental effect to the strength of the deadman. • Full support for the ferry cable is not provided, with movement of the deadman occurring with ferry movements.	Not available

102S - Deadmen – steel

This component defines steel members that are used to anchor the ferry cables. It includes any packing (including timber) between flanges.

Units
Each

Condition state 1 -Description	Photo
• The deadman is in good condition with no deterioration of any welds or bolts. • The paint system is in good condition with only minor chalking, peeling or curling, but with no exposure of the metal. • Packing is in good condition and connection to the steel deadman are good.	 Steel RSJ deadman with timber packing, in good condition
Condition state 2 -Description	**Photo**
• Light spot rusting of the paint system is occurring to the surface area. • No corrosion has occurred as yet. • No cracking of welds has occurred, but there may be some minor rusting of nuts or bolts. • Packing is generally in good condition but may have minor deterioration. Connection to the steel is still good.	 Steel RSJ deadman generally in good condition however timber packing with minor deterioration to timber and paint system

Condition state 3 -Description	Photo
• The paint system has broken down with minor surface rusting to the area and minor corrosion and pitting in areas but no loss of section area has occurred which would affect the strength of the deadman. • No cracking of welds has occurred, but there may be some moderate rusting of nuts or bolts. • Packing is in fair condition but may have moderate deterioration. Connections to the steel may be slightly loose.	 Steel RSJ with some surface rusting and minor corrosion at base, timber packing with minor deterioration
Condition state 4 -Description	**Photo**
• The paint system has broken down with moderate surface rusting to the area and moderate corrosion and pitting in areas but no loss of section area has occurred which would affect the strength of the deadman. • Nuts and bolts may be corroded with moderate loss of tension in the bolt. • Welds may be cracked with minor loss of effectiveness. • Packing could have major splitting and/or large areas of rot. Connections may be loose and not engaged with the steel deadman.	 Steel RSJ pile with steel saddle for cable, obscured by gully cover. Visible area displays moderate rusting and corrosion
Condition state 5 -Description	**Photo**
• Corrosion is well advanced having a detrimental effect on the strength of the deadman. Full support for the ferry cable is not provided, with deadman movement occurring with ferry movements. • The paint system has completely broken down with corrosion and pitting in areas. • Packing is missing or has significant deterioration and requires treatment or replacement in the short term. Connections to the steel deadman may be completely lost.	 Steel RSJ pile with steel saddle for cable. Very poor condition – exhibits significant movement with ferry movements

103O - Ramp joints – other

This component defines the control joints located between the approach and the ramp slab (top joint) or where the concrete ramp slabs are cast against each other (slab joint).

Units
Linear metres

Condition state 1 -Description	Photo
• There may be fine cracking of the traffic surface at the top joint. • Slab joints are in good condition with no cracking or spalling at the joint edges.	 Top joint with only fine cracks
Condition state 2 -Description	**Photo**
• There is minor cracking or spalling of the concrete slab or the approach traffic surface at the joint edges.	 Slab joint with minor spalling at edges

Condition state 3 -Description	Photo
• There is moderate cracking or spalling of the concrete slab or the approach traffic surface at the joint edges.	 Moderate cracking and spalling at slab joint
Condition state 4 -Description	**Photo**
• There is significant cracking or spalling of the concrete slab or the approach traffic surface at the joint edges.	 Slab joint in poor condition. Significant cracking and spalling has seen joint open up and fill with material
Condition state 5 -Description	**Photo**
• Substantial cracking or spalling of the concrete slab or the approach traffic surface at the joint edges.	 Top joint with substantial cracking and deterioration of the AC approach surface

104S - Traffic barriers – steel

Refer Component No 26S.

Units
Linear metres

CATTLE GRIDS

110C - Abutment wall – concrete

This component is the concrete wall and steel cast-in plate located where the cattle grid and roadway meet, and supporting the grid girders.

Units

m^2 of exposed surface area

Condition state 1 -Description	Photo
• The walls are in good condition with only minor cracking due to corroding reinforcement. • No subsidence of the road surface behind the abutment. • Cast-in plate paintwork is generally sound with only minor chalking, peeling or curling, but no exposure of the metal.	 Abutment walls in good condition
Condition state 2 -Description	**Photo**
• The wall may have minor cracking and spalling due to corroding reinforcement, earth pressure, beam friction on differential movements. • Minor subsidence of the road surface may be evident behind the abutment. • Light spot rusting of the cast-in plate paint system is occurring and the system starting to lose effectiveness. No corrosion has occurred as yet	 Minor spall on abutment wall
Condition state 3 -Description	**Photo**
• Moderate cracking and spalling may be visible due to earth pressure, beam friction, edge bearing or differential movements. • Reinforcement may be corroded, with minor loss of section and associated moderate to severe cracking, spalling and delamination of concrete. • The road surface behind the abutment has moderate subsidence. • Spot rusting of the cast-in plate paint system is increasing and the system is no longer effective. Light corrosion has occurred.	 Moderate spalling and corrosion of cast-in plate

Condition state 4 -Description	Photo
• More advanced cracking and spalling may be visible due to earth pressure, beam friction, edge bearing or differential movements. • Corrosion of the reinforcement is advanced, with moderate loss of section and associated moderate to severe cracking, spalling and delamination of concrete. • The road surface behind the abutment has subsided noticeably. • The cast-in plate paint system has broken down with corrosion and pitting in areas.	 Significant spalling at abutment wall with corroded reinforcement visible
Condition state 5 -Description	**Photo**
• Severe cracking and spalling due to structural mechanisms is evident in abutment walls. • Corrosion of the reinforcement is well advanced with more severe section loss. • There may be significant movement of the abutment wall. There may be severe subsidence of the road surface behind the abutment. • Corrosion of the cast-in plate is well advanced, having a definite detrimental effect on the strength of the element. The paint system has completely broken down.	 Severe spalling with large area of corroding reinforcement; cast-in plate is also heavily corroded

111C - Pier wall – concrete

This component is the concrete wall and steel cast-in plate located between the abutment walls, and supports the grid girders. It is usually only found on double-width cattle grids.

