ARCHITECTURAL HERITAGE IMPACT ASSESSMENT

PROPOSED STRUCTURAL ENHANCEMENT OF

MARKIEVICZ BRIDGE / 'NEW BRIDGE', SLIGO

September 2024

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CONTRIBUTIONS

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1.0 INTRODUCTION

This assessment relates to proposed repair and structural enhancement of Markievicz Bridge, also known as 'New Bridge', Bridge Street, Sligo.

Molloy & Associates Conservation Architects were instructed by PUNCH Consulting Engineers to prepare an Architectural Heritage Impact Assessment for submission to An Bord Pleanála via Section 177AR application.

This assessment comprises an appraisal of the architectural character of the structure, an outline description of proposed works, and an assessment of the potential impact of those works on the architectural heritage significance of the bridge as a protected structure, and the enclosing townscape.

A desktop study was undertaken to understand the significance of the site and inspections of the bridge and immediate surroundings on the 20th and 21stJanuary 2024. A detailed condition survey has not been carried out as part of this assessment, although some observations have been made on the general architectural compositional condition of the structure and its setting, where relevant.

This AHIA should be read in conjunction with its appendix together with drawings and documentation prepared by PUNCH Consulting Engineers.

The AHIA format adheres to that recommended in Appendix 2 of 'Architectural Heritage Guidelines for Planning Authorities'.

2.0 SUMMARY OF ARCHITECTURAL CONSERVATION CONSIDERATIONS

2.1 Outline description of site

Markievicz Bridge also known as 'New Bridge', on Bridge Street, a protected structure, was constructed in the 17th century between 1673-1687, in place of a 12th century bridge. It is the oldest surviving bridge in the historic urban centre of Sligo town.

It is a seven-arch bridge, which was widened in the 18th century. In the early-mid 20th century, remedial works were undertaken to prevent scour, undermining of the foundations. Modifications comprised the provision of concrete protections at the foot of each pier, a raised concrete base and the infilling of the southernmost arch, giving the appearance of a six span bridge on the upstream elevation.

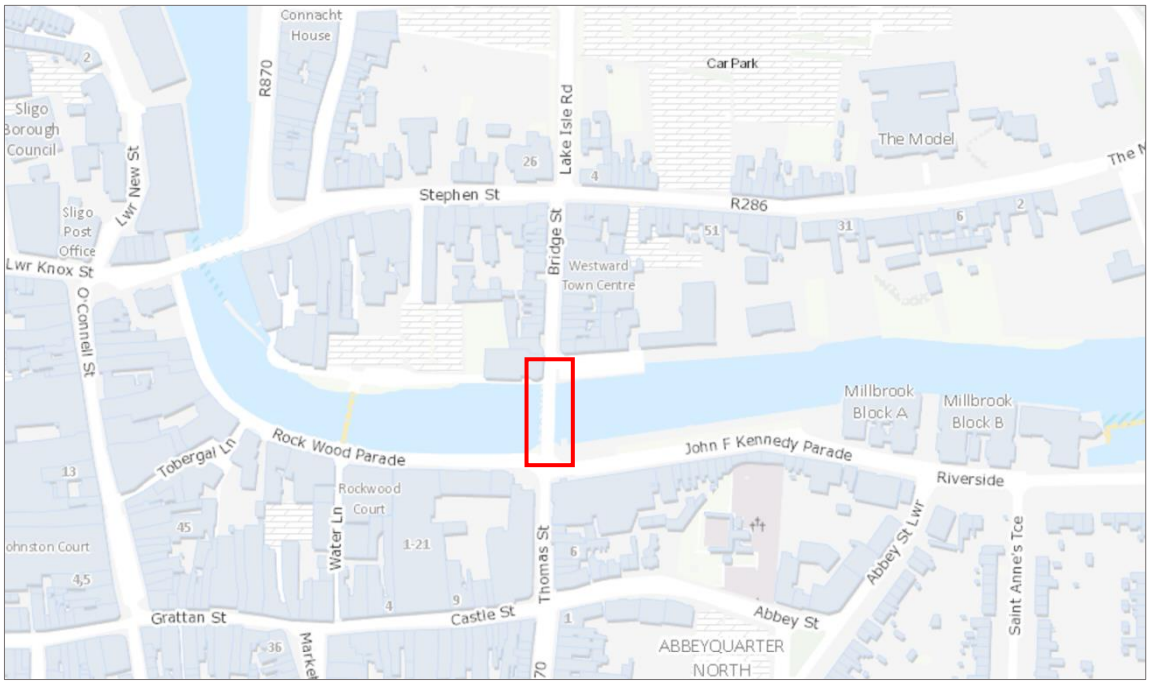

Figure 1 - Markievicz Bridge, also known as 'New Bridge', Bridge Street, Sligo outlined in RED

The parapets are constructed in random limestone rubble, with parapet cappings comprised of squared limestone blocks. Large building stones were traditionally used to bond the wall tops and reduce water ingress.

