Road Structures Inspection Manual

Part 4A: Condition State Guidelines and Photographs

Bridges

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Government of South Australia
Department of Planning, Transport and Infrastructure

Road Structures Inspection Manual

Part 4A: Condition State Guidelines and Photographs - Bridges
Department of Planning, Transport and Infrastructure, South Australia

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and adjusted for South Australian conditions.

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APPROACH

1O - Bridge approach – other

This component defines the carriageway immediately behind the abutments, and includes such items as settlement of and the traffic surface on the pavement and approach slabs if any, and transition from the approach to the bridge surface.

Where a concrete approach slab is visible and able to be inspected, this shall be considered under Component 4C. This would only usually occur in conjunction with a concrete roadway (e.g. Northern Connector).

Units
Each

Condition state 1 -Description	**Photo**
• The transition between the road and bridge is smooth with no level difference, rutting, bumps, depressions cracking or potholes. • Approach slabs are in good condition and have not settled.	 Smooth, constant approach to bridge
Condition state 2 -Description	**Photo**
• The approaches may have settled slightly but the transition is generally smooth with minor rutting, bumps, depressions, potholes or some minor cracking due to embankment movement. • Settling approach slabs have caused a small height difference and opened up the abutment expansion joint slightly.	 Minor settlement at approach

Condition state 3 -Description	Photo
• Settlement of approaches is advancing with moderate level difference within 1m of the bridge. • Rutting, bumps, depressions or potholes are starting to affect the rideability and transition onto the bridge. • Approach slabs have continued to settle and started to rotate causing an opening of the abutment expansion joints but without failure of the joint.	 Settlement of approach with cracking and potholes beginning to occur
Condition state 4 -Description	**Photo**
• Settlement of approaches has advanced further with significant level difference within 1m of the bridge. • Rutting, bumps, depressions or potholes are affecting the rideability and transition onto the bridge. • Approach slabs may have settled substantially and rotated causing a further opening of the abutment expansion joints with joint starting to show signs of failure.	 Significant settlement of approach carriageway
Condition state 5 -Description	**Photo**
• Settlement of the approaches is pronounced with substantial level difference within 1m of the bridge. • The approaches may also have rutting, bumps, depressions or potholes affecting the rideability and transition onto the bridge. • Approach slabs may have settled dramatically causing rotation at the abutment expansion joint sufficient to cause total failure of the joint.	 Severe drop and rutting in the wheel path on bridge approach.

2O - Bridge approach road – other

This component defines the carriageway immediately behind the abutments, and includes such items as the delineation of the bridge approach including linemarking, reflectors and signs.

Units
Each

Condition state 1 -Description	**Photo**
• All bridge delineation (signs, reflectors and linemarking) are in good condition	 All delineation in very good condition
Condition state 2 -Description	**Photo**
• All bridge delineation (signs, reflectors and linemarking) are generally in good condition although some minor deterioration may be present	 Approach delineation in good condition
Condition state 3 -Description	**Photo**
• Bridge delineation generally in sound condition, although moderate deterioration may be present. • Signs and reflectors in fair condition only. Some fading may be apparent. • Linemarking is wearing so that lines are starting to fade.	 Linemarking has started to fade

Condition state 4 -Description	Photo
• Width markers / hazard boards installed at incorrect places. • Linemarking has worn to the extent that lines have faded and may be starting to lose reflectivity.	 Width markers at wrong place, should be at bridge corners
Condition state 5 -Description	**Photo**
• Sighter posts missing. • Width markers / hazard boards missing. • Linemarking does not exist or has almost totally faded and has completely lost reflectivity.	 Width markers missing  Sighter posts missing above edge of culvert

3C - Bridge approach barriers – concrete (precast or cast in-situ)

This component defines all types and shapes of approach barrier where the principal component is concrete (this may be cast-in-situ concrete OR precast concrete units) leading up to the bridge and / or bridge railing.

The length of the approach barrier is at the discretion of the Inspector but generally should be no more than 20 m.

Units
Linear metres

Condition state 1 -Description	**Photo**
• The approach barrier is in good condition with no accident damage, and is well connected to the bridge endpost or railing.	 Precast concrete barrier on the bridge approaches, in good condition
Condition state 2 -Description	**Photo**
• The approach barrier is generally in good condition with only minor cracking, spalling or minor accident damage having no effect on the serviceability of the railing or connections to the endpost or bridge railing.	 Minor spalling in previously repaired barrier wall section

Condition state 3 -Description	Photo
• The approach barrier is in fair condition and may have some moderate cracking, spalling or minor accident damage having no effect on the serviceability of the railing or connections to the endpost or bridge railing.	 Moderate spalling of barrier wall
Condition state 4 -Description	**Photo**
• The approach barrier may have moderate accident damage or has medium cracking or spalling which may have a minor effect on its serviceability or connection to the endpost or bridge railing. • The approach barrier may be in good condition but is not connected to the endposts and is a potential hazard.	Not available
Condition state 5 -Description	**Photo**
• The approach barrier has heavy cracking or spalling, severe accident damage, has lost the connections or is unconnected to the endpost, or has moved relative to the endpost and is a hazard to any errant vehicle.	Not available

3S - Bridge approach barriers – steel

This component defines the approach guardrail leading up to the bridge endposts and/or bridge railing. Also included in this component are the posts and endposts, which support the railing.

Units
Linear metres

Condition state 1 -Description	**Photo**
• The approach railing is in good condition with no accident damage, and is well connected to the endpost or bridge railing.	 Approach guardrail in good condition and well attached to strengthening railing on bridge
Condition state 2 -Description	**Photo**
• The approach guardrail is generally in good condition with only minor rusting and/or minor accident damage. • The railing is well connected to the endposts or bridge railing and has sufficient strength, i.e. posts closer than 2½m centres.	 Steel approach guardrail hit but still functioning.

Condition state 3 -Description	Photo
• The approach guardrail is in fair condition with moderate rusting and/or minor accident damage. • The railing is well connected to the endposts or bridge railing and has sufficient strength, i.e. posts closer than 2½m centres.	 Missing bolt on approach barrier railing support
Condition state 4 -Description	**Photo**
• The approach guardrail may be moderately damaged due to vehicular impact or the guardrail is poorly or not connected to the endposts but have sufficient strength with posts not greater than 2½m spacings. • The guardrail may be heavily rusted or may be connected to the endposts but have insufficient strength with post spacings greater than 2½m centres.	 Damaged barrier

Condition state 5 -Description	Photo
• The approach guardrail has been severely damaged, demolished, not connected to the endposts as well as having insufficient strength, or is non-existent, too low in height to be effective, has corroded through or has lost support due to rot of the timber posts.	 Missing post on w-beam approach rail  Severe corrosion and loss of section of w-beam approach barrier

3T - Bridge approach barriers – timber

This component defines the timber approach barrier leading up to the bridge endposts and/or bridge railing.

Units
Linear metres

Condition state 1 -Description	**Photo**
• The component shows only minor deterioration and all the bolting is tight. • No accident damage is visible.	 Timber barrier in good condition
Condition state 2 -Description	**Photo**
• The component shows signs of minor decay, splitting or cracking but does not affect the strength or serviceability. • Bolting of the posts and rails is generally tight. • Accident damage is only minor with no effect on strength or serviceability.	 Minor deterioration only

Condition state 3 -Description	Photo
• Moderate decay, splitting cracking or crushing may be present affecting the strength and serviceability of the railing to a minor extent. • Bolting may be starting to loosen in a number of areas. • Accident damage may have a minor effect on the strength or serviceability of the railing.	 Moderate rotting of rail
Condition state 4 -Description	**Photo**
• Significant decay, splitting cracking or crushing may be present affecting the strength and serviceability of the railing to a moderate extent. • Bolting may be loose in a number of areas. • Accident damage may have a moderate effect on the strength or serviceability of the railing.	 Bottom rail missing
Condition state 5 -Description	**Photo**
• Severe decay splitting cracking or crushing may be present affecting the strength and serviceability of the railing. • Bolting may be quite loose affecting the strength of the railing. • Accident damage is major affecting the serviceability of the railing.	 Broken approach barrier due to termite attack

4C - Bridge approach slab – concrete

This component comprises concrete approach slabs where these are visible and able to be inspected. This will usually only occur in conjunction with a concrete roadway (e.g. Northern Connector).

Where the approach slab is not visible, the component shall be considered under Component 1O.

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.	Not available

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.	Not available

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.	Not available
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.	Not available
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.	Not available

ABUTMENT

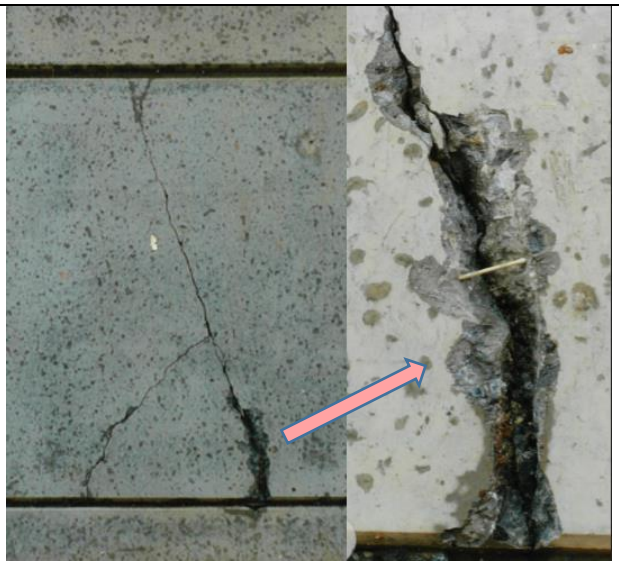
5P - Abutments – precast concrete

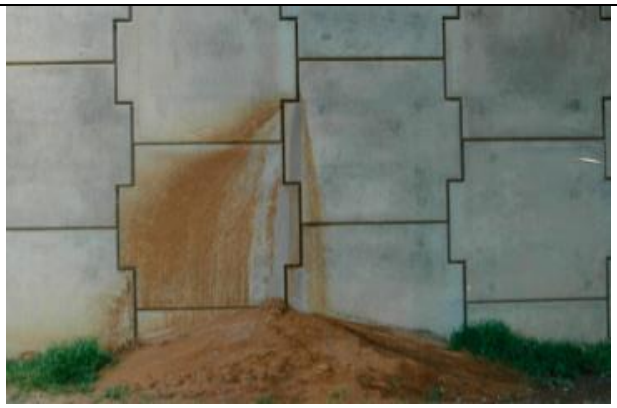
This component describes all precast concrete abutments or precast concrete components used in abutments. Included in this component are precast RC sheeting planks, precast RC earth retaining slabs, precast RC facing panels for reinforced earth walls (including cast-in-situ sill or ground beam on top), precast RC crib walls (including sill or ground beam on top), and precast RC crossheads where the crossheads are at ground or top of batter level. Where the crossheads are well above the ground level (height exceeding 1.0 m) with embankment supporting walls below, the crossheads shall be considered under Component 19.

Reinforced Earth walls are covered by Component No 8P.
Wingwalls and retaining walls are covered by Component No 9P.

Units
m^2 of exposed surface area

Condition state 1 -Description	Photo
• The units are in good condition with only minor fine cracking of no consequence. • There should be no settlement of units or gaps between units allowing loss of embankment fill to occur. • Where units form retaining walls, they must be securely positioned and have no bulging due to earth pressure.	 Precast reinforced earth panels in good condition with no cracking, spalling, settlement or bulging
Condition state 2 -Description	**Photo**
• There may be fine cracking or minor spalling of the units due to corroding reinforcement or earth pressure. • There may be minor bulging or settlement of units but allowing only minor loss of embankment fill from behind.	 Precast slab in abutment wall with panel bolts missing and minor spalling

	 Minor spalling on precast RC facing panel
Condition state 3 -Description	**Photo**
• There may be minor cracking or moderate spalling of the units due to corroding reinforcement or earth pressure. • There may be moderate bulging or settlement of units allowing minor loss of embankment fill from behind.	 Spalling to precast concrete panel
Condition state 4 -Description	**Photo**
• There may be moderate cracking or spalling of the units due to corroding reinforcement or earth pressures. • Moderate bulging, settlement or separation of units may be allowing medium loss of the embankment fill.	 Moderate cracking and spalling in RC facing panel

	 Medium loss of embankment fill
Condition state 5 -Description	**Photo**
• Severe cracking and spalling of the units may be occurring due to reinforcement corrosion or earth pressure. • Excessive bulging, settlement or separation of the units may be allowing heavy loss of embankment fill.	 Severely cracked and heavily bulged precast retaining slab (VicRoads)

5C - Abutments – cast in-situ concrete

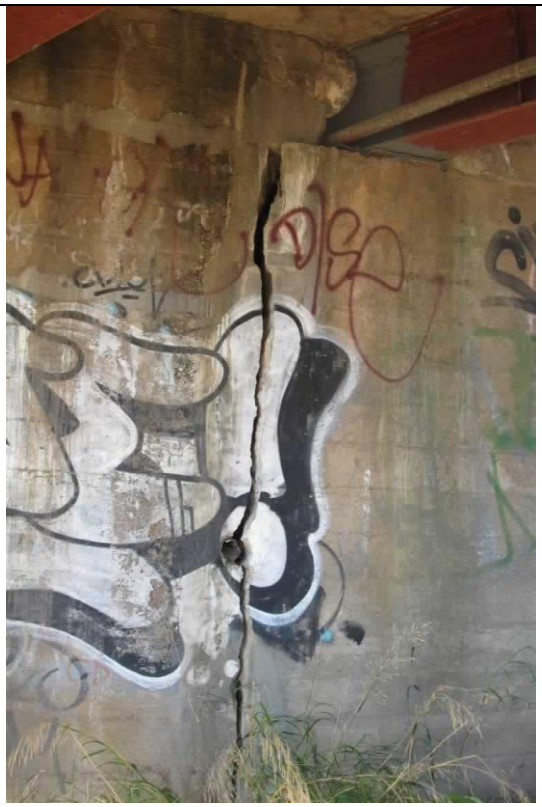
This item includes all abutments constructed of cast in-situ concrete and includes the short integral return walls which support the barrier end posts or terminals, ballast walls and side keeper walls.

Where the crossheads are well above the ground level or batter level (height exceeding 1.0m) the crossheads should be considered under Component 19.

Wingwalls, whether integral, attached or independent, are considered separately as part of Component No. 9. Damage to seating areas caused by faulty bearings is covered under the bearing items.

Units
m^2 of exposed surface area

Condition state 1 -Description	Photo
• The abutment and ballast walls are in good condition with only minor cracking due to corroding reinforcement. • There is no flexural cracking due to earth pressures or differential settlement of foundations. • Crossheads are reasonably dry and clean. • No movement of abutment should be discernible; that is, bearings shearing towards ballast wall or subsidence of the road surface behind the abutment.	 Abutment wall in good condition
Condition state 2 -Description	**Photo**
• The abutment wall may have minor cracking and spalling due to corroding reinforcement, earth pressure, beam friction on differential movements. • Crossheads should be reasonably clean and dry. Minor movement of the wall may have occurred. Crossheads may have fine moment, ASR or shear cracking. • The ballast wall may be cracked or spalled as a result of earth pressure, girders bearing on it or corrosion of reinforcement. Minor subsidence of the road surface may be evident behind the abutment.	 Spalling of abutment wall, no obvious change and no reinforcement visible

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. • Crossheads may be damp but there is no heavy staining or evidence of water being retained on the shelf. Moderate movement of the abutment. Crossheads may have medium ASR or moment cracks or fine shear cracks. • The ballast wall may be moderately cracked or spalled. The road surface behind the bridge has moderate subsidence.	 Spalling and exposed reinforcement
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. • Crossheads may be damp with some staining or evidence of water being retained on the shelf. Moderate movement of the abutment. Crossheads may have medium ASR or moment cracks or fine shear cracks. • The ballast wall may be severely cracked or spalled. The road surface behind the bridge has subsided noticeably.	 Large (40mm) crack in abutment wall

Condition state 5 -Description	Photo
• Severe cracking and spalling due to structural mechanisms is evident in abutment and ballast walls. • Corrosion of the reinforcement is well advanced with more severe section loss. • The bearing shelf/crosshead may be very wet, heavily stained or have excessive water resting on top. • Severe moment cracks or moderate shear cracks may be evident. The ballast wall has failed, is bearing against the girders and embankment material is being lost. • There may be significant movement of the abutment wall. • There may be severe subsidence of the road surface behind the abutment.	 Severe spalling and fretting of concrete abutment

5S - Abutments– steel

This item includes abutments where the main embankment support material consists of corrugated steel/iron sheeting or steel sheet piles between the piles or acting as a ballast wall.

Wingwalls and retaining walls are covered by Component No. 9S.

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. • Soil retention is effective and there is no bulging of sheets between supports.	 Sheet pilings 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. • Soil retention is substantially effective and there is only minor bulging of sheets between supports.	 Paint chipped off on corners and corrosion starting on sheet ends
Condition state 3 -Description	**Photo**
• Moderate corrosion is evident in the sheeting but there is only minor bulging of sheets between supports. • Soil retention is starting to become compromised and there may be evidence of minor subsidence of the road surface behind the abutment.	 Corrosion of sheet pilings

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. • Soil retention has been compromised and there may be evidence of subsidence of the road surface behind the abutment.	 Paint flaking and moderate corrosion
Condition state 5 -Description	**Photo**
• Severe corrosion is evident in the sheeting, bulging of sheets is excessive and joints in the sheeting have sprung. • Loss of embankment fill is occurring due to earth pressure or the material is being lost due to water wash at the base of the abutment. Severe subsidence of the road surface behind the abutment may be evident.	 Severely corroded abutment sheet piles

5T - Abutments – timber

This component includes abutments where the main embankment support material consists of timber sheeting or high timber piles. Timber piles and crossheads at abutments will be considered under other substructure components because of their uniqueness. Timber sill beams resting on a concrete footing may be considered in this component as well as timber bedlogs embedded in the embankment.

Wingwalls and retaining walls are covered by Component No. 9T.

Units
m^2 of exposed surface area

Condition state 1 -Description	Photo
• The timber may have minor decay, splits or checks but is generally in good condition.	 Timber sheeting in good condition (VicRoads)
Condition state 2 -Description	**Photo**
• Timber units may have moderate decay, splits or checks, but are generally in good condition.	 Timber sheeting showing signs of minor rot and weathering but still in generally good condition.

Condition state 3 -Description	Photo
• Timber units may have moderate decay, splits or checks, but are generally in fair condition. • Settlement of sheeting units may be starting to occur however there is no evidence of subsidence of the road surface behind the abutment.	 Moderate rotting at ends of timber abutment sheets
Condition state 4 -Description	**Photo**
• Timber units may be heavily decayed with sheeting planks rotted out or attacked by termites. • Settlement of sheeting units may be occurring or a loss of fill may be occurring due to water wash beneath the sheeting or due to sheeting rotting out. • Subsidence of the road surface behind the abutment may be evident.	 Evidence of termite attack on some abutment timbers

Condition state 5 -Description	Photo
• Timber units may be severely decayed and whole areas may have rotted out or been eaten out by termites. • Loss of embankment fill is occurring due to earth pressure or the material is being lost due to water wash at the base of the abutment. • Severe subsidence of the road surface behind the abutment may be evident.	 Rotted out timber sheeting, collapsed sheeting and washout of embankment filling behind the abutment (VicRoads)

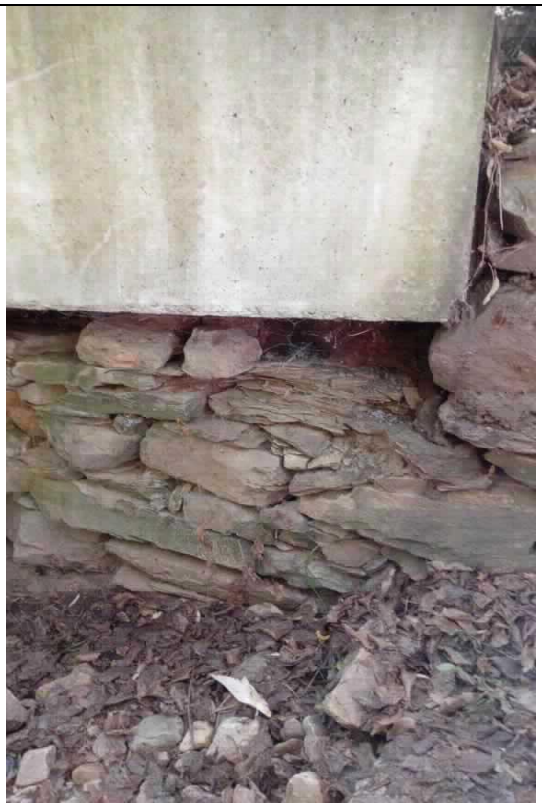
5O - Abutments – other

This component describes all abutment types other than concrete, steel or timber, and includes stone masonry walls, red brick walls or grouted rubble walls. The component does not include any reinforced concrete cap on top of the walls. Foundations, if visible, should be considered as part of this component.

Reinforced Earth walls are covered by Component No 8O.

Units
m^2 of exposed surface area

Condition state 1 -Description	Photo
• The wall is in good condition with only minor fine cracks in the mortar between bricks, stones or masonry blocks. • There should be no cracking due to differential settlement of the foundations, or bulging due to earth pressures on the walls. • There should be no loss of mortar between the blocks. The wall and sill cap should be reasonably dry with no staining.	 Masonry wall in good condition
Condition state 2 -Description	**Photo**
• The wall may have a number of fine cracks in the mortar but no cracking of the blocks. There may be minor loss of mortar of no concern. • Fine cracks may exist due to differential settlement of the foundations or minor bulging due to earth pressures. • The wall and sill cap should be reasonably dry. • The wingwalls may have slight movement away from the abutment but not sufficient to cause loss of embankment fill material.	 Cracking in mortar between masonry blocks

Condition state 3 -Description	Photo
• The wall may have a number minor cracks in the mortar and fine cracking of the blocks. There may be minor loss of mortar of no concern. • Minor cracks may exist due to differential settlement of the foundations or minor bulging due to earth pressures. • The wingwalls may have movement away from the abutment but not sufficient to cause loss of embankment fill material.	 Fretting stonework
Condition state 4 -Description	**Photo**
• Moderate cracking of the mortar or moderate mortar loss may be occurring due to water wash. • There should be only minor mortar loss beneath any masonry sill caps. Medium cracking may exist due to differential settlement of the foundations. • Wingwalls may have moderate movement away from the abutments causing some loss of fill material. • Abutment walls may have moderate bulging due to earth pressure.	 Heavy fretting with moderate mortar loss and spalling of concrete sill
Condition state 5 -Description	**Photo**
• Severe cracking of the mortar or heavy loss of mortar may be occurring in the wall. • There may be medium loss of mortar beneath the masonry sill caps. • Heavy cracking may exist due to differential settlement of the foundations or bulging of the walls due to earth pressures. • Wingwalls may have severe movement away from the abutments causing excessive loss of fill material from behind.	 Masonry missing, headwall unsupported

6P - Batter protection – precast concrete

This component defines those bridge abutment batters protected by precast concrete units placed either separately or locked together to prevent loss of embankment fill. Small walls at the toe of the batter may be included in this item even if constructed of a different material, but high vertical or near vertical walls with an abutment on top or behind should be included under the item for abutments.

Units
m^2 of exposed surface area

Condition state 1 -Description	Photo
• The precast concrete units are in good condition with no damage, differential settlement between units or scour beneath the toe of the units.	 Precast concrete units (supporting grouted stone) in good condition
Condition state 2 -Description	**Photo**
• There may be local minor damage to units or minor differential movement between units. • Minor local scour may be beginning to uncover the toe of the batter beaching.	 Minor local damage and settlement of precast unit (VicRoads)
Condition state 3 -Description	**Photo**
• There may be local moderate damage to units or minor differential movement between units. • Moderate local scour may have occurred with minor erosion at the toe of the batter beaching.	Not available

Condition state 4 -Description	Photo
• Local damage is beginning to be more pronounced and spreading to larger areas. • Differential settlement between units is more pronounced with possible loss of batter fill material from between the units. • Scouring is beginning to become a problem with the toe of the batter being eroded over reasonable length and with some possible loss of batter material from beneath the batter units. • A few units may have been lost or severely damaged.	Not available
Condition state 5 -Description	**Photo**
• Failure of the units, extensive differential movement between units or scour of the toe of the batter has resulted in loss of whole areas of the beaching. • Severe scour has undermined the toe of the beaching and batter fill has eroded away from beneath the units.	Not available

6C - Batter protection – cast in-situ concrete

This component defines those bridge abutment batters protected by cast-in-situ concrete. Concrete may be cast in forms, pumped into a nylon fabric mattress, or sprayed on the batter with or without anchorage rods into the fill material. Small retaining walls may be used at the toe of the batter and these should be considered as part of the batter protection.

Units
m^2 of exposed surface area

Condition state 1 -Description	Photo
• The batter is in good condition with no cracking or spalling noticed. • The embedded toe of the batter is in good condition with no scouring.	 Concrete batter slope in good condition

Condition state 2 -Description	Photo
• Minor local cracking or spalling may have occurred or separation or movement at casting joints. • Minor local scour may be beginning to occur, uncovering part of the toe of the beaching.	 Scour or animals causing hole beneath batter protection

Condition state 3 -Description	Photo
• Moderate local cracking or spalling may have occurred or separation or movement at casting joints. • Moderate local scour may have occurred with minor erosion at the toe of the beaching.	Not available
Condition state 4 -Description	**Photo**
• Local cracking and spalling is more pronounced with small areas broken and possibly missing. • Movement at casting joints is more pronounced with possible loss of batter material from beneath the concrete. • Scouring is becoming a problem with the toe of the batter eroded over a reasonable length and possible erosion of batter material beneath the toe.	 Large crack along batter slope protection
Condition state 5 -Description	**Photo**
• Severe cracking and spalling with large broken areas or areas of missing concrete are providing erosion of batter arterial from beneath the concrete batter. • Movements at the casting joints are excessive and batter material has been eroded away. • Severe erosion has undermined the toe of the batter with loss of batter material below the concrete	Not available

6O - Batter protection – other

This component includes those batters either unprotected, grassed, protected with stone or rocks (grouted or ungrouted), stone filled cages or mattresses, stone with reinforcing mesh tied down on top, or placed fabric tied down by light wire mesh. Small retaining walls may be used at the toe of the batter and these should be included as part of the batter protection.

