



Kilkenny County Council

Pedestrian and Cycle Link Between Bishops Meadows and Riverside Gardens

177AE Planning Application Report

**Relating to Construction, Planning & Environment Report (in
Accordance with Section 177AE of Planning and Development Act 2000
(as Amended))**

Kilkenny County Council County Hall, Johns Street, Kilkenny	21038-R-177AE Issue PL1	Kilgallen & Partners Consulting Engineers 3 Danville Business Park Kilkenny
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REVISION HISTORY

Client	Kilkenny County Council
Project	Pedestrian and Cycle Link Between Bishops Meadows and Riverside Gardens
Title	177AE Planning Application Report

Date	Detail of Issue	Issue No.	Origin	Checked	Approved
18/10/2023	Planning issue	PL1	RK	NOC	PB

TABLE OF CONTENTS

1. Introduction	1
1.1 Context.....	1
1.2 Brief Description of the Project.....	2
2. Description of Site	3
3. Planning Context	6
3.1 Kilkenny City and County Development Plan 2021-2027.....	6
3.2 Kilkenny City and Environs Development Plan 2014-2020.....	7
4. Route Options	8
5. Description of Project – general	9
5.1 Cross-section and Longitudinal Gradient	9
5.2 Use of Existing Bridge Arch	9
5.3 Lighting	9
5.4 Existing Services and Utilities	9
5.5 Peak Water Levels during Flood Events.....	10
6. Description of project - Boardwalk structure	11
6.1 Parapet.....	11
6.2 Viewing Platform / Refuge Area.....	11
6.3 Materials.....	11
7. Construction	12
7.1 Designing For Ease of Construction and Minimal Environmental Impact	12
8. Project Impact Assessments	13
8.1 AA Screening	13
8.2 Natura Impact Statement (NIS).....	13
8.3 Screening for Environmental Impact Assessment.....	13
8.4 Ecological Impact	14
8.5 Arboricultural Impact	14
8.6 Archaeological Impact	14
8.7 Architectural Heritage Impact.....	15
8.8 Flood Risk.....	15
9. Consultation	16

 Pedestrian and Cycle Link Between Bishops Meadows and Riverside Gardens

9.1	Development Applications Unit	16
9.2	National Monuments Service	16
9.3	Fisheries Ireland.....	16
9.4	National Parks and Wildlife Service	16
9.5	Office of Public Works.....	16
10.	Land Acquisition	18
10.1	Land acquisition	18
10.2	Rights of way	18
Appendix A	Drawings	
Appendix B	Construction Methodology	
Appendix C	Site-specific Flood Risk Assessment	
Appendix D	Ecological Impact Assessment Report	
Appendix E	Screening for EIA	
Appendix F	AA Screening Reports and NIS	
Appendix G	Tree Survey Report	
Appendix H	Archaeological Impact Assessment Report	
Appendix I	Architectural Heritage Impact Assessment	
Appendix J	Correspondence Records	
Appendix K	OPW Flood Alleviation Scheme Drawings – March 2006	

1. INTRODUCTION

1.1 Context

Kilkenny County Council [KCC] proposes the construction of a route for pedestrians and cyclists [‘the Project’] on lands between the River Nore Linear Park and the Riverside Gardens at Green Street, Kilkenny, Co. Kilkenny [‘the Site’].

The Project has been screened for appropriate assessment and it has been determined that a Stage II Appropriate Assessment (NIS) is required.

Section 177AE of the of the Planning and Development Act 2000 (as amended) [hereafter referred to as ‘the Act’] requires that where local authorities are proposing development which requires NIS, the local authority must receive approval for the development from An Bord Pleanála.

Kilgallen and Partners Consulting Engineers were appointed by Kilkenny County Council to prepare this Planning Report to support Kilkenny County Council’s application to An Bord Pleanála for approval of the Project under Section 177AE of the Act.

The purpose of this report is to provide An Bord Pleanála with appropriate information to assist it in determining if it should grant approval for the Project under section 177AE of the Act.

This report is to be read in conjunction with the following drawings which show details of the Project and which, along with this report, will also be made available for public inspection as required under the Act.

Drg. No	Title
21038-000	Cover & Index of Contents
21038-100	Site Location Map
21038-101	Site Layout
21038-102	Elevations and Sections
21038-103	3D Views

Table 1 Schedule of Drawings Accompanying Report

This report draws on information provided in specialist reports and assessments, listed in Table 2, which were prepared by Kilgallen and Partners and by the following specialist subconsultants:

- SLR Consulting [Environment and Ecology]
- RPS Ireland Limited (NI) [Flood Risk Assessment]
- Independent Tree Surveys Ltd. [Arborist]
- Colm Flynn Archaeology [Archaeologist]
- Bluett & O’Donoghue [Built Heritage]

Pedestrian and Cycle Link Between Bishops Meadows and Riverside Gardens

Subject	Prepared By	Location
Nore Boardwalk - Construction Methodology	Kilgallen and Partners	Appendix B
River Nore Boardwalk, Kilkenny - Flood Risk Assessment	SLR Consulting	Appendix C
Ecological Impact Assessment Report	SLR Consulting	Appendix D
Screening for Environmental Impact Assessment Report	SLR Consulting	Appendix E
Screening for Environmental Impact Assessment	Kilkenny County Council	Appendix E
AA: Screening Form	Kilkenny County Council	Appendix F
AA Screening Report and Natura Impact Statement	SLR Consulting	Appendix F
Tree Survey Report	Independent Tree Surveys Ltd	Appendix G
Archaeological Impact Assessment Report	Colm Flynn Archaeology	Appendix H
Architectural Heritage Impact Assessment	Bluett & O'Donoghue	Appendix I

Table 2 Schedule of Specialist Reports and Assessments Accompanying Report

1.2 Brief Description of the Project

The River Nore Linear Park runs through Kilkenny along the west bank of the Nore. There is a gap in the infrastructure for this route between Bishops Meadows and Riverside Gardens. This gap results in users having to leave the bank of the Nore and travel on-road via Riverside Drive, the R693 (Troy's Gate) and the R886 (New Road).

The gap in the linear park infrastructure has the following detrimental effects:

- it disrupts the amenity provided by the linear park for current users,
- it requires current users to travel on roads which do not have appropriate active travel facilities and requires them to make a crossing of a busy Regional Road,
- it discourages increased use of the amenity, whether by locals or by tourists.

The primary objective of this Project is to eliminate this gap.

2. DESCRIPTION OF SITE

The Site adjoins the western bank of the River Nore between Riverside Gardens and Bishops Meadow. The drawings in Appendix A show the Site in detail.

Greens Bridge was designed by George Smith and is one of several bridges in County Kilkenny re-built by George Smith following the "Great Flood" of 1763. Castlecomer Bridge, Graiguenamanagh Bridge and Inistioge Bridge are other examples. **No works or alterations to Greens Bridge are proposed.**

The Site comprises Bishops Meadows and Riverside Gardens at its north and south ends respectively. The middle section of the Site includes the R886 Regional Road and undeveloped lands on the western bank of the Nore (see Plate 2-3).

Riverside Gardens are amenity lands and part of the Abbey Quarter Masterplan prepared by Kilkenny County Council for redevelopment of the former Smithwick's Brewery site.

Bishops Meadows are amenity lands adjoining the west bank of the Nore and include the River Nore Linear Park.

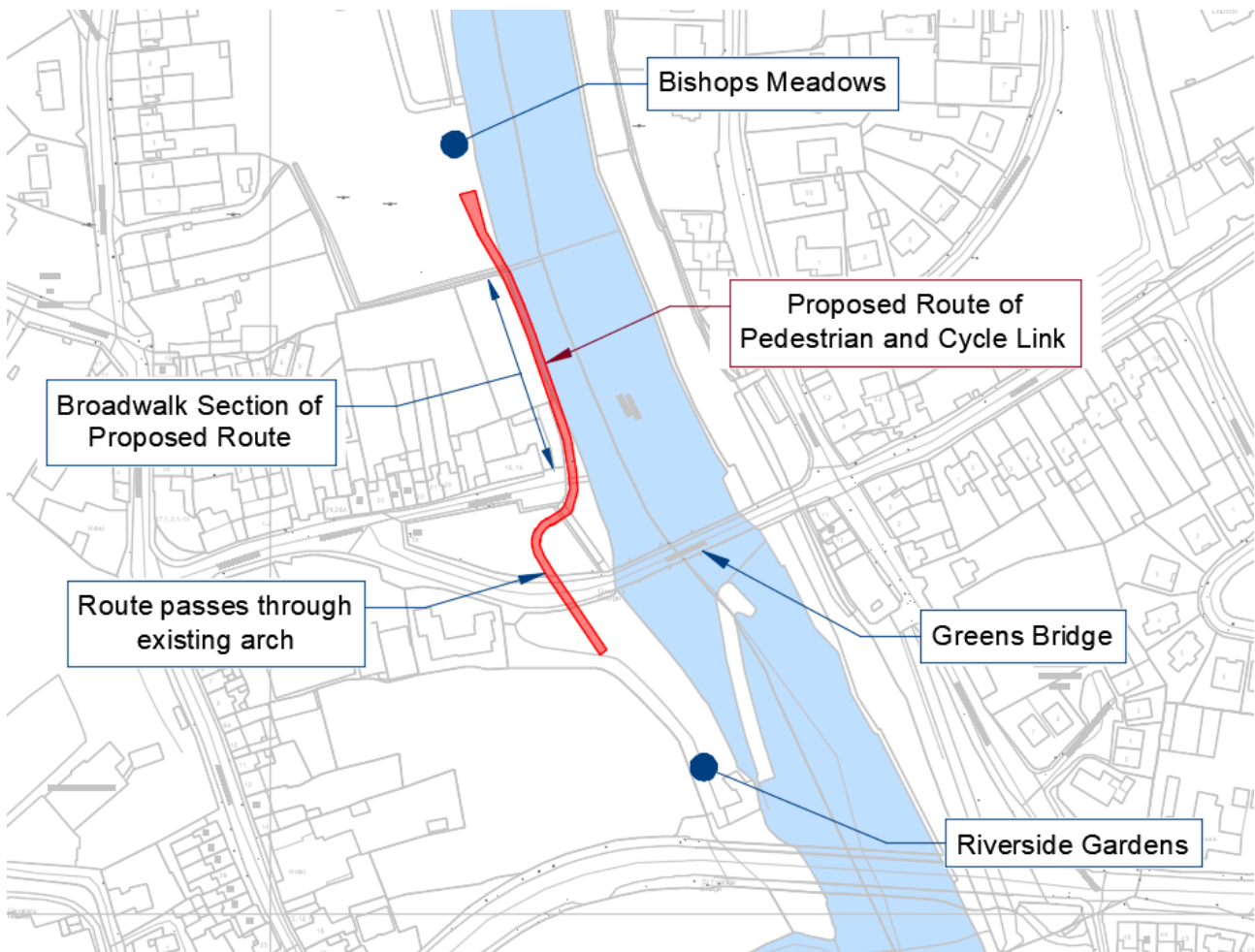


Figure 2-1 Site Location Map

Pedestrian and Cycle Link Between Bishops Meadows and Riverside Gardens

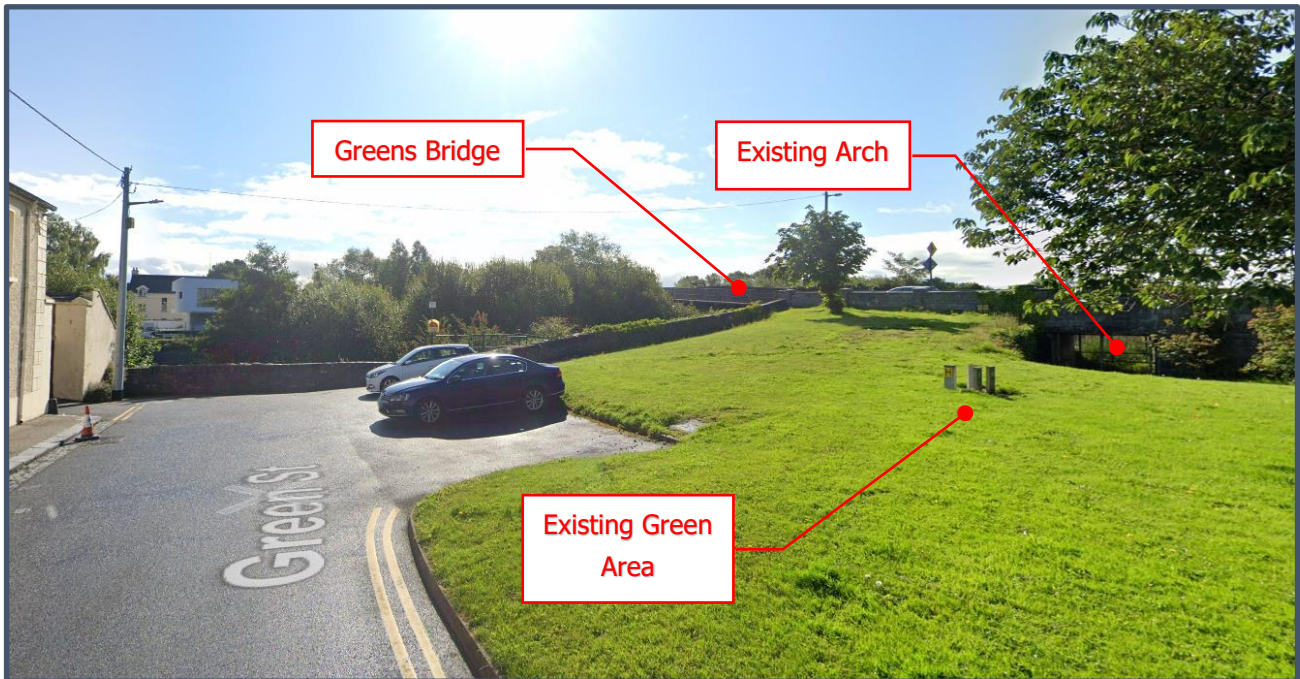


Plate 2-1 View of southern end of Site, from Green Street, facing east.

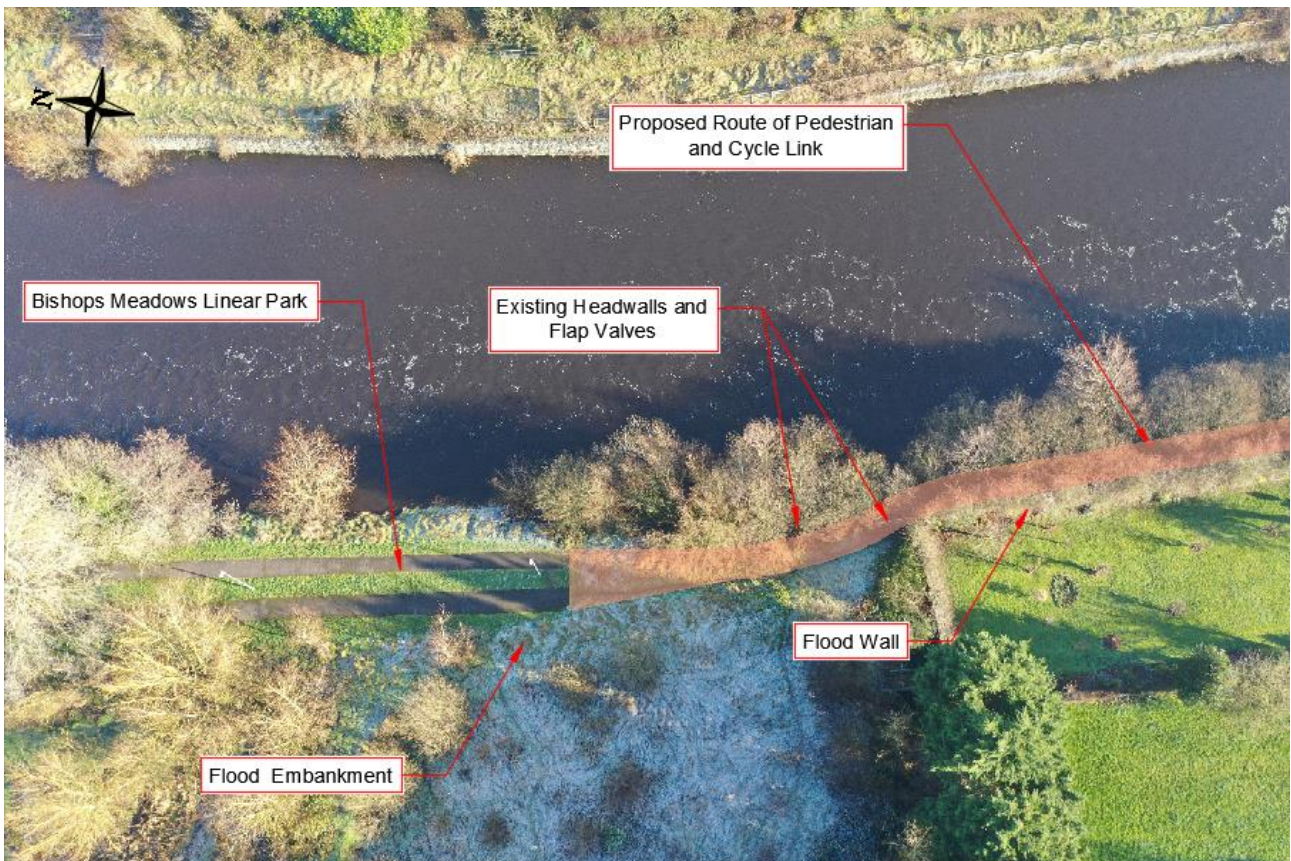


Plate 2-2 Aerial View of northern end of Site, taken from above western bank of the River Nore, facing eastwards.

Pedestrian and Cycle Link Between Bishops Meadows and Riverside Gardens

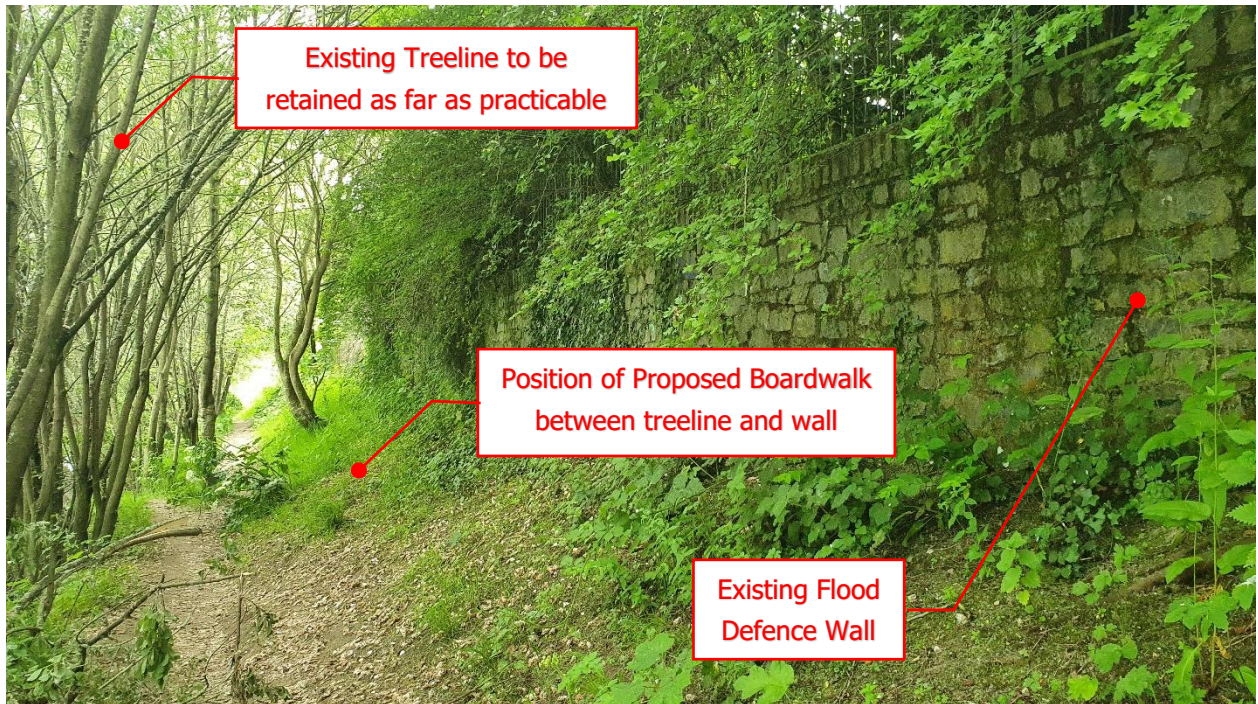


Plate 2-3 View of the central section of the proposed route, facing south.



Plate 2-4 Aerial View of the Southern section of the proposed route, facing south.

3. PLANNING CONTEXT

3.1 Kilkenny City and County Development Plan 2021-2027

Development in Kilkenny must be carried out in accordance with the Kilkenny County Development Plan [the CDP] 2021-2027.

Section 3 – Economic and Retail Strategy

Section 3 of the CDP sets out Kilkenny County Council’s policies and objectives regarding Economic and Retail Strategy. The CDP acknowledges Tourism as an important economic driver for the economy of Kilkenny. Trails, Greenways and Walkways are seen as an important part of the tourism offering in Kilkenny City and County. The provision of a boardwalk at the proposed location is specifically mentioned as part of objective C3C and aligns with objective C3B of the CDP.

The CDP includes the objectives listed in Table 3-1.

No.	Objectives
C3B	Develop an urban street through the Abbey Quarter linking Bateman Quay and St. Francis Bridge and an urban park and public plaza around St Francis’ Abbey (linking to the Riverside Linear Park) in accordance with the Abbey Quarter Masterplan.
C3C	Improve Trails, Greenways and Walkways, including the construction of a Boardwalk at Green’s Bridge to link the River Nore Riverside Walk with the new Riverside Linear Park in the Abbey Quarter and onwards to the Canal Walk, and New urban park in Abbey Quarter.

Table 3-1 CDP Section 5 - Stated Policy Objectives

Section 5 – Movement and Mobility Strategy

Section 5 of the CDP sets out policies and objectives regarding movement and mobility strategy. It identifies Kilkenny County Council’s commitment to supporting sustainable forms of transport such as public transport, walking and cycling.

The CDP includes the objectives listed in Table 3-2. The Project is specifically identified as an objective of the CDP and plans for future development of the River Nore Linear Park to the north of the scheme will complement the proposed scheme. The Project thus complies with the policies and objectives of the CDP.

No.	Objectives
C5O	To progress plans for the provision of a pedestrian bridge at Talbotsinch, including the provision of access along the eastern bank of the river up from Green’s Bridge to the proposed bio-diversity park at Dunmore as part of the River Nore Linear Park.
C5P	Construct a Boardwalk at Green’s Bridge to link the River Nore Riverside Walk with the new Riverside Linear Park in the Abbey Quarter and onwards to the Canal Walk.

Table 3-2 CDP Section 6 - Stated Policy Objectives

 Pedestrian and Cycle Link Between Bishops Meadows and Riverside Gardens

Section 6 – Placemaking

Section 6 of the CDP sets out Kilkenny County Council’s policies and objectives regarding Placemaking, with sub-section 6.8 dealing specifically with Open Space and Recreation.

The River Nore Linear Park is identified as providing a sequence of high-quality public spaces, which are a significant recreational and biodiversity asset to the city and county.

The Development Plan includes the objectives listed in Table 3-3.

The scheme is specifically identified as an objective of the County Development Plan.

No.	Objectives
C6N	To construct a boardwalk at Green’s Bridge to link the River Nore Riverside Walk at Riverside Drive with the new Riverside Linear Park in the Abbey Quarter and onwards to the Canal Walk.

Table 3-3 CDP Section 6 - Stated Policy Objectives

3.2 Kilkenny City and Environs Development Plan 2014-2020

The need for a pedestrian and cycle link from the Riverside Walk at Bishops Meadows / Riverside Drive with the Riverside Linear Park is long established and was noted in the previous revision of the Development Plan.

"As part of the continued development of the Nore Linear Park, the potential to connect the Linear Park north of Greens Bridge, under Greens Bridge and to continue the park southwards through the Smithwick’s site, is being examined."

4. ROUTE OPTIONS

The River Nore Linear Park runs through Kilkenny along the west bank of the Nore. There is a gap in the infrastructure provided between Bishops Meadow and Riverside Gardens which results in users having to leave the bank of the Nore and travel via Riverside Drive, the R693 (Troy's Gate) and the R886 (New Road). This diversion, shown as a blue line in Figure 4-1, is primarily on-road and requires a carriageway crossing of the R886.

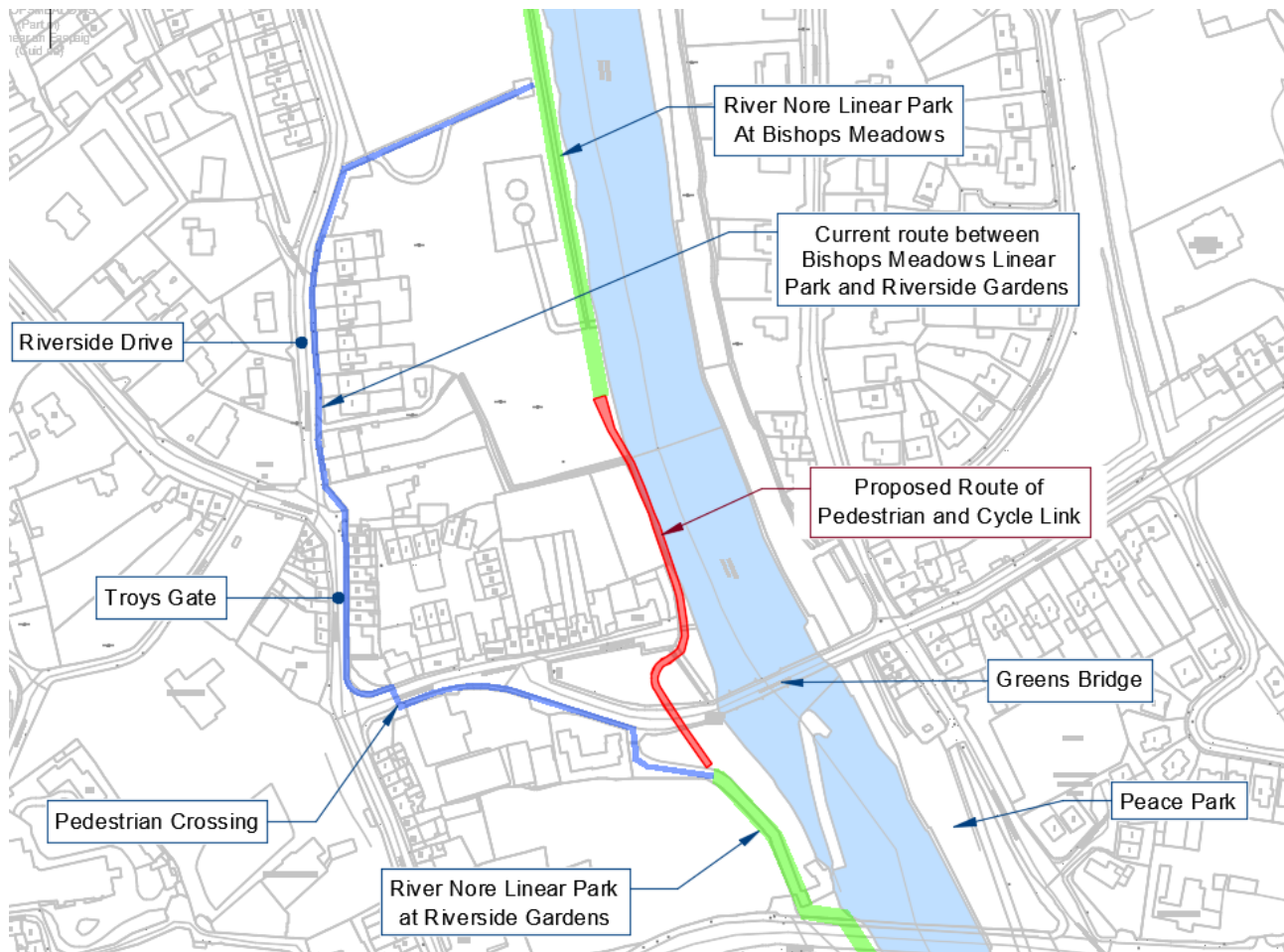


Figure 4-1 Existing and Proposed Routes

There is insufficient road width on the R693 at Troy's Gate to provide segregated cycling facilities and current footway widths are narrow with no scope for provision of additional width.

The proposed route is adjacent to No's 18/ 19 Green Street, an alternate route through this property is not possible as these buildings are rated as being of regional importance in the National Inventory of Architectural Heritage.

The area of the scheme includes flood defences constructed as part of the Kilkenny City Flood Alleviation Scheme; the current proposals have been developed to avoid any impact on the flood defence infrastructure.

As a result of the above constraints, there are no alternative options for the route of the Scheme.

5. DESCRIPTION OF PROJECT – GENERAL

The project comprises the provision of a pathway for pedestrians and cyclists between Riverside Gardens and Bishops Meadow Riverside Park.

A section of the pathway will be constructed as an elevated boardwalk running parallel to the flood defence wall constructed under the auspices of the Office of Public Works in the early 2000's. For reference, an as-built drawing from the Flood Alleviation Scheme is attached in Appendix K.

5.1 Cross-section and Longitudinal Gradient

The pathway will be 3.0m wide at minimum.

The longitudinal gradient of the pathway will not exceed 1 in 25 (i.e., 4%).

At its northern end, the pathway will cross over existing headwalls adjacent to the Nore. To achieve a gradient at or below 1:25 at this location it will be necessary to reduce the height of the existing headwalls by up to 300mm. Approval for this reduction has been granted by the Office of Public Works.

5.2 Use of Existing Bridge Arch

The pathway will cross beneath the R886 (New Road) through an existing arch which forms part of the western approach to Green's Bridge. This arch is not in use and is of relatively modern reinforced concrete construction.

The pathway can be constructed without the need for works to the structure of the arch or to Greens Bridge. Works through the arch will be limited to constructing an appropriate surface for the pathway at existing ground level.

The use of this arch has two significant benefits:

- it allows the pathway to be constructed under Green Street with minimal disruption.
- once operational, it will remove a road crossing from the most direct pedestrian and cycle route to the centre of Kilkenny.

5.3 Lighting

The extension of the footpath link from Bishops Meadows will be lit with additional lamp standards, as will the footpath link to The Riverside Gardens. The locations for these will be agreed at detailed design stage.

The boardwalk section will be lit with LED lighting incorporated into the parapet top rail.

Lighting will be designed with consideration to the various recommendations in the project impact assessment reports.

5.4 Existing Services and Utilities

Utility providers were consulted to establish the presence of underground or overground infrastructure within the Site.

Based on this consultation, 2 No Eir services were identified which will require diversion to allow construction of the Project.

Access for maintenance purposes to the existing "Flap Valves" at the northern end of the proposed boardwalk will be incorporated into the design in line with the requirements of the Office of Public Works.

5.5 Peak Water Levels during Flood Events

Table 5-1 shows peak water levels at the Site predicted by the Office of Public Works under the CFRAM programme.

Return Period	Peak Water Level
1 in 10 years	44.38m OD.
1 in 100 years	45.07m OD

Table 5-1

The minimum level of the proposed pathway level is 44.40m OD, and therefore above the 1 in 10-year flood level.

It is not practicable to set the pathway level above the 1 in 100-year flood level (45.07m OD) as tie ins to existing infrastructure at both ends would not be practicable.

As with other pathways in the city, a plan can be implemented to prevent access to the pathway during extreme flood events. It is noted that other sections of the existing Nore Linear Park experiencing flooding annually and so flood risk at the proposed pathway is less than that at other sections of the linear park.

The boardwalk section of the pathway will have an open deck and substructure and so will allow flood waters to flow through and beneath.

The proposed development was subject to flood risk assessment; the findings of this assessment are described in Section 8.

6. DESCRIPTION OF PROJECT - BOARDWALK STRUCTURE

6.1 Parapet

Parapets are required to provide fall protection at the sides of the boardwalk. A parapet height of 1.4m is the minimum required to cater for both cyclists and pedestrians.

Painted mild steel vertical uprights are proposed to support horizontal mild steel rails which will support vertical recycled plastic battens. The decision to use vertical battens in place of horizontal rails was driven by an assessment of climbability, footholds, and opening sizes in line with design guidance for footbridge parapets.

6.2 Viewing Platform / Refuge Area

At its southern end, the boardwalk will widen locally to create a platform for viewing Green's Bridge and the remains of the abutments of the original Green's Bridge which was destroyed in the "Great Flood" of 1763. This viewing platform provides a location for the *"suitably composed interpretive panel on the boardwalk overlooking the abutments"* in line with the recommendations of the Architectural Heritage Impact Assessment (See Appendix I).

In addition to providing a viewing platform, the widening also provides additional refuge space for users of the boardwalk to allow larger groups of pedestrians or cyclists to pass each other.

6.3 Materials

The boardwalk structure will consist of 200mm diameter bottom driven tubular steel mini piles infilled in concrete in pairs at 2m centres laterally and 6m centres longitudinally. Steel beams will span between the pile heads to support the boardwalk decking.

The deck surface is proposed to be manufactured from recycled plastic. This is an environmentally friendly material with excellent non-slip characteristics and is completely rot proof thus significantly reducing future maintenance.

7. CONSTRUCTION

7.1 Designing For Ease of Construction and Minimal Environmental Impact

A key objective of the design of the Project has been to minimise the impact of the construction phase. This has informed the proposal to provide a lightweight boardwalk, supported on mini-piles, which can be assembled using lightweight plant and equipment.

A construction methodology has been developed for the construction of the Project which details how the boardwalk can be constructed with minimal impact on the existing riverbank and no in-river works. This methodology is attached in Appendix B.

8. PROJECT IMPACT ASSESSMENTS

8.1 AA Screening

The River Nore is listed as a Special Protection Area by the National Parks and Wildlife Service and is part of the River Barrow and River Nore Special Area of Conservation (SAC).

An Appropriate Assessment Screening Report was prepared by SLR Consulting Ltd. to assist the relevant authority (Kilkenny County Council) in forming an opinion as to whether the Scheme requires a Natura Impact Statement. In this case, Kilkenny County Council concluded that Appropriate Assessment of the Project was required and so a Natura Impact Statement must be prepared.

The screening report prepared by SLR and the conclusion report prepared by Kilkenny County Council are included in Appendix F.

8.2 Natura Impact Statement (NIS)

Following the recommendations of the AA Screening, a Natura Impact Statement was completed by SLR Consulting Ltd.

The NIS assessed the impact of the scheme on the River Nore SPA and the River Barrow (SAC). The NIS recommends mitigation measures in respect of water control, habitat control, noise & vibration control, and lighting control. These measures are recommended to ensure there will be no adverse effects on the integrity of any Natura 2000 site and will be fully incorporated into the Project.

Considering the Project with the recommended mitigation measures and based on the best scientific knowledge, the NIS finds the Project will not undermine the conservation objectives for the River Nore SPA or the River Barrow and Nore SAC either alone or in-combination with other projects or plans.

The Natura Impact Statement is attached in Appendix F.

8.3 Screening for Environmental Impact Assessment

An Environmental Impact Assessment screening report was prepared out by SLR Consulting Ltd to assist the relevant authority (Kilkenny County Council) in forming an opinion as to whether the Scheme requires an Environmental Impact Assessment.

The EIA Screening Process is rooted in the EIA Directive, categorizing projects based on their potential environmental impact. Projects can either

- a) have a mandatory EIA requirement,
- b) be sub-threshold requiring assessment,
- c) pertain to changes or extensions of existing projects.

The proposed development is deemed sub-threshold, necessitating EIA Screening. The proposed development falls within a class of development specified in Part 2 of Schedule 5 of the Planning and Development Regulations, 2001 but does not meet or exceed the defined thresholds and is considered sub-threshold for EIA purposes. On completion of the screening assessment required for sub threshold developments, it is concluded that due to its nature, scale and location, the Project is not likely to have significant effects on the environment and therefore does not require EIA.

The screening report prepared by SLR and the conclusion report prepared by Kilkenny County Council are included in Appendix E.

8.4 Ecological Impact

An Ecological Impact Assessment was carried out by SLR Consulting Ltd.

Conclusions in the Ecological Impact Assessment report are largely aligned with the conclusions of the Natura Impact Statement in that the report makes recommendations in respect of water control, habitat control, noise & vibration control, and lighting control.

Additional recommendations are made in respect of biodiversity improvements within and adjacent to the site.

The assessment concludes that there will be no significant residual effects on flora or fauna and that there will be some temporary localised effects on ecology in the area, but these can be compensated for by adhering to measures recommended by the report.

The Ecological Impact Assessment report is attached in Appendix D.

8.5 Arboricultural Impact

A Tree Survey Report was carried out by Independent Tree Surveys Ltd.

The survey concluded that the trees in the survey area are a mix of young and semi-mature trees that appear to become established by natural regeneration (self-seeded) along the riverbank following the construction of the flood defence structures several years ago. The trees are of comparatively low arboricultural value on account of their young age and small size but that they do provide some habitat and landscape value to the locality.

The design of the scheme allows retention of the majority of the trees along the route with cutting back and removal of a relatively small number of trees which directly clash with the proposed route.

The tree species (Salix and Alnus) growing along the proposed route of the new boardwalk respond well to cutting back to stump and will grow back vigorously with fresh shoots if the main stems are cut back to near ground level.

The Tree Survey Report is attached in Appendix G.

8.6 Archaeological Impact

An assessment of the impact of the Scheme on Archaeology and Cultural Heritage was carried out by Colm Flynn Archaeology and a report on this assessment was prepared which provided a description of potential impacts arising from the Scheme.

Initial consultation with the archaeologist determined the possible presence of the remains of the western abutments of the original Green's Bridge beneath the western bank of the River Nore close to the end of Green's Street. A boardwalk is proposed at this section of the pathway and the design incorporates a local increase in the span between supports at this location to eliminate the possibility of damage to any remains of the original bridge abutment.

The initial design drawings along with the Archaeological Impact Assessment Report were submitted to the Development Applications Unit of the Department of Housing, Local Government and Heritage for pre-planning consultation.

The National Monuments Service [NMS] made several recommendations in response to this submission. Further to this, Colm Flynn Archaeology submitted a revised Archaeological Impact Assessment Report to the NMS. The revised report included the addition of "*Pre-construction targeted test trenching at the location of*

the proposed mini piles for the new River Nore Pedestrian and Cycle Link, in the vicinity of the former location of the original Greensbridge". The revised report was accepted by NMS. Relevant correspondence in this regard is provided in Appendix J.

In parallel with the planning process, Kilkenny County Council appointed Colm Flynn Archaeology Ltd. to carry out the pre-construction targeted test trenching under licence from the NMS. The results of the test trenching will inform the final positioning of the mini piles to either side of the original Green's Bridge.

The revised Archaeological Impact Assessment Report submitted to the NMS is provided in Appendix I.

8.7 Architectural Heritage Impact

An Architectural Heritage Impact Assessment was carried out by Bluett O'Donoghue Architects.

Several recommendations are contained within the report which have been incorporated into the Project as follows:

- Provision of a suitably composed interpretive panel on the boardwalk overlooking the abutments of the original Green's bridge.
- Piling for the boardwalk shall be monitored by a licenced archaeologist.
- Vibration monitors and movement tell-tales shall be attached to the protected structures during the construction phase.
- Reinstatement and compensatory planting to be carried out.
- Lighting impact to be mitigated by minimising light spillage and use of photo sensors and timers.