On the upstream elevation, which was constructed as part of 18th century widening works, the voussoirs are dressed quoins.

Patch repointing has been previously undertaken using cementitious mortars which visually disfigure the appearance of the bridge and likely to result in damage to the adjacent limestone.

The width of the deck is restricted and divided into an asphalt road surface carrying two narrow lanes of southward vehicular traffic and a footpath of limited width on the downstream side only, which is laid with concrete setts.

A pair of lamp standards are bolted to the top of the parapet cappings at either end of the bridge. Being 20th century fixtures they are not of architectural heritage significance.

A 2022 condition report prepared by Punch Engineering found the upper part of the bridge to be in stable condition but significant damage to the riverbed was identified, thus the structure in general was assigned a 'Condition Rating 3'.

2.2 Description of Proposed Repair Works

It is proposed to undertake engineering works to repair defects to Markievicz Bridge which have developed as result of scour. The channel bed has been eroded in the vicinity of the bridge as a result of contraction scour, causing a significant hydraulic jump at the upstream face of the bridge. The piers have also been undermined to varying degrees as a result of local scour. The extent of scour to the piers is a cause of concern for the structural integrity of the bridge. Detailed design following full interrogation of the completed detailed scour and bathymetric surveys will ensure the repairs achieve the following primary aims:

1. Reverse current and prevent future local scour effecting the structural integrity of the bridge by replacing the existing concrete footings and extending the pier footings further below ground level. Refer to Engineer's drawings and documentation for details.
2. Reverse the current contraction scour and delay its recurrence by rehabilitating the channel bed in the vicinity of the bridge. Refer to Engineer's drawings and documentation for details.
3. Localised repointing works to masonry spandrel, parapet, and piers.

2.3 Statutory Context

Statutory protection afforded to the bridge is as follows;

RPS No 4:	Description: Bridge
NIAH No 32007110:	Rating: Regional, Categories of Special Interest: Archaeological, Architectural, Scientific, Technical
ACA	The bridge is not positioned within the boundaries of an Architectural Conservation Area, but it is within close proximity to two ACAs. Please refer to Figure 2 for reference.
ZAP	The bridge is located with a Zone of Archaeological Potential.
Recorded Monument	New Bridge/Markievicz Bridge is a recorded monument by virtue of being a pre-1700 structure located within the Historic Town of Sligo, RMP No. SL014-065

Figure 2 – Extract from Sligo County Development Plan 2017-2023 (Extended to July 2024), Markievicz Bridge, also known as 'New Bridge', Bridge Street, Sligo identified as No.4. The boundaries of the ACAs in proximity to the Bridge are outlined in orange.