Units
m^2 of exposed surface area

Condition state 1 -Description	Photo
• The unprotected batters or protected batters are generally in good condition with no scour evident. • Some of the rock beaching may have been lost from the batter and is now in the stream, but there is no scour of the unprotected areas or toe of beaching.	 Grouted stone batter in good condition.
Condition state 2 -Description	**Photo**
• There may be some local damage to the protective system or minor differential settlement or movement of cages or mattresses. • Some wires may be damaged or broken with minor loss of the stone filling. • Minor local erosion or scour of the batters may be occurring or the toe of the beaching may be beginning to be uncovered.	 Broken wire and some rocks missing from reno mattress

Condition state 3 -Description	Photo
• There may be local damage to the protective system or moderate differential settlement or movement of cages or mattresses. • Some wires may be damaged or broken with moderate loss of the stone filling. • Moderate local erosion or scour of the batters may have occurred or the toe of the beaching may have become uncovered in some areas.	 Paving bricks missing and evidence of leaking
Condition state 4 -Description	**Photo**
• Damage to the beaching is more pronounced and spreading to larger areas. • Wire cages are broken and heavy loss of stone filling is occurring. • The batter material is being eroded from beneath the protective system or unprotected banks are beginning to be eroded away. • The toe of the protective beaching is exposed over a sizeable length and some possible loss of the batter material is occurring.	 Erosion of unprotected batter has created void beneath abutment and wingwall
Condition state 5 -Description	**Photo**
• Failure of the beaching has allowed erosion and scouring of the banks to occur. • Severe scour has undermined the toe of the beaching and batter fill material is being eroded away. • Settlement or movement of the beaching has exposed the underside of the abutments with loss of fill material in the road embankment.	 Scour has completely removed stone beaching and fill beneath and in front of abutment (VicRoads)

7C - Footing – cast in-situ concrete

This item covers all spread footing foundations constructed in cast in-situ concrete. It also covers the concrete pedestal footings used to support timber pile bases at piers and abutments.

Units

m^2 of exposed surface area

Condition state 1 -Description	Photo
• The footing 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.	 Timber prop footings in very 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.	 Pier footing in good condition
Condition state 3 -Description	**Photo**
• Moderate cracking or spalling due to differential settlement or log impact 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.	Not available

Condition state 4 -Description	Photo
• Medium cracking or spalling due to differential settlement or log impact 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.	Not available
Condition state 5 -Description	**Photo**
• Footings are severely cracked and spalled due to differential settlement of foundations or log impact. • 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.	Not available

8C - Pile cap – cast in-situ concrete

This item covers all pile cap foundations constructed in cast in-situ concrete. It also covers the concrete pedestal footings used to support timber pile bases at piers and abutments.

Units
m^2 of exposed surface area

Condition state 1 -Description	Photo
• The pile cap is in good condition with only minor cracking due to shrinkage or corroding reinforcement. • There is no cracking due to differential settlement of piles. • Overall depth of scour holes is less than 0.5 m.	 Pile cap in good condition
Condition state 2 -Description	**Photo**
• There is minor cracking or spalling due to corroding reinforcement or differential settlement of piles. Piles have adequate edge clearances and have been placed within the specified tolerances. • Overall depth of localised scour holes ranges from 0.5 m to 1.5 m.	 Minor spalling
Condition state 3 -Description	**Photo**
• Moderate cracking or spalling due to log impact or differential settlement may have occurred. • Moderate cracking and spalling due to corrosion of reinforcement or ASR may be evident. There is minor loss of reinforcement section due to corrosion. • Piles have been driven slightly out of positional tolerance but the structural strength and serviceability are not affected. • Overall depth of localised scour holes ranges from 1.5 m to 3 m.	 Spalling and dislodged pile cap skirt

Condition state 4 -Description	Photo
• More severe cracking or spalling due to log impact or differential settlement may have occurred. • Moderate to severe cracking and spalling due to corrosion of reinforcement or ASR may be evident. There is moderate loss of reinforcement section due to corrosion. • Piles have been driven significantly out of positional tolerance but the structural strength and serviceability are adequate. • Overall depth of localised scour holes ranges from 3 m to 4 m.	Not available
Condition state 5 -Description	**Photo**
• Pile caps are heavily cracked and spalled due to differential settlement of foundations or log impact. • There may be advanced reinforcement corrosion, with more severe loss of section and associated cracking and spalling. • Edges of pile caps may be spalling due to lack of edge clearance of piles. • Depth of localised scour holes is in excess of 4 m.	Not available

9P - Reinforced Earth – precast concrete

This item covers reinforced earth (also called mechanically stabilised earth, MSE) abutment walls with exterior facing comprising precast concrete elements also used in abutments. Included in this item are precast RC sheeting planks, precast RC earth retaining slabs, precast RC facing panels and precast RC crib walls.

Units
m^2 of exposed surface area

Condition state 1 -Description	Photo
• In good condition with little deterioration. • There is no settlement of units or gaps between units allowing loss of embankment fill. There is no vegetation growing between the units. • The units are in good condition with only minor fine cracking of no consequence. No reinforcement is exposed. • There is no movement of units.	 Reinforced Earth wall in good condition.
Condition state 2 -Description	**Photo**
• In good condition with minor deterioration. • There may be fine cracking or minor spalling of the units due to corroding reinforcement or earth pressure. • There may be minor bulging or settlement of units but allowing only minor loss of embankment fill from behind. There is no vegetation growing between the units.	 Minor loss of embankment fill
Condition state 3 -Description	**Photo**
• In fair condition with minor deterioration. • No exposure of soil reinforcement. • There may be minor cracking or moderate spalling of the units due to corroding reinforcement or earth pressure. • Units may have moderate movement or settlement enabling minor loss of embankment fill. • There may be some vegetation growing between the units indicating breakdown of the backing strip.	 Reinforced earth wall panels with vegetation growth

Condition state 4 -Description	Photo
• In poor condition, deterioration and defects are significant although imminent failure or reduced rating is not expected in the medium term. It is likely remedial repairs will be required to be scheduled. • Some soil reinforcement is exposed with signs of minor corrosion. • Units may have moderate movement, settlement or separation of units that may have resulted in medium loss of embankment fill. • There may be vegetation growing between the units indicating breakdown of the backing strip.	 Large gaps at top of wall corner  Exposed strap
Condition state 5 -Description	**Photo**
• In very poor condition. Deterioration and defects are severe and it is likely that without intervention failure of the component may be expected in the short to medium term. • Areas of soil reinforcement are exposed due to flooding or other significant movement of the reinforced fill. • Severe cracking and spalling of the units may be occurring due to reinforcement corrosion or earth pressure. • Units have excessive movement, settlement or separation of units which may be allowing heavy loss of embankment fill. • There may be a lot of vegetation growing between the units indicating breakdown of the backing strip.	 Severe erosion of embankment fill  Cavity showing anchor straps

9O - Reinforced Earth – other

This item covers reinforced earth (also called mechanically stabilised earth, MSE) abutment walls with gabion, masonry or keystone exterior facing, or any other type of non-concrete exterior facing.

Units
m^2 of exposed surface area

Condition state 1 -Description	Photo
• In good condition with little deterioration. • There is no movement of units.	Not available
Condition state 2 -Description	**Photo**
• In good condition with minor deterioration. • Non-grouted masonry or rubble is well stacked and is stable. • Gabions have minor settlement or minor loss of stone or a few broken wires. • Marginal gaps may have opened up allowing a minor loss of the retained fill.	Not available
Condition state 3 -Description	**Photo**
• In fair condition with minor deterioration. • There may be minor settlement or forward rotation of the wall facing as a consequence of earth pressure. • No exposure of soil reinforcement • Non-grouted masonry or rubble is still well stacked and is reasonably stable. • Gabions have minor settlement or minor loss of stone or a few broken wires. • Small gaps may have opened allowing the loss of retained embankment material. • There may be some vegetation growing between the units indicating breakdown of the backing strip.	Not available

Condition state 4 -Description	Photo
• Some soil reinforcement is exposed with signs of minor corrosion. • There may be significant settlement or forward rotation of the wall facing. • Non-grouted masonry rubble has moved with some loss of stone and minor loss of embankment fill. • Gabions may have distorted with moderate loss of stone with broken or corroded wires. • Moderate sized gaps may have opened allowing the loss of retained embankment material. • There may be some vegetation growing between the units indicating breakdown of the backing strip.	Not available
Condition state 5 -Description	**Photo**
• Areas of soil reinforcement are exposed due to flooding or other significant movement of the reinforced fill. • There may be excessive settlement or forward rotation of the wall facing. • Non-grouted masonry rubble walls have moved appreciably and lost numerous rocks. Walls are no longer effective in retaining fill. • Gabions may be badly corroded and may have lost substantial filling or have numerous broken wires. • Significant gaps may have opened allowing severe loss of the retained fill material. • There may be a lot of vegetation growing between the units indicating breakdown of the backing strip.	Not available

10P - Wingwalls / Retaining Walls – precast concrete

This item includes all bridge wingwalls and retaining walls constructed using precast reinforced concrete, and covers elements such as precast RC sheeting planks, precast RC earth retaining walls, precast RC facing panels for reinforced soil walls and precast RC crib walls.

Units
m^2 of exposed surface area

Condition state 1 -Description	Photo
• The elements are in good condition with only minor cracking or spalling noticed. There should be no movement or moment cracking in the wingwalls. • There should be no settlement of the elements or gaps between elements allowing loss of embankment fill to occur. • Where the elements form retaining walls, they must be securely positioned and have no bulging due to earth pressure.	 Precast panels in good condition
Condition state 2 -Description	**Photo**
• There may be minor cracking and spalling due to corroding reinforcement or due to earth pressures. • Retaining walls may be showing signs of minor rotation or small movements which are of no consequence. • There may be minor bulging or settlement of elements but allowing only minor loss of embankment fill from behind.	 Small tree growing against wingwall
Condition state 3 -Description	**Photo**
• There may be moderate cracking and spalling due to corroding reinforcement or due to earth pressures. There may be minor loss of section of reinforcement due to corrosion. • Retaining walls may be showing signs of moderate rotation or minor movements which are of no consequence. • There may be moderate bulging or settlement of elements but allowing only minor loss of embankment fill from behind.	Not available

Condition state 4 -Description	Photo
• There may be moderate cracking and spalling due to corroding reinforcement, ASR, or due to earth pressures. There may be moderate loss of section of reinforcement due to corrosion. • Retaining walls may be showing signs of moderate rotation or movements of up but having little effect on serviceability. • Moderate bulging, settlement or separation of the elements may be allowing medium loss of embankment fill.	Not available
Condition state 5 -Description	**Photo**
• There may be severe cracking or spalling due to corroding reinforcement or due to earth pressures. There may be more severe loss of section of reinforcement due to corrosion (and the resultant cracking and spalling this may cause). • Retaining walls may be showing signs of large rotation or movements or may be leaning due to earth pressure on them, with possible loss of embankment fill behind. • Excessive bulging, settlement or separation of the elements may be allowing heavy loss of embankment fill.	Not available

10C - Wingwalls / Retaining Walls – cast in-situ concrete

This item includes all bridge wingwalls and retaining walls constructed using cast insitu reinforced or plain concrete. Wingwalls, whether integral, attached or independent, are included.

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.	 Concrete 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.	 Slight rotation of wingwall but no loss of embankment

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. • Retaining walls and 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 cracking
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. • Retaining walls and 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.	 Loss of fill and scour behind 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. • Retaining walls and independent wingwalls may show large rotations or movements due to earth pressure causing excessive loss of fill material from behind.	 Heavy cracking and large rotation of wingwall

10S - Wingwalls / Retaining Walls – steel

This item includes all wingwalls and retaining walls where the main embankment support material consists of corrugated steel/iron sheeting or steel sheet piles between the wing piles.

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 streets. • Soil retention is effective and there is no bulging of sheets between supports.	 Steel wingwall 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. • Soil retention is substantially effective and there is only minor bulging of sheets between supports.	 Wingwall with light rusting of sheets and minor corrosion at sheet ends

Condition state 3 -Description	Photo
• There is minor corrosion evident in the sheeting with only minor bulging of sheets between supports. • Soil retention is substantially effective and there may be evidence of minor subsidence of the road surface behind the abutment.	 Minor corrosion

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. • Soil retention has been compromised and there may be moderate subsidence of the road surface behind the abutment.	 Moderate corrosion of wingwall
Condition state 5 -Description	**Photo**
• Severe corrosion is evident in the sheeting, bulging of sheets is excessive and joints in the sheeting have sprung. • Loss of embankment fill or wingwall fill is occurring, due to earth pressure, or the material is being lost due to water wash at the base of the wingwalls. • Severe subsidence of the road surface in the vicinity of the wingwall or retaining wall may be evident.	Not available

10T - Wingwalls / Retaining Walls – timber This component includes all bridge wingwalls and retaining walls consisting of timber sheeting or high timber piles.	Units m^2 of exposed surface area

Condition state 1 -Description	Photo
• The timber may have minor decay, splits or checks but is generally in good condition.	Not available
Condition state 2 -Description	**Photo**
• Timber units may have moderate decay, splits or checks, but are generally in good condition.	Not available
Condition state 3 -Description	**Photo**
• Timber units may have moderate decay, splits or checks, but are still considered in fair condition. • There may be minor settlement of sheeting units or minor loss of fill occurring.	Not available

Condition state 4 -Description	Photo
• Timber units may be heavily decayed with sheeting planks rotted out or attacked by white ants. • Settlement of sheeting units may be occurring or a loss of fill may be occurring due to water wash beneath the sheeting or due to sheeting rotting out, and subsidence of the embankment may be evident.	 Termite attack on wingwall
Condition state 5 -Description	**Photo**
• Timber units may be severely decayed and whole areas may have rotted out or been eaten out by white ants. • Loss of embankment fill or wingwall fill is occurring due to earth pressure or the material is being lost due to water wash at the base of the wingwalls, and severe subsidence may be evident.	 Wingwall has collapsed due to rotting and severe termite attack

10O - Wingwalls / Retaining Walls – other

This component includes all bridge wingwalls and retaining walls constructed using ashlar blocks, rubble masonry or brickwork.

Units
m^2 of exposed surface area

Condition state 1 -Description	Photo
• The wall is in good condition with only fine cracks in the mortar joints. There should be no cracking due to differential settlement of foundations or bulging due to earth pressure. • There should be no loss of mortar between blocks, the wall should be dry and no forward rotation or movement is evident.	 Masonry wingwall in good condition
Condition state 2 -Description	**Photo**
• There may be a number of fine cracks in the mortar joints but no cracking of the blocks or there may be minor loss of mortar of no concern. Fine cracks may exist due to differential settlement of the foundations or minor bulging due to earth pressures. • The wall is reasonably dry and there is only a slight forward movement or rotation but no loss of fill.	 Secondary gabion wingwall with minor displacement of rocks
Condition state 3 -Description	**Photo**
• Minor cracking of mortar or loss of mortar may be evident. Minor cracking due to differential footing settlement and minor bulging due to earth pressure may be seen. • Walls have rotated or show small forward movement, causing some loss of fill material.	 Cracking and small movement in masonry wingwall

Condition state 4 -Description	Photo
• Moderate cracking of mortar or loss of mortar may be evident. Moderate cracking due to differential footing settlement and moderate bulging due to earth pressure may be seen. • Walls may show moderate rotations or movements causing moderate loss of fill material.	 Moderate cracking and bulging in dry stone wingwall
Condition state 5 -Description	**Photo**
• Severe cracking or loss of mortar is occurring. Severe cracking is evident as a result of differential settlement or bulging due to earth pressures. • Walls show large rotations or movements causing excessive loss of fill material from behind.	 Stone wall collapsing

11C - Lateral Restraint Blocks – concrete This component includes reinforced concrete lateral restraint blocks placed on abutments to prevent lateral movement of the girder beams.	Units m^2 of exposed surface area

Condition state 1 -Description	Photo
• The components are in good condition with only very minor fine cracking visible. • There may be minor dampness or efflorescence powder visible in a few locations.	Not available
Condition state 2 -Description	**Photo**
• There may be a few minor cracks or spalls due to corroding reinforcement. • Restraint block may be damp and stained due to excessive moisture penetration of the deck joints, and efflorescence powder may be visible in numerous areas.	Not available

Condition state 3 -Description	Photo
• There may be moderate cracks or spalls due to corroding reinforcement. • Restraint block may be damp and stained due to excessive moisture penetration of the deck joints, and efflorescence powder may be more prevalent in numerous areas.	Not available
Condition state 4 -Description	**Photo**
• Medium cracking and spalling may be present along with possible delaminated areas due to corroding reinforcement. • Exposed reinforcement may have moderate section loss in isolated areas	Not available
Condition state 5 -Description	**Photo**
• Severe cracking, spalling or large delaminated areas exist with heavily corroded steel visible with more severe loss of section of reinforcement.	Not available

SPAN

12P - Deck Slab – precast concrete

This item includes all contiguous precast concrete deck slabs and superstructure units forming both the span and the deck.

This item does not include:

- transversely stressed deck units, considered as Component No. 12P.
- T-slabs (a trapezoidal beam with an integral top flange developed by VicRoads). A reinforced concrete in-situ slab is cast over the top flange. These are considered as Component No. 13P.
- inverted T-slabs. Bottom flanges are contiguous. Voids between units may be filled with insitu concrete; alternatively, a conventional deck slab may be cast over the top flanges. These are also considered as Component No. 13P.

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. • Minor efflorescence powder may be visible.	 Efflorescence between precast units
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.	 Minor spalling with exposed reinforcement

Condition state 3 -Description	Photo
• Moderate cracking and spalling may be present with minor loss of section of the reinforcement. • Some of the hold down bolts for the precast deck slabs may be loose.	Not available
Condition state 4 -Description	**Photo**
• Medium cracking and spalling may be present with moderate loss of section of the reinforcement. • Many of the hold down bolts are loose or missing and the units are moving when loaded, causing heavy edge spalling of the units.	Not available
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.	 Severe cracking and spalling due to chloride ingress corroding the reinforcement (VicRoads)

Prestressed slabs

Condition state 1 -Description	Photo
• The units are in good condition with minor moisture staining between the slabs and white efflorescence powder. • The units may have minor faint cracking but no spalling. • The transverse tensioning rods are in good condition with no sign of corrosion.	 Minor longitudinal cracks up to 0.2mm

Condition state 2 -Description	Photo
• The units may have slight moisture staining and efflorescence powder visible but no rust staining due to corrosion of the transverse rods. • The asphalt surface may exhibit fine longitudinal cracking along the lines of these units. • There may be minor cracks and spalls but no exposure of the stressing strands. • Impact forces have caused minor damage but have not exposed reinforcement. • The transverse tensioning rods may have minor surface corrosion.	 Cracking with no exposure of stressing strands
Condition state 3 -Description	**Photo**
• The units may have moderate moisture staining with stalactite growths and efflorescence powder visible powder in the joints, along with some rust staining due to corrosion of the transverse rods. • The asphalt surface may have moderate cracking, due to differential movement between the units or loss of tensioning force in the transverse rods; however, the anchorages are still tight in the recesses. • There may be moderate cracking and spalling with minor loss of section of the stressing strands due to corrosion. • Non-prestressed reinforcement may be corroded with minor section loss. • Impact damage comprising minor spalls of cover concrete with no significant damage to reinforcement or prestressing strands	Not available

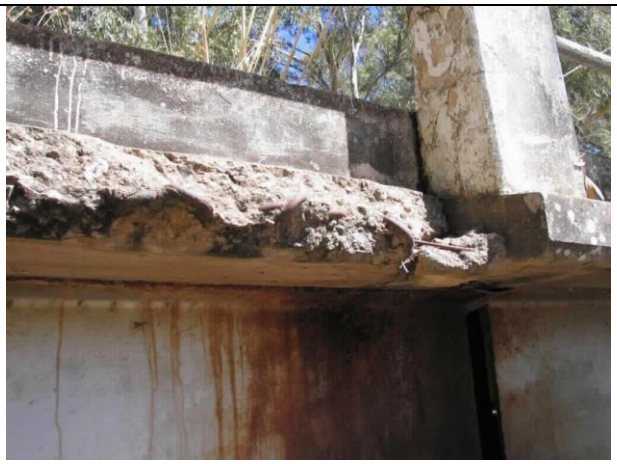
Condition state 4 -Description	Photo
• The units may have medium moisture staining and efflorescence powder in the joints, along with moderate staining due to corrosion of transverse tensioning rods. • The asphalt surface may have medium cracking due to differential movement between the units or loss of tensioning force in the transverse rods. • There may be medium cracking and spalling with moderate loss of section of the stressing strands due to corrosion. • Non-prestressed reinforcement may be heavily corroded with moderate section loss. • Impact damage comprising moderate spalls of cover concrete with no significant damage to reinforcement or prestressing strands.	Not available
Condition state 5 -Description	**Photo**
• The units may have heavy moisture staining and efflorescence powder in the joints with heavy rust staining, due to corrosion of the transverse tensioning rods. • The asphalt surface may be badly cracked or broken along the lines of the precast units. • There may be severe cracking and spalling with more severe loss of section of the non-prestressed reinforcement. • Stressing strands may be broken or have moderate section loss due to corrosion. • Transverse tensioning may be loose and the bar anchorages may have popped clear of the recess. • There may be impact damage comprising large spalls of cover concrete and damaged reinforcement or severed prestressing strands.	Not available

12C - Deck / slabs – cast in-situ concrete

This item includes all reinforced concrete decks cast in-situ, including overlays cast non-composite with precast units beneath.

Units
m^2 of exposed surface area

Condition state 1 -Description	Photo
• The deck shows little or no deterioration though there may be some dampness and efflorescence. • Minor cracking due to corroding reinforcement may be present. • The characteristic shrinkage crack down the centre of the flat slab is fine and dry.	 Cast in-situ RC slab deck in good condition
Condition state 2 -Description	**Photo**
• Minor cracking and spalling may be present with corroding reinforcement visible. • Dampness patches and efflorescence powder may be more visible. • The characteristic shrinkage crack along the centre of flat slab bridges is fine and dry.	 Shrinkage cracking in deck

Condition state 3 -Description	Photo
• Moderate cracking and spalling may be present with corrosion of the reinforcement causing minor loss of section in areas. • Dampness patches and efflorescence powder may be more prominent. • The characteristic shrinkage crack along the centre of flat slab bridges is fine with some evidence of moisture. • Deck has some fine crazed cracking but no differential movement between honeycomb sections.	 Deck edge spalling
Condition state 4 -Description	**Photo**
• Moderate cracking and spalling may be present with corrosion of the reinforcement causing moderate loss of section in areas. • Patches of dampness and efflorescence may be large with numerous stalactites and lime flows visible. • The characteristic shrinkage crack along the centre of flat slab bridges may be medium with some moisture and staining around the crack. • Deck has extensive crazed cracking but no differential movement between honeycomb sections.	 Cracking and spalling in all bays of the deck
Condition state 5 -Description	**Photo**
• Severe cracking and spalling may be present with advanced corrosion of the reinforcement over large areas, with more severe loss of section of reinforcement (and any cracking or spalling associated with it). • The characteristic shrinkage crack along the centre of flat slab bridges may be severe with excessive moisture penetration and heavy staining around the crack. • Deck has extensive honeycomb cracking with differential movement between sections of the deck, i.e. lateral load distribution has been greatly affected.	 Deck edges with severe spalling and cracking

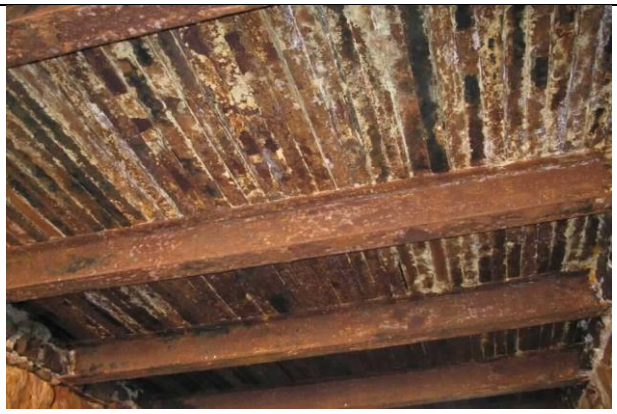
12S - Deck / slabs – steel

This component includes all deck slabs where steel rail or tramline sections are embedded in concrete. The rails may be spanning longitudinally or be placed laterally on top of the steel girders, and may be placed alongside each other or have a sizeable gap between the rails. The rails may be fully embedded or partially buried up to the top of the rail head, with gravel fill placed on top with asphalt or spayed seal. If the depth of gravel fill is approximately 100 mm or more, it should be considered under a separate item, but if it is substantially less it can be considered as part of this component. Long spans may have steel rail distributors, bare or cast in concrete at midspan to provide for lateral load distribution. The distributors may be considered as part of this component.

This component will also include steel plated deck slabs or planks for pedestrian bridges as well as steps leading up to the crossing span.

Units
m^2 of exposed surface area

Condition state 1 -Description	**Photo**
• There is no cracking of the concrete infills. The underside of the rails may have minor rusting. • The deck does not deflect excessively under load.	 Steel rails in concrete deck with only minor rusting of the rails (VicRoads)
Condition state 2 -Description	**Photo**
• There may be fine transverse cracks in the infills at midspan but no longitudinal cracking along the rail/concrete interface. • The rails may be quite rusty but no pitting or corrosion is occurring. • Distributor rails may be slightly loose or there may be minor cracking and spalling of the concrete encasement. • The deck is not deflecting excessively under load.	Not available.

Condition state 3 -Description	Photo
• There may be minor transverse cracks in the infills at midspan but no longitudinal cracking along the rail/concrete interface. • The rails may be quite rusty with slight pitting or corrosion occurring. • Distributor rails may be slightly loose or there may be moderate cracking and spalling of the concrete encasement. • The deck is not deflecting excessively under load. • If thin cover concrete has been cast under the rails then heavy spalling of the cover concrete will occur when the rails rust. This is only of concern when the cover concrete begins to disintegrate in the bearing area.	 Minor corrosion of the rails especially at the ends of deck
Condition state 4 -Description	**Photo**
• There may be medium transverse cracks in the infill concrete coupled with cracking or minor edge spalling along the rail/concrete interface. • Rails may be moderately rusty with moderate to heavy corrosion occurring. • Distributor rails may be quite loose or encasement concrete may be heavily spalled. • The deck may deflect substantially under load due to some loss of lateral distribution. • Cover concrete has cracked, spalled or is crushing under the rails at the bearing areas and a mortar or a neoprene rubber strip will need to be placed under the rails. • Steel deck plates may be loose allowing the plate to move or sit up, causing a tripping hazard for pedestrians. • Steel steps may be loose, well worn or corroded or cracked at the edges or side beam joint.	 Heavy corrosion of rail decking

Condition state 5 -Description	Photo
• Heavy cracking, spalling or crumbling of the infill concrete is occurring with loss of strength and lateral distribution. Consequently the deck is deflecting excessively under load. • The rails may be heavily pitted and corroded. Distributor rails will possibly be very loose or have broken away. • If the rails only have concrete up to the head of the rail, the outer rails may separate from the deck as bond is lost between rail and concrete. • These bridges have much reduced capacity due to lack of lateral distribution. • Holes may be found as concrete is pushed through the deck. • Steel steps may be broken and require replacement or re-welding. • Steel deck plates may be very loose and buckled requiring replacement	 Steel rails heavily corroded and concrete infill cracked and breaking up (VicRoads)

Thin plated deck support - steel

The most common form adopted is heavy gauge steel corrugated decking units spanning transversely over steel or timber girders. Infill material includes weak cast insitu concrete, asphalt and more recently reinforced concrete. Decking sheets have also been placed longitudinally over crossbeams with similar infills. This element also includes a number of deck support plates made of steel or wrought iron. Included are buckle plates, usually held to the beams and braces by riveted connections, with a weak concrete and asphalt seal placed on top or light gauge steel trough decking, generally with asphalt infill. Not included in this item are corrugated iron sheets which are only used as formwork support and not as a structural element.

