



DAVIDKELLY
PARTNERSHIP
CHARTERED ENGINEERS

Report on Conservation Works Carried Out at Birr Castle Suspension Bridge for Birr Castle Demesne



**funded by The Department of Housing, Local Government and Heritage
under the Historic Structures Fund 2023**

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1.0 INTRODUCTION

Birr Castle Demesne was awarded €200,000 by the Department of Housing, Local Government and Heritage under the Historic Structures Fund 2023 to carry out conservation work to Birr Castle Suspension Bridge.

1.1 Project Name: Birr Castle Suspension Bridge

1.2 Project Team: The project team comprised:

Engineers: Mark Murphy Consultancy Ltd. (Mark Murphy BE MSc CEng) and Civil & Structural Engineering Advisors Ltd. (Kieran Ruane, Chartered Civil and Structural Engineer)

Conservation Engineers: David Kelly Partnership (John Kelly B.E., M.Sc., C.Eng., M.I.E.I., FConsEI., M.I.Struct.E., Conservation Accredited Engineer (EI/ICE/IStructE) and Aoife Howard, B.A., B.A.I., C.Eng., M.I.E.I., Conservation Engineer)

Contractor: Mackey Ltd. Steel Fabrication Specialists

2.0 DESCRIPTION OF THE WORKS

1. The suspension cables, hangers, lattice side panels, shackles and clamps were dismantled, cleaned to remove corrosion and detached paint and re-painted with a styrene acrylic resin-based paint system to match the existing cream-white colour;
2. Damaged fittings were repaired, replacing missing sections with new mild steel welded to the existing and re-painted prior to re-assembly;
3. Decayed timber cross beams and deck planks were replaced with new timber from the Demesne. All the timber was treated with preservative and finished with anti-slip strips;
4. Detached concrete at the supports was removed and repaired in-situ to match the existing concrete;
5. The top surfaces of the abutments were carefully removed to expose the connections of the back-stays to the anchorage blocks. The connections were renewed with new clamps;
6. The iron back-stays were cleaned in-situ and repainted with a styrene acrylic resin or epoxy micaceous iron oxide coating system above ground and a coal tar epoxy-based coating below ground level;

7. The masonry abutments were repointed locally with a compatible lime mortar where the masonry joints were eroded.

3.0 CONFIRMATION REGARDING COMPLIANCE WITH METHOD STATEMENT

I confirm that the works were carried out in accordance with the method statement except that new clamps were made to connect the concrete abutments to the metal.

4.0 MATERIALS USED

Repointing was carried out with 2.5:1 Sand : NHL 3.5.

The coating system was as follows:

Primer 1 x Full Coat of Hempadur 15553 zinc phosphate anti-corrosive primer	NDFT 50-75µm
Intermediate 1 x Full Coat Hempadur HS 47950 MIO	NDFT 125-250µm
Topcoat 1 x Full Coat Hempathane HS 55613 Polyurethane	NDFT 50-75µm
Total System Thickness	NDFT 225-400µm

Hempathane Topcoat 55210 was used for the railings.

The non-slip strips were stone coloured Watco GRP Decking Strips.

5.0 MAINTENANCE STRATEGY

The following maintenance schedule should be followed to ensure the future of this conserved section of the monument.

1. The bridge should be inspected visually on a monthly basis, by a member of the Birr Castle Demense, to identify any sudden changes, vandalism, loss of masonry;
2. The bridge should be weeded by hand annually to prevent ivy and vegetation re-establishing itself on the bridge and abutments;
3. The condition of the bridge should be reviewed at least every five years by a conservation professional experienced in the assessment of historic bridges.

6.0 EMPLOYMENT BENEFIT

Contractor: 300 person days

Professional Service Providers: 54 person days

8.0 COST OF WORKS

	Cost incl. VAT
Mackey Plant Construction	€142,608.21
Mark Murphy Consultancy Ltd.	€22,539.75
Civil & Structural Engineering Advisors Ltd.	€18,204.00
David Kelly Partnership	€10,578.00
Caroline Shiels (Bat Survey)	€1,416.46
TOTAL	€195,346.42

I confirm that these costs were expended on the project within the terms of the conditions attached to the Offer of Grant from the Department. I further confirm that the principles of good heritage practice in building conservation have been adhered to throughout the project.

AOIFE HOWARD

8.0 PHOTOGRAPHIC RECORD

“Before”



Entrance



Masonry Abutments



Entrance from Castle Side



Bridge



Timber in Poor Condition



Connections



Concrete Pillars

“During”