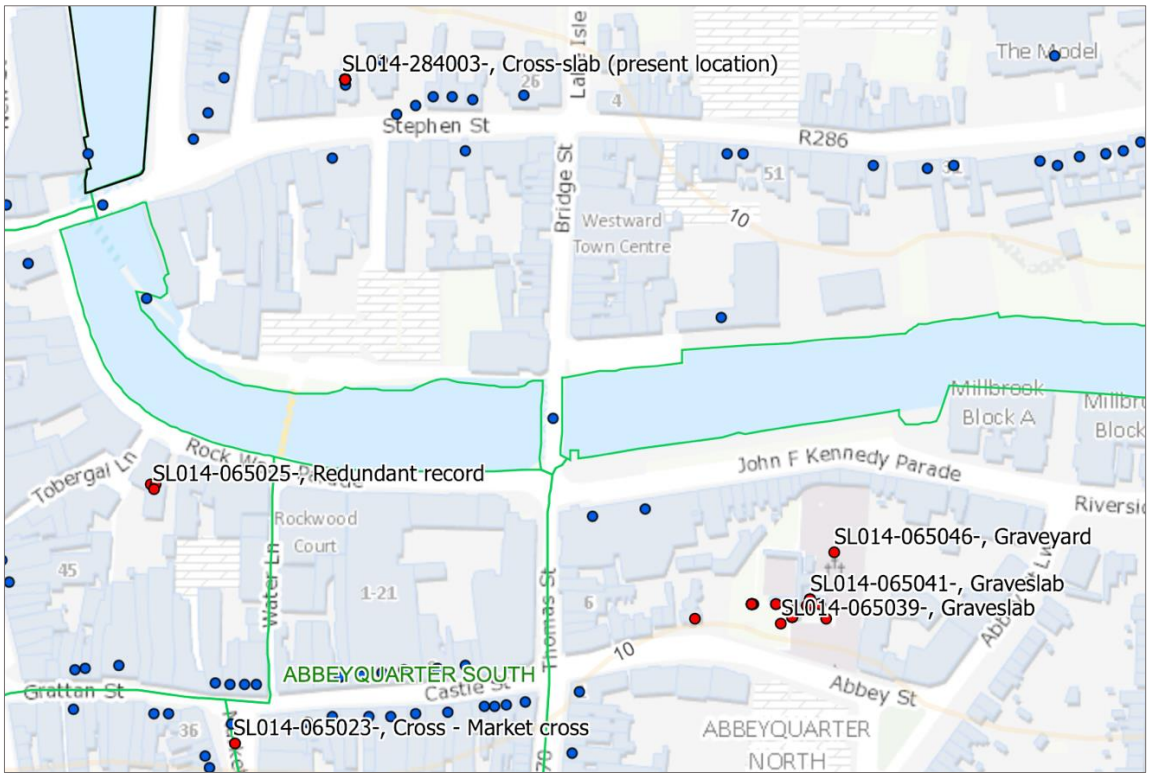

Figure 3 – Structures identified in the NIAH, Source: archaeology.ie

The description of the bridge in the NIAH appraisal is as follows;

> *Seven-arch bridge over river, built 1673. Repointed coursed rubble limestone walls centred on triangular cutwaters to piers to upriver (east) elevation on mass concrete bases having rendered pyramidal capping with margined tooled cut-limestone coping to benchmark-inscribed parapets. 'Series of seven segmental arches with margined tooled limestone ashlar block-and-start voussoirs (east) or rough hewn limestone voussoirs (west). Sited spanning Garvogue River."*
>
> *Appraisal: A bridge representing an important component of the seventeenth-century built heritage of Sligo (Irish Historic Towns Atlas Sligo 2012, 21) with the architectural value of the composition confirmed not only by the blue-grey limestone dressings demonstrating good quality workmanship, but also by the elegant "sweep" of the arches making a pleasing visual statement at a crossing over the Garvogue River: meanwhile, a benchmark remains of additional interest for the connections with cartography and the preparation of maps by the Ordnance Survey (established 1824).*

2.4 Brief account of historical development

New Bridge was erected by the Corporation in *c.* 1673 when the town expanded in the 17th century [1]and is thought to have replaced the original bridge built in 1188.

Medieval Sligo, as depicted in the Down Survey, (Figure 4), depicts a single crossing at the site of 'Old Bridge'. The bridge, originally called Victoria Bridge, now Hyde Bridge. Taylor and Skinner's 18th century map (Figure 5) depicts a second crossing upstream, at the location of the subject bridge.

[1] Irish Historic Towns Atlas (IHTA), no. 24, *Sligo,* Fióna Gallagher and Marie-Louise Legg