Refer Component No 110C.

Units
m^2 of exposed surface area

112C - Grid base slab – concrete

This component is the concrete floor of the cattle grid. If the floor cannot be properly assessed due to the grid being filled or partially filled by gravel, soil or vegetation comment should be included here.

Units
m^2 of exposed surface area

Condition state 1 -Description	Photo
• The slab shows little or no deterioration with only a few fine superficial cracks of no importance. • Minor cracking due to corroding reinforcement may be present. • The slab is clear with no or little gravel, soil or vegetation build up present.	 Base slab in good condition
Condition state 2 -Description	**Photo**
• Minor cracking and spalling may be present with small areas of corroding reinforcement visible. • Dampness patches and efflorescence powder may be visible with evidence of minor ponding. • Shrinkage cracking is fine and dry. • Minor soil, gravel or vegetation build up is present on the slab, but having no effect on the components.	 Base slab in good condition with minor gravel build up of little consequence
Condition state 3 -Description	**Photo**
• Moderate cracking and spalling may be present with minor loss of section due to corroding reinforcement. • Dampness patches and efflorescence powder may be more prominent. • Water may be ponding on the slab. • Shrinkage cracking is fine and dry. • Moderate soil or gravel build up is present on the slab, but only having minor effect on the components.	 Moderate spalling in base slab

Condition state 4 -Description	Photo
• There may be moderate to severe cracking and spalling with moderate loss of section due to corroding reinforcement. • The slab has extensive crazed cracking. • Significant accumulation of soil, gravel or vegetation build up is present and partially filling the grid and threatening corrosion of the components.	 Grid almost full of soil
Condition state 5 -Description	**Photo**
• There may be severe cracking/spalling or advanced corrosion of reinforcement over large areas with more severe loss of section of reinforcement. • Excessive accumulation of soil, gravel or vegetation build up is present and filling the grid, causing corrosion of the components.	 Severe cracking and spalling on base slab

113C - Wingwall – concrete

This component is the concrete walls adjoining the abutment walls but extending past the end of the cattle grid.

Units
m^2 of exposed surface area

Condition state 1 -Description	Photo
• The wall is in good condition with no cracking, spalling, rotation, movement or moment cracking. • Independent wingwalls are hard up against the abutment walls.	 Wingwalls in good condition
Condition state 2 -Description	**Photo**
• There may be some minor cracking or spalling due to corroding reinforcement or earth pressures. • Any joint with the abutment may be cracked as a result of differential movement. • Independent walls may be rotating or show small forward movements but there is no loss of embankment material.	 Minor spall
Condition state 3 -Description	**Photo**
• There may be moderate cracking or spalling due to corroding reinforcement or earth pressures. There may be minor loss of section of reinforcement due to corrosion. • Any joints with the abutment may have minor cracking and minor spalling of the adjoining edges may be evident. • Independent wingwalls may show minor rotations or movements. • There is some loss of fill but little effect on serviceability as a result of differential movements.	 Moderate spalling

Condition state 4 -Description	Photo
• There may be medium cracking or spalling due to corroding reinforcement, ASR or earth pressures. There may be moderate loss of section of reinforcement due to corrosion. • Any joints with the abutment may be cracked and spalling of the adjoining edges may be evident. • Independent wingwalls may show moderate rotations or movements. • There is moderate loss of fill with minor effect on serviceability as a result of differential movements.	 Large crack and spall at wingwall
Condition state 5 -Description	**Photo**
• There may be heavy cracking or spalling due to corroding reinforcement or earth pressures. There may be more severe loss of section of reinforcement due to corrosion (and the resultant cracking and spalling this may cause). This may include any joint with the abutment that is cracked and badly spalled as a result of differential movements. • The water bar may be torn and fill escaping through the gap. • Independent wingwalls may show large rotations or movements due to earth pressure causing excessive loss of fill material from behind.	 Heavy spalling on wingwall

114S - Grid baffle plates – steel

These are the steel plates placed above the abutment walls between the girder ends, and used to prevent the road fill from spilling into the cattle grid. Includes welds to the grid girders and cast-in plates of the abutments.

