

Principal Inspection Report



Structure Name:	BOXTED
Identifier:	0059
Financial Year:	2023/24
Planned Inspection Date:	01/05/2023
Inspection Date:	27/06/2023
Inspector:	[REDACTED]
Submitted Date:	14/07/2023
Report Status:	Approved
Submission Count:	1
BCI Average:	52.64
BCI Critical:	22.12
Report Print Date:	31/08/2023

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Structure Summary

Name:	BOXTED												
Identifier:	0059	Element Hierarchy Status:	Compliant										
Structure Type:	Bridge	Carried:	WICK ROAD										
BPRN Structure:	No	Crossed:	STOUR										
Authority:	Essex County Council	Restrictions:	[None]										
Owner:	ECC (Essex Highways)	Assessment Status:	29/05/1992 (BD21: Detailed Assessment)										
Maintaining Authority:	ECC (Essex Highways)	Assessed Capacity:	3 t										
		HB Rating:	0 Units										
Easting/Northing:	601244, 234419												
Year of Construction:	1897												
No. of Spans:	1	Latest Inspection:	SUI - 29/08/2023										
Primary Deck Form:	06 - Beam/Girder (half through)	BCI Average (Latest Condition):	52.64										
Primary Deck Material:	Fabricated Steel, Rolled Steel, Steel, or Steel Plate	BCI Critical (Latest Condition):	22.12										
Structure Condition Index Key:	<table border="1"> <tr> <td>Very Good</td> <td>Good</td> <td>Fair</td> <td>Poor</td> <td>Very Poor</td> </tr> <tr> <td>>=90 & <=100</td> <td>>=80 & <90</td> <td>>=65 & <80</td> <td>>=40 & < 65</td> <td>>=0 & <40</td> </tr> </table>			Very Good	Good	Fair	Poor	Very Poor	>=90 & <=100	>=80 & <90	>=65 & <80	>=40 & < 65	>=0 & <40
Very Good	Good	Fair	Poor	Very Poor									
>=90 & <=100	>=80 & <90	>=65 & <80	>=40 & < 65	>=0 & <40									

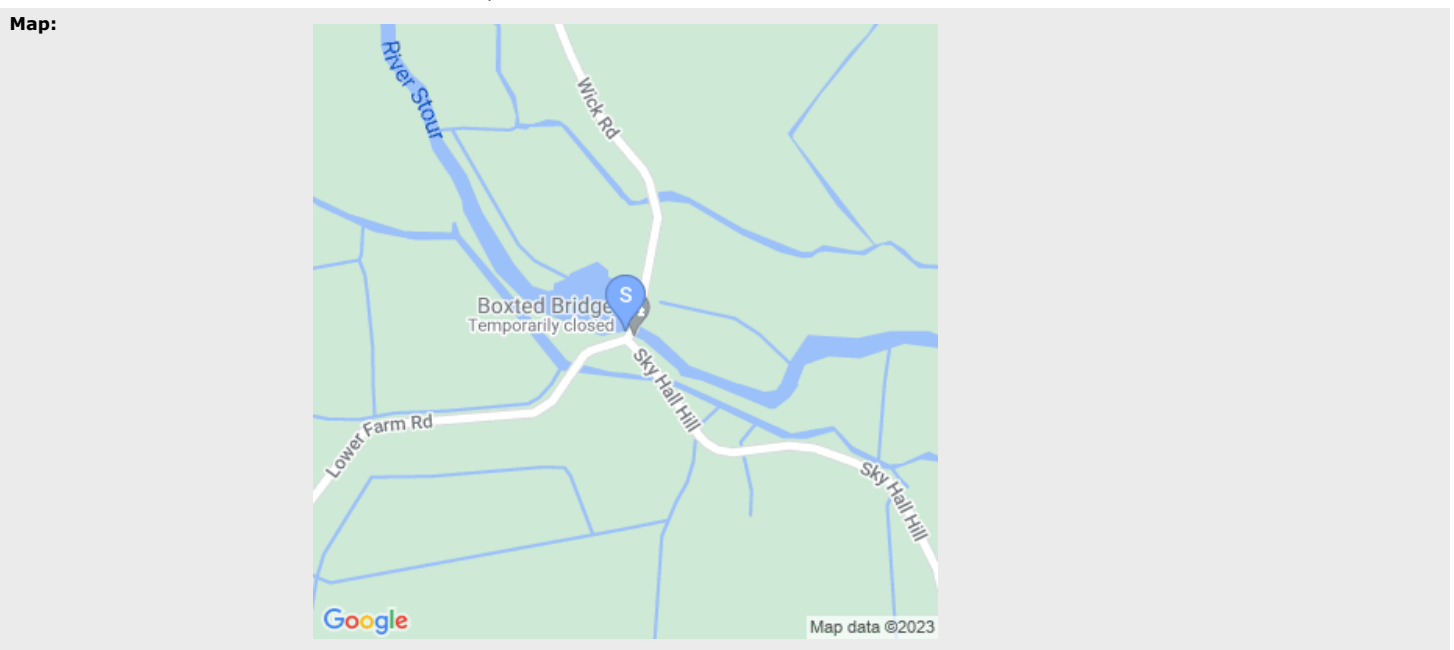
Last Data Change: Element Details

Description: Boxted Bridge is located on the unclassified Wick Road, Boxted and crosses the River Stour at Ordnance Survey grid reference TM 012 344. The bridge is on the Essex and Suffolk border and within the Dedham Vale Area of Outstanding Natural Beauty.

The bridge was constructed in 1897 and is a simply supported single span half-through steel deck on brick abutments but the foundation type is unknown. The form of the structure is believed to have been dictated by River Stour Navigation clearance requirements.

The deck comprises riveted plate girder primary edge and transverse secondary beams, with tertiary longitudinal rolled I-beam/channel sections and hogging plates. The deck has an effective square span of 12.50m. There are no safety margins to separate the traffic and the half-through edge beams which are at risk of (and subject to) of vehicle impact. There is a significant hump in the vertical carriageway profile over the bridge which inhibits inter-visibility for oncoming traffic. The bridge runs slightly off north south, however for the purpose of this inspection the abutments are considered North and South and the edge girders are considered East and West.

Comments: Structures Hierarchy: STR 3



Summary Photographs:



East Elevation



West Elevation



North West Corner Deck Soffit (looking SE)



Topside North (Looking South)



Topside South (looking North)

CSS Inspection Proforma

Inspection Details

Inspection Type: Principal **Financial Year:** 2023/24
Inspector: [REDACTED] **Inspection Date:** 27/06/2023

Risk Assessment Reviewed and Updated:

All Above Ground Elements Inspected: Yes **Photographs:** Yes

Inspection Methodology: Inspection carried out over 3 days (pontoon and tower 27&28/06/23) (Topside Girders and river bed 4/7/23) On site were [REDACTED] (Inspector) [REDACTED] (Senior Engineer/Line Manager) [REDACTED] (Senior Engineer) with additional presence on 27/06/23 of [REDACTED] (Graduate Engineer) and [REDACTED] (Graduate Engineer). Weather conditions were dry and mild for all days of inspection and the inspection was carried out under a road closure at all times. A close visual touching distance inspection was carried out with full appropriate PPE including life jackets, tablet, camera, ranging rod, tapping hammer, digital laser measure, digital spirit level.

Special Instructions:

Inspection Condition

Condition	Index	Score	Rating
Average (27/06/2023)	52.64	3.21	Poor
Critical (27/06/2023)	22.12	4.30	Very Poor

Note: Index, Score and Rating are given up to the date of inspection. Previous conditions are used where required to produce a set of conditions based on as many elements as possible. Average and Critical Conditions labelled 'Projected' need to be confirmed by signing off the inspection before they are shown elsewhere.

Inspection Signatures

Inspected By: [REDACTED]
Inspector's Comments By: [REDACTED]
Checker's Comments By: [REDACTED]
Engineer's Comments By: [REDACTED]

Inspection Sign-off History

Change Date	User Name	Action	Old Status	New Status	Comments
14/07/2023	[REDACTED]	Inspection submitted	Draft	Submitted	

Structure Details

Bridge Name: BOXTED **Identifier:** 0059
Authority: Essex County Council **Structure Type:** Bridge
Owner: ECC (Essex Highways) **Easting:** 601244
Maintaining Authority: ECC (Essex Highways) **Northing:** 234419
Overall Structure Length (m): 13.70 **Average Width (m):** 5.80

Dimension Details:

Span Name	Qty	Span Length (m)	Max Width (m)	Min Width (m)	Internal Headroom (m)	Measured Headroom (A) (m)	Signed Headroom (A) (m)	Measured Headroom (B) (m)	Signed Headroom (B) (m)
BOXTED - Span 1	1	13.10	5.80			2.33			

Construction Details:

Span/Wall/Gantry	Construction	Form/Material
BOXTED - Span 1	Primary Deck (01/Primary Deck Element)	06 - Beam/Girder (half through) / Fabricated Steel, Rolled Steel, Steel, or Steel Plate
BOXTED - Span 1	Secondary Deck (02/Sec.Deck Elem/s Transv Beam)	
BOXTED - Span 1	Secondary Deck (03/Sec.Deck Element/s Other)	36 - Transverse Beams - Other / Fabricated Steel, Rolled Steel, Steel, or Steel Plate

General View Photographs



West Elevation
West Elevation



East Elevation
East Elevation



South Topside (looking north)
South Topside (looking north)

Element Conditions

BOXTED - Span 1

Deck Elements

No	Element Name	Sev	Ext	Defect	Works	Priority	Cost £k
1	01/Primary Deck Element				<input type="checkbox"/>		

Comment

The main edge girders appear to be in poor condition. The bottom flanges were severely corroded in locations especially in the vicinity of the channel sections with section loss to the bottom flange topside due to rusting. The web has sporadic corrosion which has caused loss of web section in places upto to 50%. The top flanges had severe corrosion in the vicinity of the pilasters resulting in section loss and perforations. Rotation was noted to both edge girder ends and mid span. This may be the result of lateral torsional buckling and investigation and assessment should be considered.

Remedial Works

[none]

No	Element Name	Sev	Ext	Defect	Works	Priority	Cost £k
1	01/Primary Deck Element	4	C	1.2	<input checked="" type="checkbox"/>	H	250

Comment

Both edge girders presented severe corrosion with section loss with worst area affected being the top flange of the east edge girder at the south end where there was a perforation of 100mm x 35mm. A perforation was also noted to the top flange of the west girder at south end due to corrosion through entire section, 40mm x 25mm.

Corrosion leading to section loss was recorded to the top flange of the west girder at south end and the top flange of the east girder at the north end.

There was section loss to the bottom flange of the western edge girder at 1m and 13m in from the south. There was section loss to the bottom flange of the eastern edge girder at 0.1m and 9m from the south where there was a perforation due to heavy corrosion. Sporadic section loss to the topside of both east and west bottom flange, where the thickness was recorded to a maximum depth of 10mm into the surface, worst areas affected being the west side between 7m-9m in from the south.

The west face of the topside east edge girder web and stiffeners had major deterioration and section loss due to corrosion along the lower areas adjacent the carriageway full span, mainly at the T-stiffeners with the worst area being between 4m - 9m in from the south. At 5m in from the south pilaster a perforation was noted completely through the bottom of the T stiffener measuring 60mm x 60mm and the girder web lower area was corroded 10mm in depth through the 20mm thick web section.

Moderate sporadic corrosion to east and west edge girder webs and T stiffeners both carriageway side and river side leading to loss in section of up to 50% and deflection of riveted plates.

Remedial Works

Abrade corrosion and repaint with a suitable protective paint system to match existing all areas of corrosion to the main beams of bridge. Repair areas of section loss to the main beams of bridge deck and replace any severely corroded rivets. This would need major excavation, encapsulation and propping for works to be carried out.

No	Element Name	Sev	Ext	Defect	Works	Priority	Cost £k
1	01/Primary Deck Element	4	C	1.1	<input checked="" type="checkbox"/>	H	

Comment

Severe corrosion to both the east and west edge girder top flanges and splice plates at midspan has caused the splice plates to deflect a maximum of 35mm to the east and a maximum of 27mm to the west.

Severe corrosion to the east and west edge girders top and bottoms flanges adjacent to the pilasters.

Severe corrosion and pitting to the east and west edge girders bottom flange underside adjacent to the channel section, jack arches and transverse beams.

Severe corrosion and pitting to the east and west edge girder inner webs midspan above the bottom flanges where jack arches expose bottom web sections.

Moderate sporadic corrosion to east and west edge girder webs and T stiffeners and T stiffener riveted plates to both faces. Worst being the east face of the east edge girder web and riveted plates between 3m-8m in from the south.

Moderate and minor corrosion was noted to the web, T stiffeners edges, edge girder top and bottom flange external edges.

Severe corrosion and pitting to SE, NE, SW and NW bearing plates.

Remedial Works

Remedial works and costing of works included in remedial works to defect 1.2 above.

No	Element Name	Sev	Ext	Defect	Works	Priority	Cost £k
1	01/Primary Deck Element	4	B	1.3	<input checked="" type="checkbox"/>	H	
Comment							
Several rivets to stiffening plates, edge girder top flange and web had corroded away and some were corroding away at the following locations (chainage in from the west);							
- East external edge girder 2no. 3m in from the south.							
- East internal edge girder top flange at 3m, 6m and 7m in from the south.							
- West external edge girder 2no. at 4m and 5m in from the south.							
- West internal edge girder top flange at 0.5m, 1.5m, 4m, 6.5m, 7m, 7.5m, 8m and 11m in from the south.							
Remedial Works							
Remedial works and costing of works included in remedial works to defect 1.2 above.							

No	Element Name	Sev	Ext	Defect	Works	Priority	Cost £k
1	01/Primary Deck Element	3	C	13.1	<input type="checkbox"/>	L	
Comment							
Historic impact damage appeared to have caused deformation of the western edge girder's end plate, at the northern pilaster. The deformation was measured to be 30mm.							
Historic impact damage appeared to have caused deformation of the eastern edge girder's end plate, at the southern pilaster. The deformation was measured to be 15mm.							
Remedial Works							
[none]							

No	Element Name	Sev	Ext	Defect	Works	Priority	Cost £k
1	01/Primary Deck Element	3	C		<input type="checkbox"/>	M	
Comment							
The east edge girder had rotated inwards by 65mm measured mid span. The west edge girder had rotated inwards by 30mm measured at the north end. All measurements taken from the web. These rotations may be evidence of lateral torsional buckling.							
Remedial Works							
[none]							

No	Element Name	Sev	Ext	Defect	Works	Priority	Cost £k
1	01/Primary Deck Element	2	B		<input type="checkbox"/>	L	
Comment							
Disused birds nest on east edge girder inner bottom flange between the 2nd and 3rd transverse beam from the south.							
Remedial Works							
[none]							

No	Element Name	Sev	Ext	Defect	Works	Priority	Cost £k
1	01/Primary Deck Element	4	C	17.13	<input checked="" type="checkbox"/>	H	1
Comment							
Sealant along the carriageway edge and the east edge girder cracked and breaking up between 4m to 9m in from the south.							
Remedial Works							
Sealant to be replaced.							

No	Element Name	Sev	Ext	Defect	Works	Priority	Cost £k
2	02/Sec.Deck Elem/s Transv Beam				<input type="checkbox"/>		
Comment							
The transverse beams bottom flanges are severely corroded causing section loss in both width and in flange thickness. Expansive corrosion was causing the riveted transverse beam plates to deflect significantly at outer edges placing the rivets under additional loading and rivet heads were noted to have moderate corrosion.							
Remedial Works							
[none]							

No	Element Name	Sev	Ext	Defect	Works	Priority	Cost £k
2	02/Sec.Deck Elem/s Transv Beam	4	D	1.2	<input checked="" type="checkbox"/>	H	
Comment							
Transverse beams bottom flanges severely corroded resulting in perforations and section loss to both width and thickness at beam ends with the worst areas being the east side at north and south ends and west side at north end. The worst beam was at the east side at the south end where beam width is normally 310mm with section loss the width was 220mm (90mm loss in width) the beam thickness was feathered from corrosion and section loss,							
Remedial Works							
Abrade to remove corrosion and repaint affected areas with a suitable protective paint system to match existing. Repair areas of section loss. Remedial works and costing of works included in remedial works to defect 1.2 above.							

No	Element Name	Sev	Ext	Defect	Works	Priority	Cost £k
2	02/Sec.Deck Elem/s Transv Beam	4	D	1.1	<input checked="" type="checkbox"/>	H	
Comment							
Transverse beam bottom flange riveted plates had severe deflection to external edges throughout deck soffit due to corrosion measuring between 20mm to a maximum of 80mm from transverse beam bottom flange (normal thickness of riveted plate at centre is 17mm). Worst plates affected were on the east side 3rd and 6th beam from the south.							
Remedial Works							
Replace heavily defected riveted bottom flange plates to transverse beams, costing included in works to element 2.1							
2	02/Sec.Deck Elem/s Transv Beam	4	B	1.3	<input checked="" type="checkbox"/>	H	0.3
Comment							
Missing rivet due to corrosion which was causing deflection on the riveted transverse beam plate east side 1st beam in from the south.							
Remedial Works							
Replace missing rivet.							
3	03/Sec.Deck Element/s Other				<input type="checkbox"/>		
Comment							
Minor movement had occurred to several jack arches causing misalignment and separation this had caused the protective paint to the hogging plates to split and fail leading to corrosion at hogging plate edges, some corrosion had caused the concrete arch infill to become exposed and start to spall.							
The channel sections were in poor condition with major section loss of the bottom flange.							
Remedial Works							
[none]							
3	03/Sec.Deck Element/s Other	2	D		<input type="checkbox"/>	M	
Comment							
Jack arch hogging plates misaligned and separated at jack arch section joints throughout the deck soffit. The worst misalignment was to the west jack arch at north end which had a change in level of 30mm. The worst jack arch separation gap was noted at 5mm which was located to the east side between the 4th and 5th transverse beam from the south end.							
Remedial Works							
[none]							
3	03/Sec.Deck Element/s Other	3	B	1.2	<input checked="" type="checkbox"/>	M	
Comment							
Section loss to hogging plate due to historic corrosion on the east jack arch at north and south end adjacent channelling exposing concrete infill.							
Section loss to channel section bottom flanges due to historic corrosion full width at east and west sides with the worst affected areas being the north and south ends of the east channel section. Channel bottom flange width normally measures approximately 80mm and was 45mm on east side at south end and 50mm at east side at north end. The west channel sections were corroded down to 60mm at narrowest width at north and south ends.							
Remedial Works							
Abrade corrosion and repaint. Repair areas of section loss. Remedial works and costing of works included in remedial works to defect 1.2 above.							
3	03/Sec.Deck Element/s Other	3	C	1.1	<input checked="" type="checkbox"/>	L	
Comment							
Widespread corrosion to the jack arch hogging plates at the following locations, the jack arch joints, at edge girder, at channel sections and at transverse beam joints throughout the deck with the worst of the corrosion being to the east side.							
Minor corrosion to external edges of longitudinal beams at north and south ends.							
Remedial Works							
Remedial works and costing included in element 3.2 above.							

No	Element Name	Sev	Ext	Defect	Works	Priority	Cost £k
3	03/Sec.Deck Element/s Other	3	B	2.1	<input checked="" type="checkbox"/>	M	

Comment

Spalling to concrete infill in jack arch edges on the east side adjacent channel sections at north and south ends, jack arch infill spalling depth up to 45mm maximum.

Remedial Works

Repair spalling to concrete jack arch infill and edge of hogging plate section. Costing of works included in remedial works to defect 1.2 above.

