

K424-OCSC-XX-XX-RP-C-0003

REMEDIATION METHODOLOGY

Monasterevin Bridge Remediation

Project: K424

January 2021



OCSC

O'CONNOR | SUTTON | CRONIN

Multidisciplinary
Consulting Engineers



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1 INTRODUCTION

1.1 Introduction

O'Connor Sutton Cronin (OCSC) were appointed by Kildare County Council to undertake a condition survey of Monasterevin Bridge. Following the condition survey OCSC undertook the design of the remediation works required for the structure. The survey identified that the proposed repair works consists of repointing of the parapets, relaying of the bridge surface, reconstruction of the riverbed under some of the arches, removal of vegetation from embankments and the inclusion of underpinning repairs to the upstream cutwaters of the R445 bridge crossing the River Barrow in Monasterevin, Co. Kildare.

An AA screening was required to be undertaken for the proposed remedial works to confirm if likely significant effects on European sites will arise from the proposed repair works either alone or in combination with other plans or projects and as to whether the proposed development is likely to have significant effects on European sites, either individually or in combination with other plans or projects.

For the reasons set out in detail in the AA Screening Report undertaken by Scott Cawley (reference date 08th May 2019), it was objectively concluded that an Appropriate Assessment of the proposed Project is required as it could not be concluded, on the basis of objective information, that the proposed Project, either individually or in combination with other plans or projects, will not have a significant effect on the following European site(s): River Barrow and River Nore SAC.

As part of the Appropriate Assessment process OCSC engaged QED Engineering to prepare a Natura Impact Statement (NIS). To assist QED in completing the NIS, OCSC are required to prepare a construction methodology to be submitted to QED for its inclusion in the Natura Impact Statement, which is the subject of this report.

1.2 Project Background

In October 2014, Malachy Walsh and Partners Consulting Engineers conducted a Principal Inspection survey for Monasterevin Bridge (See Appendix A). The bridge was given an overall structural rating of "Category 4". The Principal survey was conducted, and rating given in accordance with EIRSPAN Bridge Management System Principal Inspection manual (AM-STR-06054) published by TII. As can be seen from this report, areas of particular deterioration include the Bridge piers and Riverbed scour, both categories receiving a "Category 4" rating.

1.3 Bridge Description

Monasterevin Bridge carries the R445 over the River Barrow located in the south western area of Monasterevin town, Co. Kildare. The bridge is a five-span cut-stone road bridge built circa 1832. The superstructure is supported by 2 no. masonry abutments and 4 no. masonry piers. The arches are elliptical in shape with cut stone voussoirs. The original bridge deck was made of rubble stone that has since been rendered over. Concrete skirts have been retrofitted to the 2 no. abutments and 4 no. piers to provide scour protection. See figure 1 below for photo of Monasterevin Upstream Elevation.



Figure 1: Monasterevin Bridge Upstream Elevation

2 SITE ECOLOGIST

For the duration of the project a site ecologist will be employed.

3 SITE ACCESS

Access to the bridge will be from the R445. Please see figure 2 and 3 below site location drawing K424-OCSC-XX-XX-DR-C-0100 (See Appendix B) detailing the location of the site. Access to the riverbed for plant and equipment will be from the downstream west embankment.



Figure 2: Site Location map

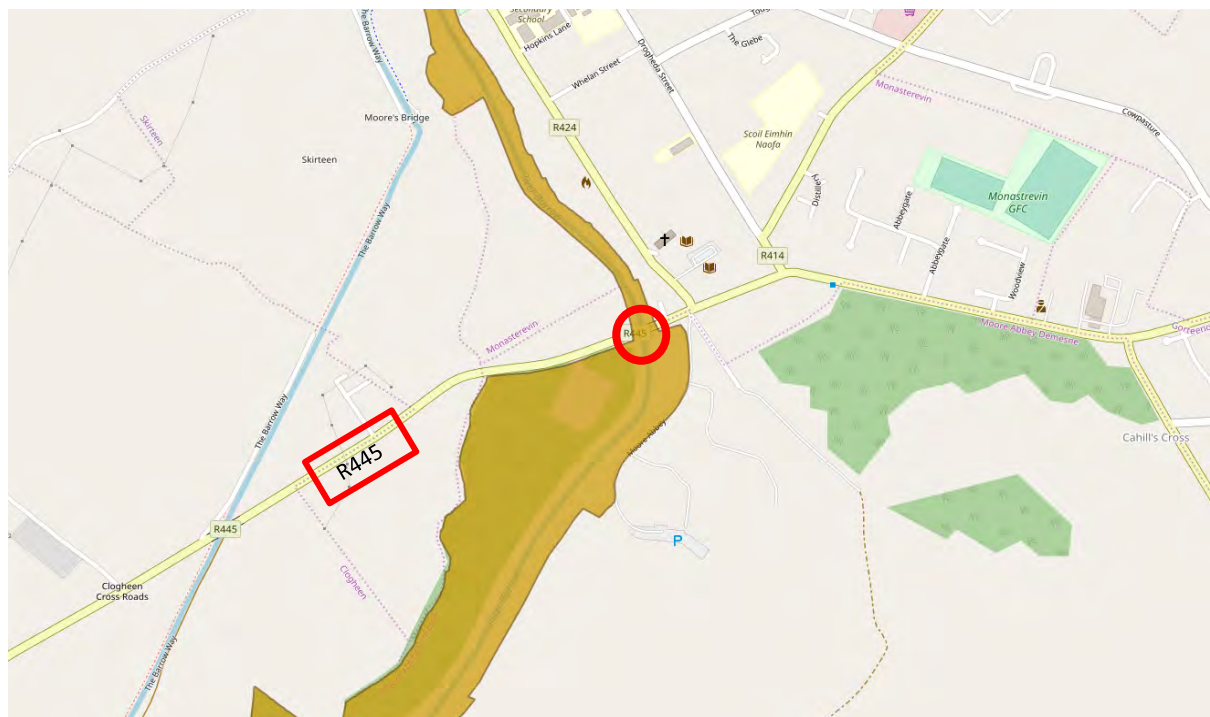


Figure 3: Location map with the boundary of the River Barrow SAC highlighted in orange

4 DESCRIPTION OF IN-STREAM WORKS

4.1 Rock Armour Installation

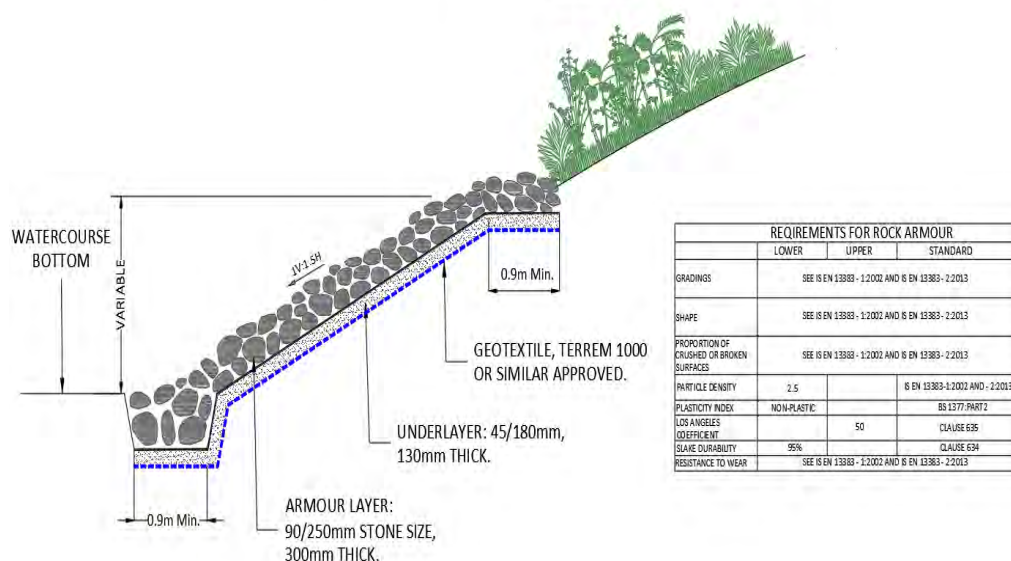
It was noted during OCSCs survey of Monasterevin Bridge that on the downstream east embankment scouring was occurring along a 15m section. OCSC are proposing the installation of rock armour along the 15m section. See Figure 4 below for image of extent of scouring and Detail 8 overleaf for scour protection – rock armour installation.