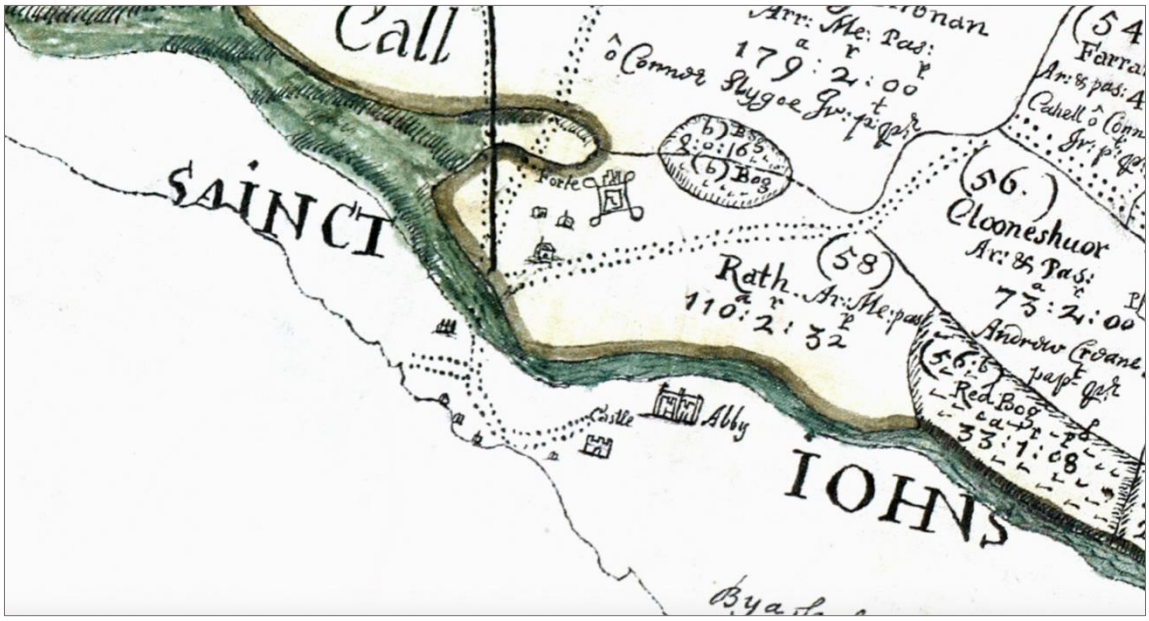

Figure 4 – Extract of the Callrie Parish 1657 Down Survey, Source: Sligo County Council. A crossing is depicted at the site of 'Old Bridge', now Hyde Bridge

Figure 5 – Extract of George Taylor and Andrew Skinner, Road Maps of Ireland, Map 65 – Road from Dublin to Sligo by Longford, 1777. A 2nd crossing is shown east of Old Bridge, in the present location of Markievicz / New Bridge. Source: S.wilson.info

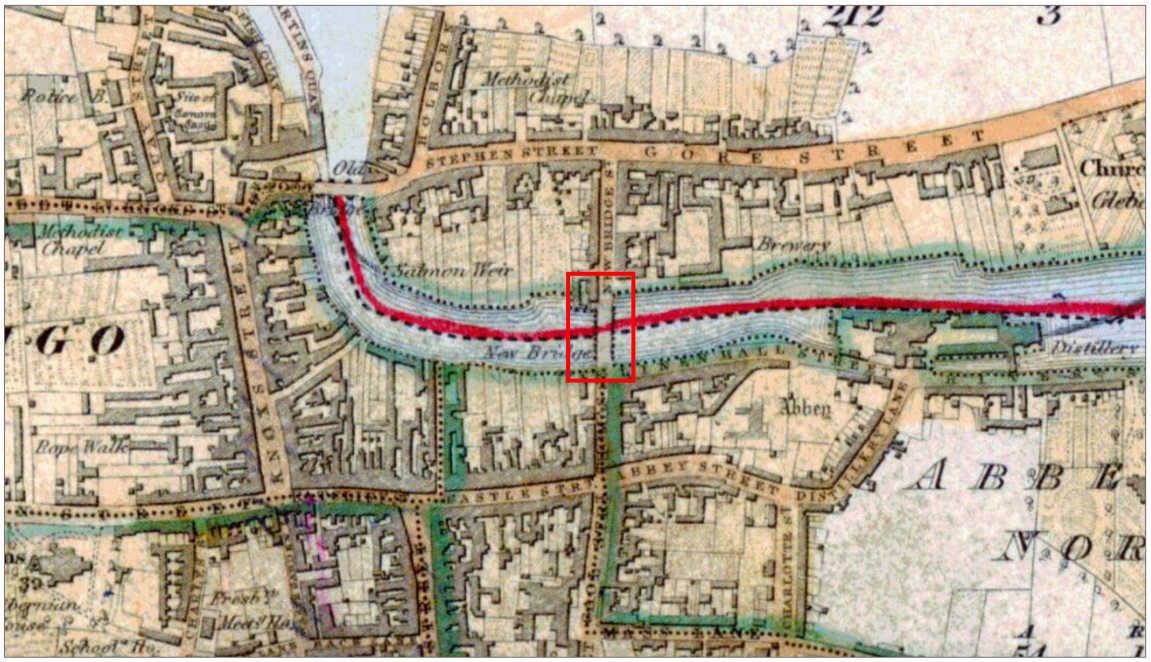

Figure 6 – Extract of the 1837 6-inch Ordnance Survey Map, Source: Sligo County Council