Load-bearing Substructure

No	Element Name	Sev	Ext	Defect	Works	Priority	Cost £k
8	08/Foundations	2	C	6.1	<input checked="" type="checkbox"/>	L	2

Comment

Possible evidence of historic foundation settlement due to full height cracks to both abutments at east end and north east wing wall which has displaced / separated by 250mm and moved 90mm eastwards. No evidence of new movement noted.

Remedial Works

Settlement is historic with no evidence of new movement. Recommend stitching of the cracks and re-pointing.

No	Element Name	Sev	Ext	Defect	Works	Priority	Cost £k
9	09/Abutments(inc.arch spring)	3	C	3.5	<input checked="" type="checkbox"/>	M	10

Comment

2no. vertical cracks parallel to each other to south abutment at east end (6m in from the west). Upper crack extending from jack arch infill down through bearing stones and masonry abutment 0.7m in length, open 3mm (upper), 20mm (centre) and 1.5mm (lower), the lower crack extends 1.55m through masonry abutment down to concrete edging / training, open 1mm (upper), 12mm (centre) and hairline (lower).

Vertical crack to north abutment at east end (6m in from the west) extending 1.8m full height from the jack arch through the bearing stones and masonry abutment down to the concrete edging / training, open 1mm (upper), 10mm (above midpoint) and 1mm (lower). An area of brick spalling was noted above the midpoint of the crack or 0.1m x 0.1m x 10mm in depth.

Shrinkage hairline cracks to all jack arch infills above the bearing stones on south abutment full width were noted, insignificant defect to non structural element.

Spalling to concrete infill between jack arches on south abutment at the following locations (chainage in from the west);

- 1m - Concrete infill spall 0.3m x 0.1m x 35mm deep.
- 1.8m - Concrete infill spall 0.2m x 0.070m x 35mm deep.
- 6m - Concrete infill spall 0.3m x 0.2m x 35mm deep.

Remedial Works

Repair and seal cracks to abutment over 1mm wide and repair any areas of concrete spalling.

No	Element Name	Sev	Ext	Defect	Works	Priority	Cost £k
9	09/Abutments(inc.arch spring)	2	B	3.6	<input type="checkbox"/>	L	

Comment

Minor weathering to brick faces on south abutment between 3m - 5m in from the west just above midpoint, area affected 2m x 0.5m x 20mm weathering depth into brick.

Remedial Works

[none]

Durability Elements

No	Element Name	Sev	Ext	Defect	Works	Priority	Cost £k
19	19/Finishes:deck elements	3	E	4.1	<input checked="" type="checkbox"/>	H	5

Comment

Failure to paintwork on all deck elements with the worst affected areas being at the hogging plate joints, transverse beam bottom flange edges and along girder top and bottom edges.

Remedial Works

Remove defective paintwork and re-apply a new protective paint system to match existing.

No	Element Name	Sev	Ext	Defect	Works	Priority	Cost £k
21	21/Finishes:parapet/saf.fences	5	D	4.1	<input checked="" type="checkbox"/>	M	1

Comment

Protective paint top coat chipped and flaked on railings and concrete posts on south east approach rail full length.

Remedial Works

Remove defective paintwork and re-apply a new protective paint system to match existing to south east approach railings.

Safety Elements

No	Element Name	Sev	Ext	Defect	Works	Priority	Cost £k
23	23/Handrail/parapet/saf.fences	3	C	3.5	<input checked="" type="checkbox"/>	M	2

Comment

North east pilaster has a diagonal stepped crack to east face lower section extending 1.1m from the abutment bearing stone to the wing wall and embankment, open 3.5mm (upper) to hairline (lower) minor brick spalling was noted at crack midpoint to a depth of 25mm. Vertical crack to lower pilaster east face on the north side extending 0.5m, open 1mm. Roots were identified growing within the gap of the crack.

South west pilaster has brick spalling to the upper north east and south east corners and moderate spalling to brick work to the lower south east corner measuring 0.5m x 0.2m x 40mm maximum depth.

Bees nest in small void in south east pilaster brick work just above abutment in north east corner.

Remedial Works

Seal and repair cracks to brickwork in north east pilaster and south west pilaster.

No	Element Name	Sev	Ext	Defect	Works	Priority	Cost £k
23	23/Handrail/parapet/saf.fences	2	C	3.2	<input checked="" type="checkbox"/>	L	1

Comment

South west pilaster has minor pointing loss between brick work to the lower east face.

North west pilaster has minor pointing loss lower section (just above abutment corner) of west face up to a depth of 10mm. Pointing missing between brick pilaster and concrete abutment bearing stone 0.3m in length creating a gap of 10mm.

North east pilaster has minor pointing loss to upper and lower east face to a depth of 10mm.

Remedial Works

Replace missing mortar to south west pilaster, north west pilaster and north east pilaster.

No	Element Name	Sev	Ext	Defect	Works	Priority	Cost £k
23	23/Handrail/parapet/saf.fences	3	C	3.6	<input checked="" type="checkbox"/>	M	2

Comment

North west pilaster has approximately 1no brick missing along with spalling to the surrounding concrete haunching, area of 230mm x 120mm. 1no brick broken up to lower section of the south west corner adjacent to the abutment. Minor brick face weathering of up to 20mm in depth was noted to east face corner edge of the north west pilaster extending over its full height.

North east pilaster had moderate brick loss to the lower south east corner above abutment bearing stone, there was evidence of missing bricks as there was 1no. loose brick laying on the bearing plate, area affected is 1m x 0.5m x 100mm maximum depth.

Remedial Works

Repair and replace missing brick work.

No	Element Name	Sev	Ext	Defect	Works	Priority	Cost £k
23	23/Handrail/parapet/saf.fences	3	C	5.1	<input checked="" type="checkbox"/>	H	1

Comment

Ivy stump growing adjacent south face of north west pilaster above abutment.

Ivy growing around the south west pilaster west face.

Tree growing adjacent south east pilaster at south east corner.

Remedial Works

Remove vegetation

No	Element Name	Sev	Ext	Defect	Works	Priority	Cost £k
23	23/Handrail/parapet/saf.fences	2	B		<input type="checkbox"/>	L	

Comment

Bees nest in south east pilaster just above abutment in north east corner.

Remedial Works

[none]

No	Element Name	Sev	Ext	Defect	Works	Priority	Cost £k
24	24/Carriageway surfacing	2	C	9.4	<input checked="" type="checkbox"/>	L	2.5
Comment							
3no shallow potholes to carriageway asphalt surface at the south end. Pothole to the west side measures 1.2m x 0.3m x 20mm in depth, centre concrete filled bore hole measures 0.250m x 0.250m x 15mm in depth and the pothole to the east side measures 0.8m x 0.1m x 20mm in depth.							
White carriageway centre lane markings faded full span.							
Remedial Works							
Repair potholes and repaint centre lane markings							

No	Element Name	Sev	Ext	Defect	Works	Priority	Cost £k
24	24/Carriageway surfacing	2	C	9.2	<input checked="" type="checkbox"/>	L	10
Comment							
Tracking was noted from the south extending 10m in both lanes either side of centre line with evidence of farm vehicle tyre marks in the dips, both tracking lanes measured 10m x 0.6m wide.							
Remedial Works							
Resurface carriageway level.							

No	Element Name	Sev	Ext	Defect	Works	Priority	Cost £k
25	25/Fway/verge/fbrdge surfacing	4	C	9.2	<input checked="" type="checkbox"/>	H	2
Comment							
Concrete fillet between east carriageway kerbing and east edge girder cracked and broken up between 5m to 7m in from the south.							
Remedial Works							
Replace concrete fillet between east carriageway kerbing and east edge girder.							

No	Element Name	Sev	Ext	Defect	Works	Priority	Cost £k
25	25/Fway/verge/fbrdge surfacing	3	D	5.1	<input checked="" type="checkbox"/>	H	0.3
Comment							
Weeds and grasses growing along between east and west edge kerbing and edge girders full length.							
Remedial Works							
Remove vegetation.							

Other Bridge Elements

No	Element Name	Sev	Ext	Defect	Works	Priority	Cost £k
26	26/Invert/river bed	2	C	7.2	<input checked="" type="checkbox"/>	H	1
Comment							
Broken jagged timber posts along river bed edges approximately between 200mm-400mm in height adjacent both abutments some submerged, a submerged broken timber post was noted to the north river bed 4m in from the west and 2m from north abutment.							
There was a submerged length of rope to the north river bed adjacent the abutment tied to broken timber posts at 1m and 4m in from the west.							
Remedial Works							
Remove submerged posts and rope.							

No	Element Name	Sev	Ext	Defect	Works	Priority	Cost £k
26	26/Invert/river bed	2	C	7.1	<input type="checkbox"/>	L	
Comment							
Minor scour to centre of river bed below west edge girder. Scour not affecting structure at time of inspection. (Refer to attached scour form)							
Remedial Works							
[none]							

No	Element Name	Sev	Ext	Defect	Works	Priority	Cost £k
29	River training works	1	A	0	<input type="checkbox"/>		
Comment							
No defects noted to concrete river training at time of inspection.							
Remedial Works							
[none]							

No	Element Name	Sev	Ext	Defect	Works	Priority	Cost £k
31	31/Wing walls				<input type="checkbox"/>		

Comment

The wing walls were in poor condition. The northeast wall had completely separated and settled, with various large cracks and leaning across length. The south east wall had bulging sections through most of its length with multiple cracks and gaps being forced open by tree roots and vegetation. Trees and ivy were damaging all of the wing walls to varying degrees.

Remedial Works

[none]

No	Element Name	Sev	Ext	Defect	Works	Priority	Cost £k
31	31/Wing walls	5	E	3.1	<input checked="" type="checkbox"/>	H	15

Comment

North east wing wall cracked, separated and displaced at south end between drainage outlet and pilaster. The stepped vertical crack extended 1.3m and was open 250mm in gap width, the wing wall north of the crack had displaced 90mm eastwards.

Concrete plinth at the base of the north east wing wall had displaced 60mm eastwards at south end.

The top two courses of bricks on the south west wing wall have separated due to tree roots and vegetation extending full length and open a maximum of 30mm at west end, a maximum of 25mm at midpoint and a maximum of 60mm at east end. The top two brick courses at west end of the wing wall had displaced 30mm northwards and the 5th - 7th brick courses down from the top have displaced 20mm northwards.

The top two courses of bricks on the south east wing wall have separated due to tree roots from 3m from the west, the top course extended 4m, open a maximum of 35mm and the second course down extending 7m, open 50mm (west end) and 40mm (east end).

Remedial Works

Replace / repair damaged section of wing walls

No	Element Name	Sev	Ext	Defect	Works	Priority	Cost £k
31	31/Wing walls	3	D	3.7	<input checked="" type="checkbox"/>	H	15

Comment

North east wing wall north end leaning approximately 100mm eastwards due to tree growing on top of wing wall.

Moderate bulging to south west wing wall at midpoint from 6m - 17m in from the west end, the area affected was approximately 11m in length and 1m in height.

Remedial Works

Replace / repair damaged wing walls

No	Element Name	Sev	Ext	Defect	Works	Priority	Cost £k
31	31/Wing walls	3	B	3.6	<input checked="" type="checkbox"/>	L	5

Comment

Small area of bricks breaking up to upper section of north east wing wall 2m in from the south to a maximum depth of 30mm.

Small areas of bricks breaking up at the bottom of south west wing wall at 4m, 10m, 13m, 14m and 17m in from the west with the worst area being at 4m in where a depth of 40mm into the brick was recorded. Area of broken bricks to upper section at 14m in from the west of 1m x 0.7m x 15mm maximum depth into the brick work.

Brick loss to north west wing wall section (adjacent concrete plinth) at south end with bricks breaking up to a depth of 120mm and loose with 1no. brick laying on the embankment.

Remedial Works

Repair / replace areas of brick damage

No	Element Name	Sev	Ext	Defect	Works	Priority	Cost £k
31	31/Wing walls	3	C	3.5	<input checked="" type="checkbox"/>	M	5

Comment

North east wing wall had a vertical stepped crack 1m in from the south end extending 0.4m from top of the wall to the top of the redundant drainage outlet, open 15mm.

Multiple horizontal cracks to brickwork between brick courses on south west wing wall with crack to the lower section at west end, cracks to the centre area at wall midpoint and cracks to the upper section at east end, the worst of these was at 8m in from the west 9 brick course up from the base extending 3m, open 10mm, crack have ivy growing through the gaps.

Multiple vertical stepped cracks to south west wing wall between 13m - 17m in from the west with the worst being at 14m in from the west extending from the 2nd brick course down 0.6m and open a maximum of 10mm.

Diagonal crack through brick work to south west wing wall at 13m in from the west extending 0.7m, open 1mm (upper), 2mm-6mm (centre) and 3.5mm-2mm (lower). Diagonal crack at 16m in from the west upper section extending from pattrass plate 0.7m through brick work, open 1mm with minor brick loss at crack midpoint to a depth of 20mm.

Horizontal crack to south east wing wall at 3m in from the west to lower section extending 2m, open 30mm with ivy growing through the gap.

Vertical cracks extending from top of south east wing wall at 0.5m, 1m and 3m in from the west, the worst being at 0.5m in from the west extending 0.4m, open 2mm (upper), 5mm (centre) and 3mm (lower).

Vertical and horizontal stepped cracking lower north west wing wall section (adjacent to concrete plinth) west face extending 0.8m, open 4mm.

Remedial Works

Repair cracks to brickwork in all four wing walls.

No	Element Name	Sev	Ext	Defect	Works	Priority	Cost £k
31	31/Wing walls	2	C	3.2	<input checked="" type="checkbox"/>	L	1

Comment

Pointing loss to a depth of 20mm on the north east wing wall to upper section and midpoint from 2m in from the south end to the north end.

Sporadic pointing loss to south west wing wall between horizontal cracks where vegetation was growing between brick courses full length, worst area being at centre 12m-14m in from the west.

Remedial Works

Replace missing pointing mortar to north east wing wall and to south west wing wall.

No	Element Name	Sev	Ext	Defect	Works	Priority	Cost £k
31	31/Wing walls	4	C	5.1	<input checked="" type="checkbox"/>	H	10

Comment

Tree growing on top of the north east wing wall at north end causing leaning.

Tree roots and ivy roots growing on structure at 0m, 1m, 1.5m, 3m, 7m and 9m in from the west. ivy roots growing through horizontal cracks full length of wing wall. Tree roots had pushed approximately 3no. bricks off of the top brick course at east end. Tree growing on top of the south west wing wall at 15m in from the west and roots were vertically separating the top course of bricks by 15mm. Large tree growing up against west end of wing wall.

Trees growing on top of the south east wing wall damaging brick work at 0.5m, 1m, 2m and 3m in from the west. Tree growing adjacent wing wall at 4m in from the west and tree stumps growing from base of wing wall at 1.5m and 3.5m in from the west with ivy growing out of brickwork at midpoint at the west end.

Trees and saplings growing on top of north west wing wall with 2no large trees at 1.5m in from the south and at north end, with roots growing under the base and adjacent the north end of wingwall. Vegetation growing out of concrete plinth along the top and along the base.

Remedial Works

Possible investigation in to tree removal to prevent further structural damage.

No	Element Name	Sev	Ext	Defect	Works	Priority	Cost £k
31	31/Wing walls	2	D	20.1	<input type="checkbox"/>	L	

Comment

Moss to the top of north east wing wall full length and to concrete plinth at the south end base of the wing wall.

Remedial Works

[none]

No	Element Name	Sev	Ext	Defect	Works	Priority	Cost £k
31	31/Wing walls	3	E	1.1	<input checked="" type="checkbox"/>	M	4

Comment

All tie rod pattress plates on south west wing wall had surface corrosion at 10m, 13m, 15m and 17m in from the west end.

Remedial Works

Replace pattress plates and tie rod nuts.

No	Element Name	Sev	Ext	Defect	Works	Priority	Cost £k
33	33/Embankments	3	D	5.1	<input checked="" type="checkbox"/>	H	8

Comment

NE embankment had a tree trunk growing approximately 0.8m from abutment but the roots are adjacent the structure.

SE embankment had trees growing adjacent wing wall at 2m and 4m in from the west.

SW embankment had a large tree growing adjacent the west end of wing wall and roots are growing on wing wall at 1m, 2m, 4m, 7m and 9m in from the west.

Remedial Works

Removal of trees to prevent further structural damage.

Ancillary Elements

No	Element Name	Sev	Ext	Defect	Works	Priority	Cost £k
35	Approach rails/barriers/walls	4	B	13.1	<input checked="" type="checkbox"/>	H	1.5

Comment

South east approach rail concrete post at east end broken in half at lower railing joint with a gap of 100mm being held together by the 4 strengthening rods in the post which had rusted, the post was relatively solid with little movement.

Railing end 'D' capping missing.

Remedial Works

Replace broken concrete post and D cap.

Inspector's Comments:

Please tick here if you believe that span length, span width and/or form of construction needs reviewing by the bridge manager. Please include appropriate comments in inspection comment section below

Boxted bridge is in poor overall condition with severe corrosion, section loss and delamination of the top and bottom flanges of the edge girders especially in close proximity to the south pilasters. There was severe corrosion, section loss and deflection of the transverse beams and channel sections, also movement, corrosion and spalling to hogging plates and jack arches. The extent of the corrosion to the bottom flanges of the beams beneath the bridge that has caused significant section loss and deflection of the bottom plates will impact any options that may be proposed for the strengthening of the existing structure, replacement may be a better option. There were significant cracks to the abutments at the east end which should be repaired. The north east and south west wingwalls have failed structurally and the evidence of the tree root damage will have to be addressed upon repair / replacement. Rotation was found to the edge girder bottom flanges and edge girder webs, this may be due to a number of factors or a result of all factors, being, historic vehicle strikes, evidence of foundation settlement and severe corrosion to all deck elements. The defects identified in this inspection are a result of many years of deterioration in the structure with the deterioration getting worse with time which is greatly compromising the strength of the structure. Investigation into replacement or strengthening should be expected.

Inspector's Name: [Redacted]

Checker's Comments:

I have undertaken a line by line check of the report and discussed defect scoring and word selection with the inspector and the engineer. It is noted that the cost of repair is not easily estimated short of a tender process where specialist contractors may be required to price the deconstruction of the bridge in order to replace components and undertake weld repairs, where possible. The deterioration of hidden elements is not known which could lead to further escalation of costs. The bridge may well be beyond economic repair.

Checker's Name: [Redacted]

Engineer's Comments:

This 2023 Principal Inspection has found the bridge to be in a poor condition, with a BCI average score of 52.64 and a BCI critical score of 22.12. The BCI critical score is due to the numerous defects to elements 1, 2 and 3 which is predominantly corrosion and loss of section to these elements and due to loss of rivets or heavy corrosion to these rivets. Suitable remedial works are required to repair these areas of corrosion and prevent further corrosion to these elements in the future.