Figure 4: Scouring along downstream east embankment

DETAIL 8: SCOUR PROTECTION- ROCK ARMOUR

Scale: NTS



The following is the methodology for the installation of rock armour:

- i. Please refer to section 6 of this report for refuelling and servicing of plant/equipment prior to commencement of works;
- ii. Access to the riverbed for plant and equipment will be from the downstream west embankment;
- iii. Sandbags and silt fences or similar will be installed adjacent to the section of bank where the works are to be undertaken to divert the river flow from the works area. If pumping is required to dewater the works area silt bags will also be used. The site ecologist will monitor suspended solids downstream of the works;
- iv. With the river flow diverted the works will be able to be undertaken in a dry stream environment to ensure that no discharge of sediment occurs to the river during the works;
- v. The existing embankment will be regraded to achieve a slope ratio 1vertical:1.5horizontal. Any excess material will be taken away and disposed of offsite. Measures will be implemented to minimise waste and ensure correct handling, storage and disposal of waste;
- vi. A toe trench will be dug along the bottom of the embankment, minimum 0.9m wide;
- vii. At the top of the embankment a plateau will be formed tying into the existing bank, minimum 0.9m wide;
- viii. A geotextile, Terram 1000 or similarly approved material will be laid on the newly profiled bank;
- ix. A 130mm thick underlayer consisting of 45/180mm grade material to be laid on the terram;
- x. A 300mm thick rock armour layer to be laid over the underlayer. Stone size in the range 90-250mm;
- xi. Upon completion of the above sequence of works the sandbag protection will be removed the river flow returned to its normal course.

4.2 Repair of Concrete Skirt

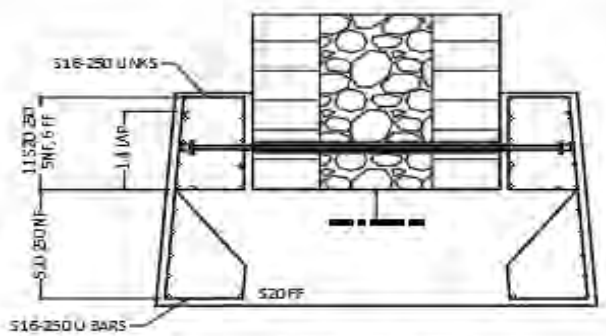
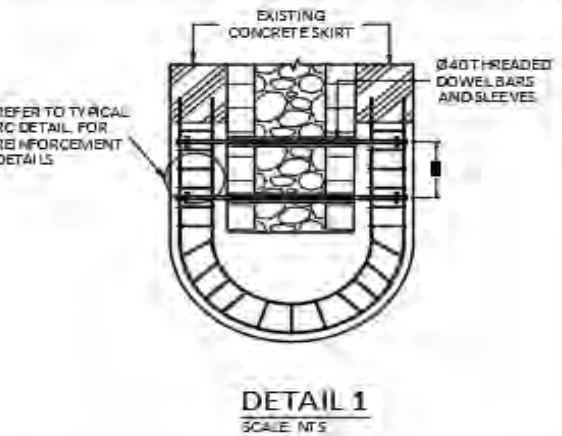
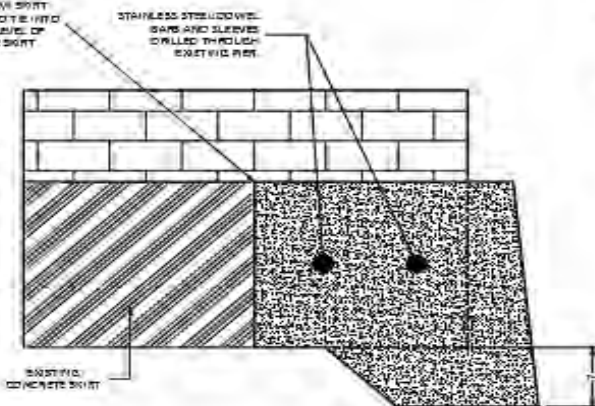
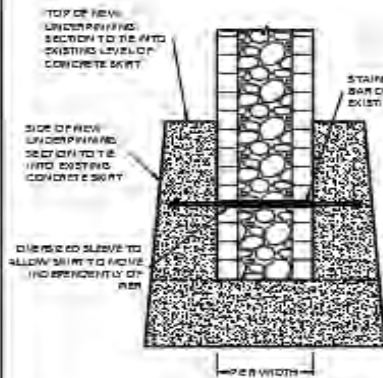
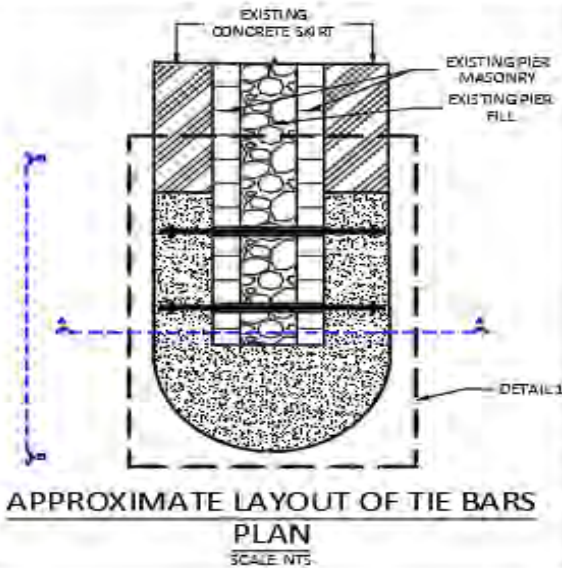
It was noted during OCSCs survey of Monasterevin Bridge that on the upstream face scouring was undermining the leading edge of the concrete skirts that protect the piers. As a result, large cracks have formed in the skirts and the masonry cutwaters are beginning to fail. See figure 5 below for image of damage to concrete skirt and cutwater and Detail 9 overleaf for the proposed scour protection and underpinning detail.