Units
Linear metres

Condition state 1 -Description	**Photo**
• The paint system is generally sound with only minor chalking, peeling or curling, but with no exposure of metal. • All welds, bolts and rivets are in good condition.	Not available
Condition state 2 -Description	**Photo**
• Rusting of the paint or galvanising system to the surface area is occurring and the paint system is losing effectiveness. • No corrosion of the section has occurred. • No cracking of welds has occurred, but there may be some minor rusting of nuts or bolts.	 Baffle plate with some rusting but no corrosion
Condition state 3 -Description	**Photo**
• Rusting of the paint system to the surface area is occurring and the paint system is no longer effective. • Some surface pitting may be present. • No cracking of welds has occurred, but there may be some moderate rusting of nuts or bolts. • Minor corrosion has occurred in isolated areas and minor loss of section area may have occurred which would affect the strength of the member.	 Baffle plate with minor corrosion

Condition state 4 -Description	Photo
• The paint or galvanising system has completely broken down with surface pitting in locations. • Welds may be cracked with minor loss of effectiveness. Nuts and bolts may be corroded with minor loss of tension in bolt. • Active corrosion may be occurring in isolated areas and moderate loss of section area has occurred affecting the strength of the member. • Baffle plate is deformed with loss of fill from behind.	 Corrosion and holes in baffle plate  Bent baffle plate
Condition state 5 -Description	**Photo**
• Corrosion is well advanced and significant loss of section has occurred having a detrimental effect on the strength of the member. • Welds may be broken. Bolts or rivets may be missing. Splice joint bolts may be loose (can be loosened by a spanner).	 Severe baffle plate corrosion and loss of section

115S - Grid girders – steel

These are the steel girders supporting the cattle grid railing. Includes welds to the cast-in plates of the abutments.

Units
Linear metres

Condition state 1 -Description	**Photo**
• The paint system is generally sound with only minor chalking, peeling or curling, but with no exposure of metal. • All welds, bolts and rivets are in good condition.	 Girder in good condition
Condition state 2 -Description	**Photo**
• Rusting of the paint or galvanising system to the surface area is occurring and the paint system is losing effectiveness. • No corrosion of the section has occurred. • No cracking of welds has occurred, but there may be some minor rusting of nuts or bolts.	 Girders in good general condition, with some surface rusting

Condition state 3 -Description	Photo
• Rusting of the paint system to the surface area is occurring and the paint system is no longer effective. • Some surface pitting may be present. • No cracking of welds has occurred, but there may be some moderate rusting of nuts or bolts. • Minor corrosion has occurred in isolated areas but no loss of section area has occurred which would affect the strength of the member.	 Bottom flange of girder bent  Girder corrosion
Condition state 4 -Description	**Photo**
• The paint or galvanising system has completely broken down with surface pitting in locations. • Welds may be cracked with minor loss of effectiveness. Nuts and bolts may be corroded with minor loss of tension in bolt. • Active corrosion may be occurring in isolated areas but no loss of section area has occurred which would affect the strength of the member.	 Heavy corrosion of girder
Condition state 5 -Description	**Photo**
• Corrosion is well advanced and loss of section has occurred having a detrimental effect on the strength of the member, i.e. a flange may be badly corroded over a sizeable length. • Welds may be broken. Bolts or rivets may be missing. Splice joint bolts may be loose (can be loosened by a spanner).	Not available

116S - Grid packers – steel

These are packers used beneath the girders to ensure the crossfall of the railing of the cattle grid matches that of the adjoining road surface. Includes welds to the grid girders and cast-in plates of the abutments.

Units
Each

Condition state 1 -Description	**Photo**
• The paint system is generally sound with only minor chalking, peeling or curling, but with no exposure of metal. • All welds, bolts and rivets are in good condition.	 Packers in good condition (abutment spall assessed under Component 110C)
Condition state 2 -Description	**Photo**
• Rusting of the paint or galvanising system to the surface area is occurring and the paint system is losing effectiveness. • No corrosion of the section has occurred. • No cracking of welds has occurred, but there may be some minor rusting of nuts or bolts.	 Packer with surface rusting but no corrosion, and welds in good condition
Condition state 3 -Description	**Photo**
• Rusting of the paint system to the surface area is occurring and the paint system is no longer effective. • Some surface pitting may be present. • No cracking of welds has occurred, but there may be some moderate rusting of nuts or bolts. • Minor corrosion has occurred in isolated areas but no loss of section area has occurred which would affect the strength of the member.	 Packer not centred

Condition state 4 -Description	Photo
• The paint or galvanising system has completely broken down with surface pitting in locations. • Welds may be cracked with minor loss of effectiveness. Nuts and bolts may be corroded with minor loss of tension in bolt. • Packer may be dislodged. • Active corrosion may be occurring in isolated areas but no loss of section area has occurred which would affect the strength of the member.	 Loose packer, weld broken
Condition state 5 -Description	**Photo**
• Corrosion is well advanced and loss of section has occurred having a detrimental effect on the strength of the member, i.e. a flange may be badly corroded over a sizeable length. • Packer may be missing. • Welds may be broken. Bolts or rivets may be missing. Splice joint bolts may be loose (can be loosened by a spanner).	 Packer missing under girder  Packer badly corroded with loss of section affecting strength

117O - Grid rails – steel

Units
Linear metres

This component describes the steel railing that forms the trafficable surface of the grid and includes all welds to the grid girders, plates welded to the rails to maintain even heights and any steel plates placed over railing joins or gaps.

Comment should also be made regarding the vertical alignment of the railings – but being aware this could indicate the failure of other grid components (such as grid packers, girders, abutments or pier walls) and therefore an appropriate condition rating should be applied for that component.

