

**Bridge Inspection Pro Forma**

Version: July 2004

Superficial		General		<input checked="" type="checkbox"/>	Principal	Special		From 1 for 4 for this bridge		
Inspector: Afnan Hassan					Date: 01/03/2021		Next Inspection Type/Date: 01/03/2023			
Bridge Name: Bridge A Arches Railway Viaduct Extension						Bridge Ref/No: 1101094		Road Ref/No:		
Map Ref: TQ 11944 95405			O.S.E 511944		O.S.N: 195405		Bridge Code Primary deck form Table G.4 Primary deck material Table G.6 Secondary deck form Table G.5 Secondary deck material Table G.6			
Span 1 of 1			Span Width (m): 16.2m		Span Length (m): 18.2m					
All above ground elements inspected:			Yes	No	<input checked="" type="checkbox"/>	Photographs? Yes				No
Number of construction forms in bridge/span*			1	2	<input checked="" type="checkbox"/>	3				More (*delete as appropriate)

Set	No	Element Description	S	Ex	Def	W	P	Comment/Remarks
Deck Elements	1	Primary deck element	2	B	1.1			1. Minor surface rusting to main beams. Under bridge is covered with metal net to avoid bird nesting and dirt however, making it very difficult to inspect.
	2	Transverse beams						
	3	Concrete Deck Slab	3	D	9.1			3. Moderate discolouration due to weathering. Full visibility of concrete is not possible due to the metal net. Hidden defects may occur.
	4	Half joints	3	B	2.1	<input checked="" type="checkbox"/>		4. Deformation/exposed shear links/ corrosion/ seepage to the half joint is an indication of possible failure. Work is required but not urgent to avoid future costly redevelopment and major failure.
	5	Tie beam/rod						
	6	Parapet beams or cantilever						
	7	Deck bracing						
Load-bearing Substructure	8	Foundations	4	E	6.5	<input checked="" type="checkbox"/>		8. Foundation structure is not in good condition. Material consists of masonry and reinforced concrete. Work is required and regular maintenance. More defects included below.
	9	Abutments (incl. arch springing)	4	C	3.4		<input checked="" type="checkbox"/>	9. Bank-seat abutment style on one side not clearly visible due to metal nets. Other abutment has a wide, longitudinal crack. Crack is likely to get bigger. Immediate action required to avoid failure.
	10	Spandrel wall/head wall						
	11	Pier/column	4	D	2.2	<input checked="" type="checkbox"/>		11. Longitudinal cracks on the side of column. Adjacent to half joint indicating pressure or vibration. Work is required and regular maintained is needed to ensure crack is not getting bigger.
	12	Cross-head/capping beam						
	13	Bearings	3	B	12.2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	13. One of the bearing below the half joint is bent. Immediate work is required to avoid failure.
	14	Bearing plinth/shelf						
Durability Elements	15	Superstructure drainage	2	D	8.1			15. Superstructure drainage system seem to be functioning moderately.
	16	Substructure drainage	4	E	8.3	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	16. Substructure drainage is failed due to the surface excessive dampness and algal growth causing bright green/ black staining. Work is required to avoid further bridge elements damage.
	17	Waterproofing	5	E	14.2		<input checked="" type="checkbox"/>	17. Non-functional waterproofing causing water leakage affecting bridge structure elements.
	18	Movement/expansion joints	1	A	1.3			18. No visible defect. Hidden by metal net.
	19	Finishes: deck elements						
	20	Finishes: substructure elements						
	21	Finishes: parapets/safety fences						
Safety Elements	22	Access/walkways/gantries						
	23	Handrail/parapets/safety fences	1	A	1.1			23. No signs of defects on the handrail. However, handrail must also be checked from above.
	24	Carriageway surfacing						
	25	Footway/verge/footbridge surfacing						
Other Bridge Elements	26	Invert/river bed						
	27	Aprons						
	28	Fenders/cutwaters/collision port						
	29	River training works						
	30	Revetment/batter paving						
	31	Wing walls						
	32	Retaining walls	4	E	3.5		<input checked="" type="checkbox"/>	32. Very wide diagonal cracks for at least 7 meters in the wall is an indication of further hidden issue. Cracks must be looked into immediately to avoid major failure of the retaining wall imposing great danger to pedestrians.
	33	Embankments	1	A	11.1			33. Embankment defects no visible. Need to be checked from above.
	34	Machinery						
Ancillary Elements	35	Approach rails/barriers/walls						
	36	Signs						
	37	Lighting						
	38	Services						

S - severity, Ex - extent, Def - defects, W - work required, P - work priority

MULTIPLE DEFECTS									
Element No.	Defect 1			Defect 2			Defect 3		
	S	Ex	Def	S	Ex	Def	S	Ex	Def
8	2	C	6.3	3	D	3.1	5	E	14.1
11	3	D	3.1	5	D	14.2	3	C	2.1
13	4	E	12.1						

8. No visible rotation/sliding but a large crack may be due to it. Moderate deformation to the corner of the masonry work. Non-functional waterproofing causing critical damage to external elements.