Engineer's Name: [Redacted]

Works Required:

BOXTED - Span 1

1 Deck Elements

No	Element Name	Remedial Works	Priority	Cost £k
1	01/Primary Deck Element	Abrade corrosion and repaint with a suitable protective paint system to match existing all areas of corrosion to the main beams of bridge. Repair areas of section loss to the main beams of bridge deck and replace any severely corroded rivets. This would need major excavation, encapsulation and propping for works to be carried out.	H	250.00
1	01/Primary Deck Element	Remedial works and costing of works included in remedial works to defect 1.2 above.	H	
1	01/Primary Deck Element	Remedial works and costing of works included in remedial works to defect 1.2 above.	H	
1	01/Primary Deck Element	Sealant to be replaced.	H	1.00
2	02/Sec.Deck Elem/s Transv Beam	Abrade to remove corrosion and repaint affected areas with a suitable protective paint system to match existing. Repair areas of section loss. Remedial works and costing of works included in remedial works to defect 1.2 above.	H	
2	02/Sec.Deck Elem/s Transv Beam	Replace heavily defected riveted bottom flange plates to transverse beams, costing included in works to element 2.1	H	
2	02/Sec.Deck Elem/s Transv Beam	Replace missing rivet.	H	0.30
3	03/Sec.Deck Element/s Other	Abrade corrosion and repaint. Repair areas of section loss. Remedial works and costing of works included in remedial works to defect 1.2 above.	M	
3	03/Sec.Deck Element/s Other	Remedial works and costing included in element 3.2 above.	L	
3	03/Sec.Deck Element/s Other	Repair spalling to concrete jack arch infill and edge of hogging plate section. Costing of works included in remedial works to defect 1.2 above.	M	

2 Load-bearing Substructure

No	Element Name	Remedial Works	Priority	Cost £k
8	08/Foundations	Settlement is historic with no evidence of new movement. Recommend stitching of the cracks and re-pointing.	L	2.00
9	09/Abutments(inc.arch spring)	Repair and seal cracks to abutment over 1mm wide and repair any areas of concrete spalling.	M	10.00

3 Durability Elements

No	Element Name	Remedial Works	Priority	Cost £k
19	19/Finishes:deck elements	Remove defective paintwork and re-apply a new protective paint system to match existing.	H	5.00
21	21/Finishes:parapet/saf.fences	Remove defective paintwork and re-apply a new protective paint system to match existing to south east approach railings.	M	1.00

4 Safety Elements

No	Element Name	Remedial Works	Priority	Cost £k
23	23/Handrail/parapet/saf.fences	Remove vegetation	H	1.00
23	23/Handrail/parapet/saf.fences	Repair and replace missing brick work.	M	2.00
23	23/Handrail/parapet/saf.fences	Replace missing mortar to south west pilaster, north west pilaster and north east pilaster.	L	1.00
23	23/Handrail/parapet/saf.fences	Seal and repair cracks to brickwork in north east pilaster and south west pilaster.	M	2.00
24	24/Carriageway surfacing	Repair potholes and repaint centre lane markings	L	2.50
24	24/Carriageway surfacing	Resurface carriageway level.	L	10.00
25	25/Fway/verge/fbrdge surfacing	Remove vegetation.	H	0.30
25	25/Fway/verge/fbrdge surfacing	Replace concrete fillet between east carriageway kerbing and east edge girder.	H	2.00

5 Other Bridge Elements

No	Element Name	Remedial Works	Priority	Cost £k
26	26/Invert/river bed	Remove submerged posts and rope.	H	1.00
31	31/Wing walls	Possible investigation in to tree removal to prevent further structural damage.	H	10.00
31	31/Wing walls	Repair / replace areas of brick damage	L	5.00
31	31/Wing walls	Repair cracks to brickwork in all four wing walls.	M	5.00

31	31/Wing walls	Replace / repair damaged section of wing walls	H	15.00
31	31/Wing walls	Replace / repair damaged wing walls	H	15.00
31	31/Wing walls	Replace missing pointing mortar to north east wing wall and to south west wing wall.	L	1.00
31	31/Wing walls	Replace pattress plates and tie rod nuts.	M	4.00
33	33/Embankments	Removal of trees to prevent further structural damage.	H	8.00

6 Ancillary Elements

No	Element Name	Remedial Works	Priority	Cost £k
35	Approach rails/barriers/walls	Replace broken concrete post and D cap.	H	1.50

£355.60 k

Defect View Photographs

BOXTED - Span 1

Deck Elements



East Girder Top Flange (south end)
 Severe corrosion leading to section loss.

No	Element Name	Element Description	Sev	Ext	Defect	Priority	Works	Cost £k
1	Primary deck element (Table 2)	01/Primary Deck Element	4	C	1.2	H	Y	250

Comment

Both edge girders presented severe corrosion with section loss with worst area affected being the top flange of the east edge girder at the south end where there was a perforation of 100mm x 35mm. A perforation was also noted to the top flange of the west girder at south end due to corrosion through entire section, 40mm x 25mm.

Corrosion leading to section loss was recorded to the top flange of the west girder at south end and the top flange of the east girder at the north end.

There was section loss to the bottom flange of the western edge girder at 1m and 13m in from the south. There was section loss to the bottom flange of the eastern edge girder at 0.1m and 9m from the south where there was a perforation due to heavy corrosion. Sporadic section loss to the topside of both east and west bottom flange, where the thickness was recorded to a maximum depth of 10mm into the surface, worst areas affected being the west side between 7m-9m in from the south.

The west face of the topside east edge girder web and stiffeners had major deterioration and section loss due to corrosion along the lower areas adjacent the carriageway full span, mainly at the T-stiffeners with the worst area being between 4m - 9m in from the south. At 5m in from the south pilaster a perforation was noted completely through the bottom of the T stiffener measuring 60mm x 60mm and the girder web lower area was corroded 10mm in depth through the 20mm thick web section.

Moderate sporadic corrosion to east and west edge girder webs and T stiffeners both carriageway side and river side leading to loss in section of up to 50% and deflection of riveted plates.

Remedial Works

Abrade corrosion and repaint with a suitable protective paint system to match existing all areas of corrosion to the main beams of bridge. Repair areas of section loss to the main beams of bridge deck and replace any severely corroded rivets. This would need major excavation, encapsulation and propping for works to be carried out.

BOXTED - Span 1
Deck Elements



External East Girder Bottom Flange (north end)

Severe corrosion leading to perforation and section loss to flange edge.

No	Element Name	Element Description	Sev	Ext	Defect	Priority	Works	Cost £k
1	Primary deck element (Table 2)	01/Primary Deck Element	4	C	1.2	H	Y	250

Comment

Both edge girders presented severe corrosion with section loss with worst area affected being the top flange of the east edge girder at the south end where there was a perforation of 100mm x 35mm. A perforation was also noted to the top flange of the west girder at south end due to corrosion through entire section, 40mm x 25mm.

Corrosion leading to section loss was recorded to the top flange of the west girder at south end and the top flange of the east girder at the north end.

There was section loss to the bottom flange of the western edge girder at 1m and 13m in from the south. There was section loss to the bottom flange of the eastern edge girder at 0.1m and 9m from the south where there was a perforation due to heavy corrosion. Sporadic section loss to the topside of both east and west bottom flange, where the thickness was recorded to a maximum depth of 10mm into the surface, worst areas affected being the west side between 7m-9m in from the south.

The west face of the topside east edge girder web and stiffeners had major deterioration and section loss due to corrosion along the lower areas adjacent the carriageway full span, mainly at the T-stiffeners with the worst area being between 4m - 9m in from the south. At 5m in from the south pilaster a perforation was noted completely through the bottom of the T stiffener measuring 60mm x 60mm and the girder web lower area was corroded 10mm in depth through the 20mm thick web section.

Moderate sporadic corrosion to east and west edge girder webs and T stiffeners both carriageway side and river side leading to loss in section of up to 50% and deflection of riveted plates.

Remedial Works

Abrade corrosion and repaint with a suitable protective paint system to match existing all areas of corrosion to the main beams of bridge. Repair areas of section loss to the main beams of bridge deck and replace any severely corroded rivets. This would need major excavation, encapsulation and propping for works to be carried out.

BOXTED - Span 1

Deck Elements



West External Edge Girder Bottom Flange

Corrosion leading to section loss of 10mm in depth to surface.

No	Element Name	Element Description	Sev	Ext	Defect	Priority	Works	Cost £k
1	Primary deck element (Table 2)	01/Primary Deck Element	4	C	1.2	H	Y	250

Comment

Both edge girders presented severe corrosion with section loss with worst area affected being the top flange of the east edge girder at the south end where there was a perforation of 100mm x 35mm. A perforation was also noted to the top flange of the west girder at south end due to corrosion through entire section, 40mm x 25mm.

Corrosion leading to section loss was recorded to the top flange of the west girder at south end and the top flange of the east girder at the north end.

There was section loss to the bottom flange of the western edge girder at 1m and 13m in from the south. There was section loss to the bottom flange of the eastern edge girder at 0.1m and 9m from the south where there was a perforation due to heavy corrosion. Sporadic section loss to the topline of both east and west bottom flange, where the thickness was recorded to a maximum depth of 10mm into the surface, worst areas affected being the west side between 7m-9m in from the south.

The west face of the topline east edge girder web and stiffeners had major deterioration and section loss due to corrosion along the lower areas adjacent the carriageway full span, mainly at the T-stiffeners with the worst area being between 4m - 9m in from the south. At 5m in from the south pilaster a perforation was noted completely through the bottom of the T stiffener measuring 60mm x 60mm and the girder web lower area was corroded 10mm in depth through the 20mm thick web section.

Moderate sporadic corrosion to east and west edge girder webs and T stiffeners both carriageway side and river side leading to loss in section of up to 50% and deflection of riveted plates.

Remedial Works

Abrade corrosion and repaint with a suitable protective paint system to match existing all areas of corrosion to the main beams of bridge. Repair areas of section loss to the main beams of bridge deck and replace any severely corroded rivets. This would need major excavation, encapsulation and propping for works to be carried out.

BOXTED - Span 1
Deck Elements



Internal Web Face of East Girder Web and T Stiffener (midspan)

Severe corrosion along the lower areas of the girder, particularly at T stiffener connections which has led to complete section loss to the stiffener at 5m in from the south, shown here and loss of up to 50% in edge girder web section.

No	Element Name	Element Description	Sev	Ext	Defect	Priority	Works	Cost £k
1	Primary deck element (Table 2)	01/Primary Deck Element	4	C	1.2	H	Y	250

Comment

Both edge girders presented severe corrosion with section loss with worst area affected being the top flange of the east edge girder at the south end where there was a perforation of 100mm x 35mm. A perforation was also noted to the top flange of the west girder at south end due to corrosion through entire section, 40mm x 25mm.

Corrosion leading to section loss was recorded to the top flange of the west girder at south end and the top flange of the east girder at the north end.

There was section loss to the bottom flange of the western edge girder at 1m and 13m in from the south. There was section loss to the bottom flange of the eastern edge girder at 0.1m and 9m from the south where there was a perforation due to heavy corrosion. Sporadic section loss to the topside of both east and west bottom flange, where the thickness was recorded to a maximum depth of 10mm into the surface, worst areas affected being the west side between 7m-9m in from the south.

The west face of the topside east edge girder web and stiffeners had major deterioration and section loss due to corrosion along the lower areas adjacent the carriageway full span, mainly at the T-stiffeners with the worst area being between 4m - 9m in from the south. At 5m in from the south pilaster a perforation was noted completely through the bottom of the T stiffener measuring 60mm x 60mm and the girder web lower area was corroded 10mm in depth through the 20mm thick web section.

Moderate sporadic corrosion to east and west edge girder webs and T stiffeners both carriageway side and river side leading to loss in section of up to 50% and deflection of riveted plates.

Remedial Works

Abrade corrosion and repaint with a suitable protective paint system to match existing all areas of corrosion to the main beams of bridge. Repair areas of section loss to the main beams of bridge deck and replace any severely corroded rivets. This would need major excavation, encapsulation and propping for works to be carried out.

BOXTED - Span 1

Deck Elements



East Edge Girder Riveted Splice Plate
 Severe corrosion leading to deflection of up to 35mm.

No	Element Name	Element Description	Sev	Ext	Defect	Priority	Works	Cost £k
1	Primary deck element (Table 2)	01/Primary Deck Element	4	C	1.1	H	Y	

Comment **Remedial Works**

Severe corrosion to both the east and west edge girder top flanges and splice plates at midspan has caused the splice plates to deflect a maximum of 35mm to the east and a maximum of 27mm to the west.

Remedial works and costing of works included in remedial works to defect 1.2 above.

Severe corrosion to the east and west edge girders top and bottoms flanges adjacent to the pilasters.

Severe corrosion and pitting to the east and west edge girders bottom flange underside adjacent to the channel section, jack arches and transverse beams.

Severe corrosion and pitting to the east and west edge girder inner webs midspan above the bottom flanges where jack arches expose bottom web sections.

Moderate sporadic corrosion to east and west edge girder webs and T stiffeners and T stiffener riveted plates to both faces. Worst being the east face of the east edge girder web and riveted plates between 3m-8m in from the south.

Moderate and minor corrosion was noted to the web, T stiffeners edges, edge girder top and bottom flange external edges.

Severe corrosion and pitting to SE, NE, SW and NW bearing plates.

BOXTED - Span 1

Deck Elements



East Edge Girder Top Flange (north side)

Corrosion to exposed top flange edges.

No	Element Name	Element Description	Sev	Ext	Defect	Priority	Works	Cost £k
1	Primary deck element (Table 2)	01/Primary Deck Element	4	C	1.1	H	Y	

Comment

Severe corrosion to both the east and west edge girder top flanges and splice plates at midspan has caused the splice plates to deflect a maximum of 35mm to the east and a maximum of 27mm to the west.

Severe corrosion to the east and west edge girders top and bottoms flanges adjacent to the pilasters.

Severe corrosion and pitting to the east and west edge girders bottom flange underside adjacent to the channel section, jack arches and transverse beams.

Severe corrosion and pitting to the east and west edge girder inner webs midspan above the bottom flanges where jack arches expose bottom web sections.

Moderate sporadic corrosion to east and west edge girder webs and T stiffeners and T stiffener riveted plates to both faces. Worst being the east face of the east edge girder web and riveted plates between 3m-8m in from the south.

Moderate and minor corrosion was noted to the web, T stiffeners edges, edge girder top and bottom flange external edges.

Severe corrosion and pitting to SE, NE, SW and NW bearing plates.

Remedial Works

Remedial works and costing of works included in remedial works to defect 1.2 above.

BOXTED - Span 1

Deck Elements



East Edge Girder Bottom Flange (south side)

Corrosion and pitting adjacent channel section.

No	Element Name	Element Description	Sev	Ext	Defect	Priority	Works	Cost £k
1	Primary deck element (Table 2)	01/Primary Deck Element	4	C	1.1	H	Y	

Comment **Remedial Works**

Severe corrosion to both the east and west edge girder top flanges and splice plates at midspan has caused the splice plates to deflect a maximum of 35mm to the east and a maximum of 27mm to the west.

Remedial works and costing of works included in remedial works to defect 1.2 above.

Severe corrosion to the east and west edge girders top and bottoms flanges adjacent to the pilasters.

Severe corrosion and pitting to the east and west edge girders bottom flange underside adjacent to the channel section, jack arches and transverse beams.

Severe corrosion and pitting to the east and west edge girder inner webs midspan above the bottom flanges where jack arches expose bottom web sections.

Moderate sporadic corrosion to east and west edge girder webs and T stiffeners and T stiffener riveted plates to both faces. Worst being the east face of the east edge girder web and riveted plates between 3m-8m in from the south.

Moderate and minor corrosion was noted to the web, T stiffeners edges, edge girder top and bottom flange external edges.

Severe corrosion and pitting to SE, NE, SW and NW bearing plates.

BOXTED - Span 1

Deck Elements



West Edge Girder Bottom Flange and Inner Web (midspan)

Severe corrosion and pitting to the bottom flange inner edge and bottom inner web.

No	Element Name	Element Description	Sev	Ext	Defect	Priority	Works	Cost £k
1	Primary deck element (Table 2)	01/Primary Deck Element	4	C	1.1	H	Y	

Comment **Remedial Works**

Severe corrosion to both the east and west edge girder top flanges and splice plates at midspan has caused the splice plates to deflect a maximum of 35mm to the east and a maximum of 27mm to the west.

Remedial works and costing of works included in remedial works to defect 1.2 above.

Severe corrosion to the east and west edge girders top and bottoms flanges adjacent to the pilasters.

Severe corrosion and pitting to the east and west edge girders bottom flange underside adjacent to the channel section, jack arches and transverse beams.

Severe corrosion and pitting to the east and west edge girder inner webs midspan above the bottom flanges where jack arches expose bottom web sections.

Moderate sporadic corrosion to east and west edge girder webs and T stiffeners and T stiffener riveted plates to both faces. Worst being the east face of the east edge girder web and riveted plates between 3m-8m in from the south.

Moderate and minor corrosion was noted to the web, T stiffeners edges, edge girder top and bottom flange external edges.

Severe corrosion and pitting to SE, NE, SW and NW bearing plates.

BOXTED - Span 1

Deck Elements



East External Edge Girder (south side)
 Corrosion to the edge girder web and rivet plates of the T stiffeners.

No	Element Name	Element Description	Sev	Ext	Defect	Priority	Works	Cost £k
1	Primary deck element (Table 2)	01/Primary Deck Element	4	C	1.1	H	Y	

Comment **Remedial Works**

Severe corrosion to both the east and west edge girder top flanges and splice plates at midspan has caused the splice plates to deflect a maximum of 35mm to the east and a maximum of 27mm to the west.

Remedial works and costing of works included in remedial works to defect 1.2 above.

Severe corrosion to the east and west edge girders top and bottoms flanges adjacent to the pilasters.

Severe corrosion and pitting to the east and west edge girders bottom flange underside adjacent to the channel section, jack arches and transverse beams.

Severe corrosion and pitting to the east and west edge girder inner webs midspan above the bottom flanges where jack arches expose bottom web sections.

Moderate sporadic corrosion to east and west edge girder webs and T stiffeners and T stiffener riveted plates to both faces. Worst being the east face of the east edge girder web and riveted plates between 3m-8m in from the south.

Moderate and minor corrosion was noted to the web, T stiffeners edges, edge girder top and bottom flange external edges.

Severe corrosion and pitting to SE, NE, SW and NW bearing plates.

BOXTED - Span 1

Deck Elements



South East Bearing Plate
 Corrosion to bearing plate.

No	Element Name	Element Description	Sev	Ext	Defect	Priority	Works	Cost £k
1	Primary deck element (Table 2)	01/Primary Deck Element	4	C	1.1	H	Y	

Comment **Remedial Works**

Severe corrosion to both the east and west edge girder top flanges and splice plates at midspan has caused the splice plates to deflect a maximum of 35mm to the east and a maximum of 27mm to the west.

Remedial works and costing of works included in remedial works to defect 1.2 above.

Severe corrosion to the east and west edge girders top and bottoms flanges adjacent to the pilasters.

Severe corrosion and pitting to the east and west edge girders bottom flange underside adjacent to the channel section, jack arches and transverse beams.

Severe corrosion and pitting to the east and west edge girder inner webs midspan above the bottom flanges where jack arches expose bottom web sections.

Moderate sporadic corrosion to east and west edge girder webs and T stiffeners and T stiffener riveted plates to both faces. Worst being the east face of the east edge girder web and riveted plates between 3m-8m in from the south.

Moderate and minor corrosion was noted to the web, T stiffeners edges, edge girder top and bottom flange external edges.

Severe corrosion and pitting to SE, NE, SW and NW bearing plates.

BOXTED - Span 1

Deck Elements



East Edge Girder Stiffener Rivets (East Face) (south end)
 Corroded rivet heads.

No	Element Name	Element Description	Sev	Ext	Defect	Priority	Works	Cost £k
1	Primary deck element (Table 2)	01/Primary Deck Element	4	B	1.3	H	Y	

Comment

Several rivets to stiffening plates, edge girder top flange and web had corroded away and some were corroding away at the following locations (chainage in from the west);

- East external edge girder 2no. 3m in from the south.
- East internal edge girder top flange at 3m, 6m and 7m in from the south.
- West external edge girder 2no. at 4m and 5m in from the south.
- West internal edge girder top flange at 0.5m, 1.5m, 4m, 6.5m, 7m, 7.5m, 8m and 11m in from the south.

Remedial Works

Remedial works and costing of works included in remedial works to defect 1.2 above.

BOXTED - Span 1

Deck Elements



West Edge Girder Top Flange (south end)
 Rivet corroding away with protective paint loss to girder.