The assessment concluded that the design of the works has had due regard to the historic character of the area and will make its heritage assets more accessible to the public. Appropriate mitigation measures are included in the scope of works and overall, the heritage impact is justified and acceptable.

8.8 Flood Risk

A flood risk assessment of the proposed development was carried out by RPS Ireland Limited (NI).

The original flood model of the Kilkenny Flood Alleviation Scheme was obtained from the OPW and updated by RPS to include the proposed boardwalk.

The report concluded:

- that the proposed riverside boardwalk site can be considered as a 'water-compatible development' and is therefore a type of development that would be appropriate for the proposed location.
- While the modelling showed a "slight and localised increase" in the 1% AEP Flood Extents, the flood levels associated with these slight spatial flood extent increases can be considered as negligible (<0.03m).
- Overall, the average water level difference between all scenarios returned a negligible average difference, indicating that the emplacement of the proposed riverside boardwalk does not present an increased flood risk to Kilkenny.

The Flood Risk Assessment Report is included in Appendix C.

9. CONSULTATION

9.1 Development Applications Unit

A pre-application consultation report was submitted to the Department of Housing, Local Government and Heritage's Development Application Unit on 15th February 2023.

Observations in relation to Archaeological heritage, were received in response on 28th March 2023.

Further observations, in relation to Nature Conservation, were received on 15th May 2023.

The correspondence with the DAU is attached in Appendix J.

9.2 National Monuments Service

Following receipt of Archaeological observations via the Development Applications Unit on 28th March 2023, the project Archaeological consultant (Colm Flynn Archaeology) made direct contact with the National Monuments Service with regards to the scope and nature of the Archaeological recommendations.

Following further consultation with the NMS, and provision of additional information in an updated Archaeological Impact Assessment Report, the National Monuments Service accepted the recommendations of Colm Flynn Archaeology with respect to the scope of Archaeological surveys and monitoring.

The relevant correspondence with the NMS is attached in Appendix J.

The Archaeological Heritage Impact Assessment is attached in Appendix I.

9.3 Fisheries Ireland

Fisheries Ireland was contacted by Kilgallen and Partners in March 2023. In response, Fisheries Ireland provided several observations / requirements in regard to the Project in April 2023.

Kilgallen and Partners sought clarification from Fisheries Ireland in relation to the observation that "Bankside works should only take place during the close season 1 July to 30 September."

Clarification was received from Fisheries Ireland in September 2023 to the effect that while all groundworks and piling must be completed during the closed season (1st July to 30th September), construction of the prefabricated decking above the bank level can proceed outside of the closed season subject to no material from the works being allowed to enter the water.

The relevant correspondence with Fisheries Ireland is attached in Appendix J.

9.4 National Parks and Wildlife Service

Initial contact was made with the NWPS in January 2023. NWPS advised that all pre-application consultation must be submitted via the Development Applications Unit. See section 9.1 above.

9.5 Office of Public Works

The Kilkenny City Flood Alleviation Scheme is maintained by the Office of Public Works [OPW]. As such, any works within the river corridor must be done with agreement of the OPW. Kilgallen and Partners met with the OPW on site in September 2023. Email correspondence summarising the outcome of the site visit is attached in Appendix J.

Pedestrian and Cycle Link Between Bishops Meadows and Riverside Gardens

Kilkenny County Council submitted a data request to the OPW for the flood model information for the Nore Flood Alleviation Scheme to allow a flood risk assessment to be completed. This information was received from the OPW in July 2023 allowing the flood modelling to be completed by RPS. The flood risk assessment is attached in Appendix C.

10. LAND ACQUISITION

10.1 Land acquisition

The Scheme does not require the acquisition of any private lands.

10.2 Rights of way

The Scheme does not propose the elimination of any rights of way.

Appendix A

Drawings

KILKENNY COUNTY COUNCIL



PEDESTRIAN LINK BETWEEN THE RIVER NORE LINEAR PARK AND THE RIVERSIDE GARDENS

PLANNING DRAWINGS

INDEX OF CONTENTS

DRAWING No.	DRAWING TITLE
21038 - 100 - PL1	SITE LOCATION MAP
21038 - 101 - PL1	SITE LAYOUT PLAN
21038 - 102 - PL1	ELEVATIONS & SECTIONS
21038 - 103 - PL1	3D VIEWS


1. THESE DRAWINGS ARE INTENDED FOR PLANNING PERMISSION PURPOSES ONLY AND SHOULD NOT BE USED FOR ANY OTHER PURPOSE. THESE DRAWINGS ARE NOT INTENDED FOR TENDERING OR CONSTRUCTION PURPOSES.
2. DO NOT SCALE FROM DRAWING. USE FIGURED DIMENSIONS ONLY.
3. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER SUBMITTED DRAWINGS AND DOCUMENTS.
4. ABBREVIATIONS AS FOLLOWS:
 - > CFW = CONTINUOUS FILLET WELD
 - > CHS = CIRCULAR HOLLOW SECTION
 - > CJ = CONTROL JOINT
 - > CRS = CENTERS
 - > DP = DEEP
 - > EJ = EXPANSION JOINT
 - > KP = KILGALLEN & PARTNERS
 - > LVL = LEVEL
 - > OEA = OR EQUALLY APPROVED
 - > RC = REINFORCED CONCRETE
 - > SCJ = SAW CUT JOINT
 - > SHS = SQUARE HOLLOW SECTION
 - > SS = STAINLESS STEEL
 - > SSL = STRUCTURAL SLAB LEVEL
 - > TBA = TO BE AGREED
 - > TBC = TO BE CONFIRMED
 - > TOF = TOP OF FOUNDATION
 - > TOS = TOP OF STEEL
 - > UNO = UNLESS NOTED OTHERWISE

PL	DATE	BY	DETAILS
PL1	16/09/2023	KC	ISSUED WITH PLANNING APPLICATION
PL2	14/09/2023	KC	ISSUED FOR CLIENT APPROVAL

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DESIGN
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STATUS
Planning

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 Kilkenny County Council
 Comhairle Chontae Chill Chainnigh

PROJECT
River Nore Pedestrian & Cycle Link

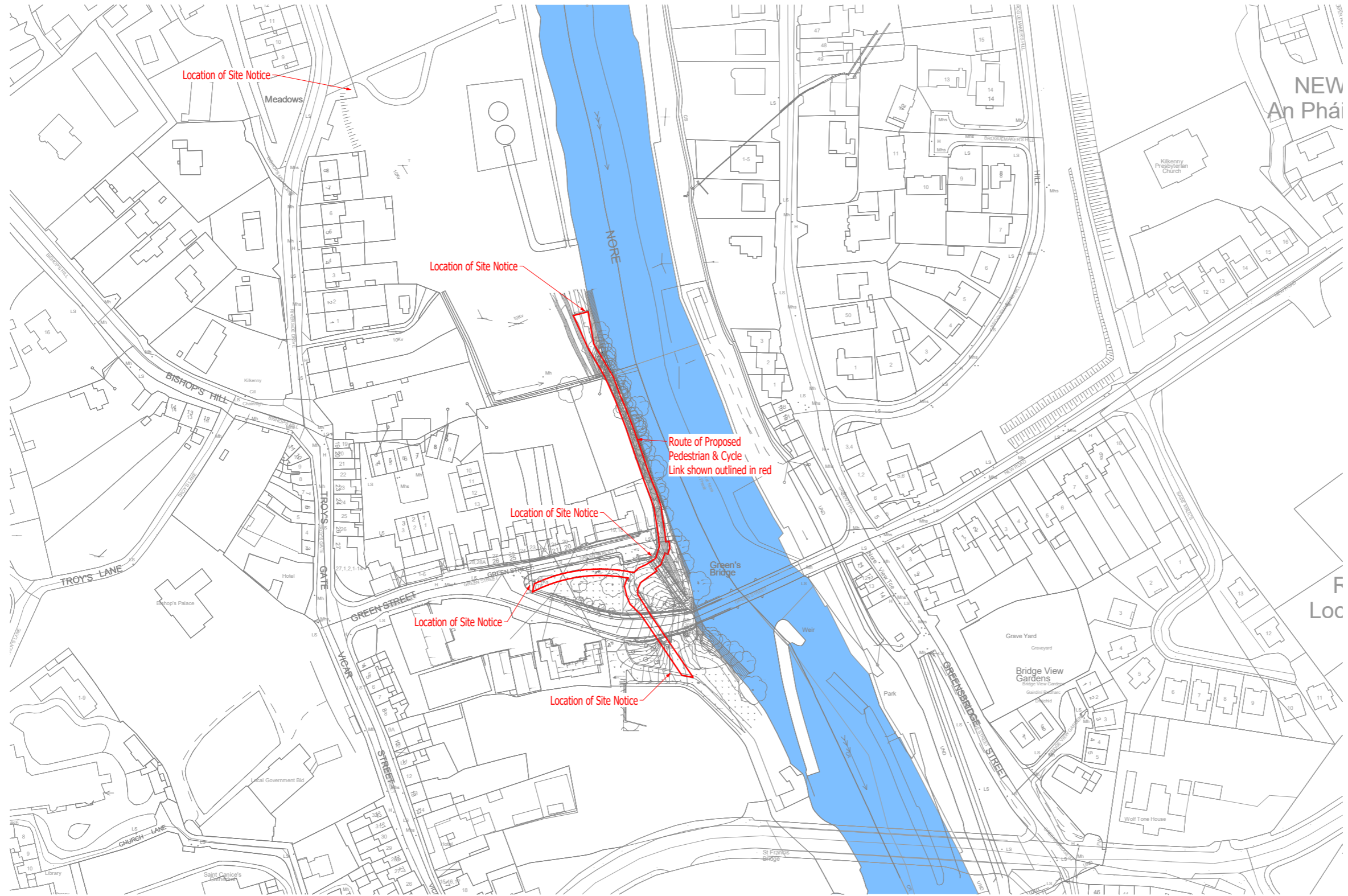
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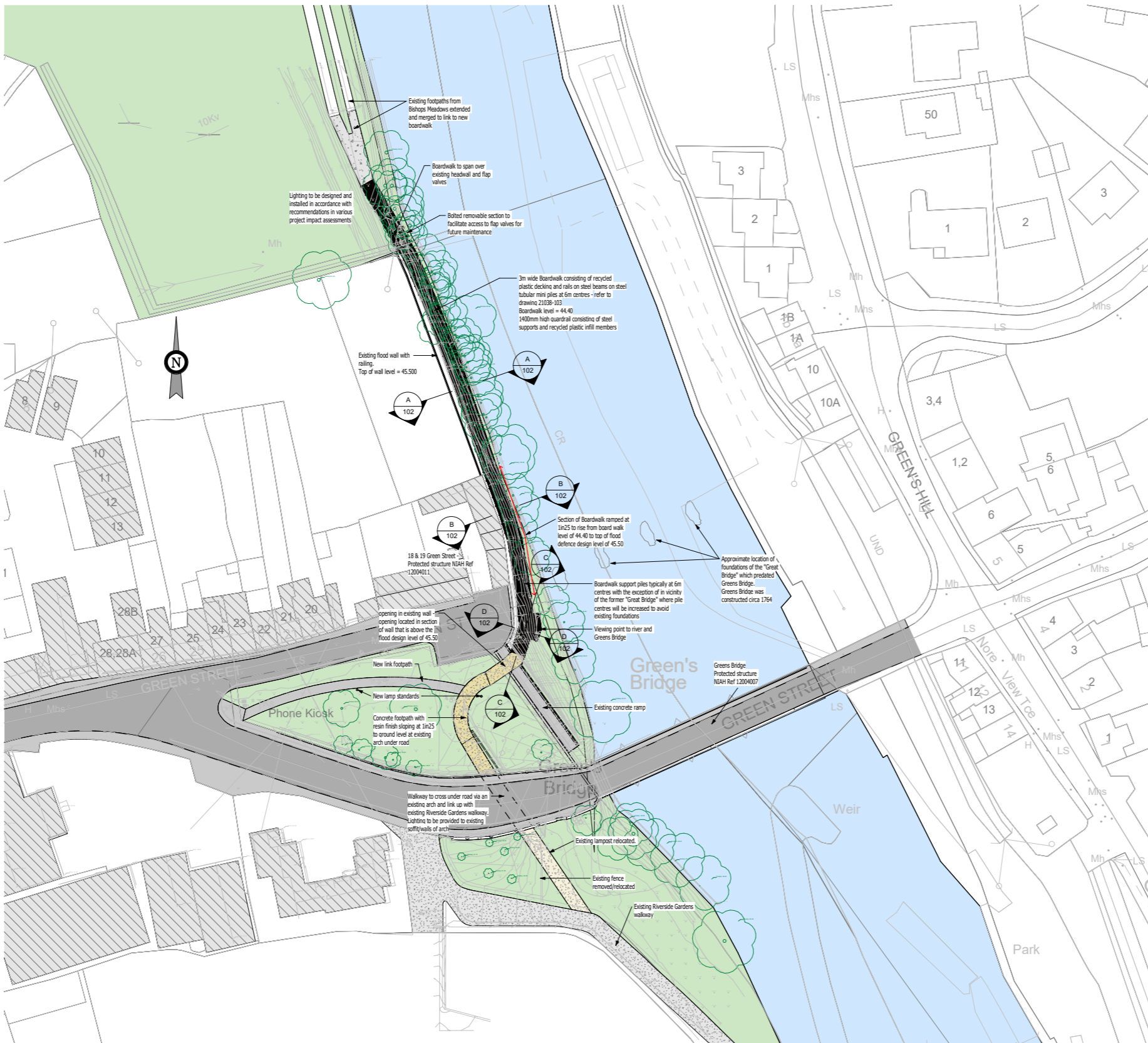
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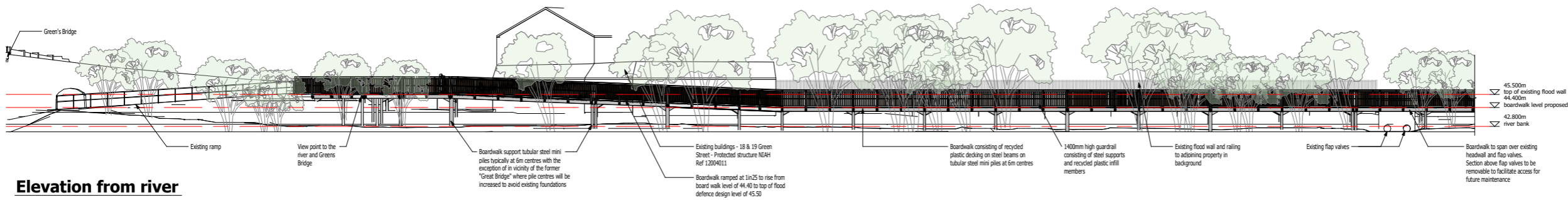
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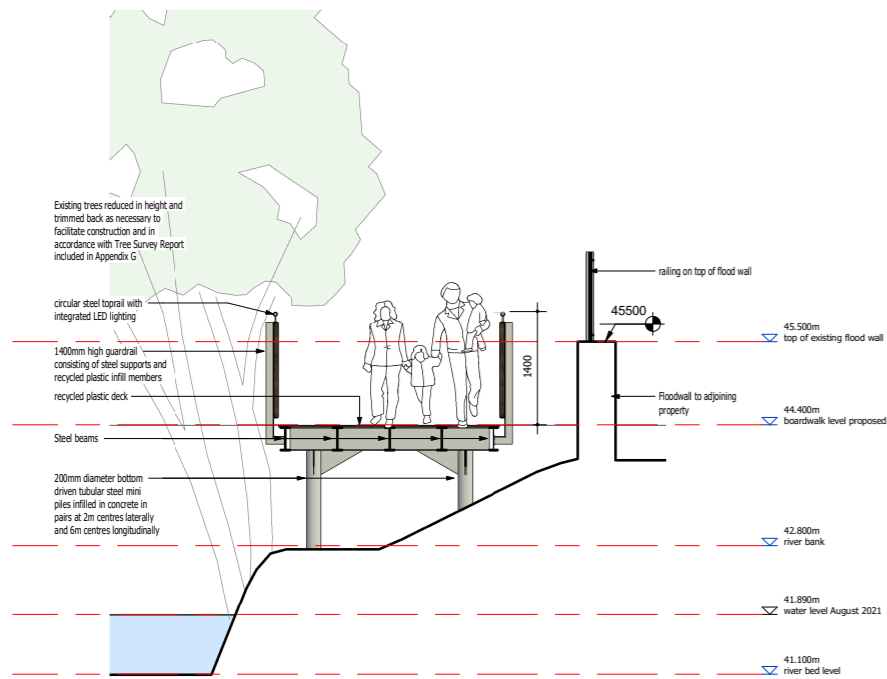
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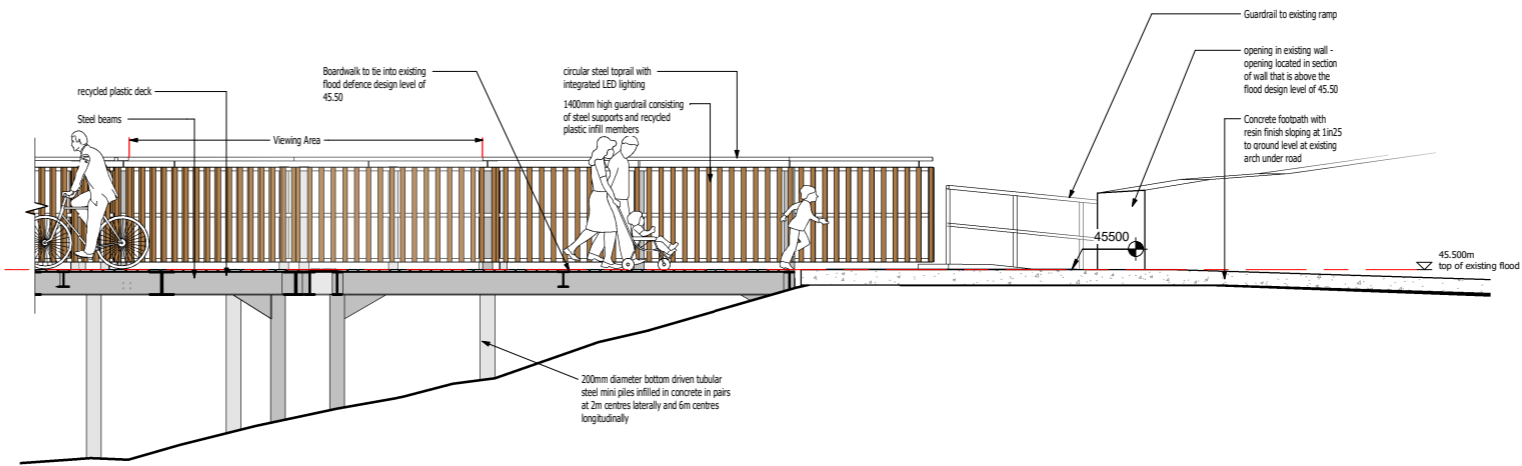
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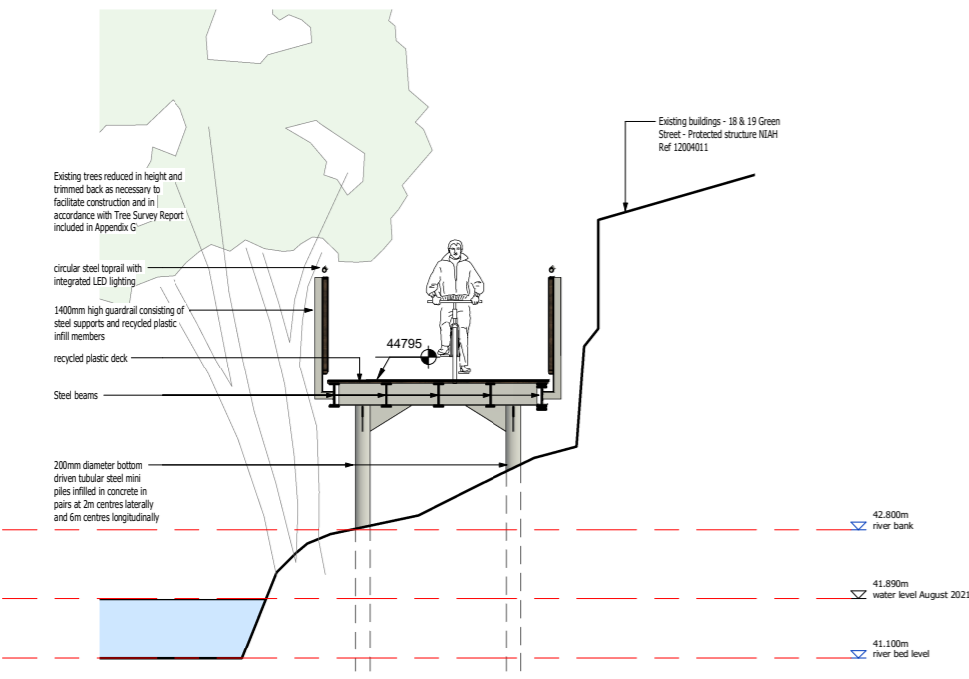
Elevation from river
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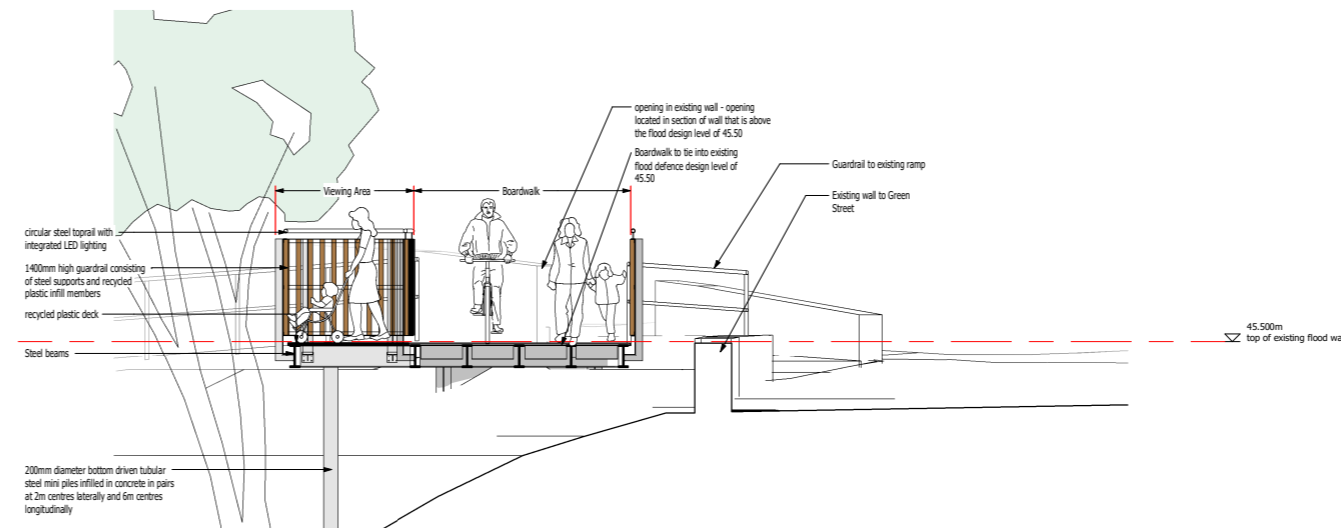
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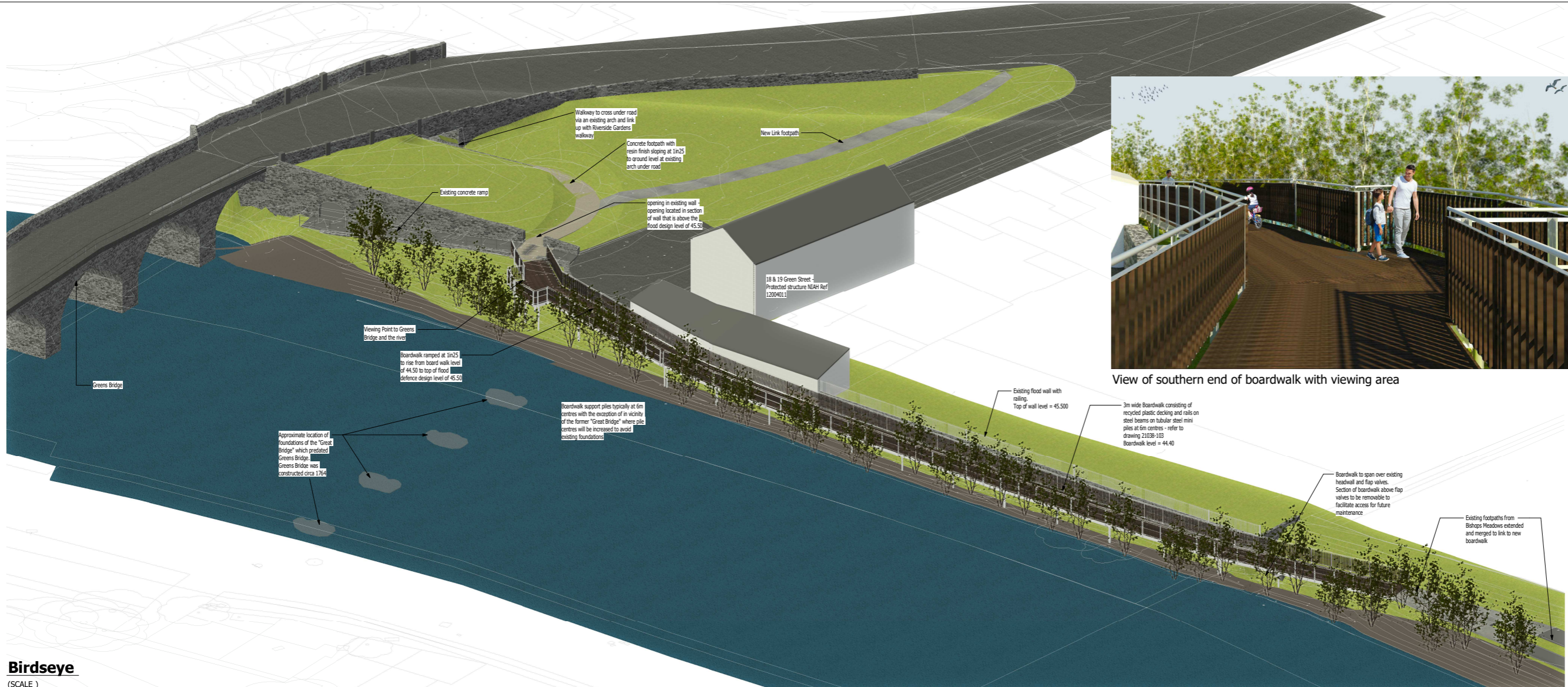
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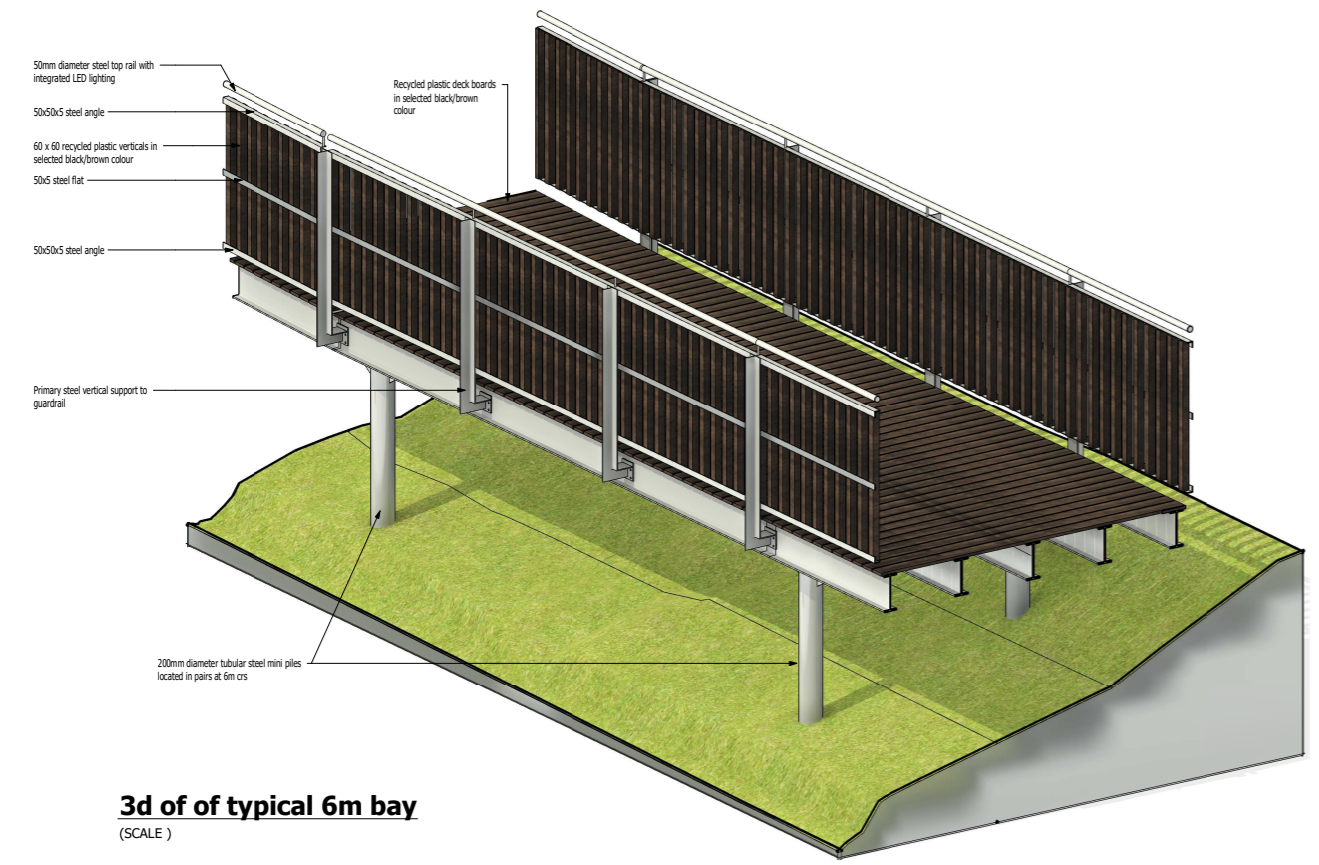
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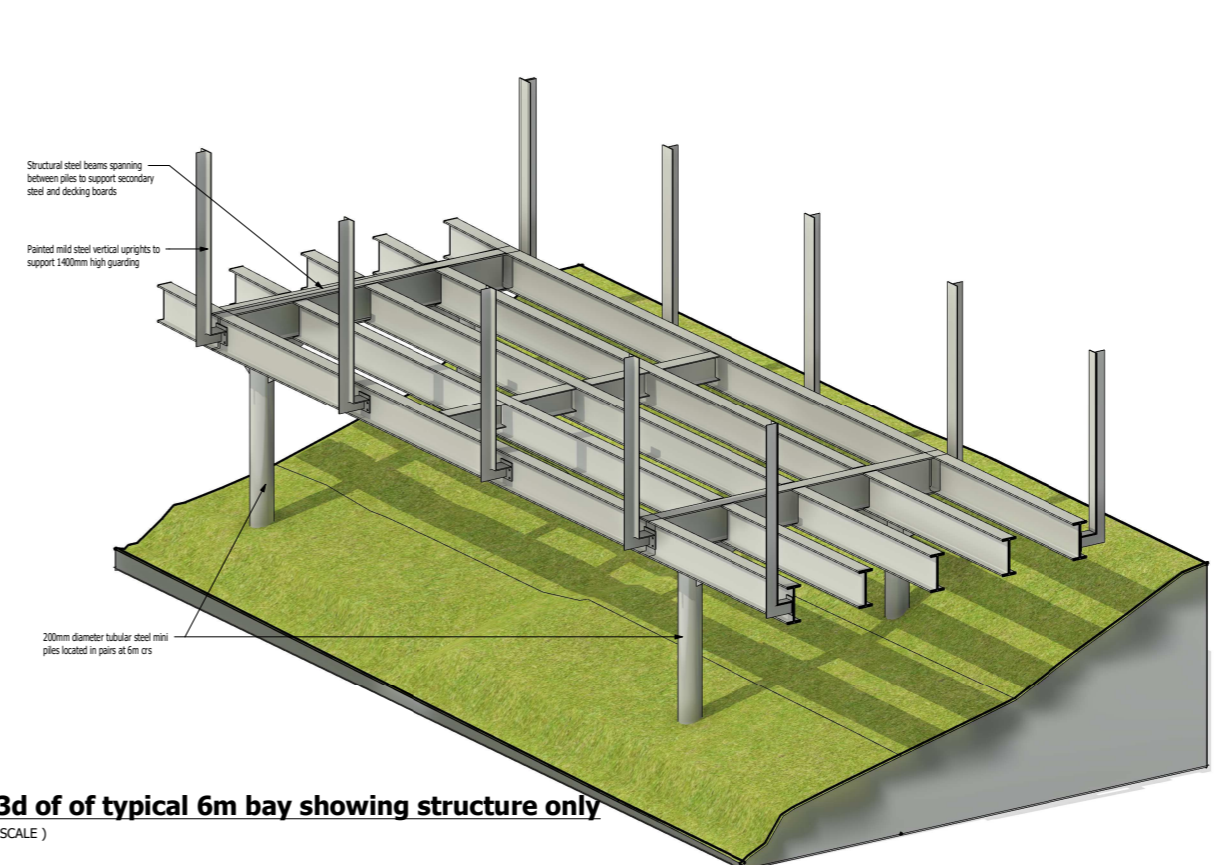
View of southern end of boardwalk with viewing area



Birdseye
(SCALE)



3d of of typical 6m bay
(SCALE)



3d of of typical 6m bay showing structure only
(SCALE)

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Appendix B

Construction Methodology

<u>Subject</u> Nore Boardwalk - Construction Methodology		<u>Reference No</u> 21038-TN-01
<u>Project</u> Nore Boardwalk	<u>Author</u> RK	<u>Issue No</u> 01
<u>Job No</u> 21038	<u>Checker</u> NOC	<u>Date</u> 04/05/2023

DESIGNING FOR MINIMAL DISTURBANCE TO RIVERBANK

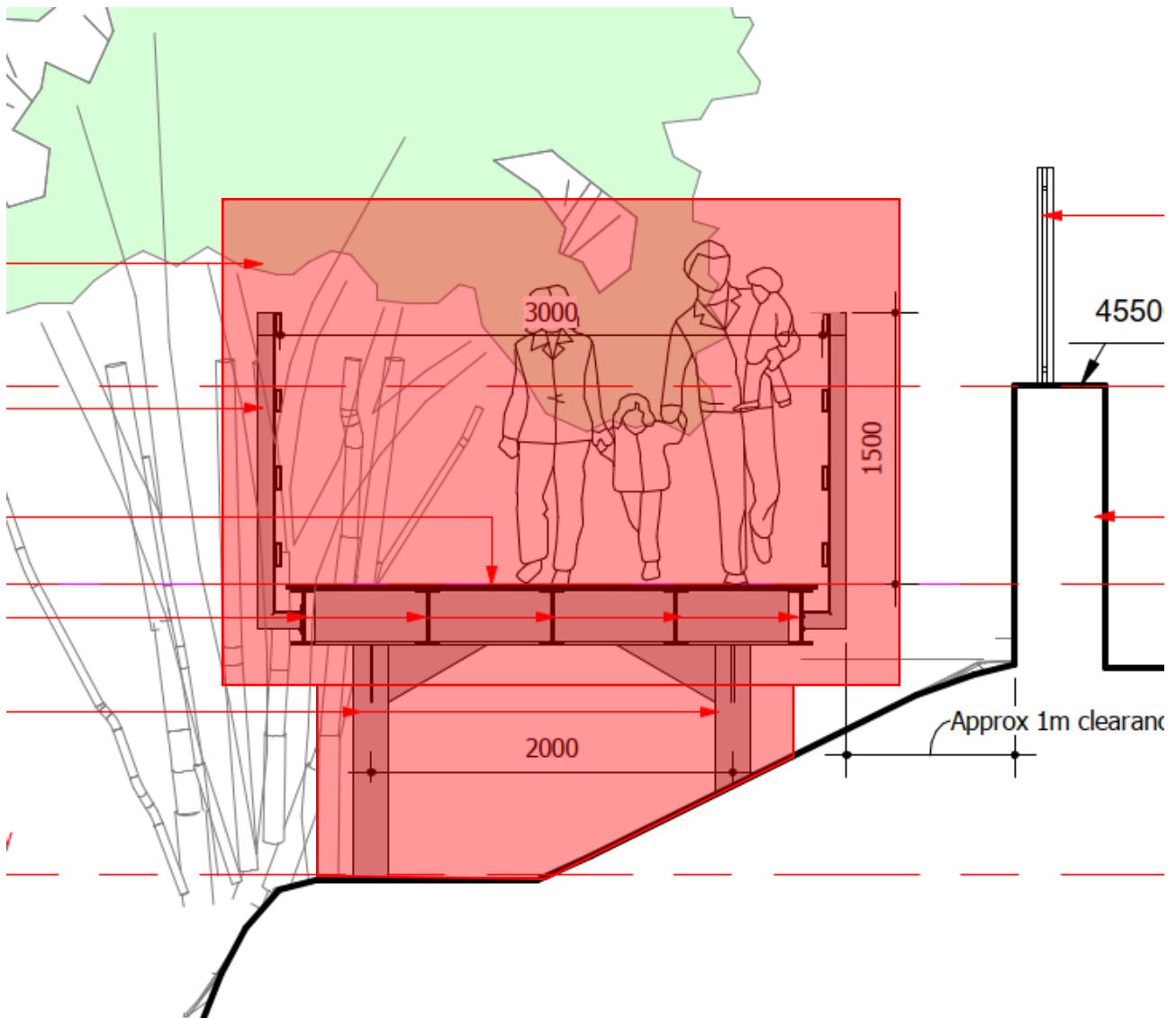
The structure has been carefully designed to minimise disturbance to the riverbank and minimise the risk of contamination of the River Nore SAC through the following:

- Use of bottom driven mini-piles to minimise ground disturbance. Piles can be driven using a lightweight micro piling rig
- Design of structure has been modularised to minimise the weight of individual components, allowing the use of small sized plant and machinery

Enabling works

Enabling works will begin with clearing of vegetation which clash with the boardwalk structure. For trees, this will be assessed on a case-by-case basis and trees will only be removed if deemed necessary. Localised pruning of trees will also be carried out if it is deemed that it facilitates the tree remaining in place.

The area to be cleared of vegetation is indicated below in red on a typical cross section of the boardwalk:



Nore Boardwalk

On completion of vegetation clearance, a silt fence (Hy-Tex Terrastop or similar approved) will be installed on the edge of the riverbank. This will run the full length of the site and be dug into the soil in accordance with the manufacturers instructions.