11. Moderate deformation to mass concrete. Major structural damage caused by waterproofing failure.

13. Major rusting on all bearings of the bridge.

32	2	D	5.2							32. Low density of vegetation just above the crack line. Vegetation must be regularly clean to avoid obscuring inspection.
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Superficial	General	<input checked="" type="checkbox"/>	Principal	Special	From 1 for 4 for this bridge
Inspector: Afnan Hassan			Date:	01/03/2021	Next Inspection Type/Date: 01/03/2023
Bridge Name: Bridge A Arches Railway Viaduct			Bridge Ref/No: 1101094		Road Ref/No:
Map Ref: TQ 11944 95405		O.S.E	511944	O.S.N: 195405	
Span 1 of 3		Span Width (m): 16.2m		Span Length (m): 9.1m	
All above ground elements inspected:		Yes	No	<input checked="" type="checkbox"/>	Photographs? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Number of construction forms in bridge/span*		1	2	<input checked="" type="checkbox"/>	3 More (*delete as appropriate)

Set	No	Element Description	S	Ex	Def	W	P	Comment/Remarks
Deck Elements	1	Primary deck element	3	E	9.1			1. Stone Voussoirs in good condition, no visible arch ring separation or cracks. Moderate weathering and
	2	Secondary deck element/s						
	3	Transverse beams						
	4	Barrel	4	E	3.2			3. Arch barrel in poor condition but not crucial. Mortar joints are in very poor condition, crumbling to touch and spread over the masonry surface. Barrel has different colour stains indicating damp and water seepage.
	5	Half joints						
	6	Tie beam/rod	2	C	1.1			5. Rod end is visible on the spandrel wall. End face has minor surface rusting but could be corroded from the inside- Signs of corrosion on brick surface.
	7	Parapet beams or cantilever						
Load-bearing Substructure	8	Deck bracing						
	8	Foundations	1	A	6.1			8. Foundation structure is not visible.
	9	Abutments (incl. arch springing)	3	E	3.2			9. Brick work is in good condition but there is a moderate loss of mortar and signs of salt crystallisation and corrosion of embedded rod on surface.
	10	Spandrel wall/head wall	2	B	3.6			10. Few bricks missing around the area of the rod end face. More defects listed below.
	11	Pier/column						
	12	Cross-head/capping beam						
	13	Bearings						
Durability Elements	14	Bearing plinth/shelf						
	15	Superstructure drainage	5	D	8.1			15. One of the drainage pipe is completely broken causing vegetation or penetrate through the pipe. Other surface drainage pipes suffer from rusting and minor leakage. Fixing required.
	16	Substructure drainage	5	E	8.3			16. Signs of substructure drainage failure causing wet patches and sever damages to adjacent elements.
	17	Waterproofing	4	E	14.1			17. Major water seepage is visible on bricks through the barrel causing structural damage.
	18	Movement/expansion joints						
	19	Finishes: deck elements						
	20	Finishes: substructure elements						
Safety Elements	21	Finishes: parapets/safety fences						
	22	Access/walkways/gantries						
	23	Handrail/parapets/safety fences	2	B	5.1			23. Early signs of minor vegetation rooted in masonry joints need to be cleared to avoid future obscure to the structure hiding defects.
	24	Carriageway surfacing						
	25	Footway/verge/footbridge surfacing						
	26	Invert/river bed						
	27	Aprons						
Other Bridge Elements	28	Fenders/cutwaters/collision port						
	29	River training works						
	30	Revetment/batter paving						
	31	Wing walls	3	D	3.2			31. Loss/ spread/ of mortar joints
	32	Retaining walls						
	33	Embankments						
	34	Machinery						
Ancillary Elements	35	Approach rails/barriers/walls						
	36	Signs						
	37	Lighting						
	38	Services						

S - severity, Ex - extent, Def - defects, W - work required, P - work priority

MULTIPLE DEFECTS									
Element No.	Defect 1			Defect 2			Defect 3		
	S	Ex	Def	S	Ex	Def	S	Ex	Def
13	4	E	9.1						

13. Signs of chipping and spalling of bricks due to sulphate attack and patches of salt crystallisation.

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Inspector: Afnan Hassan							Date:		01/03/2021		Next Inspection Type/Date: 01/03/2023								
Bridge Name: Bridge A Arches Railway Viaduct									Bridge Ref/No: 1101094				Road Ref/No:						
Map Ref: TQ 1944 95405				O.S.E		511944		O.S.N: 195405				<div style="display: flex; align-items: center;"> <div style="writing-mode: vertical-rl; transform: rotate(180deg); border: 1px solid black; padding: 2px;">Bridge Code</div> <div>           Primary deck form Table G.4            Primary deck material Table G.6            Secondary deck form Table G.5            Secondary deck material Table G.6         </div> </div>							
Span 2 of 3				Span Width (m): 16.2m				Span Length (m): 9.1m											
All above ground elements inspected:				Yes		No		<input checked="" type="checkbox"/>		Photographs? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No									
Number of construction forms in bridge/span*				1		2		3		More		(*delete as appropriate)							