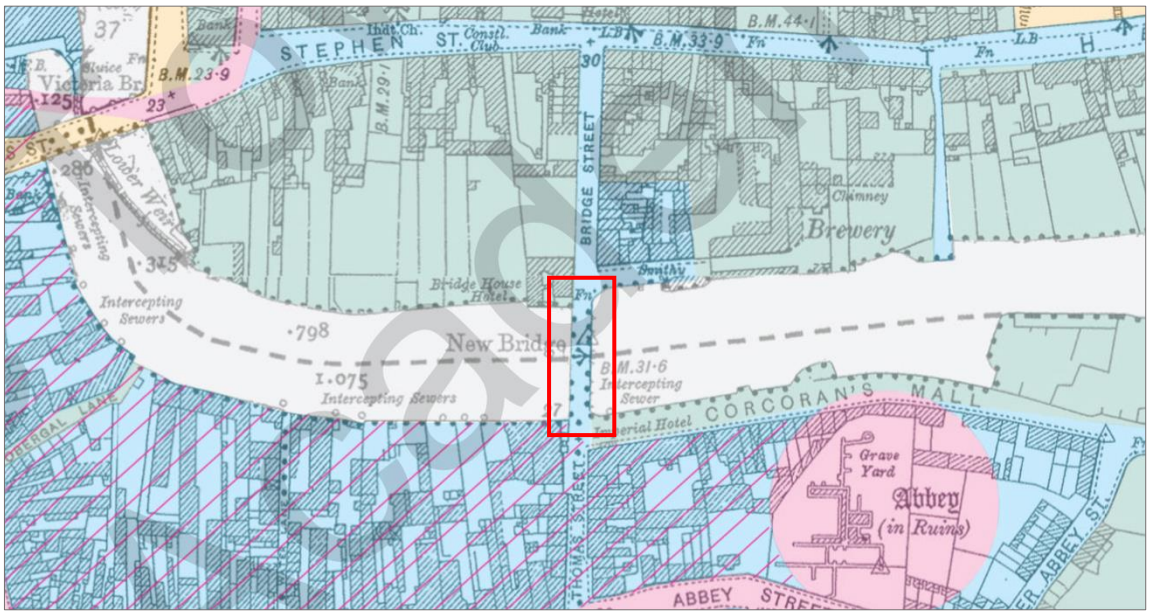

Figure 7 – Extract from Map 17, Growth of Sligo, to 1910. Sligo as thought to have been established between 1601 and 1750; the hatched area pre-1600 is the medieval core. In Fióna Gallagher and Marie-Louise Legg, Irish Historic Towns Atlas, no. 24, Sligo. Royal Irish Academy, Dublin, 2012 (www.ihta.ie)

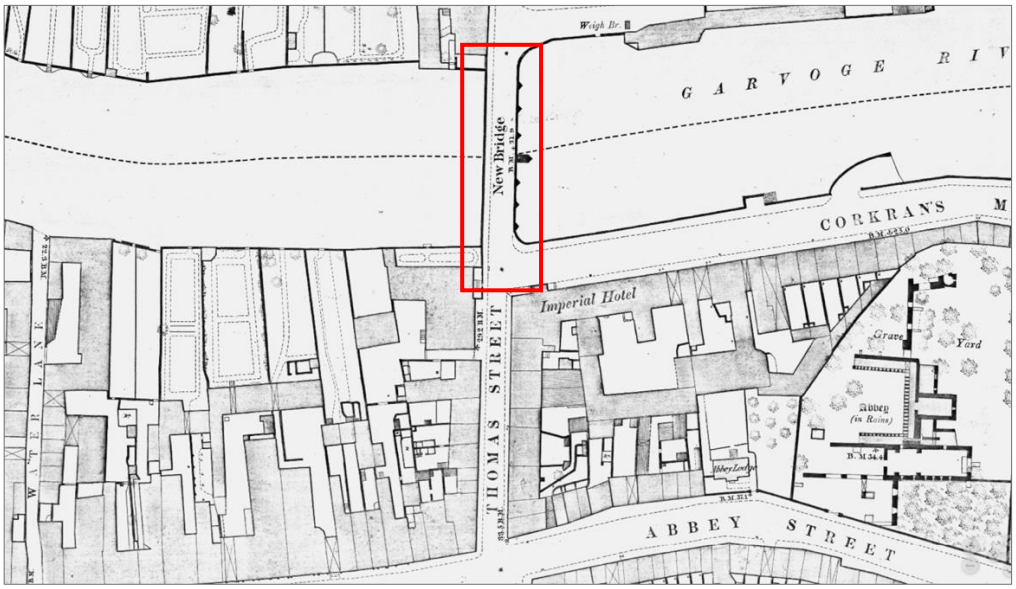

Figure 8 – Extract of the detailed 1875 6-inch Ordnance Survey Map, Source: UCD digutal.ucd.ie

