

# Level 2 Inspection Report

## Old Windsor Road Pedestrian Bridge

**Mulpha Norwest Pty Ltd**

16 December 2024

Issue No: 1

Status: Final

Ref: 241212\_R001





## Document History and Status

Issue No	Status	Date	Prepared By	Reviewed by	
				Name	Signature
1	DRAFT-FOR CLIENT REVIEW	16/12/2024	TW	FM	Dr Fred Moshiri
2	Final	19/12/2024	TW	FM	Dr Fred Moshiri



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**Client: Mulpha Norwest Pty Ltd**  
**Ref: 241212\_R001**

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# 1 Executive Summary

The pedestrian bridge over Old Windsor Road at the intersection of Old Windsor Road and Norbrik Drive, Bella Vista, is a 40m simply supported steel truss bridge constructed in 2009. The bridge is supported by two steel frame structures constructed over concrete pad footings.

MULPHA Norwest Pty Ltd have made a request for a Level 2 inspection of this bridge. The inspection was carried out on Thursday, 5<sup>th</sup> December 2024 by appropriately qualified structural engineers.

In summary, the overall pedestrian bridge's condition is classified as 'fair', with hairline to minor (0.02 to 2mm) concrete deck cracking and localized surface corrosion on steel elements indicating minimal structural compromise. Localized protective coating failures and surface rust were observed, suggesting the need for maintenance interventions.

The recorded defects have negligible impact on the overall strength and serviceability of the bridge. Nevertheless, the bridge shall be regularly monitored over the next two years to ensure serviceability, and the defects must be rectified over the next 18 months.

The recorded defects have negligible impact on the bridge's overall strength and serviceability. However, a proactive approach is recommended: implement a regular monitoring protocol over the next two years to ensure continued serviceability and rectify the documented defects within an 18-month timeframe.



## 2 Scope and Limitation

This report has been prepared by Tonkin for Mulpha Norwest Pty Ltd (Mulpha) and may only be used and relied on by Mulpha for the purpose agreed between Tonkin and Mulpha.

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The opinions, and any recommendations in this report are based on conditions encountered and information reviewed at the date of preparation of the report. Tonkin has no responsibility or obligation to update this report to account for events or changes occurring, subsequent to the date that the report was prepared.

The opinions, conclusions and any recommendations in the report are based on information provided to us to date and assumptions made by Tonkin described in this report. Tonkin disclaims liability arising from any of the assumptions being incorrect.



### 3 General Information

**Structure Name:** Old Windsor Road Pedestrian Bridge  
**Structure ID:** 10391

**Structural Overview:** The structure is a steel truss bridge with a Bondek slab deck. It features the following key elements:

The bridge comprises a simply supported steel truss superstructure with a Bondek reinforced concrete slab deck. The superstructure is supported at each abutment by steel piers, which transfer loads to reinforced concrete pad footings. All steel-to-steel connections are bolted connections, designed to resist shear and tension forces at member interfaces.

**Auxiliary Structures:** Integral to each support are steel-framed staircases, featuring steel-posted handrails. Additionally, glass-encased steel-framed lift shafts are incorporated, with their structural frames. These auxiliary structures are structurally independent but geometrically integrated with the main bridge system.