Condition state 1 -Description	Photo
• The paint system is generally sound with only minor chalking, peeling or curling, but with no exposure of metal. • All welds, bolts and rivets are in good condition.	 Grid railing in good condition

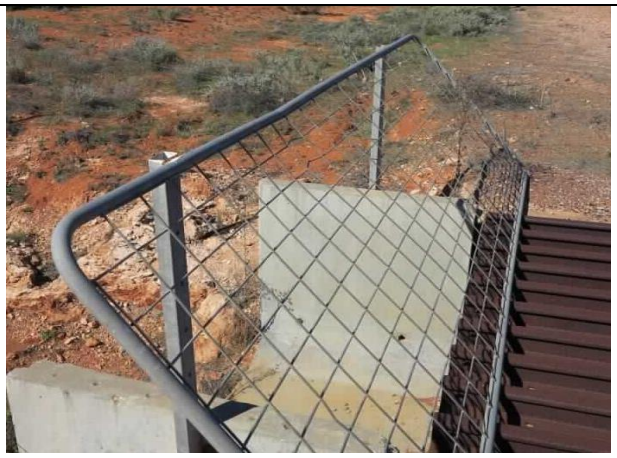
Condition state 2 -Description	Photo
• Rusting of the paint or galvanising system to the surface area is occurring and the paint system is losing effectiveness. • No corrosion of the section has occurred. • No cracking of welds has occurred, but there may be some minor rusting of nuts or bolts.	 Surface rusting but no corrosion, welds still fine

Condition state 3 -Description	Photo
• Rusting of the paint system to the surface area is occurring and the paint system is no longer effective. • Some surface pitting may be present. • No cracking of welds has occurred, but there may be some moderate rusting of nuts or bolts. • Minor corrosion has occurred in isolated areas but no loss of section area has occurred which would affect the strength of the member.	 Section of plate welded to top of rails has broken away
Condition state 4 -Description	**Photo**
• The paint or galvanising system has completely broken down with surface pitting in locations. • Welds may be cracked with minor loss of effectiveness. Nuts and bolts may be corroded with minor loss of tension in bolt. • Active corrosion may be occurring in isolated areas but no loss of section area has occurred which would affect the strength of the member.	 Rail to girder weld cracked  Broken welds on plate used to cover grid rail height difference
Condition state 5 -Description	**Photo**
• Corrosion is well advanced and loss of section has occurred having a detrimental effect on the strength of the member, i.e. a flange may be badly corroded over a sizeable length. • Rails may be deformed. • Welds may be broken. Bolts or rivets may be missing. Splice joint bolts may be loose (can be loosened by a spanner).	 Rails are bent and split

118O - Fence – other

This component is the fence or gate structure located at the ends of the cattle grid, adjoining on to the neighbouring boundary fence. These are usually constructed of steel mesh with either a metal or timber frame. Includes the posts used to support the fence.

Units
Each

Condition state 1 -Description	**Photo**
• The paint or galvanising is generally in good condition with no rusting or corrosion. • The timber shows only minor deterioration and all the bolting is tight. • No accident damage is visible.	 Fence in good condition
Condition state 2 -Description	**Photo**
• Light rusting has formed to the surface area and the paint system is losing effectiveness. • The timber shows signs of minor decay, splitting or cracking but does not affect the strength or serviceability. • Connections are generally tight. • Any accident damage or vandalism is minor and of no consequence.	 Fence bent but not affecting performance

Condition state 3 -Description	Photo
• Minor rusting has formed to the surface area and the paint system is no longer effective. • Moderate decay, splitting cracking or crushing may be present affecting the strength and serviceability of the fence to a minor extent. • Connections may be starting to loosen in a number of areas. • Accident damage has only a minor effect on strength or serviceability of the fence.	 Fence anchor weld broken
Condition state 4 -Description	**Photo**
• The paint system may have broken down and there is surface pitting in a number of locations on the fence but there is minimal effect on strength or serviceability • Significant decay, splitting cracking or crushing may be present affecting the strength and serviceability of the fence to a moderate extent. • Connections may be loose in a number of areas. • Accident damage has a moderate effect on strength or serviceability of the fence.	 Fence post attacked by white ants
Condition state 5 -Description	**Photo**
• Corrosion is advanced with loss of section affecting both strength and serviceability. • Severe decay splitting cracking or crushing may be present affecting the strength and serviceability of the fence. • Connections may be quite loose. • Accident damage is severe. • Fence has collapsed or is missing.	 Badly damaged fence

119O - Boundary fence connection – other

This is the connection between the cattle grid fence and the adjoining boundary fence, which with the cattle grid forms the barrier to prevent livestock movement between adjoining properties.

Units
Each

Condition state 1 -Description	Photo
• Connection is in good condition and forms an effective barrier.	 Connection is in good condition

Condition state 2 -Description	Photo
• Connection is generally in good condition and forms an effective barrier although minor deterioration is present.	 Connection with the boundary fence in sound condition, and forming an effective barrier

Condition state 3 -Description	Photo
• Connections may be starting to loosen in a number of areas and the effectiveness of the barrier is being affected.	 Mesh panel is not properly secured and on a lean
Condition state 4 -Description	**Photo**
• Connections may be loose in a number of areas and the barrier has lost effectiveness.	 Connection to boundary fence has partially collapsed
Condition state 5 -Description	**Photo**
• Connection may be quite loose or non-existent (may be a result of collapsed or missing boundary fence) and there is no effective barrier.	 No connection (no boundary fence present)

120 - Approach - other	Units
Refer Component Nos 1, 2 and 3	**Each**

121 - Approach road - other	Units
Refer Component No 2O	**Each**

BUSWAY TRACK

130P - Busway track – precast concrete

This component is the precast busway track including the kerb which is precast integral to the track.

Also included are the cast in-situ concrete entry and exit ramps to and from the busway track.