Arrival in Workshop



Arrival in Workshop



Checking and Retying all Connections



Clamp Prototype



Old Deck



New Deck Prototype



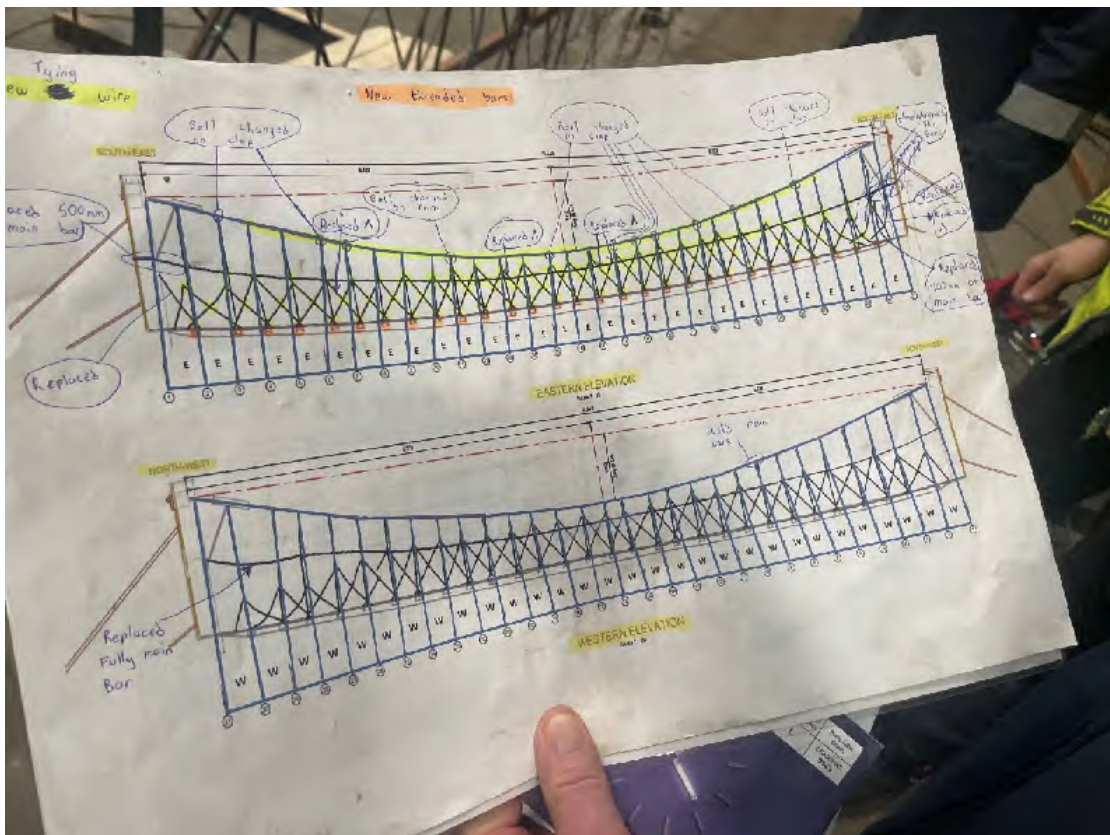
New Clamp Prototype



Connection Detail



Wire Connection Detail



Marking up of Survey



Primer Coating



Micaceous Oxide Coating



Bridge Installation



Bridge Installation



Deck Ready for Installation

“After”



Bridge Deck



Clamp



Entrance



Masonry Repairs



Clamp

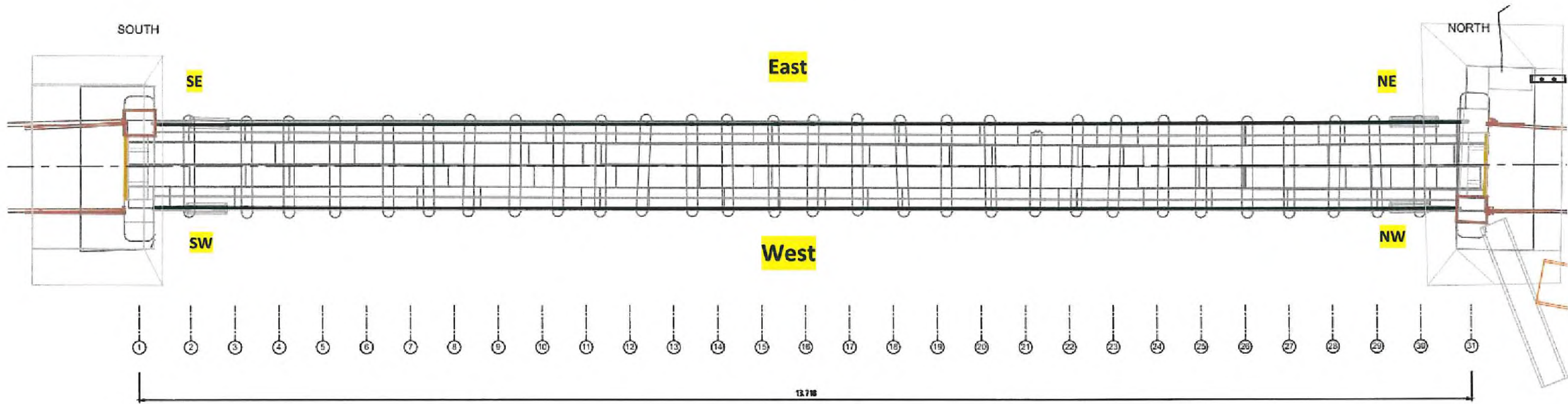


Concrete Repairs



View from Riverbank

APPENDIX – WORKS RECORD



13.718
PLAN LAYOUT

- New Threaded Bars
- New Tying Wire