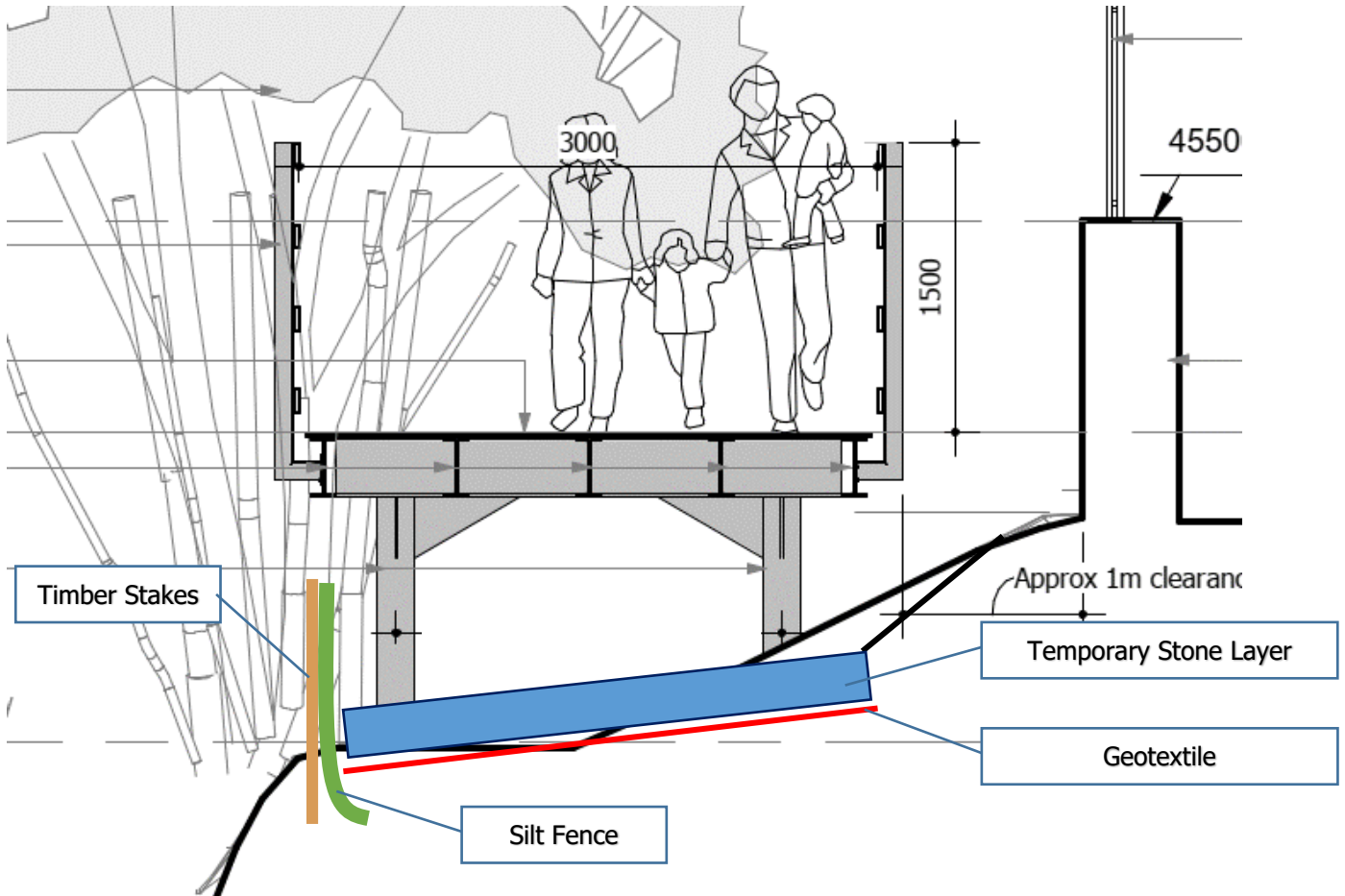
A typical silt fence used in a similar scenario is depicted below:



Nore Boardwalk

Once the silt fence has been installed, the working area will be levelled using a mini excavator and a temporary layer of crushed stone will be placed on a layer of geotextile to create a clean and stable working surface. The stone and geotextile layer will protect the soil below from becoming waterlogged during the construction period and greatly reduce the risk of surface water runoff.

The silt fence and stone layer are depicted on the typical cross section below:



Piling

Piling will be carried out using a tracked mini piling rig such as the one shown below:



Figure 1 Mini Piling Rig

The piling rig will work from the stone surface and will install the piles using the bottom driven method which minimises vibration.

Following completion of pile installation, access for plant will be limited to specialist plant which can fit between the piles. This will include machinery such as Mini-Excavators, mini-dumpers, Mini-telehandlers and/or skid steer loaders as follows:



Figure 2 Skid Steer Loader



Figure 3 Mini Telehandler (Buggisopic)

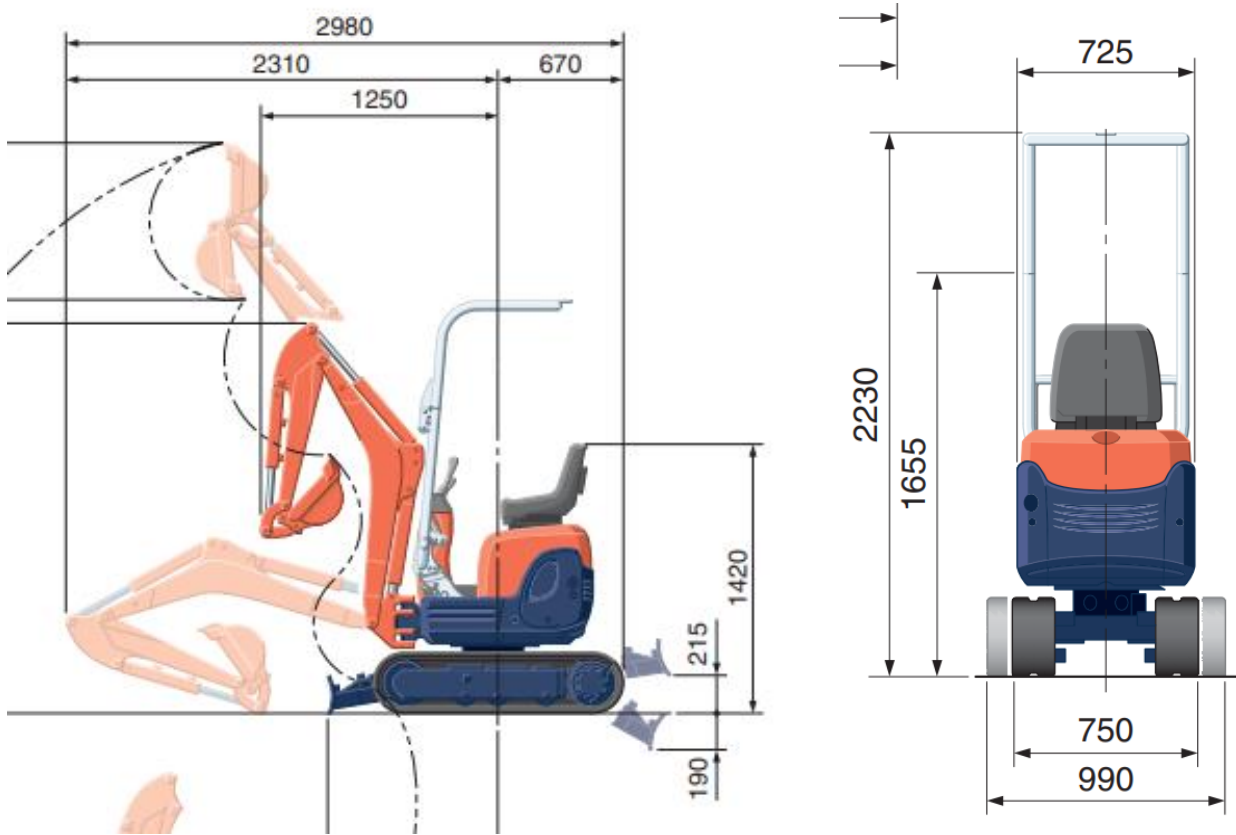


Figure 4 Mini Excavator

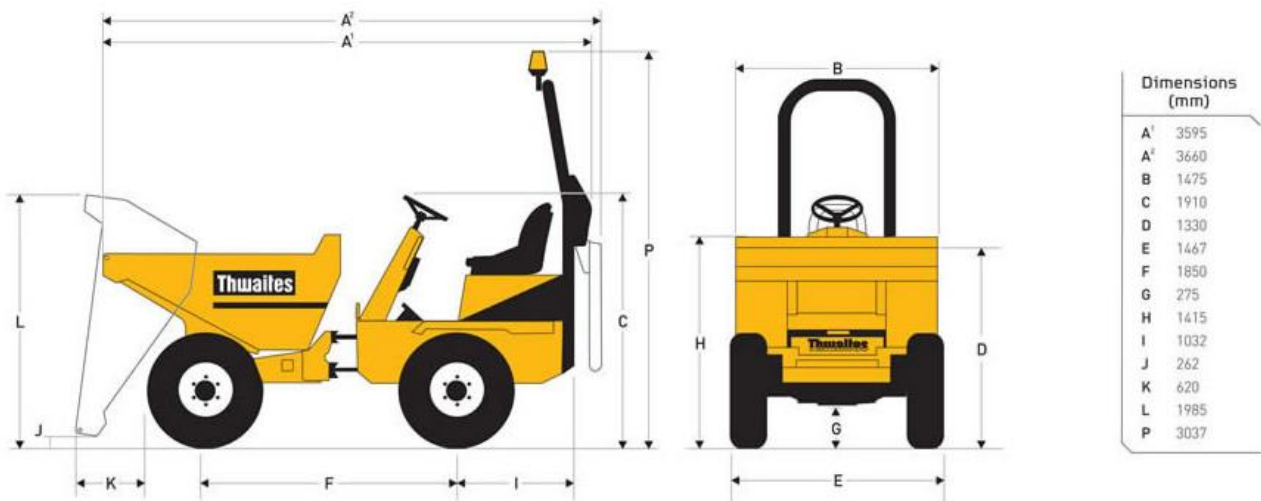


Figure 5 Mini Dumper (1 Tonne)

On completion of pile installation, the piles will be filled with concrete. Due to the small diameter of the piles, the volume of concrete required is very small (Approx. 0.1m³ per pile). All concrete works will be carried out within the confines of the silt barrier. In addition, concreting of the piles will not be permitted during periods of persistent or heavy rainfall.

The concrete can be either mixed on site or be delivered as ready-mix, but in both cases control measures including silt fencing and designated wash out areas will be in place to prevent concrete runoff entering the adjacent watercourse.

The concrete will be placed into the piles using either a wheelbarrow, mini concrete skip or specialist pouring bucket such as those shown below. These provide a high level of control while also including a lockable pouring hatch to prevent accidental spills while travelling.



Figure 6 Concrete Funnel Bucket on Skid Steer Loader



Figure 7 Concrete Funnel Bucket on Telehandler

An alternative to the above methodology which may also be utilised would be to use a grout pump or similar equipment to pump a finer aggregate cementitious material into the pile casings. The pumping unit would typically be a towable sized pump such as the one shown below and utilise a small diameter hose which can be laid out by hand along the length of the structure and material pumped into the pile casings in a very controlled manner. The pump could be situated in a designated area away from the riverbank.



Erection of Steelwork

Due to the confined nature of the site, limited access and proximity to the River Nore SAC, the steel structure of the boardwalk has been designed to be assembled on site from relatively lightweight components when compared to other structures of a similar size.

The maximum weight of a steel member is expected to be approximately 300kg, which is well within the lifting capacity of the aforementioned skid-steer loader and mini-telehandler.

Once each section of the boardwalk is assembled, access for machinery to that section will no longer be possible. Therefore, the steelwork erection phase of the works must also include any mechanical reinstatement of the area beneath the boardwalk. Installation will most likely commence at the north end of the structure and work from north to south. The proposed phasing for each 6m section of the boardwalk is as follows:

- Excavate temporary stone beneath section using mini excavator and remove using mini dumper.
- Deposit sufficient topsoil in the section for future reinstatement using mini-dumper.
- Transport primary steel members for the given section to the works location using the mini-telehandler/skid steer loader/excavator and erect steel.
- To reduce manual handling, at this point the contractor may also transport the guardrail and boardwalk material and place on top of the primary steel for future installation.
- Move to next section and repeat process, gradually working from North back to south of the structure.
- On completion of the installation of the primary steel, final landscaping works can be done by hand beneath the structure using the soil which was deposited there in advance of the steelwork installation.

Erection of the lightweight guardrails and decking material can be done from atop the structure without the need for mechanical lifting.

Landscaping, Reinstatement & maintenance

Landscaping works will be carried out in accordance with the recommendations of the project environmental consultant. The area beneath the boardwalk will be planted/seeded with suitable species to enhance biodiversity.

The silt fence will be maintained until the area freshly placed topsoil has had time to "settle" and for seed to germinate. This will be reviewed with the project ecologist and will be removed in advance of the winter period where water levels are likely to rise. The silt fence will be carefully removed by hand and the area made good.

The trees in the vicinity of the boardwalk will be allowed to grow naturally, with occasional winter pruning to control limbs which grow in the direction of the boardwalk structure.

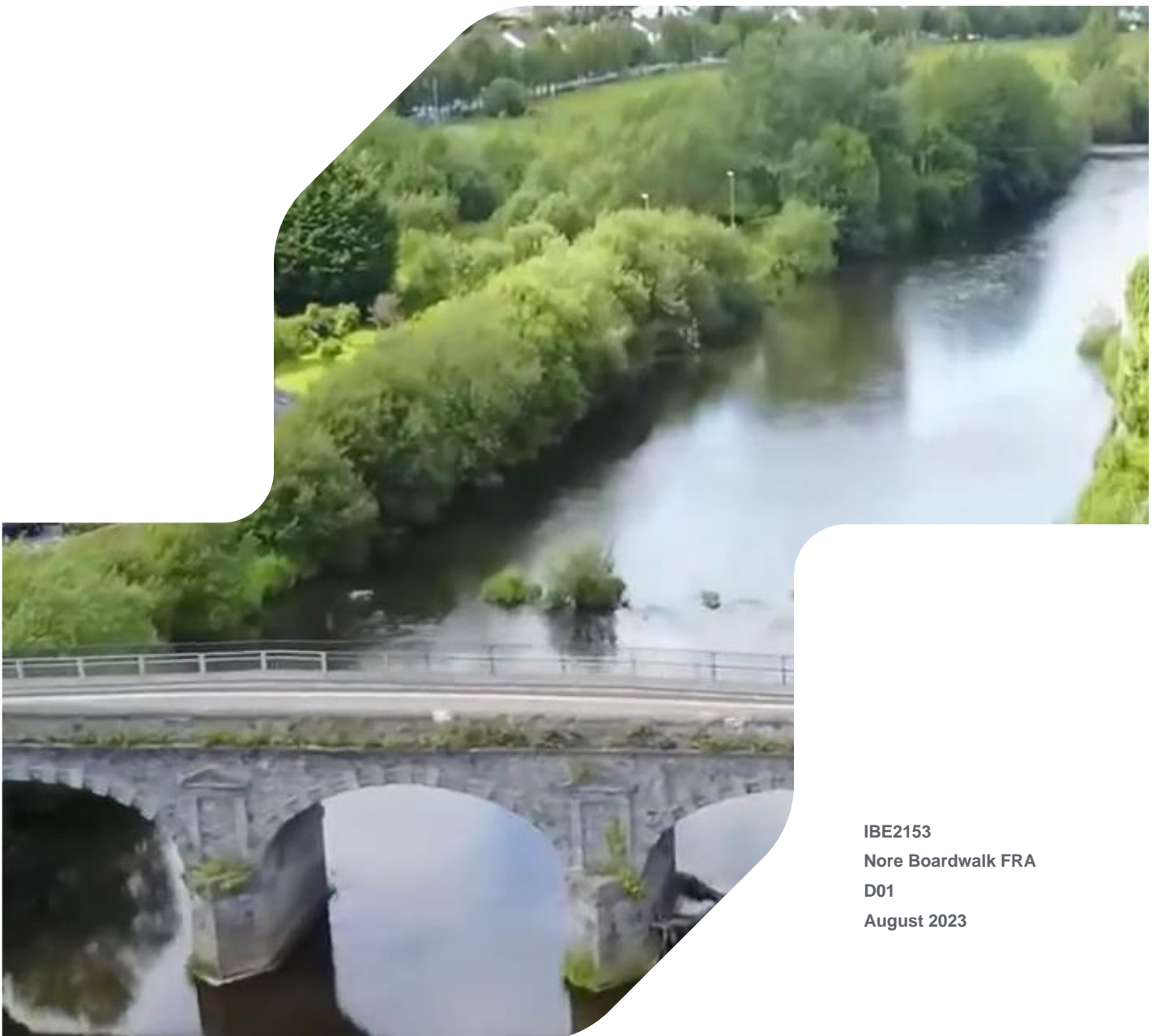
Following the completed structures first winter period, a review of the condition of the area beneath the structure will be carried out. If additional landscaping or planting works are deemed necessary, these works will be carried out in the spring to allow a full spring/summer period of growth before the water levels rise again.

Appendix C

Site-Specific Flood Risk Assessment

RIVER NORE BOARDWALK, KILKENNY

Flood Risk Assessment



IBE2153
Nore Boardwalk FRA
D01
August 2023

Document status					
Version	Purpose of document	Authored by	Reviewed by	Approved by	Review date
D01	Draft	J Murdy	D McGinnis T Donnelly	A Jackson	August 2023

Approval for issue		
Andrew Jackson		30 August 2023

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Contents

- 1 INTRODUCTION.....1**
- 1.1 Overview of Proposed Site Location1
- 1.2 Potential for River Flooding.....2
- 1.3 Classification under Planning System and Flood Risk Management Guidelines3
- 1.3.1 Flood Zones3
- 1.3.2 Classification of Vulnerability3
- 2 HYDRAULIC MODELLING6**
- 2.1 Hydraulic Model Caveats6
- 2.2 Scenario 1 – Baseline 1% AEP Flood Extents.....7
- 2.2.1 Baseline 1% AEP Flood Extent (Defended).....7
- 2.2.2 Baseline 1% AEP Flood Extent (Undefended).....10
- 2.3 Comparison of Baseline & CFRAMS Models.....12
- 2.3.1 1% AEP Flood Extent (Defended)12
- 2.3.2 1% AEP Flood Extent (Undefended)13
- 2.4 Scenario 2 – Boardwalk15
- 2.4.1 Modelling of the Boardwalk.....15
- 2.4.2 Scenario 2 – Boardwalk 1% AEP Flood Extent (Defended)17
- 2.4.3 Scenario 2 – Boardwalk 1% AEP Flood Extent (Undefended)20
- 3 CONCLUSION25**
- REFERENCES26**

Figures

- Figure 1-1 Site of Proposed Riverside Boardwalk.....1
- Figure 1-2 Extract from Kilkenny CFRAM Study Fluvial Flood Map.....2
- Figure 1-3 Classification of Vulnerability of Development (Extract from DEHLG 2009)4
- Figure 1-4 Extract from Planning Guidelines- Vulnerability versus flood zones5
- Figure 2-1 1% AEP Scenario 1 - Baseline Flood Extent (Defended)7
- Figure 2-2 Geographical Location of Water Level Sample Nodes8
- Figure 2-3 1% AEP Scenario 1 (Baseline) Flood Extent (Undefended)10
- Figure 2-4 Comparison between 1% AEP Scenario 1 Baseline and CFRAMS Flood Extents (Defended)12



Figure 2-5 Comparison between 1% AEP Scenario 1 Baseline and CFRAMS Flood Extents (Undefended)14

Figure 2-6 Hydraulic Model Cross-Sections16

Figure 2-7 Modelled Cross-Sections Representing the Proposed Boardwalk16

Figure 2-8 1% AEP Scenario 2 (Boardwalk) Flood Extent (Defended)17

Figure 2-9 Comparison of Scenario 1 Baseline & Scenario 2 Boardwalk 1% AEP Flood Extent (Defended)19

Figure 2-10 1% AEP Scenario 2 (Boardwalk) Flood Extent (Undefended)21

Figure 2-11 Comparison of Scenario 1 (Baseline) & Scenario 2 (Boardwalk) 1% AEP Flood Extent (Undefended)23

Tables

Table 1-1 CFRAM Water Levels (mOD)3

Table 2-1 Scenario 1 – Baseline Water Levels (Defended)9

Table 2-2 Scenario 1 - Baseline Water Levels (Undefended)11

Table 2-3 CFRAMS and Baseline Water Level Comparison (Defended)13

Table 2-4 CFRAMS and Baseline Water Level Comparison (Undefended)15

Table 2-5 Scenario 2 (Boardwalk) Water Levels (Defended)18

Table 2-7 Scenario 1 Baseline and Scenario 2 Boardwalk Water Level Comparison (Defended)20

Table 2-6 Scenario 2 – Boardwalk Water Levels (Undefended)22

Table 2-8 Scenario 1 Baseline and Scenario 2 Boardwalk Water Level Comparison (Undefended).....24

Appendices

Appendix A MIKE 11 Water Levels 27

1 INTRODUCTION

Kilgallen & Partners Consulting Engineers have commissioned RPS to undertake a Flood Risk Assessment (FRA) to assess if there is any additional flood impact due to the emplacement of a riverside boardwalk.

This study will assess the risk of flooding to the proposed development in accordance with the methodologies set out in the Planning System and Flood Risk Management Guidelines (November 2009).

1.1 Overview of Proposed Site Location

The proposed boardwalk will be located along the western bank of the River Nore, a short distance to the north of Greens Bridge. The proposed boardwalk will be located alongside the river side of an existing flood defence. The proposed site is shown in Figure 1-1 below.

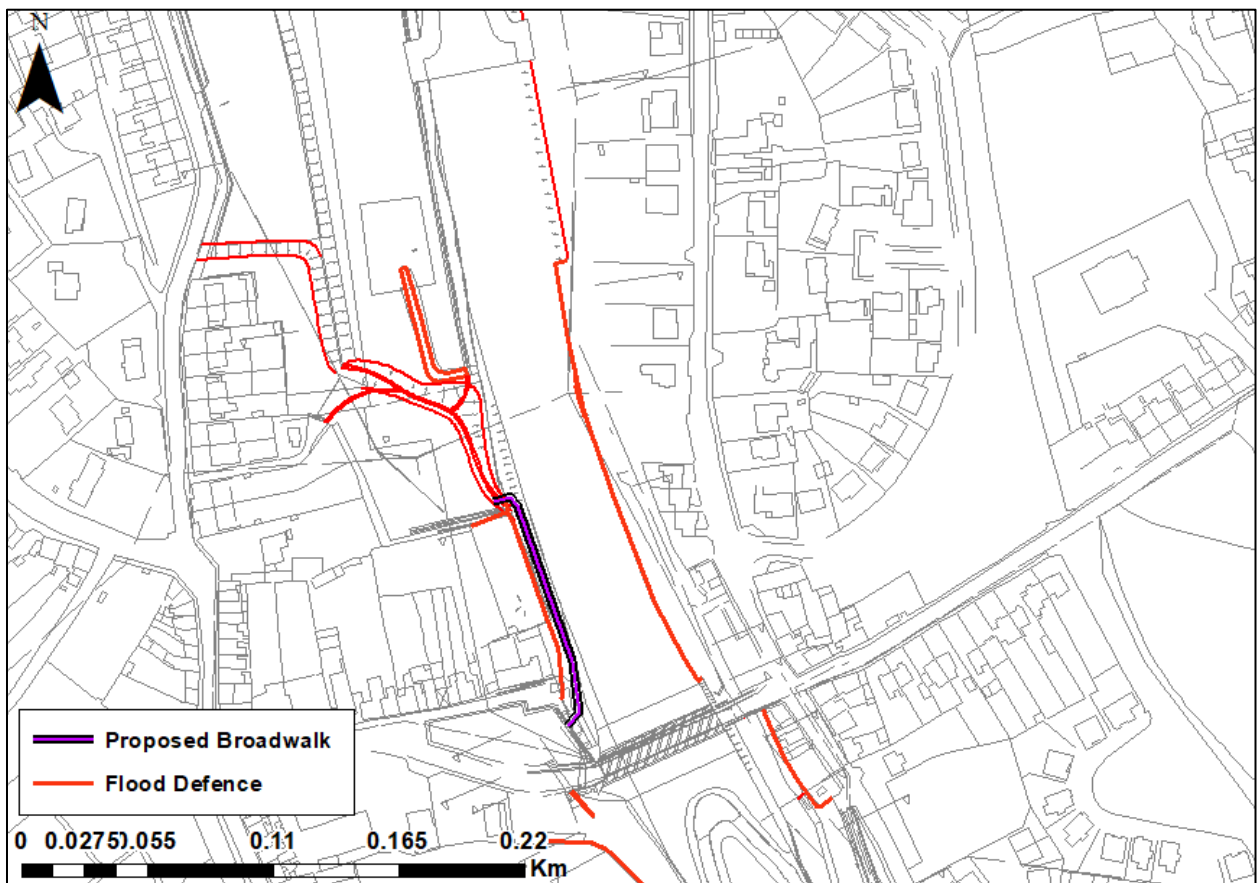


Figure 1-1 Site of Proposed Riverside Boardwalk

At the southernmost end the boardwalk will deviate away from the riverbank, across an existing green area, and under Greens Bridge via an existing arch. On the southern side of Greens Bridge the new walkway will link to the recently completed Riverside Gardens. The proposed boardwalk level is 44.40m OD Malinhead, and therefore above the 10% AEP flood level and below the 1% AEP flood level, as estimated by the CFRAM study. The proposed max width is 3m.

1.2 Potential for River Flooding

Figure 1-2 provides an extract of the OPW flood map relevant to the proposed site. The full version of flood maps is available at floodinfo.ie. The map illustrates the extent of fluvial flooding associated with the proposed site and adjacent area during a 1% Annual Exceedance Probability (AEP) fluvial flood event, equivalent to a medium probability event. This level of flooding is expected once in 100 years, or it has a 1% chance of occurring in any one year. The hatched area illustrates the area that benefits from the presence of flood defences (Benefitting Area) with a Standard of Protection (SoP) of 1% AEP. Fluvial flooding associated with this area is attributed to the River Breagagh and River Nore. Table 1-1 provides the water level associated with the 10%, 1% and 0.1% AEP fluvial flood events, associated with the nodes illustrated.

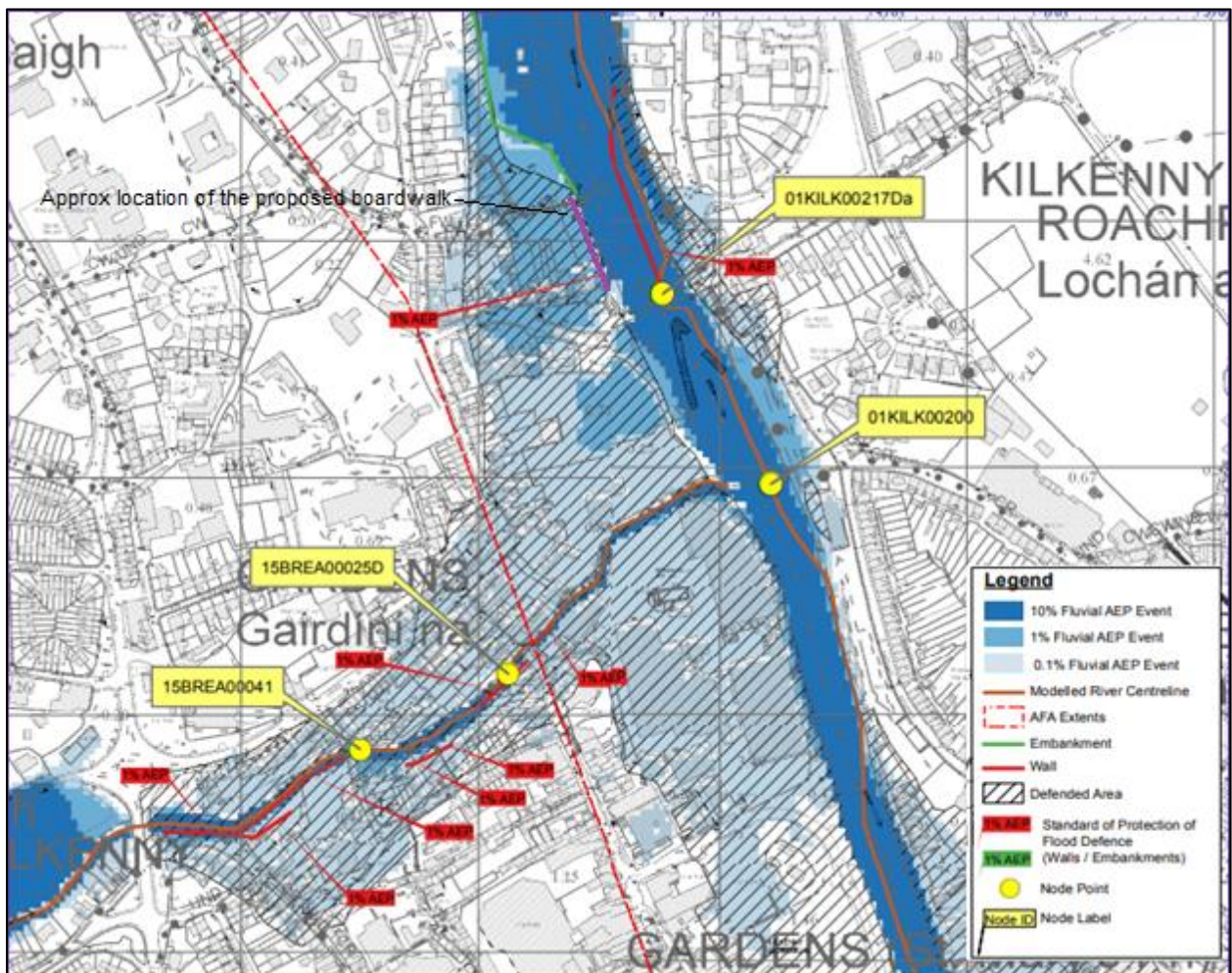


Figure 1-2 Extract from Kilkenny CFRAM Study Fluvial Flood Map

Table 1-1 CFRAM Water Levels (mOD)

Node Label	Water Level (mOD) 10% AEP	Water Level (mOD) 10% AEP	Water Level (mOD) 0.1% AEP
01KILK00217Da	44.38	45.07	45.85
01KILK00200	43.82	44.55	45.38
15BREA00025D	45.05	46.76	47.39
15BREA00041	45.21	46.7	47.31

1.3 Classification under Planning System and Flood Risk Management Guidelines

1.3.1 Flood Zones

Under the requirements of ‘The Planning System and Flood Risk Management’ Guidelines (2009), when considering existing flood risk it is necessary to assign flood zoning to the proposed development site. Flood zones are geographical areas within which the likelihood of flooding is in a particular range.

There are three types of flood zones defined in the Guidelines:

- **Flood Zone A:** areas where the probability of flooding from rivers and the sea is highest (greater than 1% for river flooding or 0.5% for coastal flooding);
- **Flood Zone B:** areas where the probability of flooding from the rivers and the sea is moderate (between 0.1% and 1% for river flooding, and between 0.1% and 0.5% for coastal flooding);
- **Flood Zone C:** Areas where the probability of flooding from rivers and the sea is low (less than 0.1% for both river and coastal flooding).

An important consideration for this particular location is the presence of the existing defences which, although offering a good standard of protection even during extreme flood events, must be ignored for the purpose of flood zoning. This is stated in Paragraph 2.25 of the Guidelines and is required because areas protected by flood defences still carry a residual risk of flooding from overtopping or breach of defences, and there is no guarantee that the defences will be maintained in perpetuity.

Based on the OPW flood maps, the proposed riverside boardwalk is located within Flood Zone A (high probability of flooding).

1.3.2 Classification of Vulnerability

The ‘Planning System and Flood Risk Management Guidelines’ classify different types of development in terms of their vulnerability class (Table 3.1 of the guidelines). This table has been reproduced as Figure 1-3. Table 3.2 of the Guidelines identifies the type of development that would be appropriate to each flood zone and those that would need the Justification Test. This table has been reproduced as Figure 1-4.

Vulnerability class	Land uses and types of development which include*:
Highly vulnerable development (including essential infrastructure)	<p>Garda, ambulance and fire stations and command centres required to be operational during flooding;</p> <p>Hospitals;</p> <p>Emergency access and egress points;</p> <p>Schools;</p> <p>Dwelling houses, student halls of residence and hostels;</p> <p>Residential institutions such as residential care homes, children’s homes and social services homes;</p> <p>Caravans and mobile home parks;</p> <p>Dwelling houses designed, constructed or adapted for the elderly or, other people with impaired mobility; and</p> <p>Essential infrastructure, such as primary transport and utilities distribution, including electricity generating power stations and sub-stations, water and sewage treatment, and potential significant sources of pollution (SEVESO sites, IPPC sites, etc.) in the event of flooding.</p>
Less vulnerable development	<p>Buildings used for: retail, leisure, warehousing, commercial, industrial and non-residential institutions;</p> <p>Land and buildings used for holiday or short-let caravans and camping, subject to specific warning and evacuation plans;</p> <p>Land and buildings used for agriculture and forestry;</p> <p>Waste treatment (except landfill and hazardous waste);</p> <p>Mineral working and processing; and</p> <p>Local transport infrastructure.</p>
Water-compatible development	<p>Flood control infrastructure;</p> <p>Docks, marinas and wharves;</p> <p>Navigation facilities;</p> <p>Ship building, repairing and dismantling, dockside fish processing and refrigeration and compatible activities requiring a waterside location;</p> <p>Water-based recreation and tourism (excluding sleeping accommodation);</p> <p>Lifeguard and coastguard stations;</p> <p>Amenity open space, outdoor sports and recreation and essential facilities such as changing rooms; and</p> <p>Essential ancillary sleeping or residential accommodation for staff required by uses in this category (subject to a specific warning and evacuation plan).</p>

*Uses not listed here should be considered on their own merits

Table 3.1 Classification of vulnerability of different types of development

Figure 1-3 Classification of Vulnerability of Development (Extract from DEHLG 2009)

	Flood Zone A	Flood Zone B	Flood Zone C
Highly vulnerable development (including essential infrastructure)	Justification Test	Justification Test	Appropriate
Less vulnerable development	Justification Test	Appropriate	Appropriate
Water-compatible development	Appropriate	Appropriate	Appropriate

Table 3.2: Matrix of vulnerability versus flood zone to illustrate appropriate development and that required to meet the Justification Test.

Figure 1-4 Extract from Planning Guidelines- Vulnerability versus flood zones

The proposed riverside boardwalk can be considered as a ‘water-compatible development’ and would therefore be a type of development that would be appropriate for Flood Zone A. The application of a Justification Test is therefore not required to determine the site’s suitability for this type of development.

To investigate if the emplacement of this boardwalk would influence the extent of Flood Zone A, or result in unacceptable adverse impacts elsewhere, hydraulic modelling was undertaken as described in the following section.

2 HYDRAULIC MODELLING

RPS obtained River Nore cross-sectional information from the Office of Public Works (OPW), to develop a hydraulic model to assess the impact of the proposed riverside walkway site. The hydraulic model river model developed for this FRA includes about an 8km length of the River Nore, including the proposed boardwalk location as well the area upstream and downstream of this site.

The model boundary used for this investigation is adapted from the Kilkenny CFRAMS model 1% AEP fluvial flood event. The Kilkenny CFRAMS model encompasses the mid and lower reaches of the River Nore, including the River Breagagh and other tributaries. For this assessment, flow and water level information relating to the River Nore has been utilised for model verification purposes.

Two hydraulic model scenarios were undertaken to investigate if the emplacement of the riverside boardwalk would impact pre-existing flood extents, these are as follow:

- **Scenario 1 (Baseline):** This scenario will represent the baseline conditions and present a 1% AEP flood extent before the emplacement of the proposed riverside boardwalk.
- **Scenario 2 (Boardwalk):** This scenario will represent the condition and present a 1% AEP flood extent following the emplacement of the proposed riverside boardwalk.

The 'Planning System and Flood Risk Management Guidelines' recommend a conservative approach to flood risk. Paragraph 2.25 of the guideline states that the presence of flood protection structures should be ignored in determining flood zones. Therefore, to model fluvial flooding at the proposed site, flood defences that form part of the Kilkenny Flood Relief Scheme have been ignored. For comparison purposes, RPS have presented both the defended and undefended versions of each scenario that is listed above.

2.1 Hydraulic Model Caveats

A notable caveat associated with the newly constructed hydraulic model, is that it does not represent the recently constructed St Francis Bridge located downstream of the proposed boardwalk site. Hydro Environmental Ltd, have previously assessed the impact of this bridge during a 1% AEP flood event. Overall, it was concluded that there would be a 40mm water level increase immediately upstream of the bridge. The presence of this bridge was therefore considered to be hydraulically insignificant, and hence justifying its omission from the new hydraulic models.

Another caveat associated with this model is that the topographic information collected to develop the cross-sections pre-date 2014. No new information has been incorporated since.

The DHI MIKE software suite used to undertake hydraulic modelling during CFRAMS has since undergone several iterations since 2011. Regardless, all hydraulic model runs will compare like with like, a comparison is made with the original CFRAMS Kilkenny model results to identify any unacceptable deviations.

2.2 Scenario 1 – Baseline 1% AEP Flood Extents

2.2.1 Baseline 1% AEP Flood Extent (Defended)

Figure 2-1 shows the defended 1% AEP fluvial flood extent relating to Scenario 1 (Baseline). The defended baseline scenario represents the current present-day situation following the occurrence of a 1% AEP fluvial flood event, with all flood defences in place.

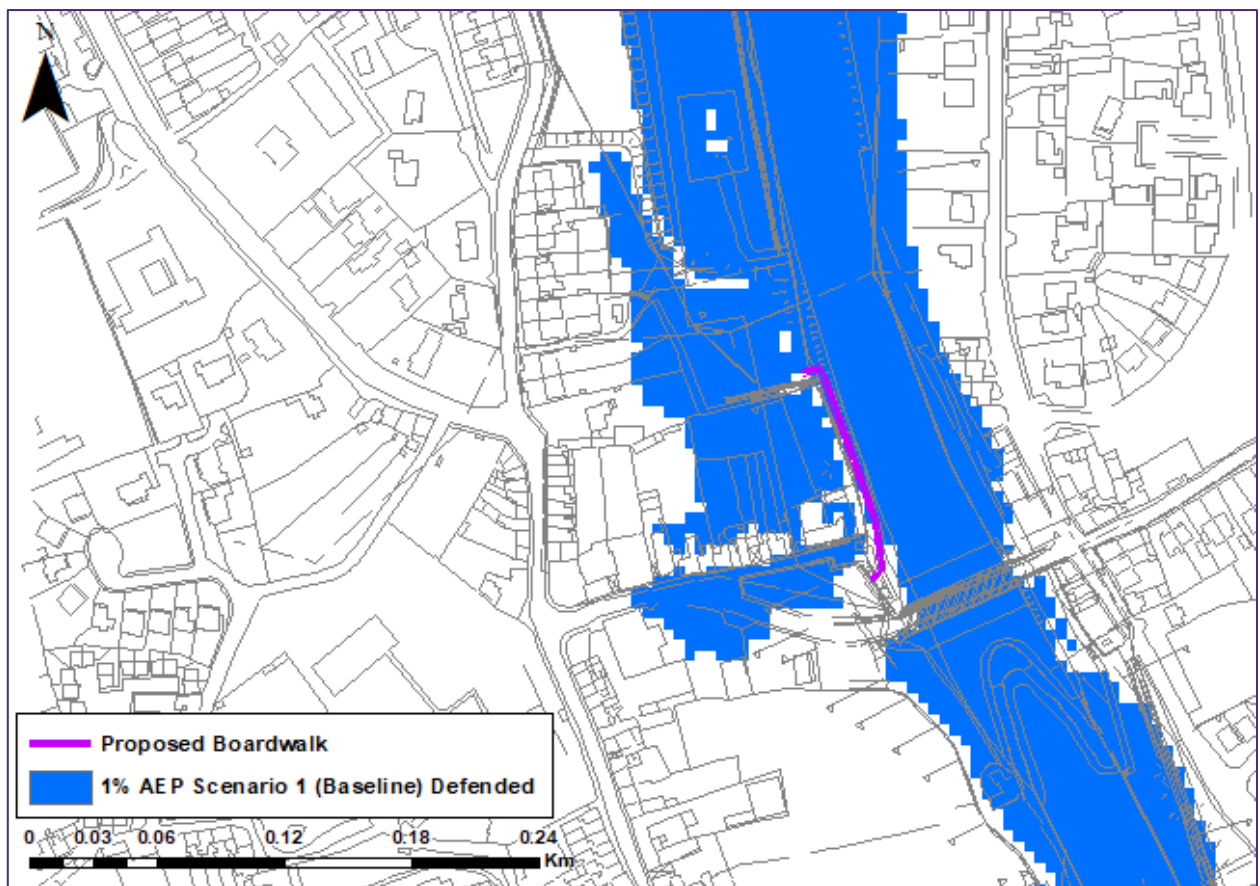


Figure 2-1 1% AEP Scenario 1 - Baseline Flood Extent (Defended)

Water level information was extracted from the 1% AEP fluvial flood extents relating to Scenario 1 (Baseline). Figure 2-2 shows the geographical location of several nodes where water level information has been extracted, including the proximal, upstream, and downstream position relevant to the proposed development site (purple line). It should be noted that model chainages will decrease upstream and increase downstream.