**Zone:** West Zone (Z3)

**Longitude:** 150.95014

**Overall Length:** 44.19m

**LGA:** The Hills (031)

**Latitude:** -33.74788

**Overall Width MAX:** 3.30m

#### Inspection Equipment

Digital Camera

#### Inspection Details

**Level of Inspection:** Level 2

**Weather:** Partially cloudy

**Inspector/s:** Tommy Wong

**Inspection Type:** Normal

**Temp (C):** 25 degrees

**Contact:**

**P:** Direct +61 2 9409 3314 **E:** Tommy.Wong@tonkin.com.au

**Inspection Date:** 5<sup>th</sup> December 2024

**Proposed Date of next Inspection:** April 2026





## Locality





## 4 Condition Rating of Elements

### 4.1 Main Bridge

Element Code	Element Description	Environment	Total Quantity	Units	Estimated Quantity in Condition State				
					1	2	3	4	5
BELA	Elastic Bearing Pad	M	4	each	4				
CDSL	Concrete-Deck Slab	M	145	m <sup>2</sup>	142	3			
CPIR	Concrete Pier (excl. any Headstock or Piles)	M	6	m <sup>2</sup>	6				
JASS	Assembly Joint / Seal	M	7	m	7				
MATT	Miscellaneous Attachments	M	5	item	4	1			
MSCR	Safety Screen	M	41	m	20	11	10		
MSWS	Stormwater Systems	M	2	item			2		
PBGI	Protective Coating – Beam / Girder	M	48	m <sup>2</sup>	46	1	1		
PBPD	Protective Coating – Buckle Plate Deck	M	69	m <sup>2</sup>	67	2			
PCBT	Protective Coating – Cables / Hangers / Tension Ties	M	28	each	26	1	1		
PCOD	Protective Coating – Corrugated / Orthotropic / etc Deck	M	145	m <sup>2</sup>	143	1	1		
PDBR	Protective Coating – Diaphragm / Bracing / Secondary Member	M	92	m <sup>2</sup>	91	1			





## Environment

**Low (L)** – Environmental factors do not adversely influence the elements condition

**Medium (M)** – Any change in the condition of the element is likely to be quite normal

**Severe (S)** – Environmental factors contribute to the rapid decline in condition of the element

## Condition State - Steel (Refer to Appendix B for other elements)

**1** – No evidence of damage or cracking.

**2** – Surface rust; minor deformations; no cracks in steel welds.

**3** – Heavy pitting; loss or missing bolts; no sufficient impact to the strength and/or serviceability to the element.

**4** – Section loss; cracks and/or deformations in the steel or welds; numerous failed or missing bolts; defects may impact the ultimate strength and/or serviceability of the element.

**5** – Not applicable

Element Code	Element Description	Environm ent	Total Quantity	Units	Estimated Quantity in Condition State				
					1	2	3	4	5
PPIR	Protective Coating – Pier	M	101	m <sup>2</sup>	99	1	1		
PTBC	Protective Coating – Truss – Bottom Chord	M	48	m <sup>2</sup>	44	2	2		
PTCG	Protective Coating – Truss – Cross Girder	M	40	m <sup>2</sup>	37	1	2		
PTDG	Protective Coating – Truss – Diagonals	M	144	m <sup>2</sup>	142	1	1		
PTTB	Protective Coating – Truss – Top Bracings	M	39	m <sup>2</sup>	39				
PTTC	Protective Coating – Truss – Top Chord	M	48	m <sup>2</sup>	47	1			
PTVT	Protective Coating – Truss – Verticals	M	12	m <sup>2</sup>	12				
RMET	Metal Railing	M	130	m	130				
RPNT	Railing Paint Work	M	130	m	129		1		



SBGI	Steel – Beam / Girder	M	48	m <sup>2</sup>	47	1			
SBPD	Steel – Buckle Plate Deck	M	69	m <sup>2</sup>	69				
SCBT	Steel – Cables / Hangers / Tension Ties	M	28	each	26	1	1		
SCOD	Steel / Aluminium – Corrugated / Orthotropic / etc Deck	M	145	m <sup>2</sup>	143	1	1		
SDBR	Steel – Diaphragm / Bracing / Secondary Member	M	92	m <sup>2</sup>	91	1			
SPIR	Steel – Pier	M	101	m <sup>2</sup>	100	1			
STBC	Steel – Truss – Bottom Chord	M	48	m <sup>2</sup>	48				
STCG	Steel – Truss – Cross Girders	M	40	m <sup>2</sup>	40				
STDG	Steel – Truss – Diagonals	M	144	m <sup>2</sup>	144				
STTB	Steel – Truss – Top Bracings	M	39	m <sup>2</sup>	39				
STTC	Steel – Truss – Top Chord	M	48	m <sup>2</sup>	48				
STVT	Steel – Truss – Verticals	M	12	m <sup>2</sup>	12				



## 5 Required Maintenance Actions

### 5.1 Main Bridge

Element Code	Environment	MMS		Inspector's Comments on Required Actions and Locations on Structure	Estimated Quantity	Units	Date for Completion	Photo No.
		Act No.	Activity Description					
CDSL	M	730.15 769.09	Monitor Bridge Element M769 Repair Concrete cracks – Deck Slab (CDSL)	Monitor crack extent (length and width) at E/end of main span. Monitor transverse cracks to top of main span at E & W/ends. Some crack repair may be required for Bondek slab where structural concrete cracks are at W/end.	3	m <sup>2</sup>	May 2026	1,2,32,35
PPIR	M	712.00	M700 Paint Repairs, Minor	Repair protective coating where surface rust is apparent to base at E/end staircase column.	1	m <sup>2</sup>	May 2026	6,7,15,38
MSWS	M	480.04	M480 Clean Scuppers	Clear-out blocked scuppers and ensure working drainage systems at E & W/ends.	2	item	May 2026	3,4,5
SBGI	M	712.00	M700 Paint Repairs, Minor	Repair protective coating where surface rust is apparent to base at E/end staircase.	2	m <sup>2</sup>	May 2026	13,14
PTCG	M	712.00	M700 Paint Repairs, Minor	Repair protective coating where rust is apparent to cross girder at E & W/ends.	3	m <sup>2</sup>	May 2026	8,9,10,16,17
PTDG	M	712.00	M700 Paint Repairs, Minor	Repair protective coating where rust is apparent to cross girder at E & W/ends.	1	m <sup>2</sup>	May 2026	22
PCBT	M	712.00	M700 Paint Repairs, Minor	Repair protective coating where corrosion is apparent to cable bracing or protective coating is cracked at E & W/end.	1	m <sup>2</sup>	May 2026	11,12,21