No	Element Name	Element Description	Sev	Ext	Defect	Priority	Works	Cost £k
1	Primary deck element (Table 2)	01/Primary Deck Element	4	B	1.3	H	Y	

Comment

Several rivets to stiffening plates, edge girder top flange and web had corroded away and some were corroding away at the following locations (chainage in from the west);

- East external edge girder 2no. 3m in from the south.
- East internal edge girder top flange at 3m, 6m and 7m in from the south.
- West external edge girder 2no. at 4m and 5m in from the south.
- West internal edge girder top flange at 0.5m, 1.5m, 4m, 6.5m, 7m, 7.5m, 8m and 11m in from the south.

Remedial Works

Remedial works and costing of works included in remedial works to defect 1.2 above.

BOXTED - Span 1

Deck Elements



Western Girder (East Face)
 Missing rivet.

No	Element Name	Element Description	Sev	Ext	Defect	Priority	Works	Cost £k
1	Primary deck element (Table 2)	01/Primary Deck Element	4	B	1.3	H	Y	

Comment

Several rivets to stiffening plates, edge girder top flange and web had corroded away and some were corroding away at the following locations (chainage in from the west);

- East external edge girder 2no. 3m in from the south.
- East internal edge girder top flange at 3m, 6m and 7m in from the south.
- West external edge girder 2no. at 4m and 5m in from the south.
- West internal edge girder top flange at 0.5m, 1.5m, 4m, 6.5m, 7m, 7.5m, 8m and 11m in from the south.

Remedial Works

Remedial works and costing of works included in remedial works to defect 1.2 above.

BOXTED - Span 1
Deck Elements



East Internal Edge Girder (south end)
 Deformation of end plate of 15mm due to impact damage.

No	Element Name	Element Description	Sev	Ext	Defect	Priority	Works	Cost £k
1	Primary deck element (Table 2)	01/Primary Deck Element	3	C	13.1	L	N	

Comment **Remedial Works**

Historic impact damage appeared to have caused deformation of the western edge girder's end plate, at the northern pilaster. The deformation was measured to be 30mm.

[none]

Historic impact damage appeared to have caused deformation of the eastern edge girder's end plate, at the southern pilaster. The deformation was measured to be 15mm.

BOXTED - Span 1
Deck Elements



West Internal Edge Girder (north end)
 Deformation of end plate of 30mm due to impact damage.

No	Element Name	Element Description	Sev	Ext	Defect	Priority	Works	Cost £k
1	Primary deck element (Table 2)	01/Primary Deck Element	3	C	13.1	L	N	

Comment	Remedial Works
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Historic impact damage appeared to have caused deformation of the western edge girder's end plate, at the northern pilaster. The deformation was measured to be 30mm.

[none]

Historic impact damage appeared to have caused deformation of the eastern edge girder's end plate, at the southern pilaster. The deformation was measured to be 15mm.

BOXTED - Span 1
Deck Elements



East Edge Girder Web (midspan)
 Rotation of 37mm/m. Overall Girder rotation of up to 65mm full height.

No	Element Name	Element Description	Sev	Ext	Defect	Priority	Works	Cost £k
1	Primary deck element (Table 2)	01/Primary Deck Element	3	C		M	N	

Comment	Remedial Works
The east edge girder had rotated inwards by 65mm measured mid span. The west edge girder had rotated inwards by 30mm measured at the north end. All measurements taken from the web. These rotations may be evidence of lateral torsional buckling.	[none]



East Edge Girder Bottom Flange
 Disused birds nest on east edge girder inner bottom flange between the 2nd and 3rd transverse beam from the south.

No	Element Name	Element Description	Sev	Ext	Defect	Priority	Works	Cost £k
1	Primary deck element (Table 2)	01/Primary Deck Element	2	B		L	N	

Comment	Remedial Works
Disused birds nest on east edge girder inner bottom flange between the 2nd and 3rd transverse beam from the south.	[none]

BOXTED - Span 1
Deck Elements



East Internal Topside Edge Girder (midpoint)
 Sealant broken up and cracked.

No	Element Name	Element Description	Sev	Ext	Defect	Priority	Works	Cost £k
1	Primary deck element (Table 2)	01/Primary Deck Element	4	C	17.13	H	Y	1

Comment

Sealant along the carriageway edge and the east edge girder cracked and breaking up between 4m to 9m in from the south.

Remedial Works

Sealant to be replaced.

BOXTED - Span 1
Deck Elements



East Transverse Beam (At south end)
 Severe section loss and perforation due to corrosion. (1st beam in from the south)

No	Element Name	Element Description	Sev	Ext	Defect	Priority	Works	Cost £k
2	Transverse beams	02/Sec.Deck Elem/s Transv Beam	4	D	1.2	H	Y	

Comment

Transverse beams bottom flanges severely corroded resulting in perforations and section loss to both width and thickness at beam ends with the worst areas being the east side at north and south ends and west side at north end. The worst beam was at the east side at the south end where beam width is normally 310mm with section loss the width was 220mm (90mm loss in width) the beam thickness was feathered from corrosion and section loss,

Remedial Works

Abrade to remove corrosion and repaint affected areas with a suitable protective paint system to match existing. Repair areas of section loss. Remedial works and costing of works included in remedial works to defect 1.2 above.

BOXTED - Span 1

Deck Elements



East Transverse Beam (At south end)
 Beam edges have corroded, causing section loss both in width and in thickness. (3rd beam in from the south)

No	Element Name	Element Description	Sev	Ext	Defect	Priority	Works	Cost £k
2	Transverse beams	02/Sec.Deck Elem/s Transv Beam	4	D	1.2	H	Y	

Comment

Transverse beams bottom flanges severely corroded resulting in perforations and section loss to both width and thickness at beam ends with the worst areas being the east side at north and south ends and west side at north end. The worst beam was at the east side at the south end where beam width is normally 310mm with section loss the width was 220mm (90mm loss in width) the beam thickness was feathered from corrosion and section loss,

Remedial Works

Abrade to remove corrosion and repaint affected areas with a suitable protective paint system to match existing. Repair areas of section loss. Remedial works and costing of works included in remedial works to defect 1.2 above.

BOXTED - Span 1

Deck Elements



West Transverse Beam (at north end)
 Severe section loss and corrosion. (6th beam in from the south)

No	Element Name	Element Description	Sev	Ext	Defect	Priority	Works	Cost £k
2	Transverse beams	02/Sec.Deck Elem/s Transv Beam	4	D	1.2	H	Y	

Comment

Transverse beams bottom flanges severely corroded resulting in perforations and section loss to both width and thickness at beam ends with the worst areas being the east side at north and south ends and west side at north end. The worst beam was at the east side at the south end where beam width is normally 310mm with section loss the width was 220mm (90mm loss in width) the beam thickness was feathered from corrosion and section loss,

Remedial Works

Abrade to remove corrosion and repaint affected areas with a suitable protective paint system to match existing. Repair areas of section loss. Remedial works and costing of works included in remedial works to defect 1.2 above.

BOXTED - Span 1
Deck Elements



Transverse Beam Plate (East Side)
 Severe deflection due to corrosion up to 80mm. (6th beam in from the south)

No	Element Name	Element Description	Sev	Ext	Defect	Priority	Works	Cost £k
2	Transverse beams	02/Sec.Deck Elem/s Transv Beam	4	D	1.1	H	Y	

Comment

Transverse beam bottom flange riveted plates had severe deflection to external edges throughout deck soffit due to corrosion measuring between 20mm to a maximum of 80mm from transverse beam bottom flange (normal thickness of riveted plate at centre is 17mm). Worst plates affected were on the east side 3rd and 6th beam from the south.

Remedial Works

Replace heavily defected riveted bottom flange plates to transverse beams, costing included in works to element 2.1



Riveted Transverse Beam Plate (East Side)
 Missing rivet due to deflection. (1st beam in from the south)

No	Element Name	Element Description	Sev	Ext	Defect	Priority	Works	Cost £k
2	Transverse beams	02/Sec.Deck Elem/s Transv Beam	4	B	1.3	H	Y	0.3

Comment

Missing rivet due to corrosion which was causing deflection on the riveted transverse beam plate east side 1st beam in from the south.

Remedial Works

Replace missing rivet.

BOXTED - Span 1

Deck Elements



Jack Arch at East side.
 Jack arch hogging plate separation of up to 5mm to east side between the 4th and 5th transverse beam from the south end.

No	Element Name	Element Description	Sev	Ext	Defect	Priority	Works	Cost £k
3	Element from Table 3	03/Sec.Deck Element/s Other	2	D		M	N	

Comment	Remedial Works
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Jack arch hogging plates misaligned and separated at jack arch section joints throughout the deck soffit. The worst misalignment was to the west jack arch at north end which had a change in level of 30mm. The worst jack arch separation gap was noted at 5mm which was located to the east side between the 4th and 5th transverse beam from the south end.

[none]

BOXTED - Span 1

Deck Elements



Jack Arch at West side at north end
 Jack arch misaligned 30mm to the west jack arch at north end.

No	Element Name	Element Description	Sev	Ext	Defect	Priority	Works	Cost £k
3	Element from Table 3	03/Sec.Deck Element/s Other	2	D		M	N	

Comment	Remedial Works
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Jack arch hogging plates misaligned and separated at jack arch section joints throughout the deck soffit. The worst misalignment was to the west jack arch at north end which had a change in level of 30mm. The worst jack arch separation gap was noted at 5mm which was located to the east side between the 4th and 5th transverse beam from the south end.

[none]

BOXTED - Span 1

Deck Elements



East Jack Arch at South End
 Section loss to jack arch hogging plate.

No	Element Name	Element Description	Sev	Ext	Defect	Priority	Works	Cost £k
3	Element from Table 3	03/Sec.Deck Element/s Other	3	B	1.2	M	Y	

Comment

Section loss to hogging plate due to historic corrosion on the east jack arch at north and south end adjacent channelling exposing concrete infill.

Section loss to channel section bottom flanges due to historic corrosion full width at east and west sides with the worst affected areas being the north and south ends of the east channel section. Channel bottom flange width normally measures approximately 80mm and was 45mm on east side at south end and 50mm at east side at north end. The west channel sections were corroded down to 60mm at narrowest width at north and south ends.

Remedial Works

Abrade corrosion and repaint. Repair areas of section loss. Remedial works and costing of works included in remedial works to defect 1.2 above.

BOXTED - Span 1
Deck Elements



East Channel Section at South End.
 Section loss of up to 35mm to bottom flange of channel section.

No	Element Name	Element Description	Sev	Ext	Defect	Priority	Works	Cost £k
3	Element from Table 3	03/Sec.Deck Element/s Other	3	B	1.2	M	Y	

Comment	Remedial Works
Section loss to hogging plate due to historic corrosion on the east jack arch at north and south end adjacent channelling exposing concrete infill.	Abrade corrosion and repaint. Repair areas of section loss. Remedial works and costing of works included in remedial works to defect 1.2 above.

Section loss to channel section bottom flanges due to historic corrosion full width at east and west sides with the worst affected areas being the north and south ends of the east channel section. Channel bottom flange width normally measures approximately 80mm and was 45mm on east side at south end and 50mm at east side at north end. The west channel sections were corroded down to 60mm at narrowest width at north and south ends.

BOXTED - Span 1

Deck Elements



East Jack Arch Hogging Plate Joint (at south end)
 Minor corrosion of hogging plates at joint.

No	Element Name	Element Description	Sev	Ext	Defect	Priority	Works	Cost £k
3	Element from Table 3	03/Sec.Deck Element/s Other	3	C	1.1	L	Y	

Comment

Widespread corrosion to the jack arch hogging plates at the following locations, the jack arch joints, at edge girder, at channel sections and at transverse beam joints throughout the deck with the worst of the corrosion being to the east side.

Minor corrosion to external edges of longitudinal beams at north and south ends.

Remedial Works

Remedial works and costing included in element 3.2 above.

BOXTED - Span 1
Deck Elements



East Jack Arch Hogging Plate Edge (at south end)

Significant corrosion of hogging plate edge at joint with transverse and girder beams.

No	Element Name	Element Description	Sev	Ext	Defect	Priority	Works	Cost £k
3	Element from Table 3	03/Sec.Deck Element/s Other	3	C	1.1	L	Y	

Comment **Remedial Works**

Widespread corrosion to the jack arch hogging plates at the following locations, the jack arch joints, at edge girder, at channel sections and at transverse beam joints throughout the deck with the worst of the corrosion being to the east side.

Remedial works and costing included in element 3.2 above.

Minor corrosion to external edges of longitudinal beams at north and south ends.



East Jack Arch at South End.

Hogging plate section loss exposing concrete infill which has spalled to a depth of 45mm maximum.

No	Element Name	Element Description	Sev	Ext	Defect	Priority	Works	Cost £k
3	Element from Table 3	03/Sec.Deck Element/s Other	3	B	2.1	M	Y	

Comment **Remedial Works**

Spalling to concrete infill in jack arch edges on the east side adjacent channel sections at north and south ends, jack arch infill spalling depth up to 45mm maximum.

Repair spalling to concrete jack arch infill and edge of hogging plate section. Costing of works included in remedial works to defect 1.2 above.

BOXTED - Span 1
Load-bearing Substructure



North Abutment (looking west)
 Full height crack indicating possible movement of foundations.

No	Element Name	Element Description	Sev	Ext	Defect	Priority	Works	Cost £k
8	Foundations	08/Foundations	2	C	6.1	L	Y	2

Comment

Possible evidence of historic foundation settlement due to full height cracks to both abutments at east end and north east wing wall which has displaced / separated by 250mm and moved 90mm eastwards. No evidence of new movement noted.

Remedial Works

Settlement is historic with no evidence of new movement. Recommend stitching of the cracks and re-pointing.



North East Wing Wall (looking north)
 Wing wall movement indicating possible movement of foundations.

No	Element Name	Element Description	Sev	Ext	Defect	Priority	Works	Cost £k
8	Foundations	08/Foundations	2	C	6.1	L	Y	2

Comment

Possible evidence of historic foundation settlement due to full height cracks to both abutments at east end and north east wing wall which has displaced / separated by 250mm and moved 90mm eastwards. No evidence of new movement noted.

Remedial Works

Settlement is historic with no evidence of new movement. Recommend stitching of the cracks and re-pointing.

BOXTED - Span 1
Load-bearing Substructure



South Abutment (west end)
 Jack arch infill has shrinkage cracks.

No	Element Name	Element Description	Sev	Ext	Defect	Priority	Works	Cost £k
9	Abutments (inc arch springing)	09/Abutments(inc.arch spring)	3	C	3.5	M	Y	10

Comment **Remedial Works**

2no. vertical cracks parallel to each other to south abutment at east end (6m in from the west). Upper crack extending from jack arch infill down through bearing stones and masonry abutment 0.7m in length, open 3mm (upper), 20mm (centre) and 1.5mm (lower), the lower crack extends 1.55m through masonry abutment down to concrete edging / training, open 1mm (upper), 12mm (centre) and hairline (lower).

Repair and seal cracks to abutment over 1mm wide and repair any areas of concrete spalling.

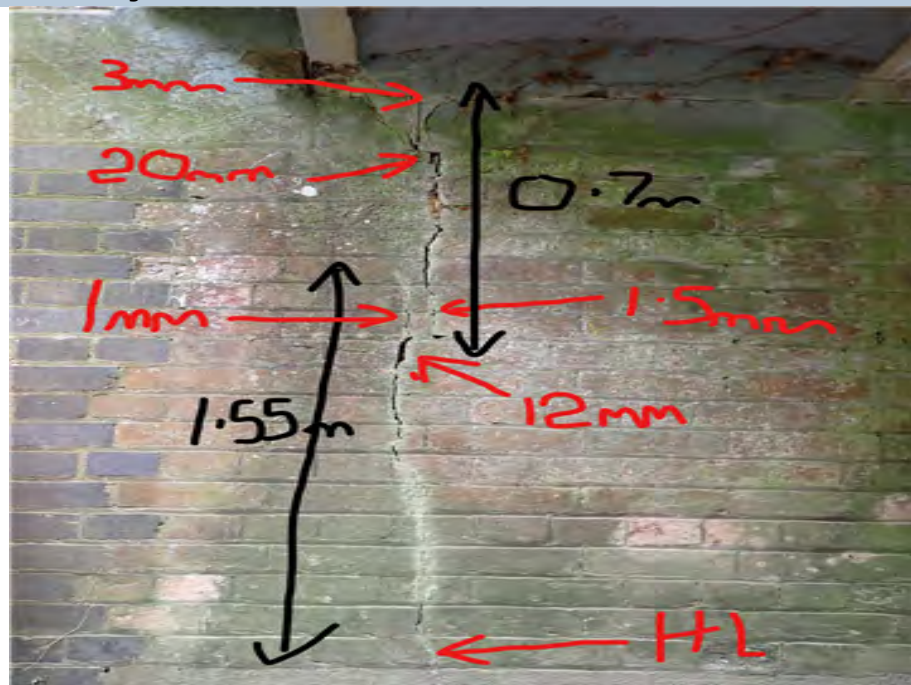
Vertical crack to north abutment at east end (6m in from the west) extending 1.8m full height from the jack arch through the bearing stones and masonry abutment down to the concrete edging / training, open 1mm (upper), 10mm (above midpoint) and 1mm (lower). An area of brick spalling was noted above the midpoint of the crack or 0.1m x 0.1m x 10mm in depth.

Shrinkage hairline cracks to all jack arch infills above the bearing stones on south abutment full width were noted, insignificant defect to non structural element.

Spalling to concrete infill between jack arches on south abutment at the following locations (chainage in from the west);

- 1m - Concrete infill spall 0.3m x 0.1m x 35mm deep.
- 1.8m - Concrete infill spall 0.2m x 0.070m x 35mm deep.
- 6m - Concrete infill spall 0.3m x 0.2m x 35mm deep.

BOXTED - Span 1
Load-bearing Substructure



South Abutment (east end)
 Vertical cracks 2no. to abutment.

No	Element Name	Element Description	Sev	Ext	Defect	Priority	Works	Cost £k
9	Abutments (inc arch springing)	09/Abutments(inc.arch spring)	3	C	3.5	M	Y	10

Comment **Remedial Works**

2no. vertical cracks parallel to each other to south abutment at east end (6m in from the west). Upper crack extending from jack arch infill down through bearing stones and masonry abutment 0.7m in length, open 3mm (upper), 20mm (centre) and 1.5mm (lower), the lower crack extends 1.55m through masonry abutment down to concrete edging / training, open 1mm (upper), 12mm (centre) and hairline (lower).

Repair and seal cracks to abutment over 1mm wide and repair any areas of concrete spalling.

Vertical crack to north abutment at east end (6m in from the west) extending 1.8m full height from the jack arch through the bearing stones and masonry abutment down to the concrete edging / training, open 1mm (upper), 10mm (above midpoint) and 1mm (lower). An area of brick spalling was noted above the midpoint of the crack or 0.1m x 0.1m x 10mm in depth.

Shrinkage hairline cracks to all jack arch infills above the bearing stones on south abutment full width were noted, insignificant defect to non structural element.

Spalling to concrete infill between jack arches on south abutment at the following locations (chainage in from the west);

- 1m - Concrete infill spall 0.3m x 0.1m x 35mm deep.
- 1.8m - Concrete infill spall 0.2m x 0.070m x 35mm deep.
- 6m - Concrete infill spall 0.3m x 0.2m x 35mm deep.

BOXTED - Span 1
Load-bearing Substructure



North Abutment (east end)
 Vertical crack to north abutment.

No	Element Name	Element Description	Sev	Ext	Defect	Priority	Works	Cost £k
9	Abutments (inc arch springing)	09/Abutments(inc.arch spring)	3	C	3.5	M	Y	10

Comment **Remedial Works**

2no. vertical cracks parallel to each other to south abutment at east end (6m in from the west). Upper crack extending from jack arch infill down through bearing stones and masonry abutment 0.7m in length, open 3mm (upper), 20mm (centre) and 1.5mm (lower), the lower crack extends 1.55m through masonry abutment down to concrete edging / training, open 1mm (upper), 12mm (centre) and hairline (lower).