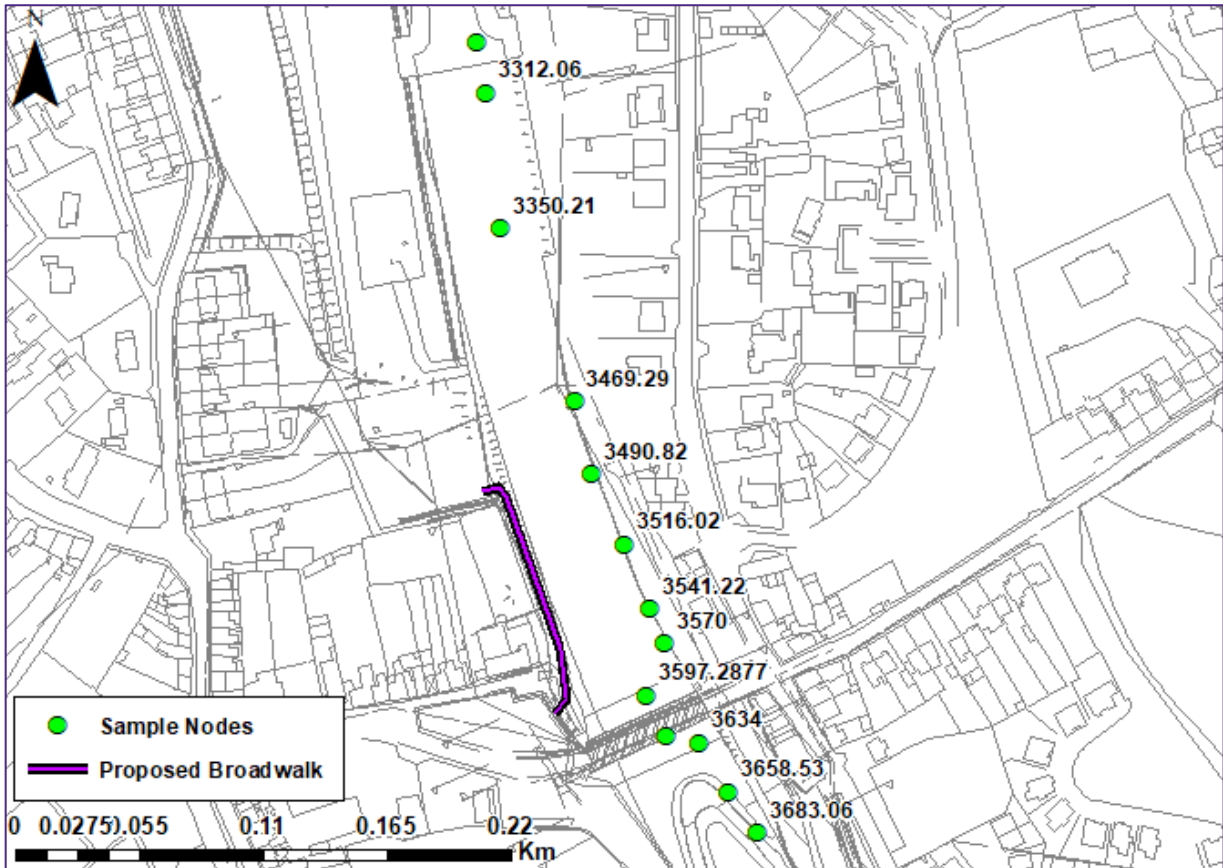


Figure 2-2 Geographical Location of Water Level Sample Nodes

Table 2-1 presents the water level results extracted from the baseline defended run (with flood defence). The chainages in **bold** represent model chainages adjacent and closest to the to the proposed development.

Table 2-1 Scenario 1 – Baseline Water Levels (Defended)

Model Chainage (m)	Baseline (Defended) (*m OD)
NORE 3312.06	45.422
NORE 3331.13	45.399
NORE 3350.21	45.367
NORE 3369.29	45.324
NORE 3393.37	45.312
NORE 3417.46	45.294
NORE 3441.54	45.268
NORE 3465.62	45.21
NORE 3490.82	45.16
NORE 3516.02	45.12
NORE 3541.22	45.111
NORE 3570	45.1
NORE 3597.5	45.081
NORE 3605	45.072
NORE 3613	44.667
NORE 3634	44.684
NORE 3658.53	44.632
NORE 3683.06	44.558

**Please note that all water levels are in mOD (Malinhead)*

2.2.2 Baseline 1% AEP Flood Extent (Undefended)

Figure 2-3 shows the undefended 1% AEP fluvial flood extent relating to Scenario 1 (Baseline), the undefended baseline scenario represents the current present-day situation following the occurrence of a 1% AEP fluvial flood event. The undefended scenario applies a conservative approach, whereby all flood protection structures are ignored.

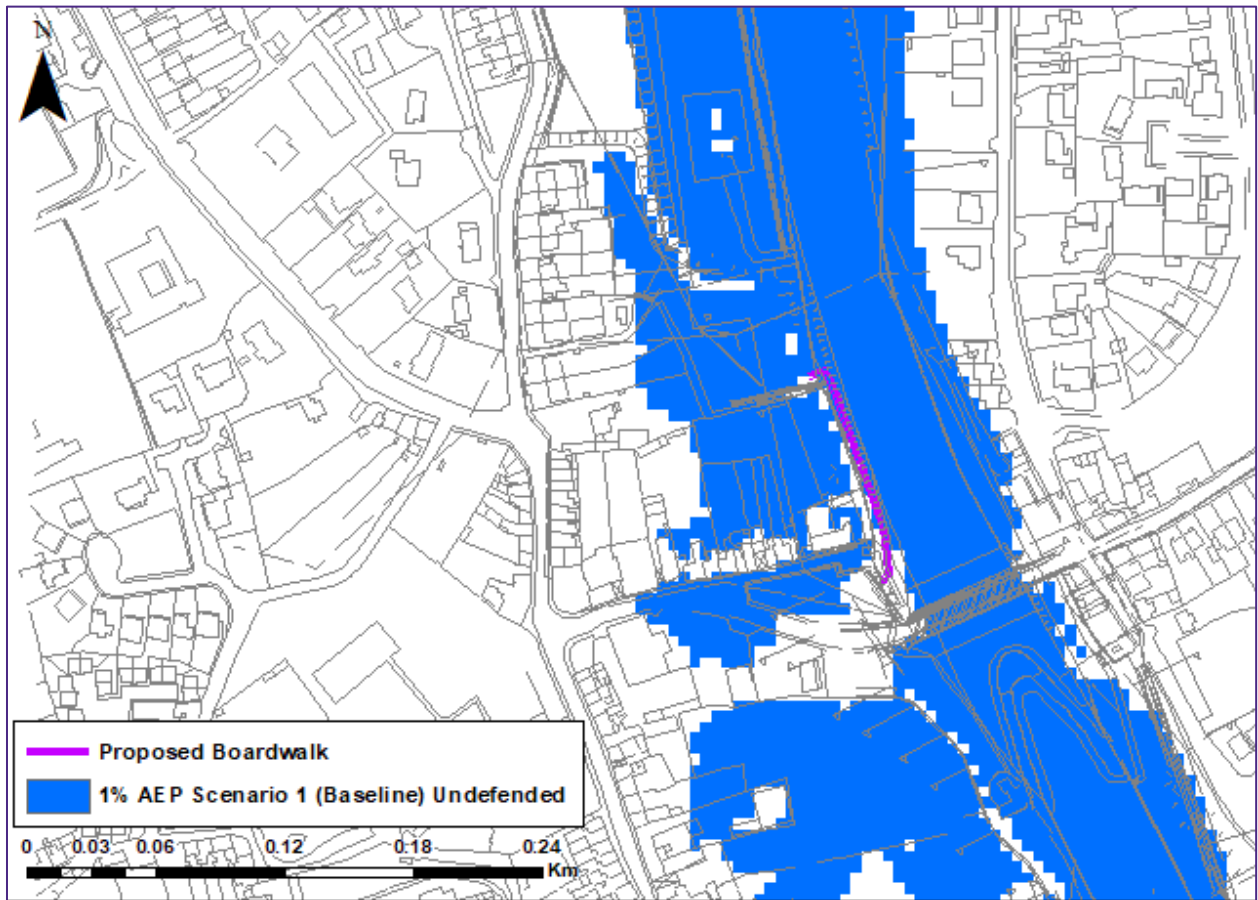


Figure 2-3 1% AEP Scenario 1 (Baseline) Flood Extent (Undefended)

Table 2-2 presents the water level results extracted from the baseline undefended run (without flood defence). The chainages in **bold** represent model chainages adjacent and closest to the to the proposed development.

Table 2-2 Scenario 1 - Baseline Water Levels (Undefended)

Model Chainage (m)	Baseline (Undefended) (m OD)
NORE 3312.06	45.42
NORE 3331.13	45.398
NORE 3350.21	45.366
NORE 3369.29	45.324
NORE 3393.37	45.311
NORE 3417.46	45.293
NORE 3441.54	45.267
NORE 3465.62	45.205
NORE 3490.82	45.163
NORE 3516.02	45.119
NORE 3541.22	45.11
NORE 3570	45.099
NORE 3597.5	45.08
NORE 3605	45.071
NORE 3613	44.666
NORE 3634	44.683
NORE 3658.53	44.631
NORE 3683.06	44.558

2.3 Comparison of Baseline & CFRAMS Models

2.3.1 1% AEP Flood Extent (Defended)

Figure 2-4 presents the defended 1% AEP Baseline flood extents in red and the CFRAMS flood extent in blue. The Baseline extents are slightly greater than the CFRAMS flood extents, particularly to the area to the west and upstream of Greens Bridge.

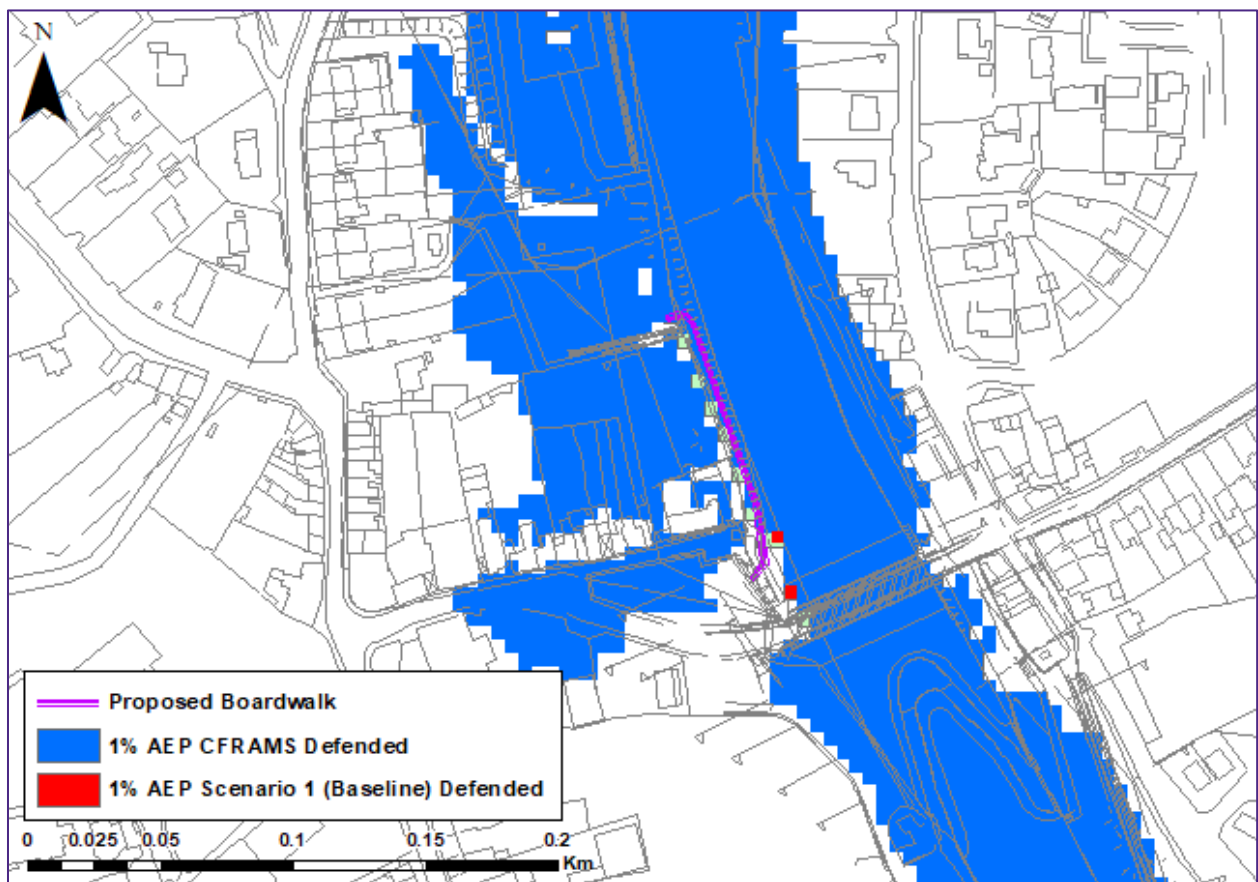


Figure 2-4 Comparison between 1% AEP Scenario 1 Baseline and CFRAMS Flood Extents (Defended)

Table 2-3 presents a comparison between the CFRAMS and newly constructed baseline (Defended), 1% AEP fluvial flood model scenarios. The overall results show that there is a negligible difference between model version output. Overall, the new model results tend to be more conservative when compared with the original CFRAM model water levels with an average difference of 2.5mm. The largest difference between modelled water levels occurs immediately upstream of Greens Bridge (23mm) at chainage 3465.62m, with no or a negligible impact downstream of the proposed development (<5mm). The chainages in **bold** represent model chainages adjacent and closest to the to the proposed development.

Table 2-3 CFRAMS and Baseline Water Level Comparison (Defended)

Model Chainage *(m)	CFRAMS (Defended) (m OD)	Baseline (Defended) (m OD)	Difference between CFRAMS & Baseline (Defended) (m)
NORE 3312.06	45.425	45.422	-0.003
NORE 3331.13	45.401	45.399	-0.002
NORE 3350.21	45.368	45.367	-0.001
NORE 3369.29	45.325	45.324	-0.001
NORE 3393.37	45.312	45.312	0
NORE 3417.46	45.291	45.294	0.003
NORE 3441.54	45.257	45.268	0.011
NORE 3465.62	45.187	45.21	0.023
NORE 3490.82	45.151	45.16	0.009
NORE 3516.02	45.117	45.12	0.003
NORE 3541.22	45.108	45.111	0.003
NORE 3570	45.096	45.1	0.004
NORE 3597.5	45.078	45.081	0.003
NORE 3605	45.07	45.072	0.002
NORE 3613	44.664	44.667	0.003
NORE 3634	44.681	44.684	0.003
NORE 3658.53	44.628	44.632	0.004
NORE 3683.06	44.553	44.558	0.005

2.3.2 1% AEP Flood Extent (Un defended)

Figure 2-5 presents the undefended 1% AEP Baseline flood extents in red and the CFRAMS flood extent in blue. Scenario 1 (Baseline) extents are slightly greater than the CFRAMS flood extents, particularly to the area to the east and downstream of Greens Bridge.

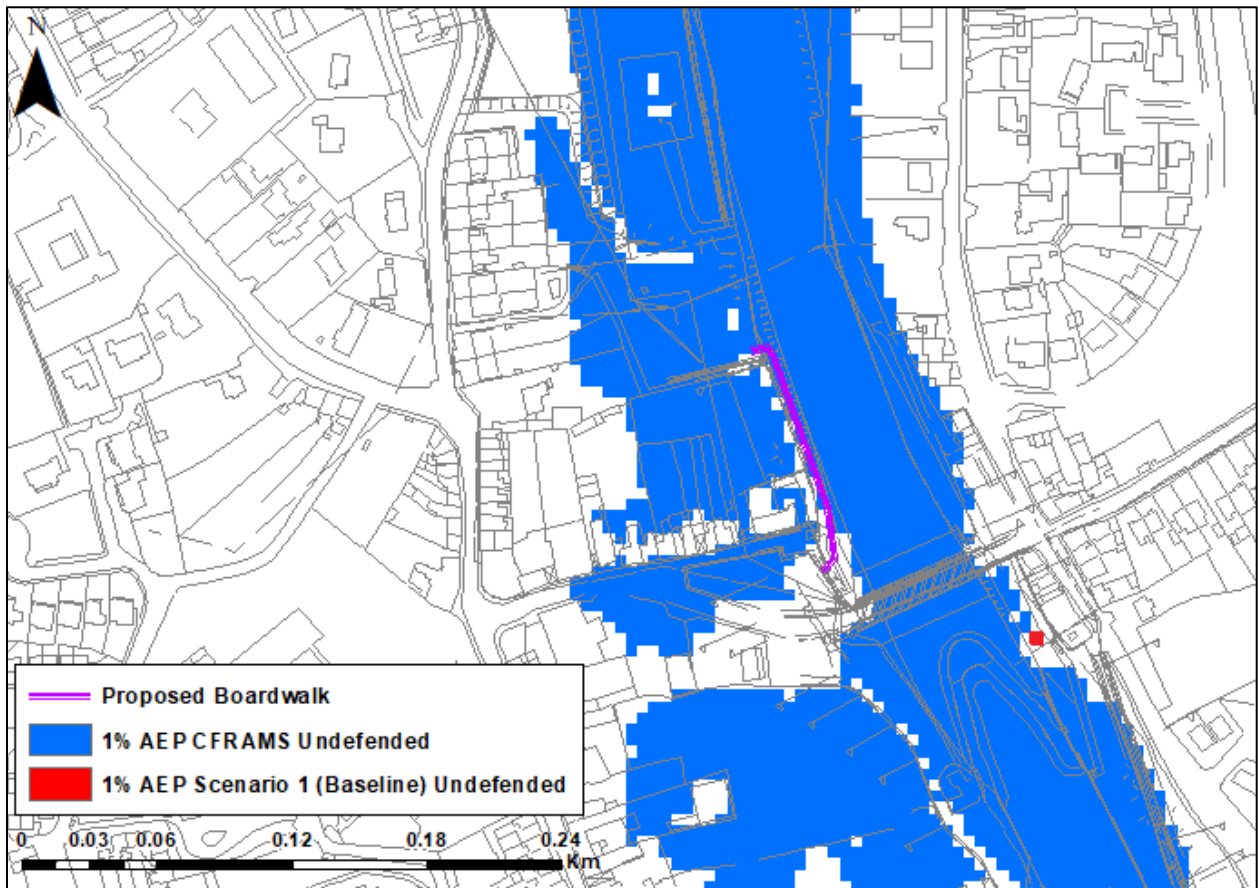


Figure 2-5 Comparison between 1% AEP Scenario 1 Baseline and CFRAMS Flood Extents (Undefended)

Table 2-4 presents a comparison between the CFRAMS model and the newly constructed baseline 1% AEP fluvial flood model. The water level results show that there is a negligible difference between model version output during an undefended scenario. Overall, the newer model results tend to be more conservative when compared with the original CFRAM model water levels. The largest difference between modelled water levels occurs immediately upstream of Greens Bridge (17mm) at chainage 3465.62m with a negligible impact downstream of the proposed development (<4mm). The chainages in **bold** represent model chainages adjacent and closest to the to the proposed development.

Table 2-4 CFRAMS and Baseline Water Level Comparison (Undefended)

Model Chainage (m)	CFRAMS (Undefended) (m OD)	Baseline (Undefended) (m OD)	Difference between CFRAMS & Baseline (Undefended) (m)
NORE 3292.98	45.438	45.433	-0.005
NORE 3312.06	45.425	45.42	-0.005
NORE 3331.13	45.401	45.398	-0.003
NORE 3350.21	45.368	45.366	-0.002
NORE 3369.29	45.324	45.324	0
NORE 3393.37	45.311	45.311	0
NORE 3417.46	45.291	45.293	0.002
NORE 3441.54	45.255	45.267	0.012
NORE 3465.62	45.188	45.205	0.017
NORE 3490.82	45.151	45.163	0.012
NORE 3516.02	45.117	45.119	0.002
NORE 3541.22	45.108	45.11	0.002
NORE 3570	45.096	45.099	0.003
NORE 3597.5	45.078	45.08	0.002
NORE 3605	45.07	45.071	0.001
NORE 3613	44.666	44.666	0
NORE 3634	44.682	44.683	0.001
NORE 3658.53	44.63	44.631	0.001
NORE 3683.06	44.554	44.558	0.004

2.4 Scenario 2 – Boardwalk

2.4.1 Modelling of the Boardwalk

Scenario 2 (Post Boardwalk Emplacement) has incorporated the proposed boardwalk into the model. Figure 2-6 shows the location of the proposed boardwalk relevant to the model cross-sections, these cross-sections have been selected and edited to represent the boardwalk. Each cross-section is located upstream of Greens Bridge at model chainage 3465.2m, 3490.82m, 3516.02m and 3541.22m.

NORE BOARDWALK FLOOD RISK ASSESSMENT

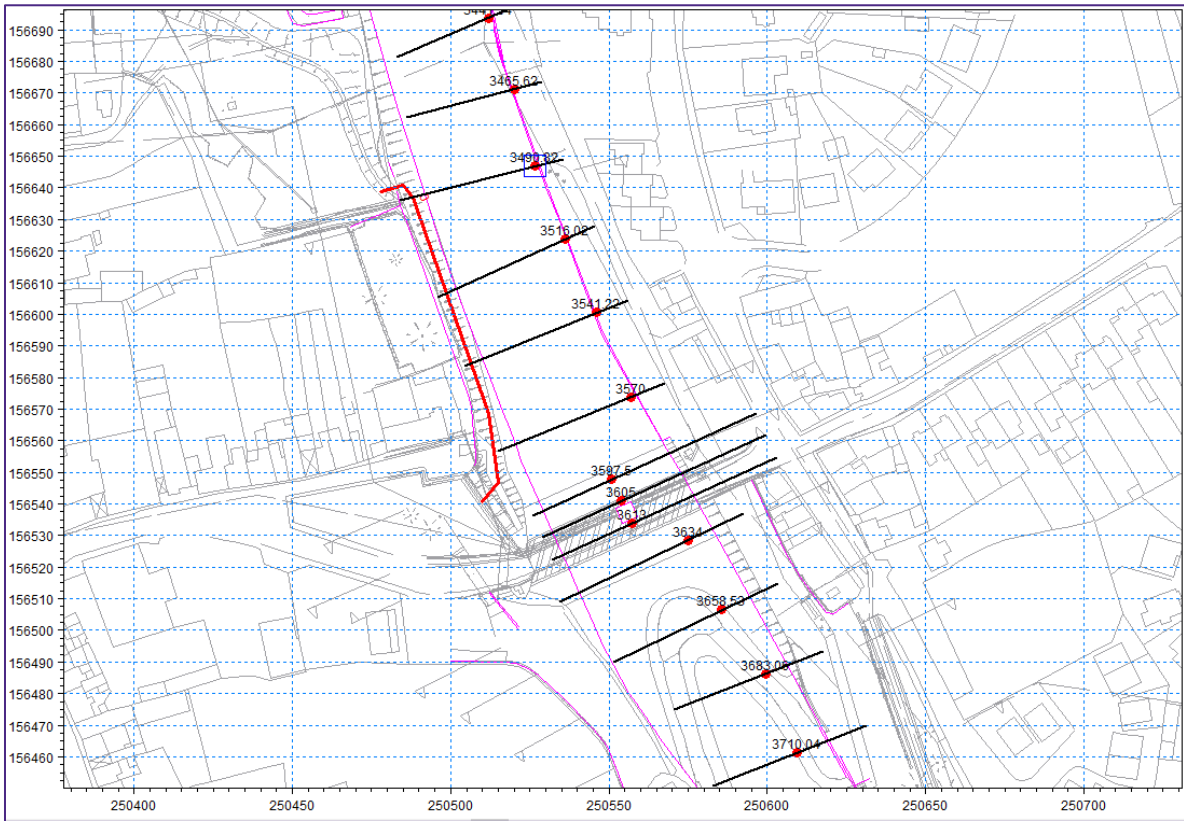


Figure 2-6 Hydraulic Model Cross-Sections

Figure 2-7 shows the cross-sections that represent the proposed 3m wide boardwalk at a level of 44.4mOD. This boardwalk is located along the riverside of a section of flood defence with a design level of 45.5m OD. For Scenario 2, the boardwalk is represented conservatively by altering the shape of the cross-section along the right bank (west) to fit the proposed design dimensions. To apply a conservative approach as recommended by the Planning Guidelines, the influence of the flood defences have been removed. For comparison purposes the defended version of this scenario has also been produced.

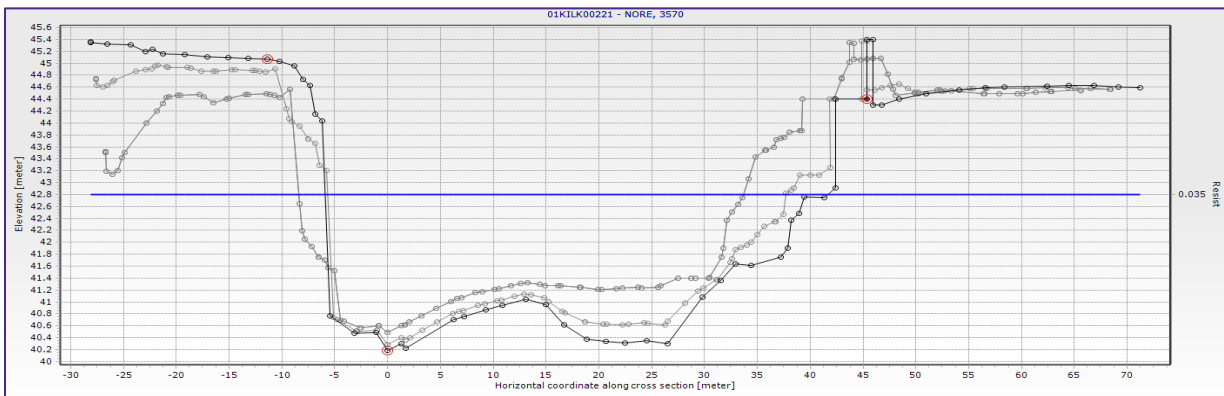


Figure 2-7 Modelled Cross-Sections Representing the Proposed Boardwalk

2.4.2 Scenario 2 – Boardwalk 1% AEP Flood Extent (Defended)

Figure 2-8 shows the defended 1% AEP fluvial flood extent relating to Scenario 2 (Boardwalk). This scenario represents the current present-day situation, following the emplacement of the proposed boardwalk and the occurrence of a 1% AEP fluvial flood event.

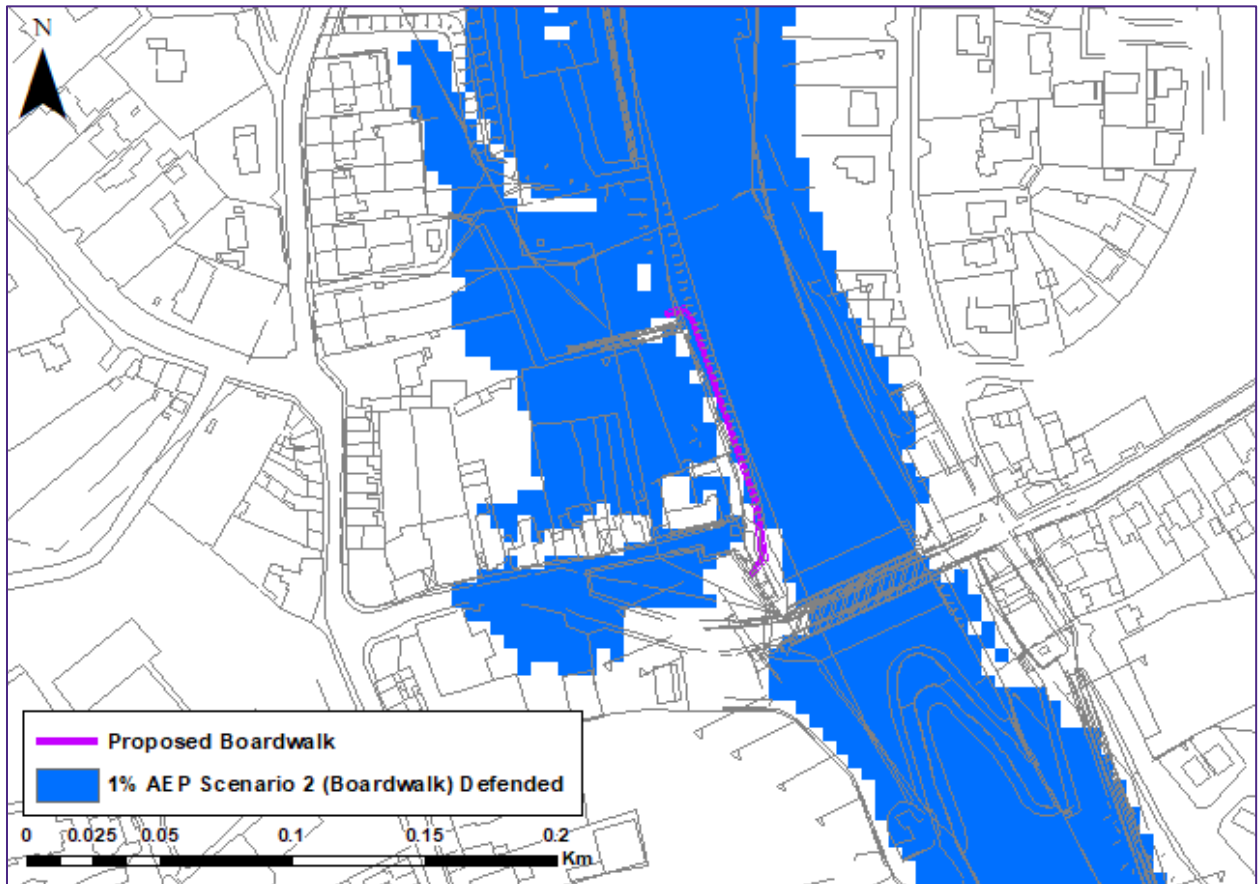


Figure 2-8 1% AEP Scenario 2 (Boardwalk) Flood Extent (Defended)

Table 2-1 shows the boardwalk Scenario 2 water level results extracted from upstream, proximal, and downstream of the proposed boardwalk. The chainages in **bold** represent model chainages adjacent and closest to the proposed development.

Table 2-5 Scenario 2 (Boardwalk) Water Levels (Defended)

Model Chainage (m)	Boardwalk (Defended) (m OD)
NORE 3292.98	45.439
NORE 3312.06	45.428
NORE 3331.13	45.405
NORE 3350.21	45.373
NORE 3369.29	45.33
NORE 3393.37	45.318
NORE 3417.46	45.3
NORE 3441.54	45.274
NORE 3465.62	45.217
NORE 3490.82	45.163
NORE 3516.02	45.121
NORE 3541.22	45.111
NORE 3570	45.097
NORE 3597.5	45.081
NORE 3605	45.072
NORE 3613	44.667
NORE 3634	44.684
NORE 3658.53	44.633
NORE 3683.06	44.559

Figure 2-9 shows an overlie of the of the 1% AEP flood extent relating to the baseline (blue) and following the emplacement of the proposed boardwalk (red) (with flood defence). The post development situation (red) is slightly greater than the baseline situation (blue), particularly to the area to the west of the proposed boardwalk. There are no changes in the flood extent upstream or downstream of this area.

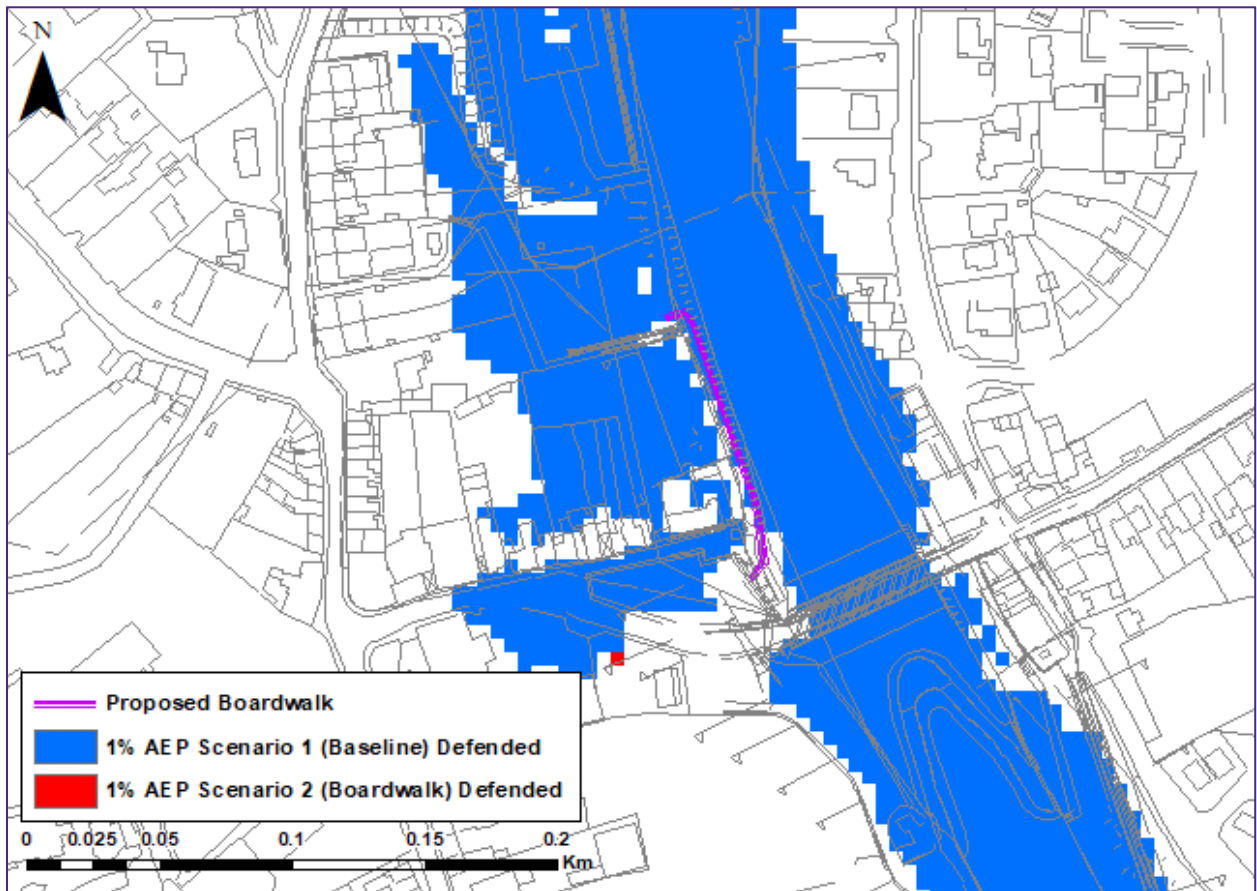


Figure 2-9 Comparison of Scenario 1 Baseline & Scenario 2 Boardwalk 1% AEP Flood Extent (Defended)

Table 2-6 presents a comparison between the newly constructed hydraulic model baseline and boardwalk (proposed development), 1% AEP fluvial flood water levels. Both scenarios are representing a situation whereby flood defences are present, or the area is defended. The comparison of these results show that there is a negligible impact to the 1% AEP fluvial flood levels following the emplacement of the proposed boardwalk during a defended scenario. The largest difference occurs upstream of the proposed development (7mm) with a negligible impact downstream of the proposed development (<1mm).

Table 2-6 Scenario 1 Baseline and Scenario 2 Boardwalk Water Level Comparison (Defended)

Model Chainage (m)	Baseline (Defended) (m OD)	Boardwalk (Defended) (m OD)	Difference Baseline & Boardwalk (Defended) (m)
NORE 3292.98	45.434	45.439	0.005
NORE 3312.06	45.422	45.428	0.006
NORE 3331.13	45.399	45.405	0.006
NORE 3350.21	45.367	45.373	0.006
NORE 3369.29	45.324	45.33	0.006
NORE 3393.37	45.312	45.318	0.006
NORE 3417.46	45.294	45.3	0.006
NORE 3441.54	45.268	45.274	0.006
NORE 3465.62	45.21	45.217	0.007
NORE 3490.82	45.16	45.163	0.003
NORE 3516.02	45.12	45.121	0.001
NORE 3541.22	45.111	45.111	0
NORE 3570	45.1	45.097	-0.003
NORE 3597.5	45.081	45.081	0
NORE 3605	45.072	45.072	0
NORE 3613	44.667	44.667	0
NORE 3634	44.684	44.684	0
NORE 3658.53	44.632	44.633	0.001
NORE 3683.06	44.558	44.559	0.001

2.4.3 Scenario 2 – Boardwalk 1% AEP Flood Extent (Undefended)

Figure 2-10 shows the undefended 1% AEP fluvial flood extent relating to Scenario 2 (Boardwalk). This scenario represents the current present-day situation, following the emplacement of the proposed boardwalk and the occurrence of a 1% AEP fluvial flood event. This represents the worst-case scenario as no flood defences are in place.