Units
m^2 of exposed surface area

Condition state 1 -Description	Photo
• The units are in good condition with only minor faint cracking or minor edge chipping of the units. • Entry/exit ramp is in good condition with only minor cracking and has not settled.	 Track in good condition
Condition state 2 -Description	**Photo**
• Minor cracks or spalls may be present with only minor reinforcement corrosion. • Edge spalling of the units may have exposed some reinforcement. • Entry/exit ramp may have settled slightly but level differences between ramp sections are minor.	 Kerb spall at saw cut

Condition state 3 -Description	Photo
• Moderate cracking and spalling may be present with minor loss of section of the reinforcement. • Entry/exit ramp may have settled further with moderate level differences between slab sections. • Vegetation growth adjacent or within the track, but only minimal effect on the busway. Removal should be considered.	 Track spall at joint  Track spall at joint with failed Silspec repair  Loss of fines on running path  Small tree within track

Condition state 4 -Description	Photo
• Medium cracking and spalling may be present with moderate loss of section of the reinforcement. • Entry/exit ramp may have settled further with significant level differences between slab sections. • Vegetation growth adjacent or within the track is affecting the busway, and should be removed.	 Spall over connection  Large tree adjacent track
Condition state 5 -Description	**Photo**
• Heavy spalling and advanced corrosion may be present, or the precast deck units are completely loose and moving excessively under load. • Heavy edge spalling or delaminated concrete may be present.. • Entry/exit ramp may have settled dramatically with substantial level differences between slab sections.	Not available

131P - Busway sleepers – precast concrete

This component is the precast concrete sleepers supporting the track, Includes the clamp brackets holding the track to the sleepers (and any packers) and the bolts attaching the sleepers to the concrete piles.

Units
Each

Condition state 1 -Description	**Photo**
• The sleepers are in good condition with only very minor cracking due to corroding reinforcement, shrinkage, lack of curing. • The clamp brackets and hold-down bolts and nuts are generally in good condition with no surface rust. • All connections are tight and in good condition, with full thread engagement by nuts. Nuts and washers are present on all bolts.	 Sleepers in good condition
Condition state 2 -Description	**Photo**
• The sleepers may have a few minor fine cracks or minor spalls due to corroding reinforcement. • The clamp brackets and hold-down bolts and nuts may have minor rust spotting to the surface area. Minor pitting may occur. Small amounts of debris may be present. • The connections may be slightly loose. Connection bolts may be tight but too short and not fully threaded. Nuts may be loose, and washers may be absent.	 Minor cracks in sleeper  Minor spall in sleeper

Condition state 3 -Description	Photo
• Moderate cracking or spalling may exist and there may be some light rust staining in the cracks. • Exposed reinforcement may have minor section loss in isolated areas. • The clamp brackets and hold-down bolts and nuts may have moderate rust spotting to the surface area. Moderate pitting may occur. A moderate amount of debris may be present. • The connections may be loose.	 Loose sleeper bolt  Packing shim dislodged  Spall to end of sleeper  Debris around clamp brackets

Condition state 4 -Description	Photo
• Medium cracking or spalling may exist and there may be some rust staining in the cracks. • Exposed reinforcement may have moderate section loss in isolated areas. • The clamp brackets and hold-down bolts and nuts have medium corrosion with significant surface area rusted. • Surface pitting may be evident but section loss is minor. • The connections may be moderately corroded, loose or only half threaded. One nut may be missing.	 Spalled end of sleeper  Minimal thread of sleeper bolt
Condition state 5 -Description	**Photo**
• Severe cracking or spalling may have occurred with large delaminated areas visible. • More severe loss of section of reinforcement. • The clamp brackets and hold-down bolts and nuts are severely corroded with moderate loss of section. • Bolts may be fractured and there may be visible evidence of cracking of bolts. Multiple nuts may be missing or loose.	Not available

132C - Busway piles – cast in-situ concrete

This component is the cast in-situ concrete piles supporting the sleepers.

The measurement unit for this component is 'Each' as for many piles, there is very little area visible below the sleepers. If there are clearly differing condition states for a single pile, a partial condition rating quantity may be used as outlined in Part 3 Section 1.2.2.3 of this manual.

Units
Each

Condition state 1 -Description	**Photo**
• The piles show only minor fine cracking due to reinforcement corrosion. • The piles are well braced with no or very minimal scour.	Not available

Condition state 2 -Description	**Photo**
• The piles have fine cracking or spalling due to corroding reinforcement. • Minor scour has only a slight effect on pile support.	 Minor scour around pile

Condition state 3 -Description	Photo
• The piles have minor cracking or spalling due to corroding reinforcement with minor loss of section in the steel bars. • Moderate level of scour and may be starting to have a minor effect on the level of pile support.	 Spalling to pile  Moderate scour around pile
Condition state 4 -Description	**Photo**
• The piles have moderate cracking or spalling due to corroding reinforcement with moderate loss of section in the steel bars. • Scour is advanced and is affecting the level of pile support. Remedial action should be considered.	 Moderate spalling to pile
Condition state 5 -Description	**Photo**
• Severe cracking or spalling due to corroding reinforcement may be visible with advanced corrosion of the steel bars with more severe loss of section of reinforcement. • Scour is significant and very advanced. Undermining of the pile is occurring. Needs to be remedied in order to protect the integrity of the structure.	Not available

133S - Busway guide rails – steel

This component is the steel guide rails fixed to the concrete entry and exit ramps to and from the busway track. Includes steel fixings holding the rail to the track.