Repair and seal cracks to abutment over 1mm wide and repair any areas of concrete spalling.

Vertical crack to north abutment at east end (6m in from the west) extending 1.8m full height from the jack arch through the bearing stones and masonry abutment down to the concrete edging / training, open 1mm (upper), 10mm (above midpoint) and 1mm (lower). An area of brick spalling was noted above the midpoint of the crack or 0.1m x 0.1m x 10mm in depth.

Shrinkage hairline cracks to all jack arch infills above the bearing stones on south abutment full width were noted, insignificant defect to non structural element.

Spalling to concrete infill between jack arches on south abutment at the following locations (chainage in from the west);

- 1m - Concrete infill spall 0.3m x 0.1m x 35mm deep.
- 1.8m - Concrete infill spall 0.2m x 0.070m x 35mm deep.
- 6m - Concrete infill spall 0.3m x 0.2m x 35mm deep.

BOXTED - Span 1
Load-bearing Substructure



South abutment (east end)
 Spalling to jack arch concrete infill adjacent channel section (6m in from the west).

No	Element Name	Element Description	Sev	Ext	Defect	Priority	Works	Cost £k
9	Abutments (inc arch springing)	09/Abutments(inc.arch spring)	3	C	3.5	M	Y	10

Comment **Remedial Works**

2no. vertical cracks parallel to each other to south abutment at east end (6m in from the west). Upper crack extending from jack arch infill down through bearing stones and masonry abutment 0.7m in length, open 3mm (upper), 20mm (centre) and 1.5mm (lower), the lower crack extends 1.55m through masonry abutment down to concrete edging / training, open 1mm (upper), 12mm (centre) and hairline (lower).

Repair and seal cracks to abutment over 1mm wide and repair any areas of concrete spalling.

Vertical crack to north abutment at east end (6m in from the west) extending 1.8m full height from the jack arch through the bearing stones and masonry abutment down to the concrete edging / training, open 1mm (upper), 10mm (above midpoint) and 1mm (lower). An area of brick spalling was noted above the midpoint of the crack or 0.1m x 0.1m x 10mm in depth.

Shrinkage hairline cracks to all jack arch infills above the bearing stones on south abutment full width were noted, insignificant defect to non structural element.

Spalling to concrete infill between jack arches on south abutment at the following locations (chainage in from the west);

- 1m - Concrete infill spall 0.3m x 0.1m x 35mm deep.
- 1.8m - Concrete infill spall 0.2m x 0.070m x 35mm deep.
- 6m - Concrete infill spall 0.3m x 0.2m x 35mm deep.

BOXTED - Span 1
Load-bearing Substructure



South Abutment
 Weathering to brick faces

No	Element Name	Element Description	Sev	Ext	Defect	Priority	Works	Cost £k
9	Abutments (inc arch springing)	09/Abutments(inc.arch spring)	2	B	3.6	L	N	

Comment	Remedial Works
Minor weathering to brick faces on south abutment between 3m - 5m in from the west just above midpoint, area affected 2m x 0.5m x 20mm weathering depth into brick.	[none]



East Edge Girder Top Flange (looking north)
 Protective paint top coat flaking.

No	Element Name	Element Description	Sev	Ext	Defect	Priority	Works	Cost £k
19	Finishes: deck elements	19/Finishes:deck elements	3	E	4.1	H	Y	5

Comment	Remedial Works
Failure to paintwork on all deck elements with the worst affected areas being at the hogging plate joints, transverse beam bottom flange edges and along girder top and bottom edges.	Remove defective paintwork and re-apply a new protective paint system to match existing.

BOXTED - Span 1
Durability Elements



South East Approach Rail
 Protective paint top coat chipped and flaked on railings and concrete posts.

No	Element Name	Element Description	Sev	Ext	Defect	Priority	Works	Cost £k
21	Finishes: parapets/safety fences	21/Finishes:parapet/saf.fences	5	D	4.1	M	Y	1

Comment

Protective paint top coat chipped and flaked on railings and concrete posts on south east approach rail full length.

Remedial Works

Remove defective paintwork and re-apply a new protective paint system to match existing to south east approach railings.

BOXTED - Span 1

Safety Elements



South East Pilaster (NE corner)
 Bees nest in pilaster void just above abutment.

No	Element Name	Element Description	Sev	Ext	Defect	Priority	Works	Cost £k
23	Handrail/parapets/safety fences	23/Handrail/parapet/saf.fences	3	C	3.5	M	Y	2

Comment

North east pilaster has a diagonal stepped crack to east face lower section extending 1.1m from the abutment bearing stone to the wing wall and embankment, open 3.5mm (upper) to hairline (lower) minor brick spalling was noted at crack midpoint to a depth of 25mm. Vertical crack to lower pilaster east face on the north side extending 0.5m, open 1mm. Roots were identified growing within the gap of the crack.

South west pilaster has brick spalling to the upper north east and south east corners and moderate spalling to brick work to the lower south east corner measuring 0.5m x 0.2m x 40mm maximum depth.

Bees nest in small void in south east pilaster brick work just above abutment in north east corner.

Remedial Works

Seal and repair cracks to brickwork in north east pilaster and south west pilaster.

BOXTED - Span 1

Safety Elements



North East Pilaster (east face)
 Stepped diagonal crack extending from bearing stone to wing wall open 3.5mm with vegetation roots growing in the gap.

No	Element Name	Element Description	Sev	Ext	Defect	Priority	Works	Cost £k
23	Handrail/parapets/safety fences	23/Handrail/parapet/saf.fences	3	C	3.5	M	Y	2

Comment

North east pilaster has a diagonal stepped crack to east face lower section extending 1.1m from the abutment bearing stone to the wing wall and embankment, open 3.5mm (upper) to hairline (lower) minor brick spalling was noted at crack midpoint to a depth of 25mm. Vertical crack to lower pilaster east face on the north side extending 0.5m, open 1mm. Roots were identified growing within the gap of the crack.

South west pilaster has brick spalling to the upper north east and south east corners and moderate spalling to brick work to the lower south east corner measuring 0.5m x 0.2m x 40mm maximum depth.

Bees nest in small void in south east pilaster brick work just above abutment in north east corner.

Remedial Works

Seal and repair cracks to brickwork in north east pilaster and south west pilaster.

BOXTED - Span 1

Safety Elements



North West Pilaster (west face)
 Pointing loss of up to 10mm in depth between bricks.

No	Element Name	Element Description	Sev	Ext	Defect	Priority	Works	Cost £k
23	Handrail/parapets/safety fences	23/Handrail/parapet/saf.fences	2	C	3.2	L	Y	1

Comment

South west pilaster has minor pointing loss between brick work to the lower east face.

North west pilaster has minor pointing loss lower section (just above abutment corner) of west face up to a depth of 10mm. Pointing missing between brick pilaster and concrete abutment bearing stone 0.3m in length creating a gap of 10mm.

North east pilaster has minor pointing loss to upper and lower east face to a depth of 10mm.

Remedial Works

Replace missing mortar to south west pilaster, north west pilaster and north east pilaster.

BOXTED - Span 1

Safety Elements



North West Pilaster (west face lower section)

Brick missing along with concrete haunching.

No	Element Name	Element Description	Sev	Ext	Defect	Priority	Works	Cost £k
23	Handrail/parapets/safety fences	23/Handrail/parapet/saf.fences	3	C	3.6	M	Y	2

Comment

North west pilaster has approximately 1no brick missing along with spalling to the surrounding concrete haunching, area of 230mm x 120mm. 1no brick broken up to lower section of the south west corner adjacent to the abutment. Minor brick face weathering of up to 20mm in depth was noted to east face corner edge of the north west pilaster extending over its full height.

North east pilaster had moderate brick loss to the lower south east corner above abutment bearing stone, there was evidence of missing bricks as there was 1no. loose brick laying on the bearing plate, area affected is 1m x 0.5m x 100mm maximum depth.

Remedial Works

Repair and replace missing brick work.

BOXTED - Span 1
Safety Elements



North East Pilaster (south east corner)
 Bricks broken up, loose and missing.

No	Element Name	Element Description	Sev	Ext	Defect	Priority	Works	Cost £k
23	Handrail/parapets/safety fences	23/Handrail/parapet/saf.fences	3	C	3.6	M	Y	2

Comment **Remedial Works**

North west pilaster has approximately 1no brick missing along with spalling to the surrounding concrete haunching, area of 230mm x 120mm. 1no brick broken up to lower section of the south west corner adjacent to the abutment. Minor brick face weathering of up to 20mm in depth was noted to east face corner edge of the north west pilaster extending over its full height.

Repair and replace missing brick work.

North east pilaster had moderate brick loss to the lower south east corner above abutment bearing stone, there was evidence of missing bricks as there was 1no. loose brick laying on the bearing plate, area affected is 1m x 0.5m x 100mm maximum depth.

BOXTED - Span 1

Safety Elements



North West Pilaster (south face)
 Ivy stump adjacent pilaster.

No	Element Name	Element Description	Sev	Ext	Defect	Priority	Works	Cost £k
23	Handrail/parapets/safety fences	23/Handrail/parapet/saf.fences	3	C	5.1	H	Y	1

Comment

Ivy stump growing adjacent south face of north west pilaster above abutment.

Ivy growing around the south west pilaster west face.

Tree growing adjacent south east pilaster at south east corner.

Remedial Works

Remove vegetation

BOXTED - Span 1
Safety Elements



South East Pilaster (south face)
 Tree growing adjacent SE corner of pilaster.

No	Element Name	Element Description	Sev	Ext	Defect	Priority	Works	Cost £k
23	Handrail/parapets/safety fences	23/Handrail/parapet/saf.fences	3	C	5.1	H	Y	1

Comment	Remedial Works
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Ivy stump growing adjacent south face of north west pilaster above abutment.

Remove vegetation

Ivy growing around the south west pilaster west face.

Tree growing adjacent south east pilaster at south east corner.

BOXTED - Span 1

Safety Elements



Carriageway Surface (south end)
 Shallow potholes 3no. to south end.

No	Element Name	Element Description	Sev	Ext	Defect	Priority	Works	Cost £k
24	Carriageway surfacing	24/Carriageway surfacing	2	C	9.4	L	Y	2.5

Comment

3no shallow potholes to carriageway asphalt surface at the south end. Pothole to the west side measures 1.2m x 0.3m x 20mm in depth, centre concrete filled bore hole measures 0.250m x 0.250m x 15mm in depth and the pothole to the east side measures 0.8m x 0.1m x 20mm in depth.

Remedial Works

Repair potholes and repaint centre lane markings

White carriageway centre lane markings faded full span.



Carriageway Surface (looking north)
 Tracking to both carriageway lanes for 10m.

No	Element Name	Element Description	Sev	Ext	Defect	Priority	Works	Cost £k
24	Carriageway surfacing	24/Carriageway surfacing	2	C	9.2	L	Y	10

Comment

Tracking was noted from the south extending 10m in both lanes either side of centre line with evidence of farm vehicle tyre marks in the dips, both tracking lanes measured 10m x 0.6m wide.

Remedial Works

Resurface carriageway level.

BOXTED - Span 1
Safety Elements



East Carriageway (midspan)
 Concrete edge fillet broken up.

No	Element Name	Element Description	Sev	Ext	Defect	Priority	Works	Cost £k
25	Footway/verge/footbridge surfacing	25/Fway/verge/fbrdge surfacing	4	C	9.2	H	Y	2

Comment	Remedial Works
Concrete fillet between east carriageway kerbing and east edge girder cracked and broken up between 5m to 7m in from the south.	Replace concrete fillet between east carriageway kerbing and east edge girder.



West Carriageway Edge
 Grasses and weeds growing along between edge kerbing and edge girder.

No	Element Name	Element Description	Sev	Ext	Defect	Priority	Works	Cost £k
25	Footway/verge/footbridge surfacing	25/Fway/verge/fbrdge surfacing	3	D	5.1	H	Y	0.3

Comment	Remedial Works
Weeds and grasses growing along between east and west edge kerbing and edge girders full length.	Remove vegetation.

BOXTED - Span 1

Other Bridge Elements



North River Bed (4m in from the west)
 Submerged rope and broken timber post
 (bottom left)

No	Element Name	Element Description	Sev	Ext	Defect	Priority	Works	Cost £k
26	Invert/river bed	26/Invert/river bed	2	C	7.2	H	Y	1

Comment

Broken jagged timber posts along river bed edges approximately between 200mm-400mm in height adjacent both abutments some submerged, a submerged broken timber post was noted to the north river bed 4m in from the west and 2m from north abutment.

There was a submerged length of rope to the north river bed adjacent the abutment tied to broken timber posts at 1m and 4m in from the west.

Remedial Works

Remove submerged posts and rope.

BOXTED - Span 1
Other Bridge Elements



River Bed in front of South Abutment.
 Broken timber posts at river bed edge.

No	Element Name	Element Description	Sev	Ext	Defect	Priority	Works	Cost £k
26	Invert/river bed	26/Invert/river bed	2	C	7.2	H	Y	1

Comment **Remedial Works**

Broken jagged timber posts along river bed edges approximately between 200mm-400mm in height adjacent both abutments some submerged, a submerged broken timber post was noted to the north river bed 4m in from the west and 2m from north abutment.

Remove submerged posts and rope.

There was a submerged length of rope to the north river bed adjacent the abutment tied to broken timber posts at 1m and 4m in from the west.



West River Bed (midspan)
 Minor scour, slightly deeper area of river bed.

No	Element Name	Element Description	Sev	Ext	Defect	Priority	Works	Cost £k
26	Invert/river bed	26/Invert/river bed	2	C	7.1	L	N	

Comment **Remedial Works**

Minor scour to centre of river bed below west edge girder. Scour not affecting structure at time of inspection. (Refer to attached scour form)

[none]

BOXTED - Span 1
Other Bridge Elements

Scour Form 1
 Scour Form 1

No	Element Name	Element Description	Sev	Ext	Defect	Priority	Works	Cost £k
26	Invert/river bed	26/Invert/river bed	2	C	7.1	L	N	

Comment Minor scour to centre of river bed below west edge girder. Scour not affecting structure at time of inspection. (Refer to attached scour form)

Remedial Works [none]

Scour Form 2
 Scour Form 2

No	Element Name	Element Description	Sev	Ext	Defect	Priority	Works	Cost £k
26	Invert/river bed	26/Invert/river bed	2	C	7.1	L	N	

Comment Minor scour to centre of river bed below west edge girder. Scour not affecting structure at time of inspection. (Refer to attached scour form)

Remedial Works [none]

BOXTED - Span 1
Other Bridge Elements



North East Wing Wall (looking north)
 Wing wall cracked through over full height, separated and significantly displaced.

No	Element Name	Element Description	Sev	Ext	Defect	Priority	Works	Cost £k
31	Wing walls	31/Wing walls	5	E	3.1	H	Y	15

Comment **Remedial Works**

North east wing wall cracked, separated and displaced at south end between drainage outlet and pilaster. The stepped vertical crack extended 1.3m and was open 250mm in gap width, the wing wall north of the crack had displaced 90mm eastwards.

Replace / repair damaged section of wing walls

Concrete plinth at the base of the north east wing wall had displaced 60mm eastwards at south end.

The top two courses of bricks on the south west wing wall have separated due to tree roots and vegetation extending full length and open a maximum of 30mm at west end, a maximum of 25mm at midpoint and a maximum of 60mm at east end. The top two brick courses at west end of the wing wall had displaced 30mm northwards and the 5th - 7th brick courses down from the top have displaced 20mm northwards.

The top two courses of bricks on the south east wing wall have separated due to tree roots from 3m from the west, the top course extended 4m, open a maximum of 35mm and the second course down extending 7m, open 50mm (west end) and 40mm (east end).

BOXTED - Span 1

Other Bridge Elements



North East Wing Wall (looking west)
 Gap separation maximum 250mm at widest part.

No	Element Name	Element Description	Sev	Ext	Defect	Priority	Works	Cost £k
31	Wing walls	31/Wing walls	5	E	3.1	H	Y	15

Comment **Remedial Works**

North east wing wall cracked, separated and displaced at south end between drainage outlet and pilaster. The stepped vertical crack extended 1.3m and was open 250mm in gap width, the wing wall north of the crack had displaced 90mm eastwards.

Replace / repair damaged section of wing walls

Concrete plinth at the base of the north east wing wall had displaced 60mm eastwards at south end.

The top two courses of bricks on the south west wing wall have separated due to tree roots and vegetation extending full length and open a maximum of 30mm at west end, a maximum of 25mm at midpoint and a maximum of 60mm at east end. The top two brick courses at west end of the wing wall had displaced 30mm northwards and the 5th - 7th brick courses down from the top have displaced 20mm northwards.

The top two courses of bricks on the south east wing wall have separated due to tree roots from 3m from the west, the top course extended 4m, open a maximum of 35mm and the second course down extending 7m, open 50mm (west end) and 40mm (east end).

BOXTED - Span 1

Other Bridge Elements



North East Wing Wall (looking north)
 Concrete plinth at the base of wing wall displaced by 60mm.

No	Element Name	Element Description	Sev	Ext	Defect	Priority	Works	Cost £k
31	Wing walls	31/Wing walls	5	E	3.1	H	Y	15

Comment

North east wing wall cracked, separated and displaced at south end between drainage outlet and pilaster. The stepped vertical crack extended 1.3m and was open 250mm in gap width, the wing wall north of the crack had displaced 90mm eastwards.

Concrete plinth at the base of the north east wing wall had displaced 60mm eastwards at south end.

The top two courses of bricks on the south west wing wall have separated due to tree roots and vegetation extending full length and open a maximum of 30mm at west end, a maximum of 25mm at midpoint and a maximum of 60mm at east end. The top two brick courses at west end of the wing wall had displaced 30mm northwards and the 5th - 7th brick courses down from the top have displaced 20mm northwards.

The top two courses of bricks on the south east wing wall have separated due to tree roots from 3m from the west, the top course extended 4m, open a maximum of 35mm and the second course down extending 7m, open 50mm (west end) and 40mm (east end).

Remedial Works

Replace / repair damaged section of wing walls

BOXTED - Span 1

Other Bridge Elements



South West Wing Wall (west end)
 Brickwork displaced 30mm northwards.

No	Element Name	Element Description	Sev	Ext	Defect	Priority	Works	Cost £k
31	Wing walls	31/Wing walls	5	E	3.1	H	Y	15

Comment

North east wing wall cracked, separated and displaced at south end between drainage outlet and pilaster. The stepped vertical crack extended 1.3m and was open 250mm in gap width, the wing wall north of the crack had displaced 90mm eastwards.

Concrete plinth at the base of the north east wing wall had displaced 60mm eastwards at south end.

The top two courses of bricks on the south west wing wall have separated due to tree roots and vegetation extending full length and open a maximum of 30mm at west end, a maximum of 25mm at midpoint and a maximum of 60mm at east end. The top two brick courses at west end of the wing wall had displaced 30mm northwards and the 5th - 7th brick courses down from the top have displaced 20mm northwards.

The top two courses of bricks on the south east wing wall have separated due to tree roots from 3m from the west, the top course extended 4m, open a maximum of 35mm and the second course down extending 7m, open 50mm (west end) and 40mm (east end).

Remedial Works

Replace / repair damaged section of wing walls

BOXTED - Span 1
Other Bridge Elements



South West Wing Wall (east end)
 The top two brick courses were separated up to 60mm due to tree roots.

No	Element Name	Element Description	Sev	Ext	Defect	Priority	Works	Cost £k
31	Wing walls	31/Wing walls	5	E	3.1	H	Y	15

Comment

North east wing wall cracked, separated and displaced at south end between drainage outlet and pilaster. The stepped vertical crack extended 1.3m and was open 250mm in gap width, the wing wall north of the crack had displaced 90mm eastwards.