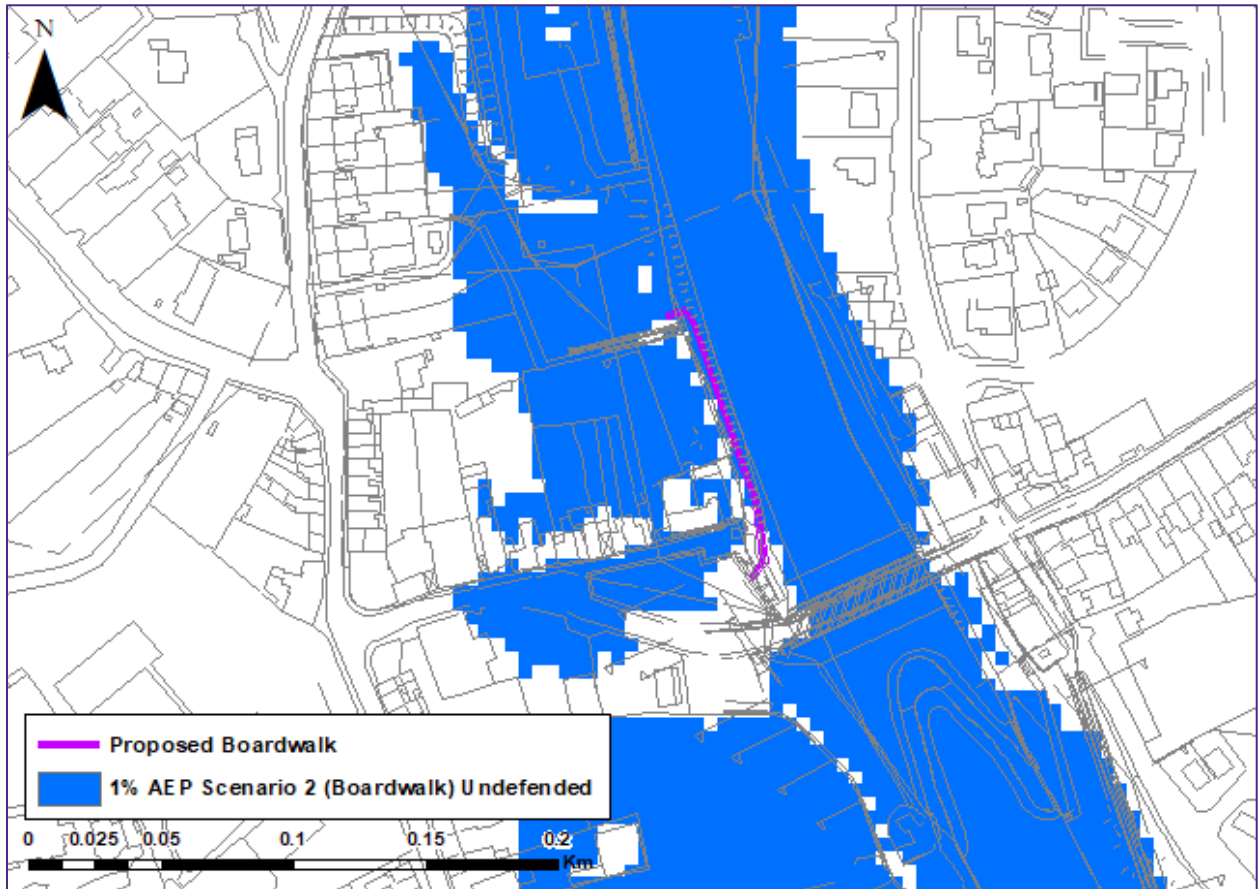


Figure 2-10 1% AEP Scenario 2 (Boardwalk) Flood Extent (Undefended)

Table 2-7 presents water level results extracted from upstream, proximal, and downstream of the proposed boardwalk. The chainages in **bold** represent model chainages adjacent and closest to the to the proposed development. It should be noted that model chainages will decrease upstream and increase downstream.

Overall, the defenced boardwalk model water level results tend to be less conservative when compared with the undefended model water levels. The largest difference between modelled water levels occurs immediately upstream of Greens Bridge (1mm) at chainage 3465.62m, with no or a negligible impact downstream of the proposed development (<1mm).

Table 2-7 Scenario 2 – Boardwalk Water Levels (Undefended)

Model Chainage (m)	Boardwalk (Undefended) (m OD)
NORE 3312.06	45.432
NORE 3331.13	45.411
NORE 3350.21	45.38
NORE 3369.29	45.338
NORE 3393.37	45.327
NORE 3417.46	45.309
NORE 3441.54	45.284
NORE 3465.62	45.227
NORE 3490.82	45.171
NORE 3516.02	45.12
NORE 3541.22	45.113
NORE 3570	45.097
NORE 3597.5	45.082
NORE 3605	45.073
NORE 3613	44.668
NORE 3634	44.684
NORE 3658.53	44.633
NORE 3683.06	44.559

Figure 2-11 shows an overlie of the of the 1% AEP flood extent relating to the baseline (blue) and following the emplacement of the proposed boardwalk (red) (without the influence of flood defences). This example presents the worst-case situation. The post development situation (red) is slightly greater than the baseline situation (blue), particularly to the area to the west of the proposed boardwalk. There are no changes in the flood extent upstream or downstream of this area.

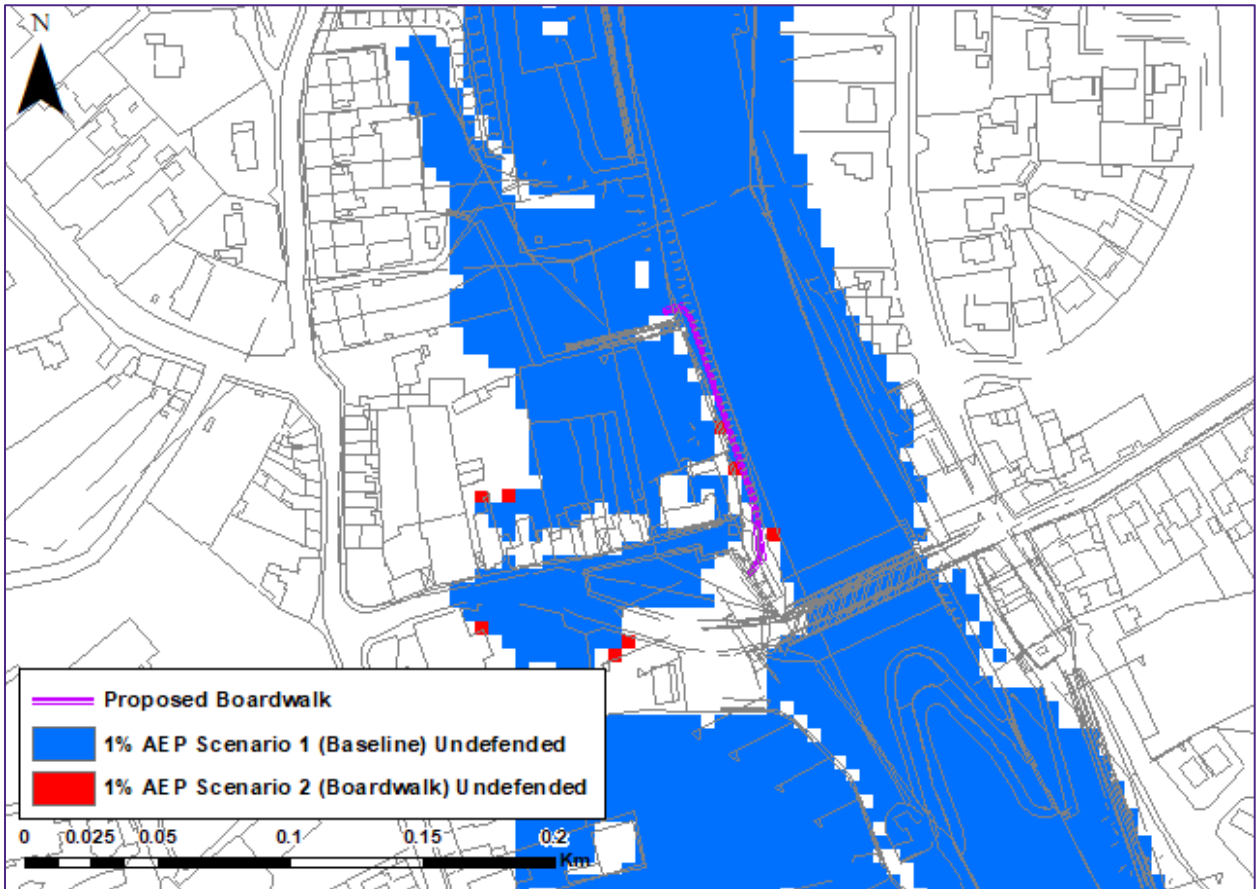


Figure 2-11 Comparison of Scenario 1 (Baseline) & Scenario 2 (Boardwalk) 1% AEP Flood Extent (Undefended)

Table 2-8 presents a comparison between the newly constructed baseline (undefended) and boardwalk (proposed development), 1% fluvial flood scenarios. In essence, these results show that there is a negligible impact to the 1% AEP fluvial flood levels following the emplacement of the proposed riverside boardwalk along the edge of the River Nore. The largest difference between these scenarios, occurs upstream of the proposed development (22mm) with no or a negligible impact downstream of the proposed development (<2mm).

Table 2-8 Scenario 1 Baseline and Scenario 2 Boardwalk Water Level Comparison (Undefended)

Model Chainage (m)	Baseline (Undefended) (m OD)	Boardwalk (Undefended) (m OD)	Difference Baseline & Boardwalk (Undefended) (m)
NORE 3292.98	45.433	45.446	0.013
NORE 3312.06	45.42	45.432	0.012
NORE 3331.13	45.398	45.411	0.013
NORE 3350.21	45.366	45.38	0.014
NORE 3369.29	45.324	45.338	0.014
NORE 3393.37	45.311	45.327	0.016
NORE 3417.46	45.293	45.309	0.016
NORE 3441.54	45.267	45.284	0.017
NORE 3465.62	45.205	45.227	0.022
NORE 3490.82	45.163	45.171	0.008
NORE 3516.02	45.119	45.12	0.001
NORE 3541.22	45.11	45.113	0.003
NORE 3570	45.099	45.097	-0.002
NORE 3597.5	45.08	45.082	0.002
NORE 3605	45.071	45.073	0.002
NORE 3613	44.666	44.668	0.002
NORE 3634	44.683	44.684	0.001
NORE 3658.53	44.631	44.633	0.002
NORE 3683.06	44.558	44.559	0.001

In summary, the water level results show that there is a negligible impact to the 1% AEP flood levels through the emplacement of the proposed riverside boardwalk. All model water level results have been presented in Appendix A.

3 CONCLUSION

OPW flood maps show that the proposed site is located within Flood Zone A (high risk of flooding). The proposed riverside boardwalk site can be considered as a 'water-compatible development' and is therefore a type of development that would be appropriate for Flood Zone A. The application of a Justification Test was not required to determine the site's suitability for this type of development.

This study has presented a comparative analysis of the proposed development in place (riverside boardwalk) with pre-existing (baseline) conditions during the occurrence of a 1% AEP fluvial flood event. Following the recommended 'Planning System and Flood Risk Management Guidelines' a conservative approach to this flood risk assessment has been applied. While the site has a good level of protection from the existing flood alleviation scheme, the 'Planning System and Flood Risk Management Guidelines' recommend a conservative approach. The flood zones have therefore been plotted as if there are no defences in place (undefended).

A comparison of the 1% AEP fluvial flood extents relating to the baseline and proposed boardwalk, showed slight and localised increases within the immediate area of the proposed boardwalk in both the defended and undefended scenarios. The flood levels associated with this slight spatial flood extent increase can be considered as negligible (<0.03m). There were no changes in the flood extent upstream or downstream of this area.

A water level comparison of the baseline and post-development situation (defended and undefended) was undertaken, this demonstrated that there is some but small and localised differences. Overall, the average water level difference between all scenarios returned a negligible average difference, indicating that the emplacement of the proposed riverside boardwalk does not present an increased flood risk to Kilkenny.

This FRA meets the requirement of a Stage 3 Detailed flood risk assessment as detailed in the guidelines. An assessment of the fluvial risk as detailed in this report demonstrates that the proposed development of a riverside walkway will result in a negligible change to the existing 1% AEP fluvial flood extent and water levels. Therefore, there is no increased flood risk to any receptors.

REFERENCES

1. Kilgallen & Partners (2022): Pedestrian & Cycle Link between the River Nore Linear Park and the Riverside Gardens Kilkenny, Feasibility Report: 21038-FR01[PR2] Nore Boardwalk - without 2009 report.pdf
2. The Planning system and Flood Risk Management: Guidelines for Planning Authorities (2009) ([gov.ie](http://www.gov.ie) - [The Planning System and Flood Risk Management - Guidelines for Planning Authorities \(Nov 09\) \(www.gov.ie\)](http://www.gov.ie))
3. CFRAMS Kilkenny Flood maps, downloaded from <https://www.floodinfo.ie/> (accessed 10/08/2023)
4. South Eastern CFRAM Study, HA15 Hydraulics Report (2017) (downloaded 22/08/2022 [IBE0601Rp0015_HA15_Hydraulics_Report_F05.pdf](#))

Appendix A
MIKE 11 Water Levels

NORE BOARDWALK FLOOD RISK ASSESSMENT (FRA)

MIKE 11 Water Levels (mOD)

Chainage (m)	CFRAMS (m)	Baseline (Defended)(m)	Difference between CFRAMS & Baseline (Defended)(m)	Boardwalk (Defended)(m)	Difference Baseline & Boardwalk (Defended)(m)	CFRAMS (Undefended)(m)	Baseline (Undefended)(m)	Difference between CFRAMS & Baseline (Undefended)(m)	Boardwalk (Undefended)(m)	Difference Baseline & Boardwalk (Undefended)(m)
NORE 0	49.106	49.098	-0.008	49.098	0	49.106	49.098	-0.008	49.098	0
NORE 59.44	49.039	49.029	-0.01	49.029	0	49.039	49.03	-0.009	49.029	-0.001
NORE 86.666	49.017	49.007	-0.01	49.007	0	49.017	49.007	-0.01	49.007	0
NORE 113.892	48.984	48.974	-0.01	48.974	0	48.984	48.975	-0.009	48.974	-0.001
NORE 141.118	48.931	48.92	-0.011	48.92	0	48.931	48.92	-0.011	48.92	0
NORE 168.344	48.862	48.85	-0.012	48.85	0	48.862	48.85	-0.012	48.85	0
NORE 194.39	48.735	48.722	-0.013	48.722	0	48.735	48.722	-0.013	48.722	0
NORE 220.434	48.698	48.683	-0.015	48.684	0.001	48.698	48.684	-0.014	48.684	0
NORE 246.479	48.648	48.635	-0.013	48.635	0	48.648	48.635	-0.013	48.635	0
NORE 272.524	48.592	48.58	-0.012	48.58	0	48.592	48.581	-0.011	48.58	-0.001
NORE 302.388	48.582	48.573	-0.009	48.574	0.001	48.582	48.574	-0.008	48.573	-0.001
NORE 332.252	48.564	48.554	-0.01	48.553	-0.001	48.564	48.554	-0.01	48.555	0.001
NORE 362.116	48.549	48.532	-0.017	48.532	0	48.549	48.533	-0.016	48.532	-0.001
NORE 391.79	48.454	48.432	-0.022	48.432	0	48.454	48.432	-0.022	48.432	0
NORE 421.464	48.379	48.354	-0.025	48.354	0	48.379	48.354	-0.025	48.354	0
NORE 451.138	48.337	48.309	-0.028	48.308	-0.001	48.337	48.309	-0.028	48.309	0
NORE 480.812	48.283	48.251	-0.032	48.252	0.001	48.283	48.252	-0.031	48.253	0.001
NORE 507.786	48.273	48.239	-0.034	48.239	0	48.273	48.24	-0.033	48.239	-0.001
NORE 534.761	48.259	48.223	-0.036	48.223	0	48.258	48.223	-0.035	48.223	0
NORE 561.74	48.255	48.217	-0.038	48.217	0	48.254	48.217	-0.037	48.217	0
NORE 590.696	48.234	48.194	-0.04	48.194	0	48.233	48.194	-0.039	48.194	0
NORE 619.656	48.22	48.178	-0.042	48.178	0	48.219	48.178	-0.041	48.178	0
NORE 648.617	48.2	48.157	-0.043	48.156	-0.001	48.199	48.157	-0.042	48.157	0
NORE 677.578	48.171	48.125	-0.046	48.124	-0.001	48.17	48.125	-0.045	48.125	0
NORE 700.932	48.174	48.128	-0.046	48.127	-0.001	48.173	48.128	-0.045	48.128	0
NORE 724.285	48.174	48.127	-0.047	48.126	-0.001	48.173	48.127	-0.046	48.127	0
NORE 747.638	48.176	48.129	-0.047	48.128	-0.001	48.175	48.129	-0.046	48.129	0
NORE 770.992	48.182	48.134	-0.048	48.134	0	48.181	48.135	-0.046	48.135	0
NORE 793.771	48.174	48.127	-0.047	48.126	-0.001	48.173	48.127	-0.046	48.127	0
NORE 816.551	48.161	48.113	-0.048	48.112	-0.001	48.16	48.113	-0.047	48.113	0
NORE 839.331	48.134	48.089	-0.045	48.088	-0.001	48.138	48.089	-0.049	48.089	0
NORE 862.11	48.107	48.059	-0.048	48.058	-0.001	48.109	48.059	-0.05	48.057	-0.002
NORE 888.583	48.096	48.046	-0.05	48.045	-0.001	48.1	48.046	-0.054	48.046	0
NORE 915.055	48.077	48.03	-0.047	48.029	-0.001	48.083	48.029	-0.054	48.03	0.001
NORE 941.528	48.055	48.011	-0.044	48.011	0	48.063	48.01	-0.053	48.012	0.002
NORE 968	48.029	47.965	-0.064	47.965	0	48.035	47.963	-0.072	47.966	0.003
NORE 995.948	47.995	47.935	-0.06	47.934	-0.001	47.993	47.933	-0.06	47.935	0.002
NORE 1023.9	47.972	47.906	-0.066	47.906	0	47.971	47.906	-0.065	47.907	0.001
NORE 1051.84	47.962	47.9	-0.062	47.899	-0.001	47.962	47.899	-0.063	47.9	0.001
NORE 1079.79	47.963	47.903	-0.06	47.903	0	47.963	47.902	-0.061	47.904	0.002
NORE 1106.53	47.935	47.876	-0.059	47.876	0	47.936	47.874	-0.062	47.877	0.003
NORE 1133.27	47.92	47.861	-0.059	47.861	0	47.921	47.859	-0.062	47.862	0.003
NORE 1160.01	47.918	47.859	-0.059	47.86	0.001	47.919	47.857	-0.062	47.86	0.003
NORE 1183.72	47.901	47.843	-0.058	47.843	0	47.902	47.84	-0.062	47.843	0.003
NORE 1207.43	47.877	47.806	-0.071	47.813	0.007	47.873	47.809	-0.064	47.804	-0.005
NORE 1231.14	47.82	47.75	-0.07	47.75	0	47.817	47.756	-0.061	47.749	-0.007

NORE BOARDWALK FLOOD RISK ASSESSMENT (FRA)

Chainage (m)	CFRAMS (m)	Baseline (Defended)(m)	Difference between CFRAMS & Baseline (Defended)(m)	Boardwalk (Defended)(m)	Difference Baseline & Boardwalk (Defended)(m)	CFRAMS (Undefended)(m)	Baseline (Undefended)(m)	Difference between CFRAMS & Baseline (Undefended)(m)	Boardwalk (Undefended)(m)	Difference Baseline & Boardwalk (Undefended)(m)
NORE 1254.85	47.728	47.684	-0.044	47.68	-0.004	47.728	47.685	-0.043	47.682	-0.003
NORE 1278.64	47.697	47.668	-0.029	47.672	0.004	47.697	47.671	-0.026	47.67	-0.001
NORE 1302.42	47.682	47.664	-0.018	47.664	0	47.682	47.665	-0.017	47.664	-0.001
NORE 1326.19	47.636	47.625	-0.011	47.626	0.001	47.636	47.627	-0.009	47.625	-0.002
NORE 1349.96	47.585	47.58	-0.005	47.584	0.004	47.585	47.582	-0.003	47.581	-0.001
NORE 1373.72	47.514	47.531	0.017	47.534	0.003	47.514	47.527	0.013	47.53	0.003
NORE 1410	47.409	47.446	0.037	47.444	-0.002	47.409	47.449	0.04	47.446	-0.003
NORE 1410	47.409	47.446	0.037	47.444	-0.002	47.409	47.449	0.04	47.446	-0.003
NORE 1432	47.315	47.333	0.018	47.333	0	47.315	47.334	0.019	47.335	0.001
NORE 1454.17	47.251	47.251	0	47.251	0	47.251	47.251	0	47.251	0
NORE 1454.17	47.251	47.251	0	47.251	0	47.251	47.251	0	47.251	0
NORE 1508	47.326	47.327	0.001	47.328	0.001	47.326	47.327	0.001	47.327	0
NORE 1512	47.316	47.317	0.001	47.318	0.001	47.316	47.317	0.001	47.317	0
NORE 1546	47.265	47.265	0	47.266	0.001	47.265	47.265	0	47.265	0
NORE 1580.67	47.235	47.235	0	47.235	0	47.235	47.235	0	47.235	0
NORE 1615.33	47.195	47.195	0	47.195	0	47.195	47.195	0	47.196	0.001
NORE 1650	47.14	47.14	0	47.141	0.001	47.142	47.141	-0.001	47.139	-0.002
NORE 1690.5	47.1	47.098	-0.002	47.098	0	47.1	47.098	-0.002	47.098	0
NORE 1731	47.063	47.06	-0.003	47.06	0	47.063	47.06	-0.003	47.06	0
NORE 1763.27	47.011	47.007	-0.004	47.007	0	47.011	47.007	-0.004	47.007	0
NORE 1795.54	46.967	46.962	-0.005	46.962	0	46.967	46.962	-0.005	46.962	0
NORE 1795.54	46.967	46.962	-0.005	46.962	0	46.967	46.962	-0.005	46.962	0
NORE 1842.8	46.912	46.908	-0.004	46.908	0	46.912	46.908	-0.004	46.907	-0.001
NORE 1867.61	46.891	46.885	-0.006	46.886	0.001	46.891	46.886	-0.005	46.886	0
NORE 1892.43	46.867	46.861	-0.006	46.862	0.001	46.867	46.862	-0.005	46.862	0
NORE 1917.24	46.85	46.845	-0.005	46.845	0	46.85	46.845	-0.005	46.845	0
NORE 1952.06	46.833	46.829	-0.004	46.829	0	46.833	46.83	-0.003	46.829	-0.001
NORE 1975.19	46.814	46.812	-0.002	46.812	0	46.814	46.813	-0.001	46.812	-0.001
NORE 1998.33	46.793	46.798	0.005	46.799	0.001	46.793	46.801	0.008	46.799	-0.002
NORE 2021.47	46.775	46.793	0.018	46.801	0.008	46.775	46.795	0.02	46.801	0.006
NORE 2048.08	46.74	46.775	0.035	46.778	0.003	46.74	46.776	0.036	46.777	0.001
NORE 2074.69	46.696	46.711	0.015	46.713	0.002	46.696	46.711	0.015	46.713	0.002
NORE 2101.3	46.662	46.649	-0.013	46.652	0.003	46.661	46.65	-0.011	46.652	0.002
NORE 2127.92	46.623	46.615	-0.008	46.619	0.004	46.624	46.616	-0.008	46.618	0.002
NORE 2157.58	46.602	46.595	-0.007	46.599	0.004	46.601	46.596	-0.005	46.599	0.003
NORE 2187.24	46.556	46.551	-0.005	46.555	0.004	46.555	46.553	-0.002	46.555	0.002
NORE 2216.91	46.494	46.489	-0.005	46.492	0.003	46.494	46.492	-0.002	46.493	0.001
NORE 2241.17	46.476	46.47	-0.006	46.477	0.007	46.476	46.471	-0.005	46.472	0.001
NORE 2265.43	46.459	46.452	-0.007	46.46	0.008	46.46	46.457	-0.003	46.459	0.002
NORE 2289.7	46.419	46.419	0	46.426	0.007	46.42	46.42	0	46.423	0.003
NORE 2313.96	46.367	46.374	0.007	46.38	0.006	46.369	46.377	0.008	46.379	0.002
NORE 2338.22	46.332	46.343	0.011	46.349	0.006	46.331	46.346	0.015	46.348	0.002
NORE 2367.47	46.297	46.31	0.013	46.319	0.009	46.297	46.312	0.015	46.314	0.002
NORE 2396.72	46.265	46.281	0.016	46.28	-0.001	46.265	46.283	0.018	46.285	0.002
NORE 2425.97	46.244	46.252	0.008	46.246	-0.006	46.244	46.253	0.009	46.255	0.002
NORE 2455.22	46.23	46.222	-0.008	46.227	0.005	46.231	46.225	-0.006	46.227	0.002
NORE 2484.85	46.22	46.213	-0.007	46.22	0.007	46.22	46.217	-0.003	46.218	0.001
NORE 2514.48	46.2	46.197	-0.003	46.202	0.005	46.2	46.198	-0.002	46.202	0.004
NORE 2539.94	46.176	46.175	-0.001	46.181	0.006	46.177	46.178	0.001	46.18	0.002

NORE BOARDWALK FLOOD RISK ASSESSMENT (FRA)

Chainage (m)	CFRAMS (m)	Baseline (Defended)(m)	Difference between CFRAMS & Baseline (Defended)(m)	Boardwalk (Defended)(m)	Difference Baseline & Boardwalk (Defended)(m)	CFRAMS (Undefended)(m)	Baseline (Undefended)(m)	Difference between CFRAMS & Baseline (Undefended)(m)	Boardwalk (Undefended)(m)	Difference Baseline & Boardwalk (Undefended)(m)
NORE 2565.4	46.156	46.158	0.002	46.162	0.004	46.156	46.158	0.002	46.162	0.004
NORE 2590.86	46.138	46.141	0.003	46.144	0.003	46.138	46.141	0.003	46.145	0.004
NORE 2616.32	46.127	46.129	0.002	46.133	0.004	46.126	46.127	0.001	46.135	0.008
NORE 2639.15	46.109	46.115	0.006	46.116	0.001	46.11	46.113	0.003	46.119	0.006
NORE 2661.98	46.095	46.108	0.013	46.105	-0.003	46.095	46.101	0.006	46.106	0.005
NORE 2684.81	46.08	46.084	0.004	46.084	0	46.081	46.096	0.015	46.083	-0.013
NORE 2707.64	46.064	46.053	-0.011	46.056	0.003	46.063	46.052	-0.011	46.057	0.005
NORE 2731.33	46.046	46.047	0.001	46.048	0.001	46.048	46.045	-0.003	46.048	0.003
NORE 2755.02	46.034	46.015	-0.019	46.008	-0.007	46.032	46.005	-0.027	46.026	0.021
NORE 2778.72	45.99	45.983	-0.007	45.977	-0.006	45.991	45.975	-0.016	45.99	0.015
NORE 2802.41	45.957	45.954	-0.003	45.961	0.007	45.957	45.958	0.001	45.962	0.004
NORE 2829.8	45.901	45.907	0.006	45.908	0.001	45.896	45.912	0.016	45.916	0.004
NORE 2857.2	45.853	45.864	0.011	45.868	0.004	45.852	45.864	0.012	45.874	0.01
NORE 2884.59	45.825	45.837	0.012	45.844	0.007	45.823	45.84	0.017	45.841	0.001
NORE 2911.99	45.816	45.821	0.005	45.828	0.007	45.813	45.824	0.011	45.831	0.007
NORE 2933.44	45.783	45.778	-0.005	45.787	0.009	45.782	45.776	-0.006	45.792	0.016
NORE 2954.9	45.766	45.752	-0.014	45.754	0.002	45.761	45.75	-0.011	45.759	0.009
NORE 2976.35	45.747	45.744	-0.003	45.747	0.003	45.745	45.743	-0.002	45.753	0.01
NORE 3003.3	45.733	45.72	-0.013	45.726	0.006	45.732	45.718	-0.014	45.732	0.014
NORE 3030.25	45.706	45.699	-0.007	45.702	0.003	45.705	45.698	-0.007	45.708	0.01
NORE 3057.2	45.673	45.67	-0.003	45.675	0.005	45.673	45.669	-0.004	45.678	0.009
NORE 3081.03	45.646	45.645	-0.001	45.649	0.004	45.643	45.644	0.001	45.652	0.008
NORE 3104.85	45.623	45.622	-0.001	45.626	0.004	45.623	45.621	-0.002	45.632	0.011
NORE 3128.68	45.602	45.601	-0.001	45.608	0.007	45.604	45.603	-0.001	45.614	0.011
NORE 3152.5	45.57	45.564	-0.006	45.569	0.005	45.57	45.563	-0.007	45.575	0.012
NORE 3173.93	45.565	45.561	-0.004	45.561	0	45.565	45.555	-0.01	45.567	0.012
NORE 3195.35	45.562	45.555	-0.007	45.56	0.005	45.562	45.554	-0.008	45.566	0.012
NORE 3216.77	45.547	45.543	-0.004	45.548	0.005	45.547	45.544	-0.003	45.554	0.01
NORE 3240.65	45.602	45.599	-0.003	45.603	0.004	45.602	45.599	-0.003	45.611	0.012
NORE 3278	45.497	45.492	-0.005	45.497	0.005	45.497	45.491	-0.006	45.503	0.012
NORE 3292.98	45.438	45.434	-0.004	45.439	0.005	45.438	45.433	-0.005	45.446	0.013
NORE 3312.06	45.425	45.422	-0.003	45.428	0.006	45.425	45.42	-0.005	45.432	0.012
NORE 3331.13	45.401	45.399	-0.002	45.405	0.006	45.401	45.398	-0.003	45.411	0.013
NORE 3350.21	45.368	45.367	-0.001	45.373	0.006	45.368	45.366	-0.002	45.38	0.014
NORE 3369.29	45.325	45.324	-0.001	45.33	0.006	45.324	45.324	0	45.338	0.014
NORE 3393.37	45.312	45.312	0	45.318	0.006	45.311	45.311	0	45.327	0.016
NORE 3417.46	45.291	45.294	0.003	45.3	0.006	45.291	45.293	0.002	45.309	0.016
NORE 3441.54	45.257	45.268	0.011	45.274	0.006	45.255	45.267	0.012	45.284	0.017
NORE 3465.62	45.187	45.21	0.023	45.217	0.007	45.188	45.205	0.017	45.227	0.022
NORE 3490.82	45.151	45.16	0.009	45.163	0.003	45.151	45.163	0.012	45.171	0.008
NORE 3516.02	45.117	45.12	0.003	45.121	0.001	45.117	45.119	0.002	45.102	-0.017
NORE 3541.22	45.108	45.111	0.003	45.111	0	45.108	45.11	0.002	45.113	0.003
NORE 3570	45.096	45.1	0.004	45.097	-0.003	45.096	45.099	0.003	45.097	-0.002
NORE 3597.5	45.078	45.081	0.003	45.081	0	45.078	45.08	0.002	45.082	0.002
NORE 3605	45.07	45.072	0.002	45.072	0	45.07	45.071	0.001	45.073	0.002
NORE 3613	44.664	44.667	0.003	44.667	0	44.666	44.666	0	44.668	0.002
NORE 3634	44.681	44.684	0.003	44.684	0	44.682	44.683	0.001	44.684	0.001
NORE 3658.53	44.628	44.632	0.004	44.633	0.001	44.63	44.631	0.001	44.633	0.002

NORE BOARDWALK FLOOD RISK ASSESSMENT (FRA)

Chainage (m)	CFRAMS (m)	Baseline (Defended)(m)	Difference between CFRAMS & Baseline (Defended)(m)	Boardwalk (Defended)(m)	Difference Baseline & Boardwalk (Defended)(m)	CFRAMS (Undefended)(m)	Baseline (Undefended)(m)	Difference between CFRAMS & Baseline (Undefended)(m)	Boardwalk (Undefended)(m)	Difference Baseline & Boardwalk (Undefended)(m)
NORE 3683.06	44.553	44.558	0.005	44.559	0.001	44.554	44.558	0.004	44.559	0.001
NORE 3710.04	44.539	44.545	0.006	44.545	0	44.541	44.545	0.004	44.546	0.001
NORE 3737.03	44.536	44.541	0.005	44.541	0	44.537	44.54	0.003	44.542	0.002
NORE 3764.01	44.54	44.544	0.004	44.545	0.001	44.542	44.544	0.002	44.545	0.001
NORE 3791	44.55	44.553	0.003	44.554	0.001	44.551	44.553	0.002	44.554	0.001
NORE 3791	44.55	44.553	0.003	44.554	0.001	44.551	44.553	0.002	44.554	0.001
NORE 3815.18	44.511	44.514	0.003	44.515	0.001	44.512	44.514	0.002	44.515	0.001
NORE 3839.36	44.468	44.472	0.004	44.472	0	44.47	44.471	0.001	44.472	0.001
NORE 3863.54	44.42	44.423	0.003	44.424	0.001	44.422	44.423	0.001	44.424	0.001
NORE 3887.72	44.366	44.369	0.003	44.37	0.001	44.367	44.369	0.002	44.37	0.001
NORE 3912.71	44.35	44.354	0.004	44.354	0	44.351	44.353	0.002	44.354	0.001
NORE 3937.71	44.334	44.338	0.004	44.339	0.001	44.336	44.338	0.002	44.339	0.001
NORE 3962.7	44.32	44.324	0.004	44.324	0	44.321	44.323	0.002	44.325	0.002
NORE 3987.7	44.306	44.31	0.004	44.31	0	44.307	44.309	0.002	44.311	0.002
NORE 4014.21	44.228	44.232	0.004	44.232	0	44.23	44.232	0.002	44.233	0.001
NORE 4040.72	44.163	44.166	0.003	44.167	0.001	44.164	44.165	0.001	44.167	0.002
NORE 4067.23	44.133	44.137	0.004	44.137	0	44.134	44.136	0.002	44.137	0.001
NORE 4093.74	44.148	44.151	0.003	44.151	0	44.149	44.15	0.001	44.151	0.001
NORE 4119.09	44.124	44.127	0.003	44.127	0	44.125	44.126	0.001	44.127	0.001
NORE 4144.44	44.099	44.102	0.003	44.102	0	44.1	44.101	0.001	44.102	0.001
NORE 4169.79	44.073	44.077	0.004	44.077	0	44.074	44.076	0.002	44.077	0.001
NORE 4195.14	44.047	44.05	0.003	44.05	0	44.048	44.049	0.001	44.05	0.001
NORE 4219.61	44	44.003	0.003	44.004	0.001	44.001	44.002	0.001	44.004	0.002
NORE 4244.09	43.957	43.96	0.003	43.96	0	43.958	43.959	0.001	43.96	0.001
NORE 4268.56	43.919	43.922	0.003	43.922	0	43.92	43.921	0.001	43.922	0.001
NORE 4293.03	43.889	43.892	0.003	43.892	0	43.89	43.891	0.001	43.892	0.001
NORE 4311.52	43.916	43.919	0.003	43.919	0	43.917	43.918	0.001	43.919	0.001
NORE 4330	43.936	43.938	0.002	43.939	0.001	43.936	43.937	0.001	43.939	0.002
NORE 4344.91	43.933	43.936	0.003	43.936	0	43.934	43.935	0.001	43.936	0.001
NORE 4354.91	43.89	43.893	0.003	43.893	0	43.891	43.892	0.001	43.893	0.001
NORE 4362	43.872	43.875	0.003	43.875	0	43.873	43.874	0.001	43.875	0.001
NORE 4371.03	43.817	43.82	0.003	43.82	0	43.818	43.819	0.001	43.82	0.001
NORE 4388	43.775	43.777	0.002	43.778	0.001	43.776	43.777	0.001	43.778	0.001
NORE 4394	43.767	43.77	0.003	43.77	0	43.768	43.769	0.001	43.77	0.001
NORE 4400.41	43.752	43.755	0.003	43.755	0	43.753	43.754	0.001	43.755	0.001
NORE 4423.29	43.737	43.74	0.003	43.74	0	43.738	43.739	0.001	43.74	0.001
NORE 4446.17	43.72	43.722	0.002	43.722	0	43.72	43.721	0.001	43.722	0.001
NORE 4469.05	43.7	43.702	0.002	43.702	0	43.701	43.701	0	43.703	0.002
NORE 4491.93	43.677	43.68	0.003	43.68	0	43.678	43.679	0.001	43.68	0.001
NORE 4516.73	43.655	43.657	0.002	43.657	0	43.655	43.656	0.001	43.657	0.001
NORE 4541.53	43.629	43.631	0.002	43.632	0.001	43.63	43.631	0.001	43.632	0.001
NORE 4566.33	43.6	43.602	0.002	43.603	0.001	43.601	43.601	0	43.603	0.002
NORE 4591.14	43.567	43.569	0.002	43.569	0	43.568	43.568	0	43.569	0.001
NORE 4613.43	43.503	43.505	0.002	43.505	0	43.503	43.504	0.001	43.505	0.001
NORE 4635.71	43.425	43.427	0.002	43.427	0	43.425	43.426	0.001	43.427	0.001
NORE 4658	43.328	43.33	0.002	43.33	0	43.329	43.33	0.001	43.331	0.001
NORE 4683.67	43.236	43.238	0.002	43.238	0	43.237	43.238	0.001	43.239	0.001
NORE 4709.33	43.111	43.113	0.002	43.113	0	43.112	43.112	0	43.113	0.001
NORE 4735	42.94	42.941	0.001	42.941	0	42.94	42.94	0	42.941	0.001

NORE BOARDWALK FLOOD RISK ASSESSMENT (FRA)

Chainage (m)	CFRAMS (m)	Baseline (Defended)(m)	Difference between CFRAMS & Baseline (Defended)(m)	Boardwalk (Defended)(m)	Difference Baseline & Boardwalk (Defended)(m)	CFRAMS (Undefended)(m)	Baseline (Undefended)(m)	Difference between CFRAMS & Baseline (Undefended)(m)	Boardwalk (Undefended)(m)	Difference Baseline & Boardwalk (Undefended)(m)
NORE 4735	42.94	42.941	0.001	42.941	0	42.94	42.94	0	42.941	0.001
NORE 4765	43.087	43.089	0.002	43.089	0	43.088	43.088	0	43.089	0.001
NORE 4774	42.967	42.968	0.001	42.968	0	42.967	42.967	0	42.968	0.001
NORE 4805	42.825	42.827	0.002	42.827	0	42.826	42.826	0	42.828	0.002
NORE 4827.25	42.729	42.731	0.002	42.731	0	42.73	42.729	-0.001	42.731	0.002
NORE 4849.5	42.689	42.691	0.002	42.691	0	42.69	42.69	0	42.692	0.002
NORE 4871.75	42.688	42.69	0.002	42.69	0	42.689	42.689	0	42.691	0.002
NORE 4894	42.706	42.708	0.002	42.708	0	42.707	42.707	0	42.709	0.002
NORE 4915	42.679	42.681	0.002	42.681	0	42.679	42.68	0.001	42.682	0.002
NORE 4936	42.657	42.66	0.003	42.66	0	42.658	42.659	0.001	42.66	0.001
NORE 4957	42.641	42.644	0.003	42.644	0	42.642	42.643	0.001	42.644	0.001
NORE 4978	42.63	42.632	0.002	42.632	0	42.63	42.631	0.001	42.633	0.002
NORE 4978	42.63	42.632	0.002	42.632	0	42.63	42.631	0.001	42.633	0.002
NORE 5003	42.618	42.62	0.002	42.62	0	42.619	42.619	0	42.621	0.002
NORE 5009	42.541	42.544	0.003	42.544	0	42.542	42.543	0.001	42.545	0.002
NORE 5044.5	42.527	42.53	0.003	42.53	0	42.528	42.528	0	42.53	0.002
NORE 5080	42.499	42.502	0.003	42.502	0	42.5	42.501	0.001	42.503	0.002
NORE 5080	42.499	42.502	0.003	42.502	0	42.5	42.501	0.001	42.503	0.002
NORE 5118.93	42.511	42.513	0.002	42.513	0	42.512	42.512	0	42.514	0.002
NORE 5118.93	42.511	42.513	0.002	42.513	0	42.512	42.512	0	42.514	0.002
NORE 5140.36	42.512	42.515	0.003	42.515	0	42.513	42.513	0	42.515	0.002
NORE 5161.78	42.512	42.515	0.003	42.515	0	42.513	42.514	0.001	42.516	0.002
NORE 5183.21	42.513	42.515	0.002	42.515	0	42.514	42.514	0	42.516	0.002
NORE 5196.8	42.46	42.462	0.002	42.463	0.001	42.461	42.461	0	42.463	0.002
NORE 5224.48	42.444	42.447	0.003	42.447	0	42.445	42.446	0.001	42.448	0.002
NORE 5252.17	42.431	42.434	0.003	42.434	0	42.432	42.433	0.001	42.435	0.002
NORE 5273.09	42.404	42.407	0.003	42.407	0	42.405	42.406	0.001	42.408	0.002
NORE 5298.8	42.399	42.402	0.003	42.402	0	42.4	42.401	0.001	42.403	0.002
NORE 5324.51	42.394	42.398	0.004	42.398	0	42.395	42.397	0.002	42.399	0.002
NORE 5350.23	42.39	42.393	0.003	42.393	0	42.391	42.392	0.001	42.394	0.002
NORE 5375.94	42.387	42.39	0.003	42.39	0	42.388	42.389	0.001	42.391	0.002
NORE 5401.66	42.37	42.373	0.003	42.373	0	42.371	42.372	0.001	42.374	0.002
NORE 5423.68	42.358	42.362	0.004	42.362	0	42.359	42.36	0.001	42.362	0.002
NORE 5445.69	42.343	42.346	0.003	42.346	0	42.344	42.345	0.001	42.347	0.002
NORE 5467.71	42.326	42.329	0.003	42.329	0	42.327	42.328	0.001	42.33	0.002
NORE 5493.89	42.31	42.314	0.004	42.314	0	42.311	42.312	0.001	42.314	0.002
NORE 5520.07	42.293	42.297	0.004	42.297	0	42.294	42.296	0.002	42.298	0.002
NORE 5546.25	42.277	42.281	0.004	42.281	0	42.278	42.28	0.002	42.282	0.002
NORE 5572.43	42.261	42.265	0.004	42.265	0	42.262	42.264	0.002	42.266	0.002
NORE 5598.61	42.245	42.25	0.005	42.25	0	42.246	42.248	0.002	42.251	0.003
NORE 5608.83	42.236	42.241	0.005	42.241	0	42.237	42.24	0.003	42.242	0.002
NORE 5634.85	42.208	42.214	0.006	42.214	0	42.209	42.213	0.004	42.215	0.002
NORE 5660.87	42.176	42.184	0.008	42.184	0	42.177	42.183	0.006	42.185	0.002
NORE 5686.89	42.138	42.149	0.011	42.149	0	42.139	42.148	0.009	42.15	0.002
NORE 5692.6	42.123	42.135	0.012	42.135	0	42.124	42.134	0.01	42.136	0.002
NORE 5719.79	42.117	42.13	0.013	42.13	0	42.118	42.129	0.011	42.131	0.002
NORE 5746.97	42.112	42.126	0.014	42.126	0	42.113	42.125	0.012	42.127	0.002
NORE 5774.15	42.109	42.123	0.014	42.123	0	42.111	42.122	0.011	42.124	0.002
NORE 5799.81	42.097	42.112	0.015	42.112	0	42.099	42.111	0.012	42.113	0.002
NORE 5825.47	42.085	42.1	0.015	42.1	0	42.086	42.099	0.013	42.101	0.002

