

Monasterevin Bridge Rehabilitation Works

Preliminary Remedial Works Report

Client: Kildare County Council

Project: K424

March 2019



OCSC

O'CONNOR | SUTTON | CRONIN

Multidisciplinary
Consulting Engineers





PRELIMINARY REMEDIAL WORKS REPORT

MONASTEREVIN BRIDGE
Kildare County Council
Project No. K424
14th March 2019

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APPENDIX

A. Inspection Photographs of Monasterevin Bridge

1 DESCRIPTION

Monasterevin Bridge is a limestone square cut, 5 span, masonry arch structure, located in Monasterevin, Co. Kildare. The superstructure is supported by 2 no. Masonry abutments and 4 no. Masonry piers.



MONASTEREVIN BRIDGE UPSTREAM FACE

2 SURVEY

A principle survey was carried out by O'Connor Sutton Cronin on the 28th February 2019 in dry weather conditions. The following are the findings of the condition of each of the bridge components and the proposed remedial works for the same.

2.1 BRIDGE SURFACE

Damage/Remarks

- i. Major patch repair works to Surface, see photograph 3-1, 3.2 and 3.3

Remedial Works

- i. Road to be planned and resurfaced, see photograph 3.4

2.2 FOOTWAY

Damage/Remarks

- i. Downstream and upstream footpaths are in good condition.

Remedial Works

- i. No remedial works needed

2.3 PARAPET WALLS

2.3.1 Downstream Roadside West/East

Damage/Remarks

- i. Vegetation on Downstream Roadside West capping, See photographs 3.5, 3.6, 3.7 and 3.8
- ii. Tree roots growing between capping on West roadside parapet, See photographs 3.9 and 3.10
- iii. Missing Masonry on Downstream West Parapet, See photograph 3.11
- iv. Bunker settling on Downstream side West, See photographs 3.12, 3.13, 3.14 and 3.15
- v. Joints in poor condition on downstream roadside parapet, See photographs 3.16, 3.17 and 3.18
- vi. Masonry dislodged at section of downstream East parapet, See photograph 3.19 and 3.20
- vii. Bulging on section of downstream East parapet, See photograph 3.21
- viii. East parapet settling away from capping, See photograph 3.22
- ix. East parapet wall joints in poor condition, See photograph 3.23, 3.24 and 3.25
- x. Downstream East parapet wall collapsing, See photograph 3.26

Remedial Works

- i. Vegetation to removed, raking and repointing of joints, 2m x 5m
- ii. Capping to be removed to allow for removal of vegetation growth underneath. Original capping to be reinstated after, 10mm dia tree root to be removed.
- iii. Masonry to be reinstated to match existing, 0.15m x 0.2m.
- iv. Due to the heavy overgrowth on the riverside bank of the bunker, the full extent of the remediation works cannot be deemed. From inspection on the roadside, it can be seen that the foundation should be underpinned, Crack 50mm-10mm and 4.2m long
- v. Rake and repoint joints, 10% of joints.
- vi. Section of wall to be demolished and reconstructed, 0.35m x 0.4m
- vii. Section of wall to be demolished and reconstructed, 2.6m x 1.1m x 1.4m

- viii. Capping to be reset, 0.5m x 0.5m
- ix. Wall to be raked and repointed, 60% of joints
- x. Section of wall to be reconstructed, 4m x 0.3m.

2.3.2 Upstream Roadside West

Damage/Remarks

- i. Vegetation on upstream West side parapet capping, See photograph 3.27
- ii. Tree roots growing within capping on upstream West side parapet, See photograph 3.28
- iii. Joints in poor condition on Upstream roadside parapet wall, See photograph 3.29
- iv. Vegetation growing on Upstream capping eastroadside parapet, See photograph 3.30 and 3.31
- v. Edge stones in poor condition on upstream East parapet, See photograph 3.32
- vi. Joints on upstream West roadside parapet in poor condition, See photograph 3.33 and 3.34

Remedial Works

- i. Vegetation to be removed and joints to be raked and repointed, 6m x 0.8m, fencing on top
- ii. Capping to be removed to allow for removal of vegetation growth underneath. Original capping to be reinstated after, 3.1m x 1.3m
- iii. Joints to be raked and repointed, 10% of joints.
- iv. Remove vegetation from capping and rake and repoint joints, 80% of joints (3.5m x 1.7m)
- v. Remove existing edge stones and replace to match existing, 0.5m x 1.6m
- vi. Joints to be raked and repointed, 60% of joints.

2.3.3 Downstream Riverside West

Damage/Remarks

- i. Vegetation growing on downstream riverside parapet, See photograph 3.44 and 3.45

Remedial Works

- i. Vegetation to be removed and joints to be raked and repointed, 14m x 2m + 10% of joints.