Figure 5: Cracking in concrete skirt and failure of masonry cutwater

DETAIL 9: SCOUR PROTECTION MEASURES - REPAIR CONCRETE SKIRT

Scale: NTS



- GENERAL NOTES:**
1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS NOTED OTHERWISE.
 2. DO NOT SCALE FROM THIS DRAWING. USE DIMENSIONS ONLY.
 3. THIS DRAWING SHALL BE USED FOR THE DESIGN ELEMENT NOTED ONLY.
 4. ALL STRUCTURES SHALL BE CLOSED USING A HIGH PRESSURE WATER BLAST TO REMOVE ALL DIRT, SURFACE DEBRIS AND VEGETATION FROM THE SURFACE OF THE STRUCTURE.
 5. ALL REPAIR WORKS SHALL BE CARRIED OUT IN ACCORDANCE WITH THE RELEVANT DRAWINGS AND SPECIFICATION, AND TO THE SATISFACTION OF THE EMPLOYER'S REPRESENTATIVE.
 6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE STABILITY OF ALL STRUCTURES IN THE TEMPORARY CASE DURING THE CONSTRUCTION.
 7. WHERE CRITICAL DETECTION OF A STRUCTURE HAS BEEN IDENTIFIED, DETAILED RECORDS SHALL BE MADE OF SUCH DEFECTS BEFORE AND AFTER REMEDIATION, INCLUDING DRAWINGS AND MEASUREMENTS AND PHOTOGRAPHS. THIS IS TO INSURE THAT THE DEFECTS NOT REPAIRED PRIOR TO FUTURE INSPECTIONS AND TO FACILITATE LONG TERM MONITORING.

- NOTE:**
- 1. CONCRETE GRADE TO BE OBTAINED
 - 2. ALL DIMENSIONS IN MM UNLESS NOTED OTHERWISE. COVER TO REINFORCEMENT TO BE 75mm UNLESS NOTED OTHERWISE.
 - 3. REINFORCEMENT STEEL TYPE S= STAINLESS STEEL REBAR BAR CONFORMING WITH BS 5001 + L4301 GRADED REINFORCEMENT IS CALLED UP AS FOLLOWS:
- | NO. OF BARS | BAR DIA. | SPACING | GRADE OF STEEL | BAR MARK | LOCATION |
|-------------|----------|---------|----------------|----------|----------|
| 30 | 16 | 150 | S | | TOP |
| 30 | 16 | 150 | S | | BOTTOM |
- LOCATIONS:
 LB = LUGAR
 ALT = ALTERNATE
 SF = FACE
 TF = FACE
 IF = FACE
 ISF = REAR FACE
 STF = SIDE FACE
 T = TOP
 B = BOTTOM
- 4. MINIMUM REINFORCEMENT LAPS:
 T12=45D
 T16=55D
 T20=65D
 T25=85D
 T32=95D
 T40=115D
 - 5. COVER VALUES TO BE FACTORED BY 1.3 OR 2.0 WHERE NECESSARY TO COMPLY WITH BS 8000 PART 4: 1992, CLAUSE 5.8.7.
 - 6. CONTRACTOR TO PROVIDE DESIGN FOR TEMPORARY WORKS.
 - 7. SHEET PILING COULD BE USED TO CREATE A DRY AREA AROUND THE PIER REDUCING THE AMOUNT OF WATER TO BE PUMPED OUT TO SATURATE TANKS.

The following is the methodology for the installation of a new concrete skirt and the rebuilding of the masonry cutwaters:

- i. Please refer to section 6 of this report for refuelling and servicing of plant/equipment prior to commencement of works;
- ii. Access to the riverbed for plant and equipment will be from the downstream west embankment;
- iii. Contractor could erect sheet piling or similar to create a dry works area around each pier. If pumping is required to dewater the works area silt bags will also be used. The site ecologist will monitor suspended solids downstream of the works;
- iv. The Contractor will work on one pier at a time so as to not alter the flows dramatically in the other channels;
- v. The damaged concrete skirt shall be removed and taken back to sound material from which the new skirt can be tied into. Material shall be removed and disposed offsite;
- vi. Dismantling of the masonry cutwaters is to be done by hand using suitable hand tools to free the masonry units from their positions. Care is to be taken to ensure that the masonry units are not damaged during this process;
- vii. All masonry units are to be numbered upon removal in relation to their existing positions and reinstated to their existing positions. Care is to be taken to ensure that the exposed surfaces of the reinstated masonry are free from any marking or staining as a result of the numbering system used. A numeric log is to be kept;
- viii. The contractor shall keep a photographic log of all masonry units prior to their removal, and upon removal with numbering system as above in place;
- ix. The numeric and photographic logs are to be made available to the Employers Representative on request and a copy is to be handed over on completion;
- x. It is expected to find a loss of material below the piers at the upstream end and in the fill between the two masonry leaves after removing the cutwater. These voids will be grouted and this will create a solid surface from which the new cutwater will be built;
- xi. A silt curtain will be incorporated into the temporary works to prevent the accidental discharge of any grout to the watercourse;
- xii. Following the grouting, the remaining pier masonry shall be repaired and repointed while it is exposed;
- xiii. Dowel bars and sleeves shall be drilled through one side of the existing masonry pier and out the other side;
- xiv. With the dowel bars set in place the reinforcement for the concrete skirt can be fixed tying into the existing concrete skirt;
- xv. Shuttering to be erected and concrete poured. Raw or uncured waste concrete will be removed from the construction site and disposed of in accordance with the relevant waste management legislation. Wash down water from concrete trucks, cast in situ concrete etc. will be collected in a suitable containment structure and then taken off-site for appropriate disposal;
- xvi. Once the concrete has cured the cutwater will be re-erected and tied into the existing masonry pier;

- xvii. Following completion of the remedial works to the pier any debris or materials used as part of the remedial works will be removed from the works area and any disturbance to the riverbed reinstated;
- xviii. The sheet piling or other temporary works will be removed from around the pier and the normal flow returned to the channel prior to moving onto the next pier and the same process as detailed above carried out on each of the remaining piers in turn.

4.3 De-vegetation and Repointing of Masonry

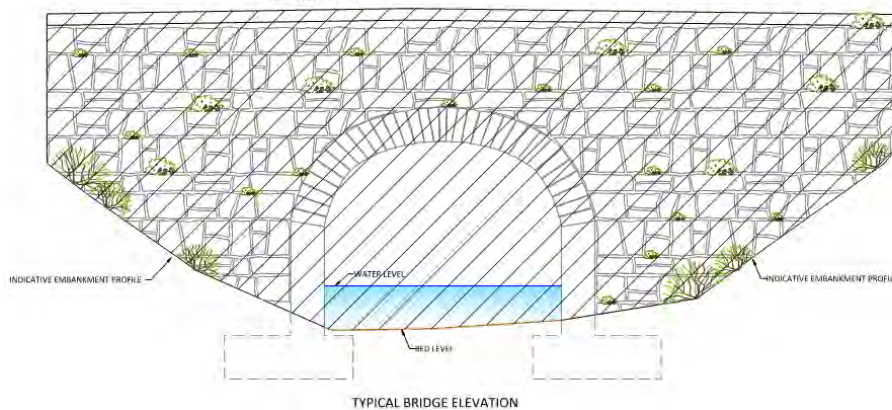
It was noted during OCSCs survey of Monasterevin Bridge that on some of the masonry units there was a loss of mortar in the joints and vegetation growing between the units. See figure 6 below for image of masonry loss and vegetation growth and Detail 1 + 3 below for vegetation removal and masonry repointing.