NORE BOARDWALK FLOOD RISK ASSESSMENT (FRA)

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NORE 5851.13	42.072	42.087	0.015	42.087	0	42.073	42.086	0.013	42.088	0.002
NORE 5865.68	42.039	42.056	0.017	42.046	-0.01	42.04	42.045	0.005	42.047	0.002
NORE 5887.81	42.026	42.03	0.004	42.029	-0.001	42.027	42.029	0.002	42.031	0.002
NORE 5909.93	42.013	42.018	0.005	42.018	0	42.015	42.017	0.002	42.019	0.002
NORE 5932.06	42.003	42.009	0.006	42.009	0	42.005	42.008	0.003	42.01	0.002
NORE 5955.32	41.989	41.995	0.006	41.995	0	41.991	41.994	0.003	41.996	0.002
NORE 5978.58	41.977	41.982	0.005	41.982	0	41.978	41.981	0.003	41.983	0.002
NORE 6001.84	41.966	41.971	0.005	41.971	0	41.967	41.97	0.003	41.972	0.002
NORE 6025.1	41.956	41.961	0.005	41.961	0	41.957	41.96	0.003	41.962	0.002
NORE 6046.61	41.937	41.942	0.005	41.942	0	41.939	41.942	0.003	41.943	0.001
NORE 6068.11	41.919	41.925	0.006	41.924	-0.001	41.92	41.925	0.005	41.926	0.001
NORE 6089.62	41.894	41.901	0.007	41.901	0	41.895	41.909	0.014	41.902	-0.007
NORE 6112.75	41.851	41.855	0.004	41.855	0	41.852	41.849	-0.003	41.857	0.008
NORE 6135.87	41.811	41.828	0.017	41.819	-0.009	41.813	41.819	0.006	41.82	0.001
NORE 6159	41.781	41.791	0.01	41.789	-0.002	41.782	41.79	0.008	41.79	0
NORE 6182.12	41.759	41.77	0.011	41.766	-0.004	41.761	41.769	0.008	41.768	-0.001
NORE 6206.85	41.722	41.733	0.011	41.731	-0.002	41.723	41.732	0.009	41.733	0.001
NORE 6231.57	41.68	41.699	0.019	41.698	-0.001	41.684	41.698	0.014	41.699	0.001
NORE 6256.3	41.619	41.641	0.022	41.64	-0.001	41.618	41.64	0.022	41.641	0.001
NORE 6284	41.575	41.596	0.021	41.594	-0.002	41.575	41.595	0.02	41.595	0
NORE 6308	41.496	41.511	0.015	41.509	-0.002	41.497	41.509	0.012	41.511	0.002
NORE 6340.93	41.4	41.419	0.019	41.406	-0.013	41.401	41.406	0.005	41.413	0.007
NORE 6363.54	41.372	41.377	0.005	41.371	-0.006	41.373	41.371	-0.002	41.381	0.01
NORE 6386.16	41.306	41.296	-0.01	41.299	0.003	41.307	41.298	-0.009	41.299	0.001
NORE 6409.76	41.285	41.275	-0.01	41.276	0.001	41.286	41.276	-0.01	41.278	0.002
NORE 6433.36	41.26	41.242	-0.018	41.243	0.001	41.257	41.243	-0.014	41.245	0.002
NORE 6453.96	41.288	41.282	-0.006	41.279	-0.003	41.289	41.28	-0.009	41.281	0.001
NORE 6474.55	41.3	41.302	0.002	41.302	0	41.301	41.304	0.003	41.303	-0.001
NORE 6492.28	41.284	41.282	-0.002	41.29	0.008	41.285	41.289	0.004	41.293	0.004
NORE 6510	41.26	41.256	-0.004	41.262	0.006	41.268	41.267	-0.001	41.272	0.005
NORE 6534.1	41.225	41.235	0.01	41.236	0.001	41.226	41.237	0.011	41.242	0.005
NORE 6558.21	41.167	41.172	0.005	41.178	0.006	41.167	41.173	0.006	41.178	0.005
NORE 6582.31	41.09	41.098	0.008	41.098	0	41.091	41.095	0.004	41.1	0.005
NORE 6609.19	41.053	41.061	0.008	41.062	0.001	41.054	41.058	0.004	41.057	-0.001
NORE 6636.06	40.999	40.994	-0.005	40.995	0.001	40.997	40.996	-0.001	40.995	-0.001
NORE 6662.94	40.917	40.911	-0.006	40.912	0.001	40.918	40.911	-0.007	40.911	0
NORE 6689.81	40.839	40.838	-0.001	40.838	0	40.84	40.827	-0.013	40.838	0.011
NORE 6718.1	40.773	40.781	0.008	40.777	-0.004	40.777	40.78	0.003	40.776	-0.004
NORE 6746.38	40.716	40.723	0.007	40.725	0.002	40.717	40.722	0.005	40.723	0.001
NORE 6774.66	40.662	40.672	0.01	40.675	0.003	40.664	40.672	0.008	40.672	0
NORE 6802.94	40.579	40.585	0.006	40.581	-0.004	40.58	40.581	0.001	40.584	0.003
NORE 6831.97	40.468	40.467	-0.001	40.469	0.002	40.469	40.467	-0.002	40.468	0.001
NORE 6860.99	40.395	40.396	0.001	40.398	0.002	40.396	40.395	-0.001	40.397	0.002
NORE 6890.02	40.35	40.351	0.001	40.353	0.002	40.352	40.351	-0.001	40.352	0.001
NORE 6919.04	40.325	40.328	0.003	40.33	0.002	40.327	40.328	0.001	40.33	0.002
NORE 6947.23	40.303	40.307	0.004	40.311	0.004	40.305	40.313	0.008	40.309	-0.004
NORE 6975.43	40.276	40.282	0.006	40.285	0.003	40.278	40.281	0.003	40.284	0.003
NORE 7003.62	40.232	40.232	0	40.236	0.004	40.234	40.239	0.005	40.235	-0.004

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NORE 7031.82	40.2	40.194	-0.006	40.2	0.006	40.202	40.193	-0.009	40.198	0.005
NORE 7060.01	40.153	40.151	-0.002	40.155	0.004	40.155	40.15	-0.005	40.153	0.003
NORE 7088.79	40.119	40.116	-0.003	40.121	0.005	40.121	40.115	-0.006	40.119	0.004
NORE 7117.58	40.107	40.104	-0.003	40.111	0.007	40.11	40.103	-0.007	40.109	0.006
NORE 7146.36	40.127	40.123	-0.004	40.132	0.009	40.131	40.123	-0.008	40.13	0.007
NORE 7196.02	40.029	40.027	-0.002	40.036	0.009	40.034	40.026	-0.008	40.031	0.005
NORE 7230	40.013	40.019	0.006	40.021	0.002	40.018	40.017	-0.001	40.019	0.002
NORE 7255.28	39.922	39.924	0.002	39.925	0.001	39.927	39.923	-0.004	39.925	0.002
NORE 7255.28	39.922	39.924	0.002	39.925	0.001	39.927	39.923	-0.004	39.925	0.002
NORE 7265.3	40.106	40.106	0	40.106	0	40.106	40.103	-0.003	40.106	0.003
NORE 7270.9	39.992	39.992	0	39.992	0	39.994	39.99	-0.004	39.991	0.001
NORE 7305	39.804	39.804	0	39.804	0	39.806	39.802	-0.004	39.802	0
NORE 7338	39.812	39.809	-0.003	39.809	0	39.812	39.806	-0.006	39.807	0.001
NORE 7377.5	39.767	39.764	-0.003	39.763	-0.001	39.768	39.759	-0.009	39.761	0.002
NORE 7417	39.74	39.74	0	39.741	0.001	39.741	39.737	-0.004	39.739	0.002
NORE 7456.5	39.724	39.74	0.016	39.744	0.004	39.722	39.742	0.02	39.743	0.001
NORE 7496	39.707	39.763	0.056	39.776	0.013	39.705	39.763	0.058	39.775	0.012
NORE 7533.81	39.696	39.768	0.072	39.787	0.019	39.692	39.787	0.095	39.784	-0.003
NORE 7571.63	39.667	39.687	0.02	39.698	0.011	39.667	39.709	0.042	39.697	-0.012
NORE 7609.44	39.648	39.642	-0.006	39.64	-0.002	39.653	39.64	-0.013	39.64	0
NORE 7647.25	39.652	39.649	-0.003	39.645	-0.004	39.642	39.646	0.004	39.646	0
NORE 7673.58	39.616	39.611	-0.005	39.617	0.006	39.618	39.615	-0.003	39.611	-0.004
NORE 7699.92	39.606	39.624	0.018	39.618	-0.006	39.604	39.612	0.008	39.611	-0.001
NORE 7726.25	39.589	39.607	0.018	39.601	-0.006	39.584	39.603	0.019	39.599	-0.004
NORE 7752.58	39.585	39.597	0.012	39.607	0.01	39.585	39.599	0.014	39.599	0
NORE 7778.92	39.587	39.606	0.019	39.603	-0.003	39.585	39.603	0.018	39.597	-0.006
NORE 7805.25	39.589	39.592	0.003	39.585	-0.007	39.587	39.586	-0.001	39.608	0.022
NORE 7834.25	39.565	39.551	-0.014	39.55	-0.001	39.561	39.573	0.012	39.571	-0.002
NORE 7863.25	39.534	39.531	-0.003	39.532	0.001	39.53	39.521	-0.009	39.521	0
NORE 7892.25	39.5	39.509	0.009	39.504	-0.005	39.503	39.513	0.01	39.508	-0.005
NORE 7921.25	39.464	39.467	0.003	39.473	0.006	39.459	39.471	0.012	39.471	0
NORE 7945.58	39.42	39.415	-0.005	39.411	-0.004	39.424	39.416	-0.008	39.414	-0.002
NORE 7975.78	39.347	39.372	0.025	39.371	-0.001	39.35	39.366	0.016	39.369	0.003
NORE 7975.78	39.347	39.372	0.025	39.371	-0.001	39.35	39.366	0.016	39.369	0.003
NORE 7994.25	39.293	39.322	0.029	39.317	-0.005	39.298	39.32	0.022	39.321	0.001
NORE 8017.27	39.275	39.3	0.025	39.292	-0.008	39.284	39.309	0.025	39.298	-0.011
NORE 8040.3	39.259	39.28	0.021	39.276	-0.004	39.264	39.275	0.011	39.281	0.006
NORE 8067.31	39.247	39.259	0.012	39.256	-0.003	39.239	39.264	0.025	39.26	-0.004
NORE 8094.33	39.218	39.223	0.005	39.224	0.001	39.215	39.221	0.006	39.228	0.007
NORE 8121.34	39.184	39.197	0.013	39.191	-0.006	39.189	39.192	0.003	39.191	-0.001
NORE 8148.36	39.154	39.158	0.004	39.158	0	39.155	39.159	0.004	39.158	-0.001
NORE 8175.38	39.132	39.143	0.011	39.133	-0.01	39.132	39.137	0.005	39.137	0
NORE 8205.01	39.104	39.11	0.006	39.112	0.002	39.105	39.109	0.004	39.106	-0.003
NORE 8234.65	39.078	39.077	-0.001	39.079	0.002	39.076	39.081	0.005	39.073	-0.008
NORE 8264.29	39.052	39.051	-0.001	39.057	0.006	39.051	39.058	0.007	39.05	-0.008
NORE 8293.93	39.032	39.035	0.003	39.038	0.003	39.033	39.038	0.005	39.028	-0.01
NORE 8323.57	38.991	38.989	-0.002	38.99	0.001	38.99	38.988	-0.002	38.979	-0.009
NORE 8348.13	38.961	38.969	0.008	38.966	-0.003	38.961	38.963	0.002	38.968	0.005

Appendix D

Ecological Impact Assessment Report

PROPOSED NORE BOARDWALK, CO. KILKENNY

Planning Ref: 22/204

Ecological Impact Assessment Report

Prepared for: Kilgallen & Partners Ltd

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BASIS OF REPORT

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CONTENTS

SUMMARY	5
1.0 INTRODUCTION	6
1.1 Background	6
1.2 Site Description	6
1.3 Details of the Proposed Development	6
1.3.1 The Boardwalk.....	6
1.3.2 Construction	7
1.4 Purpose of this Report	10
1.5 Evidence of Technical Competence and Experience	11
1.6 Relevant Legislation and Policy	11
2.0 METHODOLOGY	12
2.1 Scope.....	12
2.1.1 Study Area	12
2.1.2 Survey Area.....	12
2.1.3 Ecological Features Included.....	12
2.2 Baseline Data Collection	13
2.2.1 Desk Study	13
2.2.2 Field Surveys.....	13
2.2.3 Limitations	14
2.3 Assessment Approach.....	14
2.3.1 Important Ecological Features	14
2.3.2 Impact Assessment	15
2.3.3 Significant Effects	16
2.3.4 Cumulative Effects	16
2.3.5 Avoidance, Mitigation, Compensation and Enhancement.....	16
3.0 BASELINE ECOLOGICAL CONDITIONS	18
3.1 Designated Sites.....	18
3.1.1 River Nore SPA (004233).....	18
3.1.2 River Barrow and River Nore SAC (002162)	18
3.1.3 Newpark Marsh pNHA (000845).....	19
3.1.4 Lough Macask pNHA (001914)	20
3.2 Habitats	20
3.2.1 Annex I habitats.....	20

3.2.2	FW2 Depositing/lowland rivers.....	20
3.2.3	BL1 Stone walls and other stonework	20
3.2.4	BL2 Earth banks	21
3.2.5	BL3 Buildings and artificial surfaces.....	21
3.2.6	GA2 Improved amenity grassland.....	21
3.2.7	WS1 Scrub	21
3.2.8	WL2 Treeline	21
3.2.9	WD5 Scattered trees and parkland.....	22
3.2.10	Invasive plants.....	22
3.3	Species	24
3.3.1	Rare, Protected & Invasive Flora and Fauna.....	24
3.3.2	Amphibians.....	25
3.3.3	Badgers.....	25
3.3.4	Bats	26
3.3.5	Birds.....	26
3.3.6	Fish.....	27
3.3.7	Hedgehog	27
3.3.8	Invertebrates	27
3.3.9	Otter	27
3.3.10	Pygmy shrew	27
3.3.11	Other mammals.....	28
3.4	Summary of Important Ecological Features	29
4.0	ASSESSMENT OF EFFECTS AND MITIGATION MEASURES	31
4.1	Do Nothing Impact.....	31
4.2	Embedded/Designed-In Mitigation	31
4.3	Designated Sites.....	31
4.3.1	River Nore SPA.....	31
4.3.2	River Barrow and River Nore SAC	32
4.3.3	Newpark Marsh pNHA	32
4.3.4	Lough Macask pNHA	32
4.4	Habitats	32
4.4.1	Depositing/lowland river.....	32
4.4.2	Scrub.....	32
4.4.3	Treeline.....	32
4.4.4	Invasive plant species.....	33
4.5	Species	33
4.5.1	Bats	33
4.5.2	Common Frog.....	34

4.5.3	Fish.....	34
4.5.4	Hedgehog.....	34
4.5.5	Kingfisher.....	34
4.5.6	Other Birds.....	34
4.5.7	Otter.....	35
4.5.8	Pygmy shrew.....	35
4.5.9	White-clawed crayfish.....	35
4.6	Cumulative Effects.....	35
4.7	Biodiversity Enhancements.....	36
4.8	Summary of Effects.....	37
5.0	CONCLUSIONS.....	38
6.0	REFERENCES.....	39

DOCUMENT REFERENCES

TABLES

Table 3-1: Designated sites within 2km of the Proposed Development Site.....	18
Table 3-2: Rare, Protected and Invasive Species Recorded Within 100m Grid Squares S504565, S505565, S505564 and S504566.....	24
Table 3-3: Rare and Protected and Invasive Species Recorded Within the 1km Grid Square S5056 and the 2km Grid Square S55D.....	25
Table 3-4: Summary of Important Ecological Features Subject to Detailed Assessment.....	29
Table 4-1: Summary of Potential Impacts, Proposed Mitigation and Residual Effects.....	37

FIGURES

Figure 1: The Nore Linear Park.....	8
Figure 2: Link between the proposed route and the new Riverside Gardens walkway.....	9
Figure 3: Route of the proposed pedestrian link.....	10

DRAWINGS

- Drawing 01: Fossitt habitat map of the proposed Nore boardwalk
Drawing 02: Map of Natura 2000 sites within 2km of the proposed Nore boardwalk

APPENDICES

- Appendix 01: Relevant Legislation and Planning Policy
Appendix 02: Bat Conservation Trust Guidelines for assessing the potential suitability of proposed development sites for bats

Summary

SLR Consulting Ireland (SLR) was commissioned by Kilgallen & Partners Ltd. on behalf of Kilkenny County Council to prepare an ecological impact assessment (EiA) report for a proposed pedestrian link between the River Nore Linear Park and the Riverside Gardens in Kilkenny City, Co. Kilkenny.

The route of the proposed pedestrian link is along the western bank of the River Nore, north of Greens Bridge in central Kilkenny, joining up the existing Bishops Meadows Walk and the new Riverside Gardens Walk. The pedestrian link will pass under an archway beneath Greens Bridge and will continue north via an elevated boardwalk lit with LED lighting. The overall length of the proposed pedestrian link is approximately 190 metres. The working area required for construction and the permanent footprint of the proposed pedestrian link comprise the proposed development site ("the Site").

The aim of this report is to evaluate the habitats and species present at the Site, as well as characterising the impacts and effects of the proposed development. Recommendations on appropriate mitigation measures will be given if required, as will recommendations for biodiversity enhancement.

A desk study was carried out to collate available information on sites designated for nature conservation as well as records of rare and/or protected species within the potential zone of influence of the proposed development. There are two Natura 2000 sites overlapping the Site: River Nore SPA and River Barrow and River Nore SAC. There are two nationally important sites within 2km of the Site: Newpark Marsh pNHA and Lough Macask pNHA.

The Site was surveyed by SLR ecologist Michael Bailey (MCIEEM) on 24th November 2022 and by SLR ecologists Aisling Kinsella and Faolán Linnane on the 2nd May 2023. The habitats within the Site are composed of depositing/lowland rivers (FW2), scrub (WS1), treelines (WL2), stone walls and other stonework (BL1), earth banks (BL2), buildings and artificial surfaces (BL3), improved amenity grassland (GA2) and scattered trees and parkland (WD5). The scrub and woodland areas provide foraging and breeding habitat for birds. The Site also contains foraging and commuting habitat for bats.

Dusk emergence and dawn re-entry bat surveys were conducted on the 2nd May and 3rd May 2023 respectively at the archway underneath Green's Bridge which is located within the footprint of the development. No bats were observed using the archway however high levels of bat commuting and foraging activity along the river and riparian habitats was observed.

Only vegetation which clashes with the boardwalk structure will be cleared. For trees, this will be assessed on a case-by-case basis and trees will only be removed if deemed necessary. This will only apply to a section of treeline that is approximately 100m long along the riverbank.

Impacts on water quality within the River Nore will be avoided by following best construction practice throughout the works.

Opportunities for biodiversity enhancement include removing invasive plant species, planting native trees, erecting bat boxes, maintaining native hedgerows, planting pollinator-friendly trees, cutting grass less frequently, applying the Sustainable Use of Pesticides Directive (SUD) to ensure the sustainable use of pesticides within this location, and providing nesting habitat for wild bees.

The assessment concludes that the residual effects on birds, bats and the quality of treeline and scrub habitat can be compensated for in several ways. Nesting bird checks prior to the removal of vegetation will greatly reduce the risk of harm to nesting birds. Following guidance set out by the Institute of Lighting Professionals and Bat Conservation Ireland should reduce disturbance to bats. The long-term effect on trees and scrub will be greatly compensated for by planting/ seeding the area beneath the boardwalk and planting native trees

to replace the vegetation removed prior to development. This should ultimately enhance biodiversity within the vicinity of the Site.

1.0 Introduction

SLR Consulting was commissioned by Kilgallen & Partners Ltd. on behalf of Kilkenny County Council to prepare an ecological impact assessment (EclA) report for a proposed pedestrian link between the River Nore Linear Park and the Riverside Gardens in Kilkenny City, Co. Kilkenny.

1.1 Background

The River Nore Linear Park, which was constructed in 2006, comprises five walkways along the River Nore (Figure 1). The Bishops Meadows Walk is currently linked to the Peace Park Walk and Canal Walk through a series of access routes which takes the public away from the river's edge. The Riverside Gardens Project, which was constructed in 2020/21, provides a pedestrian link between Greens Bridge and Bateman Quay (located north of St John's Bridge). The provision of the proposed pedestrian link, joining the River Nore Linear Park to the Riverside Gardens project is an objective of the Kilkenny City and County Development Plan 2021-2027.

1.2 Site Description

The midway point of the proposed walkway is located at approximate ITM coordinates 650449 656562 on the western bank of the River Nore, in the townland of Gardens in the West of Kilkenny City. The Site comprises land consisting of an existing footpath along the river bounded by a willow treeline and a mortared stone wall, amenity grassland and scrub. The site is divided by Greens Bridge, which spans the river in a west to east direction, as the proposed route passes under the bridge. There is a stone archway located underneath the bridge within the footprint of the proposed development. The overall length of the proposed boardwalk is 190m, as shown in Figure 3.

The site is bounded to the west by Green Street and residential properties which front onto Green Street. To the east is the River Nore, to the south is the Abbey Quarter/Riverside Garden area, and to the north the River Nore Linear Park at Bishops Meadows.

1.3 Details of the Proposed Development

The proposed pedestrian link will join up the Bishops Meadows Walk approximately 160m upstream of Greens Bridge to the new Riverside Gardens walk, approximately 30m downstream of Greens Bridge (Figure 2). The pedestrian link will pass under the archway beneath Greens Bridge. To complete the link upstream of Greens Bridge towards Bishops Meadows Walk, an elevated boardwalk will be constructed. The boardwalk section will be lit with LED lighting incorporated into the parapet top rail.

1.3.1 The Boardwalk

The boardwalk structure will comprise 200mm diameter tubular steel mini piles, infilled with concrete, installed in pairs at 2m centres at intervals of 6m along the route. Steel beams will span the pile heads to support the boardwalk decking. The deck surface is proposed to be manufactured from recycled plastic. The proposed deck width is 3m, reduced to 2.2m at pinch points between existing trees and walls and the river's edge. An area of clearance of 1m is proposed at the western side of the boardwalk to allow for maintenance. Parapets are required to provide fall protection at the sides of the boardwalk to a height of 1.5m. The parapets will be constructed from painted mild steel vertical uprights supporting recycled plastic horizontal rails.

For drainage purposes, the boardwalk deck would be constructed from slatted recycled plastic boards. Joints will be open, allowing rainwater to pass directly through the deck without the requirement for collection and disposal.

1.3.2 Construction

The two options for works access are either via Bishops Meadows to the north of the proposed boardwalk, or via the small car park to the south. Some preliminary civil works will be required to facilitate access for construction plant and operatives through Bishops Meadows. The mini-digger and mini-piling rig for the ground investigation for this project successfully used the access at the southern end, therefore this is the more likely construction access route.

The design brief, provided by the Client, states that the project will be carried out during the summer months, when water levels are low and the ground is at its driest, in order to minimise impact on the riverbank. All of the required works can be undertaken from the riverbank. No in-channel works are required or proposed. The Construction Methodology, provided by the Client, also states that the structure has been carefully designed to minimise disturbance to the riverbank and minimise the risk of contamination of the River Nore through the following;

- Use of bottom driven mini-piles to minimise ground disturbance. Piles can be driven using a lightweight micro piling rig;
- Design of structure has been modularised to minimise the weight of individual components, allowing the use of small sized plant and machinery.

Enabling works will begin with clearing of vegetation which clashes with the boardwalk structure. For trees, this will be assessed on a case-by-case basis and trees will only be removed if deemed necessary. Localised pruning of trees will also be carried out if it is deemed that it facilitates the tree remaining in place. On completion of vegetation clearance, a silt fence) will be installed on the edge of the riverbank. This will run the full length of the site and be dug into the soil in accordance with the manufacturer's instructions. This will minimise the risk of sediment release to the river during the construction phase.

Once the silt fence has been installed, the working area will be levelled using a mini excavator and a temporary layer of crushed stone will be placed on a layer of geotextile to create a clean and stable working surface. The stone and geotextile layer will protect the soil below from becoming waterlogged during the construction period and greatly reduce the risk of surface water runoff.

On completion of pile installation, the piles will be filled with concrete. Due to the small diameter of the piles, the volume of concrete required is very small (Approx. 0.1m³ per pile). All concrete works will be carried out within the confines of the silt barrier. In addition, concreting of the piles will not be permitted during periods of persistent or heavy rainfall¹. The concrete can be either mixed on site or be delivered as ready-mix, but in both cases control measures including silt fencing and designated wash out areas will be in place to prevent concrete runoff entering the adjacent watercourse. The concrete will be placed into the piles using either a wheelbarrow, mini concrete skip or specialist pouring bucket such as those shown below. These provide a high level of control while also including a lockable pouring hatch to prevent accidental spills while travelling.

Landscaping works will be carried out in accordance with the recommendations of the project environmental consultant. The area beneath the boardwalk will be allowed to regenerate to be consistent with the natural flora present to enhance biodiversity. The silt fence will be maintained until the area freshly placed topsoil has had time to "settle" and for seed to germinate. This will be reviewed with the project ecologist and will be removed in advance of the winter period where water levels are likely to rise. The silt fence will be carefully removed by hand and the area made good. The trees in the vicinity of the boardwalk will be allowed to grow naturally, with occasional winter pruning to control limbs which grow in the direction of the boardwalk structure. Following the completed structures first winter period, a review of the condition of the area beneath the structure will be carried out. If additional landscaping or planting works are deemed necessary, these works will be carried out in the spring to allow a full spring/summer period of growth before the water levels rise again.

¹ Persistent rainfall relates to precipitation occurring for 7+ hours consistently. Heavy rainfall is defined as 3mm or more per day.



Figure 1: The Nore Linear Park

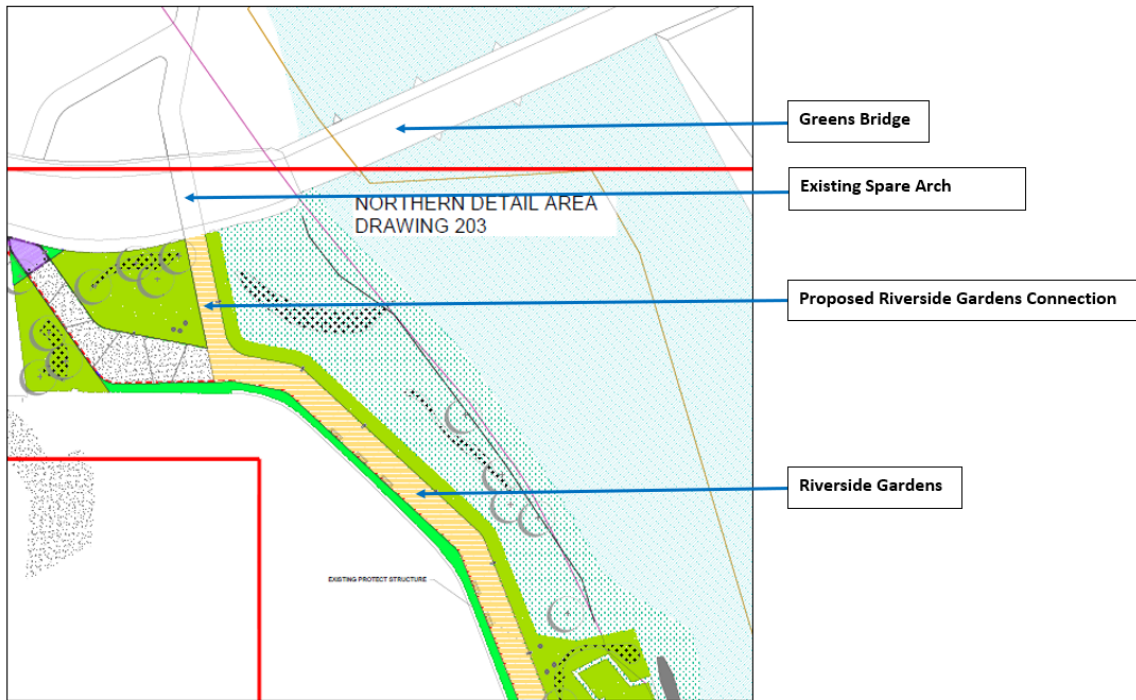


Figure 2: Link between the proposed route and the new Riverside Gardens walkway



Figure 3: Route of the proposed pedestrian link

1.4 Purpose of this Report

The purpose of this report is:

- To describe the baseline data collection and assessment methods used;
- To summarise the baseline ecological conditions;
- To identify and describe all potentially significant ecological effects associated with the proposed development;
- To set out the design, mitigation and compensation measures required to ensure compliance with nature conservation legislation and to address any potentially significant ecological effects;
- To identify how mitigation and compensation measures will/could be delivered;
- To provide an assessment of the significance of any residual effects in relation to the effects on biodiversity and the legal and policy implications;
- To identify appropriate enhancement measures and how these will/could be delivered; and
- To set out the requirements for post-construction monitoring.

1.5 Evidence of Technical Competence and Experience

This report was prepared by Alice Magee, reviewed by Stephanie Boocock and approved by Richard Arnold. Michael Bailey undertook the site visit to inform this report.

- **Alice Magee MSc** - Alice is a Project Ecologist with SLR and holds a BSc in Zoology from University College Dublin and an MSc in Ecological Management and Conservation Biology from Queen's University Belfast. Her experience to date has included ornithological surveys (including vantage point surveys and intertidal bird surveys) and the preparation of bird survey reports for wind farm projects.
- **Aisling Kinsella MSc** – Aisling is a Senior Ecologist with SLR and holds a BSc in Zoology from University College Cork and MSc in Wildlife Management and Conservation from University College Dublin. Aisling has three years' experience in ecological consultancy and has worked on a range of developments in multiple capacities – project management and report writing (EcIA, EIAR, Bird survey reports, AA screening reports and Natura Impact Statements) as well as fieldwork including habitat assessments, specialist botanical surveys, badger surveys, amphibian surveys and bird & bat surveys.
- **Michael Bailey MCIEEM** - Michael is an Associate Ecologist with SLR and holds a BSc in Biology and Ecology from the University of Ulster and an MSc in Quantitative Conservation Biology from the University of the Witwatersrand in Johannesburg. He has extensive experience in ecological studies and assessments across a range of sectors in Ireland. He is a member of the Chartered Institute of Ecology and Environmental Management (MCIEEM).
- **Stephanie Boocock MCIEEM** - Steph is a Principal Ecologist based at our Bristol office. Steph has over 19 years of experience in environment-based roles and is a Chartered Environmentalist and Full Member of the Chartered Institute of Ecology and Environmental Management (MCIEEM). Steph has led on medium-large scale development projects delivering Ecological Impact Assessments, Appropriate Assessments (in UK and Ireland) and developing mitigation strategies for a range of EPS, including obtaining licences for bats.
- **Richard Arnold MCIEEM** – Richard is a Technical Director with SLR. Richard has over 24 years of experience as a professional ecological consultant and has served on the Council of CIEEM. Richard has led on projects in most development sectors delivering Ecological Impact Assessments, Habitat Regulations Assessments (UK), protected species licensing and on-site mitigation.

1.6 Relevant Legislation and Policy

The main pieces of legislation in terms of ecology in regard to developments such as this are as follows:

- The Habitats Directive (92/43/EEC)The Birds Directive (2009/147/EC);
- The Wildlife Acts 1976 to 2012;
- The Flora (Protection) Order 2022;
- European Communities (Birds and Natural Habitats) Regulations 2011;
- National Biodiversity Action Plan 2017-2021;
- Kilkenny City and County Development Plan 2021-2027; and
- Abbey Quarter Masterplan 2015.

Appendix 01 contains relevant legislation and policy text.

2.0 Methodology

2.1 Scope

2.1.1 Study Area

The Study Area comprises a buffer of 2km applied to the Site boundary, for which data on important ecological features was gathered, extending downstream along the River Nore to determine the nearest known location of other important ecological features.

The zone of influence (Zoi) for a project is the area over which ecological features may be affected by biophysical changes as a result of the proposed project and associated activities. This is likely to extend beyond the project site, for example where there are ecological or hydrological links beyond the site boundaries. The zone of influence will vary for different ecological features depending on their sensitivity to an environmental change (CIEEM, 2018). A feasibility study, design brief, construction methodology and records of previous bat surveys undertaken on the Abbey Quarter, provided by Kilkenny City Council and Kilgallen & Partners, have helped to inform the zone of influence for this project.

Due to the short length of the Site boundary (190m), the zone of influence for sessile terrestrial receptors (i.e. habitats and plant species) was defined as 100m. Using a precautionary approach, the zone of influence for designated sites, motile receptors (i.e. animal species) and sessile aquatic receptors downstream from the Site was defined as 2km due to the potential for downstream impacts and impacts on species commuting to and from the Site.

The Study Area is considered sufficiently large to encompass the Zoi for the majority of ecological features. However, with regard to hydrological links, designated sites and associated protected species occurring further downstream have also been considered.

2.1.2 Survey Area

The survey area covered the working area required for construction and the permanent footprint of the proposed pedestrian link ("the Site"). The scope of the ecological surveys was to classify the habitats present within the Site and to evaluate their suitability to support protected species and to determine the potential for roosting bats within the Site.

2.1.3 Ecological Features Included

Designated sites were considered in the report. Natura 2000 sites are designated in the European Union and include Special Protected Areas (SPAs) and Special Areas of Conservation (SACs), which are designated under the Birds Directive and Habitats Directive respectively. Natural Heritage Areas (NHAs) are nationally designated sites and are protected from damage under the Wildlife Amendment Act (2000). Proposed Natural Heritage Areas (pNHAs) are sites that have been formally proposed but not yet designated on a statutory basis.

Important habitats were considered in the report, including woodlands, trees, and rivers. Protected species (including birds, bats, mammals, amphibians, invertebrates, and plants) were also considered.

2.2 Baseline Data Collection

2.2.1 Desk Study

A desk study was carried out to collate the available existing ecological information on the Site. The Site and the surrounding area were viewed using available satellite imagery².

The National Parks and Wildlife Service (NPWS)³ and the National Biodiversity Data Centre (NBDC)⁴ online resources were accessed for information on sites designated for nature conservation and on protected habitats and species. Only records for the past 10 years are considered within this report as older records are unlikely to still be relevant given their age and the changes in land management that have occurred in the intervening period. Environmental Protection Agency (EPA) Maps⁵ was accessed for other environmental information relevant to preparation of this report, such as surface water features.

The Kilkenny County Council website was also accessed for information on relevant planning policy while the planning portal⁶ and Myplan.ie⁷ were accessed for information on other planning applications within the Site and immediate surrounding area.

The conservation status of birds is evaluated using Birds of Conservation Concern in Ireland (BoCCI) published by BirdWatch Ireland and the RSPB NI (Colhoun & Cummins, 2013)⁸. This is a list of priority bird species for conservation action on the island of Ireland. The BoCCI lists birds which breed and / or winter in Ireland and classifies them into three separate lists; Red, Amber and Green; based on the conservation status of the bird and hence their conservation priority.

The conservation status of mammals within Ireland and Europe is evaluated using one or more of the following documents: Wildlife Acts (1976 - 2012), the Red List of Terrestrial Mammals (Marnell et al., 2009) and the EU Habitats Directive 92/43/EEC.

2.2.2 Field Surveys

The preliminary site visit was conducted on 24 November 2022 with subsequent surveys on 2nd May 2023 and 3rd May 2023. The surveyors walked the 190m section of the proposed pedestrian link from the newly developed parkland at Abbey Quarter/Riverside Garden area at the southern end to the River Nore Linear Park at Bishops Meadows at the northern end. Peripheral habitats were visually surveyed. The objectives of the site visits were to determine the ecological value of the habitats and species present and to identify the ecological constraints and opportunities associated with the proposed development. During the site visits, sightings, evidence of, and potential for protected species were noted. The presence of non-native or invasive species was also noted.

The preliminary site visit identified the archway underneath Greens Bridge, within the Site boundary, as a potential roosting feature for bats but could not be fully assessed at the time. As a result, dedicated dusk emergent and dawn re-entry bat surveys were conducted at the archway on the evening of 2nd May 2023 and morning of 3rd May 2023. Two surveyors, located at either end of the archway, surveyed from 15 minutes before sunset to 90 minutes after sunset for the emergent survey and 90 minutes before sunrise to 15 minutes after sunrise for the re-entry surveys. Each surveyor had a Batlogger detector.