Units
Linear metres

Condition state 1 -Description	**Photo**
• The guide rails are in good condition with minimal corrosion or loss of coating and no visible cracks. • Connections are tight and in good condition.	 Guide rail in good condition
Condition state 2 -Description	**Photo**
• The guide rails may have some minor surface corrosion. There are no visible cracks. • Connections may be slightly loose or beginning to corrode.	 Debris in guide rail fixings

Condition state 3 -Description	Photo
• The guide rails may have some moderate surface corrosion. There are no visible cracks. • The connections may be loose or have minor corrosion.	 Fixing rotated
Condition state 4 -Description	**Photo**
• The surface coating system may have broken down and some active corrosion may be present with significant rust spotting to the guide rails and surface pitting. There are no visible cracks. • Connections may be moderately corroded or loose.	 Fixing for guide rail rotated and loose
Condition state 5 -Description	**Photo**
• The coating system may have completely broken down. There may be well advanced corrosion. • Any visible signs of cracking of the parent metal or welds shall be recorded and reported immediately. • Connections may be very loose or heavily corroded.	Not available

134S - Busway sump busters – steel / concrete

This component comprises the steel sump buster and also includes the concrete pad supporting the sump buster, and the steel guide rails leading into it.

Units
Each

Condition state 1 -Description	**Photo**
• The steel in good condition with minimal corrosion or loss of coating and no visible cracks. • Connections are tight and in good condition. • The mortar pad completely fills the area beneath the sump buster, is sound with no drummy sound, cracking, spalling or other signs of deterioration. • No or very little debris is present.	Not available
Condition state 2 -Description	**Photo**
• The steel may have some minor surface corrosion. There are no visible cracks. • Connections may be slightly loose or beginning to corrode. • The mortar pad may have minor cracks or minor spalls, but is generally sound and fills the area beneath the baseplate. • Small amounts of accumulated debris are present	 Debris in sump buster and cracking in mortar pad

Condition state 3 -Description	Photo
• The steel may have some moderate surface corrosion. There are no visible cracks. • The connections may be loose or have minor corrosion. • The mortar pad may have moderate cracks or spalls, but is still generally sound and fills the area beneath the sump buster. • Accumulated debris is present and is building up around the sump buster or guide rails, and should be removed.	 Spalled mortar pad under sump buster
Condition state 4 -Description	**Photo**
• The surface coating system may have broken down and some active corrosion may be present with significant rust spotting to steel and surface pitting. There are no visible cracks. • Connections may be moderately corroded or loose. • The mortar pad may be severely cracked or spalled. • Significant amounts of accumulated debris are present and have built up against the sump buster or guide rails, and should be removed.	 Missing bolts on sump buster rails
Condition state 5 -Description	**Photo**
• The coating system may have completely broken down. There may be well advanced corrosion. Any visible signs of cracking of the parent metal or welds shall be recorded. • Connections may be very loose or heavily corroded. • The mortar pad may be completely fractured or not present. • Large amounts of accumulated debris are present and are impacting on the performance of the sump buster. Debris should be removed within the short term.	Not available

TUNNELS

140C - Tunnel wall – concrete

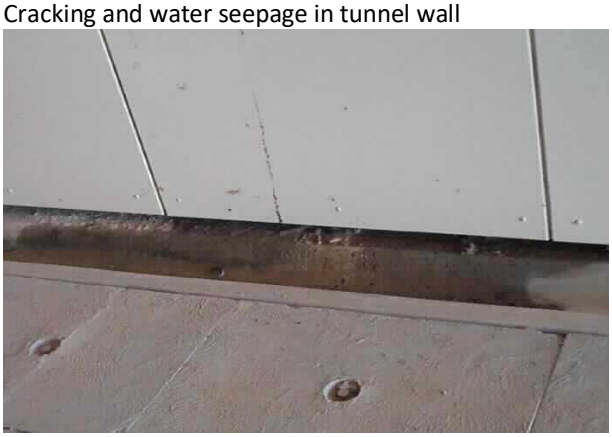
This component describes all tunnel wall linings constructed of reinforced concrete.

It does not include the composite lining facing the tunnel wall, which is non-structural and placed for light reflectivity purposes. This is to be assessed under Component no. 147O.

This component was previously assessed as 'Abutment'

Units
m^2 of exposed surface area

Condition state 1 -Description	Photo
• The tunnel walls are in good condition with only minor shrinkage cracking. Precast units are in good condition with only minor fine cracking of no consequence. • The wall should be reasonable dry.	 Concrete wall lining in good condition

Condition state 2 -Description	Photo
• The tunnel wall may have minor cracking and spalling due to shrinkage or corroding reinforcement. • Minor water seepage is evident along with some efflorescence.	 Cracking and water seepage in tunnel wall  Water in side spoon drain, likely from leaking shrinkage cracks in wall

Condition state 3 -Description	Photo
• Minor cracking or spalling may be visible due to corroding reinforcement or earth pressure. • Moderate water seepage and efflorescence is evident.	 Void in wall above lining
Condition state 4 -Description	**Photo**
• More advanced cracking and spalling may be visible due to to corroding reinforcement or earth pressures. • Significant water seepage and large areas of efflorescence are evident.	Not available
Condition state 5 -Description	**Photo**
• Severe cracking and spalling due to reinforcement corrosion or earth pressure is evident in tunnel walls. • Excessive water seepage and extensive areas of efflorescence are evident.	Not available

140S - Tunnel wall – steel

This component describes all tunnel wall linings constructed of steel sheet pile.

It does not include any composite lining facing the tunnel wall, which is non-structural and placed for light reflectivity and/or acoustic and fire purposes. This is to be assessed under Component no. 147O.