The infill or decking material should be included with this item as it greatly influences the action and rate of deterioration of the steel decking.

Units

m^2 of exposed surface area

Condition state 1 -Description	Photo
• The steel is in good condition with only minor rusting at the joints. The surfacing or infill is in good condition with no cracking, rutting or potholes. • The decking units are well bolted to the support, or all rivets are good and tight. • Connections between the units are in good condition with no separation.	 Steel trough decking supporting deck material in sound condition
Condition state 2 -Description	**Photo**
• There is rusting and minor corrosion at the joints but all bolting, tap screw connections, welds or rivets are good and tight. • There may be minor cracking and rutting of the asphalt surface.	 Paint failure evident on buckle plate
Condition state 3 -Description	**Photo**
• Moderate corrosion is occurring at the joints and buckle plates are showing minor leakage at the joints. • With trough decking the welds between the units may have minor cracking or some tap screws may be loose with minor separation of the units. • The hold down of the units may be slightly loose allowing too much flexing of the sections. • Asphalt surface may have medium cracking, rutting, small broken up areas or small potholes.	 Corrosion of corrugated steel decking

Condition state 4 -Description	Photo
• Medium corrosion is occurring at the joints. • Buckle plates show moderate leakage at the joints with small stalactites forming. • With trough decking the welds between the units may have moderate cracking or some tap screws may be loose or sheared off with minor separation of the units. • The hold down of the units may be loose allowing too much flexing of the sections. • Asphalt surface may have moderate cracking, rutting, broken up areas or potholes. • Concrete infill may be breaking up allowing excessive moisture penetration.	 Corrosion of steel buckle plate
Condition state 5 -Description	**Photo**
• Heavy corrosion is occurring with holes appearing in the trough decking and concrete or asphalt fill above. • Trough decking units may be separating with many of the joining tap screws broken or missing, may also be cracked transversely to the ribs • Hold down bolts may be completely loose and the sections are flexing up and down under load. • The asphalt surfacing is severely cracked, rutted, or has large badly broken areas and potholes. • Rivets holding the buckle plates in position may have sheared or the edge material of the buckle plates may have sheared. • The buckle plates may have severely corroded with holes appearing. • Large stalactite growths indicate excessive moisture penetration of the severely cracked weak concrete above. • Holding down bolts and/or channels may be severely corroded.	 Severe corrosion and holes in buckle plate

12T - Deck / slabs – timber

This component includes all types of timber decks constructed using fully treated timber and acting as a plate deck. Included in this component are nailed laminated pine decks, stress laminated timber decks and glued laminated timber sheet decks either as a longdecking or crossdecking replacement or as a span replacement.

Units
m^2 of exposed surface area

Condition state 1 -Description	Photo
• The timber may have minor cracks, splits or checks but is fully protected by the preservatives, with no untreated heartwood. • The decks are well bolted to the supports. • Tensioning rods have adequate stressing and there is no damage to the timber at the stressing plates.	 Transverse 'Bridgewood' glued laminated decking in good condition (VicRoads)
Condition state 2 -Description	**Photo**
• Preservative protection may be beginning to dissipate with small leaching of preservative salts (white powder on underside of deck) and with some weathering and rot of timber. • Bolting of the deck may be slightly loose with fine reflective cracks through the asphalt on top. • Tensioning rods should still have adequate stressing and there should be no damage to the timber at the stressing plates.	 Nailed laminated pine decking showing signs of weathering and end decay (VicRoads)

Condition state 3 -Description	Photo
• Preservative protection may have dissipated somewhat with minor leaching of preservative salts and with minor weathering and rot of timber. • Bolting of the deck may be slightly loose with minor reflective cracks through the asphalt on top. • Tensioning rods should still have adequate stressing.	Not available
Condition state 4 -Description	**Photo**
• Further leaching of the preservative is occurring with the timber looking well weathered and rot pockets forming. • Bolting of the decks may be loose and minor corrosion, with medium reflective cracking through the asphalt on top. • With transverse sheeting, reflective cracking may also be occurring due to differential movement between the slabs under loading, or due to inadequate bolting. • Tensioning rods may be losing stress with minor movement or separation of the laminations beginning to occur.	 Nailed laminated pine decking showing signs of separation of the laminations and some loss of preservation salts due to moisture ingress (VicRoads)
Condition state 5 -Description	**Photo**
• Deterioration of the timber may be well advanced with substantial loss of the preservative protection. • Weathering and rot of the timber is severe with some laminations almost rotted out. Bolting of the decks is very poor with excessive movement of the decking. • If small washers were used, the bolts may have punched through the decking which lead to loose panels. • Tensioning rods may be loose with movement and separation of the laminations. • Longitudinal cracking in the asphalt above the laminations will be seen if this is occurring. • The decking will also deflect excessively under load as the lateral distribution has been severely affected.	 'Bridgewood' decking sheets showing edge damage to top ply layers. Bolting is loose with one sheet having lost all intermediate hold down bolts (VicRoads)

13T - Longdecking / crossdecking – timber

This component includes all timber planked decking systems whether the system is longdecking or crossdecking with or without thin longitudinal running planks, though the latter system is generally to be found on lower classified roads. If timber spiking planks are used with the crossdecking, then their condition should also be considered as part of this component.

Units
m^2 of exposed surface area

Condition state 1 -Description	Photo
• The timber is in good condition with only minor checks, splits or weathering having no effect on strength. The longdecking is tightly bolted at the ends and each alternate crossbeam. • Longdecking is continuous over at least 3 crossbeams. Crossdecking is firmly held at each stringer or spiking plank and running planks are firmly held to the crossdecking. • Crossdecking should also span across 3 supports.	 Longdecking in good condition
Condition state 2 -Description	**Photo**
• The timber shows only minor signs of decay, weathering, splitting or checks but does not affect the strength of the members. • Bolted connections may be slightly loose or longdecking is only held down at the ends of the planks. • Crossdecking may be slightly loose or not bolted at each support. • Running planks may be slightly loose or held down at the ends only. Spiking planks are in good condition.	 Crossdecking with minor signs of weathering

Condition state 3 -Description	Photo
• The timber shows moderate signs of decay, weathering, splitting or checks but does not affect the strength of the members. • Bolted connections may be slightly loose or longdecking is only held down at the ends of the planks. • Crossdecking may be slightly loose or not bolted at each support. • Running planks may be slightly loose or held down at the ends only. • The spiking planks may have minor rot, splits or are loose but still serviceable.	 Timber crossdecking generally sound (despite appearance)
Condition state 4 -Description	**Photo**
• Medium decay, weathering, splitting or checks may be present, affecting the strength of the member to a minor extent. • Bolted connections may be loose or the longdecking may only have two supports. • Crossdecking may be rotting beneath the running planks, or may only have 2 supports, or may be allowing the member to move excessively under load. • Running planks may be split with sections broken away or the planks split in half. • The spiking planks may have moderate rot, splits or are loose but still serviceable.	 Timber crossdecking in poor condition with edge rot
Condition state 5 -Description	**Photo**
• The member is heavily damaged, weathered, split or rotted which affects the strength of the member. • Ends of the longdecking may be in poor condition and bolting may be completely loose allowing the member to flap up and down when loaded. • Crossdecking may be severely rotted under the longdecking or may be completely loose. • Running planks are split, broken or completely loose. • The spiking planks may be split in two and no longer effective or they may have fallen out completely.	 Hole in timber crossdecking

14P - Girders – closed web / box girder – precast concrete

This component includes all closed web or box girder bridges constructed of precast units and includes segmental post tensioned box girders and precast prestressed bath tub beams with a cast-in-situ deck to form the closed box shape. This component includes the deck whether precast with the box or cast in-situ at a later date.

Units
m^2 of exposed surface area

Condition state 1 -Description	Photo
• There may be only minor cracking of the units due to corroding reinforcement or lack of distribution reinforcement but definitely no spalling or cracking of a structural nature or exposure of stressing ducts. • Some minor discolouration or white efflorescence powder may be visible at the former lifting holes.	 Hint of efflorescence and discolouration on underside of box
Condition state 2 -Description	**Photo**
• There may be a few minor cracks or spalls due to corroding reinforcement in locations but there should be no exposure of any stressing tendons or stressing ducts. • Some minor discolouration or white efflorescence powder may be visible at a few joints between the precast units.	 Minor spalling

Condition state 3 -Description	Photo
• There may be some spalling in isolated areas with the stressing tendons or stressing ducts exposed but with little or no corrosion occurring. • Other exposed reinforcement may have minor corrosion of the bars in isolated areas.	 Exposed reinforcement in girder end block
Condition state 4 -Description	**Photo**
• There may be some delamination or spalling in isolated areas with the stressing tendons or stressing ducts exposed with minor corrosion occurring. • Other exposed reinforcement may have moderate corrosion of the bars in isolated areas.	Not available
Condition state 5 -Description	**Photo**
• There may be severe cracking due to structural defects or advanced corrosion of the reinforcement. • Delamination or spalling is present in large areas with heavy corrosion of reinforcing bars. • Stressing tendons exposed in the spalled areas may have moderate corrosion. Some strands may also be broken or there may be heavy cracking or failure at the anchorages. • There may also be lateral cracking of the underside of the box at the midspan or heavy cracking in the deck above the supports.	Not available

14C - Girders – closed web / box girder – cast in-situ concrete

This component includes all cast-in-situ, post tensioned concrete box girder and voided slab bridges, and includes the deck as part of the component. Voided slab bridges can be recognised by their shallow depth compared to a box girder. These structures are generally built on, or over freeways and are well suited to spans of 34 to 40 metres. Voided slabs greater than 35 metres will generally have a variable depth due to their massive dead load compared with box girders.

Units
m^2 of exposed surface area

Condition state 1 -Description	**Photo**
• There may be minor cracking of the girder or deck due to corroding reinforcement or a lack of distribution reinforcement, but there should be no structural cracking or spalling. • Minor discolouration of efflorescence powder may be visible in a few locations.	 Minor cracking in voided slab
Condition state 2 -Description	**Photo**
• There may be a few minor cracks or spalls due to corroding reinforcement in locations but there should be no exposure of the stressing ducts. • Some minor discolouration or white efflorescence powder may be visible in a few locations.	 Cracking in voided slab repaired with epoxy, performing satisfactorily

Condition state 3 -Description	Photo
• There may be some spalling in isolated areas with the stressing tendons or stressing ducts exposed but with little or no corrosion occurring. • Other exposed reinforcement may have minor corrosion of the bars in isolated areas.	 Spalling to voided slab girder edge
Condition state 4 -Description	**Photo**
• There may be some delamination or spalling in isolated areas with the stressing tendons or stressing ducts exposed with minor corrosion occurring. • Other exposed reinforcement may have moderate corrosion of the bars in isolated areas.	Not available
Condition state 5 -Description	**Photo**
• There may be severe cracking due to structural defects or advanced corrosion of the reinforcement. • Delamination or spalling is present in large areas with heavy corrosion of reinforcing bars. • Stressing tendons exposed in the spalled areas may have moderate corrosion. Some strands may also be broken or there may be heavy cracking or failure at the anchorages. • There may also be lateral cracking of the underside of the box at the midspan or heavy cracking in the deck above the supports.	Not available

14S - Girders – closed web / box girder – steel

This component includes all closed web steel box girder bridges with concrete or steel deck closing the top of the box or boxes. The steel may be painted or galvanized. The component does not include the deck.

Units
m^2 of exposed surface area

Condition state 1 -Description	Photo
• The paint system is generally sound with minor chalking, peeling or curling but no exposure of the metal. • All welds or bolts are in good condition with no corrosion, cracking or loose bolts.	 Steel box girders in good condition
Condition state 2 -Description	**Photo**
• Light rust spotting of the paint system to the surface area is occurring and the paint system is losing effectiveness. No corrosion or section loss has occurred. • All welds or bolts are in good condition with no cracking, corrosion or loose bolts.	 Surface rust on girder floor

Condition state 3 -Description	Photo
• Minor rust spotting of the paint system to the surface area is occurring and the paint system is no longer effective. Minor corrosion has occurred but has not affected the strength of the member as a whole. • Nuts and bolts are in fair condition and are still tight and no cracking of welds has occurred.	 Rust on floor of girder caused by water ponding
Condition state 4 -Description	**Photo**
• Some surface pitting present and active corrosion is occurring in isolated areas, but no significant loss of area is occurring to affect the strength of the member as a whole. • Paint system has broken down with moderate surface rusting and pitting present in a number of locations. • Nuts and bolts may be corroded but are still tight and no cracking of welds has occurred.	 Nut missing from stiffener inside box
Condition state 5 -Description	**Photo**
• Corrosion is well advanced and significant loss of section has definitely occurred which may have a detrimental effect on the strength of the member e.g. a flange badly corroded over much of its length. • Welds may be cracked. Nuts or bolts are severely corroded and possibly no longer functioning to full capacity. There is distortion of webs/soffit as a result of vehicular impact. • Protection coating system is completely lost	 Collision damage to box girder

15P - Open girders / stringers – precast concrete

Units
m^2 of exposed surface area

This item includes a variety of girders developed over the years using reinforced and prestressed concrete. The vast majority are pretensioned, prestressed concrete members; however, post-tensioned girders, including some segmental constructions, have also been adopted. This component description includes:

- standard precast high strength reinforced concrete 'I' beams and prestressed concrete 'I' beams
- non-standard 'I' girders (including segmental constructions)
- standard NAASRA 'I' sections
- prestressed inverted 'T' beams (developed for use on structures crossing freeways, as the bottom of the flanges when placed against each other formed an aesthetically pleasing flat undersurface to the overpass)
- bulb-T (basically a thickened I section with a 1.2 m wide top flange – some units have been constructed segmentally)
- super-T (a trapezoidal beam with an integral 2.0 m wide top flange developed by VicRoads).

Reinforced concrete beams

Condition state 1 -Description	Photo
• The girders are in good condition with only very minor cracking due to corroding reinforcement, shrinkage, lack of curing.	 Precast high strength reinforced concrete "I" beams in good condition (VicRoads)

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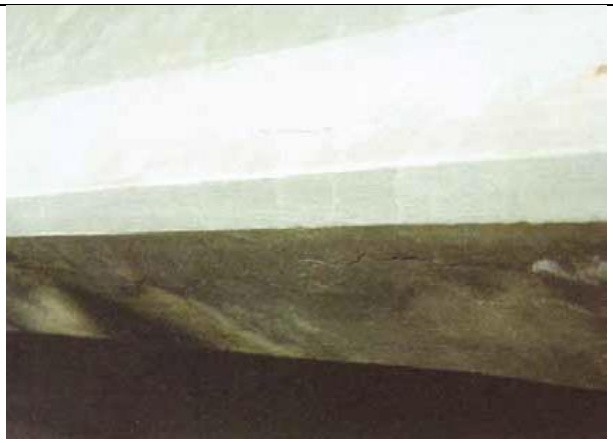
Condition state 2 -Description	Photo
• Flexural cracking and cracking due to reinforcement corrosion is fine though no rust staining is visible in the cracks. • A few minor spalls may be present. • Fine cracking may have occurred at the bearing areas of the beam.	 Fine flexural cracking between 0.1 mm to 0.3 mm with no rust staining evident (VicRoads)
Condition state 3 -Description	**Photo**
• Flexural cracking and cracking due to reinforcement corrosion is minor with slight rust staining visible in the cracks. • Minor spalling is present. • Minor cracking may have occurred at the bearing areas of the beam.	 Cracking along side and underside of reinforced concrete “I” beam (VicRoads)
Condition state 4 -Description	**Photo**
• Flexural cracking has increased with cracks in the medium size. • Cracking due to reinforcement corrosion is medium and a number of spalls may have occurred, and/or heavy rust staining is present at the cracks. • Where reinforcement is close together, some delamination of the concrete may have occurred. • Moderate loss of section of corroding reinforcement is evident. • Medium cracking may have occurred at the ends of the beam affecting the bearing area of the unit.	 Large spall to underside of reinforced concrete beam, with rust staining and corrosion present

Condition state 5 -Description	Photo
• Corrosion of the reinforcement is well advanced with more severe loss of bar section. • Flexural cracking in the member may be heavy with the beam noticeably deflecting under load. • Severe spalling may have occurred due to corroding reinforcement or at the ends of the beam at the bearing areas.	Not available

Prestressed concrete beams

Condition state 1 -Description	Photo
• The beams are in good condition with only very minor cracking due to corroding reinforcement, shrinkage, lack of curing or prestressing (longitudinal cracks in webs of ends of girder).	 Prestressed beams in good condition
Condition state 2 -Description	**Photo**
• The beams may have minor cracking due to corrosion of reinforcement but there is no rust staining in cracks. • There are a few minor spalls but the stressing strand is not exposed. • Impact damage has not exposed reinforcement (some minor discolouration or efflorescence powder may be visible at joints between segments).	 Minor spalls in bottom flange of prestressed beam

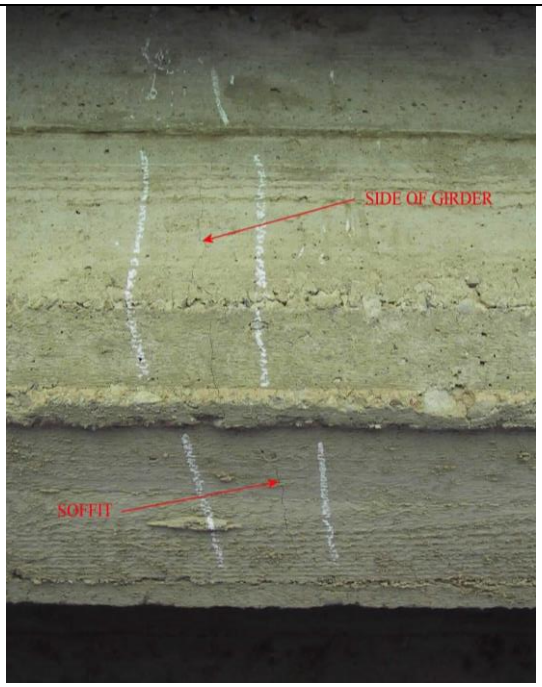
Condition state 3 -Description	Photo
• Crack widths are moderate and a few spalls may have occurred which have exposed stressing strands. • The stressing strands should not show any evidence of corrosion • Light flexural cracking may exist in the beams.	 Spalling to girder
Condition state 4 -Description	**Photo**
• Cracking has increased in size and a few medium spalls or delaminations may have occurred exposing stressing strands and/or heavy rust staining is present at the cracks • The stressing strands should only have very minor corrosion whilst non-prestressed reinforcement may moderate loss of section. • Medium cracking may have occurred at the ends of the beam affecting the bearing area of the unit. • Medium flexural cracks may be evident in beams.	 Medium spalling and broken ligature to girder, caused by overheight train impact
Condition state 5 -Description	**Photo**
• Delaminations, spalls and corrosion of reinforcement are prevalent with more severe loss of reinforcement section. • Exposed stressing strands may have moderate corrosion to their cross section or some strands may have broken. • Heavy cracking or failure of the anchorages may have occurred. • Heavy flexural cracking may be present in the beams or in the deck above the supports. • Severe spalling may have occurred due to corroding reinforcement or at the ends of the beam at the bearing areas.	 Severe spalling along bottom of beam with corroding reinforcement (VicRoads)

15C - Open girders / stringers – cast in-situ concrete

This component includes all reinforced concrete beams cast in-situ using varying depth beams continuously over pier supports with a larger central span.

These structures are generally continuous monolithic small span bridges with the longest span being approximately 13 m (beam shape is always rectangular).

Units
m^2 of exposed surface area

Condition state 1 -Description	Photo
• The girders have minor fine cracking due to corroding reinforcement but there should be no shear cracking or spalling of the concrete. • Hair line cracking may exist at the built-in supports or fine vertical shrinkage cracks may appear in the beams due to the locked up movements of the structure.	 Variable depth cast-in-situ RC T-beams in good condition with diaphragm bracing at quarter points of span (VicRoads)
Condition state 2 -Description	**Photo**
• The girders may have fine flexural and/or shear cracking. • Vertical shrinkage cracks and cracking at built-in supports may be fine. • Longitudinal cracking along the bottom of the beams due to reinforcement corrosion may be of fine size with minor spalling. • The ends of simply supported beams may have minor cracking in the bearing areas due to the bearings or locating dowels.	 Fine flexural cracking between 0.1 mm to 0.3 mm with no rust staining evident

Condition state 3 -Description	Photo
• Flexural cracking and shear cracking may be moderate with minor cracking along the beam deck joint. • Moderate vertical shrinkage cracks and cracking at built-in supports may be present • Longitudinal cracking may be moderate along the bottom of the beams due to reinforcement corrosion and there may be moderate spalling • Exposed reinforcement may have some corrosion with only minor section loss in areas. The beams may have moderate cracking in the bearing areas at the ends of the beams.	 Spall with exposed reinforcement at underside of girder
Condition state 4 -Description	**Photo**
• Flexural cracking and shear cracking may be medium sized with moderate cracking along the beam deck joint. • Vertical shrinkage cracks and cracking at built-in supports may be medium in size. • Longitudinal cracking may be medium along the bottom of the beams due to reinforcement corrosion and there may be large spalls with delaminated cover concrete. • Exposed reinforcement may have heavy corrosion with moderate section loss in areas. The beams may have medium cracking in the bearing areas at the ends of the beams.	 Heavy spalling along underside of beam with heavy corrosion of reinforcement
Condition state 5 -Description	**Photo**
• Flexural and shear cracking may be heavy with medium cracking along the beam/deck joint. • Vertical shrinkage cracks and cracking at built-in supports may be heavy in size. • Severe spalling or delamination of the underside of the beams may be occurring, with heavy corrosion of the reinforcement with more severe section loss in areas. • The beams may have heavy cracking in the bearing area with severe loss of bearing support.	 Severe spalling and heavy corrosion with significant loss of section

15S - Open girders / stringers – steel

This component includes all girders constructed of wrought iron or steel. The girders may be rolled sections, welded plate girders, riveted girders constructed of plates and angles, or lattice girders using flat sections crossing each other to form the vertical web/webs. Metal may be painted or galvanised.

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.	 Steel girders in good condition
Condition state 2 -Description	**Photo**
• Light spot 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. • All welds, bolts or rivets are in good condition with no movement of plates or sections in the component.	 Paint starting to show rust in top and bottom flange areas

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. • Some surface pitting may be present. • Minor corrosion has occurred in isolated areas but no loss of section area has occurred which would affect the strength of the member. • Nuts and bolts are in fair condition and are still tight and no cracking of welds has occurred.	 Rusted flanges and webs
Condition state 4 -Description	**Photo**
• The paint or galvanising system has completely broken down with surface pitting in locations. • Active corrosion may be occurring in isolated areas but no loss of section area has occurred which would affect the strength of the member. • Nuts and bolts may be corroded but are still tight and no cracking of welds has occurred. • Riveted plates may have very minor movements of 1 to 2 mm but rivets are generally sound.	 Pitting corrosion of girder especially at end
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 of made up girders. The paint or galvanising system has completely broken down.	 Severe corrosion of girder at ends, with significant flange loss and perforation of web

16S - Deck truss – steel

This component includes all steel or wrought iron trusses that are below the deck level of the roadway. The component includes all truss chords, verticals, crossbraces and windbracing. This component does not include crossbeams or floorbeams supporting the roadway.

Units
m^2 of exposed surface area

Condition state 1 -Description	Photo
• The paint system is generally sound with minor chalking, peeling or curling but no exposure of the metal. • All welds or bolts in good condition with no corrosion, cracking or loose bolts.	 Steel deck truss in good condition

Condition state 2 -Description	Photo
• Rust spotting of the paint system is occurring and the paint system is losing effectiveness. • No corrosion or section loss has occurred. • Welds or bolts are in good condition with no cracking, corrosion or loose bolts. • Isolated pigeon droppings in bottom chords of truss	 Rust spotting of rivet in truss top chord  Rust spots bottom truss chord

Condition state 3 -Description	Photo
• Surface rust or minor pitting has formed or is forming and the paint system is no longer effective. There is no measurable loss of section • All welds, bolts and rivets are in sound condition • There are no cracks in the steel • Significant build-up of pigeon droppings and/or nests in bottom chords of truss	 Corrosion and rivets missing in top chord of truss
Condition state 4 -Description	**Photo**
• Active corrosion is occurring in isolated areas, but no loss of area is occurring to affect the strength of the member as a whole. • Paint system has broken down with surface pitting present in a number of locations. • Nuts and bolts may be corroding but are still tight and no cracking of welds has occurred.	 Corrosion of flange of top chord of truss
Condition state 5 -Description	**Photo**
• Corrosion is well advanced and some loss of section has definitely occurred which may have a detrimental effect on the strength of the member, i.e. a flange badly corroded over much of its length. Welds may be cracked. • Nuts or bolts are severely corroded and possibly no longer functioning to full capacity. • Paint system has completely broken down.	 Corrosion of truss top chord and rivets missing  Heavy corrosion and pitting of truss at support

17P - Arches – precast concrete

This component includes all precast reinforced concrete arches either in whole sections or with pin joints. Bowstring and spandrel arches are the main type of arch used to pass road or rail traffic through. Smaller three pin arches or units used specifically to allow water or cattle traffic through shall be considered as culverts.

Units
m^2 of exposed surface area

Condition state 1 -Description	Photo
• The component shows only fine cracking, scaling or efflorescence having no effect on strength. • Shape, line and level of the arch units is good and straight. • The concrete footing and base slab are in good condition with no cracking or spalling.	 Precast concrete arch in good condition.
Condition state 2 -Description	**Photo**
• The component may have slight cracking and spalling due to corroding reinforcement, or simply a construction joint opening up. • There may be patchy scaling of the concrete surface with an increase in white efflorescence powder on the surface. • Shape, line and level of the arch units should be good and straight. • The footing may have minor cracking and spalling due to corroding reinforcement, but no cracking due to movement or differential settlement.	 Chipping in edge of precast unit

Condition state 3 -Description	Photo
• The component may have minor cracking and spalling due to corroding reinforcement, or simply a construction joint opening up. • Scaling of the concrete surface may be in larger patches with increased white efflorescence powder on the surface. • Shape, line and level of the arch units should be good and straight. • The footing may have moderate cracking and spalling due to corroding reinforcement, or fine cracking due to slight movement or differential settlement.	 Efflorescence due to leaking construction joints
Condition state 4 -Description	**Photo**
• The component may have medium cracking and spalling due to corroding reinforcement. • Scaling and efflorescence may be prevalent. • The arch may be beginning to lose shape with a flat spot at the top due to movement of a footing, or there may be minor cracking due to differential movement of the foundations.	Not available
Condition state 5 -Description	**Photo**
• There may be heavy cracking and spalling due to corroding reinforcement. • The arch may have lost shape with a large flat spot due to movement of a footing, or there may be heavy cracking due to differential settlement of the foundations. • Accident damage may be severe and having a definite effect on the structure.	Not available

17C - Arches – cast in-situ concrete

This component includes all cast in-situ reinforced concrete arches and small portal bridges built pre 1950. Large freeway "portal" bridges may be considered as monolithic structures built according to their superstructure type i.e. flat slab, box girder or voided slab bridges.