Concrete plinth at the base of the north east wing wall had displaced 60mm eastwards at south end.

The top two courses of bricks on the south west wing wall have separated due to tree roots and vegetation extending full length and open a maximum of 30mm at west end, a maximum of 25mm at midpoint and a maximum of 60mm at east end. The top two brick courses at west end of the wing wall had displaced 30mm northwards and the 5th - 7th brick courses down from the top have displaced 20mm northwards.

The top two courses of bricks on the south east wing wall have separated due to tree roots from 3m from the west, the top course extended 4m, open a maximum of 35mm and the second course down extending 7m, open 50mm (west end) and 40mm (east end).

Remedial Works

Replace / repair damaged section of wing walls

BOXTED - Span 1
Other Bridge Elements



South East Wing Wall
 Tree root damage to wing wall 4m in from the west,

No	Element Name	Element Description	Sev	Ext	Defect	Priority	Works	Cost £k
31	Wing walls	31/Wing walls	5	E	3.1	H	Y	15

Comment

North east wing wall cracked, separated and displaced at south end between drainage outlet and pilaster. The stepped vertical crack extended 1.3m and was open 250mm in gap width, the wing wall north of the crack had displaced 90mm eastwards.

Concrete plinth at the base of the north east wing wall had displaced 60mm eastwards at south end.

The top two courses of bricks on the south west wing wall have separated due to tree roots and vegetation extending full length and open a maximum of 30mm at west end, a maximum of 25mm at midpoint and a maximum of 60mm at east end. The top two brick courses at west end of the wing wall had displaced 30mm northwards and the 5th - 7th brick courses down from the top have displaced 20mm northwards.

The top two courses of bricks on the south east wing wall have separated due to tree roots from 3m from the west, the top course extended 4m, open a maximum of 35mm and the second course down extending 7m, open 50mm (west end) and 40mm (east end).

Remedial Works

Replace / repair damaged section of wing walls

BOXTED - Span 1
Other Bridge Elements



North East Wing Wall (looking north)
 Wing wall leaning due to adjacent tree.

No	Element Name	Element Description	Sev	Ext	Defect	Priority	Works	Cost £k
31	Wing walls	31/Wing walls	3	D	3.7	H	Y	15

Comment

North east wing wall north end leaning approximately 100mm eastwards due to tree growing on top of wing wall.

Moderate bulging to south west wing wall at midpoint from 6m - 17m in from the west end, the area affected was approximately 11m in length and 1m in height.

Remedial Works

Replace / repair damaged wing walls

BOXTED - Span 1
Other Bridge Elements



South West Wing Wall (looking west)
Moderate bulging to midpoint of brickwork.

No	Element Name	Element Description	Sev	Ext	Defect	Priority	Works	Cost £k
31	Wing walls	31/Wing walls	3	D	3.7	H	Y	15

Comment

North east wing wall north end leaning approximately 100mm eastwards due to tree growing on top of wing wall.

Moderate bulging to south west wing wall at midpoint from 6m - 17m in from the west end, the area affected was approximately 11m in length and 1m in height.

Remedial Works

Replace / repair damaged wing walls

BOXTED - Span 1
Other Bridge Elements



North East Wing Wall
 Area of bricks breaking up to upper section.

No	Element Name	Element Description	Sev	Ext	Defect	Priority	Works	Cost £k
31	Wing walls	31/Wing walls	3	B	3.6	L	Y	5

Comment **Remedial Works**

Small area of bricks breaking up to upper section of north east wing wall 2m in from the south to a maximum depth of 30mm.

Repair / replace areas of brick damage

Small areas of bricks breaking up at the bottom of south west wing wall at 4m, 10m, 13m, 14m and 17m in from the west with the worst area being at 4m in where a depth of 40mm into the brick was recorded. Area of broken bricks to upper section at 14m in from the west of 1m x 0.7m x 15mm maximum depth into the brick work.

Brick loss to north west wing wall section (adjacent concrete plinth) at south end with bricks breaking up to a depth of 120mm and loose with 1no. brick laying on the embankment.

BOXTED - Span 1
Other Bridge Elements



South West Wing Wall (west end)
 Brickwork breaking up at bottom of wing wall to a maximum depth of 40mm.

No	Element Name	Element Description	Sev	Ext	Defect	Priority	Works	Cost £k
31	Wing walls	31/Wing walls	3	B	3.6	L	Y	5

Comment

Small area of bricks breaking up to upper section of north east wing wall 2m in from the south to a maximum depth of 30mm.

Small areas of bricks breaking up at the bottom of south west wing wall at 4m, 10m, 13m, 14m and 17m in from the west with the worst area being at 4m in where a depth of 40mm into the brick was recorded. Area of broken bricks to upper section at 14m in from the west of 1m x 0.7m x 15mm maximum depth into the brick work.

Brick loss to north west wing wall section (adjacent concrete plinth) at south end with bricks breaking up to a depth of 120mm and loose with 1no. brick laying on the embankment.

Remedial Works

Repair / replace areas of brick damage

BOXTED - Span 1
Other Bridge Elements



North West Wing Wall (lower section)
 Bricks breaking up and loose at south end of the wall.

No	Element Name	Element Description	Sev	Ext	Defect	Priority	Works	Cost £k
31	Wing walls	31/Wing walls	3	B	3.6	L	Y	5

Comment

Small area of bricks breaking up to upper section of north east wing wall 2m in from the south to a maximum depth of 30mm.

Small areas of bricks breaking up at the bottom of south west wing wall at 4m, 10m, 13m, 14m and 17m in from the west with the worst area being at 4m in where a depth of 40mm into the brick was recorded. Area of broken bricks to upper section at 14m in from the west of 1m x 0.7m x 15mm maximum depth into the brick work.

Brick loss to north west wing wall section (adjacent concrete plinth) at south end with bricks breaking up to a depth of 120mm and loose with 1no. brick laying on the embankment.

Remedial Works

Repair / replace areas of brick damage

BOXTED - Span 1

Other Bridge Elements



North East Wing Wall
 Stepped crack open 15mm, extending from near top of the wall to the top of the redundant drainage outlet.

No	Element Name	Element Description	Sev	Ext	Defect	Priority	Works	Cost £k
31	Wing walls	31/Wing walls	3	C	3.5	M	Y	5

Comment

North east wing wall had a vertical stepped crack 1m in from the south end extending 0.4m from top of the wall to the top of the redundant drainage outlet, open 15mm.

Multiple horizontal cracks to brickwork between brick courses on south west wing wall with crack to the lower section at west end, cracks to the centre area at wall midpoint and cracks to the upper section at east end, the worst of these was at 8m in from the west 9 brick course up from the base extending 3m, open 10mm, crack have ivy growing through the gaps.

Multiple vertical stepped cracks to south west wing wall between 13m - 17m in from the west with the worst being at 14m in from the west extending from the 2nd brick course down 0.6m and open a maximum of 10mm.

Diagonal crack through brick work to south west wing wall at 13m in from the west extending 0.7m, open 1mm (upper), 2mm-6mm (centre) and 3.5mm-2mm (lower). Diagonal crack at 16m in from the west upper section extending from patters plate 0.7m through brick work, open 1mm with minor brick loss at crack midpoint to a depth of 20mm.

Horizontal crack to south east wing wall at 3m in from the west to lower section extending 2m, open 30mm with ivy growing through the gap.

Vertical cracks extending from top of south east wing wall at 0.5m, 1m and 3m in from the west, the worst being at 0.5m in from the west extending 0.4m, open 2mm (upper), 5mm (centre) and 3mm (lower).

Vertical and horizontal stepped cracking lower north west wing wall section (adjacent to concrete plinth) west face extending 0.8m, open 4mm.

Remedial Works

Repair cracks to brickwork in all four wing walls.

BOXTED - Span 1

Other Bridge Elements



South East Wing Wall

Horizontal 30mm wide crack with vegetation growing through the gap at 3m in from the west end of the wall.

No	Element Name	Element Description	Sev	Ext	Defect	Priority	Works	Cost £k
31	Wing walls	31/Wing walls	3	C	3.5	M	Y	5

Comment

North east wing wall had a vertical stepped crack 1m in from the south end extending 0.4m from top of the wall to the top of the redundant drainage outlet, open 15mm.

Multiple horizontal cracks to brickwork between brick courses on south west wing wall with crack to the lower section at west end, cracks to the centre area at wall midpoint and cracks to the upper section at east end, the worst of these was at 8m in from the west 9 brick course up from the base extending 3m, open 10mm, crack have ivy growing through the gaps.

Multiple vertical stepped cracks to south west wing wall between 13m - 17m in from the west with the worst being at 14m in from the west extending from the 2nd brick course down 0.6m and open a maximum of 10mm.

Diagonal crack through brick work to south west wing wall at 13m in from the west extending 0.7m, open 1mm (upper), 2mm-6mm (centre) and 3.5mm-2mm (lower). Diagonal crack at 16m in from the west upper section extending from patters plate 0.7m through brick work, open 1mm with minor brick loss at crack midpoint to a depth of 20mm.

Horizontal crack to south east wing wall at 3m in from the west to lower section extending 2m, open 30mm with ivy growing through the gap.

Vertical cracks extending from top of south east wing wall at 0.5m, 1m and 3m in from the west, the worst being at 0.5m in from the west extending 0.4m, open 2mm (upper), 5mm (centre) and 3mm (lower).

Vertical and horizontal stepped cracking lower north west wing wall section (adjacent to concrete plinth) west face extending 0.8m, open 4mm.

Remedial Works

Repair cracks to brickwork in all four wing walls.

BOXTED - Span 1
Other Bridge Elements



North East Wing Wall
Pointing loss to upper section between bricks to a maximum depth of 20mm.

No	Element Name	Element Description	Sev	Ext	Defect	Priority	Works	Cost £k
31	Wing walls	31/Wing walls	2	C	3.2	L	Y	1

Comment

Pointing loss to a depth of 20mm on the north east wing wall to upper section and midpoint from 2m in from the south end to the north end.

Sporadic pointing loss to south west wing wall between horizontal cracks where vegetation was growing between brick courses full length, worst area being at centre 12m-14m in from the west.

Remedial Works

Replace missing pointing mortar to north east wing wall and to south west wing wall.

BOXTED - Span 1
Other Bridge Elements



South West Wing Wall (west end, looking east)
 Roots growing up against wing wall at 1m - 10m in from the west.

No	Element Name	Element Description	Sev	Ext	Defect	Priority	Works	Cost £k
31	Wing walls	31/Wing walls	4	C	5.1	H	Y	10

Comment

Tree growing on top of the north east wing wall at north end causing leaning.

Tree roots and ivy roots growing on structure at 0m, 1m, 1.5m, 3m, 7m and 9m in from the west. ivy roots growing through horizontal cracks full length of wing wall. Tree roots had pushed approximately 3no. bricks off of the top brick course at east end. Tree growing on top of the south west wing wall at 15m in from the west and roots were vertically separating the top course of bricks by 15mm. Large tree growing up against west end of wing wall.

Trees growing on top of the south east wing wall damaging brick work at 0.5m, 1m, 2m and 3m in from the west. Tree growing adjacent wing wall at 4m in from the west and tree stumps growing from base of wing wall at 1.5m and 3.5m in from the west with ivy growing out of brickwork at midpoint at the west end.

Trees and saplings growing on top of north west wing wall with 2no large trees at 1.5m in from the south and at north end, with roots growing under the base and adjacent the north end of wingwall. Vegetation growing out of concrete plinth along the top and along the base.

Remedial Works

Possible investigation in to tree removal to prevent further structural damage.

BOXTED - Span 1

Other Bridge Elements



South West Wing Wall (east end)
 Tree root has pushed approximately 3no bricks off of top course.

No	Element Name	Element Description	Sev	Ext	Defect	Priority	Works	Cost £k
31	Wing walls	31/Wing walls	4	C	5.1	H	Y	10

Comment **Remedial Works**

Tree growing on top of the north east wing wall at north end causing leaning.

Possible investigation in to tree removal to prevent further structural damage.

Tree roots and ivy roots growing on structure at 0m, 1m, 1.5m, 3m, 7m and 9m in from the west. ivy roots growing through horizontal cracks full length of wing wall. Tree roots had pushed approximately 3no. bricks off of the top brick course at east end. Tree growing on top of the south west wing wall at 15m in from the west and roots were vertically separating the top course of bricks by 15mm. Large tree growing up against west end of wing wall.

Trees growing on top of the south east wing wall damaging brick work at 0.5m, 1m, 2m and 3m in from the west. Tree growing adjacent wing wall at 4m in from the west and tree stumps growing from base of wing wall at 1.5m and 3.5m in from the west with ivy growing out of brickwork at midpoint at the west end.

Trees and saplings growing on top of north west wing wall with 2no large trees at 1.5m in from the south and at north end, with roots growing under the base and adjacent the north end of wingwall. Vegetation growing out of concrete plinth along the top and along the base.

BOXTED - Span 1
Other Bridge Elements



North East Wing Wall
 Moss growing on brick surface.

No	Element Name	Element Description	Sev	Ext	Defect	Priority	Works	Cost £k
31	Wing walls	31/Wing walls	2	D	20.1	L	N	

Comment	Remedial Works
Moss to the top of north east wing wall full length and to concrete plinth at the south end base of the wing wall.	[none]



South West Wing Wall (east end)
 Pattress plates and tie rods are heavily corroded.

No	Element Name	Element Description	Sev	Ext	Defect	Priority	Works	Cost £k
31	Wing walls	31/Wing walls	3	E	1.1	M	Y	4

Comment	Remedial Works
All tie rod pattress plates on south west wing wall had surface corrosion at 10m, 13m, 15m and 17m in from the west end.	Replace pattress plates and tie rod nuts.

BOXTED - Span 1
Other Bridge Elements



South West Embankment (west end, looking west)

Large tree growing adjacent west end of wing wall on embankment.

No	Element Name	Element Description	Sev	Ext	Defect	Priority	Works	Cost £k
33	Embankments	33/Embankments	3	D	5.1	H	Y	8

Comment **Remedial Works**

NE embankment had a tree trunk growing approximately 0.8m from abutment but the roots are adjacent the structure.

Removal of trees to prevent further structural damage.

SE embankment had trees growing adjacent wing wall at 2m and 4m in from the west.

SW embankment had a large tree growing adjacent the west end of wing wall and roots are growing on wing wall at 1m, 2m, 4m, 7m and 9m in from the west.

BOXTED - Span 1
Other Bridge Elements



South West Embankment (west end, looking east)
 Tree roots growing on wing wall and embankment.

No	Element Name	Element Description	Sev	Ext	Defect	Priority	Works	Cost £k
33	Embankments	33/Embankments	3	D	5.1	H	Y	8

Comment	Remedial Works
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NE embankment had a tree trunk growing approximately 0.8m from abutment but the roots are adjacent the structure.

Removal of trees to prevent further structural damage.

SE embankment had trees growing adjacent wing wall at 2m and 4m in from the west.

SW embankment had a large tree growing adjacent the west end of wing wall and roots are growing on wing wall at 1m, 2m, 4m, 7m and 9m in from the west.

BOXTED - Span 1
Ancillary Elements



South East Approach Rail
 Concrete post broken at lower rail joint being held together by reinforcement.

No	Element Name	Element Description	Sev	Ext	Defect	Priority	Works	Cost £k
35	Approach rails/barriers/walls	Approach rails/barriers/walls	4	B	13.1	H	Y	1.5

Comment

South east approach rail concrete post at east end broken in half at lower railing joint with a gap of 100mm being held together by the 4 strengthening rods in the post which had rusted, the post was relatively solid with little movement. Railing end 'D' capping missing.

Remedial Works

Replace broken concrete post and D cap.



South East Approach Rail
 Concrete post broken at lower rail joint being held together by reinforcement. D end cap missing.

No	Element Name	Element Description	Sev	Ext	Defect	Priority	Works	Cost £k
35	Approach rails/barriers/walls	Approach rails/barriers/walls	4	B	13.1	H	Y	1.5

Comment

South east approach rail concrete post at east end broken in half at lower railing joint with a gap of 100mm being held together by the 4 strengthening rods in the post which had rusted, the post was relatively solid with little movement. Railing end 'D' capping missing.

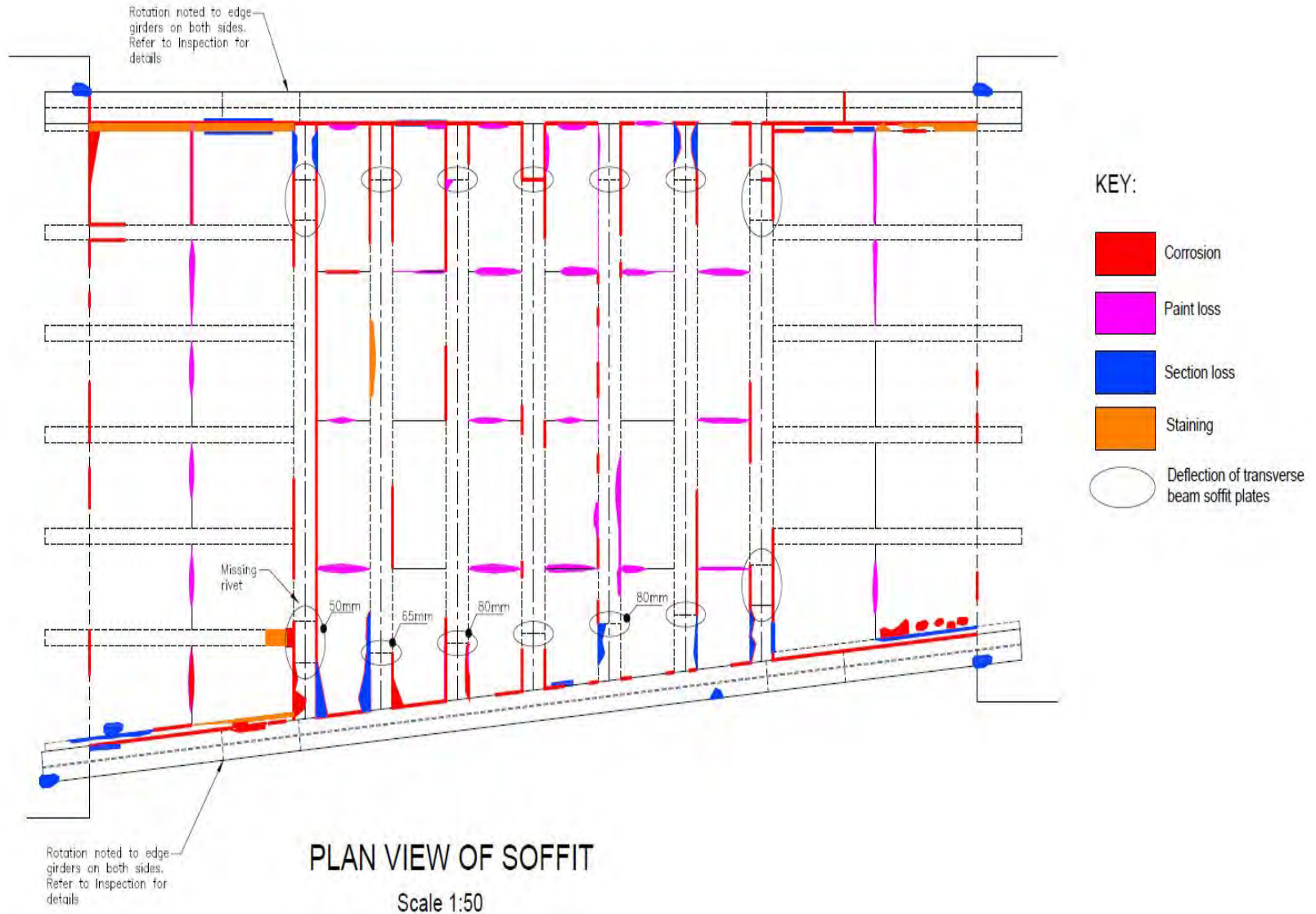
Remedial Works

Replace broken concrete post and D cap.