2.4 EMBANKMENTS

2.4.1 Downstream West Embankment

Damage/Remarks

- i. Heavy overgrowth on downstream west left embankment causing a blockage for accessing the embankment, See photograph 3.35, 3.36 and 3.37
- ii. Retaining wall failing on downstream west left embankment, See photograph 3.38 and 3.77
- iii. Tree's overgrowing on downstream west left embankment, See photograph 3.39 and 3.40
- iv. Tree's and overgrowth growing wild on downstream east embankment, See photographs 3.41, 3.42 and 3.43
- v. Outfall pipe has collapsed on downstream left embankment, See photographs 3.78 and 3.79

Remedial Works

- i. Remove area of overgrowth on the embankment to allow ease of access
- ii. Retaining wall to be reconstructed, 1m x 1.5m x 2m.
- iii. Remove 2 no overgrown tree's.
- iv. Tree's to be cut back and partially removed
- v. Outfall pipe to be reconstructed in embankment, 225 diameter.

2.4.2 Upstream East Embankment

Damage/Remarks

- i. Heavy overgrowth on upstream east embankment, See photograph 3.47
- ii. Culvert on upstream embankment failing, See photograph 3.48 and 4.49
- iii. Wall at outfall of culvert has collapsed, See photograph 3.50
- iv. Tree growing from upstream east parapet, See photograph 3.51

Remedial Works

- i. Remove vegetation and overgrowth from embankment
- ii. Reconstruct failing section of culvert 3.48 & 3.49
- iii. Wall to be reconstructed at outfall of culvert, 1.2m x 1.4m x 0.6m.
- iv. Tree to be poisoned and killed off, 1m diameter.

2.5 SPANDREL WALLS

2.5.1 Downstream at Pier 2

Damage/Remarks

- i. Vegetation growing on the spandrel walls at Pier 2, See photograph 3.59 and 3.60

Remedial Works

- i. Remove vegetation, rake and repoint 5% of joints.

2.6 ABUTMENTS

2.6.1 West abutment at Arch 3

Damage/Remarks

- i. Minor mortar loss to joints, see photograph 3.61

Remedial Works

- i. Rake and repointing needed on 40% of the joints.

2.7 DECK

Arch numbering is by reference when looking downstream. Arch number 1 is the right hand side with the numbering being from right to left.

2.7.1 Arch 1

Damage/Remarks

- i. Hole in upstream Bridge Deck, See photograph 3.52

Remedial Works

- i. Confirm with drainage section if the hole is used in conjunction with a gully/ drainage system at road level. If it is not hole to be filled and repaired.

2.7.2 Arch 2

Damage/Remarks

- i. Hole in upstream and downstream Bridge Deck, See photograph 3.56

Remedial Works

- ii. Confirm with drainage section if the hole is used in conjunction with a gully/ drainage system at road level. If it is not hole to be filled and repaired.

2.7.3 Arch 3

Damage/Remarks

- ii. Hole in upstream and downstream Bridge Deck

Remedial Works

- iii. Confirm with drainage section if the hole is used in conjunction with a gully/ drainage system at road level. If it is not hole to be filled and repaired.

2.7.4 Arch 4

Damage/Remarks

- i. Hole in upstream Bridge Deck, See photograph 3.64 and 3.65

Remedial Works

- ii. Confirm with drainage section if the hole is used in conjunction with a gully/ drainage system at road level. If it is not hole to be filled and repaired.

2.7.5 Arch 5

Damage/Remarks

- i. Hole in upstream and downstream Bridge Deck, see photograph 3.72 and 3.73

Remedial Works

- ii. Confirm with drainage section if the hole is used in conjunction with a gully/ drainage system at road level. If it is not hole to be filled and repaired.

2.8 RIVERBED

Damage/Remarks

- i. Evidence of stone or concrete eroded away on river bed under Arch 5, see photographs 3-74, 3-75 and 3.76

Remedial Works

- i. Remove debris and regrade the riverbed

2.9 BRIDGE PIERS

Damage/Remarks

- i. Vegetation growing around Pier 1, See photograph 3.53
- ii. Pier 2 upstream cutwater undermined and separating from bridge pier, See photograph 3.54 and 3.55
- iii. Vegetation growing on downstream Pier 2, See photograph 3.57 and 3.58
- iv. Scouring occurring at upstream cutwater Pier 3, See photograph 3.66, 3.67 and 3.68
- v. Vegetation growing on downstream Pier 4, See photograph 3.62
- vi. Vegetation growing on upstream Pier 4 and a small crack commencing in the upstream cutwater, See photographs 3.69, 3.70 and 3.71

Remedial Works

- i. Remove vegetation and clean pier.
- ii. Underpin cutwater, provide scour protection and reconstruct Pier 2 upstream cutwater
- iii. Remove vegetation and clean pier, 40% of joints
- iv. Underpin cutwater, provide scour protection and reconstruct Pier 3 upstream cutwater
- v. Remove vegetation and clean pier, 40% of joints
- vi. Remove vegetation and clean pier, 50% of joints. Provide scour protection to upstream cutwater.