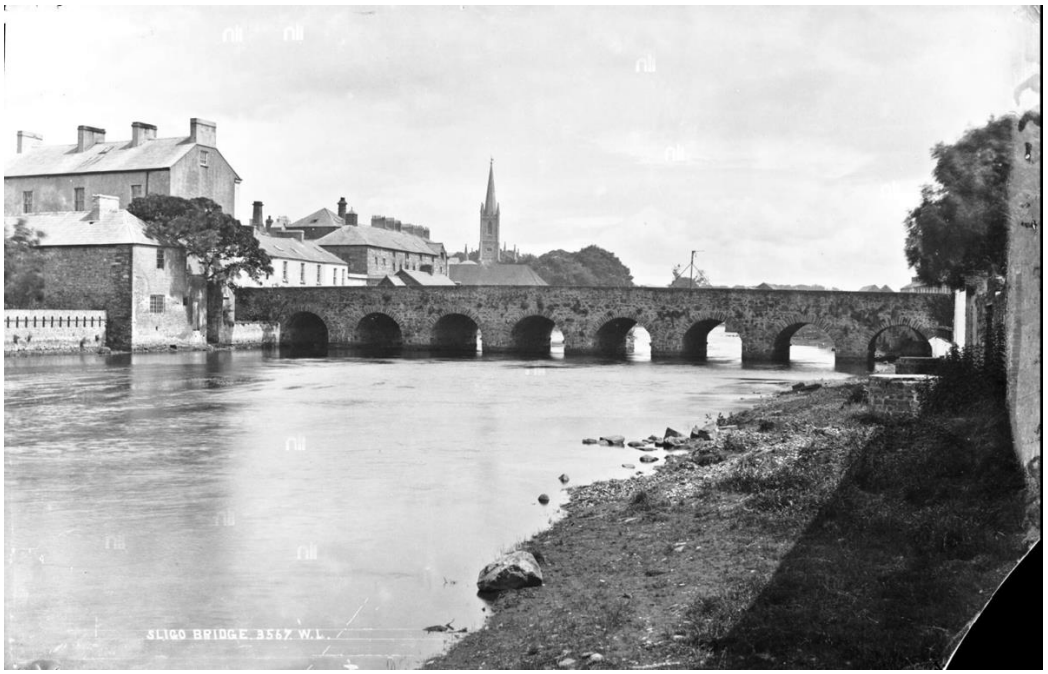

Figure 9 – Hotel Bridge, Sligo, Co. Sligo by: Robert French, 1841-1917 photographer,

Source: The Laurence Photograph Collection National Library of Ireland

Figure 10 – Present view of the Markievicz Bridge, taken from a similar vantage point. The architectural grouping comprised of the bridge, the former warehouse on Kemptem Parade and the steeple of Calry Church in the background contribute to the character of the townscape

3.0 APPRAISAL OF HERITAGE SIGNIFICANCE

This appraisal is based on the findings of both desk and field research. A detailed appraisal of the categories of special interest identified in the NIAH cite Architectural, Historical and Technical significance.

Architectural

This simple but elegant multispan bridge is one of the more important historic bridges in County Sligo and is an integral element of the built heritage of the townscape.

The elegant, arched masonry bridge of roughly coursed limestone, rough-hewn limestone voussoirs (downstream) and decorative embellishments limited to the upstream aspect comprising dressed limestone voussoirs (upstream) testament to the multiple phases of its construction demonstrates high quality workmanship. The historic evolution of the bridge evidenced in the multiple layers of construction is part of its character.

The architectural significance of the bridge is related to its contribution to the townscape owing to its prominence in the vista from the urban centre, particularly from the pedestrian 'Bridge of Light', Rockwood Parade and Stephen Street Public Plaza, which is presently undergoing public realm improvement works. In a town that has undergone much change by virtue of the redevelopment along the River Garvogue, this characterful bridge acts as a local place-maker in the built environment.

The character of the town as captured by Robert French in an early 20th century photograph of Sligo town

(Figure 8) has endured largely on account of the survival of the architecturally pleasing grouping of the bridge, the former warehouse on Kemptem Promenade and the steeple of Calry Church in the background.

The visual amenity of the bridge within the townscape is sensitive to change and the impact of any proposed repairs or alterations must be considered in that context.

Figure 11 – The bridge is prominent in views and a recognisable local landmark in the townscape. This view is of the bridge from the south riverbank, adjacent the pedestrian "Bridge of Light'

Historical

The bridge was constructed in the 17th century between 1673-1687, in place of an 12th century bridge making it the oldest surviving bridge in the historic urban core.

Technical

The bridge is robustly built using rubble stone masonry, and its survival for over three hundred years is testament to the inherent strength of the arch construction. The wide piers between the arches are a feature of these early bridges and the projecting corbels indicate the method of construction of the stone arch barrels.

The triangular-profile cutwaters to the upstream elevation were a later addition built to protect the bridge from damage. The dry arch to the south end of the bridge indicates where the promenade was widened during twentieth century.