Units
m^2 of exposed surface area

Condition state 1 -Description	Photo
• The component shows only fine superficial cracking, scaling or efflorescence having no effect on strength.	 Cast-in-situ concrete arch in good condition
Condition state 2 -Description	**Photo**
• The component may have slight cracking and spalling due to corroding reinforcement, or there may be a fine horizontal crack in the portal wall at the thickening, due to earth pressures on the walls or simply a construction joint opening up. • There may be patchy scaling of the concrete surface with an increase in white efflorescence powder on the surface.	 Minor crack along arch centreline

Condition state 3 -Description	Photo
• The component may have minor cracking and spalling due to corroding reinforcement, or there may be a minor horizontal crack in the portal wall at the thickening, due to earth pressures on the walls or simply a construction joint opening up. • Scaling of the concrete surface may be in larger patches with an increase in white efflorescence powder on the surface.	 Deck spall and efflorescence on arch soffit
Condition state 4 -Description	**Photo**
• The component may have moderate cracking and spalling due to corroding reinforcement or there may be a medium size horizontal crack in the portal wall at the thickening. • In arches there may be leakage, staining and spalling at the arch/side wall joint due to wet fill inside the arch. • Scaling and efflorescence may be prevalent. • The arch may be beginning to loose shape with a flat spot at the top due to movement of a footing, or there may be cracking due to slight differential movement of the foundations.	 Exposed reinforcement and spalling in the arch soffit
Condition state 5 -Description	**Photo**
• There may be heavy cracking and spalling due to corroding reinforcement or horizontal cracking in the portal wall at the thickening. • Scaling and efflorescence may be prevalent and leakage at the arch/side wall joint may be excessive. • The arch may have lost shape with a large flat spot due to movement of a footing, or there may be heavy cracking due to differential settlement of the foundations. • Accident damage may be severe and having a definite effect on the structure.	 Concrete arch cracked and broken at crown (VicRoads)

17S - Arches – steel

This component includes all large corrugated multi-plate arches, Superspans, Nova spans or multi-plate underpasses used to pass road or rail traffic through. Smaller units or units used specifically to allow water or cattle traffic through shall be considered as culverts.

Units
m^2 of exposed surface area

Condition state 1 -Description	Photo
• The component shows no corrosion of the metal. • Any concrete at the base of the arch is in good condition with no cracking or spalling. • There is no evidence of plate buckling or seam shearing. • All bolts connecting the multi-plates are in good condition and are tight. • No distortion of arch shapes with attendant change in dimensions is evident. • There is no damage to the component from vehicular traffic.	 Corrugated steel arch in good condition
Condition state 2 -Description	**Photo**
• The component may show light spot rusting. • All bolts are tight with no movement of the plates. • There is no damage to the component from vehicular impact. • Any concrete at the base of the arch may have minor cracking or spalling due to corroding reinforcement but there should be no cracking due to settlement of the foundations. • No distortion of the arch shape is discernible; however, there may be a slight change in dimensions.	 Corrosion at isolated locations due to seepage through bolt holes

Condition state 3 -Description	Photo
• The component may show minor spot rusting. • All bolts are tight with no movement of the plates. • Accident damage from vehicles is minor and does not affect the structure. • Any concrete at the base of the arch may have moderate cracking or spalling due to corroding reinforcement or it may have fine cracking due to minor differential settlement of the foundations. • No distortion of the arch shape is discernible; however, there may be a minor change in dimensions.	 Impact damage but not affecting the structure
Condition state 4 -Description	**Photo**
• The component may show rusting and areas of minor corrosion. Some bolts may be a little loose and some plates may have slipped slightly. • The plate around some bolts may be damaged or torn allowing distortion to occur. • The arch span may have increased by in size since last inspection. • The arch may be developing a small flat spot due to movement of a footing. • Accident damage from vehicles is moderate with insignificant effect to the structure. • Any concrete at the bottom of the arch may have medium cracking and spalling due to corroding reinforcement or it may have minor cracking due to differential settlement of the foundations.	 Rusting and areas of minor corrosion

Condition state 5 -Description	Photo
• The component may have heavy rusting and corrosion. • Some bolts may have pulled loose and plates have moved or bolts have pulled through the plates. Plates may have crinkled at the bolt line or may have bulged due to earth pressures. • Accident damage may be severe and have a definite effect on the structure. • Concrete at the base of the arch may have heavy cracking and spalling due to corroding reinforcement or moderate differential settlement cracking. • The arch span may have increased significantly since the last inspection and gross distortion of the arch shape is evident. • The arch may have a large flat spot at the top due to movement of a footing.	Not available

17O - Arches – other

This component includes all arch bridges constructed of masonry or red brick which have earth fill inside. The condition of the road surface should be considered under a separate item and not included as part of this item. The arch sidewalls however should be included as part of this item.

Units
m^2 of exposed surface area

Condition state 1 -Description	Photo
• The component shows little or no deterioration with no cracking of mortar or loss of mortar between the blocks. • There may be small areas of dampness and efflorescence.	 Masonry arch in good condition
Condition state 2 -Description	**Photo**
• There may be minor cracking of the mortar or minor loss of mortar between the blocks, but not sufficient to affect the strength of the arch. • The shape of the arch is still good and there is no cracking or bulging of the sidewalls. • There may be large areas of dampness and efflorescence.	 Circumferential cracking between blocks
Condition state 3 -Description	**Photo**
• There may be minor cracking or loss of mortar between blocks which has a minor effect on the strength of the arch, but not of sufficient magnitude to cause concern. • Some soffit blocks may have started to slip marginally due to the loss of mortar. • Minor settlements, movements, loss of arch shape, or cracking may be present, but not of sufficient magnitude to cause concern.	 Fretted mortar and weathering of stone in crown

Condition state 4 -Description	Photo
• There may be moderate cracking or loss of mortar between blocks which has a moderate effect on the strength of the arch. • Some soffit blocks may have slipped slightly due to the loss of mortar. • Moderate settlements, movements, loss of arch shape, or cracking and minor bulging of the sidewalls may be present, but not of sufficient magnitude to cause concern.	 Loose and missing mortar, with stone missing in arch soffit
Condition state 5 -Description	**Photo**
• There may be severe cracking or loss of mortar between blocks which has a significant effect on the strength of the arch. • Some soffit blocks may have slipped significantly and some blocks may have cracked through or edges broken off. • Abutments or piers may have settled or moved significantly causing a loss of shape of the arch. • Differential settlement of the foundations may have also caused heavy cracking along the arch soffit. • Earth pressure on the sidewall may have caused heavy cracking, movement or large bulging of the blocks to occur.	 Large crack and heavy mortar loss in masonry arch side wall

18C - Diaphragms / bracing – cast in-situ concrete

This component includes cast in-situ reinforced concrete end of deck stiffening and deep diaphragms between "I" and "T" beams. In monolithic cast-in-situ flat slab bridges this component includes the deck thickening beam at the pier supports.

Units
m^2 of exposed surface area

Condition state 1 -Description	Photo
• The components are in good condition with only very minor fine cracking visible. • There may be minor dampness or efflorescence powder visible in a few locations.	 Diaphragm with minor fine cracking
Condition state 2 -Description	**Photo**
• There may be a few minor cracks or spalls due to corroding reinforcement. • End of deck stiffener may be damp and stained due to excessive moisture penetration of the deck joints, and efflorescence powder may be visible in numerous areas. • In monolithic structures there may be slight cracking of the tops of the columns or at the bearing areas of expansion type piers.	 Minor cracks in diaphragm

Condition state 3 -Description	Photo
• There may be moderate cracks or spalls due to corroding reinforcement. • End of deck stiffener may be damp and stained due to excessive moisture penetration of the deck joints, and efflorescence powder may be more prevalent in numerous areas. • In monolithic structures there may be minor cracking of the tops of the columns or at the bearing areas of expansion type piers.	 Spalled diaphragm over pier
Condition state 4 -Description	**Photo**
• Medium cracking and spalling may be present along with possible delaminated areas due to corroding reinforcement. • Exposed reinforcement may have moderate section loss in isolated areas. • Local spalling or cracking may have occurred as a result of obstructions being trapped in expansion joint gaps or insufficient gap provision for free expansion. • In monolithic structures there may be medium cracking or spalling in the bearing areas of expansion type piers, or at the column/diaphragm joint of fixed type piers.	 Medium spalling and exposure of corroded reinforcement in diaphragm
Condition state 5 -Description	**Photo**
• Severe cracking, spalling or large delaminated areas exist with heavily corroded steel visible with more severe loss of section of reinforcement. • Entire sections of end diaphragms may have spalled as a result of obstructions trapped in expansion joint gaps or insufficient gaps for free expansion. • Monolithic structures may have heavy spalling in the bearing areas with loss of bearing area greater than 40%.	 Severely spalled diaphragm over column support with heavily corroded steel reinforcement

18S - Diaphragms / bracing – steel

This component includes all stiffening devices for the ends of the deck and between steel girders and includes wind bracing of large girder bridges. The diaphragms may have stud connectors into the deck to support and stiffen the ends of the deck. Bracing may be simple steel rods, straps or small angles crossing between the girders, or be heavy channel connectors between the beam webs. Wind bracing may be by steel angles or steel rods.

Units
m^2 of exposed surface area

Condition state 1 -Description	Photo
• The paintwork is generally sound with only minor chalking, peeling or curling, but no exposure of the metal. • All welds, bolts and rivets are in good condition. • Distance between adequate bracing is no more than 5 or 6 metres unless the RSJs have a composite reinforced concrete deck.	 Steel bracing between beams in good condition
Condition state 2 -Description	**Photo**
• Light spot rusting of the paint system is occurring and the system starting to lose effectiveness. • No corrosion has occurred as yet. No cracking of welds has occurred, but there may be some minor rusting of nuts or bolts. • Bracing may be too far apart to adequately stiffen girders, or bracing may be too light if deck is not solid.	 Light rusting on steel channel bracing

Condition state 3 -Description	Photo
• Spot rusting of the paint system is increasing and the system is no longer effective. • Light corrosion has occurred. No cracking of welds has occurred, but there may be some moderate rusting of nuts or bolts. • Bracing may be too far apart to adequately stiffen girders, or bracing may be too light if deck is not solid.	 Cross bracing is rusty with light corrosion
Condition state 4 -Description	**Photo**
• The paint system has broken down with corrosion and pitting in areas. • Nuts and bolts may be corroded with minor loss of tension in bolt. • Welds may be cracked with minor loss of effectiveness. • Bracing is far too light or inadequate, offering little effect in stiffening of the superstructure, especially if deck is not concrete. • Lateral bowing of girders may be evident under load.	 Corroded cross bracing
Condition state 5 -Description	**Photo**
• Corrosion is well advanced, having a definite detrimental effect on the strength of the element. • Braces are inadequate or have broken loose or buckled and the girders are bowing noticeably under load. • There may be no transverse distribution of wheel loads and the girders are acting independently. • Bolts or rivets may be missing. Splice joint bolts may be loose (can be loosened by a spanner). • The paint system has completely broken down.	 Heavy corrosion to cross bracing

19C - Load bearing diaphragms – cast in-situ concrete

This component defines the load bearing diaphragms constructed using reinforced or prestressed concrete which are integral with the superstructure beams and visible to the inspector. These diaphragms are used as a means of joining precast beams to provide continuity over the pier supports, and the diaphragm is used to support the beams on the pier or columns below. Those load bearing diaphragms built-in to box girders or voided slab bridges and are not visible should be considered as part of the superstructure and are not to be included in this component.

Units
m^2 of exposed surface area

Condition state 1 -Description	Photo
• The load bearing diaphragm is in good condition with only minor cracking due to corroding reinforcement. • The crossheads should have no flexural or shear cracking.	 T-girders joined by load bearing diaphragms for continuity over the piers

Condition state 2 -Description	Photo
• The load bearing diaphragms may have minor cracking and spalling due to corroding reinforcement. • There may be some very fine flexural or shear cracks. No stressing strands should be exposed. • Minor cracking at prestressing anchorages may be evident.	 Cracking between precast girder (left) and cast-in-situ diaphragm (right), with separation of the girder from the common steel bearing plate (VicRoads)

Condition state 3 -Description	Photo
• Moderate cracks, spalls and possible delaminations may be present with exposed reinforcement having moderate corrosion with possible minor section loss. • There may be some slight flexural or shear cracks. No stressing strands should be exposed. • Moderate cracking at prestressing anchorages may be evident.	Not available
Condition state 4 -Description	**Photo**
• Medium cracks, spalls and possible delaminations may be present with exposed reinforcement being heavily corroded with moderate section loss. • Stressing strands may be exposed with only minor corrosion. • Flexural cracking may be medium sized but shear cracks should only be fine. • Medium cracking or spalling may be evident at prestressing anchorages.	Not available
Condition state 5 -Description	**Photo**
• Severe cracking, spalling or large delaminations may exist with heavily corroded reinforcement with more severe section loss. • Flexural cracking may be heavy but shear cracks should only be medium sized. • Exposed stressing strands may have moderate section loss. • Anchorage efficiency is materially compromised by severe cracking and spalling.	Not available

19S - Load bearing diaphragms – steel

This component defines those load bearing diaphragms constructed using steel which are integral with the superstructure and visible to the inspector. These diaphragms are used as a means of joining the steel girders or boxes to provide continuity over the pier supports, and the diaphragm is used to support and distribute the loads to the pier or columns below. If the load bearing diaphragm is built-in to the steel box and is not externally visible to the inspector, it should be considered as part of the superstructure and not included in this component.

Units
m^2 of exposed surface area

Condition state 1 -Description	**Photo**
• The load bearing diaphragm is in good condition with no deterioration of the welds or bolts. • The paint system is in good condition with only minor chalking, peeling or curling, but with no exposure of the metal.	 Steel diaphragm 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.	Not available

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. • No cracking of welds has occurred, but there may be some moderate rusting of nuts or bolts.	 Minor corrosion on diaphragms (VicRoads)
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. • Nuts and bolts may be corroded with moderate loss of tension in the bolt. • Welds may be cracked with minor loss of effectiveness.	Not available
Condition state 5 -Description	**Photo**
• Corrosion is well advanced having a detrimental effect on the strength of the component. • The paint system has completely broken down with corrosion and pitting in areas.	Not available

20S - Propping – steel

Units
Each

This component comprises steel compression members (props, shores, struts) installed so that satisfactory structural performance is achieved for the prevailing road traffic loading.

The props are often installed as a short-term solution to an immediate problem, but can remain at a site for a number of years.

Condition state 1 -Description	**Photo**
• The steel is in good condition with only spot rusting. • If painted, 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.	 Steel props in very good condition
Condition state 2 -Description	**Photo**
• Spot rusting to the surface area is occurring and the paint system is losing effectiveness. • No corrosion of the section has occurred. • There is no deformation of the steel props.	 Steel propping in good condition

Condition state 3 -Description	Photo
• Surface rusting is occurring and the paint system is no longer effective. • Minor corrosion has occurred in isolated areas but no loss of section area has occurred which would affect the strength of the propping. • Connections are in fair condition and are still tight and no cracking of welds has occurred. • There may be a build up of debris around the propping.	 Surface rusting of props  Acrow props with light debris build up
Condition state 4 -Description	**Photo**
• The paint or galvanising system has completely broken down with surface pitting in locations. • Active corrosion may be occurring in areas but no loss of section area has occurred which would affect the strength of the propping. • Nuts and bolts may be corroded but are still tight and no cracking of welds has occurred.	 Corrosion at base of prop
Condition state 5 -Description	**Photo**
• Corrosion is well advanced and loss of section has occurred having a detrimental effect on the strength of the propping. • 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.	 Prop is not supporting girder, with 10mm gap evident

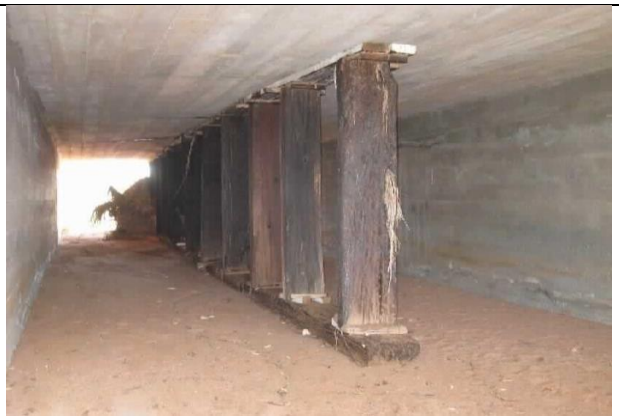
20T - Propping – timber

Units: **Each**

This component comprises timber compression members (props, shores, struts) installed so that satisfactory structural performance is achieved for the prevailing road traffic loading.

The props are often installed as a short-term solution to an immediate problem, but can remain at a site for a number of years.

Condition state 1 -Description	Photo
• Props are in good condition and connections to deck and floor are good.	 Timber propping in good condition
Condition state 2 -Description	**Photo**
• Props are generally in good condition but may have minor deterioration but not affecting strength. • There is no deformation of the props.	 Props with minor deterioration but not affecting structural integrity

Condition state 3 -Description	Photo
• Props are in fair condition but may have moderate deterioration although no significant impact on strength at this stage. • Any packing (wedges, blocks, shims etc) are still tight and in good position. • There is no deformation of the propping. • There may be a build up of debris against the propping.	 Timber propping in overall fair condition
Condition state 4 -Description	**Photo**
• Props (or packing) may be loose and not engaged with the deck. • There may be slight deformation of the propping. • Props could have major splitting and/or large areas of rot that may impact on strength if not treated. • Remediation and/or replacement required before next inspection.	 Timber prop starting to fail
Condition state 5 -Description	**Photo**
• Props have significant deterioration and without treatment or replacement in the short term will affect the load carrying capacity of the structure. • Props may be missing.	 Missing prop

20O - Propping – other

Units
Each

This component comprises compression members (props, shores, struts) constructed of masonry, brick or other material and installed so that satisfactory structural performance is achieved for the prevailing road traffic loading.

Masonry or brick buttresses should be included here.

Condition state 1 -Description	**Photo**
• Props are in good condition and connections to deck and floor are good.	 Brick buttress in good condition
Condition state 2 -Description	**Photo**
• Props are generally in good condition but may have minor deterioration but not affecting strength. • There may be a number of fine cracks in the mortar joints but no cracking of the blocks or there may be minor loss of mortar of no concern.	 Brick buttress showing previous repairs but still in good condition

Condition state 3 -Description	Photo
• Props are in fair condition but may have moderate deterioration although no significant impact on strength at this stage. • Minor cracking of mortar or loss of mortar may be evident.	 Typical mortar loss in brick buttress
Condition state 4 -Description	**Photo**
• Moderate cracking of mortar or loss of mortar may be evident. • Level of deterioration may have a minor effect on strength.	Not available
Condition state 5 -Description	**Photo**
• Severe cracking or loss of mortar is occurring. • Without treatment in the short term will affect the load carrying capacity of the structure	Not available

PIER

21P - Crossheads – precast concrete (non-integral with superstructure)

This component includes all precast reinforced or prestressed concrete crossheads which are independent of the superstructure. The crossheads will have blockouts above the columns to allow for cast-in-situ full connections for transfer of load and moment to the columns or piles beneath.

Damage to bearing support areas by faulty bearings will be covered under the bearing items.

Units
m^2 of exposed surface area

Condition state 1 -Description	Photo
• There is no deterioration of the components except for possible very minor fine cracks around the cast in-situ connections.	 Precast concrete crosshead in good condition

Condition state 2 -Description	Photo
• The crossheads may have a few minor fine cracks or minor spalls due to corroding reinforcement. • No stressing strands should be exposed in any spall. • There should be no moment cracking in the stressed crossheads. Reinforced crossheads may have fine moment cracking.	 Precast concrete crosshead with minor cracking beneath beam

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. Exposed stressing strands may have only light corrosion. • Stressed crossheads may have fine flexural cracking but not shear cracking. • Reinforced crossheads may have minor flexural cracks and/or fine shear cracks	Not available
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. Exposed stressing strands may have only minor corrosion. • Stressed crossheads may have fine flexural cracking but not shear cracking. • Reinforced crossheads may have moderate flexural cracks and/or minor shear cracks	Not available
Condition state 5 -Description	**Photo**
• Severe cracking or spalling may have occurred with large delaminated areas visible. • More severe loss of section of reinforcement but stressing strands should only have minor loss of section. • Flexural cracking in reinforced crossheads may be severe but in stressed crossheads the flexural cracking should only be moderate. • Shear cracks may be of medium size in reinforced crossheads, or fine in stressed crossheads.	Not available

21C - Crossheads – cast in-situ concrete (non-integral with superstructure)

This component defines those crossheads constructed of cast-in-situ concrete and includes the concrete capping on top of bluestone, grouted rubble or brick walls at both piers and abutments.

Damage to bearing support areas caused by faulty bearings will be covered under the bearing items.

Units
m^2 of exposed surface area

Condition state 1 -Description	Photo
• The crossheads are in good condition with only minor fine cracking due to reinforcement corrosion. • The crossheads should have no moment or shear cracking.	 Crosshead in good condition
Condition state 2 -Description	**Photo**
• The crossheads may have minor spalling due to corroding reinforcement or due to beam friction and bearing directly on the crosshead edges. • Some minor fine cracks due to moment or shear may exist.	 Minor spall in pier crosshead

Condition state 3 -Description	Photo
• Moderate sized cracks, spalls and possible delaminations may exist with exposed corroding reinforcement having minor loss of section. • Flexural cracking may be moderate but any shear cracks should only be fine.	 Moderate spalling at end of crosshead
Condition state 4 -Description	**Photo**
• Medium sized cracks, spalls and possible delaminations may exist with exposed corroding reinforcement having moderate loss of section. • Flexural cracking may be medium sized but any shear cracks should only be fine.	 Severe cracking and rust staining in crosshead (VicRoads)
Condition state 5 -Description	**Photo**
• Severe cracking, spalling or large delaminations may exist with heavily corroded steel reinforcement. • Moment cracking may be severe whilst shear cracks may be moderate sized.	 Heavy shear cracking in crosshead (VicRoads)

21S - Crossheads – steel (non-integral with superstructure)

This component includes all crossheads, which are constructed of steel and are separate from the superstructure above. The steel may be painted or galvanised.

Units
m^2 of exposed surface area

Condition state 1 -Description	Photo
• The crosshead has sufficient size to adequately carry the load of the superstructure and distribute it to the supporting piles or columns. • Painted surfaces should be generally sound with only minor chalking, peeling or curling, but no exposure of metal. • All welds, bolts or rivets are in good condition.	 Steel crosshead in very good condition
Condition state 2 -Description	**Photo**
• Light spot rusting is occurring to the surface area and the paint system is losing effectiveness. • No corrosion has occurred as yet. Welds are in good condition but there may be light rusting of nuts or bolts.	 Steel crosshead with light rusting but no corrosion of the steel. Bolts also lightly rusted. (Pier column also has surface rusting)

Condition state 3 -Description	Photo
• Minor spot rusting is occurring to the surface area and the paint system is no longer effective. • Minor pitting carrion is occurring. • Nut and bolts may have minor corrosion but are still tight. • Welds are in good condition.	 Surface rust but no pitting; welds still ok
Condition state 4 -Description	**Photo**
• The paint system has broken down, and moderate surface rusting to the area and minor pitting corrosion is occurring. • Nut and bolts may have moderate corrosion with only minor loss of tension in the bolt. • Welds may have faint cracking with only minor loss of effectiveness. • Crossheads may be too light to carry the loads imposed on them and may have minor bows or buckles in them.	 Advanced corrosion of crosshead
Condition state 5 -Description	**Photo**
• Corrosion is well advanced having a definite detrimental effect on the strength of the component. • Connecting bolts or nuts may have corroded severely, broken loose or are missing. • Crosshead size may be inadequate with large bows or buckling occurring. • The paint system has completely broken down.	Not available

22C - Crossheads – cast in-situ concrete (integral with superstructure)

This component defines those crossheads using reinforced concrete cast in-situ which is integral with both the superstructure beams and with the substructure walls or columns, especially in old monolithic “T” beam bridges.

Units

m^2 of exposed surface area

Condition state 1 -Description	Photo
• The component is in good condition with only very minor fine cracking visible. • There may be minor dampness or efflorescence powder visible in a few locations.	 Integral crosshead in good condition with no cracking or staining, though beam and deck are cracked and spalled. Construction joint at underside of beam is beginning to enlarge (VicRoads)
Condition state 2 -Description	**Photo**
• There may be a few minor cracks or spalls due to corroding reinforcement but no structural cracking is visible. • There may be fine cracks at the construction joints at the undersides of the beams.	 Moisture and staining of crosshead due to crack at deck/crosshead joint (VicRoads)

Condition state 3 -Description	Photo
• Moderate cracking and spalling may exist due to corroding reinforcement and there may be minor cracking beneath supported beams. • There may be minor loss of section of reinforcement due to corrosion. • Fine cracking may exist at the crosshead/deck joint with evidence of light moisture staining and/or efflorescence visible.	Not available
Condition state 4 -Description	**Photo**
• Medium cracking and spalling may exist due to corroding reinforcement and there may be fine cracking beneath supported beams. • There may be moderate loss of section of reinforcement due to corrosion. • Minor cracking may exist at the crosshead/deck joint with moisture staining and/or efflorescence visible.	 Heavy staining, cracking and spalling at deck/crosshead joint (VicRoads)
Condition state 5 -Description	**Photo**
• Heavy cracking and spalling or large delaminated areas may exist with heavily corroded reinforcement visible, with more severe loss of section. • Medium sized cracking may exist beneath supported beams. • Medium or heavy cracks may exist at the deck/crosshead joint due to lack of moment steel, and heavy moisture staining and efflorescence may be visible.	Not available

23P - Column or pile extensions – precast concrete

This component includes all columns or protruding piles manufactured from precast concrete at either abutments or piers. The precast units may be stressed or reinforced concrete and the component should encompass footings, ties or braces which may be used to stiffen the columns or piles and to distribute the load.