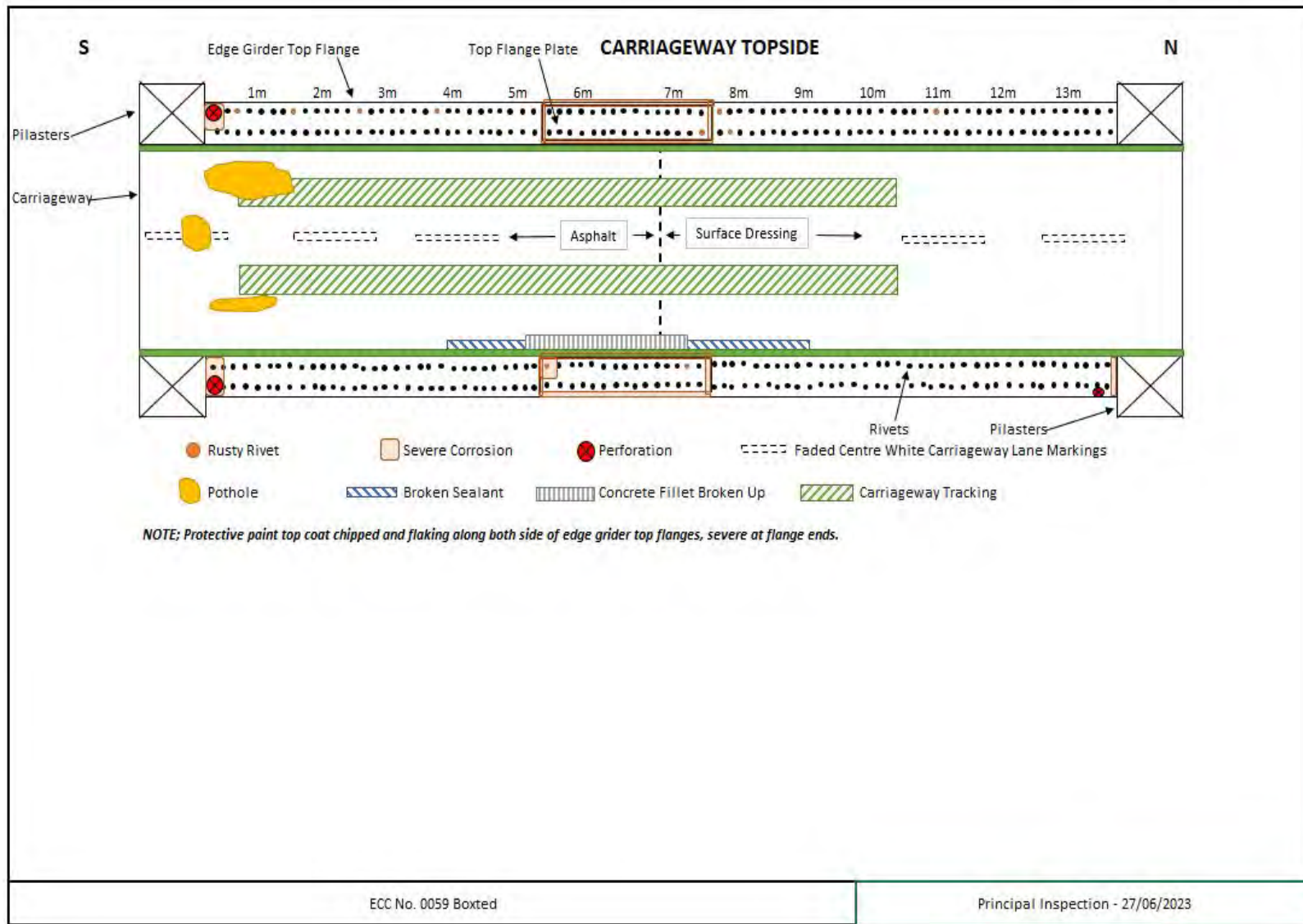
Photo Location Plans

No photo location plans added. Plans must be added to the inspection's folder with Document type: Defect Location Plan.
Supported file types: .jpeg .png .bmp