APPENDIX A – INSPECTION PHOTOGRAPHS



Photograph 3-1: Bridge Surface



Photograph 3-2: Poor Patch Repair on Bridge Surface



Photograph 3-3: Poor Patch Repair on Bridge Surface



Photograph 3-4: Poor Patch Repair on Bridge Surface



Photograph 3-5: Downstream Capping on Road Side Parapet



Photograph 3-6: Downstream Capping on Road Side Parapet



Photograph 3-7: Downstream Capping on Road Side Parapet



Photograph 3-8: Downstream Capping on Road Side Parapet



Photograph 3-9: Downstream roadside West Parapet



Photograph 3-10: Downstream Parapet Roadside Approach



Photograph 3-11: Missing Masonry on Downstream Roadside Parapet



Photograph 3-12: Settlement of Bunker on Downstream side



Photograph 3-13: Settlement of Bunker on Downstream side



Photograph 3-14: Settlement of Bunker on Downstream side



Photograph 3-15: Overall View of Bunker Settlement



Photograph 3-16: Rake and Repoint joints in Downstream Road side Parapet



Photograph 3-17: Rake and Repoint joints in Downstream Road side Parapet



Photograph 3-18: Rake and Repoint Joints in Downstream Road Side Parapet



Photograph 3-19: Masonry Dislodged on Downstream Roadside Parapet



Photograph 3-20: Section of Wall to be reconstructed on the Downstream Side



Photograph 3-21: Bulging on Section of Downstream Parapet Wall



Photograph 3-22: Capping to be reset on Downstream Parapet



Photograph 3-23: Wall to be Raked and Repointed



Photograph 3-24: Wall to be Raked and Repointed



Photograph 3-25: Wall to be Raked and Repointed



Photograph 3-26: Wall to be reconstructed on downstream side



Photograph 3-27: Vegetation on Upstream side Parapet Capping.



Photograph 3-28: Tree Roots in Capping on Upstream Parapet



Photograph 3-29: Upstream Roadside Parapet Wall



Photograph 3-30: Capping on Upstream Roadside Parapet



Photograph 3-31: Capping on Upstream Roadside Parapet



Photograph 3-32: Upstream Roadside Parapet Wall



Photograph 3-33: Upstream Roadside Parapet Wall



Photograph 3-34: Upstream Roadside Parapet Wall



Photograph 3-35: Downstream Left Embankment



Photograph 3-36: Downstream Left Embankment



Photograph 3-37: Remove Tree's on Downstream Left Embankment



Photograph 3-38: Downstream Left Embankment Retaining Wall



Photograph 3-39: Tree's to be removed on Downstream Left Embankment



Photograph 3-40: Tree's to be removed on Downstream Left Embankment



Photograph 3-41: Overgrown Vegetation on Downstream Right Embankment



Photograph 3-42: Overgrown Vegetation on Downstream Right Embankment



Photograph 3-43: Tree's to be removed on Downstream Left Embankment



Photograph 3-44: Downstream Riverside Parapet



Photograph 3-45: Downstream Riverside Parapet

Photograph 3-46: Upstream Riverside Parapet



Photograph 3-47: Upstream East Embankment



Photograph 3-48: Culvert on Upstream Embankment Failing



Photograph 3-49: Culvert on Upstream Embankment Failing



Photograph 3-50: Wall to be reconstructed



Photograph 3-51: Tree to be Poisoned and Killed



Photograph 3-52: Arch 1 - Hole in Upstream Bridge Deck



Photograph 3-53: Pier 1 – Rake and Repoint



Photograph 3-54: Pier 2 – Settling away from Bridge



Photograph 3-55: Pier 2 – Settling away from Bridge



Photograph 3-56: Hole in Upstream and Downstream of Bridge Deck 2



Photograph 3-57: Downstream Pier 2



Photograph 3-58: Downstream Pier 2



Photograph 3-59: Pier 2 – Spandrel Walls



Photograph 3-60: Pier 2 – Spandrel Walls



Photograph 3-61: Arch 3 – West Abutment



Photograph 3-62: Pier 4 - Downstream



Photograph 3-63: Arch 4 - Downstream



Photograph 3-64: Arch 4 - Bridge Deck



Photograph 3-65: Arch 4 – Bridge Deck



Photograph 3-66: Pier 3 – Natural Scouring



Photograph 3-67: Pier 3 – Natural Scouring



Photograph 3-68: Pier 3 – Natural Scouring



Photograph 3-69: Pier 4 - Upstream



Photograph 3-70: Pier 4 - Upstream



Photograph 3-71: Pier 4 - Upstream



Photograph 3-72: Arch 5 Decking Upstream



Photograph 3-73: Arch 5 Decking Downstream



Photograph 3-74: Riverbed under Arch 5



Photograph 3-75: River bed under Arch 5



Photograph 3-76: River Bed under Arch 5



Photograph 3-77: Retaining Wall to be reconstructed



Photograph 3-78: Outfall to be reconstructed



Photograph 3-79: Outfall



OCSC

O'CONNOR | SUTTON | CRONIN

Multidisciplinary
Consulting Engineers

9 Prussia Street
Dublin 7
Ireland

T | +353 (0)1 8682000
F | +353 (0)1 8682100
W | www.ocsc.ie

Dublin | London | Abu Dhabi | Belfast | Cork | Galway | Glasgow | Libya | Poland | Romania | Russia