Units
m^2 of exposed surface area

Condition state 1 -Description	Photo
• The piles or columns are in good condition with only minor fine cracking due to reinforcement corrosion. • There should be no moment cracking in the piles or columns. The piles are adequately braced with unsupported height less than 3.5 metres. • Footings, if visible, are in good condition.	 RC columns in good condition
Condition state 2 -Description	**Photo**
• The piles or columns have fine cracking or minor spalling due to corroding reinforcement. • Fine moment cracking may be visible. • Stressing strands should not be exposed. • The piles or columns may not be effectively braced, or the footings, if visible, may have fine cracking or spalling.	 Saw cut in precast RC column

Condition state 3 -Description	Photo
• Moderate cracking and spalling due to corroding reinforcement may be visible with minor loss of section of the bars. • Exposed stressing strands should only have light corrosion. • Minor flexural cracking may be evident especially if bracing or ties are ineffective or non-existent. • The footings, if visible, may have minor cracking or spalling.	 Spalls on pier columns
Condition state 4 -Description	**Photo**
• Medium cracking and spalling due to corroding reinforcement may be visible with moderate loss of section of the bars. • Exposed stressing strands should only have minor corrosion. • Flexural cracking may be moderate sized especially if bracing or ties are ineffective or non-existent. • The footings, if visible, may have medium cracking or spalling.	Not available
Condition state 5 -Description	**Photo**
• Severe cracking and spalling due to corroding reinforcement may be visible with advanced corrosion of the reinforcement with more severe loss of section. • Any exposed stressing strands may have minor section loss. • Flexural cracking may be severe, with bracing or ties totally ineffective or missing. • Footings, if visible, may have heavy cracking and spalling.	Not available

23C - Column or pile extensions – cast in-situ concrete

This component includes all cast-in-situ columns or cast-in-situ extensions on top of driven piles. This component should also encompass footings, ties or braces, which may be used to stiffen the columns or piles and to distribute loads.

Units
m^2 of exposed surface area

Condition state 1 -Description	Photo
• The piles or columns show only minor fine cracking due to reinforcement corrosion. • There should be no flexural cracking in the piles or columns. • The piles are adequately braced with unsupported height less than 3.5 metres. • Footings, if visible, are in good condition.	 Reinforced concrete columns in good condition
Condition state 2 -Description	**Photo**
• The piles or columns have fine cracking or minor spalling due to corroding reinforcement. • Fine flexural cracking may be visible. • The piles or columns may not be effectively braced, or the footings, if visible, may have fine cracking or spalling.	 Minor spalling of reinforced concrete column

Condition state 3 -Description	Photo
• The piles or columns have moderate cracking or spalling due to corroding reinforcement with minor loss of section in the steel bars. • Minor flexural cracking may be evident especially if bracing or ties are ineffective or non-existent. • The footings, if visible, may have minor cracking or spalling.	 Spalling on pier column
Condition state 4 -Description	**Photo**
• The piles or columns have medium cracking or spalling due to corroding reinforcement with moderate loss of section in the steel bars. • Flexural cracking may be moderate sized, especially if the bracing or ties are ineffective or non-existent. • Footings, if visible, may have medium cracking or spalling.	 Major spalling at base of column
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. • Flexural cracking may be severe with bracing or ties totally ineffective or missing. • Footing, if visible, may have severe cracking or spalling.	 Column with heavy spalling and advanced corrosion of reinforcement

23S - Column or pile extensions – steel

This component includes all columns or protruding piles manufactured from steel at either abutments or piers. The steel may be painted or unpainted and should encompass footings, ties and braces which may be used to stiffen the columns or piles and to distribute loads.

Units
m^2 of exposed surface area

Condition state 1 -Description	Photo
• The paintwork is generally in good condition with only minor chalking, curling or peeling, but no metal exposure. • The piles are adequately braced and all connections are in good condition.	 Steel columns in good order with no rust spotting of the paintwork
Condition state 2 -Description	**Photo**
• Painted steelwork has light spot rusting to the surface area and the protective coating is losing effectiveness. • The piles or columns may not be effectively braced or the connections may be slightly loose or corroded. • The footings, if visible, may have fine cracking or spalling. • Unpainted steel piles may be rusted.	 Pier brace buckling and light rusting of surface
Condition state 3 -Description	**Photo**
• Steelwork has minor corrosion and the paint system is no longer effective with minor surface area rusting. • Light surface pitting may be evident but section loss is minimal. Bracing may be ineffective or non-existent and connections may have minor corrosion. • If footings are visible they may have minor cracking and spalling.	 Corrosion on steel column

Condition state 4 -Description	Photo
• Steelwork has medium corrosion and the paint system has failed with moderate surface area rusting. • Surface pitting may be evident but section loss is only minor. Bracing may be ineffective or non-existent and connections may be heavily corroded or loose. • If footings are visible they may have medium cracking and spalling or some loss of support.	 Corrosion at pier top and bracing tie/turnbuckle
Condition state 5 -Description	**Photo**
• Steelwork is heavily corroded with moderate loss of section. • Footings may be heavily cracked and spalled or may have substantial loss of bearing support. • Connections may be very loose or bracing may be missing or totally ineffective. • The paint system has completely failed.	 Heavy corrosion of column

24C - Pier wall – cast in-situ concrete

This component describes pier walls constructed using cast-in-situ concrete and includes any visible footings and any thickening at the top of the wall to accommodate the superstructure bearings. If, however, this thickening cantilevers out from the walls, it shall be considered under the item for crossheads. If the pier is of a hammerhead type with large overhangs, the wall shall be considered as a column and included under that item.

Piers, which have thin infill panels between columns, are not considered under this item. These piers shall be considered as crosshead and column as the infill panels serve no structural purpose.

Units
m^2 of exposed surface area

Condition state 1 -Description	Photo
• The wall is in good condition with only fine cracking due to corroding reinforcement. • Footings, if visible, are in good condition with only fine cracking. • There is no cracking due to differential settlement of the foundations.	 Pier wall in good condition
Condition state 2 -Description	**Photo**
• The wall may have fine cracking and minor spalling due to corroding reinforcement. • Footings, if visible, may have fine cracking or spalling due to corroding reinforcement or differential settlement of foundations. • Tops of the walls may have fine cracking due to friction or edge loading of beams.	 Pier crack under fixed bearing
Condition state 3 -Description	**Photo**
• Moderate cracking and spalling may be visible with minor loss of reinforcement section. • Footings, if visible, may have minor cracking or spalling due to reinforcement corrosion or differential settlement of foundations. • Top of walls may have minor cracking or spalling due to friction or edge loading of beams.	 Pier spall under girder

Condition state 4 -Description	Photo
• Medium cracking and spalling may be visible with moderate loss of reinforcement section. • Footings, if visible, may have moderate cracking or spalling due to reinforcement corrosion or differential settlement of foundations. • Top of walls may have moderate cracking or spalling due to friction or edge loading of beams.	 Fretting and spalling of pier
Condition state 5 -Description	**Photo**
• Severe cracking or spalling may be visible with advanced corrosion of the reinforcement with more severe loss of section. • Footings, if visible, may have severe cracking or spalling due to reinforcement corrosion or differential settlement of the foundations. • Tops of walls may have severe cracking and spalling due to friction or edge loading of the beams.	 Severe spalling of pier wall, with advanced corrosion of reinforcement

24O - Pier wall – other

This component describes all wall types other than concrete and includes stone masonry walls, red brick walls or grouted rubble walls. The component does not include any reinforced concrete cap on top of the walls. If bluestone blocks are used to cap the walls, those blocks could be considered in this component. Foundations, if visible, should be included in this component.

Units
m^2 of exposed surface area

Condition state 1 -Description	Photo
• The wall is in good condition with only a few very minor fine cracks in the mortar between the bricks, stones or blocks. • There is no cracking due to differential settlement of the foundations. There should be no loss of mortar between the blocks.	 Masonry pier in good condition
Condition state 2 -Description	**Photo**
• The wall may have a number of fine cracks in the mortar between brick or blocks, but no cracking of the masonry. • There may be slight loss of mortar of no concern. • There may be fine cracking due to differential settlement of the foundations.	 Cracking between blocks with slight mortar loss

Condition state 3 -Description	Photo
• Minor cracking of the mortar between the blocks may be occurring or minor mortar loss may be occurring due to water wash. • There should be, however, be only minor mortar loss beneath any masonry capping blocks. • Moderate cracking may exist due to differential settlement of the foundations.	 Fretted stonework with minor mortar loss
Condition state 4 -Description	**Photo**
• Moderate cracking of the mortar between the blocks may be occurring or moderate mortar loss may be occurring due to water wash. • There should be, however, be only minor mortar loss beneath any masonry capping blocks. • Medium cracking may exist due to differential settlement of the foundations.	 Moderate loss of mortar at base of pier
Condition state 5 -Description	**Photo**
• The mortar and blocks may have severe cracking through them. • Mortar loss may be severe requiring pressure repointing. • Loss of mortar below masonry capping blocks may be moderate. • Differential settlement of the foundations may have caused severe cracking.	 End of pier wall lost all mortar (VicRoads)

25C - Lateral Restraint Blocks – concrete This component includes reinforced concrete lateral restraint blocks placed on piers to prevent lateral movement of the girder beams.	Units m^2 of exposed surface area

Condition state 1 -Description	Photo
• The components are in good condition with only very minor fine cracking visible. • There may be minor dampness or efflorescence powder visible in a few locations.	Not available
Condition state 2 -Description	**Photo**
• There may be a few minor cracks or spalls due to corroding reinforcement. • Restraint block may be damp and stained due to excessive moisture penetration of the deck joints, and efflorescence powder may be visible in numerous areas.	Not available

Condition state 3 -Description	Photo
• There may be moderate cracks or spalls due to corroding reinforcement. • Restraint block may be damp and stained due to excessive moisture penetration of the deck joints, and efflorescence powder may be more prevalent in numerous areas.	Not available
Condition state 4 -Description	**Photo**
• Medium cracking and spalling may be present along with possible delaminated areas due to corroding reinforcement. • Exposed reinforcement may have moderate section loss in isolated areas	Not available
Condition state 5 -Description	**Photo**
• Severe cracking, spalling or large delaminated areas exist with heavily corroded steel visible with more severe loss of section of reinforcement.	Not available

26P - Pier protection – precast concrete

This component describes all precast concrete barriers that are installed to protect vulnerable substructure elements such as piers and abutments, from errant vehicles (including ships and barges where the bridge crosses a river).

Units
m^2 of exposed surface area

Condition state 1 -Description	Photo
• The component shows only minor deterioration and the connections between units and anchorages are in good condition. • There may be discolouration, efflorescence, and/or superficial cracking but without effect on strength and/or serviceability. • No accident damage is evident.	 Concrete barrier pier protection, in good condition
Condition state 2 -Description	**Photo**
• There may be minor cracking and spalling due to corroding reinforcement. • Connections between units and anchorages should be in good condition. • Accident damage should be minor and of no consequence. • There has been no displacement of units from their installed position.	 Barrier in good condition but lifting recesses not filled

Condition state 3 -Description	Photo
• There may be moderate cracking and spalling due to corroding reinforcement. • Connections and anchorages should be in fair condition. • Accident damage has only a minor effect on strength or serviceability. • There has been small displacement of units from their installed position.	Not available
Condition state 4 -Description	**Photo**
• There may be medium cracking and spalling due to corroding reinforcement. • Connections may be slightly loose and anchorages may have minor fine cracking due to vehicle impact. • Gouging and spalling from accident damage is having a moderate effect on strength or serviceability. • There has been moderate displacement of units from their installed position.	Not available
Condition state 5 -Description	**Photo**
• There may be severe cracking and spalling affecting their strength and serviceability of the units. • Connections may be loose and anchorages may have broken away due to vehicle impact. • Gouging and spalling from accident damage is severe and is having a significant effect on strength and serviceability. • The units are essentially no longer in their installed position.	Not available

26S - Pier protection – steel

This component describes all steel barriers that are installed to protect vulnerable substructure elements such as piers and abutments, from errant vehicles including ships and barges. Included in this component are the posts and end posts which support the barrier.

Units
m^2 of exposed surface area

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 with no corrosion of steel or cracking of concrete. • No accident damage is visible.	 Steel RHS pier protection in very good condition
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 or fine cracking in the concrete, but bolting or joint support is tight. • Any accident damage is minor and of no consequence.	 Steel fendering at river pier

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 some rust and light corrosion, or minor cracking in the concrete, but bolting or joint support is still tight. • Accident damage has only a minor effect on strength or serviceability of the barrier.	 Light corrosion on fender rails
Condition state 4 -Description	**Photo**
• The paint system may have broken down and there is surface pitting in a number of locations on the rails and/or posts but there is minimal effect on strength or serviceability • Posts may also have corroding areas, loose hold down bolts or medium concrete cracking with some spalling. • Bolts holding down rails or rail joint support may be a little loose. • Accident damage has a moderate effect on strength or serviceability of the barrier, with some deformation and/or minor displacement of members. • Any stabilising or deflection limiting devices may minor cracking.	 Deformation and displacement of posts due to impact damage
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. • Bolts holding down rails or rail joint support may be a loose or missing. • Accident damage is severe with major deformation and displacement of members heavily affecting the strength and serviceability of the barrier. • Any stabilising or deflection limiting devices may be broken or have become detached.	 Large extent of paint loss and heavy corrosion on outrigger members of steel fendering

26T - Pier protection – timber

This component describes all timber barriers that are installed to protect vulnerable substructure elements such as piers and abutments, from errant vehicles including ships and barges. This component includes also the supporting posts and connecting bolts.

Units
m^2 of exposed surface area

Condition state 1 -Description	Photo
• The component shows only minor deterioration and all the bolting is tight. • No accident damage is visible.	 Timber fendering in front of pier in good condition
Condition state 2 -Description	**Photo**
• The component shows signs of minor decay, splitting or cracking but does not affect the strength or serviceability. • Bolting of the posts and rails is generally tight. • Accident damage is only minor with no effect on strength or serviceability.	 Minor splitting in timber fender

Condition state 3 -Description	Photo
• Moderate decay, splitting cracking or crushing may be present affecting the strength and serviceability of the barrier to a minor extent. • Bolting may be loose and/or corroded in some areas. • Accident damage may have a minor effect on the strength or serviceability of the barrier.	 Splitting end of channel fender horizontal member
Condition state 4 -Description	**Photo**
• Medium decay, splitting cracking or crushing may be present affecting the strength and serviceability of the railing to a moderate extent. • Bolting may have moderate corrosion and be loose in a number of areas. • Accident damage may have a moderate effect on the strength or serviceability of the barrier, with some deformation and/or minor displacement of members. • Any stabilising or deflection limiting devices may have minor cracking.	 Termite damage to fender rails
Condition state 5 -Description	**Photo**
• Severe decay splitting cracking or crushing may be present affecting the strength and serviceability of the barrier. • Bolting may be heavily corroded and quite loose affecting the strength of the barrier. • Accident damage is severe with major deformation and displacement of members heavily affecting the strength and serviceability of the barrier. • Any stabilising or deflection limiting devices may be broken or have become detached.	Not available

DECK

27S - Through truss – steel

This component includes all steel or wrought iron trusses that are above the deck level of the roadway. The component includes all truss chords (top and bottom), verticals, crossbraces, windbracing or arch braces. This component does not include the floor beams supporting the roadway.

Units
m^2 of exposed surface area

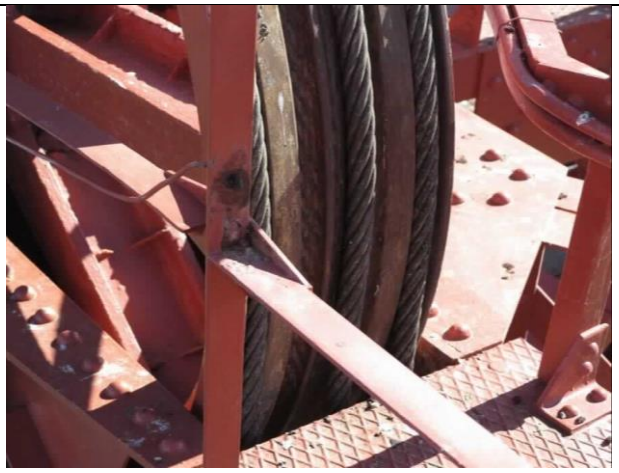
Condition state 1 -Description	Photo
• The steelwork is in good condition with no rust spotting of the paint system, though there may be minor chalking, peeling or curling. • There is no accident damage to the trusses or bracing. All welds, bolts and rivets are in good condition with no corrosion, cracking or looseness.	 Steel trusses in good condition
Condition state 2 -Description	**Photo**
• Rust spotting of the paint system is occurring. No corrosion or section loss has occurred. • All welds or bolts are in good condition with no cracking, corrosion or loose bolts. • Minor accident damage of no consequence.	 Minor rusting of top chord

Condition state 3 -Description	Photo
• Surface rust or minor pitting has formed or is forming and the paint system is no longer effective. There is no measurable loss of section • All welds, bolts and rivets are in sound condition with only superficial surface corrosion • There are no cracks in the steel • There may be minor deformations that do not affect the integrity of the component.	 Top plate element separating from top chord
Condition state 4 -Description	**Photo**
• Active corrosion is occurring in isolated areas, but no loss of a whole area is occurring to affect the strength of the member as a whole. • Paint system has broken down with surface rusting and pitting present in a number of locations. • Nuts and bolts may be corroding but are still tight. Welds may have non-continuous hairline cracks. • Riveted plates may have very minor movement of 1 mm to 2 mm but rivets are generally sound. • Accident damage to truss or overhead bracing is evident and has minor effect on the stiffness of the trusses.	 Corrosion in truss top chord
Condition state 5 -Description	**Photo**
• Corrosion is well advanced and some loss of section has definitely occurred which may have a detrimental effect on the strength of the member, i.e. a flange badly corroded over much of its length. • Welds may be cracked. Nuts or bolts are severely corroded and possibly no longer functioning to full capacity. • Accident damage to trusses or overhead bracing is evident and has major effect on strength of the trusses.	 Heavy corrosion in bottom chords

28S - Cables / hangers (not embedded in concrete) – steel

This component includes all steel cables or hangers used to support the deck. The cables may be galvanised, painted, coated or wrapped in grease with a protective outer wrapper, but are not embedded in concrete.

Units
Each

Condition state 1 -Description	**Photo**
• There is no evidence of rusting or corrosion and any paint system or protective wrapping is in good condition. • There are no signs of distress at anchors, sockets or saddles.	 Lifting span cables in good condition
Condition state 2 -Description	**Photo**
• The cables or hangers may show signs of rust and any paint system or protective wrapping is in fair condition. • There are no signs of distress at anchors or sockets but the saddles may be rusty and in need of lubrication.	 Oxy cut cable guide plate not painted
Condition state 3 -Description	**Photo**
• The cables or hangers may show light rust • The protective wrapping may be broken or in poor condition. • Anchors may have fine cracking, sockets may be a little loose or saddles may have fine cracks in the metal.	 Light rusting of cable spool

Condition state 4 -Description	Photo
• The cables or hangers may be rusty with signs of minor corrosion. • Any paint system, coating or protective wrapping has been lost or is in very poor condition. • Anchors may have minor cracking, sockets may be slightly loose or saddles may have minor cracks in the metal. • The cables may have slackened off slightly or the hangers are slipping on the cable. • Cables may be beginning to abrade but there are no wire breakages.	 Worn lift span cable
Condition state 5 -Description	**Photo**
• The cables or hangers are badly corroded or the hangers are loose and are sliding along the cables. • The cables may have slackened noticeably. • Anchorages may have severely cracked or anchorages have moved or slipped. • Sockets may have loosened or saddles are badly damaged. • Cables may be severely abraded with a number of broken wires.	 Heavily worn lift cable with broken strand

29C - Traffic barriers – concrete (precast or cast in-situ)

This item defines all types and shapes of barriers where the principal component is concrete. It includes any RC terminals, steel safety rails or traffic barriers mounted on top and holding down bolts.

Units
Linear metres

Condition state 1 -Description	**Photo**
• The component shows only minor deterioration and the end connections or anchorage to the deck are in good condition. • There may be discolouration, efflorescence, and/or superficial cracking but without effect on strength and/or serviceability. • Steel rails are in good condition with no rust spotting and bolted and welded connections show no signs of deterioration. • No accident damage is evident.	 Precast concrete barrier in very good condition
Condition state 2 -Description	**Photo**
• The rails may have minor flexural cracks or minor cracking and spalling due to corroding reinforcement. • Rail connections and anchorages should be in good condition. • Minor cracking and spalling of posts or joining concrete may be visible. • Steel railing on top of the parapets may have rust spotting but connections should still be tight. There are no cracked welds • Accident damage should be minor and of no consequence.	 Minor spalling of post

Condition state 3 -Description	Photo
• The rails may have moderate flexural cracks or minor cracking and spalling due to corroding reinforcement. • Rail connections and anchorages should be in fair condition. • Moderate cracking and spalling of posts or joining concrete may be visible. • Steel railing on top of the parapets may have minor rust spotting but connections should still be tight. There are no cracked welds • Accident damage has only a minor effect on strength or serviceability.	 Moderate cracking in concrete barrier post
Condition state 4 -Description	**Photo**
• The posts and rails may have medium cracking and spalling due to corrosion of reinforcement. • Rail connections may be slightly loose and post or parapet anchorages may have minor fine cracking due to vehicle impact. • Steel railing on top of parapets may be corroded or have loose bolting. • Accident damage has a moderate effect on strength or serviceability. • There may be minor rotation of the end posts	 Medium spalling of concrete barrier post

Condition state 5 -Description	Photo
• The posts and rails may have severe cracking and spalling affecting their strength and serviceability. • Rails may be loose or have broken away at their connections. Severe cracking or spalling of the parapets or their anchorages may affect their strength and serviceability. • Corrosion may be well advanced in the steel barrier, bolts may be loose or rails may have broken free from their mountings. The anchorage area of the steel barrier posts may be cracked and spalled. • Accident damage is severe with part of the railing missing or demolished. • End posts may show signs of significant impact or rotation.	 Severe collision damage to concrete posts

29S - Traffic barriers – steel

Units: **Linear metres**

This component defines all types of steel vehicle barrier / railing and includes rails formed from tubes, rolled hollow sections, rolled shapes or beams. It includes steel girders on railway bridges used to support the edge of the deck, and steel shields to protect against contact with electrified wires. Also included in this component are the post and endposts, which support the railing and any pedestrian grilles attached to the component.

This component does not include pedestrian mesh fencing with GWI posts and rails, nor does it include steel pedestrian grill fencing on pedestrian bridges.

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 with no corrosion of steel or cracking of concrete. • No accident damage is visible.	 Steel thrie beam barrier in very good condition
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 or fine cracking in the concrete, but bolting or joint support is tight. • Any accident damage or vandalism is minor and of no consequence.	 Light rusting on barrier post base plate
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 some rust and light corrosion, or minor cracking in the concrete, but bolting or joint support is still tight. • Accident damage has only a minor effect on strength or serviceability of the railing.	 Minor accident damage to steel w-beam barrier

Condition state 4 -Description	Photo
• The paint system may have broken down and there is surface pitting in a number of locations on the rails and/or posts but there is minimal effect on strength or serviceability • Posts may also have corroding areas, loose hold down bolts or medium concrete cracking with some spalling. • Bolts holding down rails or rail joint support may be a little loose. • Accident damage has a moderate effect on strength or serviceability of the railing.	 Corroding rails on steel traffic barrier  Barrier post anchor bolts loose
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. • Accident damage is severe with loss of railing.	 Severe damage to w-beam railing

29O - Traffic barriers – other

This component defines all types of shapes and materials other than those already covered. Included in this component are masonry parapets, aluminium rails with steel tensioning cables inside, GWI pipe, post and rails, wire mesh fencing panels, wire or chain cables. The component covers any posts required to support the railing system or cables.

Units
Linear metres

Condition state 1 -Description	**Photo**
• The component shows only minor signs of deterioration with minor cracking between masonry blocks or rusting of steelwork. • No accident damage is visible.	 Masonry wall in good condition
Condition state 2 -Description	**Photo**
• Minor cracking, spalling, loss of mortar between masonry blocks, surface or spot rusting has occurred but having little or no effect on strength or serviceability. • Accident damage is very minor with no effect on strength or serviceability.	 Bricks starting to fret

Condition state 3 -Description	Photo
• Moderate cracking, spalling, loss of mortar between masonry block, or corrosion of metal is occurring but having a minor effect on strength or serviceability. • Accident damage may have a minor effect on the strength or serviceability of the railing.	 Mortar loss between blocks
Condition state 4 -Description	**Photo**
• Medium cracking, spalling, loss of mortar between masonry block, or corrosion of metal is occurring but having a moderate effect on strength or serviceability. • Accident damage may have a moderate effect on the strength or serviceability of the railing.	 Loose headstone in masonry barrier
Condition state 5 -Description	**Photo**
• Severe cracking, spalling, loss of mortar or corrosion has a large effect on rail strength or serviceability. • Accident damage is major affecting the strength or serviceability of the railing.	 Heavy impact has dislodged majority of stone

30S - Pedestrian barrier / fence – steel

Units
Linear metres

This component defines all types of steel pedestrian barrier / railing and includes rails formed from tubes, rolled hollow sections, rolled shapes or beams. Also included in this component are the post and endposts, which support the railing and any pedestrian grilles attached to the component.

This component does not include pedestrian mesh fencing with GWI posts and rails, which is included in Component No 27O.

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 with no corrosion of steel or cracking of concrete. • No accident damage is visible.	 Steel pedestrian barrier in good condition
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 or fine cracking in the concrete, but bolting or joint support is tight. • Any accident damage or vandalism is minor and of no consequence.	 Railing is showing spot rust throughout

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 some rust and light corrosion, or minor cracking in the concrete, but bolting or joint support is still tight. • Accident damage has only a minor effect on strength or serviceability of the railing.	 Rusting and light corrosion
Condition state 4 -Description	**Photo**
• The paint system may have broken down and there is surface pitting in a number of locations on the rails and/or posts but there is minimal effect on strength or serviceability • Posts may also have corroding areas, loose hold down bolts or medium concrete cracking with some spalling. • Bolts holding down rails or rail joint support may be a little loose. • Accident damage has a moderate effect on strength or serviceability of the railing.	 Steel railing showing moderate corrosion
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. • Accident damage is severe with loss of railing.	 Section completely corroded through at base

30T - Pedestrian barrier / fence – timber

This component defines those rails constructed using timber either from a sawn section or glued laminated sections. This component includes also the supporting posts.

Units
Linear metres

Condition state 1 -Description	**Photo**
• The component shows only minor deterioration and all the bolting is tight. • No accident damage is visible.	 Timber railing in good condition with steel rubbing rail in front (VicRoads)
Condition state 2 -Description	**Photo**
• The component shows signs of minor decay, splitting or cracking but does not affect the strength or serviceability. • Bolting of the posts and rails is generally tight. • Accident damage is only minor with no effect on strength or serviceability.	 Some posts have splits and some straps holding the top rail are loose (VicRoads)

Condition state 3 -Description	Photo
• Moderate decay, splitting cracking or crushing may be present affecting the strength and serviceability of the railing to a minor extent. • Bolting may be starting to loosen in a number of areas. • Accident damage may have a minor effect on the strength or serviceability of the railing.	Not available
Condition state 4 -Description	**Photo**
• Significant decay, splitting cracking or crushing may be present affecting the strength and serviceability of the railing to a moderate extent. • Bolting may be loose in a number of areas. • Accident damage may have a moderate effect on the strength or serviceability of the railing.	 Moderate decay of timber around connecting bolts and railing becoming loose (VicRoads)
Condition state 5 -Description	**Photo**
• Severe decay splitting cracking or crushing may be present affecting the strength and serviceability of the railing. • Bolting may be quite loose affecting the strength of the railing. • Accident damage is major affecting the serviceability of the railing.	 Top rail rotted out at connection (VicRoads)

30O - Pedestrian barrier / fence – other

This component defines all types of shapes and materials other than those already covered. Included in this component are masonry parapets, aluminium rails, GWI pipe, post and rails, wire mesh fencing panels, wire or chain cables. The component covers any posts required to support the railing system or cables.