Habitats within the study area were classified after 'A Guide to Habitats in Ireland' (Fossitt, 2000). Features of ecological interest, if present, were noted and the dominant plant species present were recorded. This is not a

² <https://www.google.ie/maps> (last accessed 25 July 2023)

³ <https://www.npws.ie/> (last accessed 25 July 2023)

⁴ <http://maps.biodiversityireland.ie/#/Map> (last accessed 25 July 2023)

⁵ <http://gis.epa.ie/> (last accessed 25 July 2023)

⁶ <https://kilkennycoco.ie/eng/> (last accessed 25 July 2023)

⁷ [National Planning Application Map Viewer - My Plan](#) (last accessed 25 July 2023)

⁸ [Red and Amber Lists of Birds of Conservation Concern in Ireland \(BoCCI4\) 2020-2026 - BirdWatch Ireland](#) (last accessed 25 July 2023)

comprehensive list of plant species but is sufficient to broadly describe the botanical interest of the site. Species nomenclature follows Parnell & Curtis (2012) for scientific and English names of vascular plants. It was also noted if any Annex I habitats were present within the study area.

Mammal tracks, signs or direct observations were recorded during the walkover survey of the Site. Incidental sightings of birds, mammals or amphibians were noted during the walkover survey. The habitats present were also evaluated in terms of suitability to support foraging bats. Trees with features; such as areas of loose flaking bark, splits, cavities etc.; that could provide suitable roost sites for bats, where present, were also noted during the ground level survey. The suitability of the habitats for roosting and commuting and foraging bats was evaluated using the Bat Conservation Trust guidelines (see Appendix 02).

2.2.3 Limitations

Desk Study

Desk study data is unlikely to be exhaustive, especially in respect of species, and is intended mainly to set a context for the study. It is therefore possible that important habitats or protected species not identified during the data search do in fact occur within the vicinity of the site. Interpretation of maps and aerial photography has been conducted in good faith, using recent imagery, but it has not been possible to verify the accuracy of any statements relating to land use and habitat context outside of the field study area.

Field Survey(s)

The field survey conducted in November 2022 was outside the optimal season for botanical surveys. Some rare/protected or non-native/invasive flowering species may have been missed. High water levels were encountered at the time of this site visit. The pathway along the River Nore was partially submerged which meant it was not possible to get close enough to the river to identify in-stream or floating vegetation. The archway beneath Greens Bridge was fenced off and inaccessible at the time of this survey and therefore could not be fully assessed for its potential to support roosting bats.

To mitigate these limitations, further surveys were conducted. During the site walkover in May 2023 all areas of the site were accessible and weather conditions were clear and dry. It was also within the optimal season for botanical surveys. Therefore, the limitations encountered during the first survey were overcome.

2.3 Assessment Approach

The ecological evaluation and impact assessment approach used in this report is based on Guidelines for Ecological Impact Assessment in the United Kingdom and Ireland (“CIEEM guidelines”) (CIEEM, 2018).

2.3.1 Important Ecological Features

Ecological features can be important for a variety of reasons and the rationale used to identify them is explained in the text. Importance may relate, for example, to the quality or extent of the site or habitats therein; habitat and/ or species rarity; the extent to which such habitats and/ or species are threatened throughout their range, or to their rate of decline.

Determining Importance

The importance of an ecological feature should be considered within a defined geographical context. The following frame of reference has been used in this case, relying on known/ published accounts of distribution and rarity where available, and professional experience:

- International;
- National (i.e. Ireland)
- Regional (i.e. Leinster);

- County (i.e. Kilkenny);
- Townland (i.e. Gardens)
- Local (i.e. within circa 5km); and
- Site (i.e. development site delineated by the red line boundary)

The above frame of reference is applied to the ecological features identified during the desk study and surveys to inform this report.

The value of habitats has been measured against published selection criteria where available. Examples of relevant criteria include descriptions of habitats listed on Annex 1 of the Habitats Directive and guidelines provided by Transport Infrastructure Ireland (TII).

In assigning a level of value to a species, it is necessary to consider its distribution and status, including a consideration of trends based on available historical records. Reference has therefore been made to published lists and criteria where available. Examples of relevant lists and criteria include species of European conservation importance (as listed on Annexes II, IV and V of the Habitats Directive or Annex 1 of the Birds Directive); species protected under the Wildlife Act 1976 and species of principal importance under the Birds of Conservation Concern.

For the purposes of this report ecological features of Local level importance or greater and/or subject to legal protection have been subject to detailed assessment. Effects on other ecological features are considered unlikely to be significant in legal or policy terms.

2.3.2 Impact Assessment

The impact assessment process involves the following steps:

- identifying and characterising potential impacts;
- incorporating measures to avoid and mitigate (reduce) these impacts;
- assessing the significance of any residual effects after mitigation;
- identifying appropriate compensation measures to offset significant residual effects (if required); and
- identifying opportunities for ecological enhancement.

When describing impacts, reference has been made to the following characteristics, as appropriate:

- Positive or negative;
- Extent;
- Magnitude;
- Duration;
- Timing;
- Frequency; and
- Reversibility.

The impact assessment process considers both direct and indirect impacts: direct ecological impacts are changes that are directly attributable to a defined action, e.g. the physical loss of habitat occupied by a species during the construction process. Indirect ecological impacts are attributable to an action, but which affect ecological resources through effects on an intermediary ecosystem, process or feature, e.g. construction on the river bank which, in the absence of mitigation, causes the release of fine sediment into the river, which could cause negative effects on aquatic species.

Consideration of conservation status is important for evaluating the effects of impacts on individual habitats and species and assessing their significance:

- Habitats – conservation status is determined by the sum of the influences acting on the habitat that may affect its extent, structure and functions as well as its distribution and its typical species within a given geographical area.
- Species – conservation status is determined by the sum of influences acting on the species concerned that may affect its abundance and distribution within a given geographical area.

2.3.3 Significant Effects

The concept of ecological significance is addressed in paragraphs 5.24 through to 5.28 of CIEEM guidelines. Significance is a concept related to the weight that should be attached to effects when decisions are made. For the purpose of EclA, a 'significant effect' is an effect that either supports or undermines biodiversity conservation objectives for 'important ecological features' or for biodiversity in general. Conservation objectives may be specific (e.g. for a designated site) or broad (e.g. national/local nature conservation policy) or more wide-ranging (enhancement of biodiversity). Effects can be considered significant at a wide range of scales from international to local and the scale of significance of an effect may or may not be the same as the geographic context in which the feature is considered important.

2.3.4 Cumulative Effects

Cumulative effects can result from individually insignificant but collectively significant actions taking place over a period of time or concentrated in a location. Cumulative effects can occur where a proposed development results in individually insignificant impacts that, when considered in-combination with impacts of other proposed or permitted plans and projects, can result in significant effects.

The scope of the cumulative assessment includes:

- proposals for which consent has been applied but which are awaiting determination;
- projects which have been granted consent but which have not yet been started or which have been started but are not yet completed (i.e. under construction);
- proposals which have been refused permission but which are subject to appeal and the appeal is undetermined;
- constructed developments whose full environmental effects are not yet felt and therefore cannot be accounted for in the baseline; or
- developments specifically referenced in a National Policy Statement, a National Plan or a Local Plan.

2.3.5 Avoidance, Mitigation, Compensation and Enhancement

When seeking mitigation or compensation solutions, efforts should be consistent with the geographical scale at which an effect is significant. For example, mitigation and compensation for effects on a species population significant at a county scale should ensure no net loss of the population at a county scale. The relative geographical scale at which the effect is significant will have a bearing on the required outcome which must be achieved.

Where potentially significant effects have been identified, the mitigation hierarchy has been applied, as recommended in the CIEEM Guidelines. The mitigation hierarchy sets out a sequential approach beginning with the avoidance of impacts where possible, the application of mitigation measures to minimise unavoidable impacts and then compensation for any remaining impacts. Once avoidance and mitigation measures have been

applied residual effects are then identified along with any necessary compensation measures, and incorporation of opportunities for enhancement.

It is important for the EclA to clearly differentiate between avoidance mitigation, compensation and enhancement and these terms are defined here as follows:

- Avoidance is used where an impact has been avoided, e.g. through changes in scheme design;
- Mitigation is used to refer to measures to reduce or remedy a specific negative impact *in situ*;
- Compensation describes measures taken to offset residual effects, i.e. where mitigation *in situ* is not possible; and
- Enhancement is the provision of new benefits for biodiversity that are additional to those provided as part of mitigation or compensation measures, although they can be complementary.

3.0 Baseline Ecological Conditions

3.1 Designated Sites

Sites that have been designated for nature conservation within 2km of the Site are discussed below (see Table 3-1). A 2km radius is considered to be an appropriate radius given the localised nature and scale of the proposed works. SPAs and SACs are valued as important at the International level, and NHAs and pNHAs are valued as important at National level. A map showing the location of Natura 2000 sites within 2km of the Site is presented in the Drawings section of this report.

Table 3-1: Designated sites within 2km of the Proposed Development Site

Natura 2000 Site	Site Code	Location at Closest Point to Project Site
River Nore SPA	004233	Overlaps with the Site
River Barrow and River Nore SAC	002162	Overlaps or adjoins with the Site
Newpark Marsh pNHA	000845	710m north-east
Lough Macask pNHA	001914	1.3km north-west

A review of the supporting documents available on the NPWS website did not reveal any records to show that the qualifying interests of the River Nore SPA or River Barrow and River Nore SAC are present within the Site. However, several are likely to occur, at least occasionally, within the section of the River Nore adjacent to the Site including kingfisher, otter *Lutra lutra*, Atlantic salmon *Salmo salar*, lampreys *Lampetra* spp., and white clawed crayfish *Austropotamobius allies*.

There are no designated Natural Heritage Areas (NHAs) within 2km of the development site. However, there are two proposed Natural Heritage Areas (pNHAs) within 2km of the development site; the Newpark Marsh pNHA and Lough Macask pNHA.

3.1.1 River Nore SPA (004233)

The River Nore SPA is a long linear site that overlaps with the Site. It includes five river sections and the Site is contained within the River Nore section which runs from the bridge at Townparks (north-west of Borris in Ossory, Co. Laois) to Coolnamuck in Co. Kilkenny. The site includes the river channel and marginal vegetation.

The site is designated for kingfisher, which is listed on Annex I of the Birds Directive. A survey in 2010 recorded 22 pairs of kingfisher (based on 16 probable and 6 possible territories) within the SPA. The SPA site synopsis (NPWS. 2011) states that the SPA is supports a nationally important population of kingfisher.

3.1.2 River Barrow and River Nore SAC (002162)

The River Barrow and River Nore SAC overlaps with the Site. The site consists of the freshwater stretches of the Barrow and Nore River catchments as far upstream as the Slieve Bloom Mountains, and it also includes the tidal elements and estuary as far downstream as Creadun Head in Waterford. The site passes through eight counties – Offaly, Kildare, Laois, Carlow, Kilkenny, Tipperary, Wexford and Waterford.

The site is selected for the following habitats and species listed on Annex I/II of the E.U. Habitats Directive (* = priority; numbers in brackets are Natura 2000 codes):

- [1130] Estuaries
- [1140] Tidal Mudflats and Sandflats
- [1170] Reefs
- [1310] Salicornia Mud
- [1330] Atlantic Salt Meadows
- [1410] Mediterranean Salt Meadows
- [3260] Floating River Vegetation
- [4030] Dry Heath
- [6430] Hydrophilous Tall Herb Communities
- [7220] Petrifying Springs*
- [91A0] Old Oak Woodlands
- [91E0] Alluvial Forests*
- [1016] Desmoulin's Whorl Snail (*Vertigo moulinsiana*)
- [1029] Freshwater Pearl Mussel (*Margaritifera margaritifera*)
- [1092] White-clawed Crayfish (*Austropotamobius Pallies*)
- [1095] Sea Lamprey (*Petromyzon marinus*)
- [1096] Brook Lamprey (*Lampetra planeri*)
- [1099] River Lamprey (*Lampetra fluviatilis*)
- [1103] Twaite Shad (*Alosa fallax*)
- [1106] Atlantic Salmon (*Salmo salar*)
- [1355] Otter (*Lutra lutra*)
- [1421] Killarney Fern (*Trichomanes speciosum*)
- [1990] Nore Freshwater Pearl Mussel (*Margaritifera durrovensis*)”

The SAC site synopsis (NPWS, 2016) states that the main threats to the site include “high inputs of nutrients into the river system from agricultural run-off and several sewage plants, over-grazing within the woodland areas, and invasion by non-native species, for example Cherry Laurel (*Prunus laurocerasus*) and Rhododendron (*Rhododendron ponticum*).” It also states that the water quality of the site remains vulnerable and that good quality water is necessary to maintain the populations of the Annex II animal species listed above.

3.1.3 Newpark Marsh pNHA (000845)

The Newpark Marsh pNHA is located c. 710m north-east of the Site. The pNHA site synopsis (NPWS, 2009) gives the following account of the Newpark Marsh:

*“Newpark Marsh is a small marsh on the outskirts of Kilkenny town, and although the water level seems to be falling at the moment, it still supports semi-natural fen vegetation dominated by Tufted-sedge (*Carex elata*) and including the notable Water Dock (*Rumex hydrolapathum*) amongst a suite of more typical species.*

The area is used as a feeding site by three protected bat species, namely Leisler's Bat (Nyctalus leisleri) Brown Long-eared Bat (Plecotus auratus) and Common Pipistrelle (Pipistrellus pipistrellus). Despite the location of this site, being so close to an urban population, it is very natural. This is unusual and increases the importance of this site."

The River Nore is the closest freshwater source to the Newpark Marsh pNHA. The pNHA is upstream from the Nore Boardwalk site, therefore there is no potential for impact on water quality, water quantity or vegetation at the pNHA.

However, bats may commute to/from the pNHA to the Nore Boardwalk Site (more specifically the River Nore). Therefore, effects on bat populations at this pNHA must be considered further in the report.

3.1.4 Lough Macask pNHA (001914)

Lough Macask pNHA is located c. 1.3km north-west of the Site. The pNHA site synopsis (NPWS, 2009) give the following account of the Lough Macask:

"Lough Macask is a small pond north-west of Kilkenny that fluctuates in size over the year. The vegetation shows that the site is similar in some ways to a turlough. It therefore differs from most other wetlands around Kilkenny and has a certain interest for this reason."

The River Nore is the closest freshwater source to the Lough Macask pNHA. The pNHA is upstream from the Site, therefore there is no potential for impact on water quality, water quantity or vegetation at the pNHA. Therefore, this pNHA does not require further consideration in this report.

3.2 Habitats

Habitats present within the Site, as recorded during the site visit on 24 November 2022 and 02 May 2023, are described in this section along with a valuation of the habitat. A habitat map is presented in the Drawings section of this report.

3.2.1 Annex I habitats

No Annex I habitats associated with the River Barrow and River Nore SAC were recorded within the Site. However, the adjoining section of river could be the Annex I habitat 3260 Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation. This is a qualifying interest feature of the River Barrow and River Nore SAC.

3.2.2 FW2 Depositing/lowland rivers

The proposed boardwalk runs along the west bank of the River Nore. The river at the Site is approximately 37m wide. Water levels were high at the time of the survey in November and some of the path was submerged. The EPA estimates the flow rate of the river to be between 6.7 m³/s and 42.5 m³/s for the majority of its cycle. A Biotic Index Value (Q-value) of 3-4 was recorded by the EPA in 2022, which is classified as moderate water quality⁹. No emergent vegetation was recorded during the site visit. The River Nore is a main component of a Natura 2000 site, and as noted above, the river habitat is potentially one of its qualifying interest features along its entire length; therefore this habitat is important at the International level.

3.2.3 BL1 Stone walls and other stonework

A stone wall was recorded on the western edge of the proposed boardwalk (Figure 4). Some vegetation was growing close to the wall, most notably ivy *Hedera helix* and immature sycamore *Acer pseudo-platanus*. Non-

⁹ <https://gis.epa.ie/EPAMaps/Water>

native invasive species such as *Cotoneaster* sp., cherry laurel *Prunus laurocerasus*, butterfly bush *Buddleja davidii* and montbretia *Crocsmia x crocosmiiflora* were growing on or close to the base of the wall. Greens Bridge is a stone bridge which may provide potential roosting habitat for bats.

This habitat is well-represented in the local area and the species recorded on it are common and widespread, therefore it is important at Site level only. The value of the stone bridge for bats is covered under Section 3.3.

3.2.4 BL2 Earth banks

An earth bank was recorded adjacent to the stone wall. The earth bank in this section is covered with scrub vegetation dominated by dogwood *Cornus* sp., bramble *Rubus fruticosus*, sycamore *Acer pseudo-platanus*, elder *Sambucus nigra*, ash *Fraxinus excelsior* and hawthorn *Crataegus monogyna*. Ground vegetation consists of bush vetch *Vicia sepium*, nettle *Urtica dioica*, cleavers *Galium aparine*, horsetails *Equisetum* spp., meadowsweet *Filipendula ulmaria*, cow parsley *Anthriscus sylvestris*, hairy willowherb *Epilobium hirsutum*, creeping thistle *Cirsium arvense*, creeping buttercup *Ranunculus repens*, field mustard *Brassica rapa*, dandelion *Taraxacum* spp., lesser celandine *Ficaria verna*, ground elder *Aegopodium podagraria* and broad leaf dock *Rumex obtusifolius*. It also includes some species typically found in wetter areas such as lesser celandine *Ficaria verna*, wavy bittercress *Cardamine flexuosa*, pendulous sedge *Carex pendula* and tutsan *Hypericum androsaemum*. This habitat is well-presented in the local area and the species recorded are common and widespread, therefore it is important at Site level only.

3.2.5 BL3 Buildings and artificial surfaces

The road that crosses Greens Bridge was classified as buildings and artificial surfaces. The road itself had no suitable habitat for any protected species, therefore it is not important.

3.2.6 GA2 Improved amenity grassland

Improved amenity grassland was recorded at the southern section of the Site (Figure 5). An existing walkway passes through this habitat. This habitat is associated with managed recreational or landscaped grassland and gardens and is commonly occurring with low diversity of floral species. This habitat is species-poor, common and widespread in the local area, therefore it is not ecologically important.

3.2.7 WS1 Scrub

An earth bank running along the edge of the route consisted of scrub habitat dominated by dogwood, bramble, hawthorn and the non-native, invasive winter heliotrope *Petasites fragrans* (Figure 6). An area of scrub between a dirt path and stone wall comprised bramble, ivy, hawthorn, alder *Alnus glutinosa*, common nettle, buttercup, lesser celandine, tutsan, cuckooflower, common hogweed *Heracleum sphondylium*, sticky mouse ear chickweed *Cerastium glomeratum*, creeping cinquefoil *Potentilla repens*, and sorrel *Oxalis* sp.. Scrub is a relatively widespread and common habitat, and the area within the Site was small and supported common species of plants. Nevertheless, this area of scrub has the potential to transition into native woodland and provides habitat for protected species including birds and bats. Therefore, this habitat is evaluated as important at Local level.

3.2.8 WL2 Treeline

A treeline consisting of willow *Salix* sp. was recorded between the path and the river (Figure 7). Like scrub, treelines are relatively widespread and common, although those dominated by willow are restricted to wet areas and therefore a less common type of this habitat. In addition, native trees provide habitat and wildlife corridors for protected species such as birds and bats. Therefore, this habitat is evaluated as important at Local level.

3.2.9 WD5 Scattered trees and parkland

A section of scattered trees and parkland was recorded at the southern end of the proposed boardwalk. This habitat is common in towns and cities, is highly modified, and supports only common or ornamental species, therefore it is important at Site level only.

3.2.10 Invasive plants

Two invasive species listed under the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations 2011 were observed along the route; giant hogweed *Heracleum mantegazzianum* is present at approximate ITM coordinates 650440 656641 (Figure 8) and hybrid Spanish bluebell *Hyacinthoides x massartiana* Geerinck is present at approximate ITM coordinates 650449 656593. Giant hogweed has also been recorded in the NDBC 100m grid square S505565. This grid square covers a large portion of the southern extent of the Site, including where it was observed during the site visit.

The NDBC dataset search also returned results showing evidence of the presence of two other invasive species which are not listed on the Third Schedule but still pose a risk to native species; butterfly bush and winter heliotrope. The site visits confirmed the presence of these species along with cherry laurel and montbretia.



Figure 4: BL1 Stone wall



Figure 5: GA2 Amenity grassland



Figure 6: WS1 Scrub



Figure 7: WL2 Treeline



Figure

8:

Giant

Hogweed

3.3 Species

This section sets out the records returned for species during the desk study, the species noted during the walkover survey and the suitability of the habitats present to support such species.

3.3.1 Rare, Protected & Invasive Flora and Fauna

Table 3-2 presents records from the NBDC database of rare, protected and invasive species within the 100m grid squares within which the Site is located (squares S504565, S505565, S505564 and S504566).

Table 3-2: Rare, Protected and Invasive Species Recorded Within 100m Grid Squares S504565, S505565, S505564 and S504566

Rare and/or Protected Species	Grid Square	Date of Last Record	No. of Records	Designation	Dataset
European Otter <i>Lutra lutra</i>	S504566	2013	1	EU Habitats Directive: Annexes II and IV Protected Species: Wildlife Act	Atlas of Mammals in Ireland 2010-2015
Non-native/ Invasive Species					
Giant Hogweed <i>Heracleum mantegazzianum,</i>	S505565	2020	1	Invasive Species: High Risk of Impact. Regulation S.I. 477	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards
Butterfly Bush <i>Buddleja davidii</i>	S505565	2022	2	Invasive Species: Medium Risk of Impact	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards
Winter Heliotrope <i>Petasites fragrans</i>	S504566, S505565	2021	4	Invasive Species; Low Risk of Impact	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards

Table 3-3 presents records from the NBDC database of rare and protected species within the 1km and 2km grid squares within which the site is located.

Table 3-3: Rare and Protected and Invasive Species Recorded Within the 1km Grid Square S5056 and the 2km Grid Square S55D

Rare and/or Protected Species	Grid Square	Date of Last Record	No. of Records	Designation	Dataset
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Rare and/or Protected Species	Grid Square	Date of Last Record	No. of Records	Designation	Dataset
Common Kingfisher	S55D	2014	2	EU Birds Directive: Annex I Protected Species: Wildlife Act	Birds of Ireland
Eurasian Pygmy Shrew <i>Sorex minutus</i>	S5056	2017	1	Protected Species: Wildlife Act	Mammals of Ireland 2016-2025
European Otter <i>Lutra lutra</i>	S5056	2013	1	EU Habitats Directive: Annexes II and IV Protected Species: Wildlife Act	Atlas of Mammals in Ireland 2010-2015
Peregrine Falcon <i>Falco peregrinus</i>	S55D	2015	1	EU Birds Directive: Annex I Protected Species: Wildlife Act	Birds of Ireland
West European Hedgehog <i>Erinaceus europaeus</i>	S5056	2020	4	Protected Species: Wildlife Act	Hedgehogs of Ireland

3.3.2 Amphibians

There were no amphibians recorded during the site visit and no suitable habitat for breeding amphibians was recorded within the Site boundary. However, there is a pond situated along the Riverside Walk, between the entrance to the walk at Riverside Drive and the Site boundary, which provides suitable habitat for breeding amphibians. There are also records of common frog *Rana temporaria* (but not smooth newt *Lissotriton vulgaris*) from the 1km grid square within which the Site is located, including breeding in a garden pond and pools in the River Nore floodplain, and the Site offers suitable terrestrial habitat for this species. This species is evaluated to be of Local importance.

3.3.3 Badgers

There are no records of badger *Meles meles* within the 2km grid square overlapping the Site. There were no badger setts or any other evidence of badger activity; such as snuffle holes, digging or latrines; noted within the Site. The earth bank is shallow and prone to flooding, therefore it is unlikely to be used by badger.

Further detailed assessment of badgers is not required and they can be scoped out of further consideration in this report.

3.3.4 Bats

The River Nore and riparian treelines provide important commuting and foraging habitats for bats. Since 2015, numerous bat surveys have been conducted within 2km of the Site. Specific locations surveyed include St. Francis Abbey, Mayfair Building, the ruins along the river just north of the Wolfe Tone Bridge, the Riverside Gardens

extending from Green's Bridge to Market Yard and the Tea Houses at Market Yard. Species observed during these surveys were Daubenton's bat *Myotis daubentonii*, Common pipistrelle *Pipistrellus pipistrellus*, Soprano pipistrelle *Pipistrellus pygmaeus* and Leisler's bat *Nyctalus leisleri*. A survey conducted by Moore Group Environmental Services in September 2015 recorded Daubenton's bats flying along the river corridor from the direction of Green's Bridge downstream and returning to the Green's Bridge area.

No bats were identified using the archway underneath Green's Bridge as a roost during the dusk emergent and dawn re-entry surveys in May 2023. However, high levels of bat foraging activity were observed on the northern side of the archway, along the riparian treelines and the river and underneath Green's Bridge where it crosses the river. Species present were Daubenton's bat, Leisler's bat, Common pipistrelle and Soprano pipistrelle.

Mature trees within the boundary of the site are predominantly willow. Willow trees do not typically support roosting bats due to the lack of PRFs that they provide (e.g. deep hollow trunks, knot holes, rotting bark). Other tree species present which may provide roosting potential include ash, alder and sycamore. The majority of those present are immature or semi-mature. They were visually inspected during the site walkovers and do not provide any obvious roosting potential for bats.

The Newpark Marsh pNHA is located within 1 km and is confirmed to be a foraging site for Leisler's bat, brown long-eared bat and common pipistrelle. The foraging range of bats can be several kilometres from roosts, therefore the potential for bats to commute between the pNHA and the Site must also be considered. All three bat species known to forage at the pNHA are widespread and abundant in Ireland. Considering the potential commuting distance, the bat species assemblage present at the Site is evaluated to be important at Local level.

3.3.5 Birds

Kingfisher and peregrine falcon has been recorded within the 2km grid square overlapping the site. No other records of rare/ protected bird species were returned during the NBDC data search and none were recorded during the site visit. All birds observed on site were common, green-listed species. The scrub, treelines and stone walls within the site provide suitable breeding habitat for passerines.

Kingfisher is listed as a qualifying interest for the River Nore SPA. None were observed during the site visit and the riverbank at the Site is not suitable nesting habitat for kingfisher, being shallow and prone to flooding. However, there are records of kingfisher from approximately 600m upstream and the same distance downstream and the territory size for breeding kingfisher includes 1 – 5km of river. Therefore, this section of the river is likely to form part of a kingfisher territory. The population of kingfisher in Ireland was estimated to be between 368 and 1031 pairs in 2010 and may have declined since then. The population in Kilkenny City is therefore likely to be between 0.1 and 0.3% of the national population but is very likely to be more than 1% of the county population; therefore, the kingfisher population is of county importance.

Peregrine falcon is a common and widespread species in Ireland that nests in cliffs and quarries. There is no suitable nesting habitat within the Site or within the 2km grid square overlapping the site. The population of peregrine falcon was estimated to be 515 pairs in 2012-2015, and the population in Kilkenny City is likely to be less than 1% of the county population. Therefore, this species is of Local importance only. Otherwise, the bird species assemblage confirmed to be present on site are common and widespread, therefore it is evaluated to be important at Local level.

3.3.6 Fish

The following fish species are qualifying interests for the River Barrow and River Nore SAC: twaite shad *Alosa fallax*, Atlantic salmon *Salmo salar*, brook lamprey *Lampetra planeri*, sea lamprey *Petromyzon marinus*, and river lamprey *Lampetra fluviatilis*. The desk study did not return records of any of these species within 2km of the Site, but the River Nore adjacent to the Site provides suitable habitat for Atlantic salmon, brook lamprey and river lamprey. Twaite shad and sea lamprey are found in coastal waters and estuaries, therefore they are unlikely to

be present within the Site. The fish assemblage likely to be present within the River Nore adjacent to the Site is evaluated as important at International level.

3.3.7 Hedgehog

No evidence of hedgehog *Erinaceus europaeus* activity was noted during the Site visit. Although there is scrub present within the Site, the adjacent river bank is prone to flooding and it is therefore unlikely to provide suitable habitat for breeding and hibernation. However, hedgehog has been recorded within the 1km square overlapping the site and they can travel up to 2km a night to forage in urban areas. Hedgehog is widespread in Ireland and is likely to be widespread locally, therefore it is evaluated as important at Local level.

3.3.8 Invertebrates

No rare/protected invertebrate species were observed during the site visit. There is no suitable habitat for rare or protected terrestrial invertebrates within the Site. A survey completed for the Abbey Quarter development, ca. 300m downstream of the Site, in July 2020 recorded the presence of white-clawed crayfish, which was confirmed to be infected by crayfish plague. There are also records of white-clawed crayfish *Austropotamobius pallipes* in the 100m grid square S511558, which is located 2km downstream from the Site and more records upstream, therefore this species is likely to be present in the section of the River Nore adjoining the site.

This species has been recorded from 957 1km grid squares in Ireland but is now declining, perhaps to as low as 860 1km grid squares, with the population adjacent to the Site representing one 1km grid square, and therefore of Local importance. However, the total downstream population in the River Nore is likely to be of National importance. This species is also a qualifying interest of the River Barrow and River Nore SAC.

3.3.9 Otter

Otter was observed foraging in the river on the evening of 2nd May 2023, by the bat surveyor on the northern side of the archway. The NBDC data search returned results supporting evidence of the presence of otter within or near the Site within the last 10 years. There is no suitable habitat to support otter holts along the proposed walkway. The riverbank along the proposed route is shallow, prone to flooding and consists of an existing retaining wall in lieu of an earth embankment. Otter are likely using this stretch of the river for foraging only.

The otter is a qualifying interest of the River Barrow and River Nore SAC however this species is common in Ireland with between 7,218 and 10,186 breeding females with only one of these likely to inhabit the stretch of river which includes the Site. Therefore, the otter population is of Local importance only. Nevertheless, this species is strictly protected.

3.3.10 Pygmy shrew

There is one record of pygmy shrew within 1km of the Site, but no evidence of this species was noted during the site visit. The scrub and stone wall within the Site provides suitable foraging habitat, but the area is prone to flooding and is therefore unlikely to provide suitable nesting habitat. An estimate of the population size is unknown but it is a widespread species in Ireland. Therefore, this species is of Local importance only.

3.3.11 Other mammals

No records of other rare/protected mammal species within 2km of the site were returned during the desk study and none were observed during the site visit. Therefore, other mammals are not considered further in this report.

3.4 Summary of Important Ecological Features

Table 3-3 presents a summary of important ecological features that are subject to detailed assessment. Only features that are evaluated as important at Local level or higher are presented here.

Table 3-4: Summary of Important Ecological Features Subject to Detailed Assessment

Ecological Feature	Scale at which Feature is Important	Comments on Legal Status and/or Importance
River Nore SPA	International	SPAs are designated under the Birds Directive and protected under the Habitats Directive.
River Barrow and River Nore SAC	International	SACs are designated and protected under the Habitats Directive.
Newpark Marsh pNHA	National	pNHAs are important at National level and protected by policy.
Lough Macask pNHA	National	pNHAs are important at National level and protected by policy.
Depositing/lowland river	International	The river is potentially a qualifying interest habitat within the River Barrow and River Nore SAC and supports the qualifying interest species of the SAC and the River Nore SPA.
Scrub	Local	The scrub area is small and consists of commonly occurring species, but has the potential to transition into native woodland.
Treeline	Local	Treelines are relatively widespread and common, but those dominated by willow are restricted to wet areas and therefore less common.
Common frog	Local	Widespread in Ireland and locally. Protected species under the Wildlife Acts.
Bats	Local	Foraging and commuting habitat is present within the Site. Potential for bats to commute between Site and pNHA. Strict legal protection for bats and their roosts.
Kingfisher	County (up to National if including the entire River Nore population)	Foraging habitat for kingfisher is present adjacent to the site, and this species may perch on branches hanging over the river while foraging. >1% of county population and <1% of national population. Strict legal protection for birds and their nests.
Other Birds	Local	Foraging and breeding habitat for birds is present within the Site. Strict legal protection for birds and their nests.
Fish	Local (up to National if including the entire River Nore populations)	Qualifying interests of River Barrow and Nore SAC likely to be present.
Hedgehog	Local	Widespread in Ireland and locally. <1% of the

Ecological Feature	Scale at which Feature is Important	Comments on Legal Status and/or Importance
		county population.
White-clawed crayfish	Local (up to National if including the entire River Nore population)	White-clawed crayfish is a qualifying interest for the River Barrow and Nore SAC. <1% of the county population.
Otter	Local (up to National if including the entire River Nore population)	Qualifying interest for the River Nore and Barrow SAC and strict legal protection for otter and its holts. <1% of the county population.
Pygmy shrew	Local	Widespread in Ireland and locally.

The Lough Macask pNHA has been scoped out due to distance and lack of ecological connectivity between the site. Badgers have been scoped out because they are not likely to be present within 2km of the Site and are not likely to be affected by the proposed development.

4.0 Assessment of Effects and Mitigation Measures

This section sets out the potential impacts and their effects on important ecological features. The information available from the desk study and fieldwork has been used to identify impacts and the significant effects including positive, negative, direct, indirect and cumulative effects.

4.1 Do Nothing Impact

In the absence of the proposed development, it is assumed that non-native species such as the immature sycamore trees will develop further and become dominant within the Site. The Do Nothing Impact would result in no positive change in the ecological interest of the Site overtime.

4.2 Embedded/Designed-In Mitigation

The following design principles and “designed-in” mitigation have informed the assessment of impacts:

- Standard best practice as laid out by Inland Fisheries Ireland (IFI) will be used during construction of the proposed boardwalk. Construction will be carried out during the summer months when water levels are low and the ground is at its driest to minimise impact on the river bank and on fish species migrating the river. No in-channel works are required for this project.
- LED lighting will be used to light the boardwalk, which causes less impact on bats compared to other forms of lighting such as mercury lamps and sodium lamps. Lighting is incorporated in the top rail of the parapet at a relatively low height of 1.5m, therefore light spill onto peripheral vegetation would be reduced.

Taking the above into account, the principal potential impacts of the proposed development are outlined in the following sections.

4.3 Designated Sites

Likely significant effects on any Natura 2000 site as a result of the proposed works are considered in the Appropriate Assessment Screening report and Natura Impact Statement accompanying this planning application. The Stage 2 “Appropriate Assessment” concluded that mitigation measures will ensure that there will be no adverse effects on the integrity of any Natura 2000 site.

4.3.1 River Nore SPA

Kingfisher is a qualifying interest for the River Nore SPA. The riverbank within the Site is not suitable nesting habitat, therefore it is unlikely that the proposed development will directly affect the breeding success of kingfisher. However, construction on the riverbank can lead to a pollution event or sediment release in the absence of control measures, which could have a negative effect on prey species. Once the boardwalk is in use, foraging kingfisher could be disturbed by people using the boardwalk. Potential effects on kingfishers are further discussed in Section 4.5.3.

Best practice should be used at all times considering proximity to the river to ensure that water quality is not impacted as a result of the proposed works. The project method statement should refer to “Guidelines on Protection of Fisheries During Construction Works in And Adjacent to Waters (2016)”. These guidelines outline the best practices when carrying out works adjacent to waterways to prevent adverse impacts on water quality. These guidelines should be followed during the construction of the proposed pathway, with particular attention to the measures outlined in “Chapter 7: Construction Impacts”.

4.3.2 River Barrow and River Nore SAC

Construction on the riverbank will not result in shading of the river habitat, but it could lead to pollution or sediment run-off and therefore affect the qualifying interests of the River Barrow and River Nore SAC. There is potential for water quality impacts on qualifying interest habitats 6430, Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels, and 3260, Water courses of plain to montane levels with the *Ranunculus fluitantis* and *Callitriche-Batrachion* vegetation. These habitats were not recorded during the site visit but may occur downstream and be affected by changes in water quality. Additionally, the release of fine sediment into the river could lead to effects on white-clawed crayfish and the spawning grounds of Atlantic salmon, twaite shad, and lamprey species. The effects on these species are further discussed in Section 4.5.

Best practice should be followed at all times to ensure that water quality is not affected as a result of the proposed works.

4.3.3 Newpark Marsh pNHA

Bats commuting between the Site and pNHA could be disturbed during constructions and deterred from foraging at the Site. The effects on bat species are further discussed in Section 4.5.

4.3.4 Lough Macask pNHA

There will be no impacts on Lough Macask pNHA due to distance and lack of ecological connectivity between it and the Site.

4.4 Habitats

4.4.1 Depositing/lowland river

Construction along the riverbank could lead to a pollution event or sediment release in the absence of control measures. This has the potential to significantly reduce the water quality of the river both within and downstream from the Site. The extent and magnitude of a potential pollution event cannot be precisely quantified but depends on the volume of sediment and other pollutants that enter the river.

Best practice will be used at all times considering proximity to the river to ensure that water quality is not impacted as a result of the proposed works and that there will be no significant effects on the river habitat.

4.4.2 Scrub

There will be a temporary loss of a 3m x 10m strip of scrub habitat. This would result in the loss of foraging habitat for fauna, such as birds and bats, and the loss of potential for new woodland habitat in this location. However, this habitat is widespread, and the area affected is small. Its loss would therefore have limited impact on species of fauna.

Vegetation will only be removed outside of the bird breeding season. This will prevent disturbance and destruction of nests during the breeding season. The scrub vegetation beneath the boardwalk will recover following the completion of construction and will be further compensated by planting native trees on the grassland along the river. This will ensure that there are no significant effects resulting from the temporary loss of scrub habitat.

4.4.3 Treeline

Kilkenny County Council will engage with an arborist to carry out a tree survey and develop an Impact Assessment in line with guidance set out in *BS 5837:2012 Trees in relation to design, demolition and construction – recommendations*.

The Construction Methodology states that only vegetation which clashes with the boardwalk structure will be cleared. For trees, this will be assessed on a case-by-case basis and trees will only be removed if deemed necessary. This will only apply to a section of treeline that is approximately 100m long along the riverbank. If removed, this would reduce the ability of the trees to provide nesting habitat for birds, but the area affected is small so this will have limited impact on fauna.

Due to the constraints with winter water levels, clearance will need to be conducted during the bird breeding season. As such, a qualified ecologist will need to conduct bird nesting checks immediately prior to removal and be on site during the removal to ensure no adverse effects on nesting birds are encountered. The trees in the vicinity of the boardwalk will be allowed to grow naturally, with occasional winter pruning to control limbs which grow in the direction of the boardwalk structure. However, the trimming of trees will permanently reduce their ability to support bird nests or bat roosts.

4.4.4 Invasive plant species

Two invasive species listed under the Third Schedule were observed along the route: giant hogweed and hybrid Spanish bluebell. Construction work may cause these species to spread beyond the Site in the absence of biosecurity measures. This would result in the displacement of native species and reduce the quality of important habitats within the Site.

Winter heliotrope, cherry laurel, Cotoneaster sp., montbretia and sycamore were recorded during the field survey. These species are not listed under the Third Schedule and are considered to have a low risk of impact.

A strict biosecurity protocol will be followed to prevent the spread of invasive species. In lieu of specific guidance for pedestrian walkways, the guidance provided by Transport Infrastructure Ireland (The Management of Invasive Alien Plant Species on National Roads, 2020) will be followed during the construction period. This will include the control and removal of giant hogweed and Spanish bluebell and the other non-native invasive plant species from the Site, taking particular care that no seeds, rhizomes, or other propagules fall into the river. This will ensure that there are no significant effects on biodiversity resulting from the spread of non-native invasive plant species.