Figure 6: loss of mortar in joints and vegetation growth

DETAIL 1: VEGETATION REMOVAL

Scale: NTS



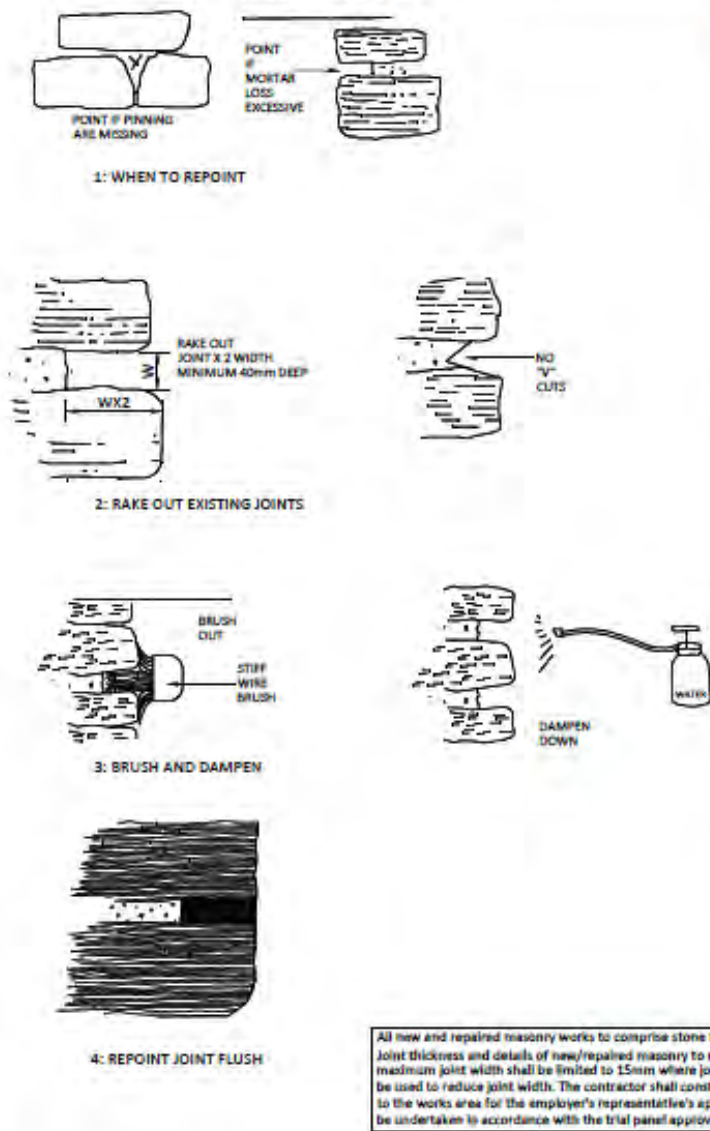
VEGETATION REMOVAL NOTES:

1. REMOVE VEGETATION FROM AREA HIGHLIGHTED BY TYPICAL ELEVATION. ANY VEGETATION PRESENT AT SOFFIT OF ARCH BARREL ALSO TO BE REMOVED. VEGETATION TO BE REMOVED TO THE SATISFACTION OF THE EMPLOYER'S REPRESENTATIVE.
2. RAKE OUT ANY LOOSE MORTAR FROM MASONRY JOINTS WHERE APPLICABLE.
3. IDENTIFY JOINTS WHERE REPOINTING IS REQUIRED AND REPORT AS PER DETAIL 3.

NOTE - TYPICAL MASONRY ARCH SHOWN; FOR CONCRETE ELEMENTS OF BRIDGE REMOVE VEGETATION IN A SIMILAR FASHION AS OUTLINED ABOVE.

DETAIL 3: MASONRY REPOINTING

Scale: NTS



MASONRY REPOINTING NOTES:

1. REPOINTING REQUIRED WHERE THE CONDITIONS PRESENTED IN (1) ARE ENCOUNTERED AND WHERE THE EMPLOYER'S REPRESENTATIVE DEEMS IT NECESSARY FOR REPOINTING TO BE CARRIED OUT. REFER TO BILL OF QUANTITIES FOR EXPECTED AREA OF STRUCTURE TO BE REPOINTED.
2. RAKE OUT EXISTING JOINTS TO REMOVE LOOSE MATERIAL. THE MASONRY BUILT IN COURSES USING SQUARE CUT STONE, SOME OF THE JOINTS WILL BE VERY FINE. TOOLS FOR RAKING OUT MAY NEED TO BE MADE SPECIFICALLY FOR THE JOB. JOINTS SHALL BE RAKED OUT TO A DEPTH OF TWICE THE JOINT WIDTH AS SHOWN.
3. JOINTS SHALL BE BRUSHED OUT USING A STIFF WIRE BRUSH. THE SURROUNDING MASONRY SHALL BE SUITABLY DAMPENED, THE CONTRACTOR SHALL ENSURE NO WATER FLOW, WEEPING, OR POOLED WATER IS PRESENT PRIOR TO REPOINTING
4. JOINTS SHALL BE REPOINTED FLUSH WITH THE EXISTING MASONRY
5. REPOINTING SHALL BE CARRIED OUT USING AN APPROPRIATE LIME MORTAR TO MATCH THE EXISTING. MORTAR FOR REPOINTING WILL BE MADE WITH NHL5 (NATURAL HYDRAULIC LIME 5) IN ACCORDANCE WITH THE SPECIFICATION. HOWEVER, WORK IN THE SPLASH/WET ZONE MAY BE SUBJECT TO PREMATURE WETTING AND THEREFORE THE MORTAR USED IN THAT ZONE MAY INCORPORATE UP TO 10 PERCENT OF PROMPT TO PRODUCE AN EARLY SET. THE PROPOSED MORTAR SHALL BE TO THE SATISFACTION OF THE EMPLOYERS REPRESENTATIVE.
6. REPOINTING WITH LIME MORTAR SHALL NOT BE CARRIED OUT IF TEMPERATURES ARE EXPECTED TO FALL BELOW 5°C WITHIN 1 WEEK OF APPLICATION.

All new and repaired masonry works to comprise stone type and size to match existing stonework. Joint thickness and details of new/repaired masonry to match existing joints thickness and details. The maximum joint width shall be limited to 15mm where joint widths exceed 15mm pinning stones shall be used to reduce joint width. The contractor shall construct a 1m²m trial panel of masonry adjacent to the works area for the employer's representative's approval. All new and repaired masonry works to be undertaken in accordance with the trial panel approved by the employer's representative.

Japanese Knotweed at site will be eradicated prior to works.

The extent of masonry repointing and vegetation removal is minor in nature with the specific repairs detailed in the notes for Details 1 and 3.

The repointing and vegetation removal will be carried out on each pier at the same time as the underpinning works to make use of the existing protection measures that will be in place.

5 TIMEFRAME AND RESTRICTIONS

It is intended that all works will be carried out between the 1st July 2021 and 30th September 2021, in accordance with Inland Fisheries Ireland's 'Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters'.

Works will take place outside the salmonid close season. Works will not be undertaken during hours of darkness to avoid disturbance of Otter foraging and commuting. Works will be undertaken outside the lamprey spawning season.

6 PLANT AND EQUIPMENT

Plant and equipment will be confirmed by the appointed contractor. The Contractor will confirm the plant required to undertake the protection measures set out in this report and in agreement with Inland Fisheries Ireland prior to any works being undertaken.

No concrete/ cement mixing or refuelling of plant and equipment will take place near any watercourse.

Fuels, lubricants and hydraulic fluids for equipment used on the construction site will be carefully handled to avoid spillage, properly secured against unauthorised access or vandalism and provided with spill containment according to current best practice.

Fuelling and lubrication of equipment will be carried out offsite or in bunded areas at site compound that must not be located within 10m of the river.

All equipment will be sterilised at a disinfection /cleaning station set up next to the site compound and not within 10m from the river.

Appropriate spill control equipment, including oil booms and oil soakage pads, will be kept within the construction site to deal with any accidental spillage.

Any spillage of fuels, lubricants or hydraulic oils will be immediately contained and the contaminated soil removed from the construction site and disposed of in accordance with all relevant waste management legislation.

Prior to any work commencing all construction equipment will be checked to ensure that it is mechanically sound, to avoid leaks of oil, fuel, hydraulic fluids and grease.