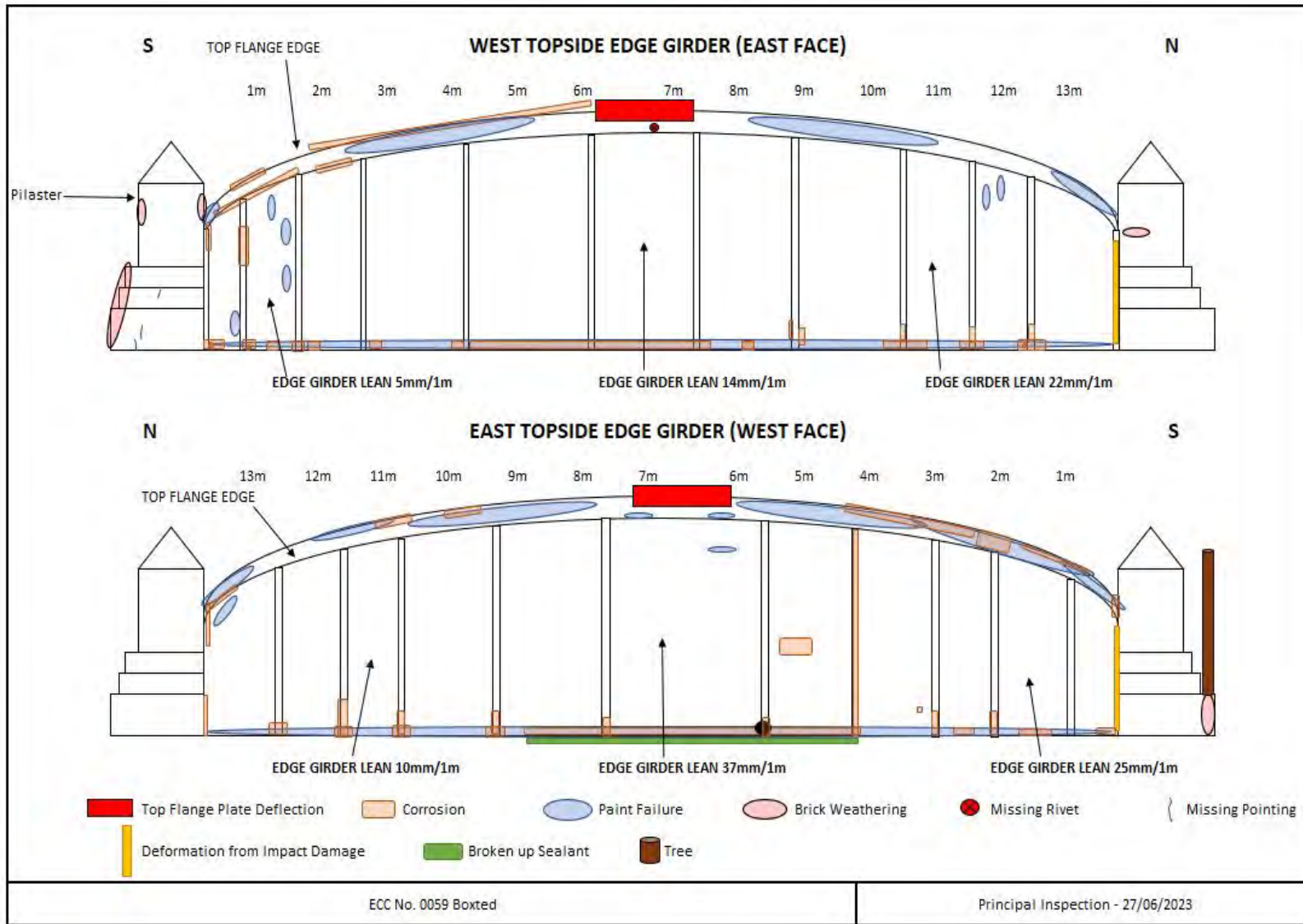
Defect Location Plans



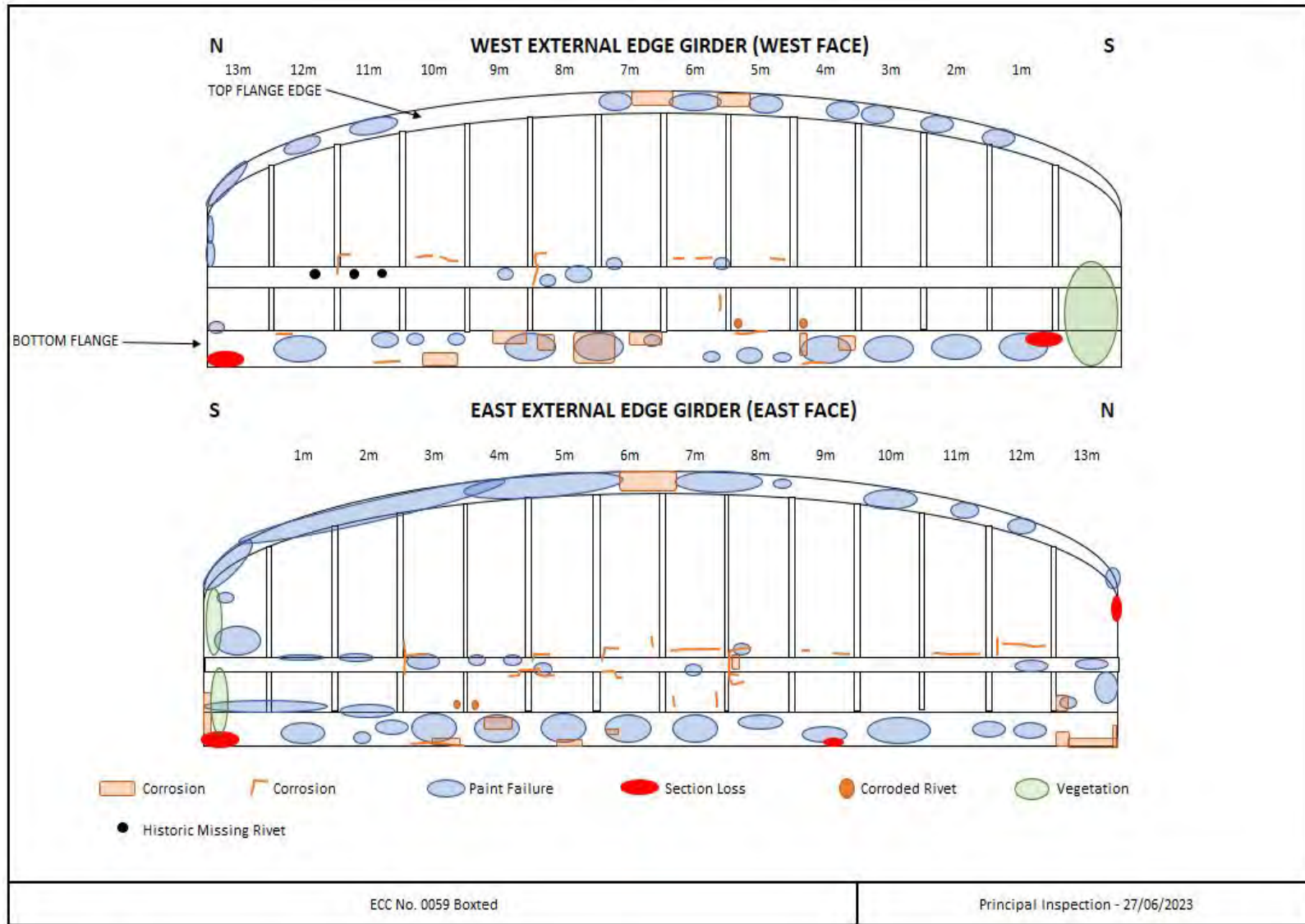
Drq 1 - Soffit.JPG



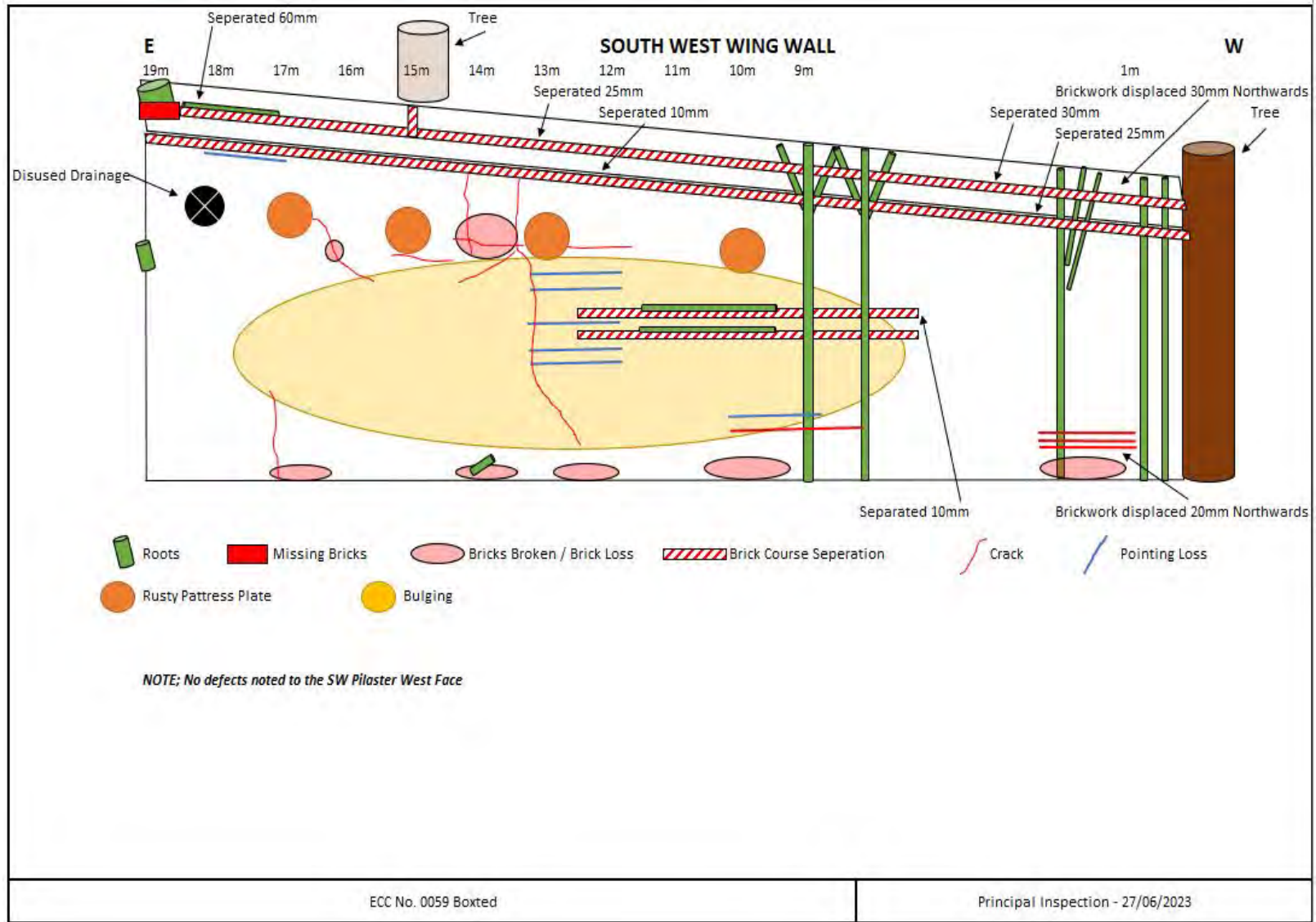
Drq 2 - Carriageway Topside.JPG



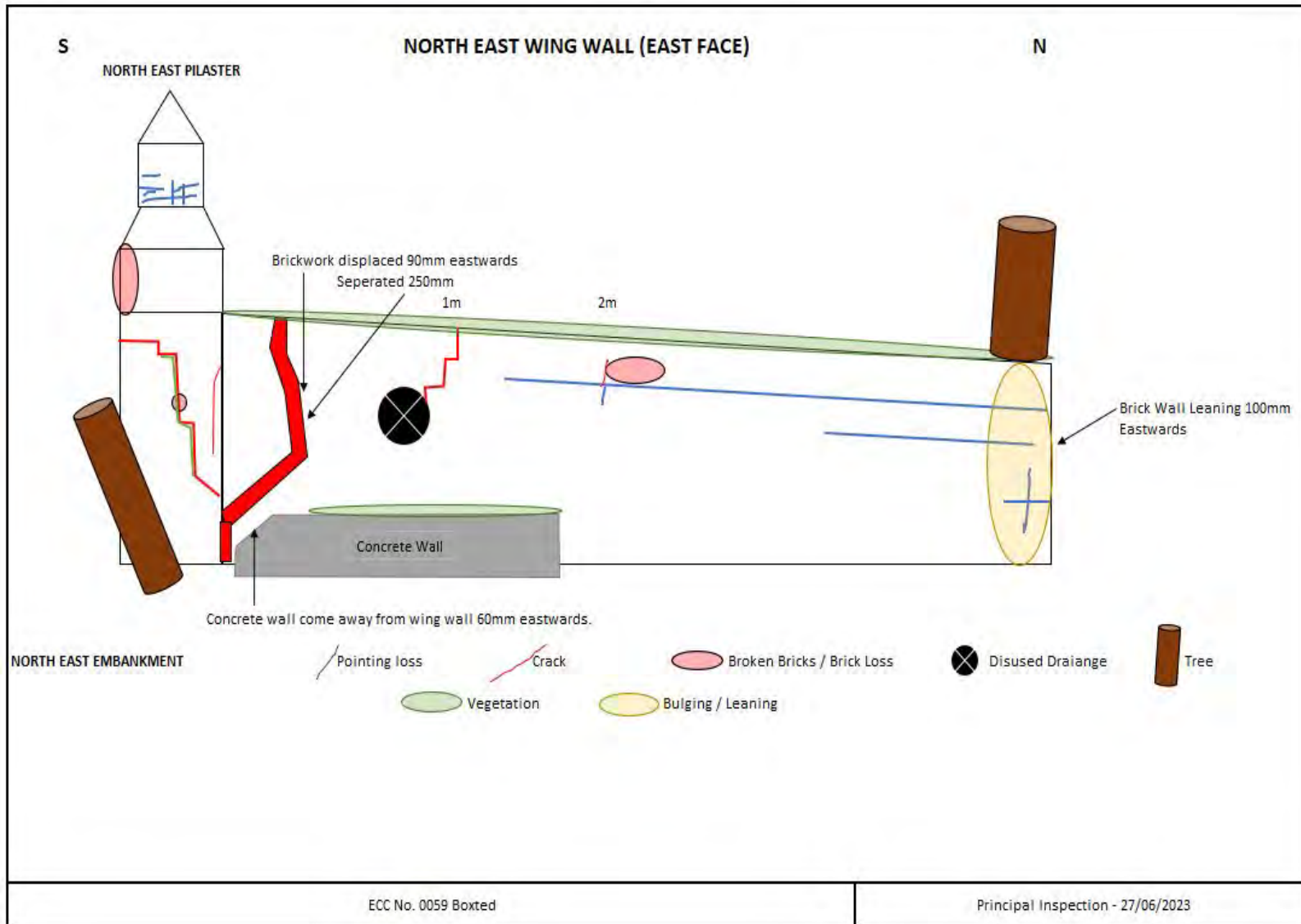
Dr3 - Topside Internal Edge Girders.JPG



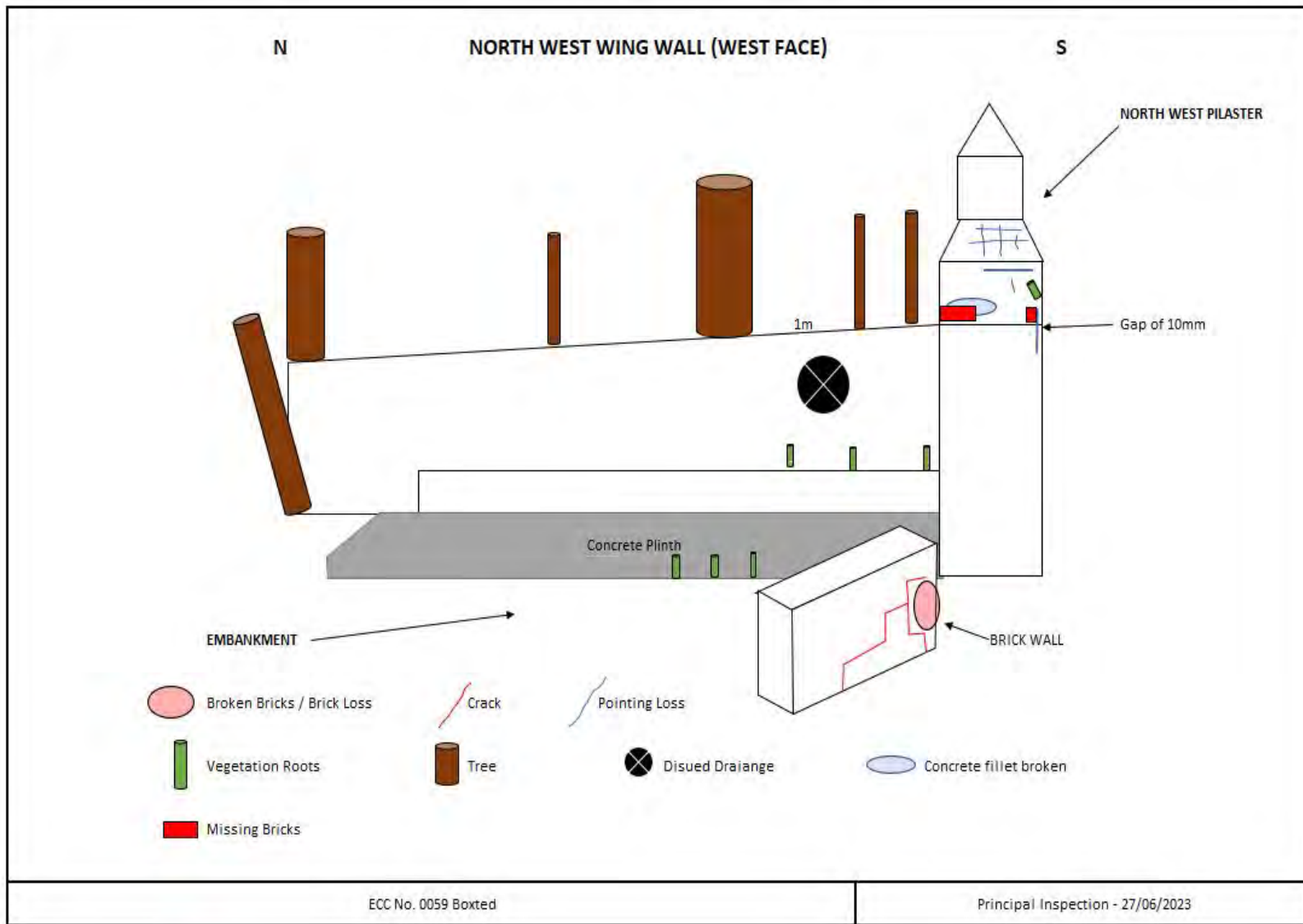
Drq 4 - External Edge Girders.JPG



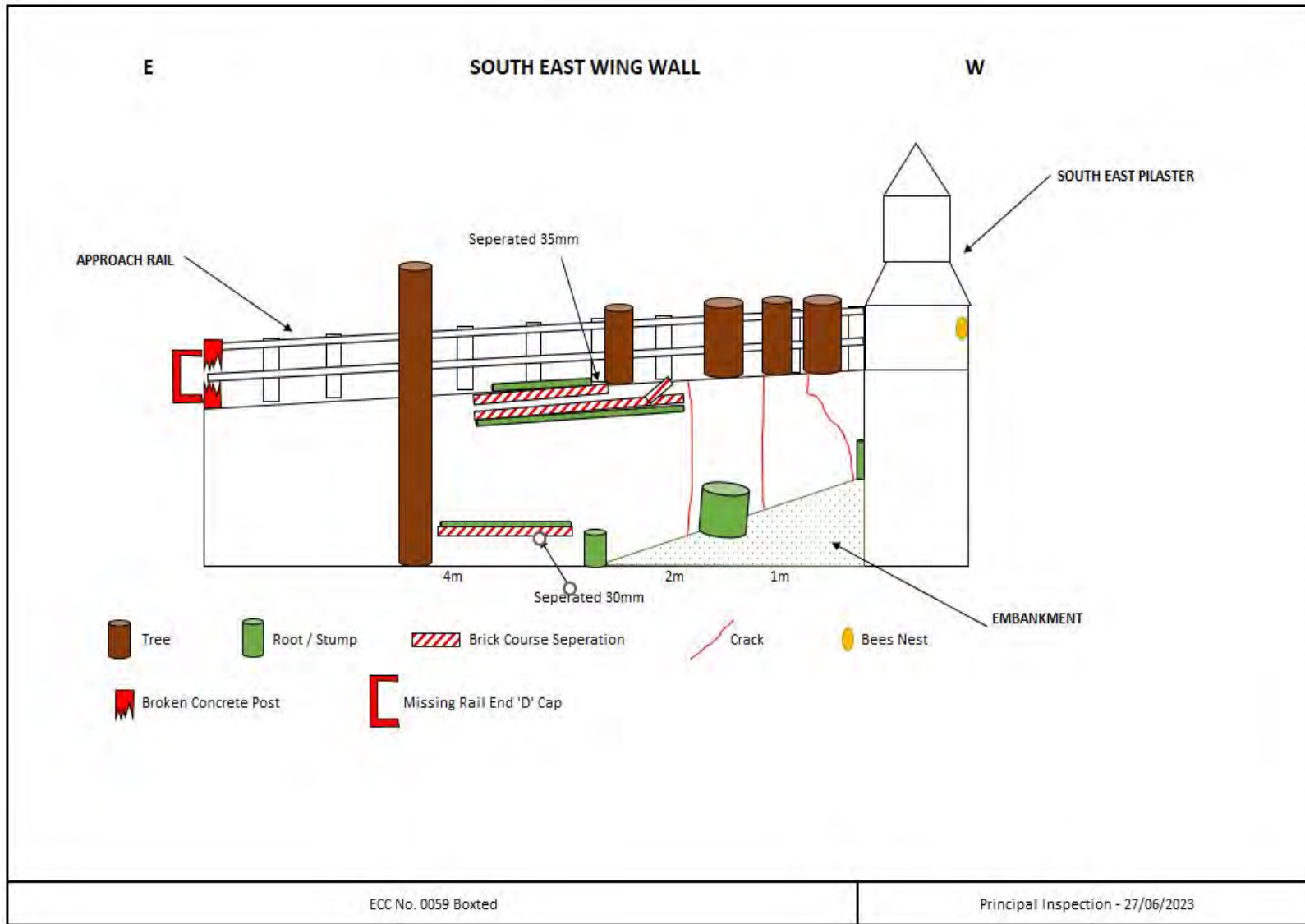
Drq 5 - South West Wing Wall.JPG



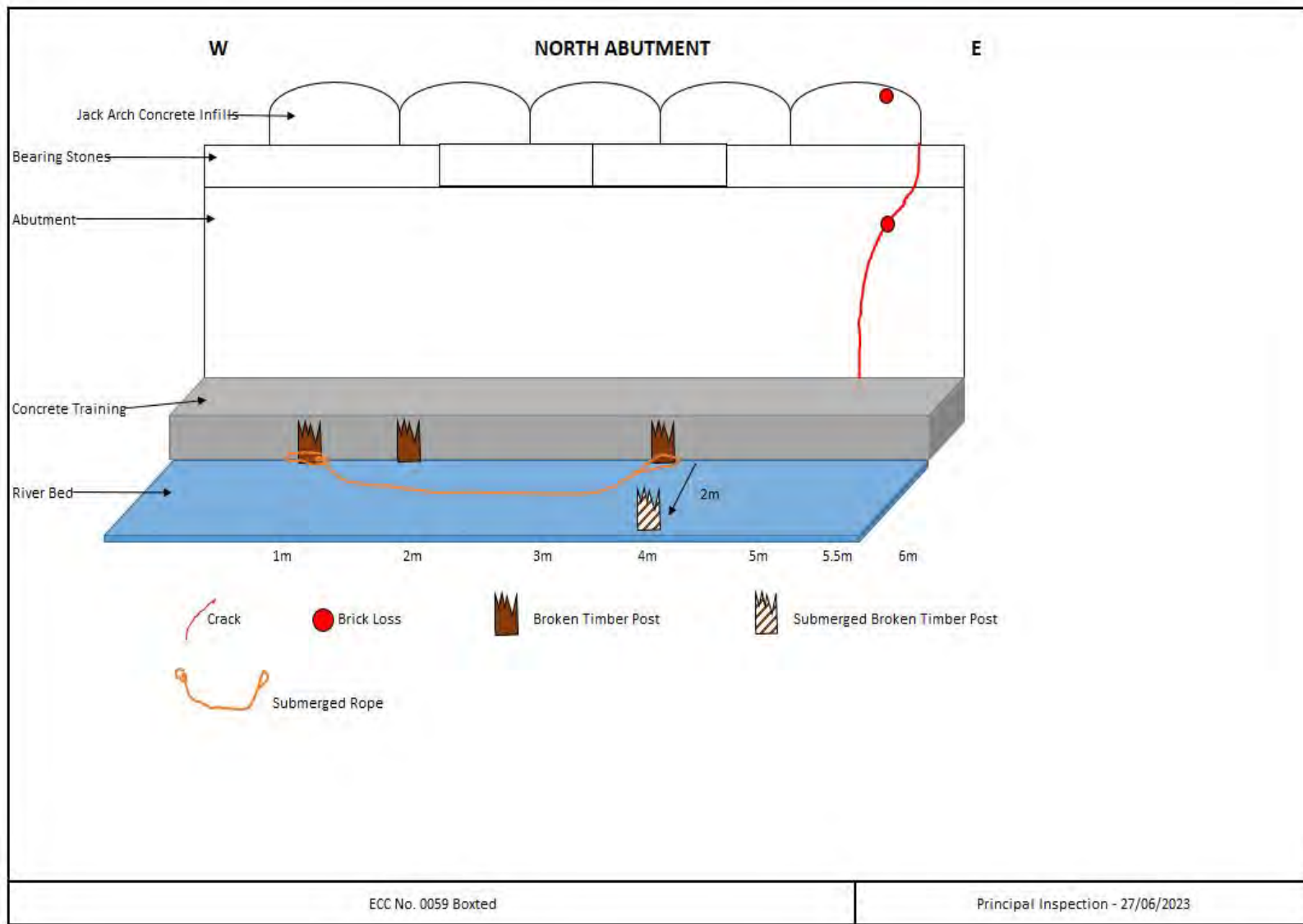
Drq 6 - North East Wing Wall and Pilaster.JPG



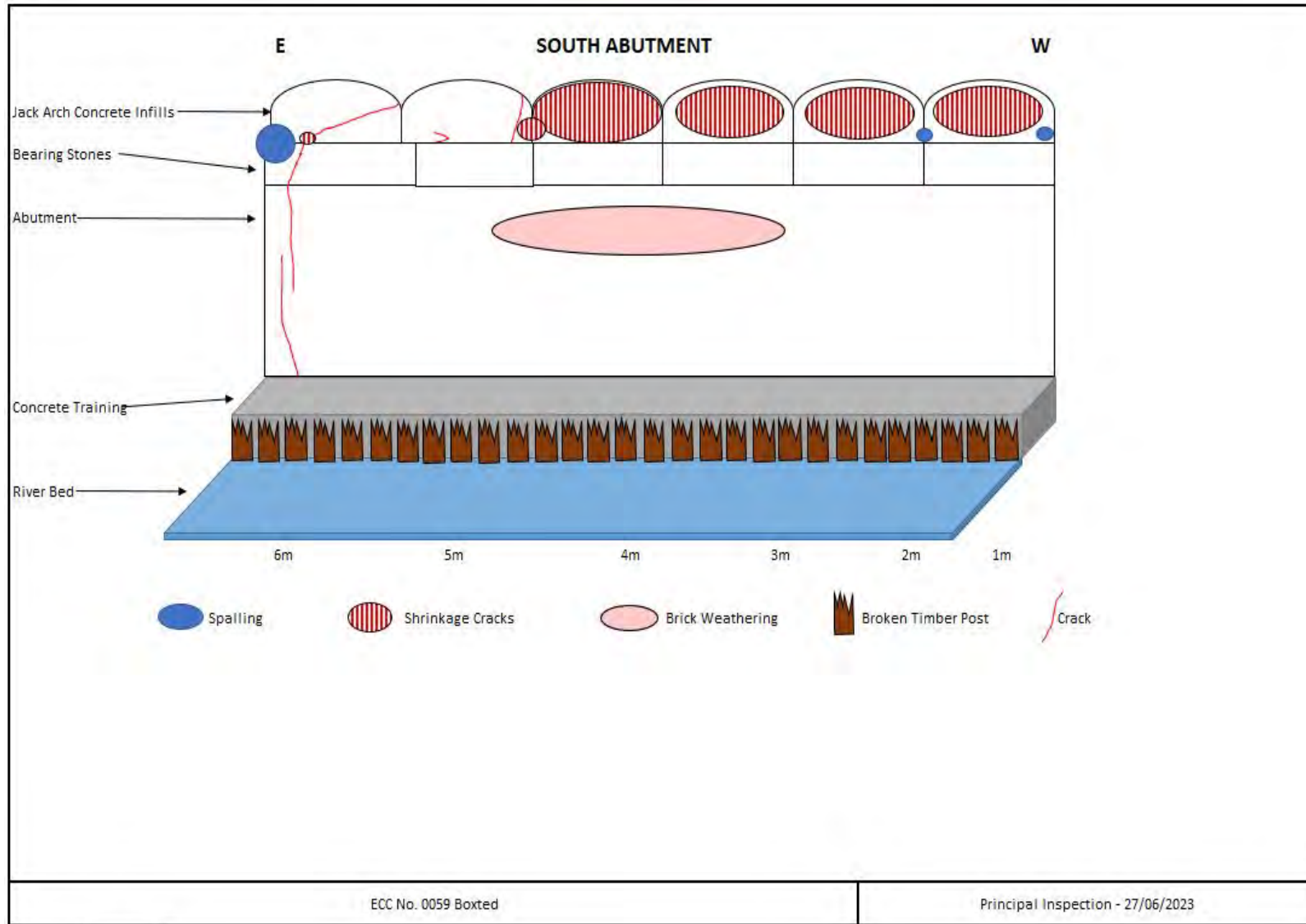
Drq 7 - North West Wing Wall and Pilaster.JPG



Drq 8 - South East Wing Wall and Pilaster.JPG



Drq 9 - North Abutment.JPG



Drq 10 - South Abutment.JPG

General Arrangement Drawings

No General Arrangement Drawings added. Drawings must be added to the inspection's folder with Document type: General Arrangement Drawings.
Supported file types: .jpeg .png .bmp

Hazard Assessment Sheet

Assessment date: 27/06/2023

Assessed by: XXXXXXXXXX

Comments:

Access Information:

Parked van in Layby to the north east of structure (Wick Road). Accessed substructure via private garden on the south east embankment.

Hazards/Risks Applicable to this Structure

Parking of vehicle

Hazard Ref	Hazard Description	Hazard Exists?	Comments:
1	Causing obstruction to carriageway or pedestrians	<input type="checkbox"/>	
2	Parking on private property	<input type="checkbox"/>	
3	Getting stuck	<input type="checkbox"/>	
4	Obstructing access to properties or land	<input type="checkbox"/>	
5	No problems	<input checked="" type="checkbox"/>	Layby to the north east of structure (Wick Road)

Inspection of elements above structure

Hazard Ref	Hazard Description	Hazard Exists?	Comments:
6	Fast moving traffic	<input type="checkbox"/>	
7	Poor visibility	<input type="checkbox"/>	
8	Narrow road	<input checked="" type="checkbox"/>	
9	No refuges/verges	<input checked="" type="checkbox"/>	
10	No problems	<input type="checkbox"/>	

Access to sub-structure elements

Hazard Ref	Hazard Description	Hazard Exists?	Comments:
11	Steep/slippery embankments	<input checked="" type="checkbox"/>	
12	Dense vegetation	<input type="checkbox"/>	
13	Fencing	<input type="checkbox"/>	
14	Barbed wire	<input type="checkbox"/>	
15	Animals	<input type="checkbox"/>	
16	Security devices	<input type="checkbox"/>	
17	Private landowners	<input checked="" type="checkbox"/>	
18	High wing walls/unprotected	<input type="checkbox"/>	
19	No problems	<input type="checkbox"/>	

Inspection of sub-structure elements

Hazard Ref	Hazard Description	Hazard Exists?	Comments:
20	Structure has limited headroom	<input type="checkbox"/>	
21	Structure is poorly lit	<input type="checkbox"/>	
22	The structure is submerged	<input type="checkbox"/>	
23	Both ends are not visible	<input type="checkbox"/>	
24	Watercourse is deep/fast or polluted	<input type="checkbox"/>	
25	Invert is uneven/unstable or soft	<input type="checkbox"/>	
26	Invert is not visible	<input type="checkbox"/>	
27	Structure requires working from height	<input checked="" type="checkbox"/>	Requires pontoon and tower for touch inspection.
28	Structure requires confined space access	<input type="checkbox"/>	
29	Structure needs to be inspected using a boat	<input type="checkbox"/>	
30	No problems	<input type="checkbox"/>	

Bearing Inspection

Hazard Ref	Hazard Description	Hazard Exists?	Comments:
31	Elevated platform will be needed	<input type="checkbox"/>	
32	No problems	<input checked="" type="checkbox"/>	

Services

Hazard Ref	Hazard Description	Hazard Exists?	Comments:
33	Overhead services	<input type="checkbox"/>	
34	Buried services i.e. apparatus/covers/chambers	<input type="checkbox"/>	

Environment Awareness Sheet

Survey date: 27/06/2023

Name of inspector: [REDACTED]

General details of structure

Location Rural Urban
Structure Spans: Water Carriageway Railway

Asbestos Management

Asbestos exists?:

Date of asbestos report:

Comments:

Last updated by:

Last updated:

Inspection of structure surroundings

Water Quality: Good Medium Poor

Are there any green plants growing submerged in the water?

Are there any plants extending out of the water?

Is gravel visible on the invert of the riverbed of the structure?

Bird nests: **Bird droppings:**

In surrounding vegetation In surrounding vegetation

On the structure On the structure

Holes in the ground: **Bank side vegetation:**

Short grass

Large > 250mm Long grass

Medium 100 - 250mm Brambles & Scrub

Small < 100mm Trees

Animal tracks?

Additional comments:

Animal droppings?

Additional comments:

Degree of traffic disturbance: **Accessibility to humans:**

Light Open

Medium Moderate

Heavy Difficult

Inspection of structure

Structural features: Voids: Large cracks Ledges:

Bats visible Newts

Bat droppings Lizards/Snakes

Oily stains around cracks Bird Boxes

Scratch Marks

Other signs of animal occupation: Bees nest in south east pilaster (on north east corner).

Additional Comments: