PRINCIPAL INSPECTION

Lydbrook Rail Bridge B976

NATIONAL GRID REFERENCE/ NEAREST POST CODE

SO 58716 17673 / HR9 6JJ

DATE OF INSPECTION

21st – 24th March 2016

JOB NUMBER

2318

REPORT REVISION RECORD

REVISION	DATE	ORIGINATOR	CHECKED	APPROVED	STATUS
0	01/04/16	S Adams	Kimble West BEng CEng MICE	M Musgrave	Final

Prepared for:

Amey OW Limited
International Design Hub
5th Floor, Colmore Plaza
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Birmingham
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Prepared by:

XEIAD
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Devonshire Gate
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CONTENTS

ANNEXES

1 INTRODUCTION

XEIAD has been contracted by Amey to carry out an emergency Principal Inspection of Lydbrook Rail Bridge which carries a disused rail line over the River Wye near Lydbrook.

This report covers the visual and tactile inspection of the visible areas of the structure. The inspections were carried out using rope access.

XEIAD has provided personnel and equipment in accordance with the company's operating procedures incorporating relevant health and safety legislation.

Loose handrailing hanging over the north bank footpath was removed during the inspection for safety reasons. Also the build-up of tree debris on the upstream face of the northern main pier was removed.

Factors relevant to the inspection of this structure are as follows:

Access criteria	– Ropes access as outlined in supplied method statement,
Weather	– Fair
Working hours	– Day time working hours
River Flow	– Moderate
Underwater visibility	– Poor
Sounding technique	– N/A
Inspection tools	– Rules/tapes, distometer, camera, masonry hammer
Other	– N/A
Complete inspection	– Yes

Parts of the structure not inspected within the agreed area of the structure:

- Elements below water level including foundations
- Hidden internal elements

ELEVATION OF STRUCTURE

2 Structure Details

Lydbrook Rail Bridge			
Structure No.	**B976**	HA ST Key: Unknown	
National Grid Ref.	SO 58716 17673	MA Structure Ref: Unknown	
County/Borough	**Gloucestershire**		
Maintaining Region	**Unkown**		
Structure Agent	**Unkown**	Date of Last Principal Inspection:	**March 2011**
Structure Owner	**GCC**		
Assigned Road	**Unknown**		

Structure Susceptible to Scour?	**Yes**
Structure on High Load Route?	**No**
Structure on Heavy Load Route?	**No**
Structure Ancient Monument?	**Unknown**

Year Structure Commissioned	**1875**
Design Office	**Unknown**
Design Load	**Unknown**
Special loading/restriction	**Unknown**

Superstructure Construction Details

Deck	**Timber on Cross Girders**
Material	**Timber and Wrought Iron**

Substructure Construction Details

End Supports	**Bonded Masonry**
Nature of Foundations	**Unknown**

Access route:

Head East on the A4136 from Monmouth. After 6 miles turn left onto Grove Rd. signposted English Bicknor. After 4 miles turn left onto track signposted Lydbrook Football Club. Follow track along river bank to structure.

Nearest Postcode: HR9 6JJ

3 GENERAL DESCRIPTION

Lydbrook Rail Bridge is an 8 span riveted plate girder structure comprising 7 piers supporting 2 main girders with transverse bracing. The main girders support transverse beams upon which the now disused main longitudinal track bearing timbers are supported.

The main girders for the longer central span have a corresponding deeper web than those on the other spans but are constructed in the same manner.

On the downside/downstream side of the bridge timber planks are placed longitudinally onto the top flange of the transverse beams to form a walkway.

The main span is supported on caissons and the other spans are supported on smaller circular piers, two at each support position. At either end there are bonded masonry abutments and wing walls.

Handrails with iron uprights and steel tubing are fixed to the Upside and Downside edges of the structure. A timber handrail is fixed to the downside timber baulk to mark the edge of the walkway.

4 INSPECTION NOTES

Deck Elements

4.1 Primary Deck Element

The main beams are formed from riveted plates. They are in a generally fair condition apart from the bottom flanges that are in fair/poor condition.

Corrosion and rust jacking is present between plates along the bottom flange (Photo 5) and in uprights at stiffener plates (Photo 6). This will be placing the rivets under increased axial stresses and could lead to them failing.

Minor areas of loss of section were noted in the gusset stiffeners (Photo 7).

Slight distortion was noted at the majority of joins along with missing rivets at these locations (Photo 8). Top flanges appear distorted upwards by up to 30mm.

An offset of 250mm was noted within the upside pier 4 caisson where the MGE girders meet. This is thought to be a construction feature rather than a defect. (Photo 9)

Impact damage was noted to the downside beam at the low mileage end above the vehicle track (Photo 10).

As mentioned in the previous report (2011) every 8th rivet is missing in the top flanges possibly to aid drainage.

4.2 Secondary Deck Element - Transverse Beams

The transverse beams (riveted plate girders) are in generally poor condition due to the condition of the top flanges.

Loss of section was noted throughout the top flanges with an estimated 35% loss to over half of the beams (Photo 11). The worst affected areas are below the walkway timbers. In places the timber decking is supported directly on the web of the beams. This is particularly bad where the path steps out over the caissons (Photo 12).

The timbers are fixed with clamps; in some areas due to corrosion these clamps are ineffectual (Photo 13).

The top flanges also show severe lamination and knife edging throughout the structure (Photo 14).

The final girder at the high mileage end show specific loss of section to the web measuring 80mm L x 40mm W (Photo 15).

Any areas of paint loss show corrosion and pitting up to 2mm depth.

4.3 Secondary Deck Elements

The longitudinal beams (constructed from rolled steel) which support the timber baulks are in fair condition (Photo 16). There are some isolated areas of loss of section to the top flanges where packing pieces between the beam and timber baulk used to be (Photo 17). Some of the connections to the transverse beams are badly corroded (Photo 18).

The timber baulks are in a poor condition (Photo 19). They are rotten throughout to a max depth of 250mm with loss of section to half depth to around 10% of both timbers (Photo 20) making them structurally irrelevant. There is also a large split to the upside timber above pier 6 (Photo 21); numerous small splits were found throughout both timbers. Vegetation is growing from the timbers throughout; some of this was removed at the time of inspection (Photo 22). There are also transverse steel tie bars (Photo 23) and transverse timbers (Photo 24) running between the two timber baulks. The tie bars are corroded throughout up to 3mm deep. There are 5no missing cross timbers and 4no of displaced timbers (Photo 25). The remaining timbers are in poor condition.

The timber walkway planks are in poor condition (Photo 26). There are several areas of plywood repairs (Photo 27) that cover collapsed timbers beneath (Photo 28). There are 4no missing or removed planks due to being rotten and no longer secured to the top flange of the transverse beams (Photo 29 + 30). The worst affected areas are at the high and low mileage ends. **These missing planks should be repaired before the walkway is re-opened.**

4.4 Half Joints

N/A

4.5 Tie Beam/Rod

The tie beams pertaining to the main timbers are corroded and missing in places. As the timbers are no longer relevant to the structure the tie beams are not considered to be structurally relevant either.

4.6 Parapet Beam or Cantilever

N/A

4.7 Deck Bracing

N/A

Load-Bearing Substructure

4.8 Foundations

Not Examined

4.9 Abutments

Both abutments are constructed from bonded masonry with a blue brick top section.

Low Mileage (Photo 31)
Vertical step fracture adjacent upside main girder, 0.5m L, open 5mm max (Photo 32).
Vertical fracture through brick section below upside main girder, 0.2m L, open 4mm. The brickwork to the downside is displaced forward by 80mm (Photo 33).
Vertical fracture through brick section below downside main girder, 0.2m L, open 3mm (Photo 34).
Vertical step fracture located in downside return. 3m up from ground level, 1.2m L open up to 70mm max and runs to full depth (Photo 35).
Vertical fracture located in downside return, 800mm L open 1-5mm (Photo 36).
Ivy growth covered the majority of the wall. This was removed at the time of examination.

High Mileage (Photo 37)

Brick top section is loose to hammer at the downside end; effecting 5no units.
Vertical fracture in brick section, 1.2m from upside. 200mm L open 6mm (Photo 38).
Vertical fracture 3m from upside, 200mm L open 5mm (Photo 39)
Vertical fracture below downside main girder, 250mm L open 3mm (Photo 40)

4.10 Spandrel Wall / Head Wall
N/A

4.11 Pier / Column
The main span is supported by pier 4 and 5 each consisting of 2no caissons, each approximately 1.5m diameter (Photo 41). The top 1m to the base of the main girders are hollow. This is filled with debris and has saplings growing from within (Photo 42).
Both Pier 4 columns have fracturing with slight displacement to the decorative banding near the top to full depth on both the internal and external faces (Photo 43). The pier 5 upside column has hairline fracturing around the collar bolts (Photo 44).
Areas of the columns that have missing paint work show typical pitting corrosion.
Cross bracing between the columns on each pier was missing the lower downside beam (Photo 45). On the upside of pier 4 the top connector has a missing bolt and is very loose (Photo 46).

The remaining piers are in a fair condition. They consist of 4no columns each with a steel box sat between two columns and the main girders (Photo 47).
A fracture was noted through the pier 3 downside box open up to 2mm (Photo 48).
Lamination and corrosion was found to the majority of bracing connections (Photo 49).

4.12 Cross-Head / Capping Beam
N/A

4.13 Bearings
No bearings were visible if present.

4.14 Bearing Plinth / Shelf
As mentioned in section 4.9 there are fractures in the abutments below the main beams at both ends.
The bearing shelves are in good condition apart from amassing minor amounts of debris (Photo 50).

Durability Elements

4.15 Superstructure Drainage
N/A

4.16 Substructure Drainage
1no weep hole was located in the centre of the high mileage abutment. This was active at the time of examination (Photo 51).

4.17 Waterproofing
N/A

4.18 Movements / Expansion Joints
N/A

4.19 Painting: Deck Elements
The paint work has generally failed throughout the deck elements.

4.20 Painting: Substructure Elements
Paintwork to piers 4 and 5 is in poor condition with large areas of loss (Photo 52).
The paintwork to the remaining piers is in generally good condition apart from areas of lamination and corrosion around bracing connections.

4.21 Painting: Parapets Safety Fences
There is no paintwork left the handrails.

Safety Elements

4.22 Access / Walkways/ Gantries
N/A

4.23 Handrail / Parapets / Safety Fences
The upside handrail is in poor condition. The high mileage third was removed during the examination as it was collapsing over a footpath (Photo 53). The remaining section is suffering from severe corrosion and loss of section to the brackets that hold the uprights to the main girder (Photo 54). The support brackets from the LM end to pier 3 have collapsed and deformed causing the handrail to fall into the bridge (Photo 55).

The downside handrail show paint loss throughout allowing corrosion and pitting to 2mm depth (Photo 56). There is a small section of deformed galvanised mesh with a missing bracket above pier 4 (Photo 57).
Rust jacking is also present on some of the uprights, the worst affected is situated above pier 5 (Photo 58).
Adjacent to pier 6 a tree is growing around the handrail (Photo 59).
Secondary bracing has been put in place at every upright to stop the handrail collapsing in the same manner as the upside (Photo 60).

The walkway upside safety fence is constructed from timber and attached to the rotten downside timber baulk (Photo 61). The majority of the fence timbers are rotten throughout and splits are present around the lower fixing bolts (Photo 62).
There is a missing section above pier 6 (Photo 63).

The parapets at either end of the bridge are constructed from bonded masonry and were found to be in overall fair condition.
Low Mileage Downside Parapet
Diagonal step fracture 700mm form high mileage end, 1.2m L open 1-3mm (Photo 64).
Open joints totalling 0.7m², 60mm deep.

Low Mileage Upside Parapet
Diagonal step fracture at centre, 2.5m L open 10mm (Photo 65).
Re-pointing is loose and displaced throughout.

No defects were noted to the high mileage parapets

4.24 Carriageway Surfacing
N/A

4.25 Footway / ~~Verge / Footbridge~~ Surfacing
The timber walkway is covered in section 4.3.

Other Bridge Elements

4.26 Invert / River Bed
N/A

4.27 Aprons
N/A

4.28 Fenders / Cutwaters / Collision Protection
N/A

4.29 River Training Works
N/A

4.30 Revetment / Batter Paving
N/A

4.31 Wing Walls

Constructed from bonded masonry. All were found to be in an overall fair condition. At the low mileage end ivy was removed to enable the examination.
A diagonal step fracture was noted to the low mileage upside wall. Located 0.7m from downside end, 3.5m L open 10mm max. The fracture was re-pointed but has since re-fractured (Photo 66).
Diagonal fracture located below the coping on the low mileage upside wall, 1.5m L open 10mm max (Photo 67).

4.32 Retaining Walls

N/A

4.33 Embankments

N/A

4.34 Machinery

N/A

Ancillary Elements

4.35 Approach Rails / Barriers / Walls

N/A

4.36 Signs

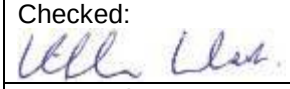
N/A

4.37 Lighting

N/A

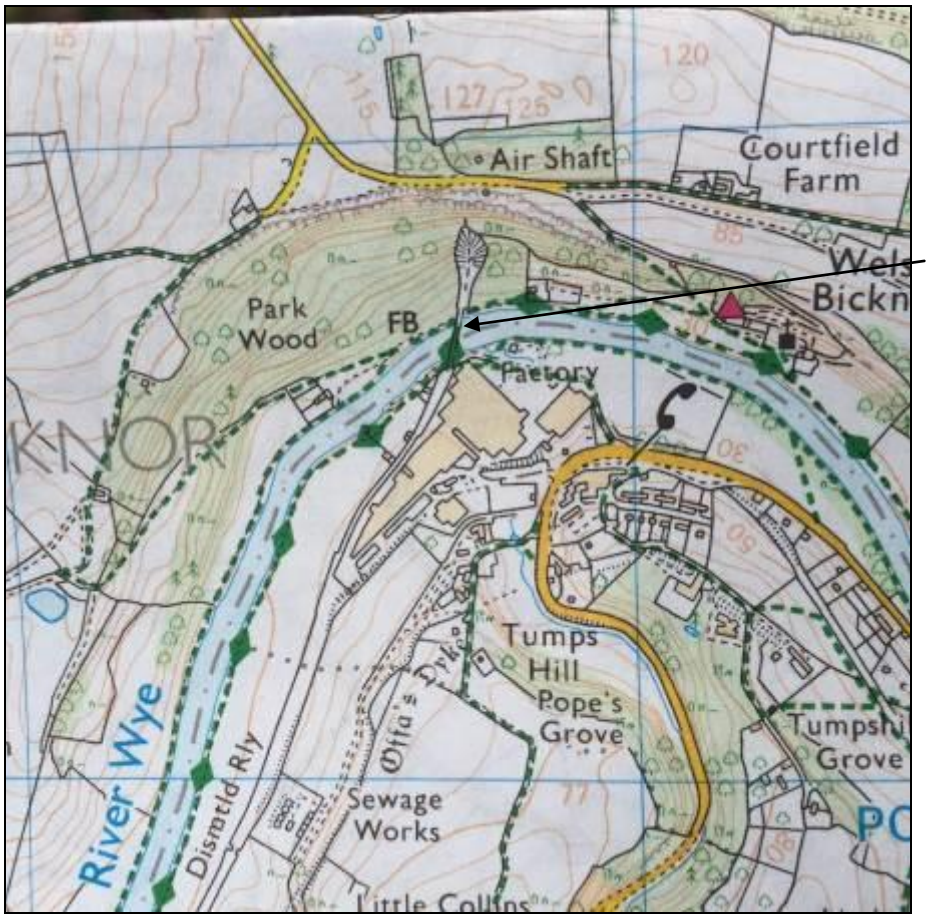
4.38 Services

N/A

TO BE SIGNED BY ENGINEER		
Inspected: 	Print Name: S. Adams J. Harvey	Date: 21-24/03/16
Prepared by: 	S. Adams	Date: 21/04/16
Checked: 	Kimble West BEng CEng MICE	Date: 22/04/2016
Approved: 	M. Musgrave BEng (Hons)	Date: 22/04/2016

ANNEX A

LOCATION PLANS



Site Location

Nearest post code: HR9 6JJ

LOCATION PLAN

AERIAL VIEW OF STRUCTURE

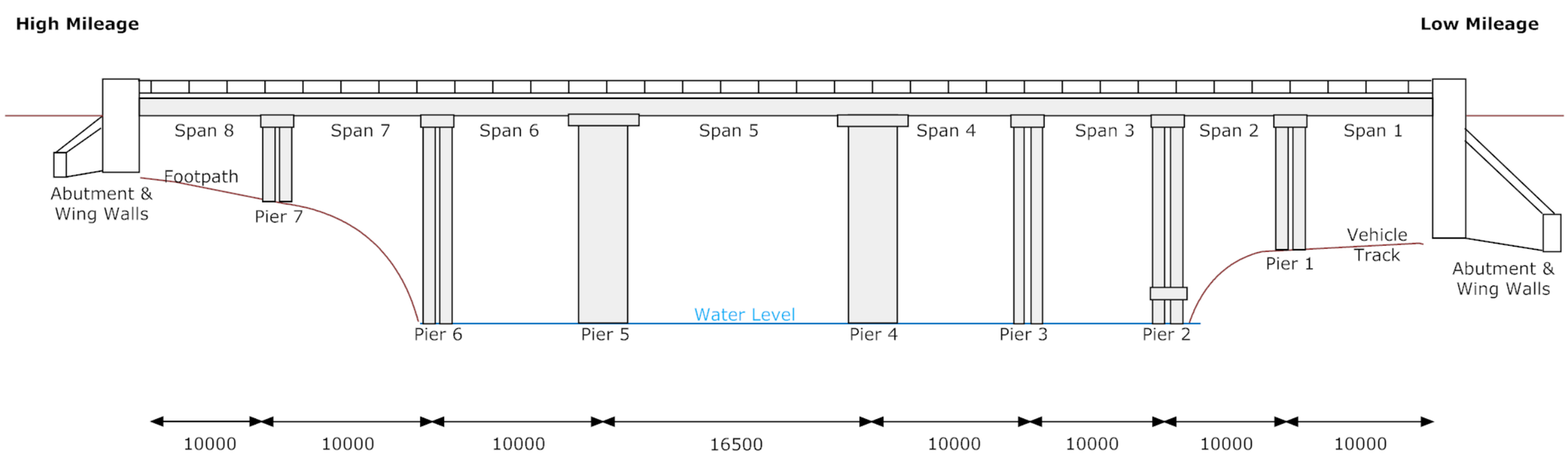
Lydbrook Rail Bridge

ANNEX B

SKETCHES

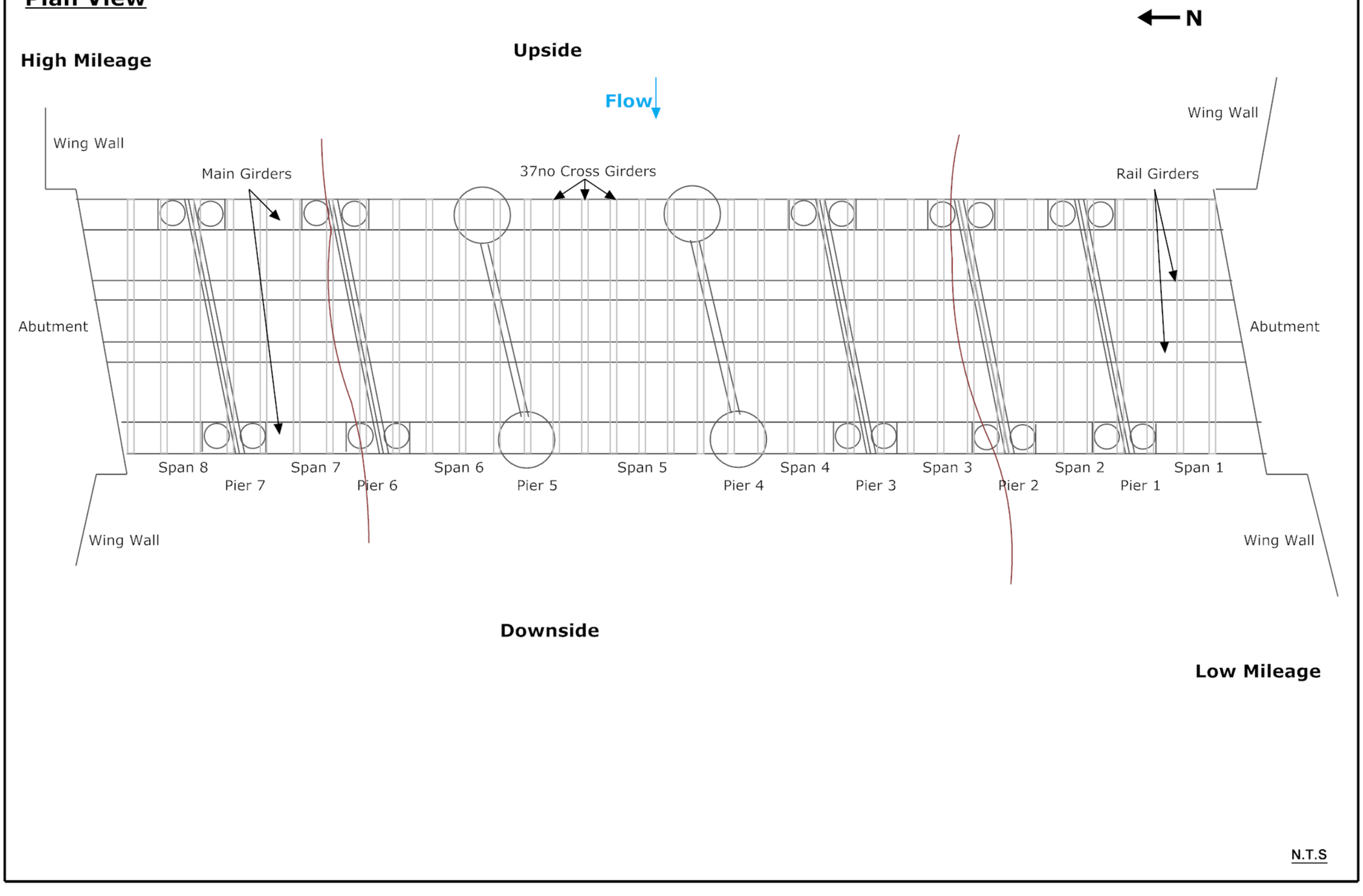
Sketch 1 – General Arrangement Elevation
Sketch 2 – General Arrangement Pla

Downside Elevation



N.T.S

Plan View



N.T.S

ANNEX C

PHOTOGRAPHS

Photo 1. View from downside.

Photo 2. View from upside.

Photo 3. View looking away to downside.

Photo 4. View looking away to upside.

Photo 5. View of rust jacking to MGE bottom flange

Photo 6. View of rust jacking to MGE upright stiffener plate

Photo 7. View of loss of section to gusset stiffener in MGE.

Photo 8. View of distortion and missing rivets, top flange, MGE joins.

Photo 9. View of offset between two main girders, Pier 4 Upside Caisson.

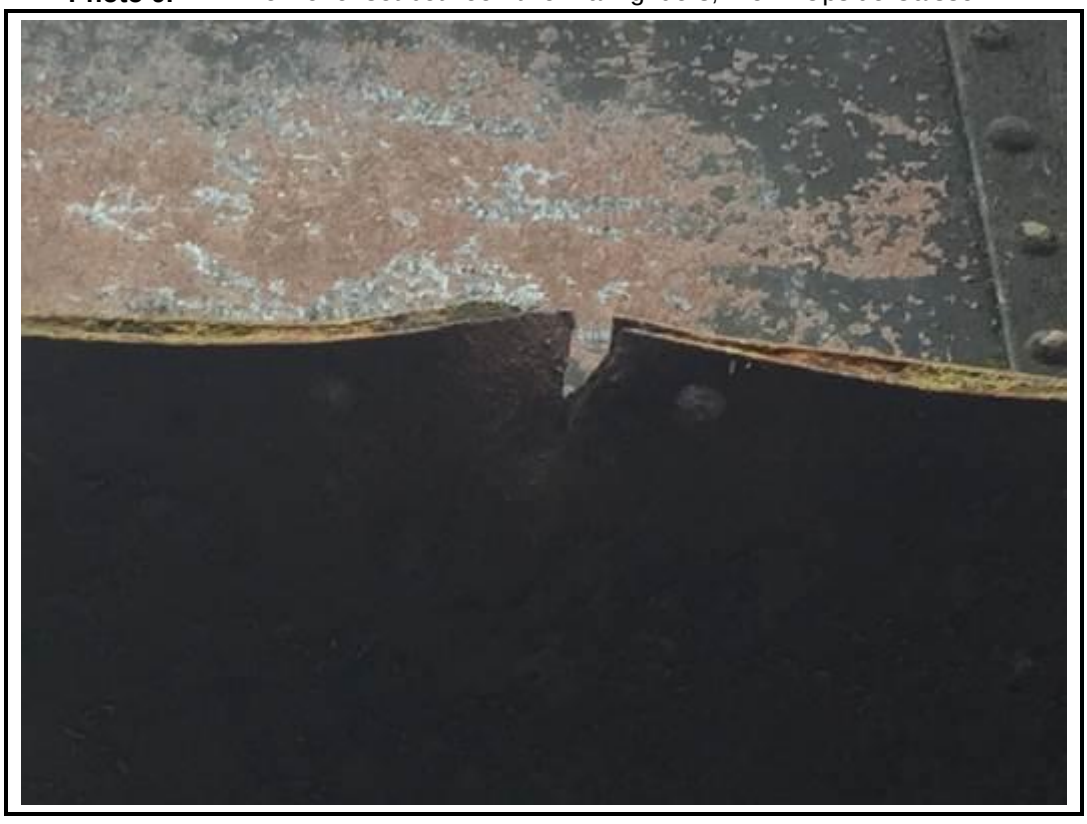


Photo 10. View of impact damage to downside beam, low mileage end.

Photo 11. View of general loss of section to transverse beams top flange.

Photo 12. View of loss of section to transverse beams below walkway.

Photo 13. View of ineffectual timber clamps beneath walkway.

Photo 14. View of lamination, loss and knife edging to top flange, transverse beams.

Photo 15. View of loss of section to web of transverse beam.

Photo 16. View of longitudinal support beam.

Photo 17. View of loss of section to top of longitudinal beams.

Photo 18. View of longitudinal beam corroded connection to transverse girder.

Photo 19. View of timber rail bearers.

Photo 20. View of loss of section and rotting to timber baulk.

Photo 21. View of splitting to timber baulk.

Photo 22. View of vegetation growth on timber baulks.

Photo 23. View of steel tie bar between timber baulks.

Photo 24. View of timber cross beams between timber baulks.

Photo 25. View of displaced cross timbers.

Photo 26. View of timber walkway planks.

Photo 27. View of plywood repairs to walkway.

Photo 28. View of collapsed walkway timber.

Photo 29. View of missing walkway timber at centre.

Photo 30. View of view of missing walkway timber at high mileage end.

Photo 31. View of Low Mileage abutment.

Photo 32. View of vertical step fracture to low mileage abutment.

Photo 33. View of vertical fracture and displacement to low mileage abutment.

Photo 34. View of vertical fracture to low mileage abutment.

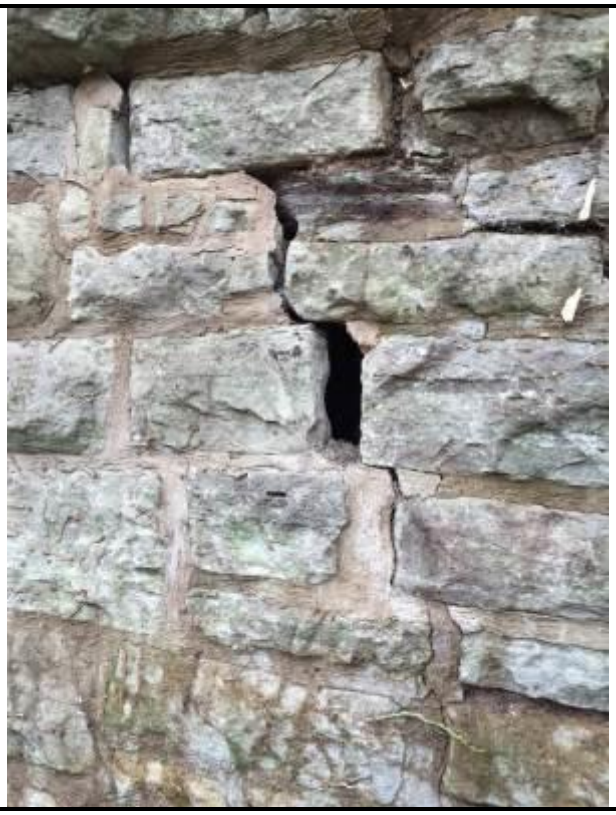


Photo 35. View of vertical step fracture to LM ABT downside return.

Photo 36. View of vertical fracture to LM ABT downside return

Photo 37. View of high mileage abutment.

Photo 38. View of vertical fracture to high mileage abutment.

Photo 39. View of vertical fracture to high mileage abutment.

Photo 40. View of vertical fracture to high mileage abutment.

Photo 41. View of main span pier construction.

Photo 42. View of typical vegetation growth within caissons.

Photo 43. View of fracturing to decorative banding on caissons.

Photo 44. View of fracturing to pier 5 caisson decorative banding.

Photo 45. View of cross bracing between piers with missing lower tie.

Photo 46. View of loose connector plate with missing bolt.

Photo 47. View of secondary pier construction.

Photo 48. View of fracture through pier 3 downside box.

Photo 49. View of typical condition of pier cross bracing connections.

Photo 50. View of typical condition of bearing shelves.

Photo 51. View of weep hole in high mileage abutment.

Photo 52. View of typical paint loss to piers 4 and 5.

Photo 53. View of removed section of upside handrail.

Photo 54. View of corrosion and LOS to base of handrail uprights.

Photo 55. View of collapsed upright brackets on US handrail.

Photo 56. View of corrosion and pitting to downside handrail.

Photo 57. View of deformed galvanised mesh to downside handrail.

Photo 58. View of rust jacking to downside handrail upright.

Photo 59. View of tree growth affecting downside handrail.

Photo 60. View of added bracing to downside handrail uprights.

Photo 61. View of upside walkway handrail.

Photo 62. View of typical splitting to base of timber handrail.

Photo 63. View of missing section to timber handrail.

Photo 64. View of fracture to low mileage downside parapet.

Photo 65. View of fracture to low mileage upside parapet.

Photo 66. View of fracture to low mileage upside wing wall.

Photo 67. View of fracture below coping, LM upside wing wall.

ANNEX F

BCI PRO FORMA

☐ ***SUPERFICIAL*** ☐ ***GENERAL*** ✔ ***PRINCIPAL*** ☐ ***SPECIAL BRIDGE INSPECTION*** Form of for this bridge

Bridge Name: Lydbrook Rail Bridge		Road Name: N/A	
Bridge Ref/No: B976	Road Ref/No: N/A	**Bridge Type Code:**	
Map Ref:	O.S. E 378176	O.S. N 217673	Primary deck element form: 04
Span 1 of 8	Span Width (m):	Span Length (m): 10	Primary deck element material: G
All above ground elements inspected: YES ✔ NO ☐		Photographs? YES ✔ NO ☐	Secondary deck element form: 36
Number of construction forms in bridge/span*: 1 ✔ 2 ☐ 3 ☐ more ☐ (*delete as appropriate)			Secondary deck element material: G

Set	No	Element Description	S	Ex	Def	W	P	Cost	Comments/Remarks
Deck Elements	1	Primary deck element (Table 2)	4	C	M	K	C		Bottom flange in poor condition due to rust jacking. Impact damage to downside beam.
	2	Secondary deck element/s: Transverse beams	5	D	1.1	K	C		Top flanges to transverse beam severely corroded
	3	Secondary deck element/s: Element from Table 3	5	C	16.2	K	B		Timber footway planks in poor condition.
	4	Half joints							
	5	Tie beam/rod							
	6	Parapet beam or cantilever							
	7	Deck bracing							
Load-bearing Substructure	8	Foundations	3	B	6.6	M	C		Settlement cracks in wing wall
	9	Abutments (incl. arch springing)	3	B	3.5	M	C		Fractures below main girders.
	10	Spandrel wall/head wall							
	11	Pier/column	2	B	1.1	Z	E		Pier 1 - good condition
	12	Cross-head/capping beam							
	13	Bearings							
	14	Bearing plinth/shelf	1	A	3.5	Z	E		
Durability Elements	15	Superstructure drainage							
	16	Substructure drainage							No weep-pipes in south abutment
	17	Waterproofing							
	18	Movement/expansion joints							
	19	Painting: deck elements	5	D	4.1	P	C		
	20	Painting: substructure elements	3	B	4.1	Z	E		Pier 1 paint – fair condition
	21	Painting: parapets/safety fences	5	E	4.1	X	D		
Safety Elements	22	Access/walkways/gantries							
	23	Handrail/parapets/safety fences	5	**E**	1.2	Z	B		Upside handrail collapsing
	24	Carriageway surfacing							
	25	Footway/verge/footbridge surfacing							
Other Bridge Elements	26	Invert/river bed							
	27	Aprons							
	28	Fenders/cutwaters/collision prot.							
	29	River training works							
	30	Revetment/batter paving							
	31	Wing walls	3	**B**	3.5	M	C		Cracking in wingwall
	32	Retaining walls							
	33	Embankments							
	34	Machinery							
Ancillary Elements	35	Approach rails/barriers/walls							
	36	Signs							
	37	Lighting							
	38	Services							
	39								
	40								

S – severity, **Ex** – extent, **Def** – defect, **W** – work required, **P** – work priority

Inspection Date: 21-24/03/16

Next Insp. (month/yr)

Multiple Defects										
Element No	**Defect 1**			**Defect 2**			**Defect 3**			**Comments**
	S	**Ex**	**Def**	**S**	**Ex**	**Def**	**S**	**Ex**	**Def**	
1	4	C	1.1	3	B	1.5				

Bridge Name: Lydbrook Rail Bridge			Road Name: N/A
Bridge Ref/No: B976	Road Ref/No: N/A		**Bridge Type Code:**
Map Ref:	O.S. E 378176	O.S. N 217673	Primary deck element form: 04
Span 2 of 8	Span Width (m):	Span Length (m): 10	Primary deck element material: G
All above ground elements inspected: YES ✔ NO ☐		Photographs? YES ✔ NO ☐	Secondary deck element form: 36
Number of construction forms in bridge/span*: 1 ✔ 2 ☐ 3 ☐ more ☐ (*delete as appropriate)			Secondary deck element material: G

Set	No	Element Description		S	Ex	Def	W	P	Cost	Comments/Remarks
Deck Elements	1	Primary deck element (Table 2)		4	C	1.1	K	C		Bottom flange in poor condition due to rust jacking. Impact damage to downside beam.
	2	Secondary deck element/s	Transverse beams	5	D	1.1	K	C		Top flanges to transverse beam severely corroded
	3		Element from Table 3	5	C	16.2	K	B		Timber footway planks in poor condition.
	4	Half joints								
	5	Tie beam/rod								
	6	Parapet beam or cantilever								
	7	Deck bracing								
Load-bearing Substructure	8	Foundations		1	A	6.1	Z	E		
	9	Abutments (incl. arch springing)								.
	10	Spandrel wall/head wall								
	11	Pier/column		2	B	1.1	Z	E		Pier 2 - good condition
	12	Cross-head/capping beam								
	13	Bearings								
	14	Bearing plinth/shelf								
Durability Elements	15	Superstructure drainage								
	16	Substructure drainage								
	17	Waterproofing								
	18	Movement/expansion joints								
	19	Painting: deck elements		5	D	4.1	P	C		
	20	Painting: substructure elements		3	B	4.1	Z	E		Pier 1 paint – fair condition
	21	Painting: parapets/safety fences		5	E	4.1	X	D		
Safety Elements	22	Access/walkways/gantries								
	23	Handrail/parapets/safety fences		5	**E**	1.2	Z	B		Upside handrail collapsing
	24	Carriageway surfacing								
	25	Footway/verge/footbridge surfacing								
Other Bridge Elements	26	Invert/river bed								
	27	Aprons								
	28	Fenders/cutwaters/collision prot.								
	29	River training works								
	30	Revetment/batter paving								
	31	Wing walls								
	32	Retaining walls								
	33	Embankments								
	34	Machinery								
Ancillary Elements	35	Approach rails/barriers/walls								
	36	Signs								
	37	Lighting								
	38	Services								
	39									
	40									

S – severity, **Ex** – extent, **Def** – defect, **W** – work required, **P** – work priority	Inspection Date: 21-24/03/16	Next Insp. (month/yr)

Bridge Name: Lydbrook Rail Bridge			Road Name: N/A
Bridge Ref/No: B976	Road Ref/No: N/A		**Bridge Type Code:**
Map Ref:	O.S. E 378176	O.S. N 217673	Primary deck element form: 04
Span 3 of 8	Span Width (m):	Span Length (m): 10	Primary deck element material: G
All above ground elements inspected: YES ✔ NO ☐		Photographs? YES ✔ NO ☐	Secondary deck element form: 36
Number of construction forms in bridge/span*: 1 ✔ 2 ☐ 3 ☐ more ☐ (*delete as appropriate)			Secondary deck element material: G

Set	No	Element Description		S	Ex	Def	W	P	Cost	Comments/Remarks
Deck Elements	1	Primary deck element (Table 2)		4	C	M	K	C		Bottom flange in poor condition due to rust jacking. Impact damage to downside beam.
	2	Secondary deck element/s	Transverse beams	5	D	1.1	K	C		Top flanges to transverse beam severely corroded
	3		Element from Table 3	5	C	16.2	K	B		Timber footway planks in poor condition.
	4	Half joints								
	5	Tie beam/rod								
	6	Parapet beam or cantilever								
	7	Deck bracing								
Load-bearing Substructure	8	Foundations		1	A	6.1	Z	E		
	9	Abutments (incl. arch springing)								.
	10	Spandrel wall/head wall								
	11	Pier/column		2	B	1.2	Z	E		Pier 3 - good condition
	12	Cross-head/capping beam								
	13	Bearings								
	14	Bearing plinth/shelf								
Durability Elements	15	Superstructure drainage								
	16	Substructure drainage								
	17	Waterproofing								
	18	Movement/expansion joints								
	19	Painting: deck elements		5	D	4.1	P	C		
	20	Painting: substructure elements		3	B	4.1	Z	E		
	21	Painting: parapets/safety fences		5	E	4.1	X	D		
Safety Elements	22	Access/walkways/gantries								
	23	Handrail/parapets/safety fences		5	**E**	1.2	Z	B		Upside handrail collapsing
	24	Carriageway surfacing								
	25	Footway/verge/footbridge surfacing								
Other Bridge Elements	26	Invert/river bed								
	27	Aprons								
	28	Fenders/cutwaters/collision prot.								
	29	River training works								
	30	Revetment/batter paving								
	31	Wing walls								
	32	Retaining walls								
	33	Embankments								
	34	Machinery								
Ancillary Elements	35	Approach rails/barriers/walls								
	36	Signs								
	37	Lighting								
	38	Services								
	39									
	40									

S – severity, **Ex** – extent, **Def** – defect, **W** – work required, **P** – work priority	Inspection Date: 21-24/03/16	Next Insp. (month/yr)

Bridge Name: Lydbrook Rail Bridge			Road Name: N/A
Bridge Ref/No: B976	Road Ref/No: N/A		**Bridge Type Code:**
Map Ref:	O.S. E 378176	O.S. N 217673	Primary deck element form: 04
Span 4 of 8	Span Width (m):	Span Length (m): 10	Primary deck element material: G
All above ground elements inspected: YES ✔ NO ☐		Photographs? YES ✔ NO ☐	Secondary deck element form: 36
Number of construction forms in bridge/span*: 1 ✔ 2 ☐ 3 ☐ more ☐ (*delete as appropriate)			Secondary deck element material: G

Set	No	Element Description		S	Ex	Def	W	P	Cost	Comments/Remarks
Deck Elements	1	Primary deck element (Table 2)		4	C	M	K	C		Bottom flange in poor condition due to rust jacking. Impact damage to downside beam.
	2	Secondary deck element/s	Transverse beams	5	D	1.1	K	C		Top flanges to transverse beam severely corroded
	3		Element from Table 3	4	C	M	K	B		Timber footway planks in poor condition.
	4	Half joints								
	5	Tie beam/rod								
	6	Parapet beam or cantilever								
	7	Deck bracing								
Load-bearing Substructure	8	Foundations		1	A	6.1	Z	E		
	9	Abutments (incl. arch springing)								.
	10	Spandrel wall/head wall								
	11	Pier/column		3	B	M	K	C		Pier 4 – Corrosion and fracturing to bands
	12	Cross-head/capping beam								
	13	Bearings								
	14	Bearing plinth/shelf								
Durability Elements	15	Superstructure drainage								
	16	Substructure drainage								
	17	Waterproofing								
	18	Movement/expansion joints								
	19	Painting: deck elements		5	D	4.1	P	C		
	20	Painting: substructure elements		5	C	4.1	Z	E		
	21	Painting: parapets/safety fences		5	E	4.1	X	D		
Safety Elements	22	Access/walkways/gantries								
	23	Handrail/parapets/safety fences		5	**E**	1.2	Z	B		Upside handrail collapsing
	24	Carriageway surfacing								
	25	Footway/verge/footbridge surfacing								
Other Bridge Elements	26	Invert/river bed								
	27	Aprons								
	28	Fenders/cutwaters/collision prot.								
	29	River training works								
	30	Revetment/batter paving								
	31	Wing walls								
	32	Retaining walls								
	33	Embankments								
	34	Machinery								
Ancillary Elements	35	Approach rails/barriers/walls								
	36	Signs								
	37	Lighting								
	38	Services								
	39									
	40									

S – severity, **Ex** – extent, **Def** – defect, **W** – work required, **P** – work priority	Inspection Date: 21-24/03/16	Next Insp. (month/yr)

Multiple Defects										
Element No	**Defect 1**			**Defect 2**			**Defect 3**			**Comments**
	S	**Ex**	**Def**	**S**	**Ex**	**Def**	**S**	**Ex**	**Def**	
11	3	C	1.2	4	B	1.1				
3	2	B	16.1	3	C	1.1				

Bridge Name: Lydbrook Rail Bridge			Road Name: N/A
Bridge Ref/No: B976	Road Ref/No: N/A		**Bridge Type Code:**
Map Ref:	O.S. E 378176	O.S. N 217673	Primary deck element form: 04
Span 5 of 8	Span Width (m):	Span Length (m): 10	Primary deck element material: G
All above ground elements inspected: YES ✔ NO ☐		Photographs? YES ✔ NO ☐	Secondary deck element form: 36
Number of construction forms in bridge/span*: 1 ✔ 2 ☐ 3 ☐ more ☐ (*delete as appropriate)			Secondary deck element material: G

Set	No	Element Description	S	Ex	Def	W	P	Cost	Comments/Remarks
Deck Elements	1	Primary deck element (Table 2)	2	C	1.1	X	D		Main beam appears in fair condition with some corrosion
	2	Secondary deck element/s: Transverse beams	5	D	1.1	K	C		Top flanges to transverse beam severely corroded
	3	Secondary deck element/s: Element from Table 3	5	C	M	Z	B		Timber footway planks in poor condition.
	4	Half joints							
	5	Tie beam/rod							
	6	Parapet beam or cantilever							
	7	Deck bracing							
Load-bearing Substructure	8	Foundations	1	A	6.1	Z	E		
	9	Abutments (incl. arch springing)							.
	10	Spandrel wall/head wall							
	11	Pier/column	4	B	M	K	C		Pier 5 – Pitting and lamination. Cracks in banding around top
	12	Cross-head/capping beam							
	13	Bearings							
	14	Bearing plinth/shelf							
Durability Elements	15	Superstructure drainage							
	16	Substructure drainage							
	17	Waterproofing							
	18	Movement/expansion joints							
	19	Painting: deck elements	5	D	4.1	P	C		
	20	Painting: substructure elements	5	C	4.1	Z	E		
	21	Painting: parapets/safety fences	5	E	4.1	X	D		
Safety Elements	22	Access/walkways/gantries							
	23	Handrail/parapets/safety fences	5	**E**	1.2	Z	B		Upside handrail collapsing
	24	Carriageway surfacing							
	25	Footway/verge/footbridge surfacing							
Other Bridge Elements	26	Invert/river bed							
	27	Aprons							
	28	Fenders/cutwaters/collision prot.							
	29	River training works							
	30	Revetment/batter paving							
	31	Wing walls							
	32	Retaining walls							
	33	Embankments							
	34	Machinery							
Ancillary Elements	35	Approach rails/barriers/walls							
	36	Signs							
	37	Lighting							
	38	Services							
	39								
	40								

S – severity, **Ex** – extent, **Def** – defect, **W** – work required, **P** – work priority	Inspection Date: 21-24/03/16	Next Insp. (month/yr)

Multiple Defects										
Element No	**Defect 1**			**Defect 2**			**Defect 3**			**Comments**
	S	**Ex**	**Def**	**S**	**Ex**	**Def**	**S**	**Ex**	**Def**	
11	4	C	1.2	4	B	1.1				
3	5	B	16.1	3	C	1.1				

Bridge Name: Lydbrook Rail Bridge			Road Name: N/A			**Bridge Type Code:**	
Bridge Ref/No: B976		Road Ref/No: N/A				Primary deck element form	04
Map Ref:	O.S. E 378176		O.S. N 217673			Primary deck element material	G
Span 6 of 8	Span Width (m):		Span Length (m): 10			Secondary deck element form	36
All above ground elements inspected: YES ✔ NO ☐			Photographs? YES ✔ NO ☐			Secondary deck element material	G
Number of construction forms in bridge/span*: 1 ✔ 2 ☐ 3 ☐ more ☐ (*delete as appropriate)							

Set	No	Element Description		S	Ex	Def	W	P	Cost	Comments/Remarks
Deck Elements	1	Primary deck element (Table 2)		4	C	1.1	K	C		Bottom flange poor due to rust jacking
	2	Secondary deck element/s	Transverse beams	5	D	1.1	K	C		Top flanges to transverse beam severely corroded
	3		Element from Table 3	5	C	16.1	Z	B		Timber footway planks in poor condition.
	4	Half joints								
	5	Tie beam/rod								
	6	Parapet beam or cantilever								
	7	Deck bracing								
Load-bearing Substructure	8	Foundations		1	A	6.1	Z	E		
	9	Abutments (incl. arch springing)								.
	10	Spandrel wall/head wall								
	11	Pier/column		2	B	1.2	K	C		Pier 6 – Surface corrosion only
	12	Cross-head/capping beam								
	13	Bearings								
	14	Bearing plinth/shelf								
Durability Elements	15	Superstructure drainage								
	16	Substructure drainage								
	17	Waterproofing								
	18	Movement/expansion joints								
	19	Painting: deck elements		5	D	4.1	P	C		
	20	Painting: substructure elements		5	B	4.1	Z	E		
	21	Painting: parapets/safety fences		5	E	4.1	X	D		
Safety Elements	22	Access/walkways/gantries								
	23	Handrail/parapets/safety fences		5	**E**	1.2	Z	B		Upside handrail collapsing
	24	Carriageway surfacing								
	25	Footway/verge/footbridge surfacing								
Other Bridge Elements	26	Invert/river bed								
	27	Aprons								
	28	Fenders/cutwaters/collision prot.								
	29	River training works								
	30	Revetment/batter paving								
	31	Wing walls								
	32	Retaining walls								
	33	Embankments								
	34	Machinery								
Ancillary Elements	35	Approach rails/barriers/walls								
	36	Signs								
	37	Lighting								
	38	Services								
	39									
	40									

S – severity, **Ex** – extent, **Def** – defect, **W** – work required, **P** – work priority	Inspection Date: 21-24/03/16	Next Insp. (month/yr)

Bridge Name: Lydbrook Rail Bridge			Road Name: N/A
Bridge Ref/No: B976	Road Ref/No: N/A		**Bridge Type Code:**
Map Ref:	O.S. E 378176	O.S. N 217673	Primary deck element form: 04
Span 7 of 8	Span Width (m):	Span Length (m): 10	Primary deck element material: G
All above ground elements inspected: YES ✔ NO ☐		Photographs? YES ✔ NO ☐	Secondary deck element form: 36
Number of construction forms in bridge/span*: 1 ✔ 2 ☐ 3 ☐ more ☐ (*delete as appropriate)			Secondary deck element material: G

Set	No	Element Description		S	Ex	Def	W	P	Cost	Comments/Remarks
Deck Elements	1	Primary deck element (Table 2)		4	C	1.1	K	C		Bottom flange poor due to rust jacking
	2	Secondary deck element/s	Transverse beams	5	D	1.1	K	C		Top flanges to transverse beam severely corroded
	3		Element from Table 3	5	B	16.1	Z	B		Timber footway planks in poor condition.
	4	Half joints								
	5	Tie beam/rod								
	6	Parapet beam or cantilever								
	7	Deck bracing								
Load-bearing Substructure	8	Foundations		1	A	6.1	Z	E		
	9	Abutments (incl. arch springing)								.
	10	Spandrel wall/head wall								
	11	Pier/column		2	B	1.2	X	D		Pier 7 – Good condition
	12	Cross-head/capping beam								
	13	Bearings								
	14	Bearing plinth/shelf								
Durability Elements	15	Superstructure drainage								
	16	Substructure drainage								
	17	Waterproofing								
	18	Movement/expansion joints								
	19	Painting: deck elements		5	D	4.1	P	C		
	20	Painting: substructure elements		5	B	4.1	Z	E		
	21	Painting: parapets/safety fences		5	E	4.1	X	D		
Safety Elements	22	Access/walkways/gantries								
	23	Handrail/parapets/safety fences		5	**E**	1.2	Z	B		Upside handrail collapsing
	24	Carriageway surfacing								
	25	Footway/verge/footbridge surfacing								
Other Bridge Elements	26	Invert/river bed								
	27	Aprons								
	28	Fenders/cutwaters/collision prot.								
	29	River training works								
	30	Revetment/batter paving								
	31	Wing walls								
	32	Retaining walls								
	33	Embankments								
	34	Machinery								
Ancillary Elements	35	Approach rails/barriers/walls								
	36	Signs								
	37	Lighting								
	38	Services								
	39									
	40									

S – severity, **Ex** – extent, **Def** – defect, **W** – work required, **P** – work priority	Inspection Date: 21-24/03/16	Next Insp. (month/yr)

Bridge Name: Lydbrook Rail Bridge			Road Name: N/A
Bridge Ref/No: B976	Road Ref/No: N/A		**Bridge Type Code:**
Map Ref:	O.S. E 378176	O.S. N 217673	Primary deck element form: 04
Span 7 of 8	Span Width (m):	Span Length (m): 10	Primary deck element material: G
All above ground elements inspected: YES ✔ NO ☐		Photographs? YES ✔ NO ☐	Secondary deck element form: 36
Number of construction forms in bridge/span*: 1 ✔ 2 ☐ 3 ☐ more ☐ (*delete as appropriate)			Secondary deck element material: G

Set	No	Element Description	S	Ex	Def	W	P	Cost	Comments/Remarks
Deck Elements	1	Primary deck element (Table 2)	4	C	1.1	K	C		Bottom flange poor due to rust jacking
	2	Secondary deck element/s: Transverse beams	5	D	1.1	K	C		Top flanges to transverse beam severely corroded
	3	Secondary deck element/s: Element from Table 3	5	B	16.1	Z	B		Timber footway planks in poor condition.
	4	Half joints							
	5	Tie beam/rod							
	6	Parapet beam or cantilever							
	7	Deck bracing							
Load-bearing Substructure	8	Foundations	1	A	6.1	Z	E		
	9	Abutments (incl. arch springing)	3	B	3.5	M	C		Fractures below main girders.
	10	Spandrel wall/head wall							
	11	Pier/column							
	12	Cross-head/capping beam							
	13	Bearings							
	14	Bearing plinth/shelf	1	A	3.5	Z	E		
Durability Elements	15	Superstructure drainage							
	16	Substructure drainage	2	**D**	8.1	X	D		Weep pipe is flowing
	17	Waterproofing							
	18	Movement/expansion joints							
	19	Painting: deck elements	5	D	4.1	P	C		
	20	Painting: substructure elements							
	21	Painting: parapets/safety fences	5	E	4.1	X	D		
Safety Elements	22	Access/walkways/gantries							
	23	Handrail/parapets/safety fences	5	**E**	1.2	Z	B		Upside handrail collapsing
	24	Carriageway surfacing							
	25	Footway/verge/footbridge surfacing							
Other Bridge Elements	26	Invert/river bed							
	27	Aprons							
	28	Fenders/cutwaters/collision prot.							
	29	River training works							
	30	Revetment/batter paving							
	31	Wing walls	1	**A**	3.2	Z	E		
	32	Retaining walls							
	33	Embankments							
	34	Machinery							
Ancillary Elements	35	Approach rails/barriers/walls							
	36	Signs							
	37	Lighting							
	38	Services							
	39								
	40								

S – severity, **Ex** – extent, **Def** – defect, **W** – work required, **P** – work priority	Inspection Date: 21-24/03/16	Next Insp. (month/yr)

	Inspectors Comments
	The bridge is in an overall fair/poor condition with the superstructure being poor overall. Rust jacking on main girders and the ongoing condition of the transverse beams should be monitored.
	Significant loss of section on transverse beams top flanges is present. This has left areas where the timber beams are not adequately supported.
	The walkway timbers are rotten and have fallen through in several places posing a significant safety risk.

Name: Simon Adams **Signed:**  **Date: 21/04/2016**

	Engineer's Comments
	The walkway should be repaired and made safe as soon as possible as it is an amenity for both local inhabitants as well as tourists and enables good access to the footpaths on both sides of the river.
	It would be advisable to carry out targeted repairs to the worst cross girders in order to maximise the benefit of the walkway in terms of ongoing maintenance.
	The substructure is in relatively fair condition given the reduced loading currently experienced in comparison to the original loading requirement.
	A diving examination is advised in order to assess the existence of any scour underwater.

Name: Kimble West BEng CEng MICE **Signed:**  **Date 22/04/2016**

Ref. No	Suggested Remedial Work	Priority	Estimated Cost	Action/Work Ordered
	(Loose handrailing overhanging the footpath was removed during the examination)			

Date Work Processed _____/_____/20_____

Name_____ **Signed** _____

PRINCIPAL INSPECTION

Lydbrook Rail Bridge B976

NATIONAL GRID REFERENCE/ NEAREST POST CODE

SO 58716 17673 / HR9 6JJ

DATE OF INSPECTION

22ND March 2016

JOB NUMBER

2318

REPORT REVISION RECORD

REVISION	DATE	ORIGINATOR	CHECKED	APPROVED	STATUS
0	01/04/16	S Adams	Kimble West BEng CEng MICE	M Musgrave	Draft

Prepared for:

Amey OW Limited
International Design Hub
5th Floor, Colmore Plaza
20 Colmore Circus
Birmingham
West Midlands
B4 6AT

Prepared by:

XEIAD
Swallow Court
Devonshire Gate
Tiverton
Devon
EX16 7EJ

CONTENTS

ANNEXES

1. INTRODUCTION

Following instructions from Amey, XEIAD have undertaken an Underwater Inspection of Lydbrook Rail Bridge.

XEIAD have provided personnel and equipment in accordance with the Companies operating procedures incorporating relevant health and safety legislation to obtain safe for diving (Diving at work Regulations 1997)

The primary aims of the inspection are as follows;

- identify structural form and construction materials
- identify and record previous repair and protection works
- report on structure condition and identify deterioration, damage and distress
- provide conclusions based on the inspection findings and recommend action(s).

Factors relevant to the inspection of this structure are as follows;

Access criteria – Surface Supply Diving
Weather – Fair
River flow – Moderate / Fast
Underwater visibility – 0m
Complete inspection – Partial
Parts of structure not inspected – any parts at 2m above water level and over
Inspection tools – rules/tapes, camera, masonry hammer
Sounding technique – Ranging Rod, sounder
Misc. -

2. INSPECTION

2.1. General details

XEIAD has been requested to undertake an Underwater Inspection of Lydbrook Rail Bridge on behalf of Amey. The structure is an eight span, former railway bridge crossing the River Wye. It comprises a steel deck supported by wrought iron/steel cylinders. The main span stands centrally in the watercourse supported by larger 2000mmø cylinders; the remaining cylinders are 400mmø and are arranged in pairs (Photos 1 & 3). Access was gained to the underwater parts of the structure with the use of surface supply diving equipment.

The structure element labelling system has been orientated in-line with the cardinal points.

2.2. Obstacle crossed

Originally part of the Wye Valley Railway infrastructure, the structure now carries a footpath over the River Wye near Lower Lydbrook in Gloucestershire (Photos 2 & 4).

2.3. Substructure (end supports)

Both abutments stand well clear of the watercourse and as such are not included in this report.

2.4. Substructure (intermediate supports)

The cylinders comprising piers 1 and 7 stand well clear of the watercourse and as such are not included in this report.

Pier 2 and 6
The 4no 400mmø cylinders stand on the edge of the watercourse and were found to be in fair condition with only minor paint loss and surface corrosion noted to the parts at and around water level - All connections were found to be tight (Photo 5)

Pier 3
The metalwork to each of the 4no cylinders was found to be fair with occasional paint loss and surface corrosion to less than 1mm around the waterline. All connections were found to be tight (Photo 6).
All waterborne debris that was noted during previous examination was removed either during or prior to the examination.

Piers 4 & 5
All four 2000mmø cylinders were found to be fair with paint loss and lamination blistering/ pitting occurring from bed level to 500mm above normal water level; corrosion was found to be up to 3mm in depth and covered a total of approximately 3m², concentrated at the upstream face of the upstream cylinders (Photos 8 to 11).

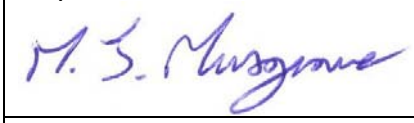
2.5. Watercourse
The structure stands on a long sweeping curve in the River Wye. The river is known to be subject to large variations in hydraulic activity. No particular features were found either up or downstream of the structure that might affect the flow. The bed adjacent to the structure, and particularly around the cylinders, was found to consist of either placed pitching stone or large sized gravel/natural bedrock. The surrounding banks are approximately 3m in height with widespread established tree growth and medium level vegetation.

3. CONCLUSIONS AND RECOMMENDATIONS

The examined elements of the structure exhibited a fair condition throughout with no significant defects being identified at the time of examination. Although the condition of the cylinders around the waterline is cosmetically poor in places, there appears to have been very little deterioration since the detailed examination carried out on 17th December 2010.

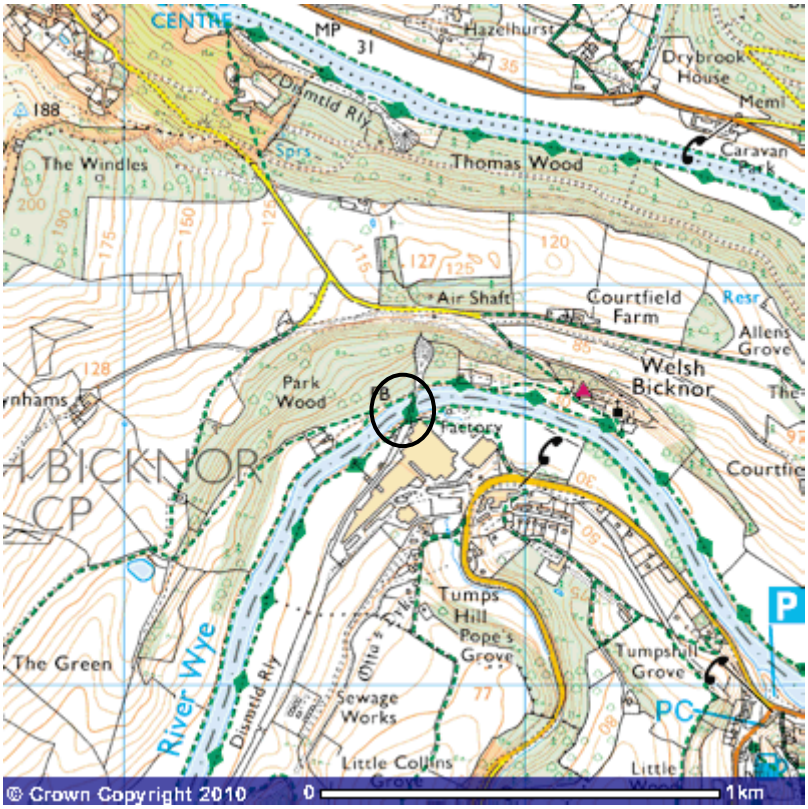
In the medium to long term the substructure would benefit from blast cleaning and repainting to ensure the integrity of the structure.

The interfaces of all cylinders with the bed are well protected with pitching stone or otherwise hard bed material throughout.

TO BE SIGNED BY ENGINEER		
Inspected: 	Print Name M Musgrave	Date: 22/07/16
Prepared by: 	M Musgrave	Date: 22/07/16
Approved: 	K West BEng CEng MICE	Date: 28/07/16

ANNEX A

LOCATION PLANS



Location Plan - 1:25,000

Google Earth Image

ANNEX B

PHOTOGRAPHS

Photo 1 – View of East (Upstream) Elevation

Photo 2 – View to Upstream

Photo 3 – View of West (Downstream) Elevation

Photo 4 – View to Downstream

Photo 5 – View of Pier 2 Cylinders

Photo 6 – View of Pier 3 Cylinders

Photo 7 – View of Pier 4 Cylinders

Photo 8 – View of Corrosion to Upstream Cylinder, Pier 4

Photo 9 – View of Pier 5 Cylinders

Photo 10 – View of surface corrosion / protective paint loss Upstream Cylinder, Pier 5

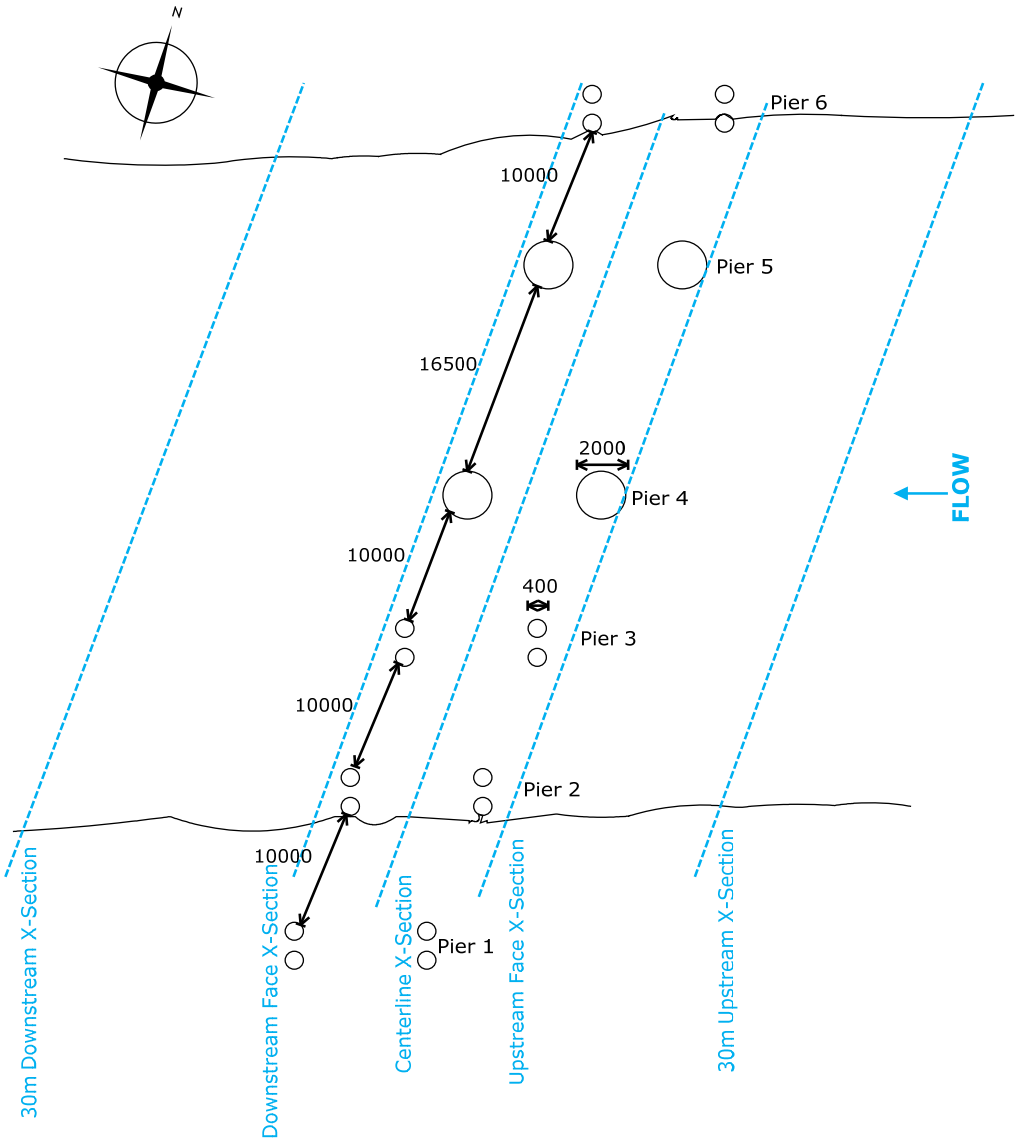
Photo 11 – View of surface corrosion Downstream Cylinder, Pier 5

Photo 12 – View of Datum Point

ANNEX C

SURVEY DRAWINGS

General Arrangement Plan



N.T.S

ANNEX D

CSS BRIDGE INSPECTION PRO FORMA

Gloucestershire HIGHWAYS
Gloucestershire County Council & Atkins

Bridge Inspection Form			Page 1_of 5 for this bridge
Bridge Name: **Lydbrook Rail Bridge**			Division
Bridge No. **976**	Span Ref: **Span 2 – South Bank**		Bridge Type Code
Map ref: **SO**		Span 2 of 8	Primary Deck Element Form Table 1: 04
OSE: **5870**	OSN: **1770**	Span Length (m) **10**	Primary Deck Element Material Table 3: G
All above ground elements inspected **NO**		Photos **YES**	Secondary Deck Element Form Table 2: 20
Number of construction forms in bridge/span 2: **ONE**			Secondary Deck Element Material Table 3: P

Set	No	Element Description	S	E	D	W	P	Cost	Comments/remarks
Deck Elements	1	Primary Deck Element (Table 1)							UW examination covers spans 2 – 6 inc only, remainder not affected by watercourse; spans labelled from South bank.
	2	Secondary Deck Elements – Transverse beams							
	3	Secondary Deck Elements – Element from Table 2							
	4	Half Joints							
	5	Tie beam/rod							
	6	Parapet beam or cantilever							
	7	Deck Bracing							
Load Bearing Substructure	8	Foundations	1	A	6.1	X	D		
	9	Abutments (incl. Arch springing)							
	10	Spandrel Wall/Head Wall							
	11	Pier/Column	2	B	1.2	X	D		Surface corrosion only to pier 2 cylinders
	12	Cross Head/Capping Beam							
	13	Bearings							
	14	Bearing Plinth/shelf							
Durability Elements	15	Superstructure Drainage							
	16	Substructure Drainage							
	17	Waterproofing							
	18	Movement/expansion Joints							
	19	Painting: Deck elements							
	20	Painting: substructure elements	5	B	4.1	X	D		Consider blast cleaning and repainting in long term. Monitor paint break down at next examination
	21	Painting: parapets/safety fences							
Safety Elements	22	Access/walkways/gantries							
	23	Handrail/Parapet/Safety fence							
	24	Carriageway Surfacing							
	25	Footway/verge/footbridge surface							
Other Bridge Elements	26	Invert/River bed	1	A	7.1	X	D		No significant erosion features to bed
	27	Aprons							
	28	Fenders/cutwaters/collision prot.							
	29	River training works							
	30	Revetment/Batter paving							
	31	Wing Walls							
	32	Retaining Walls							
	33	Embankments							
	34	Machinery							
Ancillary Elements	35	Approach rails/barriers/walls							
	36	Signs/Road markings							
	37	Lighting							
	38	Services							
	39	Street furniture							
	40	Environmental Hazards							
	41	Site safety hazards							

Traffic Management Requirements	Road Closure ~~YES~~/NO Restrictions ~~YES~~/NO	Cost	

S – Severity, E – Extent, D – Defect, (see tables 4-7)
W – Work Required, P Work Priority (see tables 8-9)

Inspection Date 22 /07/16

Inspector M Musgrave

Bridge Inspection Form			Page 2_ of 5_ for this bridge
Bridge Name: **Lydbrook Rail Bridge**			Division
Bridge No. **976**	Span Ref: **Span 3**		Bridge Type Code
Map ref: **SO**		Span 3 of 8	Primary Deck Element Form Table 1: 04
OSE: **5870**	OSN: **1770**	Span Length (m) **10**	Primary Deck Element Material Table 3: G
All above ground elements inspected **NO**		Photos **YES**	Secondary Deck Element Form Table 2: 20
Number of construction forms in bridge/span 2: **ONE**			Secondary Deck Element Material Table 3: P

Set	No	Element Description	S	E	D	W	P	Cost	Comments/remarks
Deck Elements	1	Primary Deck Element (Table 1)							
	2	Secondary Deck Elements: Transverse beams							
	3	Secondary Deck Elements: Element from Table 2							
	4	Half Joints							
	5	Tie beam/rod							
	6	Parapet beam or cantilever							
	7	Deck Bracing							
Load Bearing Substructure	8	Foundations	1	A	6.1	X	D		
	9	Abutments (incl. Arch springing)							
	10	Spandrel Wall/Head Wall							
	11	Pier/Column	2	B	1.2	X	D		Surface corrosion only to pier 3 cylinders
	12	Cross Head/Capping Beam							
	13	Bearings							
	14	Bearing Plinth/shelf							
Durability Elements	15	Superstructure Drainage							
	16	Substructure Drainage							
	17	Waterproofing							
	18	Movement/expansion Joints							
	19	Painting: Deck elements							
	20	Painting: substructure elements	5	B	4.1	X	D		Consider blast cleaning and repainting in long term. Monitor paint break down at next examination
	21	Painting: parapets/safety fences							
Safety Elements	22	Access/walkways/gantries							
	23	Handrail/Parapet/Safety fence							
	24	Carriageway Surfacing							
	25	Footway/verge/footbridge surface							
Other Bridge Elements	26	Invert/River bed	1	A	7.1	X	D		No significant erosion features to bed
	27	Aprons							
	28	Fenders/cutwaters/collision prot.							
	29	River training works							
	30	Revetment/Batter paving							
	31	Wing Walls							
	32	Retaining Walls							
	33	Embankments							
	34	Machinery							
Ancillary Elements	35	Approach rails/barriers/walls							
	36	Signs/Road markings							
	37	Lighting							
	38	Services							
	39	Street furniture							
	40	Environmental Hazards							
	41	Site safety hazards							

Traffic Management Requirements	Road Closure ~~YES~~/NO Restrictions ~~YES~~/NO	Cost	

S – Severity, E – Extent, D – Defect, (see tables 4-7) W – Work Required, P Work Priority (see tables 8-9)	Inspection Date 22 /07/16	Inspector M Musgrave

Bridge Inspection Form			Page 3_of 5_ for this bridge		
Bridge Name: **Lydbrook Rail Bridge**			Division		
Bridge No. **976**	Span Ref: **Span 4**		Bridge Type Code		
Map ref: **SO**		Span 4 of 8	Primary Deck Element Form Table 1	04	
OSE: **5870**	OSN: **1770**	Span Length (m) **10**	Primary Deck Element Material Table 3	G	
All above ground elements inspected **NO**		Photos **YES**	Secondary Deck Element Form Table 2	20	
Number of construction forms in bridge/span 2: **ONE**			Secondary Deck Element Material Table 3	P	

Set	No	Element Description		S	E	D	W	P	Cost	Comments/remarks
Deck Elements	1	Primary Deck Element (Table 1)								
	2	Secondary Deck Elements	Transverse beams							
	3		Element from Table 2							
	4	Half Joints								
	5	Tie beam/rod								
	6	Parapet beam or cantilever								
	7	Deck Bracing								
Load Bearing Substructure	8	Foundations		1	A	6.1	X	D		
	9	Abutments (incl. Arch springing)								
	10	Spandrel Wall/Head Wall								
	11	Pier/Column		3	C	1.3	X	D		Pitting and lamination corrosion to 3mm maximum around waterline to pier 4 cylinders
	12	Cross Head/Capping Beam								
	13	Bearings								
	14	Bearing Plinth/shelf								
Durability Elements	15	Superstructure Drainage								
	16	Substructure Drainage								
	17	Waterproofing								
	18	Movement/expansion Joints								
	19	Painting: Deck elements								
	20	Painting: substructure elements		5	C	4.1	X	D		Consider blast cleaning and repainting in long term. Monitor paint break down at next examination
	21	Painting: parapets/safety fences								
Safety Elements	22	Access/walkways/gantries								
	23	Handrail/Parapet/Safety fence								
	24	Carriageway Surfacing								
	25	Footway/verge/footbridge surface								
Other Bridge Elements	26	Invert/River bed		1	A	7.1	X	D		No significant erosion features to bed
	27	Aprons								
	28	Fenders/cutwaters/collision prot.								
	29	River training works								
	30	Revetment/Batter paving								
	31	Wing Walls								
	32	Retaining Walls								
	33	Embankments								
	34	Machinery								
Ancillary Elements	35	Approach rails/barriers/walls								
	36	Signs/Road markings								
	37	Lighting								
	38	Services								
	39	Street furniture								
	40	Environmental Hazards								
	41	Site safety hazards								
Traffic Management Requirements		Road Closure ~~YES~~/NO Restrictions ~~YES~~/NO				Cost				

S – Severity, E – Extent, D – Defect, (see tables 4-7) W – Work Required, P Work Priority (see tables 8-9)	Inspection Date 22 /07/16	Inspector M Musgrave

Bridge Inspection Form			Page 4_ of 5_ for this bridge
Bridge Name: **Lydbrook Rail Bridge**			Division
Bridge No. **976**	Span Ref: **Span 5**		Bridge Type Code
Map ref: **SO**		Span 5 of 8	Primary Deck Element Form Table 1: 04
OSE: **5870**	OSN: **1770**	Span Length (m) **10**	Primary Deck Element Material Table 3: G
All above ground elements inspected **NO**		Photos **YES**	Secondary Deck Element Form Table 2: 20
Number of construction forms in bridge/span 2: **ONE**			Secondary Deck Element Material Table 3: P

Set	No	Element Description	S	E	D	W	P	Cost	Comments/remarks
Deck Elements	1	Primary Deck Element (Table 1)							
	2	Secondary Deck Elements: Transverse beams							
	3	Secondary Deck Elements: Element from Table 2							
	4	Half Joints							
	5	Tie beam/rod							
	6	Parapet beam or cantilever							
	7	Deck Bracing							
Load Bearing Substructure	8	Foundations	1	A	6.1	X	D		
	9	Abutments (incl. Arch springing)							
	10	Spandrel Wall/Head Wall							
	11	Pier/Column	3	C	1.3	X	D		Pitting and lamination corrosion to 3mm maximum around waterline to pier 4 cylinders
	12	Cross Head/Capping Beam							
	13	Bearings							
	14	Bearing Plinth/shelf							
Durability Elements	15	Superstructure Drainage							
	16	Substructure Drainage							
	17	Waterproofing							
	18	Movement/expansion Joints							
	19	Painting: Deck elements							
	20	Painting: substructure elements	5	C	4.1	X	D		Consider blast cleaning and repainting in long term. Monitor paint break down at next examination
	21	Painting: parapets/safety fences							
Safety Elements	22	Access/walkways/gantries							
	23	Handrail/Parapet/Safety fence							
	24	Carriageway Surfacing							
	25	Footway/verge/footbridge surface							
Other Bridge Elements	26	Invert/River bed	1	A	7.1	X	D		No significant erosion features to bed
	27	Aprons							
	28	Fenders/cutwaters/collision prot.							
	29	River training works							
	30	Revetment/Batter paving							
	31	Wing Walls							
	32	Retaining Walls							
	33	Embankments							
	34	Machinery							
Ancillary Elements	35	Approach rails/barriers/walls							
	36	Signs/Road markings							
	37	Lighting							
	38	Services							
	39	Street furniture							
	40	Environmental Hazards							
	41	Site safety hazards							
Traffic Management Requirements		Road Closure ~~YES~~/NO Restrictions ~~YES~~/NO			Cost				

S – Severity, E – Extent, D – Defect, (see tables 4-7) W – Work Required, P Work Priority (see tables 8-9)	Inspection Date 22 /07/16	Inspector M Musgrave

Bridge Inspection Form			Page 5_of 5_ for this bridge		
Bridge Name: **Lydbrook Rail Bridge**			Division		
Bridge No. **976**	Span Ref: **Span 6 – North Bank**		Bridge Type Code		
Map ref: **SO**		Span 6 of 8	Primary Deck Element Form Table 1	04	
OSE: **5870**	OSN: **1770**	Span Length (m) **10**	Primary Deck Element Material Table 3	G	
All above ground elements inspected **NO**		Photos **YES**	Secondary Deck Element Form Table 2	20	
Number of construction forms in bridge/span 2: **ONE**			Secondary Deck Element Material Table 3	P	

Set	No	Element Description	S	E	D	W	P	Cost	Comments/remarks
Deck Elements	1	Primary Deck Element (Table 1)							
	2	Secondary Deck Elements: Transverse beams							
	3	Secondary Deck Elements: Element from Table 2							
	4	Half Joints							
	5	Tie beam/rod							
	6	Parapet beam or cantilever							
	7	Deck Bracing							
Load Bearing Substructure	8	Foundations	1	A	6.1	X	D		
	9	Abutments (incl. Arch springing)							
	10	Spandrel Wall/Head Wall							
	11	Pier/Column	2	B	1.2	X	D		Surface corrosion only to pier 6 cylinders
	12	Cross Head/Capping Beam							
	13	Bearings							
	14	Bearing Plinth/shelf							
Durability Elements	15	Superstructure Drainage							
	16	Substructure Drainage							
	17	Waterproofing							
	18	Movement/expansion Joints							
	19	Painting: Deck elements							
	20	Painting: substructure elements	5	B	4.1	X	D		Consider blast cleaning and repainting in long term. Monitor paint break down at next examination
	21	Painting: parapets/safety fences							
Safety Elements	22	Access/walkways/gantries							
	23	Handrail/Parapet/Safety fence							
	24	Carriageway Surfacing							
	25	Footway/verge/footbridge surface							
Other Bridge Elements	26	Invert/River bed	1	A	7.1	X	D		No significant erosion features to bed
	27	Aprons							
	28	Fenders/cutwaters/collision prot.							
	29	River training works							
	30	Revetment/Batter paving							
	31	Wing Walls							
	32	Retaining Walls							
	33	Embankments							
	34	Machinery							
Ancillary Elements	35	Approach rails/barriers/walls							
	36	Signs/Road markings							
	37	Lighting							
	38	Services							
	39	Street furniture							
	40	Environmental Hazards							
	41	Site safety hazards							
Traffic Management Requirements		Road Closure ~~YES~~/NO Restrictions ~~YES~~/NO			Cost				

S – Severity, E – Extent, D – Defect, (see tables 4-7) W – Work Required, P Work Priority (see tables 8-9)	Inspection Date 22 /07/16	Inspector M Musgrave

Multiple Defects										
Element No	Defect 1			Defect 2			Defect 3			Comments
	S	Ex	Def	S	Ex	Def	S	Ex	Def	

INSPECTOR'S COMMENTS

	The examined elements were found to be fair overall with moderate corrosion occurring around the waterline to pier 4 & 5 cylinders and surface corrosion only to small areas of the remaining cylinders. The affected areas of the structure would benefit from blast cleaning and repainting in the long term, all paint loss and corrosion should be monitored at the next underwater examination. No evidence of scour was found to be affecting the structure.

Name____M Musgrave_____ Signed _____ M. S. Musgrave __ Date 22_/_07_/_16_

ENGINEER'S COMMENTS

Name_____ Signed _____ Date ____/_____/_____

ANNEX E

BED SOUNDING DATA

Distance across watercourse U/S (m)	30m U/S Bed Profile Levels (m)			Water Level (m)
	22/07/16	17/12/10	N/A	
South Bank	5	5		2.5
1	2.4	2.4		2.5
2	2.3	2.1		2.5
3	2.3	2.1		2.5
4	2.3	2.0		2.5
5	2.2	1.9		2.5
6	2.1	1.8		2.5
7	2.1	1.9		2.5
8	2.0	1.7		2.5
9	2.0	1.5		2.5
10	1.9	1.3		2.5
11	1.9	1.3		2.5
12	1.8	1.5		2.5
13	1.8	1.4		2.5
14	1.7	1.2		2.5
15	1.7	1.2		2.5
16	1.6	1.1		2.5
17	1.5	1.0		2.5
18	1.3	1.0		2.5
19	1.2	1.3		2.5
20	1.0	1.6		2.5
21	1.0	1.6	No Data	2.5
22	1.0	1.6		2.5
23	1.0	1.6		2.5
24	1.0	1.4		2.5
25	1.0	1.1		2.5
26	1.4	0.9		2.5
27	0.9	1.0		2.5
28	0.8	1.2		2.5
29	0.9	1.3		2.5
30	0.9	1.2		2.5
31	0.9	1.1		2.5
32	0.8	1.2		2.5
33	0.9	1.3		2.5
34	0.9	1.4		2.5
35	0.9	1.4		2.5
36	0.9	1.4		2.5
37	1.0	1.6		2.5
38	1.0	1.6		2.5
39	1.0	2.0		2.5
40	1.2	2.3		2.5
41	2.4	2.3		2.5
42	2.4	2.3		2.5
North Bank	4.5	4.5		2.5

General Data for structure	Lydbrook Rail Bridge
Datum Level:	10 m
Datum Position:	Top of column, pier 2
Datum to Water Level:	7.5 m
Previous Datum to Water	7.5 m
Penultimate Datum to Water	N/A m
Level:	**2.5** m
Exam Date	22/07/16
Prev Date	17/12/10
Pen Date	N/A

Notes

1 U/S = Upstream
2 D/S = Downstream
3 All levels are relative to arbitary datum above

Distance across watercourse D/S (m)	30m D/S Bed Profile Levels (m)			Water Level (m)
	22/07/16	17/12/10	N/A	
South Bank	3.5	5.0		2.5
1	2.3	2.3		2.5
2	1.7	2.1		2.5
3	1.7	2.0		2.5
4	1.5	1.9		2.5
5	1.6	1.9		2.5
6	1.6	1.9		2.5
7	1.5	1.9		2.5
8	1.4	1.8		2.5
9	1.3	1.5		2.5
10	1.3	1.6		2.5
11	1.0	1.5		2.5
12	1.0	1.3		2.5
13	0.9	1.3		2.5
14	0.8	1.3		2.5
15	0.9	1.1		2.5
16	0.7	1.2		2.5
17	0.7	1.2		2.5
18	0.5	1.2		2.5
19	0.7	1.3		2.5
20	0.7	1.5		2.5
21	0.8	1.2	No Data	2.5
22	0.7	1.4		2.5
23	0.9	1.4		2.5
24	0.9	1.5		2.5
25	1.2	1.6		2.5
26	1.5	1.5		2.5
27	1.4	1.4		2.5
28	1.4	1.4		2.5
29	1.3	1.3		2.5
30	1.3	1.2		2.5
31	1.2	1.2		2.5
32	1.3	1.3		2.5
33	1.3	1.3		2.5
34	1.4	1.4		2.5
35	1.6	1.3		2.5
36	1.4	1.4		2.5
37	1.6	1.5		2.5
38	1.7	1.7		2.5
39	2.0	2.0		2.5
40	2.2	2.2		2.5
41	2.3	2.3		2.5
42	2.4	2.4		2.5
North Bank	3.5	5.0		2.5

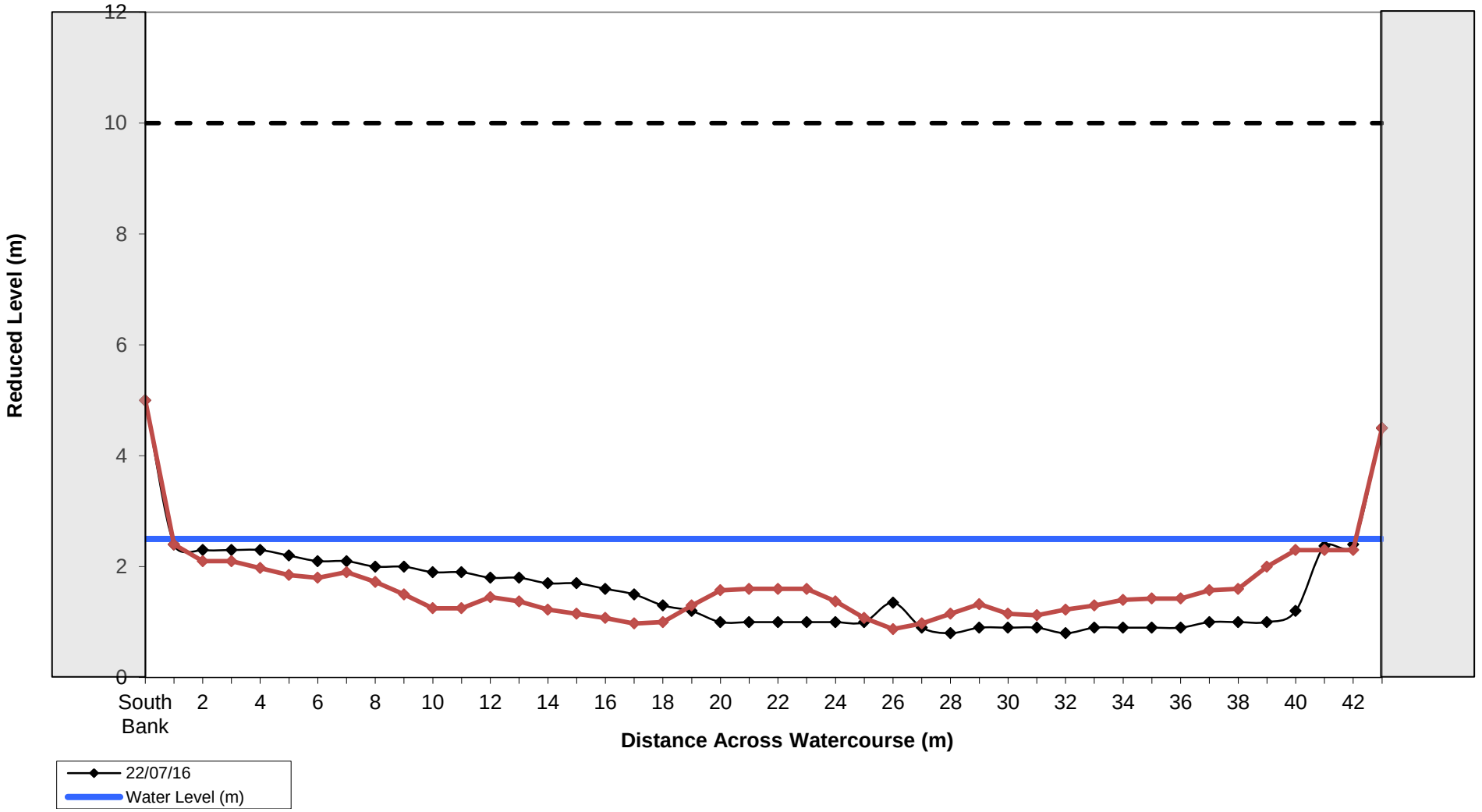
Distance across watercourse (m)	U/S Face of Structure Bed Profile Levels (m)			Water Level (m)
	22/07/16	17/12/10	N/A	
Pier 2				2.5
1	2.7	2.8		2.5
2	2.4	2.5		2.5
3	2.2	2.1		2.5
4	2.1	2.1		2.5
5	2	2		2.5
6	2	1.9		2.5
7	2.1	1.8		2.5
8	2	1.9		2.5
9	1.7	1.7		2.5
Pier 3				2.5
11	1.4	1.2		2.5
12	1.6	1.2		2.5
13	1.4	1.5		2.5
14	1.3	1.4		2.5
15	1.2	1.2		2.5
16	1.1	1.1		2.5
17	1.1	1		2.5
18	1	0.9		2.5
19	0.8	0.9		2.5
Pier 4				2.5
21	1.3	1.6		2.5
22	0.9	1.6		2.5
23	1.2	1.6	No Data	2.5
24	1.2	1.6		2.5
25	1.3	1.4		2.5
26	1.4	1.1		2.5
27	1.3	0.9		2.5
28	1.2	1		2.5
29	1.2	1.2		2.5
30	1.4	1.4		2.5
31	1.4	1.1		2.5
32	1.5	1.1		2.5
33	1.4	1.2		2.5
34	1.3	1.3		2.5
Pier 5				2.5
36	1.3	1.4		2.5
37	1.4	1.4		2.5
38	1.7	1.6		2.5
39	2	1.6		2.5
40	2.1	2		2.5
41	2.3	2.3		2.5
42	2.4	2.3		2.5
43	2.4	2.3		2.5
44	2.6	2.3		2.5
Pier 6				2.5

Distance across watercourse (m)	Centreline of Structure Bed Profile Levels (m)			Water Level (m)
	22/07/16	17/12/10	N/A	
Pier 2				
1	2.55	2.5		2.5
2	2.35	2.3		2.5
3	2.15	2.1		2.5
4	2.05	2.1		2.5
5	1.95	1.95		2.5
6	1.95	1.8		2.5
7	1.95	1.8		2.5
8	1.95	1.9		2.5
9	1.75	1.75		2.5
Pier 3	1.5	1.4		2.5
11	1.55	1.3		2.5
12	1.55	1.3		2.5
13	1.45	1.4		2.5
14	1.3	1.35		2.5
15	1.25	1.25		2.5
16	1.1	1.2		2.5
17	1.185	1.15		2.5
18	1.1	1.05		2.5
19	1.05	1.1		2.5
Pier 4	1.3	1.3		2.5
21	1.4	1.55		2.5
22	1.1	1.6		2.5
23	1.3	1.6	No Data	2.5
24	1.3	1.6		2.5
25	1.4	1.35		2.5
26	1.5	1.05		2.5
27	1.4	0.85		2.5
28	1.3	0.95		2.5
29	1.35	1.1		2.5
30	1.3	1.25		2.5
31	1.25	1.2		2.5
32	1.3	1.15		2.5
33	1.3	1.25		2.5
34	1.3	1.3		2.5
Pier 5	1.4	1.3		2.5
36	1.3	1.45		2.5
37	1.4	1.45		2.5
38	1.55	1.55		2.5
39	1.8	1.6		2.5
40	2.05	2		2.5
41	2.25	2.3		2.5
42	2.35	2.3		2.5
43	2.4	2.3		2.5
44	2.55	2.3		2.5
Pier 6				

Distance across watercourse (m)	D/S Face of Structure Bed Profile Levels (m)			Water Level (m)
	22/07/16	17/12/10	N/A	
Pier 2				
1	2.4	2.2		2.5
2	2.3	2.1		2.5
3	2.1	2.1		2.5
4	2	2.1		2.5
5	1.9	1.9		2.5
6	1.9	1.7		2.5
7	1.8	1.8		2.5
8	1.9	1.9		2.5
9	1.8	1.8		2.5
Pier 3				
11	1.7	1.4		2.5
12	1.5	1.4		2.5
13	1.5	1.3		2.5
14	1.3	1.3		2.5
15	1.3	1.3		2.5
16	1.1	1.3		2.5
17	1.27	1.3		2.5
18	1.2	1.2		2.5
19	1.3	1.3		2.5
Pier 4				
21	1.5	1.5		2.5
22	1.3	1.6		2.5
23	1.4	1.6	No Data	2.5
24	1.4	1.6		2.5
25	1.5	1.3		2.5
26	1.6	1		2.5
27	1.5	0.8		2.5
28	1.4	0.9		2.5
29	1.5	1		2.5
30	1.2	1.1		2.5
31	1.1	1.3		2.5
32	1.1	1.2		2.5
33	1.2	1.3		2.5
34	1.3	1.3		2.5
Pier 5				
36	1.3	1.5		2.5
37	1.4	1.5		2.5
38	1.4	1.5		2.5
39	1.6	1.6		2.5
40	2	2		2.5
41	2.2	2.3		2.5
42	2.3	2.3		2.5
43	2.4	2.3		2.5
44	2.5	2.3		2.5
Pier 6				

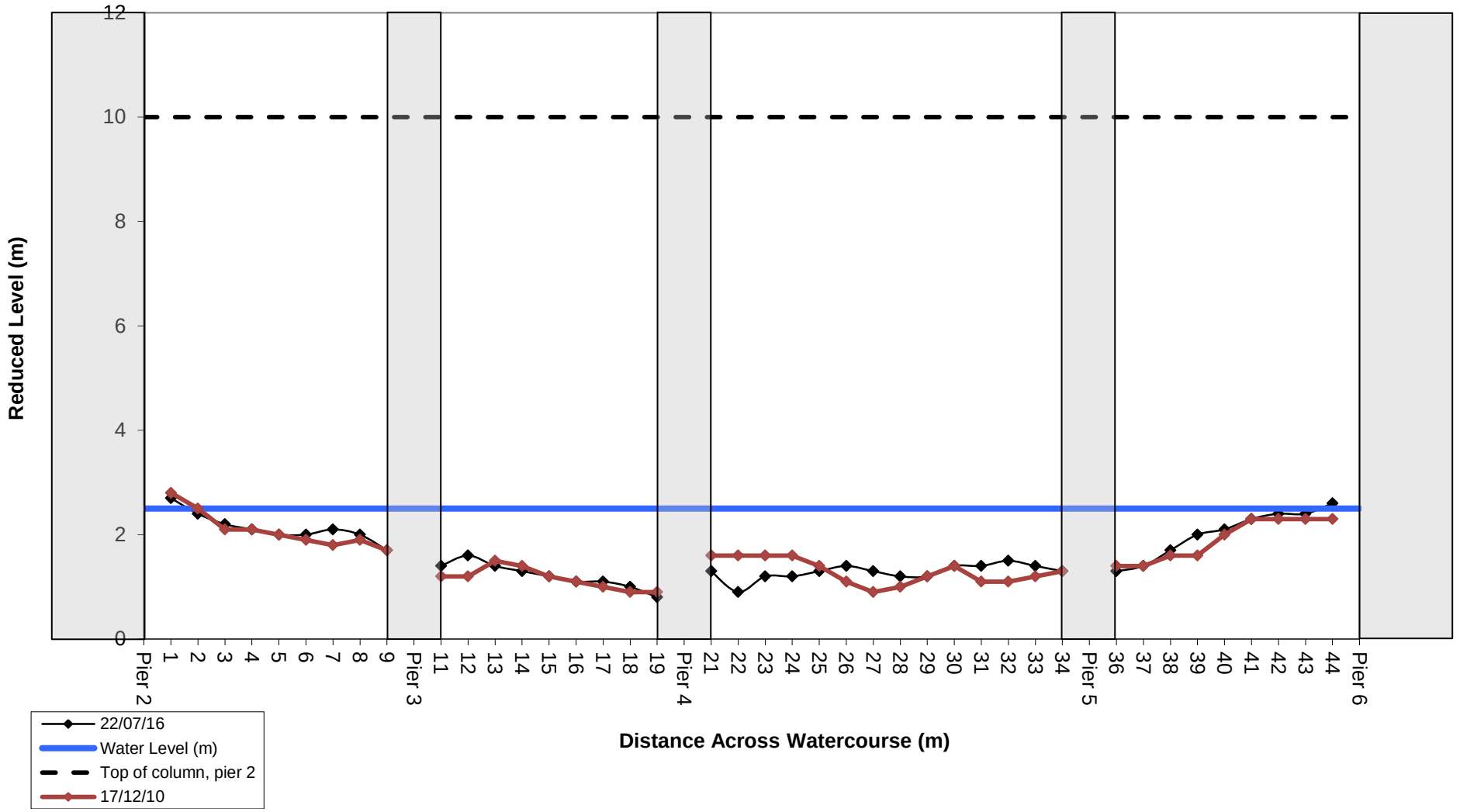
BRIDGE STRUCTURE UNDERWATER EXAMINATION REPORT
30M UPSTREAM CROSS SECTION PLOT

Lydbrook Rail Bridge



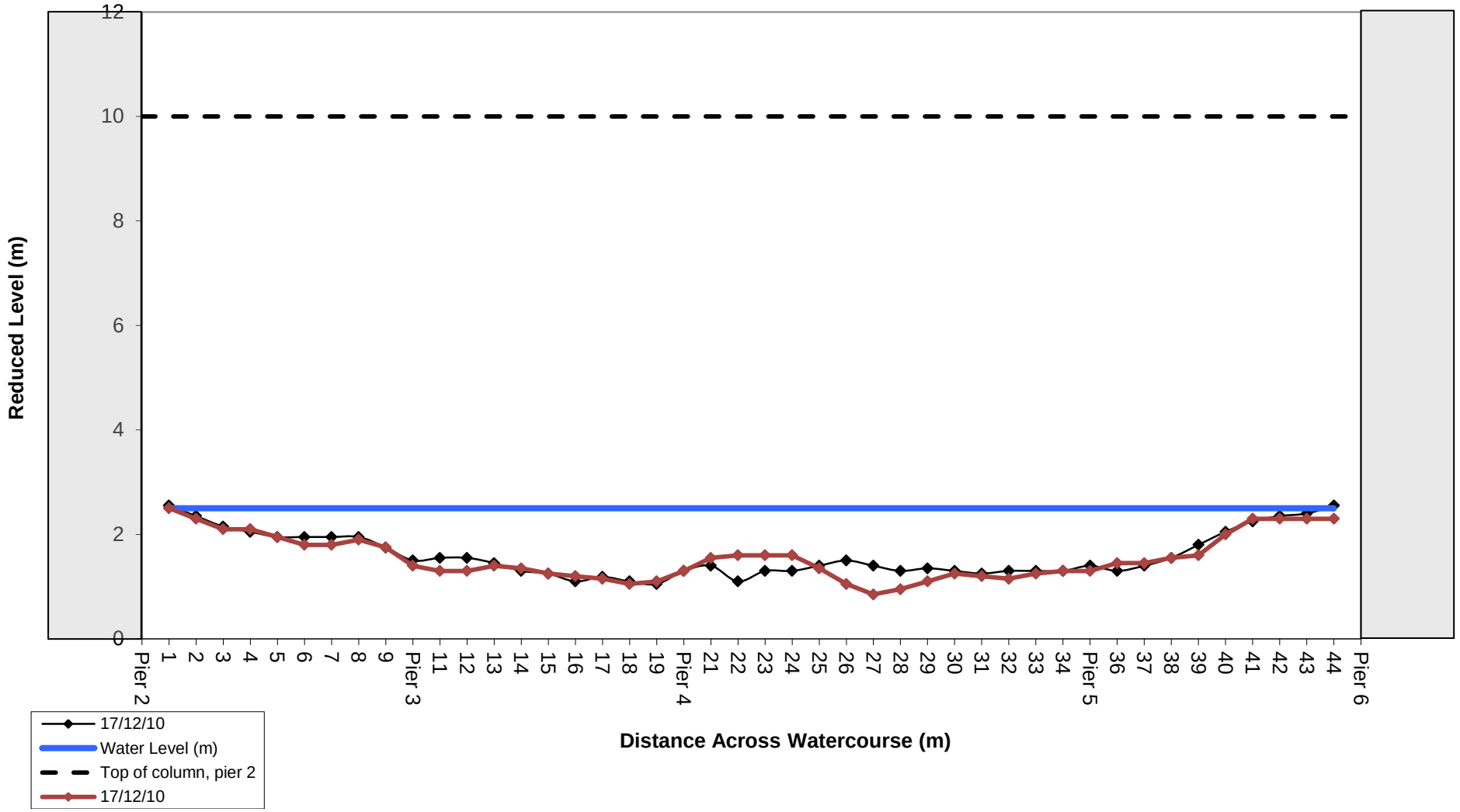
BRIDGE STRUCTURE UNDERWATER EXAMINATION REPORT
UPSTREAM FACE OF STRUCTURE CROSS SECTION PLOT

Lydbrook Rail Bridge



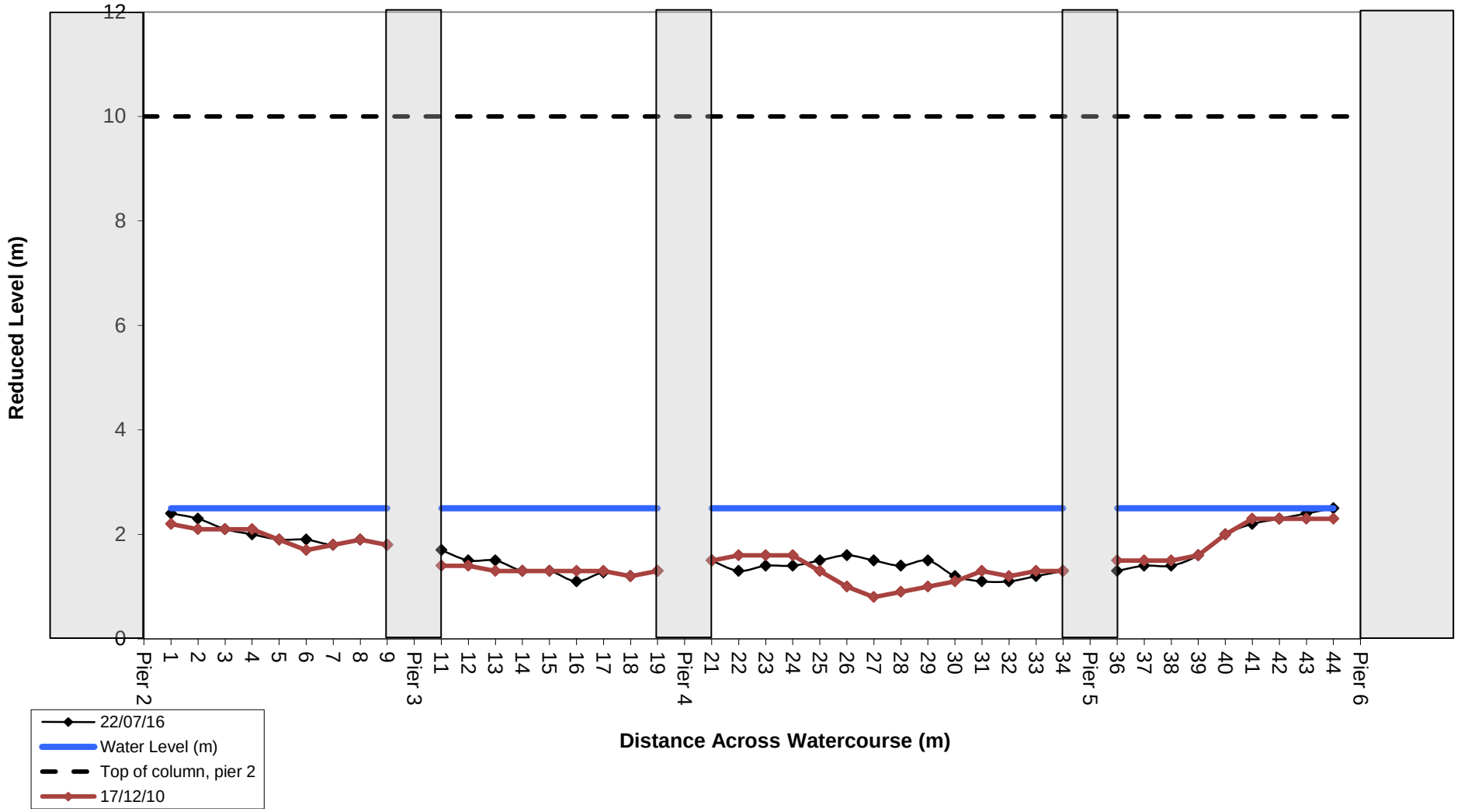
BRIDGE STRUCTURE UNDERWATER EXAMINATION REPORT
CENTRE LINE OF STRUCTURE CROSS SECTION PLOT

Lydbrook Rail Bridge



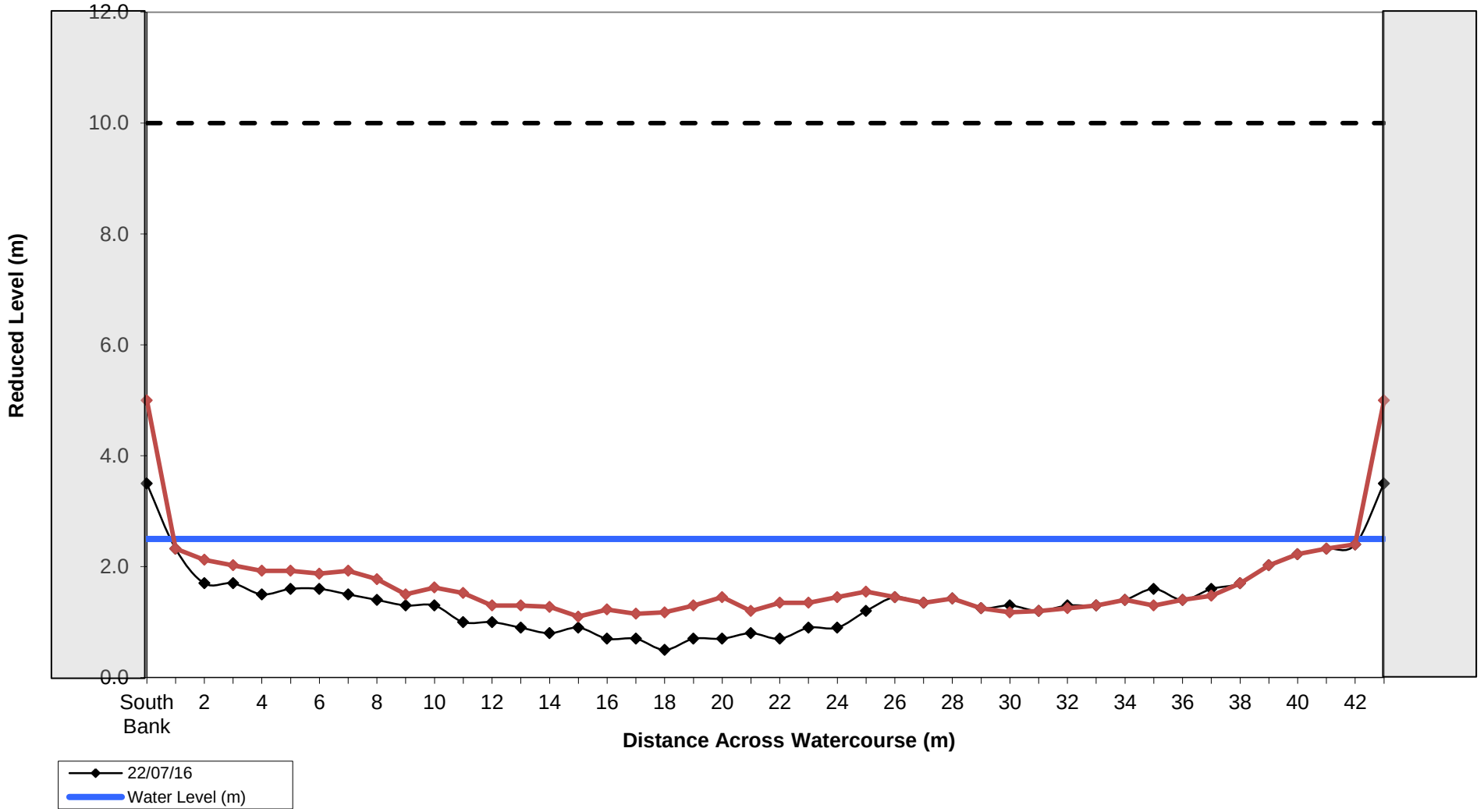
BRIDGE STRUCTURE UNDERWATER EXAMINATION REPORT
DOWNSTREAM FACE OF STRUCTURE CROSS SECTION PLOT

Lydbrook Rail Bridge



BRIDGE STRUCTURE UNDERWATER EXAMINATION REPORT
30M DOWNSTREAM CROSS SECTION PLOT

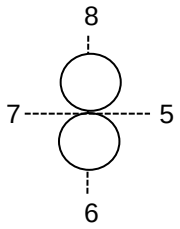
Lydbrook Rail Bridge

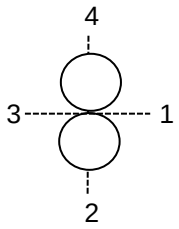


RADIALS SKETCH

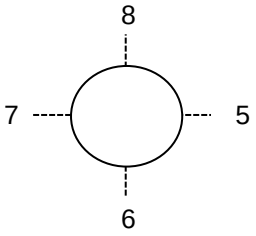
Lydbrook Rail Bridge

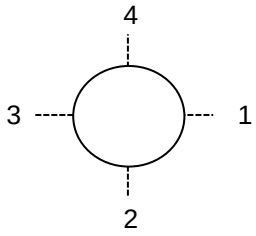
Pier 6





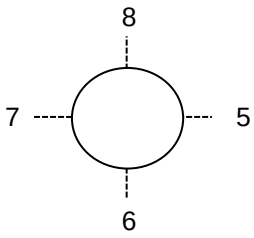
Pier 5

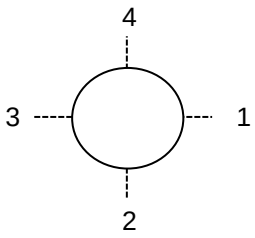




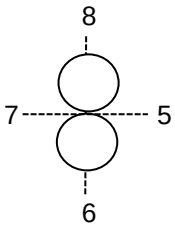
Flow ←

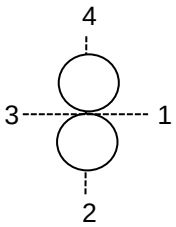
Pier 4



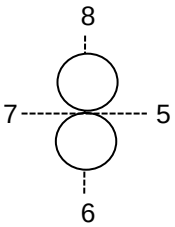


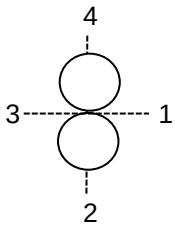
Pier 3





Pier 2



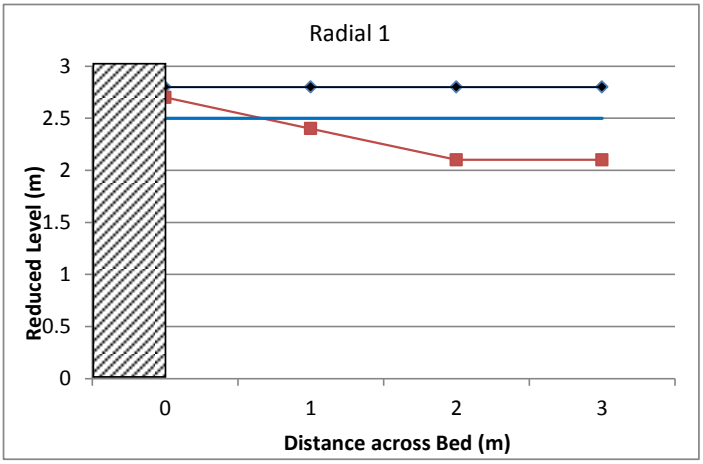


Datum: Top of column, pier 2

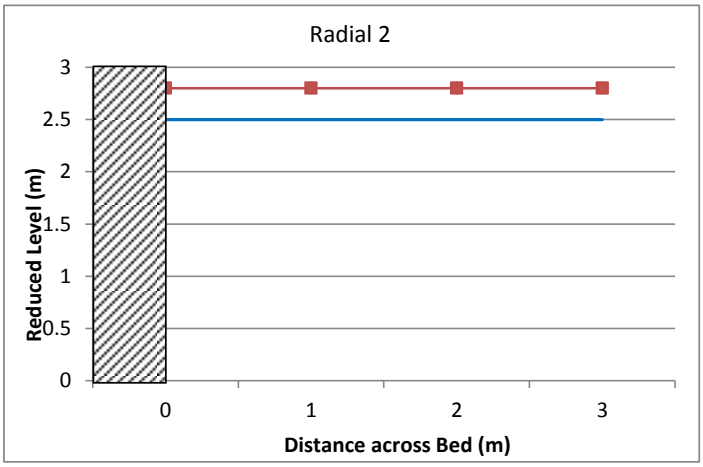
RADIAL SOUNDINGS

Lydbrook Rail Bridge

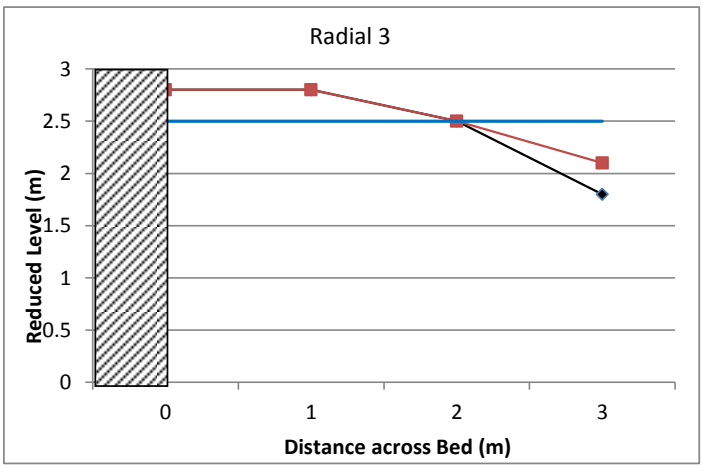
Pier 2	Radial 1		
Distance from Structure (m)	22/07/16	17/12/10	N/A
0	2.8	2.7	
1	2.8	2.4	
2	2.8	2.1	
3	2.8	2.1	



Pier 2	Radial 2		
Distance from Structure (m)	22/07/16	17/12/10	N/A
0	2.8	2.8	
1	2.8	2.8	
2	2.8	2.8	
3	2.8	2.8	



Pier 2	Radial 3		
Distance from Structure (m)	22/07/16	17/12/10	N/A
0	2.8	2.8	
1	2.8	2.8	
2	2.5	2.5	
3	1.8	2.1	



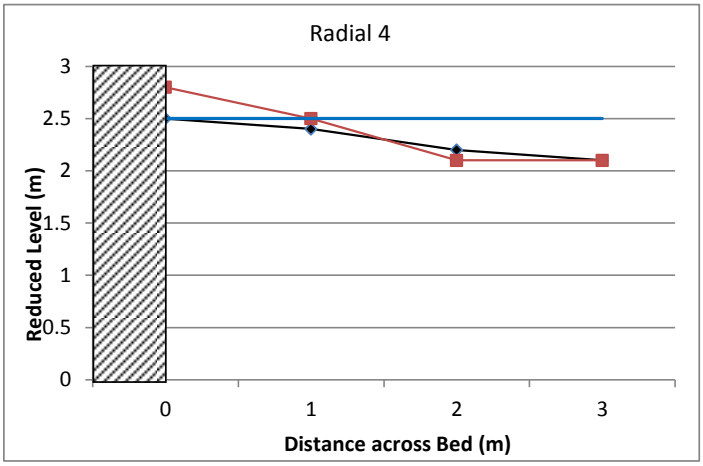
KEY:

	Current Water Level	
	Bed Level	22/07/16
	Previous Bed Level	17/12/10
	Penultimate Bed Level	N/A
	Foundation Level	

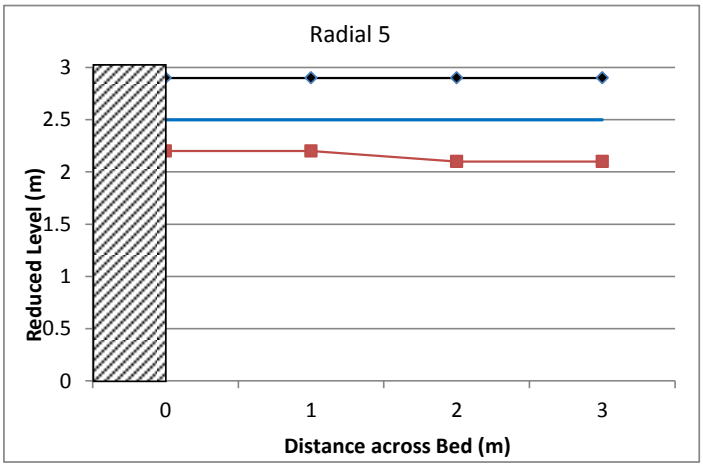
RADIAL SOUNDINGS

Lydbrook Rail Bridge

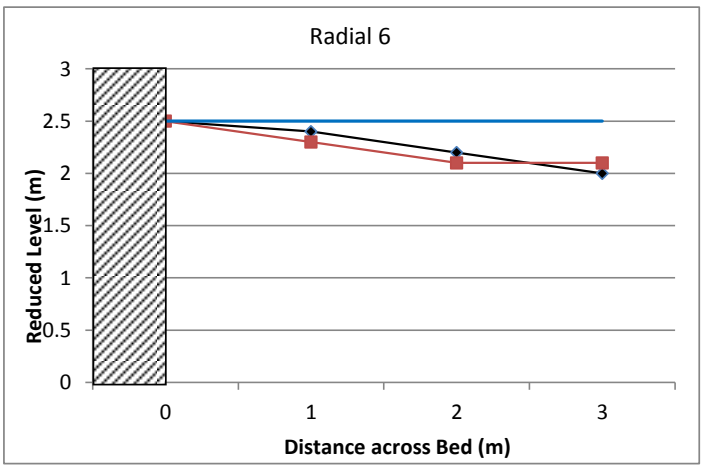
Pier 2	Radial 4		
Distance from Structure (m)	22/07/16	17/12/10	N/A
0	2.5	2.8	
1	2.4	2.5	
2	2.2	2.1	
3	2.1	2.1	



Pier 2	Radial 5		
Distance from Structure (m)	22/07/16	17/12/10	N/A
0	2.9	2.2	
1	2.9	2.2	
2	2.9	2.1	
3	2.9	2.1	



Pier 2	Radial 6		
Distance from Structure (m)	22/07/16	17/12/10	N/A
0	2.5	2.5	
1	2.4	2.3	
2	2.2	2.1	
3	2	2.1	



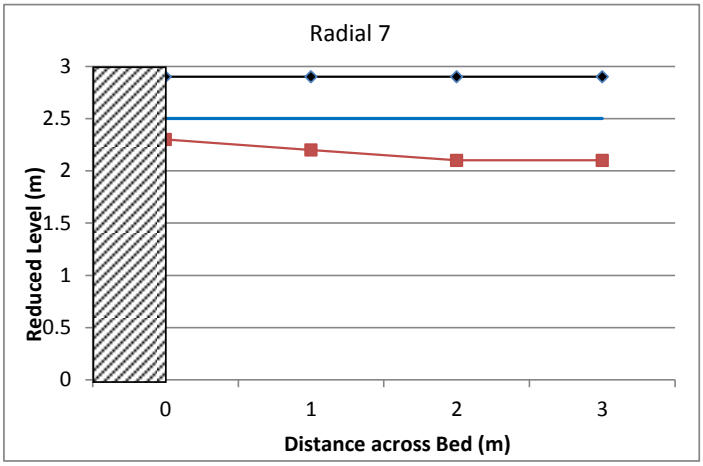
KEY:

	Current Water Level	
	Bed Level	22/07/16
	Previous Bed Level	17/12/10
	Penultimate Bed Level	N/A
	Foundation Level	

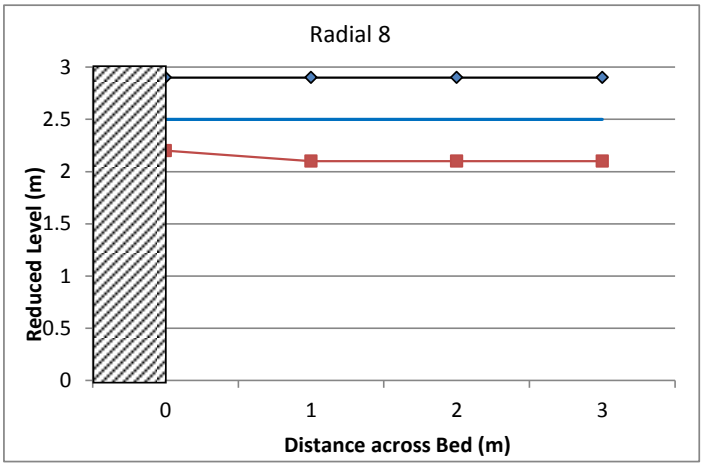
RADIAL SOUNDINGS

Lydbrook Rail Bridge

Pier 2	Radial 7		
Distance from Structure (m)	22/07/16	17/12/10	N/A
0	2.9	2.3	
1	2.9	2.2	
2	2.9	2.1	
3	2.9	2.1	



Pier 2	Radial 8		
Distance from Structure (m)	22/07/16	17/12/10	N/A
0	2.9	2.2	
1	2.9	2.1	
2	2.9	2.1	
3	2.9	2.1	



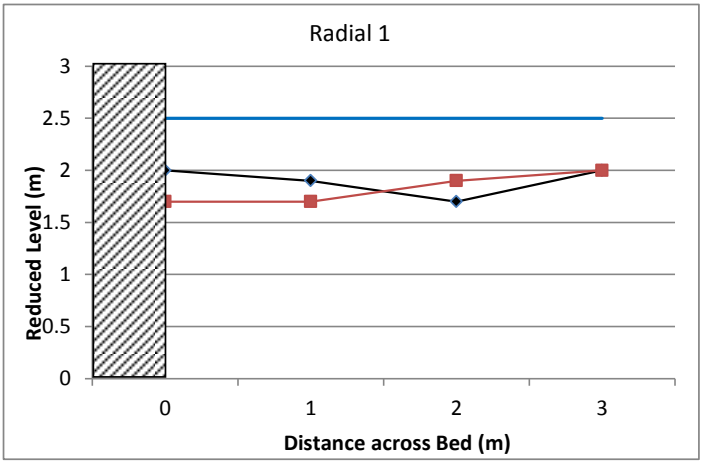
KEY:

	Current Water Level	
	Bed Level	22/07/16
	Previous Bed Level	17/12/10
	Penultimate Bed Level	N/A
	Foundation Level	

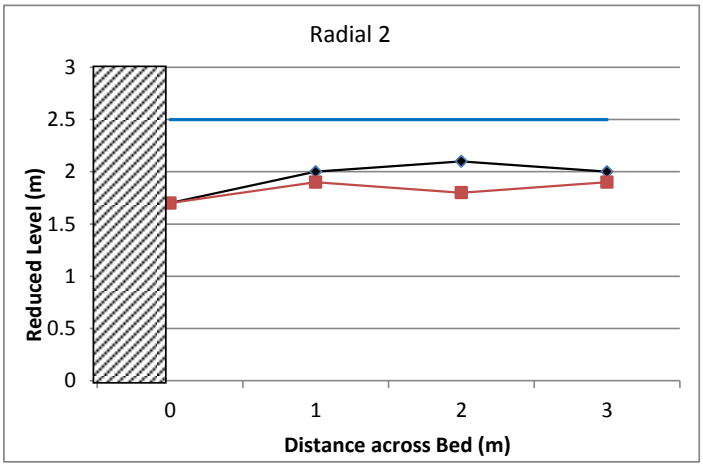
RADIAL SOUNDINGS

Lydbrook Rail Bridge

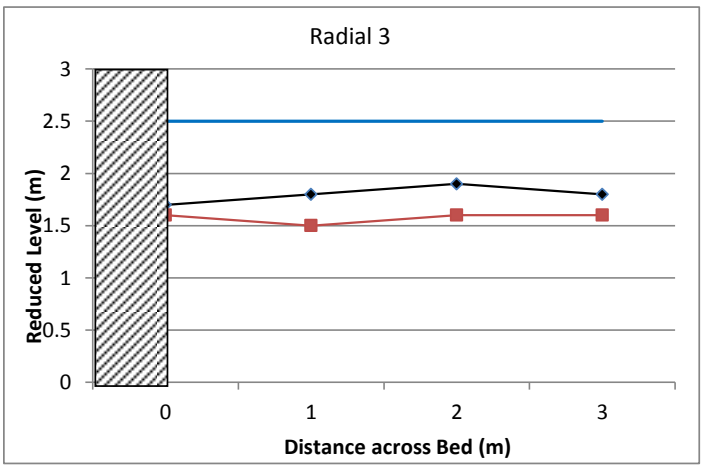
Pier 3	Radial 1		
Distance from Structure (m)	22/07/16	17/12/10	N/A
0	2	1.7	
1	1.9	1.7	
2	1.7	1.9	
3	2	2	



Pier 3	Radial 2		
Distance from Structure (m)	22/07/16	17/12/10	N/A
0	1.7	1.7	
1	2	1.9	
2	2.1	1.8	
3	2	1.9	



Pier 3	Radial 3		
Distance from Structure (m)	22/07/16	17/12/10	N/A
0	1.7	1.6	
1	1.8	1.5	
2	1.9	1.6	
3	1.8	1.6	



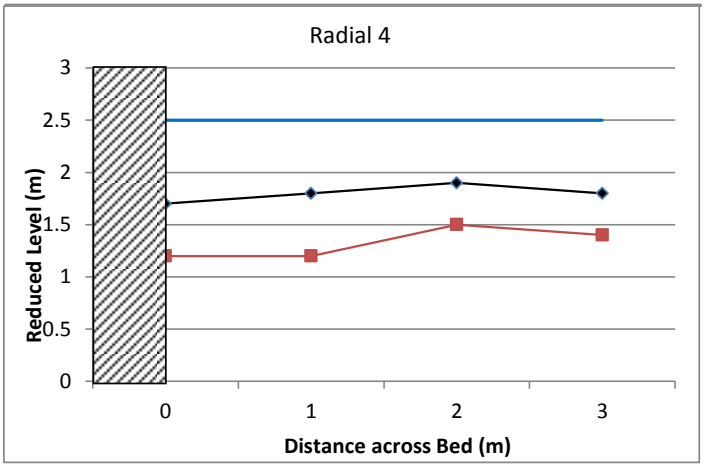
KEY:

	Current Water Level	
	Bed Level	22/07/16
	Previous Bed Level	17/12/10
	Penultimate Bed Level	N/A
	Foundation Level	

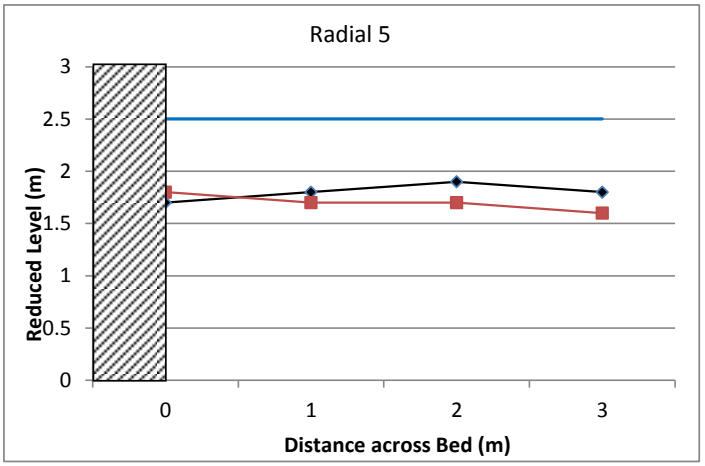
RADIAL SOUNDINGS

Lydbrook Rail Bridge

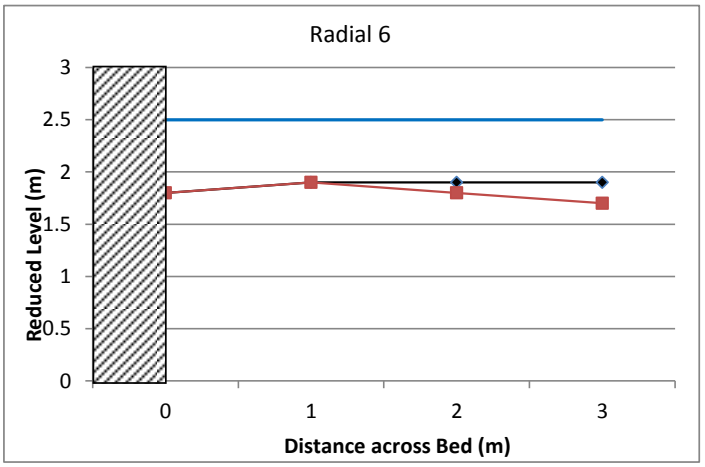
Pier 3	Radial 4		
Distance from Structure (m)	22/07/16	17/12/10	N/A
0	1.7	1.2	
1	1.8	1.2	
2	1.9	1.5	
3	1.8	1.4	



Pier 3	Radial 5		
Distance from Structure (m)	22/07/16	17/12/10	N/A
0	1.7	1.8	
1	1.8	1.7	
2	1.9	1.7	
3	1.8	1.6	



Pier 3	Radial 6		
Distance from Structure (m)	22/07/16	17/12/10	N/A
0	1.8	1.8	
1	1.9	1.9	
2	1.9	1.8	
3	1.9	1.7	



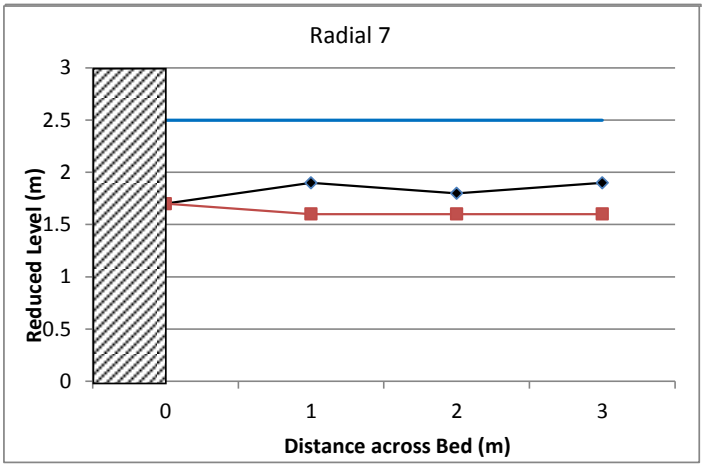
KEY:

	Current Water Level	
	Bed Level	22/07/16
	Previous Bed Level	17/12/10
	Penultimate Bed Level	N/A
	Foundation Level	

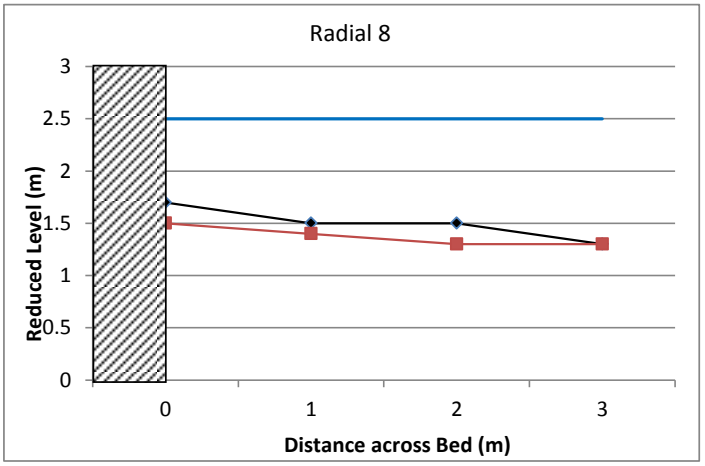
RADIAL SOUNDINGS

Lydbrook Rail Bridge

Pier 3	Radial 7		
Distance from Structure (m)	22/07/16	17/12/10	N/A
0	1.7	1.7	
1	1.9	1.6	
2	1.8	1.6	
3	1.9	1.6	



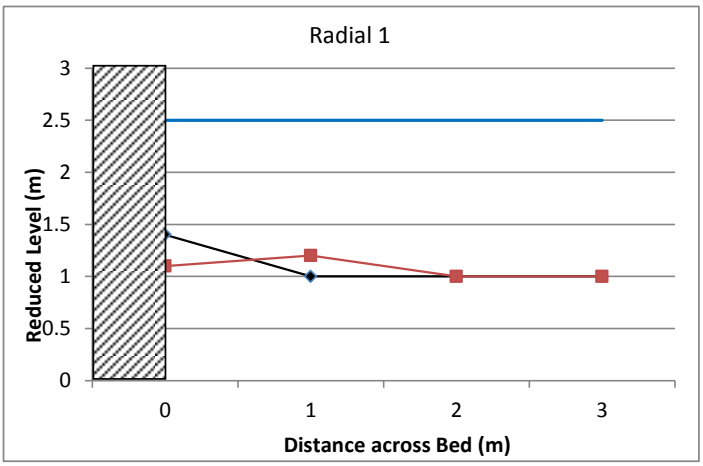
Pier 3	Radial 8		
Distance from Structure (m)	22/07/16	17/12/10	N/A
0	1.7	1.5	
1	1.5	1.4	
2	1.5	1.3	
3	1.3	1.3	



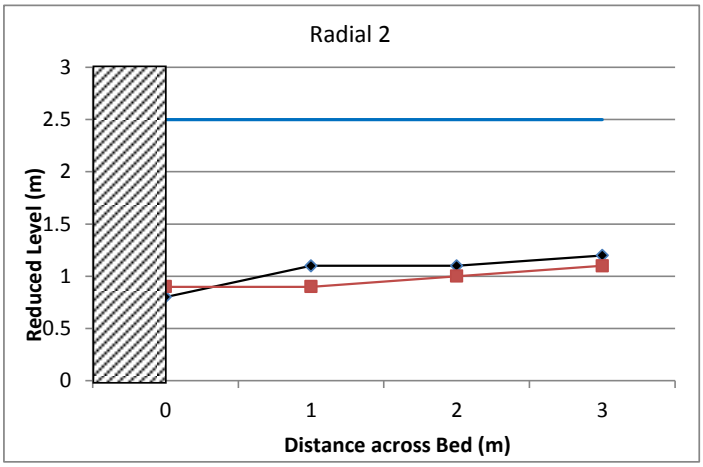
RADIAL SOUNDINGS

Lydbrook Rail Bridge

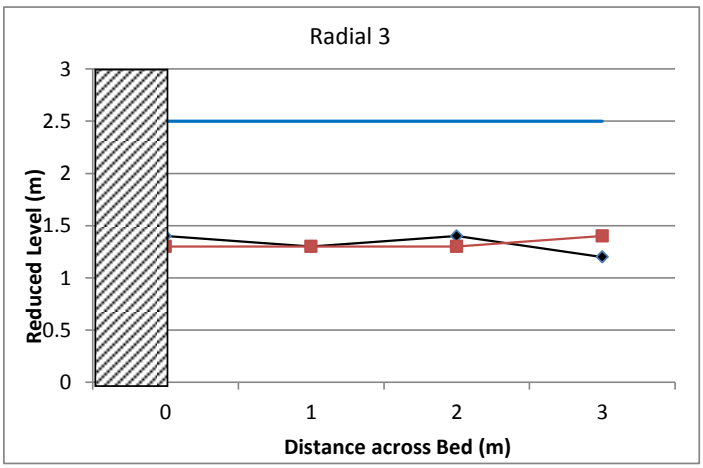
Pier 4	Radial 1		
Distance from Structure (m)	22/07/16	17/12/10	N/A
0	1.4	1.1	
1	1	1.2	
2	1	1	
3	1	1	



Pier 4	Radial 2		
Distance from Structure (m)	22/07/16	17/12/10	N/A
0	0.8	0.9	
1	1.1	0.9	
2	1.1	1	
3	1.2	1.1	



Pier 4	Radial 3		
Distance from Structure (m)	22/07/16	17/12/10	N/A
0	1.4	1.3	
1	1.3	1.3	
2	1.4	1.3	
3	1.2	1.4	



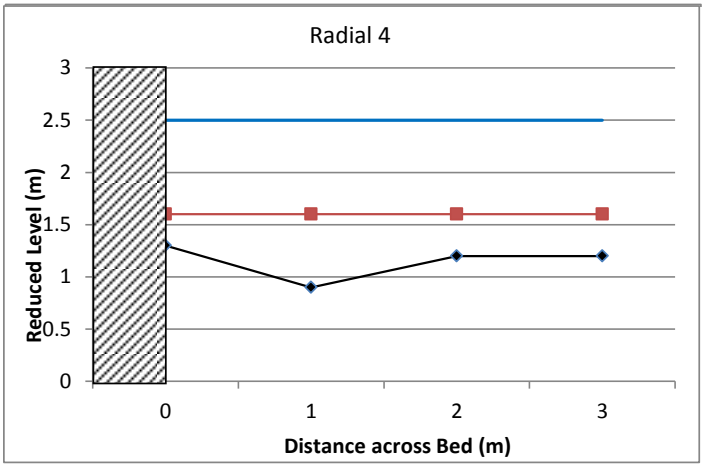
KEY:

	Current Water Level	
	Bed Level	22/07/16
	Previous Bed Level	17/12/10
	Penultimate Bed Level	N/A
	Foundation Level	

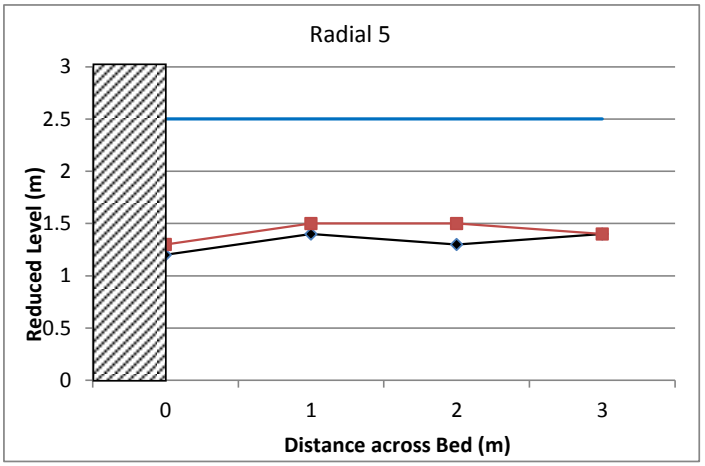
RADIAL SOUNDINGS

Lydbrook Rail Bridge

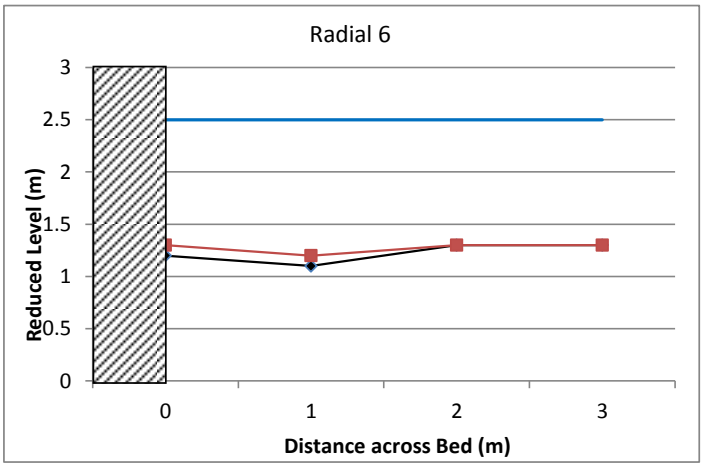
Pier 4	Radial 4		
Distance from Structure (m)	22/07/16	17/12/10	N/A
0	1.3	1.6	
1	0.9	1.6	
2	1.2	1.6	
3	1.2	1.6	



Pier 4	Radial 5		
Distance from Structure (m)	22/07/16	17/12/10	N/A
0	1.2	1.3	
1	1.4	1.5	
2	1.3	1.5	
3	1.4	1.4	



Pier 4	Radial 6		
Distance from Structure (m)	22/07/16	17/12/10	N/A
0	1.2	1.3	
1	1.1	1.2	
2	1.3	1.3	
3	1.3	1.3	



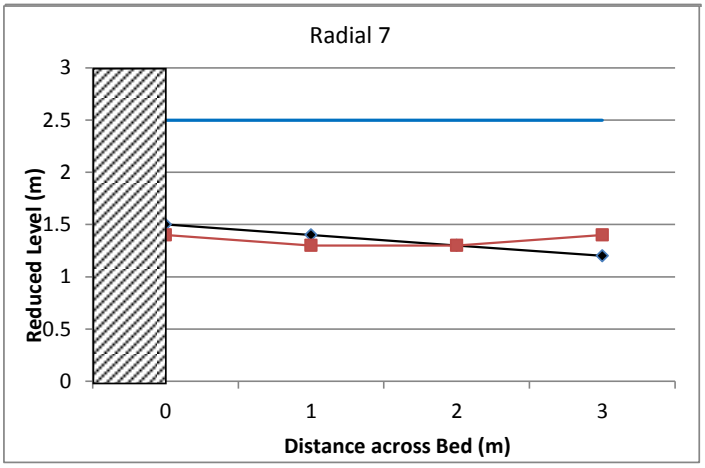
KEY:

	Current Water Level	
	Bed Level	22/07/16
	Previous Bed Level	17/12/10
	Penultimate Bed Level	N/A
	Foundation Level	

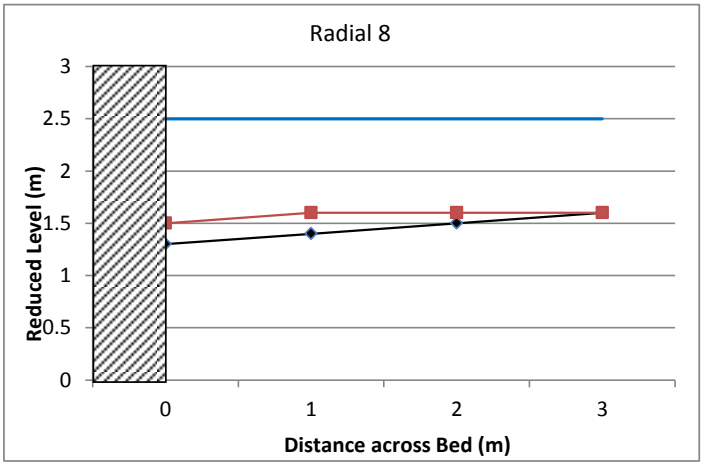
RADIAL SOUNDINGS

Lydbrook Rail Bridge

Pier 4	Radial 7		
Distance from Structure (m)	22/07/16	17/12/10	N/A
0	1.5	1.4	
1	1.4	1.3	
2	1.3	1.3	
3	1.2	1.4	



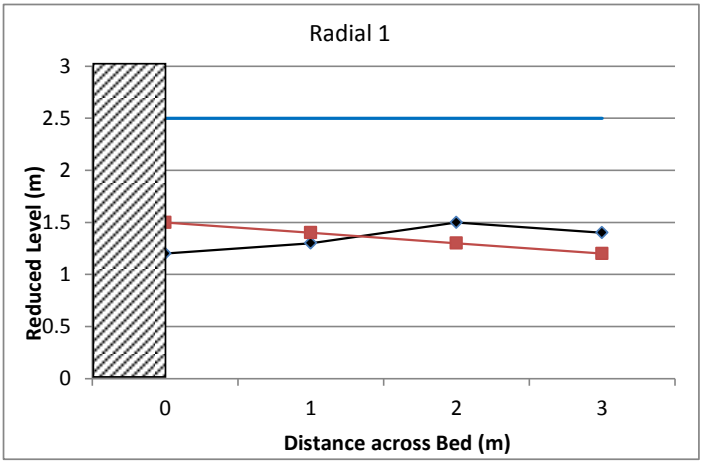
Pier 4	Radial 8		
Distance from Structure (m)	22/07/16	17/12/10	N/A
0	1.3	1.5	
1	1.4	1.6	
2	1.5	1.6	
3	1.6	1.6	



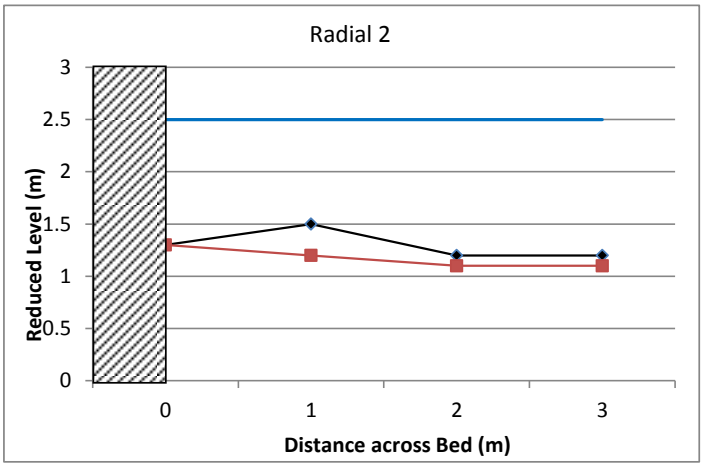
RADIAL SOUNDINGS

Lydbrook Rail Bridge

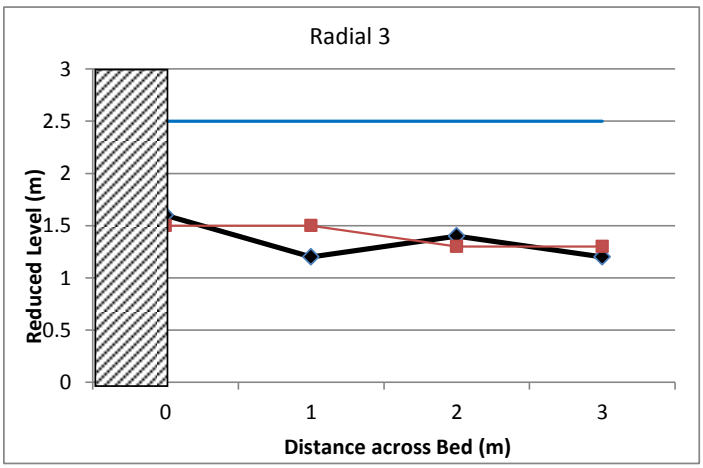
Pier 5	Radial 1		
Distance from Structure (m)	22/07/16	17/12/10	N/A
0	1.2	1.5	
1	1.3	1.4	
2	1.5	1.3	
3	1.4	1.2	



Pier 5	Radial 2		
Distance from Structure (m)	22/07/16	17/12/10	N/A
0	1.3	1.3	
1	1.5	1.2	
2	1.2	1.1	
3	1.2	1.1	



Pier 5	Radial 3		
Distance from Structure (m)	22/07/16	17/12/10	N/A
0	1.6	1.5	
1	1.2	1.5	
2	1.4	1.3	
3	1.2	1.3	



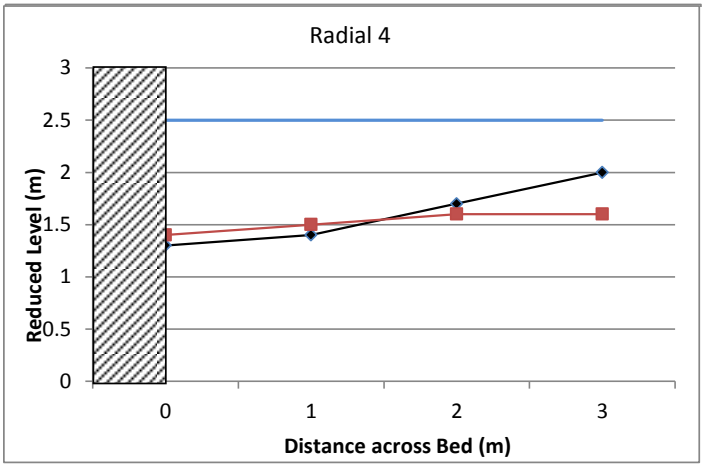
KEY:

	Current Water Level	
	Bed Level	22/07/16
	Previous Bed Level	17/12/10
	Penultimate Bed Level	N/A
	Foundation Level	

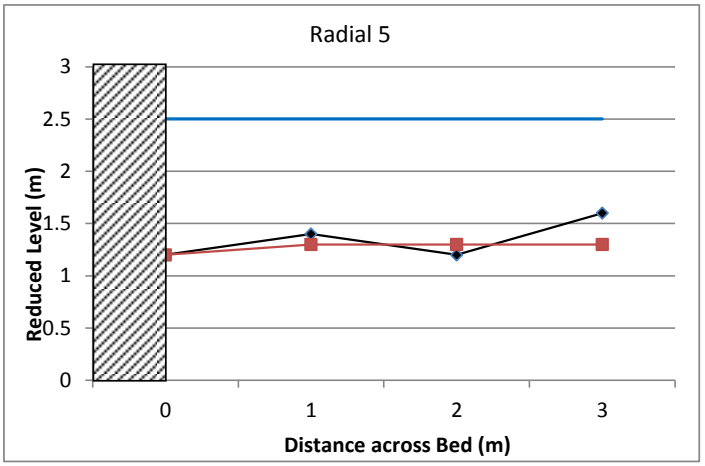
RADIAL SOUNDINGS

Lydbrook Rail Bridge

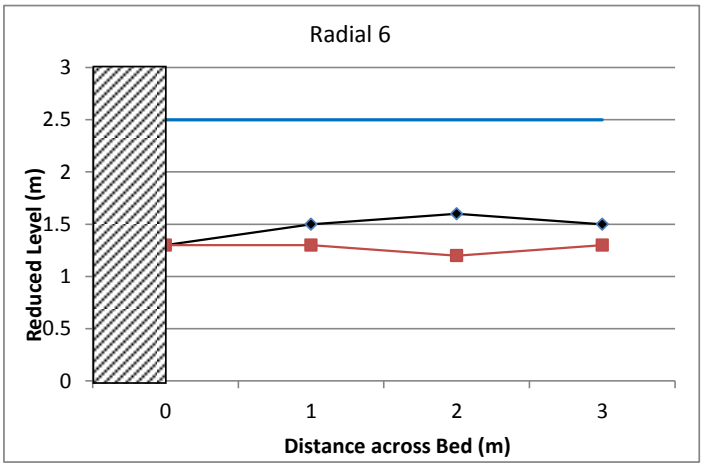
Pier 5	Radial 4		
Distance from Structure (m)	22/07/16	17/12/10	N/A
0	1.3	1.4	
1	1.4	1.5	
2	1.7	1.6	
3	2	1.6	



Pier 5	Radial 5		
Distance from Structure (m)	22/07/16	17/12/10	N/A
0	1.2	1.2	
1	1.4	1.3	
2	1.2	1.3	
3	1.6	1.3	



Pier 5	Radial 6		
Distance from Structure (m)	22/07/16	17/12/10	N/A
0	1.3	1.3	
1	1.5	1.3	
2	1.6	1.2	
3	1.5	1.3	



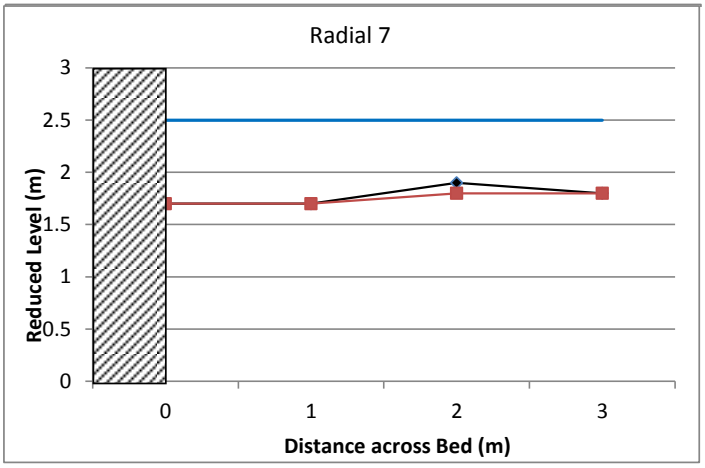
KEY:

	Current Water Level	
	Bed Level	22/07/16
	Previous Bed Level	17/12/10
	Penultimate Bed Level	N/A
	Foundation Level	

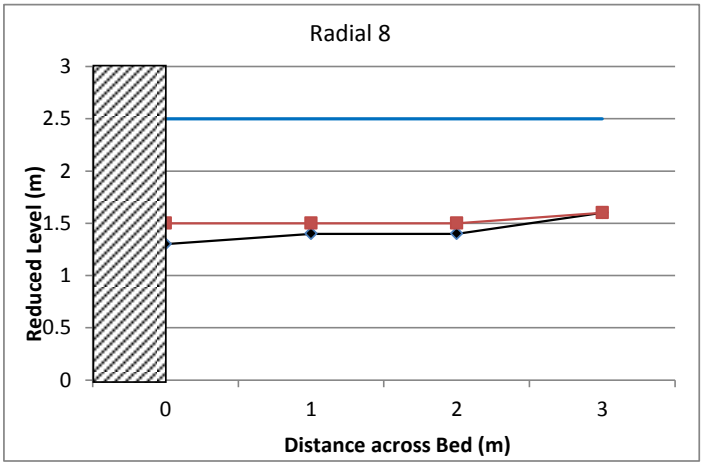
RADIAL SOUNDINGS

Lydbrook Rail Bridge

Pier 5	Radial 7		
Distance from Structure (m)	22/07/16	17/12/10	N/A
0	1.7	1.7	
1	1.7	1.7	
2	1.9	1.8	
3	1.8	1.8	



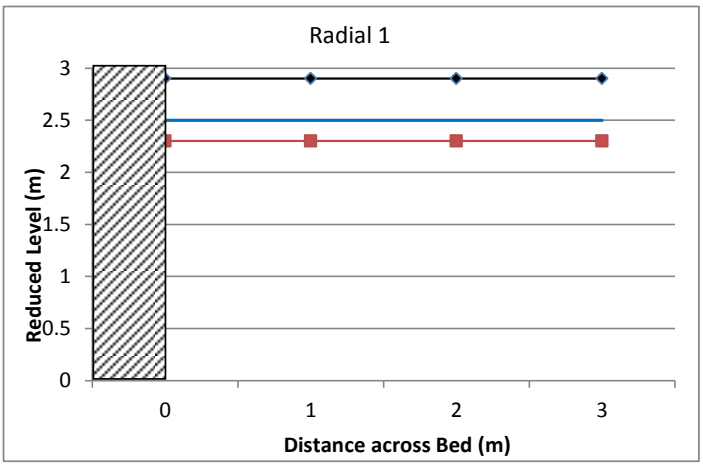
Pier 5	Radial 8		
Distance from Structure (m)	22/07/16	17/12/10	N/A
0	1.3	1.5	
1	1.4	1.5	
2	1.4	1.5	
3	1.6	1.6	



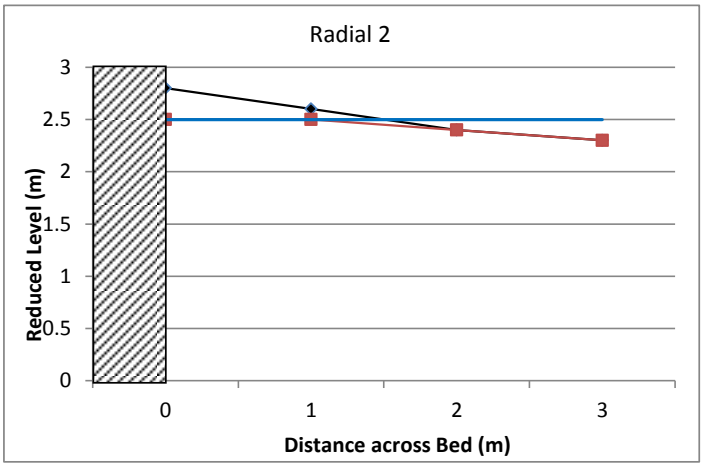
RADIAL SOUNDINGS

Lydbrook Rail Bridge

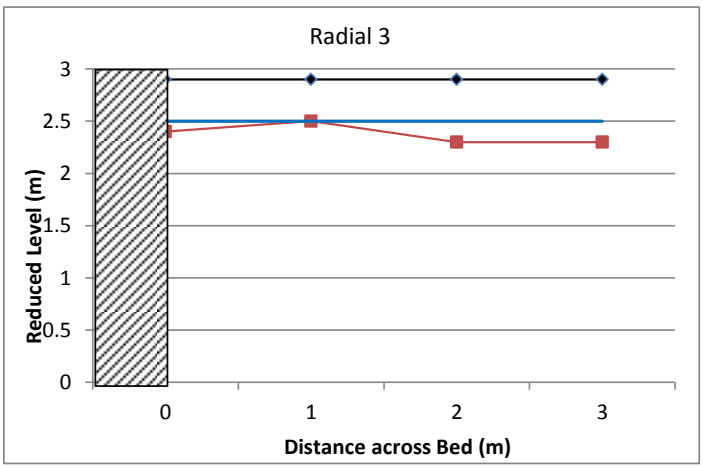
Pier 6	Radial 1		
Distance from Structure (m)	22/07/16	17/12/10	N/A
0	2.9	2.3	
1	2.9	2.3	
2	2.9	2.3	
3	2.9	2.3	



Pier 6	Radial 2		
Distance from Structure (m)	22/07/16	17/12/10	N/A
0	2.8	2.5	
1	2.6	2.5	
2	2.4	2.4	
3	2.3	2.3	



Pier 6	Radial 3		
Distance from Structure (m)	22/07/16	17/12/10	N/A
0	2.9	2.4	
1	2.9	2.5	
2	2.9	2.3	
3	2.9	2.3	



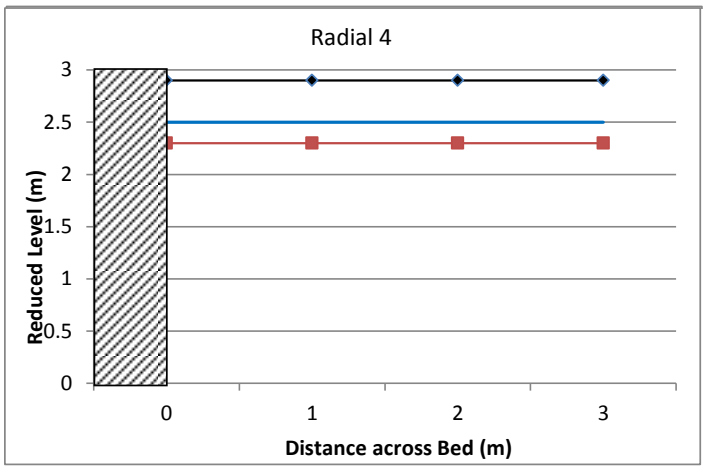
KEY:

	Current Water Level	
	Bed Level	22/07/16
	Previous Bed Level	17/12/10
	Penultimate Bed Level	N/A
	Foundation Level	

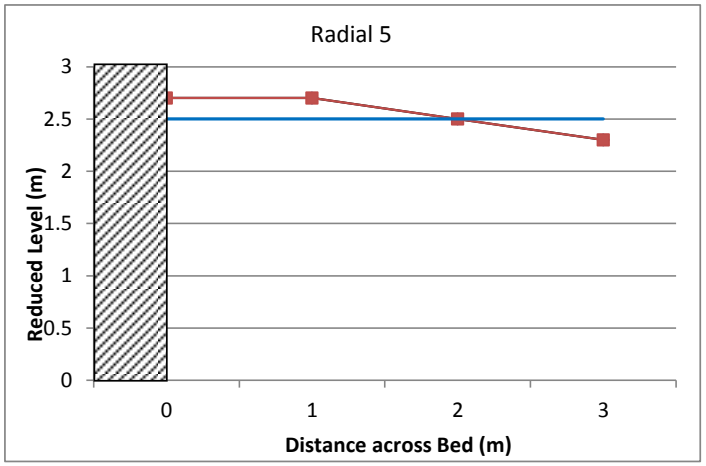
RADIAL SOUNDINGS

Lydbrook Rail Bridge

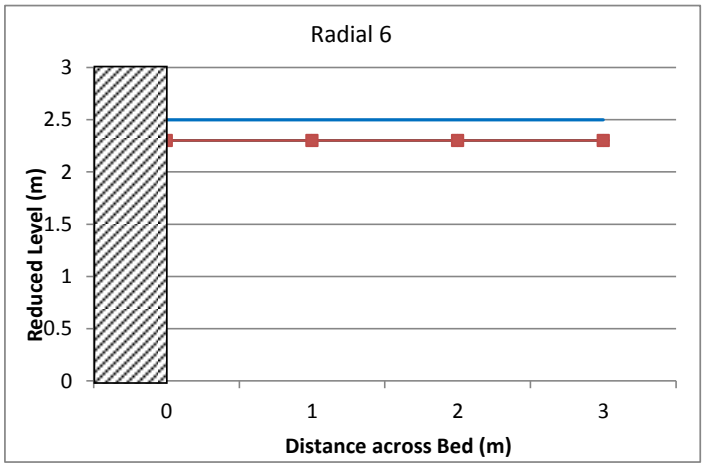
Pier 6	Radial 4		
Distance from Structure (m)	22/07/16	17/12/10	N/A
0	2.9	2.3	
1	2.9	2.3	
2	2.9	2.3	
3	2.9	2.3	



Pier 6	Radial 5		
Distance from Structure (m)	22/07/16	17/12/10	N/A
0	2.7	2.7	
1	2.7	2.7	
2	2.5	2.5	
3	2.3	2.3	



Pier 6	Radial 6		
Distance from Structure (m)	22/07/16	17/12/10	N/A
0	2.3	2.3	
1	2.3	2.3	
2	2.3	2.3	
3	2.3	2.3	



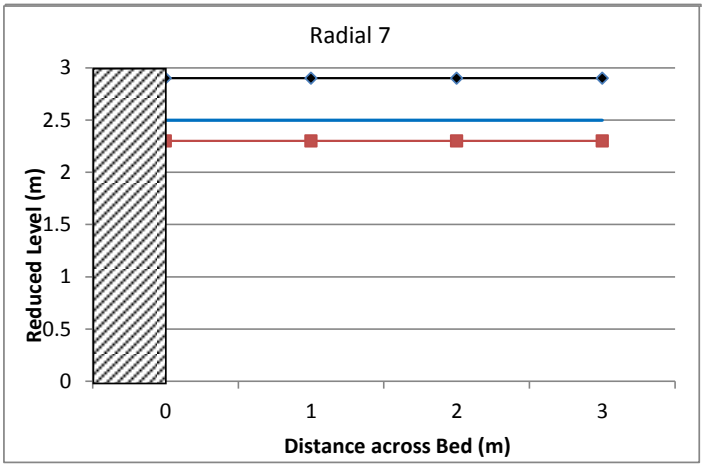
KEY:

	Current Water Level	
	Bed Level	22/07/16
	Previous Bed Level	17/12/10
	Penultimate Bed Level	N/A
	Foundation Level	

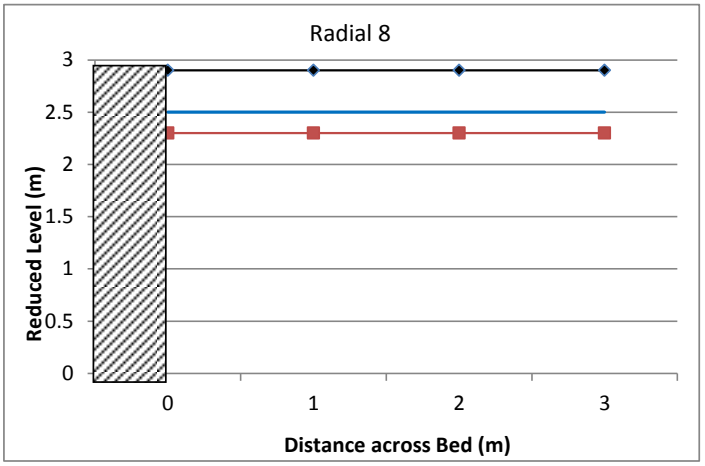
RADIAL SOUNDINGS

Lydbrook Rail Bridge

Pier 6	Radial 7		
Distance from Structure (m)	22/07/16	17/12/10	N/A
0	2.9	2.3	
1	2.9	2.3	
2	2.9	2.3	
3	2.9	2.3	



Pier 6	Radial 8		
Distance from Structure (m)	22/07/16	17/12/10	N/A
0	2.9	2.3	
1	2.9	2.3	
2	2.9	2.3	
3	2.9	2.3	



KEY:

	Current Water Level	
	Bed Level	22/07/16
	Previous Bed Level	17/12/10
	Penultimate Bed Level	N/A
	Foundation Level	