This component was previously assessed as 'Abutment'

Units
m^2 of exposed surface area

Condition state 1 -Description	Photo
• The steel is in good condition with only minor rusting at the ends of sheets. • There is no bulging of sheets between supports. • The wall should be reasonable dry.	 Steel sheet piling in good condition
Condition state 2 -Description	**Photo**
• There is minor corrosion at the sheet ends but no corrosion of the main body of the sheeting. • Minor water seepage is evident.	 Water leakage at sheet pile

Condition state 3 -Description	Photo
• Moderate corrosion is evident in the sheeting but there is only minor bulging of sheets between supports. • Moderate water seepage is evident.	Not available
Condition state 4 -Description	**Photo**
• Moderate corrosion is evident in the sheeting, bulging of sheets between supports is significant and some of the joints between sheets may have sprung. • Significant water seepage is evident.	Not available
Condition state 5 -Description	**Photo**
• Severe corrosion is evident in the sheeting, bulging of sheets is excessive and joints in the sheeting have sprung. • Excessive water seepage is evident.	Not available

141C - Tunnel portal – concrete

This component describes all tunnel portals constructed of either precast concrete panels or cast in-situ concrete.

This component was previously assessed as 'Wingwall'

Units
m^2 of exposed surface area

Condition state 1 -Description	Photo
• The portals are in good condition with only minor shrinkage cracking. Precast units are in good condition with only minor fine cracking of no consequence. • Soil retention is effective with no loss of back fill material.	 Tunnel portal in good condition
Condition state 2 -Description	**Photo**
• The tunnel portal may have minor cracking and spalling due to shrinkage or corroding reinforcement. • Minor scour is having only a slight effect on back fill material around the outside edge of the portal.	 Shrinkage cracks at tunnel entrance

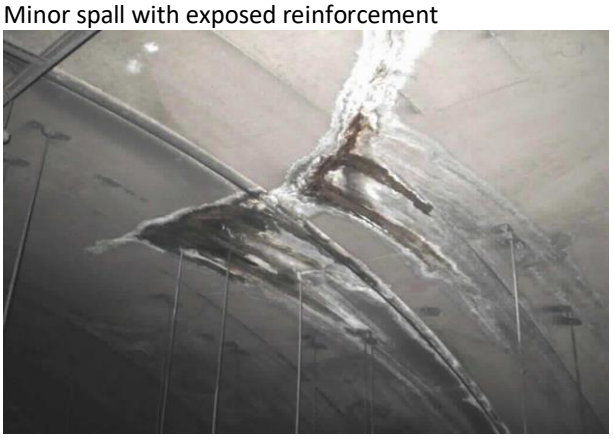
Condition state 3 -Description	Photo
• Minor cracking or spalling may be visible due to corroding reinforcement or earth pressure. • Moderate scour has allowed a minor loss of back fill material around the outside edge of the portal.	 Minor scour of back fill material around portal
Condition state 4 -Description	**Photo**
• More advanced cracking and spalling may be visible due to to corroding reinforcement or earth pressures. • Scour is advanced and is having a significant effect on the back fill material around the outside edge of the portal.	Not available
Condition state 5 -Description	**Photo**
• Severe cracking and spalling due to reinforcement corrosion or earth pressure is evident in tunnel walls. • Scour is significant and very advanced, with excessive loss of back fill material around the outside edge of the portal.	Not available

142C - Tunnel roof – concrete

This component describes all tunnel roof linings constructed of either precast concrete panels or planks, or cast in-situ concrete.

This component was previously assessed as 'Deck'

Units
m^2 of exposed surface area

Condition state 1 -Description	Photo
• The tunnel roof is in good condition with only minor shrinkage cracking. Precast units are in good condition with only minor fine cracking of no consequence. • The surface should be reasonable dry.	 Minor cracking in roof lining
Condition state 2 -Description	**Photo**
• The tunnel roof may have minor cracking and spalling due to shrinkage or corroding reinforcement. • Minor water leakage is evident along with some efflorescence.	 Minor spall with exposed reinforcement  Minor shrinkage crack with water leakage and efflorescence

Condition state 3 -Description	Photo
• Minor cracking or spalling may be visible due to corroding reinforcement or earth pressure. • Moderate water leakage and efflorescence is evident with some dripping water.	 Concrete fretting in roof  Shrinkage cracking up to 4mm and efflorescence in roof lining
Condition state 4 -Description	**Photo**
• More advanced cracking and spalling may be visible due to to corroding reinforcement or earth pressures. • Significant water leakage and dripping water with large areas of efflorescence are evident.	 Exposed reinforcement and spalling in tunnel roof
Condition state 5 -Description	**Photo**
• Severe cracking and spalling due to reinforcement corrosion or earth pressure is evident in tunnel roof. • Excessive water leakage, dripping water and extensive areas of efflorescence are evident.	 Heavy spalling with exposed reinforcement

143 - Approach, Approach road, Approach barrier	Units
Refer Component Nos 1, 2 and 3	**Each / Each / Linear Metre**

144 - Traffic surface	Units
Refer Component No 31	**m^2** of exposed surface area

145 - Base slab	Units
Refer Component No 45	**m^2** of exposed surface area

146O - Construction joints – other

This component comprises longitudinal and transverse joints formed during construction of the concrete tunnel wall and roof linings.