A benchmark cut into the eastern parapet is of additional interest for the connections with cartography and the preparation of maps by the Ordnance Survey.

Figure 12 – Benchmark cut into capstone of eastern parapet

4.0 ARCHITECTURAL HERITAGE IMPACT ASSESSMENT

There are a number of aspects for consideration with regard to the proposed works and their respective impact. Each of the proposed interventions described below are considered in terms of;

- The impact of the proposed works on the special interest values (significance) of the protected structure as identified in Section 3 above.
- The impact of the proposed development on the historic urban setting

4.1 **Intervention 1:** Reverse current and prevent future local scour effecting the structural integrity of the bridge by replacing the existing concrete footings and extending the pier footings further below ground level

The present concrete skirts at the base of each of the piers were added during the 20th century to address scour damage. These concrete footings have weathered over time and now require replacement to prevent erosion of the 17th century fabric. It is proposed to carefully remove the existing concrete footings and to subsequently reinstate new concrete footings thus safeguarding the earlier fabric.

Anticipated impact of Intervention 1

The proposed remedial works will have an nett positive impact on the protected structure. The replacement of the 20th century concrete footings will not result in any physical loss or damage to fabric of architectural heritage interest and the works are required to ensure the future stability of the structure. The concrete protection measures are sacrificial in nature and intended to protect the earlier fabric from erosion.

The present concrete footings are not found to detract from the visual amenity of the bridge at present. The plinth is simple and understated yet clearly distinguishable from the original limestone structure. During low tide the weathered concrete footings blend harmoniously with the limestone and at high tide the footings are submerged in their entirety, thus concealed from view. It is considered that the proposal to replace the concrete footings will result in no change to the existing appearance of the bridge in the long term. In the short term, the works may have a minor visual impact, until such time as the fresh concrete has weathered and the finish has acquired a patina to visually merge it with the aged limestone masonry. The proposed intervention will not alter how views of the bridge is experienced from adjacent public areas.

The extension of the pier footings further below ground will necessitate localised disturbance of the river bed. The bridge is within a zone or archaeological potential and therefore the potential impact of the works to the river bed have been separately appraised by the consultant archaeologist. Please refer to the archaeological heritage impact assessment or details.

Mitigation measures

The removal is limited to the concrete fabric. Care will be taken not to disturb rubble limestone during its removal.

It is noted that a detailed photographic record and measured building survey of the bridge have already been undertaken. This will serve as a valuable record for proposed and future work.

A suitably qualified archaeologist will be engaged to advise on suitable mitigation measures for the proposed works on the river bed.

Justification for the works

The scour damage identified at the base of the masonry piers leaves the bridge vulnerable to increased damaging scour in the future and if not addressed, will lead to loss of the historic fabric and ultimately threaten the stability of the bridge.

Figure 13 – Western elevation of Markievicz Bridge. The southernmost arch have been partially infilled, and the concrete base is exposed at low tide

4.2 **Intervention 2:** Reverse the current contraction scour and delay its recurrence by rehabilitating the channel bed in the vicinity of the bridge

Anticipated impact of Intervention 2

The riverbed is comprised of large, rounded flagstones and rough cobbles, likely incorporating fabric relating to the construction of the original bridge. An underwater dive survey has been undertaken to inform the archaeologist heritage impact assessment.

Mitigation measures

A suitably qualified archaeologist has been engaged to advise on suitable mitigation measures for the proposed works on the river bed.

Justification for the works

The works are required to delay the recurrence of damage due to scour

4.3 **Intervention 3:** Localised repointing works to masonry spandrel, parapet, and piers

It is proposed to carry out localised repointing of the joints where mortal has been lost. Appropriate repairs will be carried out to retained wall structure such as pointing to ensure its integrity and protection.

Figure 14 –Inappropriate mortar and repointing style, as evidenced in the highlighted area can injure the appearance of the bridge and where cementitious mortars are used, they can cause physical damage to the adjacent limestone

Mitigation measures

Inappropriate pointing has been previously undertaken which has had a visually disfiguring impact on the structure. It is recommended that detailed historic mortar analysis should be undertaken in advance of repairs to inform reconstruction. Repointing will be carried out using lime mortar informed by this analysis matching existing constructional techniques. New work will have continuity with the original structure and maintain the original pointing style and maintain the integrity of the original structure. At the discretion of the supervising conservation consultant, the contractor may be required to prepare repointing samples for approval.

Justification for the works

The works are required to ensure the integrity of the structure.