Units
Linear metres

Condition state 1 -Description	**Photo**
• The component shows only minor signs of deterioration with minor cracking between masonry blocks or rusting of steelwork. • No accident damage is visible.	 Aluminium fence in good condition
Condition state 2 -Description	**Photo**
• Minor cracking, spalling, loss of mortar between masonry blocks, surface or spot rusting has occurred but having little or no effect on strength or serviceability. • Accident damage is very minor with no effect on strength or serviceability.	 Pipe fence rail bent

Condition state 3 -Description	Photo
• Moderate cracking, spalling, loss of mortar between masonry block, or corrosion of metal is occurring but having a minor effect on strength or serviceability. • Accident damage may have a minor effect on the strength or serviceability of the railing.	 Corroded pedestrian handrail and chainwire
Condition state 4 -Description	**Photo**
• Medium cracking, spalling, loss of mortar between masonry block, or corrosion of metal is occurring but having a moderate effect on strength or serviceability. • Accident damage may have a moderate effect on the strength or serviceability of the railing.	 Spigot dislodged from aluminium handrail
Condition state 5 -Description	**Photo**
• Severe cracking, spalling, loss of mortar or corrosion has a large effect on rail strength or serviceability. • Accident damage is major affecting the strength or serviceability of the railing.	 GWI rails missing

31O - Other barriers and screens – other

This component defines other barrier and screen attachments on bridges. This includes safety screens and anti-throw screens.

Units
Linear metres

Condition state 1 -Description	**Photo**
• The screen is in good condition. There is little or no evidence of corrosion. 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 screen to the bridge are in good condition.	 Anti-throw screen in good condition
Condition state 2 -Description	**Photo**
• 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 bridge are in good condition.	 Safety screen mesh in contact with anchor studs
Condition state 3 -Description	**Photo**
• Surface rust has formed and pitting may be present. The protective coating, if any, is no longer effective and there may be exposed metal but any section loss is minor and does not affect the strength or serviceability of the component. • The structural connections fixing the attachment to the bridge are only in fair condition.	 Loose nut in throw screen mount

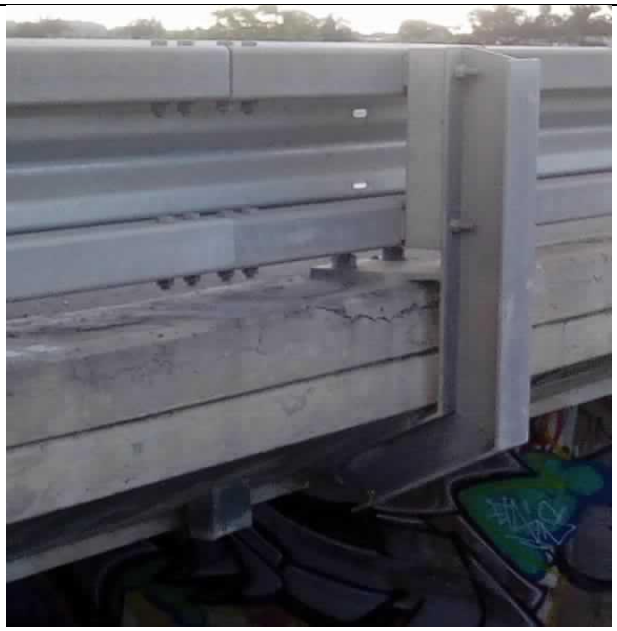
Condition state 4 -Description	Photo
• Surface pitting is present and there may be moderate section loss that has only a minor effect on the strength or serviceability of the component. • The structural connections fixing the attachment to the bridge are generally in poor condition with minor corrosion to bolts and/or cracking or spalling to mortar pads.	 Spalling around anti throw screen post
Condition state 5 -Description	**Photo**
• Corrosion is advanced. Section loss may be affecting the strength and/or serviceability of the component. • There is doubt about the integrity of the connection(s). There may be advanced corrosion or cracking of the connectors and/or the supporting bridge component.	Not available

32C - Bridge kerbs – concrete (precast or cast in-situ)

This item defines kerbs that are constructed of either precast or cast in-situ concrete on deck units or deck slabs which form an upstand at the edge of the bridge and/or carriageway. Bridge barriers are normally mounted on these members. Also included are concrete kerbs cast on timber bridge decks, with or without attached barriers.

Units
Linear metres

Condition state 1 -Description	**Photo**
• Kerbs are in good condition with only minor cracking due to shrinkage or corrosion of reinforcement.	 Minor cracking
Condition state 2 -Description	**Photo**
• There is minor cracking or spalling at the joints or on faces due to movement restraint, shrinkage or corrosion of reinforcement. • Bolts to timber girders may be slightly loose.	 Minor spall in concrete kerb

Condition state 3 -Description	Photo
• There is moderate cracking or spalling at the joints or on faces due to movement restraint, shrinkage or corrosion of reinforcement. • The reinforcement may have minor loss of section. • There may be minor cracking at the base of barrier posts as a consequence of vehicle impact but containment is not impaired. • Bolts to timber girders may be loose.	 Moderate spalling
Condition state 4 -Description	**Photo**
• There is medium cracking or spalling at the joints or on faces due to movement restraint, shrinkage or corrosion of reinforcement. • The reinforcement may have moderate loss of section. • Some minor flexural cracking may be evident on the top face over piers on continuous joints. • There may be moderate cracking at the base of barrier posts as a consequence of vehicle impact but containment is not impaired. • Bolts to timber girders may be moderately loose.	 Major cracking including separation of kerb
Condition state 5 -Description	**Photo**
• Severe cracking and spalling is evident as a result of movement restraint at joints, corrosion of reinforcement or the effects of vehicle impact on the barrier. • Containment capacity may be reduced to unsafe levels. • The reinforcement may have suffered a more severe loss of section. • Bolts to timber girders may be very loose, severely corroded or missing completely.	 Significant spalling of bridge kerb

32S - Bridge kerbs – steel

This item defines kerbs that are fabricated from steel hollow section which form an upstand at the edge of bridge and/or carriageway. Bridge barriers will not generally be mounted on these members.

Units
Linear metres

Condition state 1 -Description	**Photo**
• The steel is in good condition and firmly bolted in place. • Paint or galvanising is in good condition, with no rust spotting. • No accident damage is visible.	 Steel kerb in good condition
Condition state 2 -Description	**Photo**
• The protective system is losing effectiveness and spot rusting has occurred on the member. • All fixings are tight. • Any accident damage is minor and of no consequence.	 Spot rusting on steel kerb

Condition state 3 -Description	Photo
• The protective system is no longer effective and surface rusting with minor pitting in some areas has occurred on the member. • All fixings are tight although rust may be forming. • Any accident damage is moderate and has only minor effect on strength or serviceability.	 Corrosion staining on stainless steel kerbing
Condition state 4 -Description	**Photo**
• The protective system may have broken down and there is surface pitting in a number of locations on the member but there is minimal effect on strength or serviceability. • There may be some corrosion evident. Fixings may be loose but the kerb is still in the correct location. • Fixings may be corroding. • Accident damage has moderate effect on strength or serviceability.	 Fastener missing from steel kerb
Condition state 5 -Description	**Photo**
• Corrosion is well advanced and some loss of section has occurred which is affecting both strength and serviceability. • Fixings are extremely loose and may be missing altogether. • The kerb may no longer be in the correct position. • Accident damage is severe with the kerb member knocked out of line, or badly damaged anchors.	Not available

32T - Bridge kerbs – timber

This item defines kerbs that are constructed of timber which form an upstand at the edge of bridge and/or carriageway. Kerbs may be formed from either hardwood or plywood construction.

Units
Linear metres

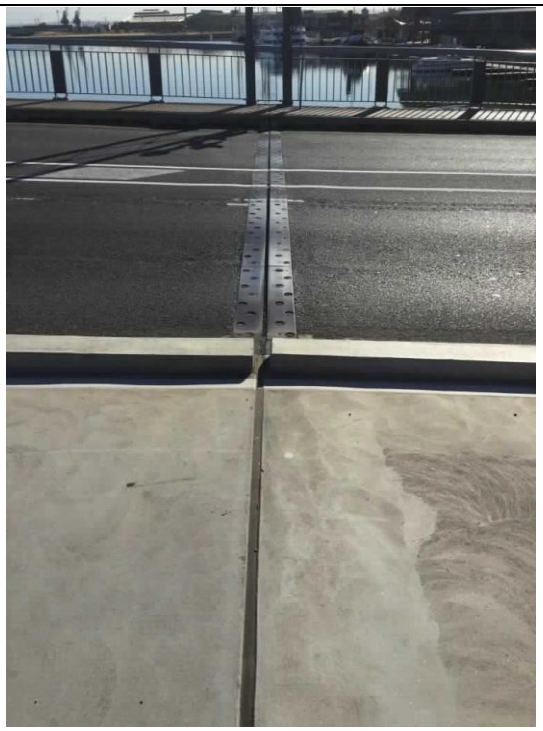
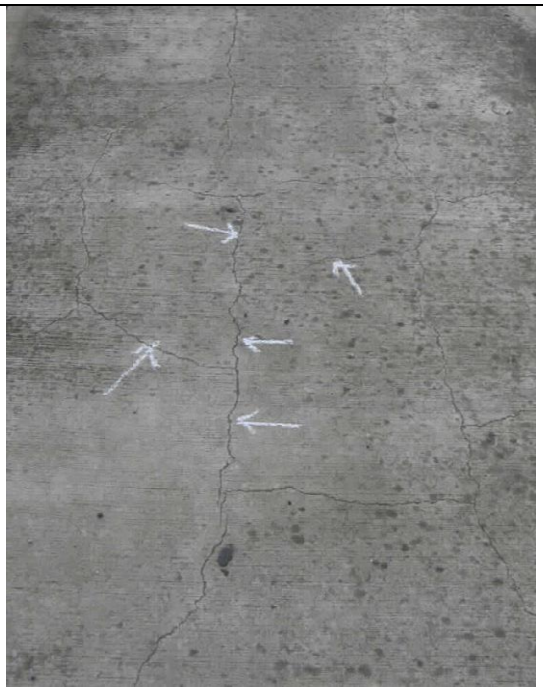
Condition state 1 -Description	**Photo**
• The timber is in good condition and firmly bolted, nailed or screwed in place. • There is little or no evidence of rot or decay. • Minor splits and cracks may be evident; however, these will have no effect on member strength.	Not available
Condition state 2 -Description	**Photo**
• Minor decay, splitting or cracking may be present but not sufficient to affect the strength or serviceability of the member.	 Timber kerb with minor splitting

Condition state 3 -Description	Photo
• Moderate decay, splitting or cracking may be present and starting to affect the strength or serviceability of the member.	Not available
Condition state 4 -Description	**Photo**
• Medium decay, splitting or crushing may be present, affecting the component's serviceability, including containment capacity if barrier attachment capacity is reduced. • In most instances, timbers will have loosened considerably. • There may be an active termite presence but with only minimal damage sustained. • The paint system on the kerb may have broken down.	Not available
Condition state 5 -Description	**Photo**
• Heavy decay, splitting or crushing may be present, affecting the serviceability of the component. • Timbers will be loose or may in fact be missing. • There may be an active termite infestation causing severe damage. • The paint system on the kerb may have broken down. • Attachment bolts may be very loose, missing completely or heavily corroded. Unsleeved attachment bolts may be severely corroded due to contact with preservative treatment in stress-laminated decks. • With ply kerbs, bolt heads may be punching into the kerb if insufficient washer sizes are used.	 Timber kerb severely eaten by termites (VicRoads)

33C - Footpaths – concrete (precast or cast in-situ)

This component defines those footpaths which are constructed using precast RC slabs spanning between cast in-situ road and outer kerbs or are fully constructed from cast-in-situ concrete, and includes all components making up the footpath

Units
Linear metres

Condition state 1 -Description	**Photo**
• The slabs are in good condition with no cracking or spalling. • Footpath slabs may have minor superficial cracks of no importance.	 Reinforced concrete kerb and footpath in good condition with no cracking or spalling
Condition state 2 -Description	**Photo**
• Kerbs may have minor cracking or spalling due to movements or corrosion of steel reinforcement. • Footpath slabs may also have slight cracking or spalling due to shrinkage, temperature, relative movement or corroding reinforcement. • Minor differential vertical movement between footpath slabs present only minimal danger to pedestrians tripping over.	 Minor footpath cracking

Condition state 3 -Description	Photo
• Kerbs may have moderate cracking or spalling due to movements or corrosion of steel reinforcement. • Footpath slabs may also have minor cracks or spalls due to shrinkage, temperature, relative movement or corroding reinforcement. • Differential vertical movement between footpath slabs may present a minor danger to pedestrians tripping over.	 Spalling footpath creating minor tripping hazard
Condition state 4 -Description	**Photo**
• Kerbs and footpaths may have medium cracking and spalling due to movement or steel reinforcement corrosion. • Differential movement between footpath slabs may have caused broken edges and vertical displacements that present a danger of tripping to pedestrians.	 Medium spalling in footpath causing tripping hazard
Condition state 5 -Description	**Photo**
• Kerbs and footpaths may have severe cracking and spalling. • Footpath slabs may be badly broken and uneven in areas or have large vertical displacements causing major danger to pedestrians.	 Footpath with large vertical displacement

33S - Footpaths – steel

This item describes those footpaths which are constructed of steel plates. Any thin layer of surfacing material should be included with this item as it greatly influences the action and rate of deterioration of the steel decking.

Units
Linear metres

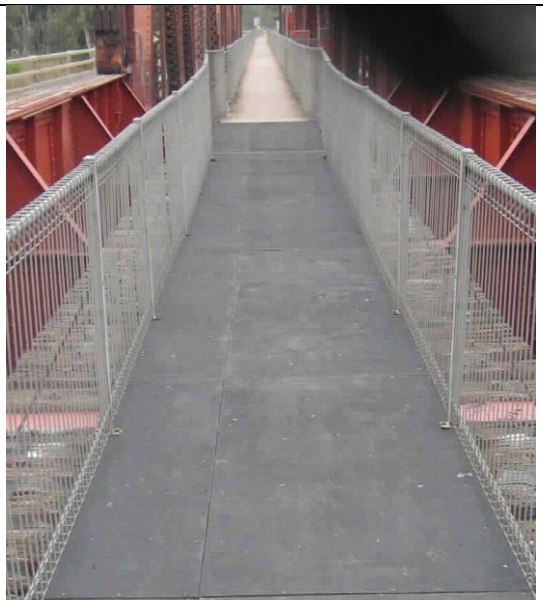
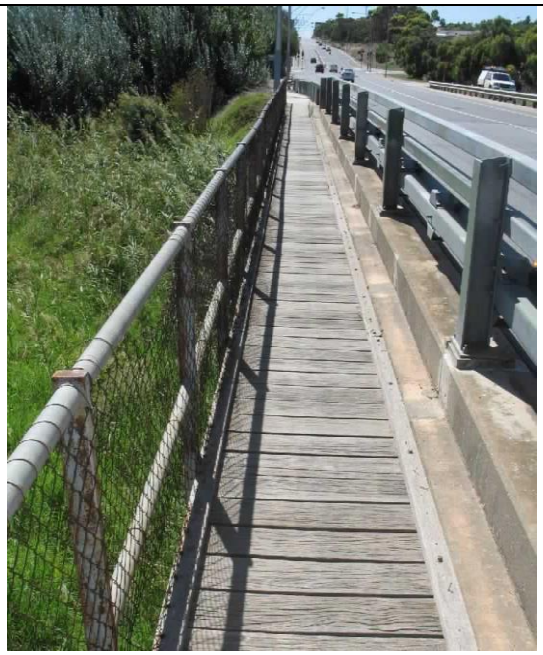
Condition state 1 -Description	**Photo**
• The steel is in good condition with no evidence of any corrosion. • The plates are rigidly bolted to supports and are good and tight. • The surfacing is in good condition with no evidence of cracking, pop-outs or delamination.	 Steel chequer plate footpath in good condition
Condition state 2 -Description	**Photo**
• Slight pitting of the surface due to corrosion may be evident but there is no loss of section. • Plates remain firmly bolted to supports and are good and tight. • There may be minor cracking of the surfacing.	Not available

Condition state 3 -Description	Photo
• Minor pitting of the surface due to corrosion may be evident and there may be no or minor loss of section. • Plates remain good and tight although hold down bolts may be showing signs of loosening. • There may be moderate cracking of the surfacing.	Not available
Condition state 4 -Description	**Photo**
• Moderate corrosion may have occurred, occasioning a moderate loss of section. • The hold down connections may be slightly loose, permitting excessive flexing or vibration or rattling of the plates. • The surfacing may exhibit moderate cracking and some local loss of material.	Not available
Condition state 5 -Description	**Photo**
• Severe corrosion may have occurred, occasioning significant loss of section. • The hold down connections may be loose and the plates are rattling up and down under load. • Bolts or edge material of the plates may have sheared under this action. • The surfacing is breaking up and delaminating from the plates.	Not available

33T - Footpaths – timber

This component defines those footpaths constructed of timber.

Units
Linear metres

Condition state 1 -Description	Photo
• The timber is in good condition and firmly bolted, nailed or screwed in place. • There are no large gaps between footpath timbers and ends of timbers are at a similar level.	 Treated pine panels with TCP coating, in good condition
Condition state 2 -Description	**Photo**
• Minor decay, splitting or cracking may be present but not affecting the strength or serviceability of the timber. • A few planks may be loose but do not cause a danger to pedestrians. • Gaps or uneven timbers are small enough not to be a danger to pedestrians.	 Footpath timber with only minor splitting

Condition state 3 -Description	Photo
• Moderate decay, splitting or cracking may be present but only having a slight effect on the strength or serviceability of the timber. • Loose planks, small gaps and a few uneven timbers do not cause a danger to pedestrians. • Non-slip surfacing on ply decks may be starting to delaminate.	 Loose timber plank caused by hold down nail pulling out
Condition state 4 -Description	**Photo**
• Medium decay, splitting or crushing may be present affecting the components serviceability. • Planks are generally loose and along with gaps and uneven ends of timbers present a danger of tripping to pedestrians. • Advancing delamination of non-slip surfacing on ply decks.	 Footpath timber deck surface breaking up
Condition state 5 -Description	**Photo**
• Severe decay, splitting or crushing may be present affecting the serviceability of the component. • Planks may be broken, missing or very loose presenting a major danger to pedestrians. • Non-slip surfacing on ply decks may be missing in substantial areas. • Acute termite infestation and damage may have occurred. • The exposed ends of ply decking may be badly weathered and delaminated.	Not available

33O - Footpaths – other

This item defines those footpaths constructed with a gravel or asphalt or sprayed seal surface, brick or masonry blocks. Kerbs may also comprise a steel plate with gravel or asphalt behind, or simply be a built up mound of asphalt.

Units
Linear metres

Condition state 1 -Description	**Photo**
• The component is in good condition with only minor superficial cracking of the surface, minor rusting of the steel kerb face plate or broken masonry blocks.	 Brick paving footpath in good condition
Condition state 2 -Description	**Photo**
• The asphalt surface may have some minor cracking, but no broken-up areas. • Steel kerb face plate may be rusty but no corrosion pitting. • Masonry kerb blocks may be cracked or have small edge spalls but still in fair condition.	 Cracked asphalt surface

Condition state 3 -Description	Photo
• Asphalt surfacing may have moderate cracking or small broken up areas. • Steel kerb face plate may be rusty with minor corrosion pitting. • Masonry kerb blocks may be cracked or have moderate edge spalls but still basically in fair condition.	 Settlement in footpath causing minor tripping hazard
Condition state 4 -Description	**Photo**
• The kerb face plate may have moderate corrosion but still be effectively holding the footway material in place. • Masonry kerb blocks may be severely cracked and broken up but still be effectively holding the footway material in place. • Asphalt surfacing may have medium cracking and a number of broken up areas.	 Asphalt surface cracking causing tripping hazard
Condition state 5 -Description	**Photo**
• Asphalt surface may be severely cracked and broken up in large areas. • Steel kerb face plate may be severely corroded with holes or loss of edges. • Masonry kerb blocks may be completely broken with sections missing.	 Severely cracked asphalt surface

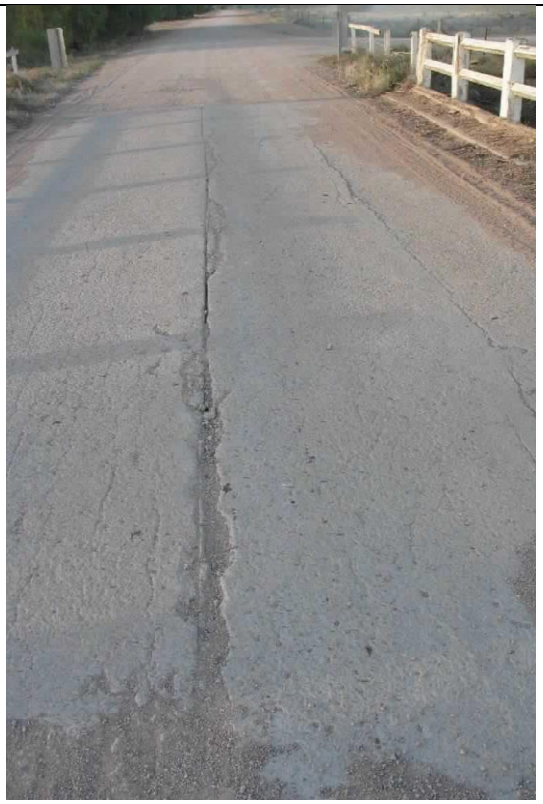
34C - Traffic surface – cast in-situ concrete

This item applies to concrete decks which form the running surface for traffic.

This includes the surface of concrete bridges that carry busway tracks, but does not include the busway tracks themselves, these shall be considered under Component No 120P.

Units
m^2 of exposed surface area

Condition state 1 -Description	Photo
• The concrete surface is in good condition and may have minor shrinkage or plastic settlement cracks. • The surface texture is pronounced and the aggregate is not worn and there is adequate crossfall or grade to efficiently drain any surface water. • All scuppers are clear.	 Minor shrinkage cracks in concrete surface
Condition state 2 -Description	**Photo**
• Shrinkage or plastic settlement cracks are of moderate width and there may be minor cracking and spalling due to corrosion of reinforcement. • Some wear or polishing of aggregate is evident but there is only a marginal loss of surface texture and skid resistance. • There may be surface irregularities which hold surface water and the ability to shed and drain surface water has been slightly impaired. • Some scuppers may be blocked with debris and isolated patches of weed are growing at the kerbs.	 Cracked and slightly worn concrete traffic surface

Condition state 3 -Description	Photo
• Moderate shrinkage or plastic settlement cracks and there may be moderate cracking and spalling due to corrosion of reinforcement. • Wear or polishing of aggregate is evident and there may be moderate loss of surface texture and skid resistance. • There may be surface irregularities which hold surface water and the ability to shed and drain surface water has been somewhat impaired. • Some blocked scuppers may be having a minor effect on deck drainage and isolated patches of weed are growing at the kerbs.	 Cracking and spalling of concrete traffic surface, along with gravel build up blocking scuppers
Condition state 4 -Description	**Photo**
• Shrinkage and plastic settlement cracks are moderate to severe and the deck has a crazed appearance but there is no differential movement between honeycomb sections. • Patches of cover concrete less than 0.5 m2 have delaminated, exposing reinforcement which may have moderate loss of its sectional area. • The surface matrix is worn. • Aggregate may be polished, with surface mortar being continually scaled over irregular areas. There may be significant depressions or other surface irregularities which are impairing the surface drainage; that is, lack of crossfall or gradient. • Deck drainage is not functioning efficiently as a result of obstructions at or in kerbs and/or scuppers or inadequate provision for drainage.	Not available

Condition state 5 -Description	Photo
• The surface matrix is worn and the aggregate polished to the extent that skid resistance is compromised. • The deck has extensive crazed honeycomb cracking with differential movement between sections. • Patches of cover concrete in excess of 1.0 m2 have delaminated as a result of corrosion of reinforcement and/or defective concrete. • Whole patches of concrete to full overlay depth may be completely missing. Reinforcement may have more severe loss of the sectional area. • Deck drainage has not been provided or has ceased to function as a result of blocked scuppers and channels. • Excessive weed is growing on the surface at the kerbs.	Not available

34O - Traffic surface – other

Units
m^2 of exposed surface area

This component includes those structures with a fill, gravel, asphalt or spray seal over the deck. This component includes asphalt overlays which have been reinforced with fibreglass mesh or polypropylene geogrid mesh. Also included is the pavement on masonry arch bridges in which the fill forms the road surface.

This component should not be used in conjunction with culverts. Generally, the road pavement is not directly supported on the culvert rather a layer of fill. If the road pavement is in poor condition over the culvert or stock underpass, describe the problem using component number 1O.

Condition state 1 -Description	Photo
• The asphalt surface is in good condition with no cracking, potholes, rutting, bumps or depressions. • The surface has adequate crossfall or gradeline to efficiently drain surface water from it. • A fine transverse crack may have opened in the asphalt over fixed or buried expansion joints.	 Road pavement in good condition
Condition state 2 -Description	**Photo**
• There may be minor cracking, rutting, small bumps or depressions. These irregularities cause a minor hindrance to drainage of the deck. • Small potholes may be beginning to form in cracked areas. • Ride qualities are beginning to be affected. • A minor crack may have opened in the asphalt over fixed or buried expansion joints.	 Minor cracking and rutting on pavement

Condition state 3 -Description	Photo
• There may be moderate cracking, rutting, small bumps or depressions. These irregularities cause a moderate hindrance to drainage of the deck. • Potholes may have formed in cracked areas. • Ride qualities are beginning to be affected to a minor extent. • A moderate sized crack may have opened in the asphalt over fixed or buried expansion joints.	 Depressions and cracking in pavement (previous repair failing)
Condition state 4 -Description	**Photo**
• Potholes, cracking, rutting, bumps or depressions are-holding moisture on the deck and allowing it to penetrate the fill. • Ride qualities have been affected to a moderate extent. • Deck drainage systems may be poor or inadequate. • Severe cracks may have opened in the asphalt over fixed or buried expansion joints.	 Traffic surface failing
Condition state 5 -Description	**Photo**
• Potholing, cracking, rutting, bumps or depressions are having a marked effect on the drainage and rideability of the asphalt surface. • The asphalt surface may not extend full width of the bridge and may have excessive weed or grass growth, or no deck drainage has been catered for. • The asphalt surfacing over fixed joints, buried expansion joints or joints between ply deck sheets may be cracked and crazed and sections are acting independently and have debonded from the deck	 Traffic surface stripped in wheel path

DECK JOINTS

35O - Pourable joint seals – other

Units
Linear metres

This component defines those joints filled with pourable joint sealant or asphalts described as Bonded Sealant Joints and Asphaltic Plug Joints in Sections 6.1 and 6.6 respectively, in RSIM Appendix A: Description of Structures and Structure Elements.