PCOD	M	766.00	M762 Rehabilitate and/or Preserve Deck	Rehabilitate protective coating where surface rust is apparent to Bondek aluminium sheet at pipe penetrations at E and W/ends. Sealant to be provided around pipe penetrations.	1	m <sup>2</sup>	May 2026	19
PDBR	M	712.00	M700 Paint Repairs, Minor	Repair protective coating where surface rust and cracking is apparent to diagonal bracing at E/end.	1	m <sup>2</sup>	May 2026	20,33,34
PPIR	M	712.00	M700 Paint Repairs, Minor	Repair protective coating where red rust is apparent to steel piers at W & E/end.	2	m <sup>2</sup>	May 2026	25
SPIR	M	781.00	M778 Steel Structural Elements, Other Specific Maintenance	Tighten loose nut at W/end staircase steel pier. Repair protective coating where handrails and connections are rusted.	1	Each	May 2026	26
PTBC	M	712.00	M700 Paint Repairs, Minor	Repair protective coating where red rust is apparent to truss bottom chord at W/end.	4	m <sup>2</sup>	May 2026	27,28
PTCG	M	712.00	M700 Paint Repairs, Minor	Repair protective coating where efflorescence is apparent to cross girders at W & E/end.	2	m <sup>2</sup>	May 2026	8,17
SCBT	M	712.00	M700 Paint Repairs, Minor	Repair protective coating where red rust is apparent to eye hook bolt at maintenance access.	1	m <sup>2</sup>	May 2026	29,30
SCOD	M	766.00	M762 Rehabilitate and/or Preserve Deck	Rehabilitate Bondek aluminium sheet where rust is apparent at E/end & N/W side.	1	m <sup>2</sup>	May 2026	18,23,24
MATT	M	790.00	M788 Other Specific Maintenance	Repair detached glass frame at eastern end of bridge.	1	Each	May 2026	31





## Appendix A– Inspection Photos & Comments



Photo 1 – Concrete deck slab with wide crack at eastern end.



Photo 2 – Concrete deck Slab with wide crack at western end.





Photo 3 – Fully blocked scuppers at western end.



Photo 4 – Fully blocked scuppers at western end.





Photo 5 – Semi blocked scuppers at eastern end.



Photo 6 – Eastern end staircase – localised protective coating failure in steel elements.





Photo 7 – Eastern end staircase – localised protective coating failure in steel columns.



Photo 8 – Eastern end transverse beam – localised protective coating failure in steel elements.



Photo 9 – Eastern end transverse beam – localised protective coating failure in steel elements.



Photo 10 – Eastern end transverse beam – localised protective coating failure in steel elements.