5.0 METHODOLOGY

The structure will be repaired traditionally as follows;

Removal of vegetation

Any biological growth embedded within walls will be removed, and the joints raked out to a sufficient depth to remove developed root systems. Where aggressive roots are found, they will be removed insofar as possible and breaches infilled to discourage regrowth.

Cleaning

The masonry will be brushed with wire brushes to clean surfaces prior to repair. In preparation for this work, any loose stones will be carefully removed and set aside for re-use. The surrounding (intact) stone will be brush-cleaned of debris and dampened down.

Once surface debris is removed, it is intended to steam clean the structure with methods to be reviewed carefully in advance of commencement, to mitigate risk of adverse conservation or environmental impacts.

Strategy for masonry consolidation and repair

- All masonry consolidation works will be carried out complying with BS 7913:1998 Guide to the Principles of the Conservation of Historic Buildings.
- The work is to be carried out by operatives skilled in the use of lime mortars and traditional masonry conservation.
- The contractor must ensure that the works are protected from inclement weather, with methods to be agreed in advance of appointment .

Lime mortar

- New bedding mortars will be required to fill breaches in the structure, and also where reinstating collapsed masonry.
- Samples, as cited below, will determine true specifications for the mortar.
- The bedding mortar in general will comprise one-part NHL3.5 lime to 2 ½ parts fine to medium grained sand.
- The new re-pointing mortars will consist of a fine to medium-grained lime based mortar mix, formulated for stone rubble in a moderately exposed location, in a moderate to severe environment. Sands will be local, and primarily consist of local limestone. The sand used will comply with current standards including BS 1200, BS 882, BS 1200:1976, BS 4551-1:1998, BS EN

998-2:2002, and the European normative references EN 1015-1. The proposed lime mortar will comprise a mix of 2.5 parts aggregate to 1 part NHL2 lime.

Raking out and repointing masonry

- All open mortar joints are to be re-pointed using a lime-based mortar. This will include the raking out of loose mortar and material prior to re-pointing.
- Cement pointing/ patch repairs where present will be carefully removed.
- Prior to the application of mortar, the stone work will be wetted down with a fine water mist using a hand sprayer. Lime mortar will be trowelled into the joints. The contractor will use small round stones and pins (i.e. long wedge-shaped pieces of stone) to reduce the areas of mortar in large joints. These infill pieces will be tapped into place by hand. Any displaced mortar from the joints will be carefully removed using a trowel. The contractor will carry out re-pointing to a trial section of the wall at high level for agreement with the conservation architect before re-pointing elsewhere.
- The work will include grouting and deep tamping of existing open and dry joints and voids; and to consolidate sections of the wall where voids are suspected within the core. This is particularly important where there are known voids. The grouting material will be lime-based with a suspension aid (such as bentonite).
- It is important that the final strength of the grout will not exceed that of the stone rubble masonry, that it be similar in permeability, low in shrinkage and have a good flow rate for effective penetration.

Cappings

- Existing stone cappings vary in style, from rounded cut stone to pointed rubble.
- It is intended, where reinstating lost wall sections, to emulate sections adjacent in accordance with methods above.
- Where original cut stone cannot be found where collapsed, new sections to match profile and stone type of original to be cut.

Operatives

- Any proposed conservation or repair works to be undertaken by a contractor with proven experience of the conservation and repair of historic masonry structures, under supervision of a suitably qualified conservation consultant/architect.
- All monitoring arrangements will be agreed at the outset of the works.
- The appointed conservation consultant/architect to carry out periodic inspections and approve workmanship.

Samples

- At the discretion of the conservation consultant/architect, the contractor may be directed to prepare sample work for approval (such as repointing and sample masonry panels).

6.0 SUMMATION

The proposed repair works will not adversely impact on the special interest value of the protected structure and are required to ensure its long-term structural stability. Repair works of this nature are routinely required to offset erosive damage. The repair works are considered to arise in a positive, minor impact.

APPENDIX 1 Photographic Inventory

Plate 1 –View of Markievicz Bridge from Kempten Promenade towards the upstream elevation

Plate 2– Dressed limestone voussoirs on the upstream elevation

Plate 3 – Detail of dressed limestone voussoirs with keystone. Vegetation is apparent on the spandrel walls and cutwaters

Plate 4 –The southernmost arch has been partially infilled and the parapet walls modified adjacent the southern bank

Plate 5 –View of the bridge towards the western (downstream) elevation

Plate 6 –Downstream view of the partially infilled southern arch

Plate 7 –The modified wing walls (southern side) are comprised of coursed limestone blocks, with heavy strap pointing

Plate 8 –Detail of base of lamp standards bolt fixed to limestone parapet walls

Plate 9–Approach to the crossing from Bridge Street, facing south