Materials used in pourable joints are bitumen, bitumen/cork filler in tin or copper trays, polyurethanes, 2 part pack polyester polyurethanes, rubberised bitumen, megaprene and polymer modified bitumens.

Asphalt joints encompass normal asphalt, rubberised asphalts and polymer modified asphalts.

Condition state 1 -Description	Photo
• The seal shows little or no deterioration and completely seals the joint against moisture penetration. • There are no adhesion cracks along the sides of the joint, or any cohesion cracks due to elongation of the sealant.	 Joint in good condition

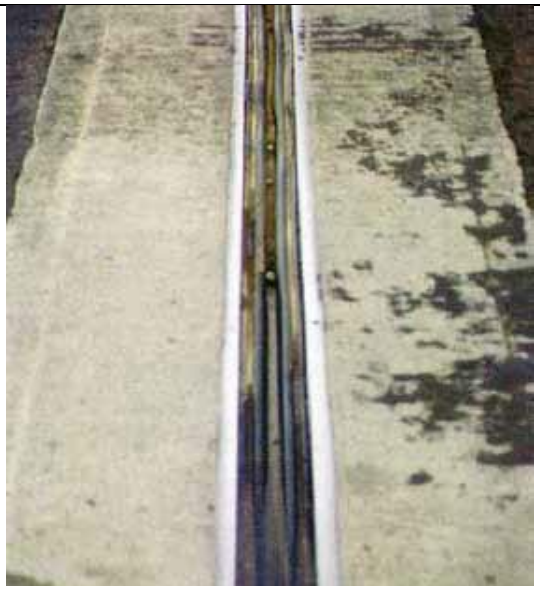
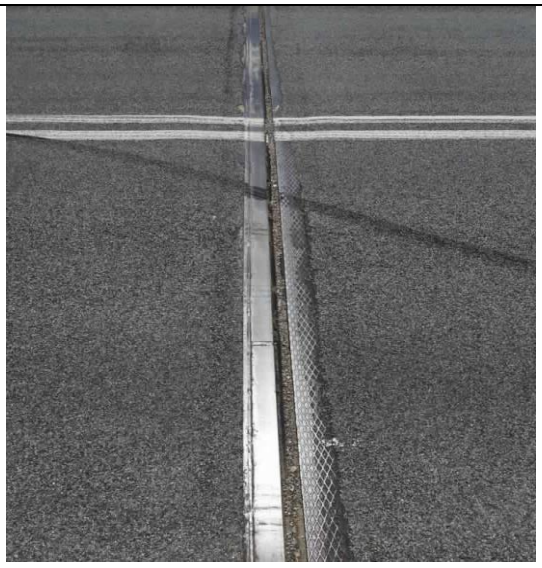
Condition state 2 -Description	Photo
• There may be fine adhesion and/or cohesion cracks allowing minor leakage of the joint. • The deck or asphalt adjacent to the joint may have minor spalling. • Overfilled sealer may be flowing out of the joint or may be impacted by traffic. • Thin asphalt surfacing over the joint may be cracked. • There may be some debris in the joint.	 Minor crack in pier joint
Condition state 3 -Description	**Photo**
• There may be minor adhesion and/or cohesion cracks allowing moderate leakage of the joint. • The deck or asphalt adjacent to the joint may have moderate spalling. • Overfilled sealer may be moderately impacted by traffic. • Thin asphalt surfacing over the joint may be cracked in areas. • There may be a moderate amount of debris in the joint.	 Joint in satisfactory condition although minor adhesion cracking and vegetation growth and debris in crack

Condition state 4 -Description	Photo
• Adhesion and/or cohesion cracking may be moderate allowing reasonable leakage of moisture through the joint. • The adjacent deck or asphalt may have medium spalling. • Overfilled sealer may be heavily impacted by traffic and tending to rip the sealer out. • Thin asphalt surface over the joint may be breaking up with minor areas lost.	 Badly cracked joint allowing water leakage to undersides
Condition state 5 -Description	**Photo**
• The joints have completely failed allowing extensive moisture penetration. • Pourable joint sealant may be almost completely lost. • Bitumen/cork filler may be broken up and being ripped out in chunks by traffic.	 Major cracking with some material loss allowing water leakage, and bulging and vegetation growth in the kerb areas

36O - Compression joint seals – other

This component describes all joints using preformed compression type seals such as plastic foam strips, rubber based hose joints, Wabo seals or Hercules/Honel seals.

Units
Linear metres

Condition state 1 -Description	**Photo**
• The joint seal and its armouring (if any) are in good condition with no movement of the armouring visible, and no adhesion or sealing problems with the compression seal.	 Hercules joint seal and concrete nosings in good condition (VicRoads)
Condition state 2 -Description	**Photo**
• The joint may have lost adhesion with the deck or armouring in small areas allowing minor leakage of moisture. • The adjacent deck may have minor spalls or the armouring may be moving slightly with cracks developing between the asphalt surface and the steel. • There may be some debris in the joint.	 Compression seal joint filled with gravel

Condition state 3 -Description	Photo
• The joint may have lost adhesion with the deck or armouring in a number of areas allowing moderate leakage of moisture. • The seal may be working to the road surface and potentially suffering damage due to traffic impact. • The adjacent deck may have moderate spalls or the armouring may be moving with cracks developing between the asphalt surface and the steel. • There may be a moderate amount of debris in the joint.	 Compression seal has partially ejected, joint is allowing minor leakage

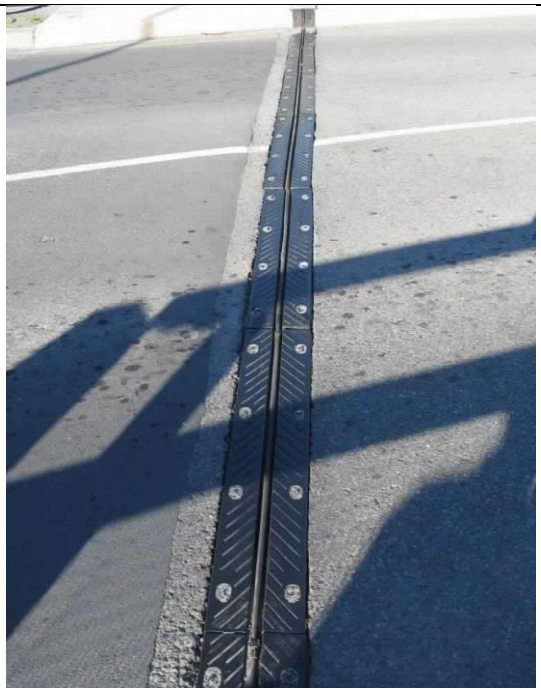
Condition state 4 -Description	Photo
• The joint may have lost adhesion over a long length allowing excessive moisture penetration. • The seal may have worked to the road surface and may be suffering damage due to traffic impact. • The adjacent deck may have medium spalling or the armouring may be moving with the asphalt surface breaking away from the steel.	 Compression seal debonded, damaged and leaking
Condition state 5 -Description	**Photo**
• The joint may have completely lost adhesion and is no longer operative or may be lost. • Steel armouring may be moving considerably and breaking free. • The joint seal may be impacted by traffic to the extent that the seal has suffered extensive damage.	 Part of steel armouring broken and missing. Compression seal rubber has significantly deteriorated

37O - Assembly joint seal – other

This component defines those joints, which have an assembly mechanism consisting of end dams bolted down to the deck with a gland or gland type seal between. Common joints, which are included in this component, are products such as Transflex, Felspan, Wabo Maurer gland seals, Cipec and Firmsec (small) joints.

Units
Linear metres

Condition state 1 -Description	**Photo**
• The seal and anchorages are in good condition and there is no cracking of the surrounding deck, concrete nosings or asphalt.	 Seal and nosing in good condition
Condition state 2 -Description	**Photo**
• There may be minor splits of the seal or gland. Some rubber may be peeling from the end dams. • Anchorages may be slightly loose and surrounding deck or concrete nosings may be cracked. • Asphalt nosings may be breaking away from the end dams, which may also be slightly higher than the approach asphalt due to slight rutting in the wheel lines. • Glands may be pulling out of their housing due to traffic impacting or poor installation. • There may be some debris in the joint.	 Minor cracking in concrete nosing, and debris in joint

Condition state 3 -Description	Photo
• There may be moderate splits of the seal or gland, which may be pulling out of their housing. Some rubber may have peeled from the end dams. • Anchorages may be loose and surrounding deck or concrete nosings may have moderate cracking. • Asphalt nosings may be breaking away from the end dams, which may also be higher than the approach asphalt due to moderate rutting in the wheel lines. • There may be a moderate amount of debris in the joint.	 Felspan joint units loose, cracked and leaking badly
Condition state 4 -Description	**Photo**
• The glands may be severely split or pulled out of their housings allowing moisture and road grit to penetrate. • Rubber may have peeled from the end dams exposing steel shims, which may be damaged by traffic. • Some anchorages may be quite loose allowing excessive movement of the end dams. • Surrounding concrete or concrete nosings may be badly cracked. Asphalt nosings may be badly rutted or cracked.	 Joint noisy due to loose and worn components

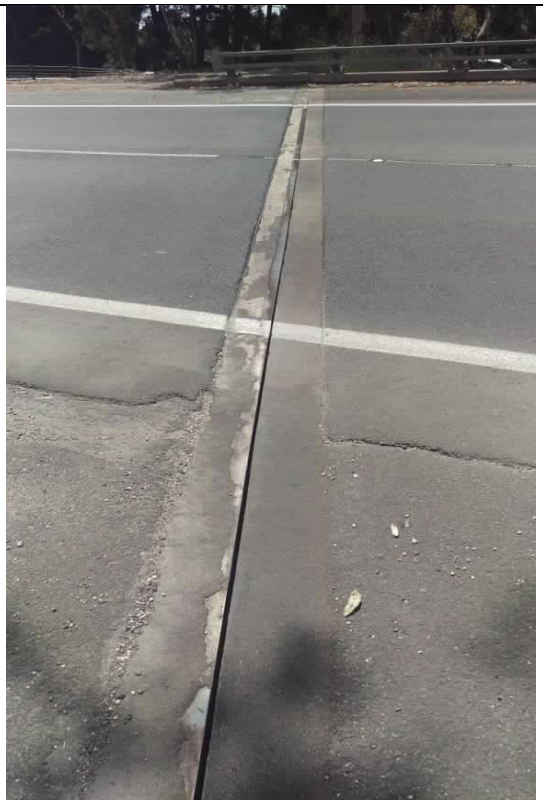
Condition state 5 -Description	Photo
• Glands may be severely damaged or completely out of their housings. • End dams may be severely damaged by traffic, or have broken loose due to anchorage failure. • Concrete nosings may be completely broken up or asphalt nosings are potholing next to the joint.	 Reinforced concrete nosing completely broken up and impact loads are occurring directly on the Felspan (VicRoads)

38S - Open expansion joint – steel

This component defines those open expansion joints constructed with steel edge armouring and designed to allow moisture and grit to penetrate the deck, to be removed by specially designed substructure components. This component does not include those expansion joints where the expansion seals have been completely lost. Those joints should be considered under their original component with the seal in place.

Units
Linear metres

Condition state 1 -Description	**Photo**
• The component shows no deterioration with the steel armouring firmly in place. • There is no cracking of the concrete block around the steel armouring. • The joint width is sufficiently wide to pass any road grit without it jamming in the joint.	 Armoured joint in good condition
Condition state 2 -Description	**Photo**
• The steel armouring may have rust staining and/or minor corrosion but it is firmly in place. • The deck may have very fine cracking in the vicinity of the joint. Width of the joint is sufficient.	 Spalled nosing

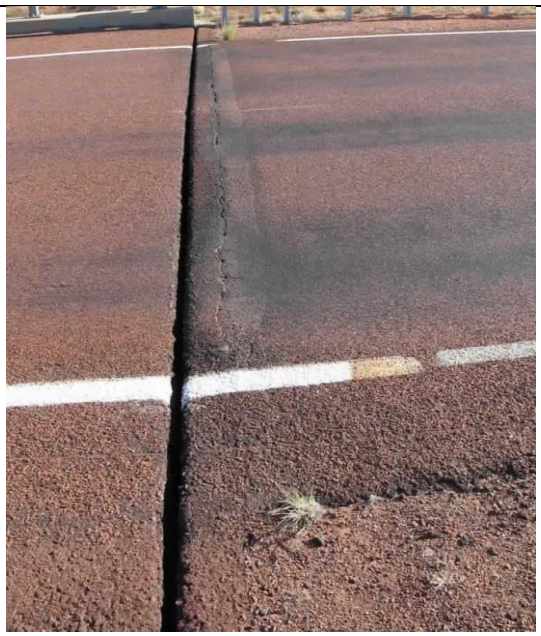
Condition state 3 -Description	Photo
• The steel armouring may have rust staining and/or moderate corrosion but it is still firmly in place. • The deck may have minor cracking in the vicinity of the joint. Width of the joint may have reduced but is still sufficient.	 Wear of material and minor surface corrosion of nosing plates

Condition state 4 -Description	Photo
• The steel armouring is showing advanced corrosion and there may be medium cracking in the deck around the joint indicating the armouring is loose due to traffic impact. • Width of joint may be small allowing road grit to jam in the joint, or joint width may be excessive allowing high traffic impact forces onto the armouring.	 Corrosion of armour plate with adjacent cracking in deck, and wearing of surface
Condition state 5 -Description	**Photo**
• The steel armouring may be loose due to excessive traffic impact. The deck may be heavily cracked and spalled due to the loose or broken anchorages of the armouring. • The deck joint may have closed up allowing dirt and grit to be trapped in the joint.	Not available.

38O - Open expansion joint – other

This component defines those expansion joints constructed without armouring and designed to allow moisture and grit to penetrate the deck into drainage systems on the substructure elements. This component does not include those expansion joints where the expansion seals have been completely lost. These joints are to be considered under their original item with the seal in place.

Units
Linear metres

Condition state 1 -Description	**Photo**
• The ends of the deck slab are intact and the joint width is sufficiently wide to pass any road grit without it jamming the joint.	 Open joint in good condition
Condition state 2 -Description	**Photo**
• There may be minor cracking of the deck slab adjacent to the joint. • Width of the deck joint gap is adequate.	 Adequate joint gap, minor cracking adjacent to joint

Condition state 3 -Description	Photo
• There may be moderate cracking of the deck slab adjacent to the joint, and/or minor spalling due to traffic impact • Width of the deck joint gap may have small amounts of dirt and grit but is still adequate.	  Joint does not have even width within depth of joint

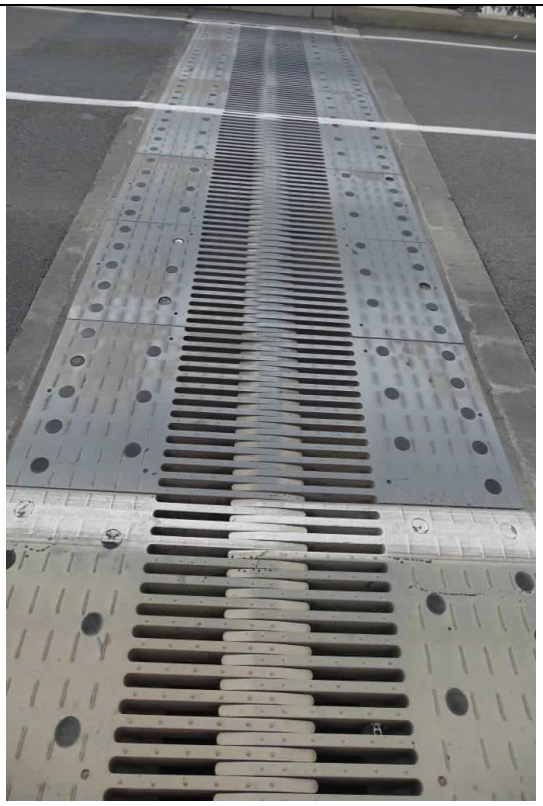
Condition state 4 -Description	Photo
• The ends of the deck slab adjacent to the joint may show medium cracking and/or moderate spalling due to traffic impact. • The width of the deck joint gap may be small, allowing grit to jam in the joint, or joint width may be excessive, allowing high traffic impact forces onto the ends of the deck slabs.	 Gap is widening as concrete edges are chipped by traffic
Condition state 5 -Description	**Photo**
• The ends of the deck slabs may be severely cracked and spalled as a result of excessive traffic impact loading caused by an excessively wide gap or uneven deck slabs. • Alternatively, the deck joint may have closed up or the gap has been blocked with dirt and grit, and the consequential restraint of movement has generated the cracking and spalling.	Not available

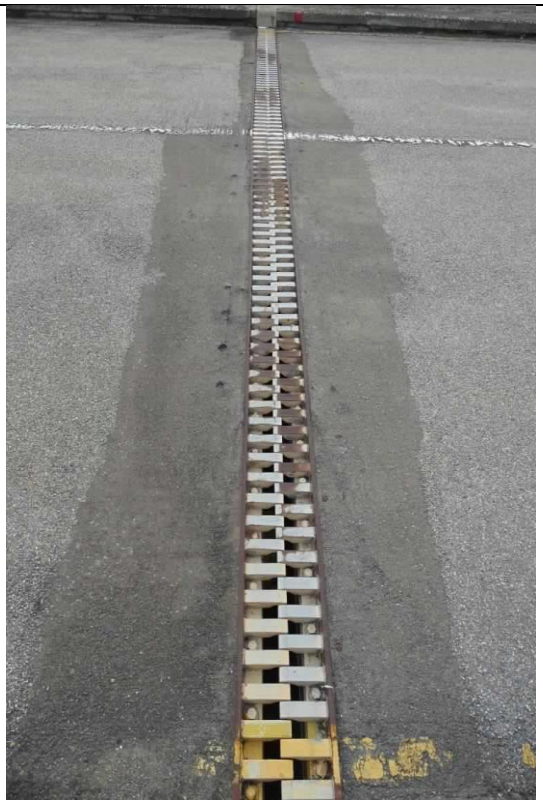
39S - Sliding joint – steel

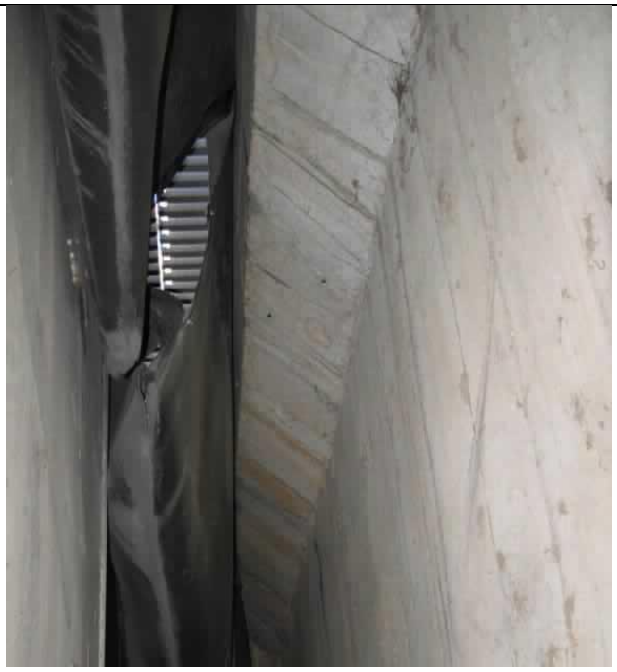
This component describes those joints constructed mainly of steel which move or slide over or within a mating component on the other side. The joints may have a compression seal, gland, membrane or catch drain beneath, which should be considered as part of the joint component.

Joints included in this component are steel sliding plates, steel finger joints, PSC FT joints, CIPEC and FIRMSEC (large) joints.

Units
Linear metres

Condition state 1 -Description	**Photo**
• The component is in good condition with only minor rusting. • All hold down bolts are in good condition with no movement of the anchorages. • The joint shows no moisture penetration.	 Finger joint in good condition with only minor faint cracking in the concrete nosing

Condition state 2 -Description	Photo
• Minor corrosion may be showing on the steel and there may be some slight loosening of the anchorage bolts. • The adjacent asphalt may have minor cracking at the joint. • The joint may show signs of light moisture penetration. • There may be some debris in the joint.	 Bitumen broken up and debris in joint
Condition state 3 -Description	**Photo**
• Moderate corrosion may be showing on the steel and there may be some minor loosening of the anchorage bolts. • The adjacent asphalt may have moderate cracking at the joint. • The joint may show signs of medium moisture penetration. • There may be a moderate amount of debris in the joint.	 Corrosion on steel fingers

Condition state 4 -Description	Photo
• Heavy corrosion of the steel plates may be present, and some bolts may have failed allowing the anchorages to move. • Cracking and minor broken up asphalt may be occurring. • The joint may show signs of heavy moisture penetration. • Catch drains may be full of grit etc. and may not be functioning or catch membranes may have badly deteriorated. • Steel fingers may be rubbing due to side movement or fingers may be raised well above the mating fingers, or widening of the gap may only have the ends of the fingers in line.	 Drain membrane torn
Condition state 5 -Description	**Photo**
• Advanced corrosion of the steel may be present and a number of bolts may have failed allowing excessive movement of the anchorages. • The asphalt around the joint may be badly cracked and pieces breaking out. • Steel fingers may be broken or completely apart due to excessive movement, or rotations. • Catch drains or membranes may have completely failed or are missing.	 Finger joint completely open

40O - Fixed joint – other

This component describes those joints, which are basically fixed but may allow very small movement of 1 or 2 mm. Transversely tensioned prestressed slabs are separated at the piers by malthoid strips and a cast-in-situ concrete infill and this joint can be considered in this component.

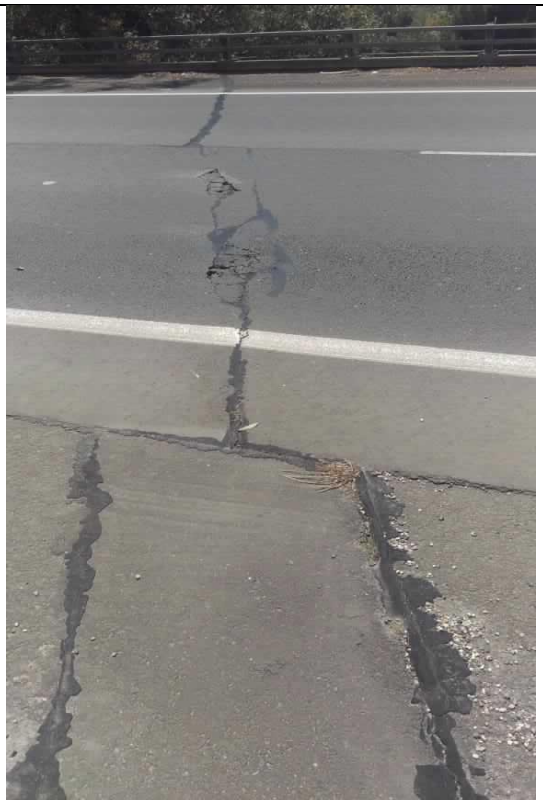
Longitudinal deck joints, with or without a sprayed seal on top, where the decks are cast against each other or with a thin separator such as cork, bitumen impregnated fibreboard, styrene sheets or malthoid sheets are included in this component. If fill has been placed over the longitudinal joints, any defect in the road surface resulting from the joint should be considered under the item for Traffic Surface.

Moisture leakage through the joint should be considered as a defect of the joint.

Units
Linear metres

Condition state 1 -Description	**Photo**
• The component shows no deterioration and the joint material is held firmly in place by the surrounding concrete. • There is no moisture penetration of the joint.	 Fine crack along abutment backwall joint, crack could be sealed by hot poured PMB

Condition state 2 -Description	Photo
• Minor deterioration of the material may have occurred or the units have moved slightly allowing minor moisture leakage of the joint through the fine crack.	 Cracking over pier joint allowing minor moisture penetration
Condition state 3 -Description	**Photo**
• Moderate deterioration of the material may have occurred or the units have moved allowing moderate moisture leakage of the joint through the crack.	 Debonded joint sealant over pier joint

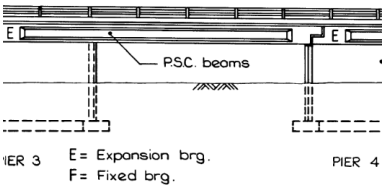
Condition state 4 -Description	Photo
• Medium deterioration of the material has occurred due to weathering, pressure or movement of the surrounding concrete. • Significant leakage is occurring as the joint material pulls away from the surrounding concrete.	 Cracking and spalling at abutment sill-girder joint
Condition state 5 -Description	**Photo**
• Severe deterioration has occurred and the joint material has pulled well apart from the surrounding concrete, or the joint material has badly weathered or been lost. • Heavy leakage is occurring through the joint and may be affecting the surrounding concrete or the mortar bearings below.	 Major cracking and spalling of pavement at pier joint allowing excessive moisture penetration

BEARINGS

Note: Bearings will usually be allocated to the Abutment and Pier inspection groups.

The exception to this is for notch bearings. Notch bearings are allocated to Span inspection groups, for the span that they support

Notch bearing



Notch bearing supporting Span 4 (between Piers 3 and 4)

Notch and bearing in mid-span (not above a pier)

41O - Fixed bearings – other

This component defines those bearings that may provide for deflection or rotation and includes steel plates bearing on concrete with or without locating pins or lugs, concrete bearing on malthoid, lead sheet or a bond breaking layer of colourless grease.