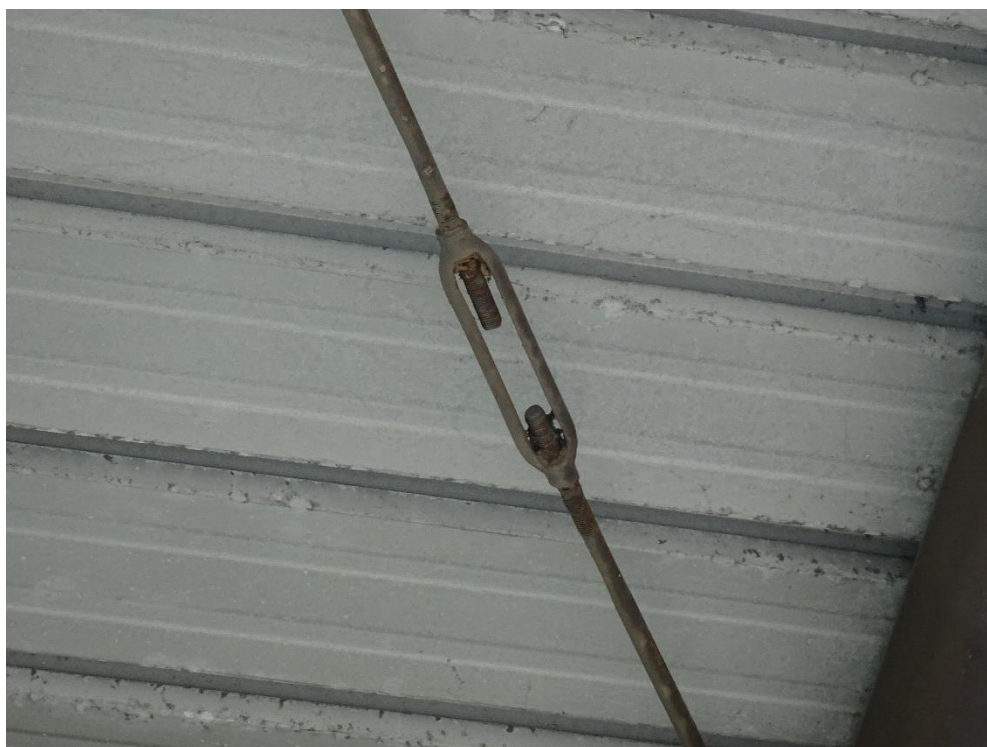


Photo 11 – Eastern end bracing – localised protective coating failure in steel elements.



Photo 12 – Eastern end bracing – localised protective coating failure in steel elements.



Photo 13 – Eastern end roof beam – localised protective coating failure in steel elements.



Photo 14 – Eastern end roof beam – localised protective coating failure in steel elements.





Photo 15 – Eastern end staircase – localised protective coating failure in steel elements.



Photo 16 – Western end transverse beam – localised protective coating failure in steel elements.

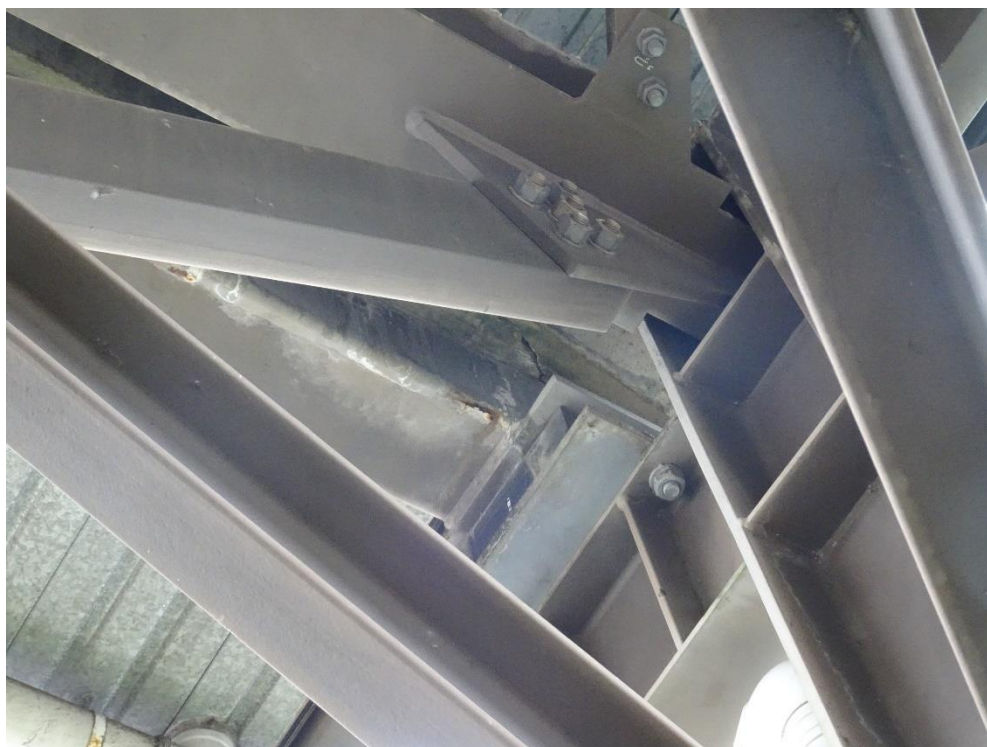


Photo 17 – Western end transverse beam – localised protective coating failure in steel elements.