Access to the riverbed for plant and equipment will be from the downstream west embankment.

7 MATERIAL REQUIREMENTS

- i. In-situ concrete with reinforcement steel for rebuilding of concrete skirts;
- ii. Hydraulic lime based grout for strengthening of piers;
- iii. Granular backfill with combined geogrid/ geotextile for installation of scour protection rock armour;
- iv. Masonry stone for replacement of damaged/missing masonry units;
- v. Lime mortar for repointing of masonry joints.

8 REDUCTION OR ELIMINATION OF POLLUTION FROM SUBSTANCES

The following guidelines, based on the IFI guidelines (2016), Chilibeck et al (1992), and NRA (2005) will be followed by the contractor where required:

- i. Raw or uncured waste concrete will be removed from the construction site and disposed of in accordance with the relevant waste management legislation;
- ii. Wash down water from concrete trucks, cast in situ concrete etc. will be collected in a suitable containment structure and then taken off-site for appropriate disposal;
- iii. Fuels, lubricants and hydraulic fluids for equipment used on the construction site will be carefully handled to avoid spillage, properly secured against unauthorised access or vandalism and provided with spill containment according to current best practice;
- iv. Fuelling and lubrication of equipment will be carried out offsite or in bunded areas;
- v. Appropriate spill control equipment, including oil booms and oil soakage pads, will be kept within the construction site to deal with any accidental spillage;
- vi. Any spillage of fuels, lubricants or hydraulic oils will be immediately contained and the contaminated soil removed from the construction site and disposed of in accordance with all relevant waste management legislation;
- vii. Prior to any work commencing all construction equipment will be checked to ensure that it is mechanically sound, to avoid leaks of oil, fuel, hydraulic fluids and grease;
- viii. Measures will be implemented to minimise waste and ensure correct handling, storage and disposal of waste;
- ix. Emergency response procedures will be put in place.



APPENDIX A. PRINCIPAL INSPECTION REPORT FOR MONASTEREVIN BRIDGE

Kildare Bridges Inventory Gathering and Principal Inspections

Structure Name:
Monasterevin Bridge
Structure ID:
KE-R445-010.00



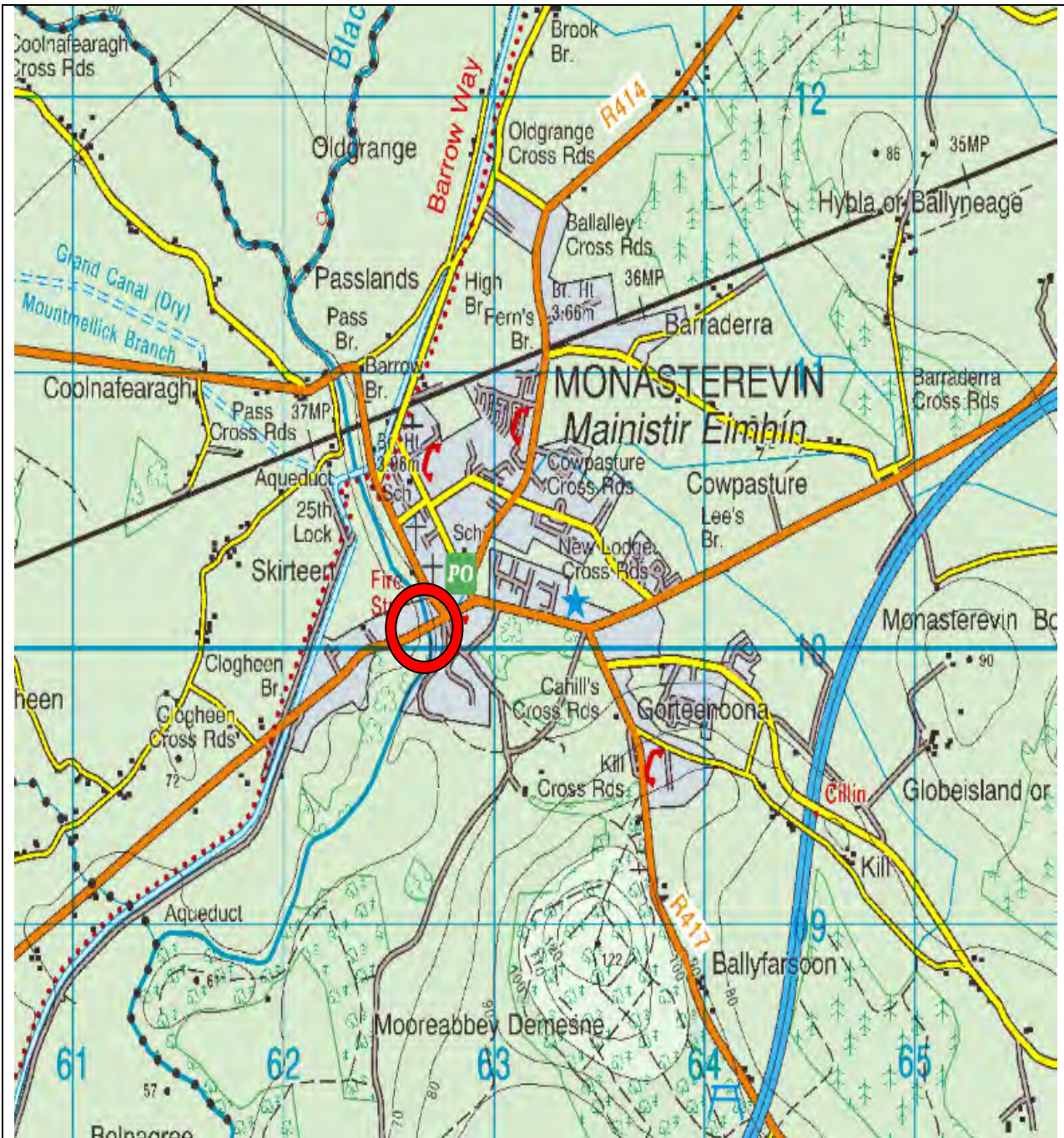
Client:
Kildare County
Council
Áras Cill Dara,
Devoy Park,
Naas,
Co. Kildare.



Engineer:
Malachy Walsh and
Partners.
Bessboro Road,
Mahon Technology Park,
Blackrock,
Cork.



Document No	Revision	Prepared By	Checked By	Approved By	Status	Date
16011-6087	A	J Mc Carthy	M Murphy	P O'Donnell	Final Issue	Oct 2014



Project:
 Kildare Bridges Inventory Gathering and
 Principal Inspections

Figure:
 Figure 1

Title:
 Location Map

Structure Name:
 Monasterevin Bridge

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Malachy Walsh and Partners
 Consulting Engineers
 Park House, Mahon Technology Park,
 Bessboro Road, Blackrock, Cork
 Tel: 021-4536400 Fax: 021-4536450
<http://www.mwp.ie>

KE-R445-010.00 Monasterevin Bridge

Maintaining Agent.....: 15 KE - Kildare

Road.....: Naas, County Kildare and Portlaoise, County Laois -
and Ro

Side of road.....:

Region.....: 2 Leinster

Struct. reg. no.....: 24

Year of construction.....:

Year of reconstruction.....:

Primary passage Overbridge/Underbridge: U

Dir. of chainage on primary road.....: W

Access equipment needed.....: 0 Nothing

Data collected: Date: 16 Oct 2014

Inspector Initials.....: JMC/DC

Checker Initials.....: MM

KE-R445-010.00 Monasterevin Bridge

Geographical position:

Easting: 662614 Northing: 710122

Geometry:

Number of spans.....: 5
Min span length.....(m): 7.30
Max span length.....(m): 7.30
Overall length.....(m): 41.30
Width out-to-out.....(m): 10.20
Width of median.....(m): 0.00
Width of footway left....(m): 1.27
Width of footway right....(m): 1.26
Width of carriageway.....(m): 5.96
Width kerb-to-kerb.....(m): 6.90
Width of approach.....(m): 6.32
Area.....(m2): 421.26
Minimum Parapet Height....(m): 0.80
Width of Soft Verge Left..(m): 0.00
Width of Soft Verge Right.(m): 0
Approach Skew 1.....(deg): 0.00
Approach Skew 2.....(deg): 0.00
Bridge curved.....(Y/N): N
Skew.....(deg): 0

Span Lengths:

Span 1...(m): 7.3 Span 6...(m): Span 11...(m):
Span 2...(m): 7.3 Span 7...(m): Span 12...(m):
Span 3...(m): 7.3 Span 8...(m): Span 13...(m):
Span 4...(m): 7.3 Span 9...(m): Span 14...(m):
Span 5...(m): 7.3 Span 10...(m):

Superstructure, principal type:

Standard design(Y/N): Y
Design of cross section.....: 60 Masonry arch
Design of elevation.....: 50 Arch, one or more spans
Material of primary members.....: 60 Stone masonry

KE-R445-010.00 Monasterevin Bridge

Superstructure, secondary type (if applicable):

Standard design(Y/N):		
Design of cross section.....:	91	Not applicable
Design of elevation.....:	91	Not applicable
Material of primary members.....:	91	Not applicable

Superstructure, tertiary type (if applicable):

Standard design(Y/N):		
Design of cross section.....:	91	Not applicable
Design of elevation.....:	91	Not applicable
Material of primary members.....:	91	Not applicable

Masonry arch (if applicable):

Span Length(m):	7.3
Rise of arch barrel at crown.....(m):	1.55
Rise of arch barrel, quarter points(m):	1.37
Springing height above mudline...(m):	2.92
Thickness of arch barrel.....(m):	0.53
Average depth of fill.....(m):	0.36
Parapet thickness.....(m):	0.45

Material:

Square cut/rubble (S/R):

Arch facing stones...: 10	Limestone	S
Arch barrel sheeting.: 92	Unknown	
Spandrel walls.....: 10	Limestone	S

Average joint thickness:

Mortar strength
Soft/Hard:

Arch facing stones...: 20	Between 10mm and 25mm	H
Arch barrel sheeting.: 92	Unknown	
Spandrel walls.....: 20	Between 10mm and 25mm	H

KE-R445-010.00 Monasterevin Bridge

Substructure:

Abutment: Type.....:	10	Abutm. wall, integ. wing walls
Material.....:	10	Masonry
Foundation.....:	10	Spread footing
Pier: Type.....:	10	Solid wall
Material.....:	10	Masonry
Foundation.....:	10	Spread footing

Details:

Type of parapet.....:	20	Masonry
Type of safety barrier.....:	0	No guard rail
Type of wearing surface.....:	21	Dense bitumen macadam
Type of expansion joint.....:	50	No joint device
Type of fixed bearings on support...:	91	Not applicable
Type of free bearings on support...:	91	Not applicable
Type of fixed bearings on girders...:	91	Not applicable
Type of free bearings on girders...:	91	Not applicable

Obstacle:

Type of passage.....:	31	River
Passage id.....:		River
Passage name.....:		River Barrow
Road side.....:		

Vertical Clearance:

Primary passage.....(m):	L:	LM:	RM:	R:
Secondary passage.....(m):	L:	LM: 4.47	RM:	R:

KE-R445-010.00 Monasterevin Bridge

Miscellaneous:

Design Load.....:		37.5HB
Load Distribution.....:	2	Distribution in 1 direction
Technical Standards.....:	0	Unknown standard
Assessed Capacity Normal.....:		
Assessed Capacity Abnormal.....:		
Weight Restriction.....:		
Owner:	13	Kildare County Council
Maintaining Agent.....:	13	Kildare County Council
Inspection Consultant.....:	115	Malachy Walsh/O'Connor Sutton
Designer/Consultant.....:	92	Unknown
Technical installations.....:	1	Lighting
	4	Water supply pipeline
	5	Telephone installation

Remarks:															
Width of approach 2 - 6.05m.															
Chronological Overview															
Date	Activity	Br	Ex	Fo	Pa	Em	Wi	Ab	Pi	Be	De	Be	Ri	Ot	St
16 Oct 2014	Principal inspection	2		1	2		1	1	4		1		4		4

KE-R445-010.00 Monasterevin Bridge

Principal Inspection:

Date.....: 16 Oct 2014
 Team Leader Name.....: Jerome McCarthy
 Initials.....: JMC/DC
 Weather.....: Overcast
 Temperature.....(deg. C): 13

Traffic:Annual Average Daily Traffic.:
 Percentage, light vehicles...:
 Percentage, heavy vehicles...:

Year for next Principal Inspection...: 2016

Remark:

KE-R445-010.00 Monasterevin Bridge

No	Component Repair work Damage description Type of damage	Repair Work							
		Con rtg	Mtn req	Spe Ins	T P	Qty	Year	Cost	Pho tos
1	Bridge surface E : Patching of potholes Bridge surface is in ok condition. Pothole at west end on south side, trench reinstatement for full length of structure in north lane. Photo 1.1 - View looking Photo 1.2 - Pothole at west end, south side Potholes	2	N	N	E	1	2016	100	2
2	Expansion joints			N					0
3	Footways/median Both footways are in good condition. Vegetation to be removed under routine maintenance. Photo 3.1 - North side footway	1	Y	N					1
4	Parapets/Safety barrier K : Masonry repointing Repointing required in localised areas throughout parapets. Remove vegetation from parapets under routine maintenance. Photo 4.1 - North parapet Photo 4.2 - South parapet Loss of masonry pointing	2	Y	N	K	80	2016	10000	0
5	Embankments/Revetments p			N					0
6	Wing/Spandrel/Retaining Walls Spandrel and wing walls in good condition. Photo 6.1 - Upstream walls Photo 6.2 - Downstream walls	1	N	N					2

KE-R445-010.00 Monasterevin Bridge

No	Component Repair work Damage description Type of damage	Repair Work							
		Con rtg	Mtn req	Spe Ins	T P	Qty	Year	Cost	Pho tos
7	Abutments Abutment surfaces are sloping with scour protection installed. Both sides in good condition. Photo 7.1 - Left side Photo 7.2 - Right side	1	N	N					2
8	Piers D : Masonry repointing E : Injection of cracks Z : Other repair work C : Masonry repair All vegetation to be removed from cutwaters under routine maintenance. Scour protection installed with sloping surfaces to all piers. Pier one right hand side is wet (Photo 8.1). Pier 2 left hand side is wet (Photo 8.2). Upstream cutwater of piers 2 & 3 are undermined and subsiding. 110mm gap in masonry of pier 3, extending 1.5m to 2m into pier. Remove weed growth from piers. Erosion / scour	4	Y	N					7
9	Bearings			N					0
10	Deck/slab/arch barrel Decks are gunited in all spans and look to be in good condition. Drainage opes present in all spans also. Photo 10.1 - Span 1 Deck Photo 10.2 - Span 2 Deck	1	N	N					2
11	Beams/girders/transverse beams			N					0
12	Riverbed	4	Y	N					1

KE-R445-010.00 Monasterevin Bridge

<p>B : Scour protection Scour at upstream end of piers 2 & 3. Remove debris from piers. Bed is very deep at upstream end of span 3. Photo 12.1 - Upstream at piers 2 & 3 Erosion / scour</p>				B	50	2015	2500	
<p>13 Other elements</p>			N					0
<p>14 Structure in generals Photo 14.1 - Upstream elevation Photo 14.2 - Downstream elevation</p>	4	Y	N					2
<p>Total Cost:</p>							64600	

KE-R445-010.00 Monasterevin Bridge

Component No.	1	Bridge surface
Bridge surface is in ok condition. Pothole at west end on south side, trench reinstatement for full length of structure in north lane.		
Photo 1.1 - View looking		
Photo 1.2 - Pothole at west end, south side		
Condition/Mainten.	2	/ N



KE-R445-010.00 Monasterevin Bridge

Component No. 1 Bridge surface

Bridge surface is in ok condition. Pothole at west end on south side, trench reinstatement for full length of structure in north lane.