Units
Each

Condition state 1 -Description	**Photo**
• The component shows minimal deterioration with the paint system in good condition protecting the steel plates and any material allowing minor movements is in good condition and functioning properly.	 Fixed steel plate bearing in good condition
Condition state 2 -Description	**Photo**
• Minor movement may have caused faint cracking in the ends of the beams due to pressure on the locating dowels. Protective paint systems may be failing allowing light rusting of the metal plates. • Malthoid or lead sheets may be deteriorating or beginning to be squeezed out from beneath the beams. • Bearing support may be cracked but still sound.	 Some corrosion starting on steel plates, fine cracking of mortar pad

Condition state 3 -Description	Photo
• Moderate movement may have caused minor cracking in the ends of the beams due to pressure on the locating dowels. • Protective paint systems may have failed allowing minor rusting of the metal plates. • Malthoid or lead sheets may have deteriorated or being squeezed out from beneath the beams. • Bearing supports may have moderate cracks but are still basically sound.	 Lead extruding from bearing
Condition state 4 -Description	**Photo**
• Medium movement may have caused medium cracking or moderate spalling of the ends of the beams. • Protective paint systems may have failed causing medium corrosion of the metal plates. • Malthoid or lead sheets may well be deteriorated or up to 50% extruded from beneath the beams. • Bearing supports may show heavy cracking, crumbling of mortar or have sizeable spalling with some reduction of bearing support area.	 Bearing plates are corroding and bearing pedestal is cracked
Condition state 5 -Description	**Photo**
• Large movements may have caused heavy spalling of the ends of the beams. • Steel plates may be heavily corroded due to complete loss of protective paint. • Malthoid or lead sheets may be totally deteriorated or almost completely extruded beneath the beams. • Bearing supports may have badly crumbled mortar or heavily spalled concrete with extensive reduction in bearing support area with possible cracking having occurred.	 Steel bearing plate badly corroded on pier

42O - Sliding bearings – other

This component defines those bearings that provide for movement by the use of a sliding mechanism. They also may have thin elastomer strips which will allow for some deflection and rotation, but the main mechanism is to allow for sliding of one surface over another with the use of copper or phosphor bronze plates, Teflon (PTFE) discs or coated sliding plates. The bearing may simply be greased surfaces with the sliding plate moving between guides in a steel base plate.

Units
Each

Condition state 1 -Description	**Photo**
• The component is in good condition with minimal deterioration. • The paint system is in good condition and sliding components are in their correct positions and appear to be working as normal. • There is minimal debris in the bearing. • Bearing support is sound with mortar or concrete uncracked and in good condition.	 Sliding bearing in good condition (excess hold down bolt thread to be removed)
Condition state 2 -Description	**Photo**
• Protective paint systems may be failing, allowing rusting of the metal plates. • Sliding components may have moved excessively but the joint is still moving correctly. • Debris in the bearing or corrosion may be having a minor effect on the movement capabilities of the bearing. • Bearing support may be lightly cracked but still sound.	 Debris build up at bearings
Condition state 3 -Description	**Photo**
• Protective paint systems may have failed causing light corrosion of the metal plates. • Sliding components may have moved excessively and beginning to be extruded between the steel plates. • Debris in the bearing or corrosion may be having a moderate effect on the movement capabilities of the bearing. • Bearing support may show moderate cracking or light crumbling of mortar but still basically sound.	 Extrusion of PTFE from bearing

Condition state 4 -Description	Photo
• Protective paint systems may have failed causing medium corrosion of the metal plates. • Sliding components may have moved excessively and are being extruded between the steel plates. • The PTFE coating is delaminating from its base plate and is buckled and being destroyed. The lubricating system may have failed and the joint is failing to operate normally. • Bearing support may show heavy cracking, crumbling of mortar or sizeable spalling with some reduction of bearing support area.	 Side restraint has broken off bearing due to transverse movement when joint closes up
Condition state 5 -Description	**Photo**
• Steel plates may be heavily corroded due to complete loss of protective paint. • Sliding components may have slipped out and are no longer functional or the PTFE coating has completely delaminated, buckled and destroyed. • The lubricating system may have failed and the joint has seized and is no longer functional. • Bearing support may have badly crumbled mortar or heavily spalled concrete with extensive reduction in bearing support area, with possible crushing having occurred.	 Sliding plate with Teflon disks completely slipped out of bearing arrangement (VicRoads)

43O - Elastomeric / pot bearings – other

Units
Each

This component defines those bridge bearings constructed primarily of elastomers, with or without metal shims reinforcing the elastomer. The bearings may be free to move or have anti-sliding containment or be fully contained in pot bearings.

This component also includes thrust/buffer bearings, which are situated between the ends of girders and abutment back walls.

Condition state 1 -Description	**Photo**
• The bearing shows minimal deterioration. • Shear deformations are correct for the temperatures and structural movements. • Bearing support surfaces are flat and sound with no cracking of the mortar or concrete.	 Elastomeric bearing in good condition
Condition state 2 -Description	**Photo**
• The bearing may have faint cracking, splitting or signs of weathering. • Shear deformations may be moderate and the bearing is functioning normally. • Bearing support surfaces may not be flat with only partial support to the bearings, or the bearing support may be cracked but still basically sound.	 Gap between bottom plate corners and pad  Moderate bearing shear

Condition state 3 -Description	Photo
• The bearing may have minor cracking, splitting or signs of weathering. • Shear deformations may be large but not excessive, and the bearing is still functioning normally. • Bearing support may have irregularities or minor spalling but with only minimal loss of bearing support area.	 Steel bearing shim plates corroding and lifting
Condition state 4 -Description	**Photo**
• The bearing may have slight bulges between the shims and the elastomer may have fine cracking or splitting. • Rotation or shear deformations may be excessive with rollover of the edges of the bearing. • Bearing is still functioning but is being overstressed. • Bearing support may have sizeable irregularities or spalling with loss of bearing support area. • Pot bearing may have faint cracking of the container. • Bearing may have large rotation or sliding components are showing large movements. Elastomer may be beginning to be extruded from the top of the container.	 Horizontal cracking near top of bearing pad
Condition state 5 -Description	**Photo**
• The bearing may have large bulging with cracking or splitting at the shims which have delaminated from the elastomer. • Shear or rotation deformations may be excessive with a sizeable reduction in the bearing area in contact with the surfaces and transferring load. • Bearing support may have heavily spalled concrete with some crushing possible. • Pot bearing container may be cracked with elastomer being extruded from the crack or through the top of the container. • Bearing may show excessive rotation or sliding components may have excessive movement and no longer functioning correctly.	 Bolt securing fixed pot bearing broken, and mortar pad severely cracked and broken

44S - Rockers / rollers – steel

This component defines those bearings that may provide for rotation and movement by means of steel rollers or rocker mechanisms. This includes knuckle / leaf type bearings.

Units
Each

Condition state 1 -Description	**Photo**
• The component shows minimal deterioration. • The paint system is in good condition with the bearing well lubricated and functioning correctly. • Bearing support is sound with no cracking of the mortar or concrete.	 Steel rocker bearing in good condition
Condition state 2 -Description	**Photo**
• Protective paint systems may be failing allowing minor rusting to the surface area of the metal. • Debris has lodged in the bearing hampering the movement or rotation of the bearing. • Rocker has rotated correctly, but not excessively, for the temperature and movements of the bridge. • Bearing support may be lightly cracked but still sound.	 Minor corrosion to bearing

Condition state 3 -Description	Photo
• Protective paint systems may have failed causing moderate surface rust to the area and moderate corrosion of the metal. • Debris is hampering the movement or rotation of the bearing and its correct operation. • Rocker has rotated correctly, but not excessively, for the temperature and movements of the bridge. • Bearing support may show moderate cracking but is still basically sound.	 Moderate rusting of steel rocker
Condition state 4 -Description	**Photo**
• Protective paint systems may have failed causing medium surface rust to the area and medium corrosion of the metal. • Debris is preventing the movement of the bearing and its correct operation. • Rockers may have rotated to their tolerance limits. • Bearing support may show heavy cracking, crumbling of mortar or sizeable spalling with some reduction of the bearing support area.	 Roller bearing at maximum travel, displaced approx. 75mm
Condition state 5 -Description	**Photo**
• The steel may be heavily corroded due to complete loss of protective paint. • Lubrication systems have completely failed and excessive debris has seized the bearing. • Rockers may have rotated to their tolerance limit and the shear key may have cracked off. • Bearing support may show badly crumbled or heavily spalled concrete with extensive rotation in bearing support areas with possible crushing having occurred.	 Front roller missing and roller race skewed and almost completely ejected, with only a third of roller length providing support to the truss

45C - Mortar pads / high bearing pedestals – cast in-situ concrete

This component defines those bearings consisting entirely of dry pack or wet boxed mortar, or high concrete pedestals greater than the nominal 50 mm thickness, unreinforced or reinforced with distribution steel. This section does not cover the packing mortar placed under a steel bearing base plate. That mortar is covered under the relevant bearing on top of the base plate.

Units
Each

Condition state 1 -Description	**Photo**
• The component is in good condition with minimal deterioration and no cracking.	 Mortar pad bearings beneath prestressed slabs in good condition though moist and stained (VicRoads)
Condition state 2 -Description	**Photo**
• The mortar pads may show signs of minor dampness and leaching. • The pedestals may have some fine cracking due to bearing movement or edge loading, but the strength of the bearing has not been affected.	 High bearing pedestal with cracking in front face due to edge loading from bearing plate overhanging the pedestal (VicRoads)

Condition state 3 -Description	Photo
• The mortar pads may show signs of moderate dampness and leaching. • The pads or pedestals may also show minor cracking, crumbling or minor crushing of the mortar, with slight loss of bearing area	Not available
Condition state 4 -Description	**Photo**
• Heavy leaching due to excessive dampness is exhibited by the mortar pads. • The pads may also show moderate cracking, crumbling or moderate crushing of the mortar, with minor loss of bearing area.	 Mortar bearing pad breaking up beneath beam (VicRoads)
Condition state 5 -Description	**Photo**
• The mortar is crushing or has been lost with large subsequent loss of bearing area. • The high concrete pedestals may have heavy cracking with large spalls and subsequent loss of bearing area.	 Mortar pad lost and edge pad cracked (VicRoads)

BRIDGE

46O - Waterway – other

Units
Each

This component defines the condition of the natural unprotected stream banks and bed in the vicinity of the structure. The major issues that will affect the bridge and therefore should be considered are:

- Scour
- Vegetation growth
- Soil and gravel deposits
- Other debris.

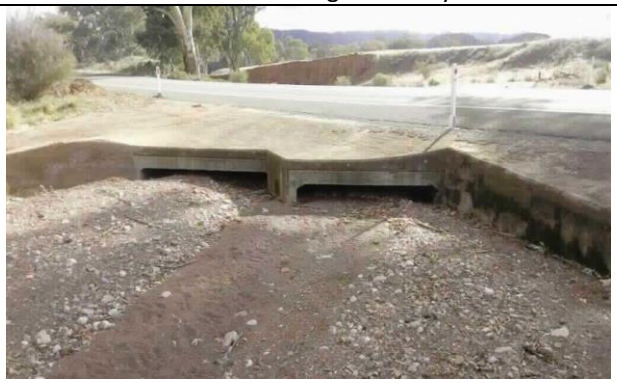
The component shall be rated for the overall portion/percentage of area of the component in each of the condition states (as outlined in Part 1.2.2.3 of this manual), taking each of the 4 deterioration issues into consideration.

Condition state 1 -Description	**Photo**
<u>Scour</u> • No or very minimal scour; no effect on waterway.	Not available
<u>Vegetation growth</u> • There is little vegetation growth at the waterway with no effect on the performance of the waterway.	
<u>Soil and gravel deposits</u> • Waterway is clear with no or little soil build up present.	
<u>Other debris</u> • No or very little debris is present in the waterway.	

Condition state 2 -Description	Photo
<u>Scour</u> • Minor scour has only a slight effect on the stream shape and bed level at the site.	 Minor scour
<u>Vegetation Growth</u> • Any vegetation growth beneath the bridge is minor and having no effect on the performance of the waterway.	 Vegetation growth is having no effect on the waterway
<u>Soil and Gravel Deposits</u> • Minor soil or gravel build up is present under the bridge, but having no effect on the waterway. • Light silting to ¼ depth in culverts.	 Minor soil and gravel deposits
<u>Other Debris</u> Small amounts of accumulated debris are present in the waterway.	 Old broken fence across waterway

Condition state 3 -Description	Photo
<u>Scour</u> • Moderate level of scour and may be starting to have a minor effect on the waterway. • Moderate scour has only a minor effect on the stream shape and bed level at the site.	 Moderate scour
<u>Vegetation growth</u> • Growth underneath or at both upstream and downstream sides, but only minimal effect on the waterway. • Removal should be considered.	 Trees growing under bridge but having minimal effect on waterway
<u>Soil and gravel deposits</u> • Moderate soil or gravel build up is present under the bridge, but only having minor effect on the waterway. • Minor ponding of water may result. • Silting from ¼ to ½ depth in culverts	 Silt build up in culvert
<u>Other debris</u> • Accumulated debris is present and is building up around the bridge supports or in the culvert cells, and should be removed. • No major impact on the waterway at this stage.	 Built up debris around piers

Condition state 4 -Description	Photo
<u>Scour</u> • Scour is advanced and is affecting the waterway. • Scour of the banks has altered the stream shape or the bed beneath the bridge is scouring due to inadequate waterway. • Remedial action should be considered.	 Advanced scour
<u>Vegetation growth</u> • Overgrowth of vegetation (blackberries, rushes, reeds etc.) under or at ends of bridge is affecting the waterway, and should be removed.	 Tree growing at downstream end of bridge
<u>Soil and gravel deposits</u> • Significant accumulation of soil or gravel build up has altered the stream shape and is restricting the waterway. • Ponding of water under the bridge may be a feature. • Heavy silting in the stream such that the culvert is silted to ½ depth.	 Substantial silt build up reducing water flow under the bridge
<u>Other debris</u> • Significant amounts of accumulated debris are present and have built up against the bridge supports or in the culvert cells, and should be removed. • The performance of the waterway is being affected.	 Debris blocking the end of culvert cells

Condition state 5 -Description	Photo
<u>Scour</u> • Scour is significant and very advanced. • Undermining of abutment, piers or riverbanks is occurring. • Unprotected banks and beds may be severely scoured with loss of approach embankment occurring. • Needs to be remedied in order to protect the integrity of the structure.	 Significant scour at pier
<u>Vegetation growth</u> • Excessive overgrowth of vegetation (blackberries, rushes, reeds etc.) has severely restricted the waterway and should be removed in the short term.	 Reeds and small trees blocking waterway
<u>Soil and gravel deposits</u> • Excessive accumulation of soil or gravel build up has rendered the waterway ineffective. • Significant ponding of water under and around the bridge. • Excessive silting has severely restricted the waterway with more than 2/3 of the culvert depth silted.	 Waterway blocked by sediment
<u>Other debris</u> • Large amounts of accumulated debris are present and are impacting on the performance of the waterway. • Waterways and culvert cells may be substantially blocked. • Debris should be removed within the short term.	 Built up debris blocking waterway

47C - Channel protection – cast in-situ concrete

Units
Each

This component defines the condition of stream or channel banks and/or bed in the vicinity of the structure which have been lined with cast-in-situ reinforced concrete or mortar pumped into a nylon mattress.

This component does not include cast in-situ base slabs within culverts and arches.

Condition state 1 -Description	**Photo**
• There is little or no change in channel shape or bed level at the site. • The reinforced concrete channel or aprons are undamaged with no differential settlement between slabs.	 Concrete lined channel in good condition
Condition state 2 -Description	**Photo**
• Channel shape and bed level is unchanged but there may be cracking of the concrete or minor differential movement between the slabs. • There may be accumulated debris or bed deposits representing up to 10% of the designed waterway area in any span.	 Concrete protection at base of wingwall and abutment, with some cracking and minor movement

Condition state 3 -Description	Photo
• Minor cracking of the concrete or moderate differential movement between the slabs has caused the concrete edges to start to break away. Water may have started seeping behind the concrete but channel shape and bed level is unchanged. • Some loss of fill material may have occurred. • There may be accumulated debris or bed deposits representing up to 20% of the designed waterway area in any span.	 Channel protection cracked and spalled
Condition state 4 -Description	**Photo**
• Differential settlement or movements have caused concrete edges to break away allowing water behind the concrete. • Moderate loss of fill material may have occurred. • There may be accumulated debris or bed deposits representing up to 30% of the designed waterway area in any span.	 Concrete channel wall and lining cracked in many places
Condition state 5 -Description	**Photo**
• Large settlements or movements have severely damaged the concrete allowing large washouts beneath the concrete banks or bed • There may be accumulated debris or bed deposits representing in excess of 30% of the designed waterway area in any span.	 Poorly formed concrete channel has water flowing underneath causing minor scour

47O - Channel protection – other

This component defines the condition of non-concrete protected stream banks and bed in the vicinity of the structure. These protected banks and bed may be constructed of brick, masonry, stone filled cages or mattresses, a geotextile layer with grass, or rocks held down by wire mesh.

Units
Each

Condition state 1 -Description	**Photo**
• There is little or no change in the stream shape or bed level at the site. • Protective works are in good condition with no damage visible.	 Rock channel protection in very good condition
Condition state 2 -Description	**Photo**
• Slight settlement may have occurred or there may be minor cracking of the mortar between stones. • Rock gabions or mattresses may have lost their shape slightly but only minor loss of rock fill may have occurred.	 Channel protection in good condition, minor vegetation growth

Condition state 3 -Description	Photo
• Moderate scour has only a minor effect on the stream shape and bed level at the site. • Minor settlement may have occurred or there may be moderate cracking of the mortar between stones. • Rock gabions or mattresses may be slightly distorted but only moderate loss of rock fill may have occurred.	 Gabions have moved since placement
Condition state 4 -Description	**Photo**
• Scour of the banks has altered the stream shape or the bed beneath the bridge is scouring due to inadequate waterway. • Settlement may have badly cracked mortar between blocks and a few blocks may be missing with possible loss of fill material. • Gabions or mattresses may be badly distorted with some wires broken and a moderate loss of rock filling may have occurred.	 Channel wall has been undermined with loss of material
Condition state 5 -Description	**Photo**
• Large settlements or movements may have severely damaged the beaching with loss of large areas of rocks, and possible large cavities due to washout of fill material. • Gabions or mattresses may be completely broken with almost total loss of rock filling.	 Stones missing from reno mattresses

48C - Base slab – cast in-situ concrete

This component describes the condition of all reinforced concrete base slabs.

Note that this does not include the protection of waterway beds and banks with a reinforced concrete lining or concrete aprons – such elements should be rated under Component No. 44C.

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.	 Concrete 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.	 Base slab with minor cracking

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.	 Concrete spalling
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.	Not available
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.	 Exposed reinforcement in base slab

48O - Base slab – other

This component describes the condition of the man-made floor of the structure in any material other than concrete, such as masonry or brick.

This item includes the following components:
• all grouted stone pitched floors
• all plum concrete floors.

Note that this does not include the protection of waterway beds with masonry or rocks – such elements should be rated under Component No. 44O.

Units
m^2 of exposed surface area

Condition state 1 -Description	Photo
• The floor shows little or no deterioration, with a very few minor fine cracks in the mortar between the stones or in the unreinforced concrete. • There should be no loss of mortar between the stones and the seal between the floor and the abutments/pier walls is intact with no visible gaps.	Not available
Condition state 2 -Description	**Photo**
• There may be minor cracking in the mortar between the stones or in the unreinforced concrete due to minor settlement. • There may be some loss of mortar of no concern. • The floor may have separated from concrete abutments/pier walls in a few locations but there is no settlement or movement occurring.	Not available

Condition state 3 -Description	Photo
• There may be moderate cracking in the mortar between the stones or in the unreinforced concrete due to minor settlement. • There may be minor loss of mortar of no concern. • Water may be ponding on the slab. • The floor may have separated from concrete abutments/pier walls in a few locations and there may be minor settlement or movement occurring.	 Water ponding in centre of base slab
Condition state 4 -Description	**Photo**
• Moderate cracking has occurred in the mortar between the stones or in the unreinforced concrete and stones may be missing. • The floor may have separated from the abutments/pier walls, providing access for moisture and there may be moderate settlement or movement occurring.	 Large scour hole in base slab
Condition state 5 -Description	**Photo**
• Severe cracking has occurred in the mortar between the stones and large areas of stones may be missing. • The unreinforced concrete may be severely cracked and broken in numerous areas. • The floor may have separated from the abutments/pier walls in many places, providing access for moisture and significant settlement or movement is occurring.	Not available

49S - Additional elements – external strengthening / post tensioning – steel

Units: **Each**

The item includes all steel bars/tendons, anchorages and associated supports used to strengthen another component through the application of external strengthening/post-tensioning. The bars/tendons may be painted, coated, wrapped in grease with a protective outer wrapper or embedded in grout within a conduit.

Strengthening relies entirely on the anchorage and bond of the material to the base component and the following areas should be inspected during a site inspection:

- The ends of the strengthened area for signs of the plates debonding from the epoxy resin or the resin debonding from the concrete base.
- The concrete base at the strengthening boundary for signs of any cracking or spalling which could affect the bonding of the steel plate to the member.
- Signs of distress in mechanical anchorage systems or in parent concrete around anchorages.
- General corrosion or deterioration of the parent concrete component.
- Corrosion or cracking of the bonded steel plate.

Condition state 1 -Description	Photo
• There is no evidence of rust and any protective coating system is in good condition. • There are no signs of distress at anchors or associated supports.	 Steel plate and anchors in good condition

Condition state 2 -Description	Photo
• The bars or tendons may show signs of rust or the protective coating system may only be in fair condition. • There are no signs of distress at anchors but the supports may be lightly corroded and in need of lubrication.	 Paint blistering on steel strengthening plate attached to girder
Condition state 3 -Description	**Photo**
• The bars or tendons may have minor rusting or the protective coating system may be broken or in poor condition. • There are no signs of distress at anchors but the supports may have minor corrosion and be in need of lubrication.	 Tie bars (preventing spread of arch spandrel walls) with rusting but no signs of distress

Condition state 4 -Description	Photo
• The bars or tendons may exhibit minor corrosion. Any protective coating system has been lost or is in very poor condition. • The conduit is in poor condition, grout may be visible through the damaged conduit and may be exhibiting signs of distress. • Anchors and associated supports may have moderate deformations. • Tendons may be beginning to abrade but there are no wire breakages. • Bars may be beginning to abrade but there is no loss of section.	 Corrosion on girder strengthening plate
Condition state 5 -Description	**Photo**
• The bars or tendons are badly corroded, or have slackened noticeably. • Anchorages may have severe deformations or anchorages have moved or slipped. Associated supports are badly damaged. • Tendons may be severely abraded with a number of broken wires. • Bars may be severely abraded with loss of section.	Not available

49O - Additional elements – external strengthening / post tensioning – other

Units
Each

This item includes all external strengthening systems constructed using composite materials, such as fibreglass-coated and/or FRP and/or carbon fibre (CFRP) strips.

Strengthening relies entirely on the anchorage and bond of the material to the base component and the following areas should be inspected during a site inspection:

- the ends of the strengthened area for signs of the strips peeling from the epoxy resin or the resin debonding from the concrete base
- the concrete base at the strengthening boundary for signs of any cracking or spalling which could affect the bonding of the FRP to the member
- delamination of the strengthening from the base concrete in other areas, or kinks in the material, air bubbles, bulging or waviness
- tears, cuts or crazing of the FRP material.

Condition state 1 -Description	**Photo**
• The system is in good condition, with no signs of distress in either the substrate, the bonding resin or the strengthening material.	 Carbon fibre strips on soffit of reinforced concrete box girder in sound condition with no evidence of bubbles or peeling at ends or along edges
Condition state 2 -Description	**Photo**
• There may be small areas of delamination (< 5% of the laminate area). • There may be evidence of minor initial breakdown of the system (that is, a fine crack across the end of the laminate or fine cracks in the resin or substrate).	Not available

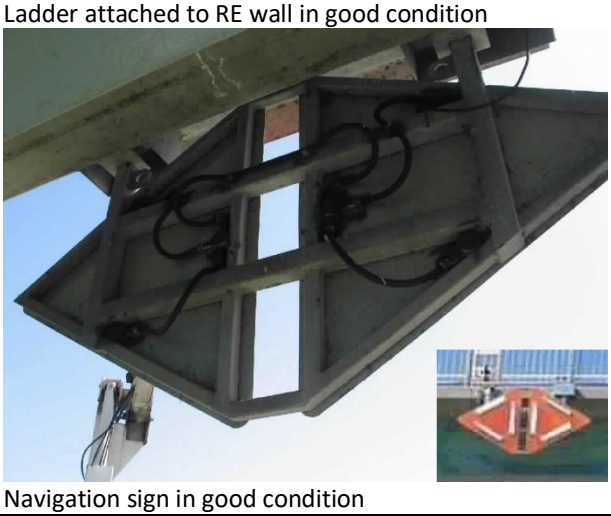
Condition state 3 -Description	Photo
• There may be areas of delamination (< 10% of the laminate area). • There may be evidence of breakdown of the system (that is, a minor crack across the end of the laminate or minor cracks in the resin or substrate).	Not available
Condition state 4 -Description	**Photo**
• The system exhibits delamination (> 10% of the laminate area). • The end of the laminate has begun to peel or the laminate and epoxy are separating from the substrate. • Cracking is more pronounced along the substrate/epoxy resin interface or along the laminate/epoxy resin interface.	Not available
Condition state 5 -Description	**Photo**
• There is widespread delamination evident. • Cracking along the interface between laminate, resin or concrete substrate is severe. • Cracking may be evident in the base concrete in the vicinity of the strengthening system.	Not available

50O - Additional elements – concrete / steel / other

Units
Each

This component defines miscellaneous attachments and other elements on bridges such as signs, ladders, light poles, access ways, service pits and urban art.

This component does not include those additional elements such as external strengthening and post tensioning that have their own separate condition rating guidelines.

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 bridge are in good condition. Ladders, gantries or access ways are in good condition.	 Ladder attached to RE wall in good condition  Navigation sign in good condition

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 bridge are in good condition. Ladders, gantries or access ways have small defects but are safe to use.	 Light corrosion of metal superstructure strut collar  Damage to protective coating of pink urban art posts

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 bridge are in sound condition. Ladders, gantries or access ways have minor defects but are safe to use.	 Spall in step of spiral staircase  Corrosion of access stairs  LED lighting not properly secured

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 bridge 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.	 Spalled footpath at abutment
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 bridge element. • Ladders, gantries or access ways have significant defects and are unsafe to use.	 Badly spalled footpath at abutment  Service pit lids dislodged and damaged

51O - Drainage system - other

This element defines only the scuppers and stormwater systems of bridges.

Units

Each span

Condition state 1 -Description	Photo
• Scuppers and stormwater system clear. • Drainage system fully functional.	Not available

Condition state 2 -Description	Photo
• Some scuppers are partly blocked but drainage of deck is satisfactory. • Drainage system is functional possibly with some minor leaky joints and/or some brackets may be broken.	 Minor debris in deck drainage pit

Condition state 3 -Description	Photo
• Some scuppers are blocked but drainage of deck is still adequate. • Drainage system is functional possibly with some moderate leakage from joints and/or some brackets may be broken.	 Blocked scupper
Condition state 4 -Description	**Photo**
• Drainage pipes may have broken sections and/or large number of leaks. • Scuppers / grates may be damaged. There may be large number of scuppers blocked affecting drainage of the deck. • There may be some loose or missing hangers.	 Scupper downpipe broken
Condition state 5 -Description	**Photo**
• Blocked scuppers prevent or threaten to prevent satisfactory drainage of deck. • Drainage system may be blocked or damaged and not functioning satisfactorily. • There may be many loose or missing hangers.	 Blocked scupper affecting drainage of deck

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