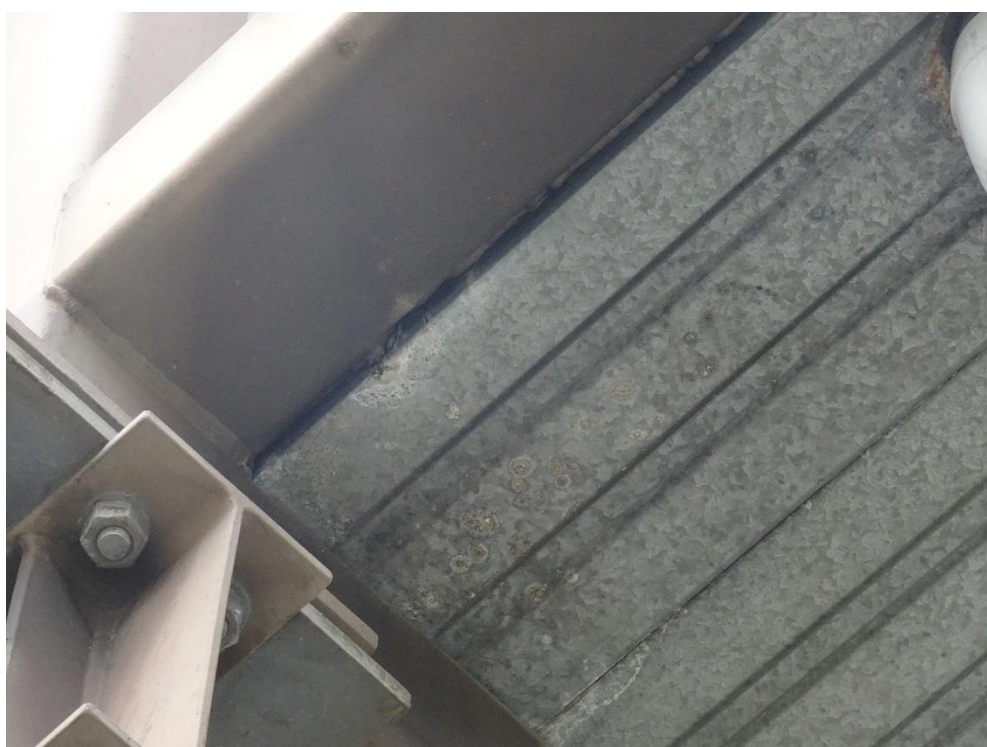






Photo 18 – Eastern end Bondek – localised rust in steel elements.

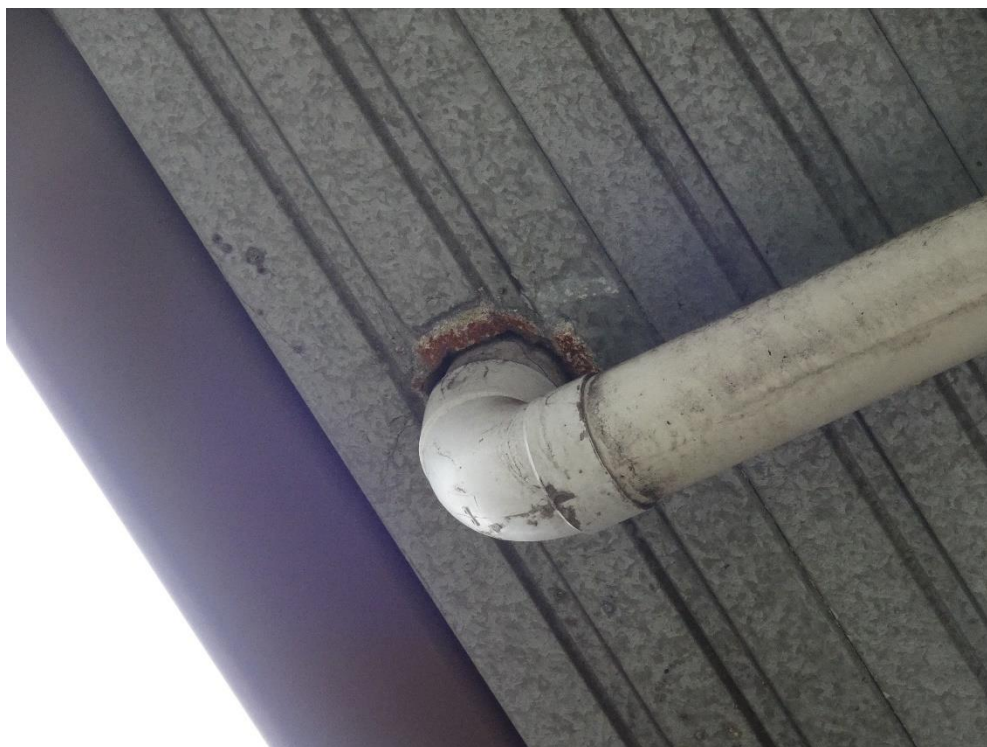


Photo 19 – Eastern end Bondek at pipe location – localised rust in steel elements.





Photo 20 – Western end bracing – Rust on protective coating of steel bracket



Photo 21 – Western end bracing – localised protective coating failure in steel elements.





Photo 22 – Eastern end diagonal – localised protective coating failure in steel element.



Photo 23 – Western end Bondek – localised rust in steel element.



Photo 24 – Western end Bondek – localised rust in steel element.



Photo 25 – Steel pier – localised protective coating failure in steel elements.





Photo 26 – Western staircase steel pier – tighten loose nut.





Photo 27 – Bridge bottom chords - localised protective coating failure in steel elements.



Photo 28 – Bridge bottom chords - localised protective coating failure in steel elements.





Photo 29 – Maintenance access – rust on hook bolt.

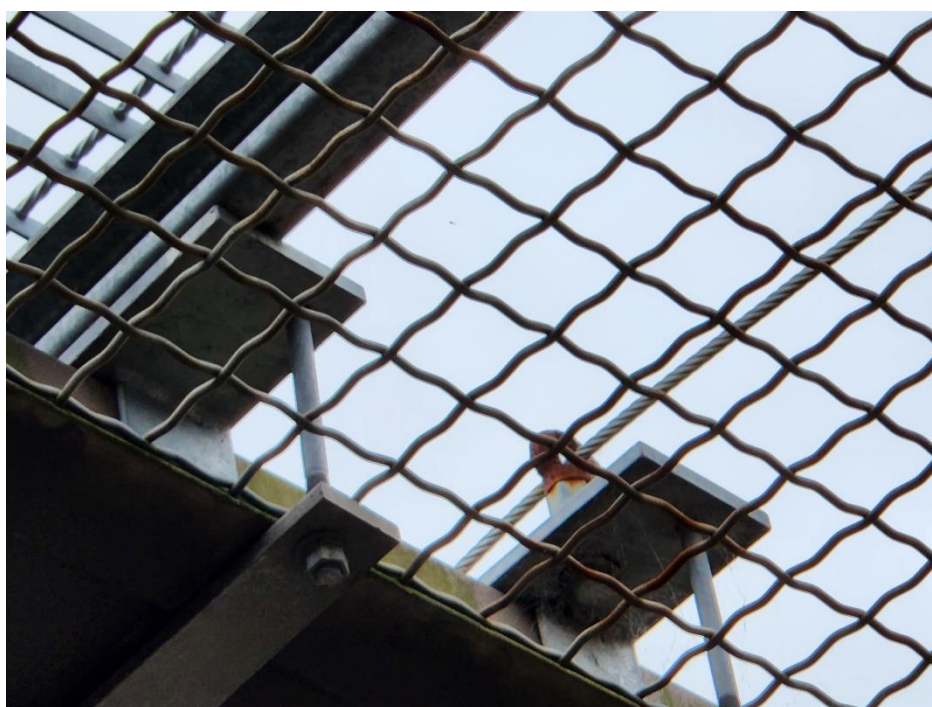




Photo 30 – Maintenance access – rust on hook bolt.



Photo 31 – Eastern end - glass framing detached.



Photo 32 – Eastern end – slab cracking.



Photo 33 – Handrail and bolt connection rusting.



Photo 34 – Handrail and bolt connection rusting.





Photo 35 –Western End – Abutment – rust on Bondek slab.



Photo 36 – Western End – Staircase – efflorescence around drilled holes in steel sheeting.



Photo 37– Maintenance access – rust to protective coating of steel element.



Photo 38 – Eastern End – Staircase –failure of protective coating of steel element and base plate.



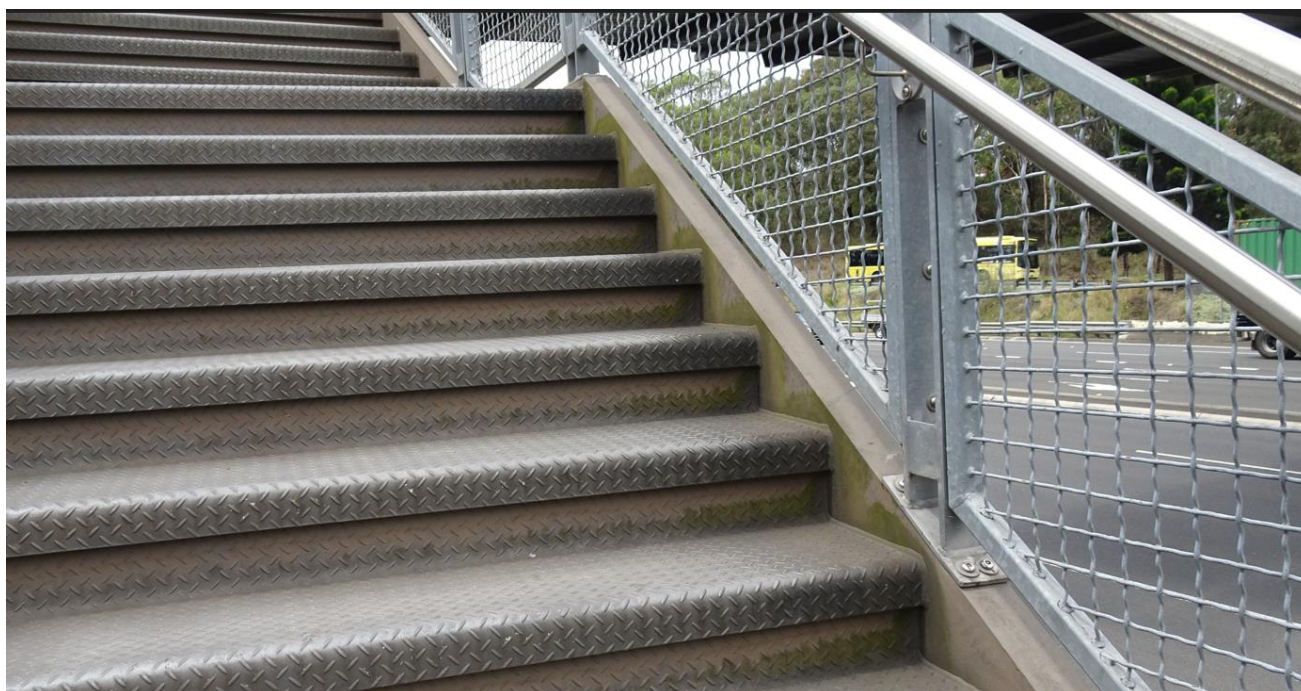


Photo 39 – Western End – Staircase – general moss on steel sheeting.

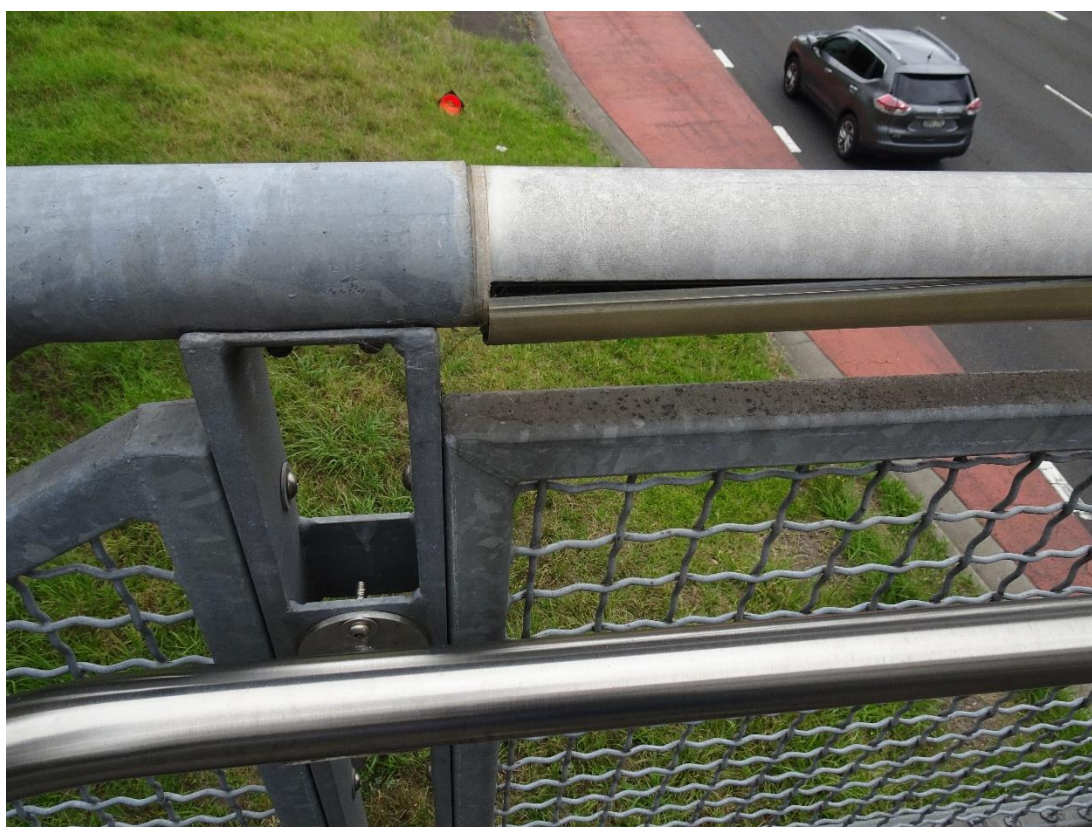


Photo 40 – Eastern End – Separation of railings.



## Appendix B– Condition State Description Tables for Elements

### Reinforced Concrete Beam/Girder/Arch

For each of condition states, report the estimated surface area in metres.

Condition state Descriptions

Condition state	Description
1	The element shows no deterioration. There may be discolouration, efflorescence, and/or superficial cracking.
2	Minor cracks and spalls may be present but there is no exposed reinforcement or surface evidence of corrosion of reinforcement.
3	Some delaminations, significant cracks or spalls may be present or some reinforcement may be exposed. Corrosion of reinforcement may be present but loss of section is minor and is not sufficient to warrant analysis to ascertain the impact on the strength and/or serviceability of either the element or the bridge.
4	Advanced deterioration. Corrosion of reinforcement and/or loss of concrete section is sufficient to warrant analysis to ascertain the impact on the strength and/or serviceability of either the element or the bridge.

### Steel Elements

For each of condition states, report the estimated surface area in metres.

Condition state Descriptions

Condition State	Description
1	There is no evidence of section loss or damage or cracking.
2	Surface rust or minor pitting has formed or is forming. There is no measurable loss of section.  There may be minor deformations that do not affect the integrity of the element.  There are no cracks in the steel or welds. All bolts and rivets are in sound condition.
3	Heavy pitting may be present. Some measurable section loss is present locally, but not critical to structural integrity and/or serviceability of the element.  There may be some loose or missing bolts or rivets. Defects have been assessed as not sufficient to impact on the ultimate strength and/or serviceability of the element.
4	Section loss is sufficient to warrant analysis to ascertain the impact on the ultimate strength and/or serviceability of either the element or the bridge.  There may be cracks and/or deformations in the steel or welds. There may be numerous failed or missing bolts or rivets. Defects may impact on the ultimate strength and/or serviceability of the element.





## Steel Protective Coating Elements

For each of condition states, report the estimated surface area in metres.

Condition state Descriptions

Condition State	Description
1	The protective coating is generally sound and unbroken. Some chalking or water staining may be evident.
2	<p>The protective coating is exhibiting:</p> <ul style="list-style-type: none"><li>○ Minor speckled white or red rusting, and/or</li><li>○ Localised pinhead rusting, and/or</li><li>○ Localised peeling and/or flaking</li></ul> <p>The top coat may exhibit one or more of the following conditions:</p> <ul style="list-style-type: none"><li>○ Loss of thickness;</li><li>○ Primer exposed over localised areas (except for lead primer)</li><li>○ Shrinkage lines – minor localised splitting;</li><li>○ Surface checking with slight localised splitting;</li><li>○ Minor unbroken blistering.</li></ul> <p>Rivets may be exposed at scattered locations.</p>
3	<p>The protective coating is exhibiting:</p> <ul style="list-style-type: none"><li>○ Speckled white rusting in areas &gt;2% and &lt;5% of affected surface area,</li><li>○ Speckled red rusting in areas &gt;0.5% and &lt;5% of affected surface area;</li></ul> <p>The top coat may exhibit one or more of the following conditions:</p> <ul style="list-style-type: none"><li>○ Primer exposed over large areas or in the case of lead primer, local areas</li><li>○ Splitting;</li><li>○ Peeling (loss of adhesion);</li><li>○ Heavily checked;</li><li>○ Blistering over large areas.</li></ul> <p>Numerous rivets may be exposed.</p>
4	<p>The protective coating is no longer effective, signs include:</p> <ul style="list-style-type: none"><li>○ Speckled rust &gt;5% (red and white) in affected areas.</li><li>○ Failure of primer over large areas.</li></ul>