



East West Rail Western Section

Underbridge Repair Schedule

March 2010

Notice

This document was produced by Atkins Limited for Milton Keynes Partnerships for the specific purpose of the Commission.

This document may not be used by any person other than Milton Keynes Partnership without Milton Keynes Partnership’s express permission. In any event, Atkins accepts no liability for any costs, liabilities or losses arising as a result of the use of or reliance upon the contents of this report by any person other than Milton Keynes Partnership.

Document History

JOB NUMBER: 5079988			DOCUMENT REF: 5079988-ATK-REP-CV-1201			
P01	For Review	R Phillips	M Bailey	B. Chaudhry	J. Baldock	09.03.10
Revision	Purpose Description	Originated	Checked	Reviewed	Authorised	Date

Contents

Section	Page
1. Introduction	3
2. Brickwork Repair Schedule	3

Appendices

Appendix A - Network Rail Brickwork and Masonry Repair Standard Details

Appendix B - Structure Defects Drawings

1. Introduction

A total of 27 No. existing underbridges carry the OXD, MCJ2 and MCJ3 lines affected by the East West Rail Project, Western Section over a variety of roads, water courses or access tracks. Many of these bridges are of masonry construction and date back to circa 1850 when the route was first opened.

The repairs included in the schedule are limited to the refurbishment of the brickwork/masonry elements of the structure. Any additional structural modifications or strengthening works which may be required as part of the implementation of the East West Rail Project will be covered separately. The majority of these items are seen as maintenance activities which will not necessarily be funded by the EWR project. The schedule has been prepared to give an indication of the volume of work for pricing using photographs and notes from initial site surveys undertaken by Atkins in October and November 2009. A more detailed survey is required to verify the quantities given.

2. Brickwork Repair Schedule

The brickwork repair schedule has been compiled for all underbridges affected by the project which includes:

- 15 No. brickwork / masonry arch structures;
- 7No. metallic deck on brick substructures;
- 5 No. Reinforced Concrete deck on brick substructures;

All structures other than Bletchley Flyover have been constructed to carry 2 No tracks. These structures vary in size from 10.44m wide single 2.74m span to 7.81m wide 4 No. 11.53m spans. The Bletchley Flyover single track bridge is a 5.8m wide 4 No. span structure, of 10.38m, 12.75m, 13.80m and 5.80m spans.

For details and specification of the repairs refer to the following Network Rail Brickwork and Masonry Repair Standard Details which are included in Appendix A:

Repair Type	Drawing Number	Revision	Title
Arch ring re-casing.	NR/CIV/SD/103	A	Re-casing of defective brickwork in arches and tunnel linings greater than 4 rings with bonding between rings
	NR/CIV/SD/104	A	Re-casing of defective brickwork in arches and tunnel linings up to 4 rings
	NR/CIV/SD/105	A	Single ring re-casing of defective brickwork in arches and tunnel linings up to 4 rings
Arch ring cross pinning and grouting.	NR/CIV/SD/106	A	Brick arch ring and tunnel lining cross pinning and grouting system
Longitudinal cracks between spandrel / voussoir and arch barrel to be stitched.	NR/CIV/SD/107	A	Stitching of longitudinal cracks in arches and tunnel lining between brick spandrel / voussoir and arch barrel

Crack to arch soffit / abutment / wingwall / parapet to be stitched.	NR/CIV/SD/108 NR/CIV/SD/109 NR/CIV/SD/110	A	Stitching of longitudinal cracks in brickwork
Jack arches to be re-cased.	NR/CIV/SD/113	A	Re-casing jack arches
Vertical walls to be re-cased.	NR/CIV/SD/116	A	Re-casing vertical walls
New tie bars / pattress plates.	NR/CIV/SD/120	A	Tie bar / pattress plate assembly options
10-25mm mortar loss to be repointed.	NR/CIV/SD/101	A	Specification for the Works
25-50mm mortar loss to be repointed.	NR/CIV/SD/101	A	Specification for the Works

Further detail on the condition of the structures can be found in Appendix C of the Structures Level 1 Assessment Report (document ref: 5079988/ATK/REP/GN/015).