Photo 1.1 - View looking

Photo 1.2 - Pothole at west end, south side

Condition/Mainten. 2 / N

P1.1



KE-R445-010.00 Monasterevin Bridge

Component No.	3	Footways/median
Both footways are in good condition. Vegetation to be removed under routine maintenance.		
Photo 3.1 - North side footway		
Condition/Mainten.	1	/ Y



KE-R445-010.00 Monasterevin Bridge

Component No. 6 Wing/Spandrel/Retaining Walls

Spandrel and wing walls in good condition.
Photo 6.1 - Upstream walls
Photo 6.2 - Downstream walls

Condition/Mainten. 1 / N

P6.2



KE-R445-010.00 Monasterevin Bridge

Component No. 6 Wing/Spandrel/Retaining Walls

Spandrel and wing walls in good condition.
Photo 6.1 - Upstream walls
Photo 6.2 - Downstream walls

Condition/Mainten. 1 / N

P6.1



KE-R445-010.00 Monasterevin Bridge

Component No.	7	Abutments s
Abutment surfaces are sloping with scour protection installed. Both sides in good condition. Photo 7.1 - Left side Photo 7.2 - Right side Condition/Mainten. 1 / N		



KE-R445-010.00 Monasterevin Bridge

Component No.	7	Abutments s
Abutment surfaces are sloping with scour protection installed. Both sides in good condition. Photo 7.1 - Left side Photo 7.2 - Right side Condition/Mainten. 1 / N		



KE-R445-010.00 Monasterevin Bridge

Component No.	8	Piers
All vegetation to be removed from cutwaters under routine maintenance. Scour protection installed with sloping surfaces to all piers. Pier one right hand side is wet (Photo 8.1). Pier 2 left hand side is wet (Photo 8.2). Upstream cutwater of piers 2 & 3 are undermined and subsiding. 110mm gap in masonry of pier 3, extending 1.5m to 2m into pier. Remove weed growth from piers.		
Condition/Mainten.	4	/ Y



KE-R445-010.00 Monasterevin Bridge

Component No.	8	Piers
All vegetation to be removed from cutwaters under routine maintenance. Scour protection installed with sloping surfaces to all piers. Pier one right hand side is wet (Photo 8.1). Pier 2 left hand side is wet (Photo 8.2). Upstream cutwater of piers 2 & 3 are undermined and subsiding. 110mm gap in masonry of pier 3, extending 1.5m to 2m into pier. Remove weed growth from piers.		
Condition/Mainten.	4	/ Y



KE-R445-010.00 Monasterevin Bridge

Component No. 8 Piers

All vegetation to be removed from cutwaters under routine maintenance. Scour protection installed with sloping surfaces to all piers. Pier one right hand side is wet (Photo 8.1). Pier 2 left hand side is wet (Photo 8.2). Upstream cutwater of piers 2 & 3 are undermined and subsiding. 110mm gap in masonry of pier 3, extending 1.5m to 2m into pier. Remove weed growth from piers.

Condition/Mainten. 4 / Y



KE-R445-010.00 Monasterevin Bridge

Component No.	8	Piers
All vegetation to be removed from cutwaters under routine maintenance. Scour protection installed with sloping surfaces to all piers. Pier one right hand side is wet (Photo 8.1). Pier 2 left hand side is wet (Photo 8.2). Upstream cutwater of piers 2 & 3 are undermined and subsiding. 110mm gap in masonry of pier 3, extending 1.5m to 2m into pier. Remove weed growth from piers.		
Condition/Mainten.	4	/ Y



KE-R445-010.00 Monasterevin Bridge

Component No.	8	Piers
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All vegetation to be removed from cutwaters under routine maintenance. Scour protection installed with sloping surfaces to all piers. Pier one right hand side is wet (Photo 8.1). Pier 2 left hand side is wet (Photo 8.2). Upstream cutwater of piers 2 & 3 are undermined and subsiding. 110mm gap in masonry of pier 3, extending 1.5m to 2m into pier. Remove weed growth from piers.

Condition/Mainten. 4 / Y



KE-R445-010.00 Monasterevin Bridge

Component No.	8	Piers
All vegetation to be removed from cutwaters under routine maintenance. Scour protection installed with sloping surfaces to all piers. Pier one right hand side is wet (Photo 8.1). Pier 2 left hand side is wet (Photo 8.2). Upstream cutwater of piers 2 & 3 are undermined and subsiding. 110mm gap in masonry of pier 3, extending 1.5m to 2m into pier. Remove weed growth from piers.		
Condition/Mainten.	4	/ Y



KE-R445-010.00 Monasterevin Bridge

Component No.	8	Piers
---------------	---	-------

All vegetation to be removed from cutwaters under routine maintenance. Scour protection installed with sloping surfaces to all piers. Pier one right hand side is wet (Photo 8.1). Pier 2 left hand side is wet (Photo 8.2). Upstream cutwater of piers 2 & 3 are undermined and subsiding. 110mm gap in masonry of pier 3, extending 1.5m to 2m into pier. Remove weed growth from piers.

Condition/Mainten. 4 / Y



KE-R445-010.00 Monasterevin Bridge

Component No.	10	Deck/slab/arch barrel
Decks are gunited in all spans and look to be in good condition. Drainage opes present in all spans also.		
Photo 10.1 - Span 1 Deck		
Photo 10.2 - Span 2 Deck		
Condition/Mainten.	1	/ N



KE-R445-010.00 Monasterevin Bridge

Component No.	10	Deck/slab/arch barrel
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Decks are gunited in all spans and look to be in good condition. Drainage opes present in all spans also.

Photo 10.1 - Span 1 Deck

Photo 10.2 - Span 2 Deck

Condition/Mainten. 1 / N



KE-R445-010.00 Monasterevin Bridge

Component No.	12	Riverbed
Scour at upstream end of piers 2 & 3. Remove debris from piers. Bed is very deep at upstream end of span 3.		
Photo 12.1 - Upstream at piers 2 & 3		
Condition/Mainten.	4	/ Y

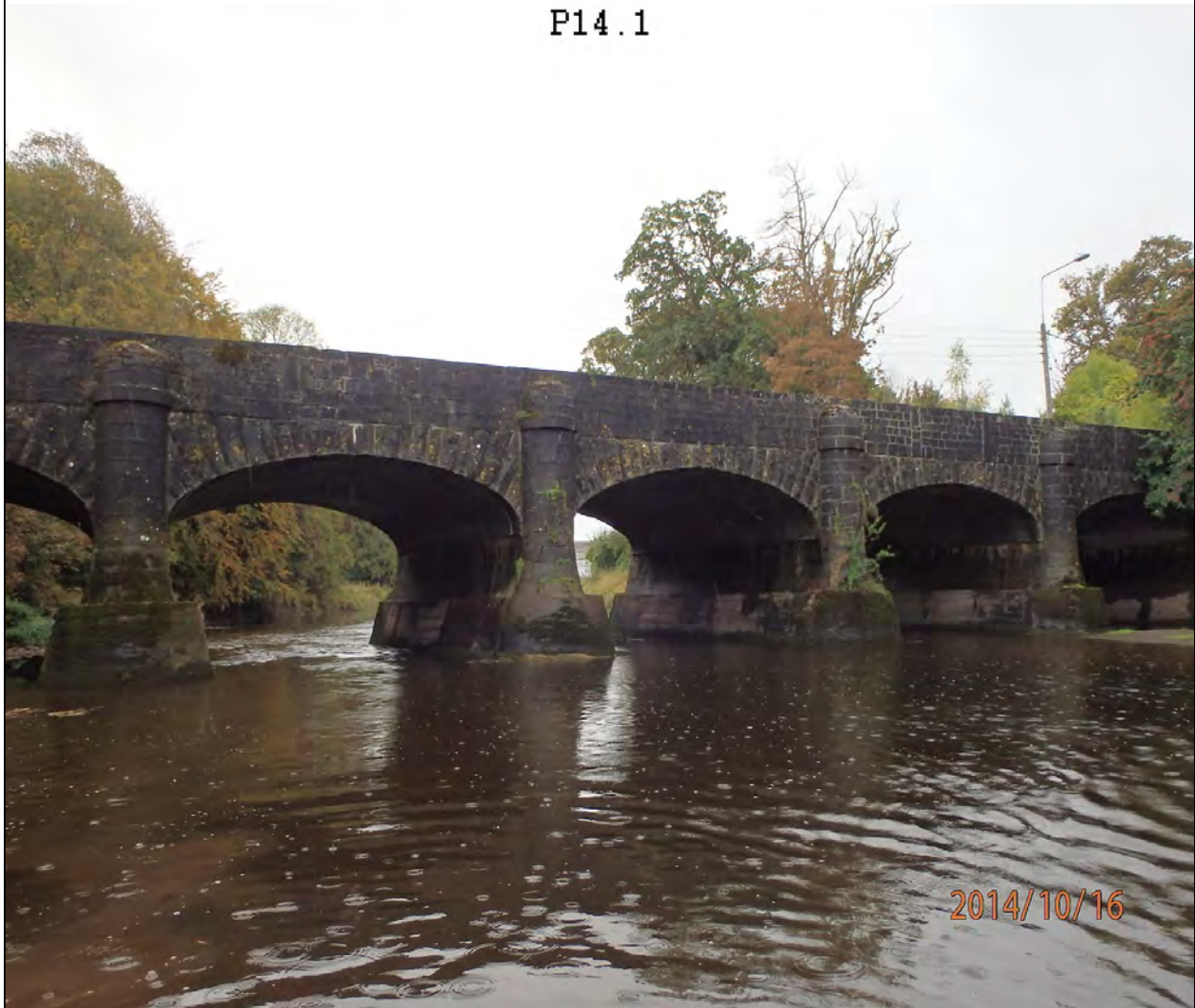


KE-R445-010.00 Monasterevin Bridge

Component No. 14 Structure in generals

Photo 14.1 - Upstream elevation
Photo 14.2 - Downstream elevation
Condition/Mainten. 4 / Y

P14.1

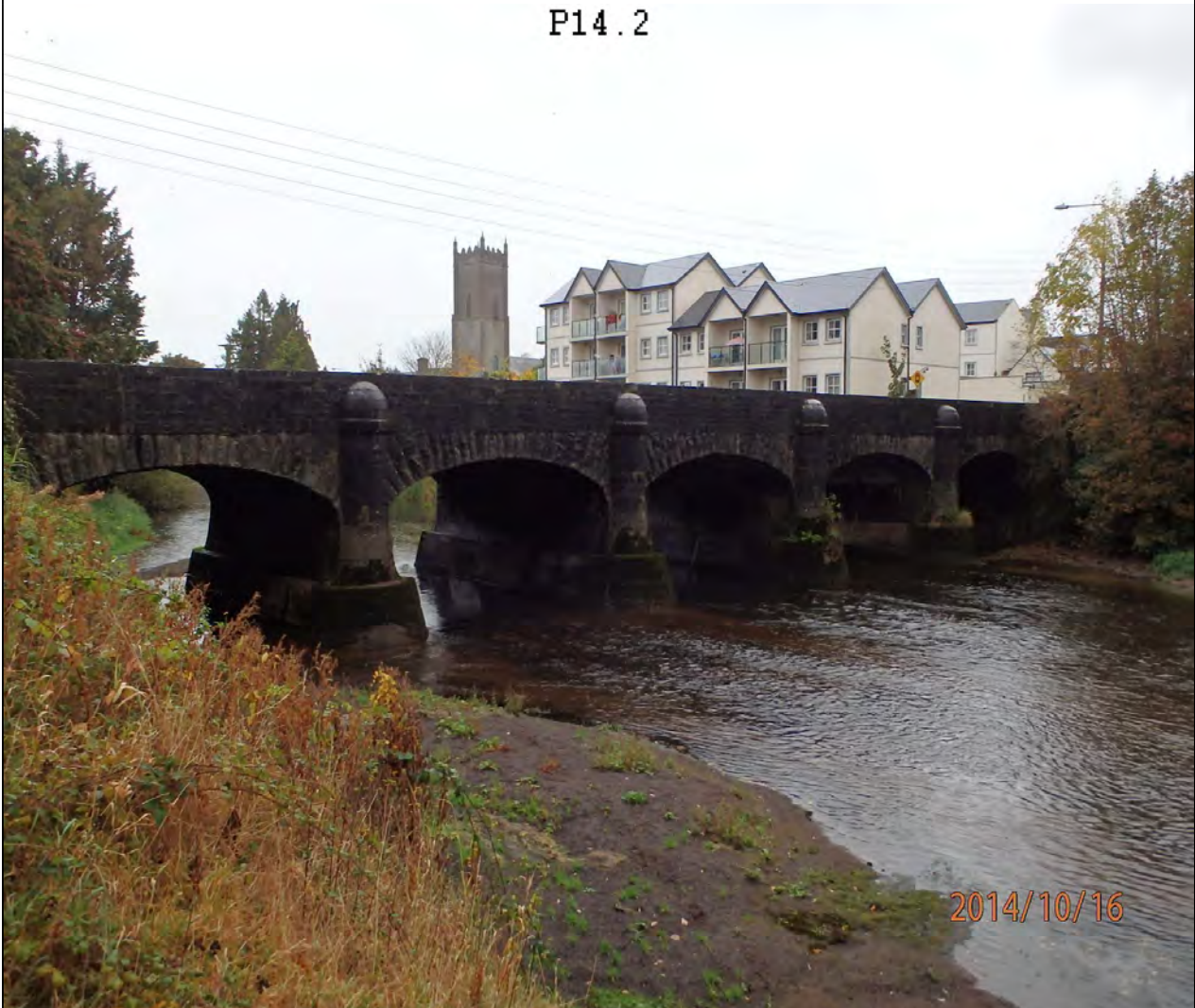


KE-R445-010.00 Monasterevin Bridge

Component No. 14 Structure in generals

Photo 14.1 - Upstream elevation
Photo 14.2 - Downstream elevation
Condition/Mainten. 4 / Y

P14.2





APPENDIX B. DRAWINGS RELATED TO THE WORKS



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