Also refer Component No 37O

Units
Linear Metres

Condition state 1 -Description	**Photo**
• The joint is in good condition with no deterioration. • There is no moisture penetration of the joint.	 Construction joint in good condition
Condition state 2 -Description	**Photo**
• Minor deterioration of the joint may have occurred, including minor spalling along the joint edge. • Minor moisture leakage and efflorescence is present.	 Leaking construction joint

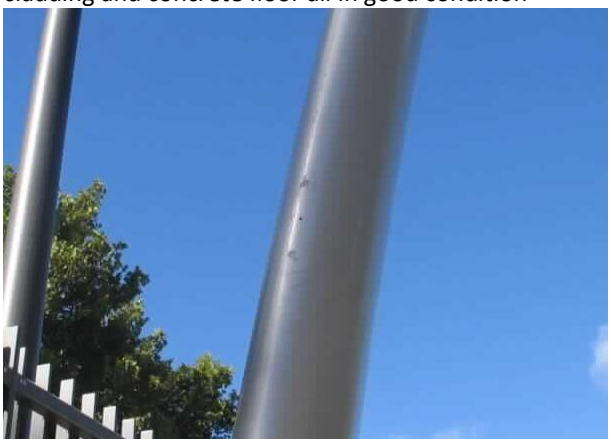
Condition state 3 -Description	Photo
• Moderate deterioration of the joint may have occurred, including spalling along the joint edge. • The joint may have opened up allowing moderate moisture leakage and areas of efflorescence are present.	 Spalled control joint
Condition state 4 -Description	**Photo**
• Medium deterioration of the joint has occurred. • The joint has opened up allowing significant moisture leakage and large areas of efflorescence are present.	 Spalling and leakage/efflorescence at joint
Condition state 5 -Description	**Photo**
• Severe deterioration of the joint has occurred. • Heavy leakage is occurring through the joint and very large areas of efflorescence are present and having an effect on the surrounding concrete.	Not available

147O - Additional elements – concrete / steel / other

Includes various elements within and attached to the tunnel, such as bolts, cable trays, canopy and also includes passageways. Non-structural composite wall lining panels placed to aid reflectivity of the tunnel walls are also included in this component.

Also refer Component No 47

Units
m^2 of exposed surface area

Condition state 1 -Description	Photo
• The attachment is in good condition. There is little or no evidence of corrosion or deterioration. The protective coating, if any, may be chalking, peeling, checking or showing other early evidence of distress but there is no exposure of metal. • The structural connections fixing the attachment to the tunnel are in good condition. Ladders, gantries or access ways are in good condition. • Bolts and nuts are generally in good condition, all connections are tight with full thread engagement by nuts and nuts and washers are present on all bolts.	 Access corridor with steel sheet piles, steelpanel cladding and concrete floor all in good condition  Unused holes in new canopy/portal arch frame (to be filled)

Condition state 2 -Description	Photo
• **Concrete**: Minor cracks or spalls. No exposed reinforcement or surface evidence of corrosion of reinforcement. • **Metal**: Surface or freckled rust has formed or is forming. The protective coating, if any, is losing effectiveness and there may be exposed metal but there is no loss of section. • The structural connections fixing the attachment to the tunnel are in good condition. Ladders, gantries or access ways have small defects but are safe to use. • Bolts and nuts may have minor rust spotting to the surface area and the connections may be slightly loose. Connection bolts may be tight but too short and not fully threaded, nuts may be loose and washers may be absent.	 Cross passage in generally good condition but with minor leaking  Minor damage to composite wall panel

Condition state 3 -Description	Photo
• **Concrete**: Moderate cracks or spalls. There may be small areas of exposed reinforcement with minor corrosion but no loss of section. • **Metal**: Surface or freckled rust has formed. The protective coating, if any, is no longer effective and there may be exposed metal but any section loss is minimal. • The structural connections fixing the attachment to the tunnel are in sound condition. Ladders, gantries or access ways have minor defects but are safe to use. • Bolts and nuts may have moderate rust spotting to the surface area and the connections may be loose.	 Bent cable tray support hangers  Fixing loose due to crack

Condition state 4 -Description	Photo
• **Concrete**: Some delamination or corrosion of reinforcement may be present. • **Metal**: Surface pitting may be present but any section loss is minor. • Any section loss or deterioration does not affect the strength or serviceability of the element. • The structural connections fixing the attachment to the tunnel are in fair condition although there may be some corrosion evident. • Ladders, gantries or access ways have moderate defects and there is doubt about adequacy of them for intended purpose. • Bolts and nuts have medium corrosion and the connections may be moderately corroded, loose or only half threaded. One nut may be missing.	 Corroded cable tray and support brackets  Corrosion of threaded rod  Louvre support frame bolts missing

Condition state 5 -Description	Photo
• **Concrete**: Advanced deterioration or corrosion of reinforcement. • **Metal**: Corrosion is advanced. Section loss is significant. • Deterioration of concrete or section loss of metal is sufficient to warrant analysis to ascertain the impact on the strength and/or serviceability of the element. • There is doubt about the integrity of the connection(s). There may be advanced corrosion or cracking of the connectors and/or the supporting tunnel element. • Ladders, gantries or access ways have significant defects and are unsafe to use. • Bolts and nuts are severely corroded with moderate loss of section. Bolts may be fractured and there may be visible evidence of cracking of bolts. Multiple nuts may be missing or loose. Fractured or cracked bolts must be recorded and reported immediately.	Not available

148 - Drainage system	Units
Refer Component No 48	**Each**

(This page has been left blank intentionally)