Set	No	Element Description	S	Ex	Def	W	P	Comment/Remarks
Deck Elements	1	Primary deck element	2	C	14.2			1. Bright green patches of Algal growth indicating high levels of dampness.
	2	Secondary deck element/s						
	3	Transverse beams						
		Barrel	4	D	10.12			3. Very wet area over one side of the barrel is an indication of joint water leakage.
	4	Half joints						
	5	Tie beam/rod						
	6	Parapet beams or cantilever						
	7	Deck bracing						
Load-bearing Substructure	8	Foundations	1	A	6.1			8. Foundation structure is not visible.
	9	Abutments (incl. arch springing)	1	A	3.1			9. Abutments have been covered with a metal structure to either perform maintenance/improvement work or to provide support to a previously failed structure.
	10	Spandrel wall/head wall	2	B	3.6			10. Good condition. Minor surface weathering and few chips to bricks.
	11	Pier/column						
	12	Cross-head/capping beam						
	13	Bearings						
	14	Bearing plinth/shelf						
Durability Elements	15	Superstructure drainage	2	E	8.1			15. Span 2 main drainage is mostly functional, no signs of leakage. Pipe work is rusting.
	16	Substructure drainage	3	D	8.2			16. Signs of substructure drainage failure causing wet patches and sever damages to adjacent elements.
	17	Waterproofing	3	D	14.1			17. Moderate dampness patches across the barrel.
	18	Movement/expansion joints						
	19	Finishes: deck elements						
	20	Finishes: substructure elements						
	21	Finishes: parapets/safety fences						
Safety Elements	22	Access/walkways/gantries						
	23	Handrail/parapets/safety fences	1	B	5.1			23. Early signs of vegetation growth.
	24	Carriageway surfacing						
	25	Footway/verge/footbridge surfacing						
Other Bridge Elements	26	Invert/river bed						
	27	Aprons						
	28	Fenders/cutwaters/collision port						
	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						
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Map Ref: TQ 11944 95405		O.S.E		511944		O.S.N: 195405		Bridge Code Primary deck form Table G.4 Primary deck material Table G.6 Secondary deck form Table G.5 Secondary deck material Table G.6	
Span 3 of 3		Span Width (m): 16.2m		Span Length (m): 9.1m					
All above ground elements inspected:		Yes	No	<input checked="" type="checkbox"/>	Photographs? Yes No				
Number of construction forms in bridge/span*		1	2	<input checked="" type="checkbox"/>	3	More		(*delete as appropriate)	

Set	No	Element Description	S	Ex	Def	W	P	Comment/Remarks
Deck Elements	1	Primary deck element	3	E	9.1			1. Moderate wear/ weathering to stone voussoir.
	2	Secondary deck element/s						
	3	Transverse beams						
	4	Barrel	3	D	10.12			3. Moderate leakage through joints and early signs of patches of salt stains.
	5	Half joints						
	6	Tie beam/rod						
	7	Parapet beams or cantilever						
Load-bearing Substructure	8	Deck bracing						
	9	Foundations	1	A	6.1			8. Foundation structure is not visible.
	10	Abutments (incl. arch springing)	4	E	14.1			9. Abutments suffer from major dark/black stains which is an indication of seepage.
	11	Spandrel wall/head wall	3	C	3.1			10. Moderate deformation due to excessive wetness visible from the deformed black stained bricks.
	12	Pier/column						
	13	Cross-head/capping beam						
	14	Bearings						
Durability Elements	15	Bearing plinth/shelf						
	16	Superstructure drainage	2	E	8.1			15. Span 2 main drainage is mostly functional, no signs of leakage. Pipe work is rusting.
	17	Substructure drainage	4	E	8.2			16. Signs of substructure drainage failure causing wet patches and sever damages to adjacent elements on or around abutment area as well as the barrel.
	18	Waterproofing	2	D	14.1			17. Slow dripping is a sign of water seepage.
	19	Movement/expansion joints						
	20	Finishes: deck elements						
	21	Finishes: substructure elements						
Safety Elements	22	Finishes: parapets/safety fences						
	23	Access/walkways/gantries						
	24	Handrail/parapets/safety fences	3	E	9.1			23. Moderate wear/ weathering.
	25	Carriageway surfacing						
Other Bridge Elements	26	Footway/verge/footbridge surfacing						
	27	Invert/river bed						
	28	Aprons						
	29	Fenders/cutwaters/collision port						
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	38	Lighting						
		Services						

S - severity, Ex - extent, Def - defects, W - work required, P - work priority

MULTIPLE DEFECTS									
Element No.	Defect 1			Defect 2			Defect 3		
	S	Ex	Def	S	Ex	Def	S	Ex	Def
1	2	C	9.1						1. Moderate wear of stone surface due to weathering.
23	2	D	9.1						23. Minor wear or masonry surface and weathering.