ELR	Structure No.	Structure Name	Mileage	Construction Type	Span(s) m	Approx. bridge width (m)	Repair Type									Bridge deck waterproofing (m ²)	Other Significant Works	Other Minor Works	
							A (m ²)	B (m ²)	C (m)	D (m)	E (m ²)	F (m ²)	G (No.)	H (m ²)	I (m ²)				
MCJ2	161	California Brook	38m45ch	4 No. longitudinal steel troughs with long timbers	4.00 (clear)	8.53											None identified.	None identified.	
MCJ2	164	Watercourse	39m02ch	2 No. Reinforced Concrete parapet beams and 4 No. post-tensioned pre-cast concrete units	3.4 (clear)	8.87				4		2			5		None identified.	None identified.	
MCJ2	168	-	39m79.5ch	Four ring masonry arch	2.74 (clear)	10.44											Removal of vegetation, stripping and rebuilding existing mass brickwork wingwall approx. 5m ²	None identified.	
MCJ2	170	River Thame	40m05ch	Reinforced Concrete slab	7.18	10.17											None identified.	None identified.	
MCJ2	171	-	40m11ch	Four ring masonry arch	2.90	10.44	10	20		4			2		10		None identified.	None identified.	
MCJ2	174	Cattle Creep	40m41ch	Four ring masonry arch	2.74 (clear)	10.44											None identified.	None identified.	
MCJ2	175	Akeman Street	40m52ch	Steel half-through with steel trough decking	9.00	7.92	Works covered by a separate Form A												
MCJ2	175A	-	40m53ch	Four ring masonry arch with internal concrete box culvert	3.66 (clear)	11.28											None identified.	None identified.	
MCJ3	571	Captain Pigott's	160m41ch	2 No. steel edge parapet girders with long steel troughing	NO	DATA											None identified.	Grit blasting, repainting.	
MCJ3	569	Adams	159m77ch	2 No. steel edge parapet girders with long steel troughing	NO	DATA											None identified.	Grit blasting, repainting.	
MCJ3	566	Costellos	158m46ch	2 No. steel edge parapet girders with long steel troughing	3.66 (Clear)	9.28								10			None identified.	Grit blasting, repainting.	
OXD	4	Cattle Arch	0m79ch	Four ring masonry arch	3.50 (clear)	8.30	Works covered by a separate Form A												
OXD	5	Cattle Arch	1m20ch	Four ring masonry arch	3.50 (clear)	12.92				50		1		15			None identified.	Raising brickwork parapets. Removal of vegetation to rear of wingwalls.	
OXD	6	Newton Road	1m38ch	Five ring masonry arch	3No 10.10 (clear)	8.25	2			15				5	300		None identified.	Raising brickwork parapets.	
OXD	7	Tomkins Bridge	1m57ch	Four ring masonry arch	6.34 (clear)	8.19	Works covered by a separate Form A												
OXD	8	Frenches Bridge	2m03ch	Four ring masonry arch	5.79 (clear)	7.35	Works covered by a separate Form A												
OXD	10A	Un-named watercourse	3m76ch	Reinforced Concrete slab	3.79	8.50									35		None identified.	Concrete repairs to parapet, infilling of void approx. 0.5m ²	
OXD	15	Horwood Brook	6m29ch	Five ring masonry arch with 3 No. four ring strengthening ribs	4 No 10.06 (clear)	8.20	Works covered by a separate Form A												
OXD	16	Horwood Road	6m47ch	Steel A-type decks	14.12	8.80	Works covered by a separate Form A												
OXD	17	Horwood Brook	6m64ch	Five ring masonry arch with 3 No. five ring strengthening ribs	3 No 6.2 (clear)	8.24	Works covered by a separate Form A												
OXD	21	Cattle Arch	8m02ch	Four ring masonry arch	5.72 (clear)	8.11									60		None identified.	Unable to inspect due to lack of access, Raising brickwork parapets.	
OXD	22	Verney Road	8m22ch	Five ring masonry arch	3 No 7.65 (clear)	8.26	Works covered by a separate Form A												
OXD	23	Cattle Arch	8m37ch	Four ring masonry arch	3 No 4.76 (clear)	7.50						1		1	1	160		None identified.	Raising brickwork parapets
OXD	24	Addington	8m66ch	Five ring masonry arch	4 No 11.53 (clear)	7.81	Works covered by a separate Form A												
OXD	32	Marsh Gibbon Turnpike	15m10ch	Reinforced Concrete slab, direct fix	9.7	8.87											Baseplates to form part of PWay Form A	None identified.	

Key to Repair Type references:

- A = Arch ring re-casing.
- B = Arch ring cross pinning and grouting.
- C = Longitudinal cracks between spandrel / voussoir and arch barrel to be stitched.
- D = Cracks to arch soffit / abutment / wingwall / parapet to be stitched.
- E = Jack arches to be re-cased.
- F = Vertical walls to be re-cased.
- G = New tie bars / pattress plates.
- H = 10-25mm mortar loss to be re-pointed.
- I = 25-50mm mortar loss to be re-pointed.

ELR	Structure No.	Structure Name	Mileage	Construction Type	Span(s) m	Approx. bridge width (m)	Repair Type									Bridge deck waterproofing (m ²)	Other Significant Works	Other Minor Works
							A (m ²)	B (m ²)	C (m)	D (m)	E (m ²)	F (m ²)	G (No.)	H (m ²)	I (m ²)			
OXD	34	Thornhill	16m47ch	Steel long and cross girders with concrete infill deck	7.74	6.57											None identified.	Grit blasting, repainting.
OXD	35	Castlemans	17m21ch	Reinforced concrete slabs	4.05	8.15											None identified.	None identified.

Key to Repair Type references:

- A = Arch ring re-casing.
- B = Arch ring cross pinning and grouting.
- C = Longitudinal cracks between spandrel / voussoir and arch barrel to be stitched.
- D = Cracks to arch soffit / abutment / wingwall / parapet to be stitched.
- E = Jack arches to be re-cased.
- F = Vertical walls to be re-cased.
- G = New tie bars / pattress plates.
- H = 10-25mm mortar loss to be re-pointed.
- I = 25-50mm mortar loss to be re-pointed.

Appendix A

Network Rail Brickwork and Masonry Repair Standard Details

Appendix B

Structure Defects Drawings