4.5 Species

4.5.1 Bats

Construction work carried out close to Green's Bridge may cause temporary disturbance to any bats that may be roosting underneath the bridge where it crosses the river due to noise. During operation, the proposed LED lighting along the route could potentially cause disturbance to bats commuting to this section of the River Nore and deter bats from foraging along the river and treelines. Artificial lighting can cause delayed roost emergence and cause bats to abandon their roost.

Health and safety considerations require the pedestrian link to have artificial lighting. Therefore, lighting along the route should be designed to be sensitive to the presence of bats in the area. Lighting should be designed in accordance with the following guidance:

- Guidance Notes for the Reduction of Obtrusive Light GN01/20 (Institute of Lighting Professionals, 2021)
- Bats & Lighting - Guidance Notes for Planners, Engineers, Architects and Developers (Bat Conservation Ireland, December 2010)
- Guidance Note 8 Bats and artificial lighting (Institute of Lighting Professionals, 2018)

This will ensure compliance with the provisions of the Wildlife Acts 1976 – 2012 with respect to wild mammals. Section 23 (4) states: "any person who wilfully interferes with or destroys the breeding place of any protected wild animal shall be guilty of an offence".

In addition, the planting of native trees (ratio of at least 2:1) will in time replace the lost foraging habitat for bats and ensure there are no significant residual effects on the bat population or the Newpark Marsh pNHA.

4.5.2 Common Frog

The area of scrub within the Site provides suitable terrestrial habitat for common frog. The removal of this scrub area during construction will result in displacement of any frogs that may be using the habitat. However, the area to be removed is small and this habitat is sufficiently common and widespread so that frogs can be accommodated elsewhere in the local area. Therefore, it is not anticipated that scrub removal will have a significant effect on this species.

4.5.3 Fish

There will be no artificial barriers that could disrupt migration and no in-channel works that could disrupt spawning grounds during construction. However, there is a risk of sediment run-off during construction, and this has the potential to indirectly affect the quality of spawning grounds downstream from the Site.

Best practice will be followed at all times during construction to prevent the release of fine sediment into the river and ensure that there are no significant effects on the salmon and lamprey populations, or any other species of fish.

4.5.4 Hedgehog

The area of scrub within the site provides suitable foraging habitat for hedgehogs. The removal of scrub during construction will result in displacement of any foraging hedgehogs. However, the area to be removed is small, and scrub and hedgerows are sufficiently widespread in the local area so that hedgehogs can be accommodated elsewhere. Therefore, it is not anticipated that scrub removal will have a significant effect on this species.

4.5.5 Kingfisher

During the construction phase, there is a risk of a pollution event or sediment release which may have an impact on the prey species of kingfisher. Best construction practice will be followed at all times to prevent any significant indirect effects on kingfisher.

On completion of the boardwalk, an increase in human activity beside the river may cause disturbance to any kingfisher foraging in the area. This species always flies away on approach by people and may be displaced by intense human activity. However, it does inhabit urban rivers subject to high levels of human activity, so it may be able to cope with increased human activity provided it can forage elsewhere within 5km of the Site. Due to the short length of the boardwalk (190m) relative to available foraging habitat along the River Nore, it is likely that any displaced kingfisher can be accommodated elsewhere along the river.

4.5.6 Other Birds

There will be temporary disturbance of birds as it is necessary for construction work to be carried out close to breeding birds in the treelines and hedgerows along the perimeter of the Site. The construction of the pathway will result in a loss of scrub, which will result in the displacement of bird species that may use this habitat. Additionally, trees may be removed, if necessary, which would result in the loss of nesting habitat. Tree removal could also result in the destruction of nests and killing/injury of birds as work will be carried out during the bird breeding season.

Trees and hedgerows will be retained where possible. An immediate pre-removal check for nesting birds should take place. Works should take place near to the end of the bird breeding season, to ensure that the majority of birds have fledged, to reduce the risk of harm to nesting birds.

This will ensure compliance with the provisions of the Wildlife Acts 1976 – 2012 with respect to birds. Section 22 (4) of the Act states “any person who wilfully takes or removes the eggs or nest of a protected wild bird; wilfully destroys, injures or mutilates the eggs or nest of a protected wild bird and wilfully disturbs a protected wild bird on or near a nest containing eggs or unflown young is guilty of an offence where they do not have the appropriate licence”.

In addition, the planting of native trees will in time replace the lost nesting habitat for birds and ensure there are no significant residual effects on the bird population.

4.5.7 Otter

Although otter is using this section of the River Nore for foraging, construction is unlikely to cause significant disturbance to otter due to the short length of the proposed development (190m) relative to available foraging habitat along the River Nore. For the same reason, an increase in human activity after construction of the boardwalk is also unlikely to cause significant disturbance to otters. However, a pollution event or sediment release into the river could cause significant indirect effects on otter by affecting the fish biomass that the otter feeds on. Best practice will be followed at all times during construction to prevent a reduction in water quality and ensure that there are no significant effects on the otter population.

4.5.8 Pygmy shrew

The area of scrub and the stone wall within the site provides suitable foraging habitat for pygmy shrew. The removal of scrub during construction will result in displacement of any foraging pygmy shrews. However, the area to be removed is small, and scrub and hedgerows are sufficiently widespread in the local area so that pygmy shrew can be accommodated elsewhere. Therefore, it is not anticipated that scrub removal will have a significant effect on this species.

4.5.9 White-clawed crayfish

The proposed development will not directly affect the habitat of white-clawed crayfish as the bank is not considered a suitable habitat for this species and no in-stream works are required. However, there is a risk of sediment run-off due to the proximity of the Site to the river and this has the potential to affect white-clawed crayfish populations downstream of the Site. Accumulation of fine sediment makes refuges unfavourable for crayfish and clogs their gills.

Best practice will be followed at all times during construction to prevent the release of fine sediment into the river and ensure that there are no significant effects on the white-clawed crayfish population.

4.6 Cumulative Effects

Cumulative effects can result from individually insignificant but collectively significant actions taking place over a period of time or concentrated in a location. Cumulative effects can occur where a proposed development results in individually insignificant impacts that, when considered in-combination with impacts of other proposed or permitted plans and projects, can result in significant effects.

Active (ie. within 6 years) planning applications in the surrounding area consist of several single house extensions, demolitions and renovations of commercial buildings.

- The River Court Hotel was granted permission to modify the existing structure. An Environmental Impact assessment was carried out and it was accepted that it would not pose any likely significant effects.
- Saint Luke’s General Hospital was granted permission to erect a single ground story floor extension of 292m² to the existing radiology department. This is an extension within the grounds of the existing building, and it was accepted that it would not affect the integrity of nearby Natura 2000 sites or the site itself.

- The existing Troyswood Water Treatment plant is a large development located North of the proposed site. The existing plant, located approximately 4.8km upstream of the proposed site location, is currently under development after planning permission was granted by An Bord Pleanála under conditions. The development by itself or in combination with other projects was deemed to not adversely affect the integrity of nearby Natura 2000 sites or the site itself. The development started in December 2021; it is estimated to take approx. 2.5 years to complete.

The effects of habitat loss and disturbance and displacement of species are likely to be confined to the immediate area of the Site. However, there is a pathway for other plans and projects to give rise to cumulative effects if construction results in pollution of the River Nore. Provided that mitigation measures to prevent river pollution are rigorously applied, it is not anticipated that this project will give rise to cumulative effects.

4.7 Biodiversity Enhancements

Enhancing the biodiversity of the Site will also further enhance the recreational value of the proposed walkway. This will be done through management of the grassland along the river through the removal of invasive species, native tree planting and the erection of bat boxes.

It is an objective of Kilkenny County Council to support the implementation of the All-Ireland Pollinator Plan. This will be implemented at the Site by :

- Maintaining native flowering hedgerows;
- Planting pollinator-friendly trees;
- Implementing best practise with regard to meadow management (Bishopmeadows is currently managed by the Parks Department under a one cut and lift per year regime);
- Apply SUD to ensure the sustainable use of pesticide within this vicinity; and
- Providing nesting places for wild solitary bees.

4.8 Summary of Effects

Table 4-1 presents a summary of potential impacts on each ecological feature along with proposed mitigation and residual effects.

Table 4-1: Summary of Potential Impacts, Proposed Mitigation and Residual Effects

Ecological Feature	Potential Impacts	Mitigation	Means of Delivering Mitigation	Residual Effects
Depositing/lowland river	Pollution event in River Nore	Following construction guidelines	Planning Condition	Not Significant
Treeline	Habitat loss	Retaining the majority of trees	Planning Condition	Not significant as it will be compensated by new tree planting.
Scrub	Habitat loss	Minimising vegetation removal	Planning Condition	Not significant as it will be compensated by new tree planting.
Bats	Disturbance during construction and use of boardwalk, habitat loss and displacement	Timing restrictions, following guidelines for installation of artificial lighting	Planning Condition	Not significant as it will be compensated by new tree planting.
Common frog	Habitat loss and displacement	N/A	N/A	Not Significant
Fish	Reduction in water quality causing displacement from spawning grounds	Following construction guidelines	Planning Condition	Not Significant
Hedgehog	Habitat loss and displacement	N/A	N/A	Not Significant
Kingfisher	Disturbance during construction and use of boardwalk, pollution event in River Nore	Following construction guidelines	Planning Condition	Not Significant
Other Birds	Disturbance during construction, habitat loss and displacement	Timing restrictions, nesting bird checks, retention of trees where possible	Planning Condition	Not significant as it will be compensated by new tree planting.
Otter	Reduction in water quality affecting prey, disturbance during construction and use of boardwalk	Following construction guidelines	Planning Condition	Not Significant
White-clawed crayfish	Reduction in water quality causing displacement and mortality	Following construction guidelines	Planning Condition	Not Significant

5.0 Conclusions

The proposed development of the Nore Boardwalk between the Nore Linear Park and the Riverside Gardens, Co. Kilkenny will result in some localised effects on the ecology within the Site.

There is a risk of a pollution event in the River Nore as a result of sediment release. This would cause direct effects on the quality of the habitat itself and indirect effects on otter, white-clawed crayfish and fish species that may be using the Site. These effects can be mitigated by following best practice during construction.

Construction and use of the boardwalk could result in disturbance to otter and kingfisher. This effect is not anticipated to be significant due to the small scale of the project and the presence of alternative foraging grounds for these species. Moreover, both species can tolerate some disturbance from human activity.

There is the potential for increased artificial lighting to influence potential bat foraging, commuting and roosting habitat, which can be mitigated by following best practice during construction and operation.

There will be the loss of a small amount of scrub and woodland habitat. It is not anticipated that this will result in significant effects on common frog, hedgehog or pygmy shrew.

There will be no significant residual effects on flora or fauna due to the implementation of compensatory measures. Nesting bird checks prior to the removal of vegetation will greatly reduce the risk of harm to nesting birds. Following guidance set out by the Institute of Lighting Professionals and Bat Conservation Ireland should reduce disturbance to bats. The long-term effect on trees and scrub will be greatly compensated for by planting/ seeding the area beneath the boardwalk and planting native trees to replace the vegetation removed prior to development.

Invasive plant species have been observed within the boundary of the proposed development, including two species listed under the Third Schedule. A strict biosecurity protocol will be followed to prevent the spread of invasive plant species.

To enhance biodiversity within and adjacent to the Site, the following measures will be implemented: removal of invasive species, planting native trees, erection of bat boxes, maintaining hedgerows, planting pollinator-friendly trees, meadow management, applying SUD and providing nesting places for solitary bees.

Overall, the assessment concludes that there will be some temporary localised effects on ecology in the area, but these can be compensated for by adhering to the above-mentioned measures.

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DRAWINGS

APPENDIX 01

Relevant Legislation and Planning Policy

PLANNING POLICY

The following policies & objectives from “Chapter 8: Open Space & Recreation” and “Chapter 9: Heritage, Culture & Arts” of the Kilkenny City & County Development Plan are considered pertinent to this report:

Chapter 8: Open Space & Recreation

Regional Park Objectives

8B To progress plans for the provision of a pedestrian bridge upstream of Greens Bridge including the provision of access along the eastern bank of the river up from Greensbridge, to the proposed bio-diversity park at Dunmore as part of the River Nore Linear Park.

8C Construction of a Boardwalk at Greensbridge to link the River Nore Riverside Walk at Riverside Drive with the new Riverside Linear Park in the Abbey Quarter and onwards to the Canal Walk.

8E To provide a pedestrian crossing along the northern side of Greens Bridge.

Trails and Walkways Objectives

8F To continue the development of new trails and walkways such as the Castlecomer, Knockdrinna Wood and Ballyhale Looped Walks and the upgrade of others such as the Freshford, Gathabawn and Kilmacoliver Looped Walks and the Nore Valley Walk.

8H To complete the development of the linear park along the River Nore in the area of the Abbey Quarter.

8I To extend the linear park at the Abbey Quarter to link with the existing section of the River Nore Linear Park at Riverside Drive.

Chapter 9: Heritage, Culture & Arts

9.2 Natural Heritage & Biodiversity

It is the aim of the Council to conserve, sustainably manage and enhance the County’s natural heritage and biodiversity and to promote understanding of and sustainable access to it.

9.2.1 Protected habitats and species designated for nature conservation

The Council will ensure that an Appropriate Assessment, in accordance with Articles 6(3) and Article 6(4) is carried out in respect of any plan or project not directly connected with or necessary to the management of the site, but likely to have a significant effect on a Natura 2000 site(s), either individually or in combination with other plans or projects, in view of the site’s conservation objectives.

The Council will seek to control the impact of visitor numbers in order to avoid significant effects including loss of habitat and disturbance, including ensuring that new any projects, such as greenways, are a suitable distance from ecological sensitivities, such as riparian zones.

Natural Heritage Areas (NHAs) and proposed Natural Heritage Areas (pNHAs) are designated under the Wildlife (Amendment) Act 2000 and encompass nationally important semi-natural and natural habitats, landforms and geomorphological features. There are 34 Natural Heritage Areas in the county.

Certain plant, animal and bird species are protected by law. These includes plant species listed in the Flora (Protection) Order 2015 (S.I. No. 356 of 2015) (or other such Orders) and animals and birds listed in the Wildlife Act, 1976 and subsequent statutory instruments, those listed in Annex IV of the Habitats Directive (92/43/EEC), and those listed in Annex I of the Birds Directive.

The Council will protect and, where possible, enhance the natural heritage sites designated under EU legislation and national legislation (Habitats Directive, Birds Directive, European Communities (Birds and Natural Habitats) Regulations 2011 and Wildlife Acts). This protection will extend to any additions or alterations to sites that may arise during the lifetime of this plan. The Council will also protect and, where possible, enhance the plant and animal species and their habitats that have been identified under European legislation (Habitats and Birds Directive) and protected under national Legislation (European Communities (Birds and Natural Habitats) Regulations 2011 (SI 477 of 2011), Wildlife Acts 1976-2010 and the Flora Protection Order (SI94 of 1999).

Development management requirements: *Ensure that an ecological impact assessment is carried out, by suitably qualified professional(s), for any proposed development likely to have a significant impact on rare and threatened species including those species protected by law and their habitats. Ensure appropriate avoidance and mitigation measures are incorporated into development proposals as part of any ecological impact assessment.*

9.2.2 Biodiversity outside of habitats designated for nature conservation

Much of the biodiversity in the county occurs in the wider countryside, i.e., in areas which are not subject to legal protection under National or EU biodiversity law. These habitats and features are particularly important in contributing to the biodiversity, landscape value and sense of place of the county. They provide vital links and corridors to allow the movement of plant and animals between the network of protected sites. These features include: hedgerows, ditches and banks, stone walls, woodlands, estates and parklands, rivers, streams and associated riparian zones, reservoirs, ponds and canals. Such corridors or interconnected networks are the basis of our Green Infrastructure. Article 10 of the Habitats Directive outlines the obligations of EU member states in relation to natural heritage in the wider countryside. It provides that through land use planning and development policies, Planning Authorities shall endeavour to improve the ecological coherence of the Natura 2000 network and encourage the management of landscape features that are of major importance for wild fauna and flora. Such features are those which, by virtue of their function and structure are essential for the migration, dispersal and genetic exchange of wild species and form part of the network of green infrastructure.

9.2.5 Woodlands, Trees and Hedgerows

Woodlands and trees contribute significantly to the biodiversity and landscape character of the county. They are a vital part of a network of habitats, ecological ‘corridors’ and ‘stepping stones’ essential for wildlife to flourish and move between and within habitats. They have a vital role to play in climate adaptation. They filter out noise, dust and pollutants and help minimise flooding by retaining moisture.

There are a number of legislative measures which recognise the importance of trees and woodlands and provide for their protection. These include:

- i. Tree Preservation Orders (TPO’s) Under the Planning and Development Act 2000, TPO’s allow for the protection of trees, groups of trees and woods of amenity value. Trees, which are the subject of a TPO, cannot be felled unless the owner also obtains planning permission. See Appendix E for list of current TPO’s in the county. This list may be added to over the course of this Plan. Consult with the Parks Department of the County Council for the most up-to-date list. The Council will conserve important trees, groups of trees or woodlands, using Tree Preservation Orders, as appropriate.*
- ii. Tree Felling Under the Forestry Act 2014, with certain exceptions, it is illegal to uproot or cut down any tree unless notice of intention to do so has been given in accordance with the Act. The Council will provide guidance to landowners on the legal requirements and procedures in relation to tree felling in order to protect the landscape character and biodiversity of the county.*

9.2.6 Inland Waters-Rivers, Streams and Groundwater

The rivers, streams, wetlands and groundwater in County Kilkenny are important riparian zones and are home to a variety of plant and animal species, and are one of the most important biodiversity resources in the county. The Rivers Barrow, Nore and Suir (known collectively as the “Three Sisters”) are the principal rivers flowing through County Kilkenny. They are protected habitats under European legislation. The rivers provide a rich landscape setting for the towns and village of the county and are the primary green infrastructure network in the county. The economic benefits of the rivers are significant. The development of riverside walks has enabled greater access to the waterway corridors, whilst the rivers themselves are used for water-pursuits including angling, boating, canoeing and kayaking, and swimming. The River Nore Heritage Audit (2009-2011) identifies and maps the built, natural and cultural heritage of the River Nore corridor in County Kilkenny (See section 8.4.1.1 River Nore for further details). Groundwater is important for supplying water and maintaining wetlands and river flows in dry periods. Chapter 9 Heritage, Culture and the Arts Kilkenny City and County Development Plan Volume 1 134 Relevant planning applications shall have regard to the guidance document ‘Planning for Watercourses in the Urban Environment’.

9.2.9 Pollinators

One third of our bee species are threatened with extinction from Ireland. Habitat loss, loss of food sources, pests and disease, pesticide and climate change all contribute. In addition to their intrinsic value, they are vital to our agricultural and horticultural industries, contribute to our health and wellbeing, and also pollinate up to 78% of flowering plants. Kilkenny County Council has adopted the All Ireland Pollinator Plan (www.pollinator.ie), a national framework which aims to make Ireland a place where pollinators thrive. The Council will continue to 9 Department of Arts, Heritage and the Gaeltacht, National Peatland Strategy, 2015 Chapter 9 Heritage, Culture and the Arts Kilkenny City and County Development Plan Volume 1 135 support the implementation of the All Ireland Pollinator Plan and is committed to undertaking actions to support pollinators in the county. The Council will in as far as is practicable and affordable manage and restore semi-natural habitats and their native plants on Council land.

9.2.10 Invasive Species

Invasive non-native plant and animal species (animals and plants that are introduced accidentally or deliberately into a natural environment where they are not normally found) are a significant threat to biodiversity. They can negatively impact on native species, can transform habitats and threaten ecosystems causing serious problems to the environment, buildings and the economy. Irish legislation makes it an offence to plant, breed, disperse, allow dispersal or cause to grow a range of plant and animal species, or to import or transport these or vector material such as soil or spoil from which they can grow (Articles 49 and 50 of the European Communities (Birds and Natural Habitats)).

9.2.11 Native Plant Species

Where possible, the use of native plants and seeds from indigenous seed sources should be used on all developments and landscape projects/treatments. This will help to:

- contribute to national commitments on the conservation of biological diversity by establishing native habitats and reducing the planting and dispersion of non-native plants*
- support a reduction in the threat posed by the importation of pests and diseases carried on non-native (and non-indigenously sourced) plant material*
- compensate for loss of habitat*

-
- *maintain regional identity, landscape character and diversity.*

The following objective from the Urban Design Framework Masterplan for Abbey Creative Quarter Kilkenny 2015 are considered pertinent to this report:

3.1.8 Site Analysis – Linear Park

The Noreside walking trails include the Nore Valley Walk from the city centre to Bennetsbridge stretching south 11 kilometres, and the Bishops Meadows Walk to the north of the city stretching 2.6 kilometres. These walks are both on the western bank of the River Nore. Currently there is a fracture in this trail as the St. Francis Abbey Brewery Site does not allow public access along the River Bank. The Masterplan will propose the creation of a linear park along the River Nore to extend the existing walkways through the city centre while being cognisant of the river as a Natura 2000 site, a Special Area of Conservation (SAC) and a Special Protection Area (SPA).

Objective 6B – *To complete the River Nore Linear Park within the lifetime of the Plan.*

LEGISLATION

The conservation status of mammals, amphibians, reptiles, fish and protected flora within Ireland and Europe is using one or more of the following documents: Wildlife Acts (1976 - 2018), the Red List of Terrestrial Mammals (Marnell et al., 2009), Ireland Red Lists No.5: Amphibians, Reptiles and Freshwater Fish (King et al. 2011), The Flora (Protection) Order, 2015 (S.I. No. 356 of 2015) and the EU Habitats Directive 92/43/EEC.

Otters

Otters are a legally protected species under Irish legislation. Otters and their holts are protected under the provisions of the Wildlife (Amendment) Act 2000. Under the Wildlife Act, it is an offence to:

- Intentionally kill, injure or take (handle) any protected wild animal;
- Intentionally interfere with or destroy the breeding place or resting place of any protected wild animal;
- Intentionally or recklessly damage, destroy or obstruct access to any structure or place used for shelter or protection by any protected wild animal; and
- Possess or control any live or dead specimen or anything derived from a protected species.

Otters are also listed as a protected species under Annex II and IV of the European Habitats Directive.

- Annex II: core areas of their habitat are designated as sites of Community importance (SCIs) and included in the Natura 2000 network. These sites must be managed in accordance with the ecological needs of the species.
- Annex IV: a strict protection regime must be applied across their entire natural range within the EU, both within and outside Natura 2000 sites.

Bats

Bats are protected by law in the Republic of Ireland under the Wildlife Acts. This legislation states that it is an offence to intentionally disturb, injure or kill a bat or disturb its resting place and any work on a roost must be carried out with the advice of the NPWS. In addition to domestic legislation, bats are also protected under the EU Habitats Directive.

Birds

The Irish bird nesting season is defined in Section 40 of the Wildlife Act 1976 and Section 46 of the Wildlife Act 2000 (as amended) as the period between 1st March and 31st August. This legislation states that:

- "It shall be an offence for a person to cut, grub, burn or otherwise destroy, during the period beginning on the 1st day of March and ending on the 31st day of August in any year, any vegetation growing on any land not then cultivated, and;
- It shall be an offence for a person to cut, grub, burn or otherwise destroy any vegetation growing in any hedge or ditch during the period mentioned in paragraph (a) of this subsection."

APPENDIX 02

Bat Conservation Trust Guidelines for assessing the potential suitability of proposed development sites for bats

Suitability	Description of Roosting Habitats	Description of Communing and Foraging Habitats
Negligible	A building, structure, tree or other feature with negligible habitat features likely to be used by bats.	Negligible habitat features on site likely to be used by commuting or foraging bats.
Low	<p>A building or structure with one or more potential roost features that could be used by individual bats opportunistically, but do not provide enough space, shelter, protection or appropriate conditions (for example temperature, humidity, height above ground, light levels, levels of disturbance) and/or suitable surrounding habitat to be used on a regular basis, or by larger numbers of bats. Buildings in this category are unlikely to support a maternity colony or be used by hibernating bats.</p> <p>A tree of sufficient size and age to contain potential roost features but with none seen from the ground, or features seen with only very limited roosting potential (i.e. some small cracks or crevices, low ivy cover).</p>	<p>Habitat that could be used by small numbers of commuting bats such as a gappy hedgerow or un-vegetated stream, but isolated and not very well connected to the surrounding landscape by other habitat and/or features.</p> <p>Suitable but isolated habitat that could be used by small numbers of foraging bats.</p>

Suitability	Description of Roosting Habitats	Description of Communing and Foraging Habitats
Moderate	<p>A building, structure, tree or other feature with one or more potential roost sites that could be used by bats due to their size, shelter, protection or appropriate conditions (for example temperature, humidity, height above ground, light levels, levels of disturbance) and surrounding habitat but unlikely to support a roost of high conservation value status.</p> <p>Buildings, structures and trees falling into this category would not be expected to support a maternity colony, or significant hibernation or transitory roost.</p>	<p>Continuous habitat connected to the wider landscape that could be used by bats for commuting such as lines of trees and scrub or linked back gardens.</p> <p>Habitat that is connected to the wider landscape that could be used by bats for foraging such as trees, scrub, grassland or water.</p>
High	<p>A building, structure, tree or other feature with one or more potential roost sites that are obviously suitable for use by large numbers of bats on a more regular basis and potentially for longer periods of time due to their size, shelter, protection or appropriate conditions (for example temperature, humidity, height above ground, light levels, levels of disturbance) and surrounding habitat.</p> <p>Buildings, structures and trees falling into this category may be expected to support a maternity colony, or significant hibernation or a significant transitory roost.</p>	<p>Continuous high-quality habitat that is well connected to the wider landscape that is likely to be used regularly by commuting bats such as river valleys, streams, hedgerows, lines of trees and woodland edge.</p> <p>High-quality habitat that is well connected to the wider landscape that is likely to be used regularly by foraging bats such as a broadleaved woodland, tree-lined watercourses and grazed parkland.</p> <p>Site is close to and connected to known roost.</p>

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Appendix E

Screening for Environmental Impact Assessment

To: Tony Lauhoff: Senior Engineer
From: Nicolaas Louw: Senior Executive Planner

Proposal: 177 AE Application proposal — Proposed pedestrian link between the River Nore linear park and the riverside gardens

Re: Environmental Impact Assessment – Screening for Environmental Impact Assessment Report (EIAR).

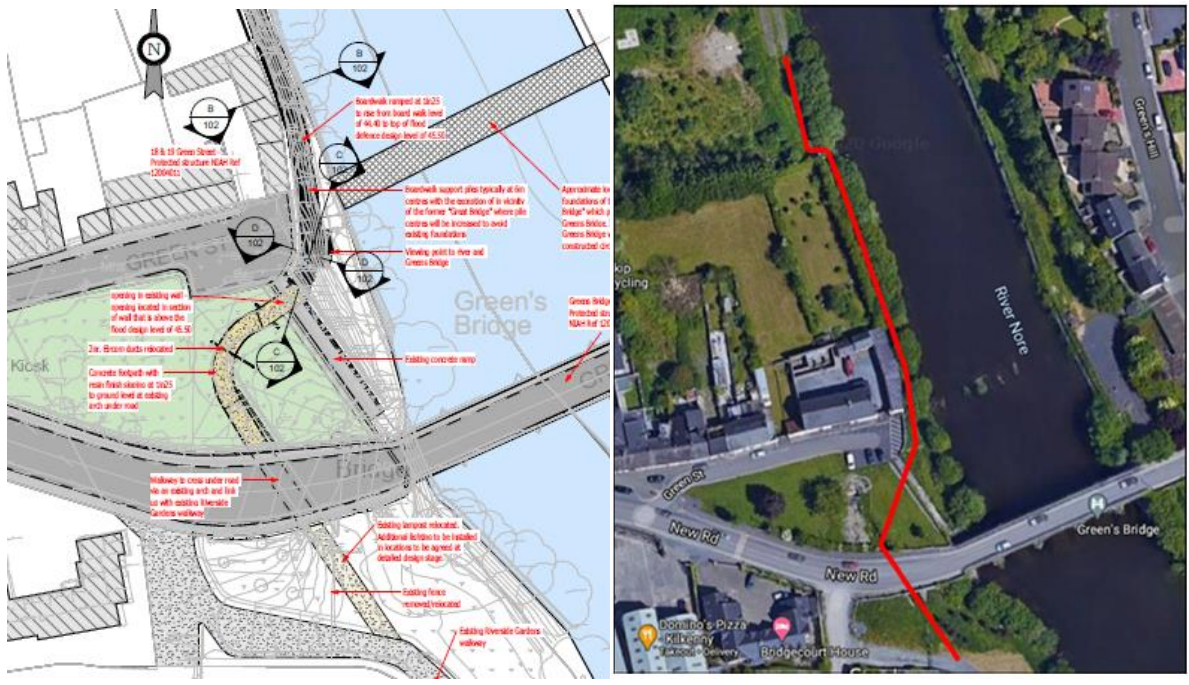
Planning Legislation:

Planning and Development Regulations 2001-as amended, Schedule 5, Part 1 and 2
European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018 Article 75 which amends Article 120 of the Planning and Development Regulations 2001-as amended
Planning and Development Act 2000 – as amended

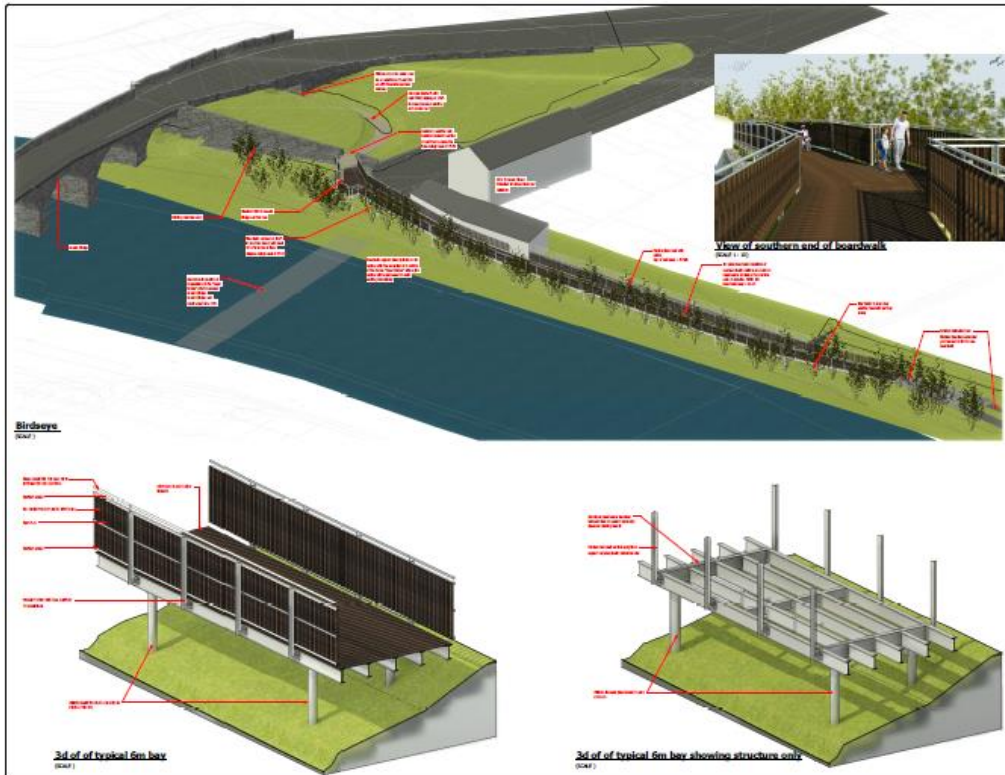
Scope of Screening:

This EIA screening will relate to a Part 10 planning application process, whereby Kilkenny County Council is proposing to develop a pedestrian and cycle link on the western bank of the River Nore, Kilkenny, between the Riverside Gardens (Abbey Quarter) and The River Nore Linear Park (Bishops Meadows). The link is required to provide a safe pedestrian route along the river’s edge from the River Nore Linear Park to the Riverside Gardens. The link is currently provided via a series of access routes which take the public away from the river’s edge.

Visuals:



EIAR screening – Pedestrian Link River Nore



Characteristics of Project

Under this 177AE proposal, Kilkenny County Council are proposing the following works:

The proposed pedestrian link, in the form of a boardwalk, is required to join up the existing River Nore Linear Park trail, approx. 160m upstream of Greens Bridge to the new Riverside Gardens walk, approx. 30m downstream of Greens Bridge. The overall length of the pedestrian link is approximately 190m.

This link will make use of the existing westernmost spare arch beneath Greens Bridge and will necessitate the construction of a boardwalk to complete the link upstream of Greens Bridge. The walkway structure will be required alongside private property on the west bank of the River Nore.

Screening Report:

A screening report for EIAR was prepared by Kilgallen and Partners was submitted, which concluded the proposed development does not require a mandatory EIAR as it does not meet or exceed a defined threshold and is considered sub-threshold for EIA purposes. On completion of the screening assessment required for sub threshold developments, it is concluded that the project due to its nature, scale and location is not likely to have significant effects on the environment and therefore does not require EIA.

Legislative Context:

Environmental Impact Assessment is mandatory for specified project types which are likely to have significant effects on the receiving environment. These projects are listed in detail in the EIA Directive, as well as in the Planning and Development Regulations, Schedule 5, Part 1.

The proposed development has been screened against the types of development, various processes and activities listed in Schedule 5 Part 1 of the Planning and Development Regulations, 2001 (as amended). The proposed development does not fall within these project types.

In addition, projects should be further considered against processes and activities listed in Schedule 5 Part 2 of the Planning and Development Regulations, 2001 (as amended).

One activity brings the project within scope:

- 10. Infrastructure projects

EIAR screening – Pedestrian Link River Nore

(b)(iv) Urban development which would involve an area greater than 2 hectares in the case of a business district, 10 hectares in the case of other parts of a built-up area and 20 hectares elsewhere.

In response, the subject site comprises a development area of 190m length x 3m width which constitutes an area of 570m² amounting to 0.057ha. and does not surpass the 2-hectare threshold. It is located in what can be considered part of a built-up area.

The proposed project falls within a class of development specified in Part 2 of Schedule 5 of the Planning and Development Regulations, 2001 (as amended). The project however falls well below the thresholds as defined under this class of development.

Sub threshold potentials for impact

From the screening report it is noted that:

“The primary challenges stem from the construction phase, notably waste removal. Temporary impacts, including noise, dust, and visual disturbances, are predicted. Once operational, the project is not expected to introduce negative impacts. The proximity of the site to two Natura 2000 sites indicates a potential for habitat loss and fragmentation. Construction activities are advised against during the bird nesting season, and the presence of otters and bats in nearby areas requires consideration.”

“Bird species, including the Kingfisher, might be affected, primarily due to the proposed additional LED lighting. The design aims to minimize disturbances to these species. Invasive plant species such as Giant hogweed, butterfly bush, and winter heliotrope have been recorded nearby.”

The impacts on the Nore /Barrow Natura 2000 site are considered in the Appropriate Assessment screening.

Conclusion

It is determined that based on the above preliminary examination, there is no real likelihood of significant effects on the environment arising from the proposed development works. Accordingly, the project can be screened out and **no** Environmental Impact Assessment Report is required.



13/10/23

Senior Executive Planner,

I agree with the above



D. Malone
Senior Planner

SCREENING FOR ENVIRONMENTAL IMPACT ASSESSMENT

**Pedestrian & Cycle Link between the River Nore
Linear Park and The Riverside
Gardens, Co. Kilkenny**

Prepared for: **Kilgallen & Partners Ltd**

SLR Ref: 501.065041.00001
August 2023

SLR 

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CONTENTS

1.0	INTRODUCTION	1
1.1	Project Overview and Rationale	1
1.2	Existing Development	1
1.3	Proposed Development	2
2.0	THE EIA SCREENING PROCESS.....	5
2.1	Introduction	5
2.2	Legislative Requirements	5
2.3	Methodology.....	5
2.4	EIA Development	7
3.0	SUB - THRESHOLD DEVELOPMENT.....	9
4.0	CHARACTERISTICS OF THE PROPOSED DEVELOPMENT	13
4.1	The size of the proposed development	13
4.2	Description of Proposed Scheme	13
5.0	THE LOCATION OF THE PROPOSED DEVELOPMENT	15
5.1	The existing and approved land use.....	15
5.2	The relative abundance, availability, quality and regenerative capacity of natural resources in the area and its underground.....	17
5.3	The absorption capacity of the natural environment	17
6.0	CHARACTERISTICS OF POTENTIAL IMPACT.....	20
6.1	The magnitude and spatial extent of the impact	20
6.2	The nature of the impact	20
6.3	The transboundary nature of the impact.....	20
6.4	The intensity and complexity of the impact.....	20
6.5	Designated Sites.....	20
6.6	Otter	24
6.7	Bats	24
6.8	Birds	25
6.9	Trees, Hedgerows and Vegetation	25
6.10	Invasive Species.....	25
6.11	Water Quality	26

6.12	Invasive Species.....	26
6.13	Summary of all potential impacts.....	26
7.0	CONCLUSION.....	28

1.0 Introduction

The purpose of this report is to identify the legal requirement or otherwise for an Environmental Impact Assessment to be carried out for a Pedestrian & Cycle link between the river Nore linear park and the Riverside Gardens in Kilkenny City, Co Kilkenny.

1.1 Project Overview and Rationale

This EIA screening will relate to a Part 10 planning application process, whereby Kilkenny County Council is proposing to develop a pedestrian and cycle link on the western bank of the River Nore, Kilkenny, between the Riverside Gardens (Abbey Quarter) and The River Nore Linear Park (Bishops Meadows). The link is required to provide a safe pedestrian route along the river's edge from the River Nore Linear Park to the Riverside Gardens. The link is currently provided via a series of access routes which take the public away from the river's edge.

1.2 Existing Development

The River Nore Linear Park, which comprises of 2.6km of walk/cycleway in Bishops Meadows, was constructed in 2006 and is currently linked to the Peace Park Walk and Canal Walk through a series of access routes, which take the public away from the river's edge, as indicated in Appendix A. The Riverside Gardens project, which was constructed in 2020, forms part of the Abbey Quarter Masterplan, providing a pedestrian and cycle link between Greens Bridge and Bateman Quay. The new boardwalk will connect both these walkways along the banks of the river.

A feasibility study was carried out in 2009, to explore options to connect the River Nore Linear Park at Bishops Meadows to the existing track/ramp at Greens Bridge. The 2009 project never came to fruition, but the new proposed project will include this element of the works and go a step further, by linking through to the new Riverside Gardens Project at the Abbey Quarter, using a spare arch in the adjoining Greens Bridge.



Figure 1:
The River Nore Linear Park

1.3 Proposed Development

The River Nore Linear Park, which comprises of a 2.6km of walkway in Bishops Meadows, was constructed in 2006 and is currently linked to the Peace Park Walk and Canal Walk through a series of access routes, which take the public away from the river's edge, as indicated in Figure 1. The Riverside Gardens project, which was constructed in 2020/21, forms part of the Abbey Quarter Masterplan, providing a pedestrian link between Greens Bridge and Bateman Quay.

The proposed pedestrian link, in the form of a boardwalk, is required to join up the existing River Nore Linear Park trail, approx. 160m upstream of Greens Bridge to the new Riverside Gardens walk, approx. 30m downstream of Greens Bridge. The overall length of the pedestrian link is approximately 190m (Figure 2).

This link will make use of the existing westernmost spare arch beneath Greens Bridge and will necessitate the construction of a boardwalk to complete the link upstream of Greens Bridge. The walkway structure will be required alongside private property on the west bank of the River Nore.

Figure 2-1:
Proposed route linking Linear Park and Riverside Gardens Indicative Layouts)

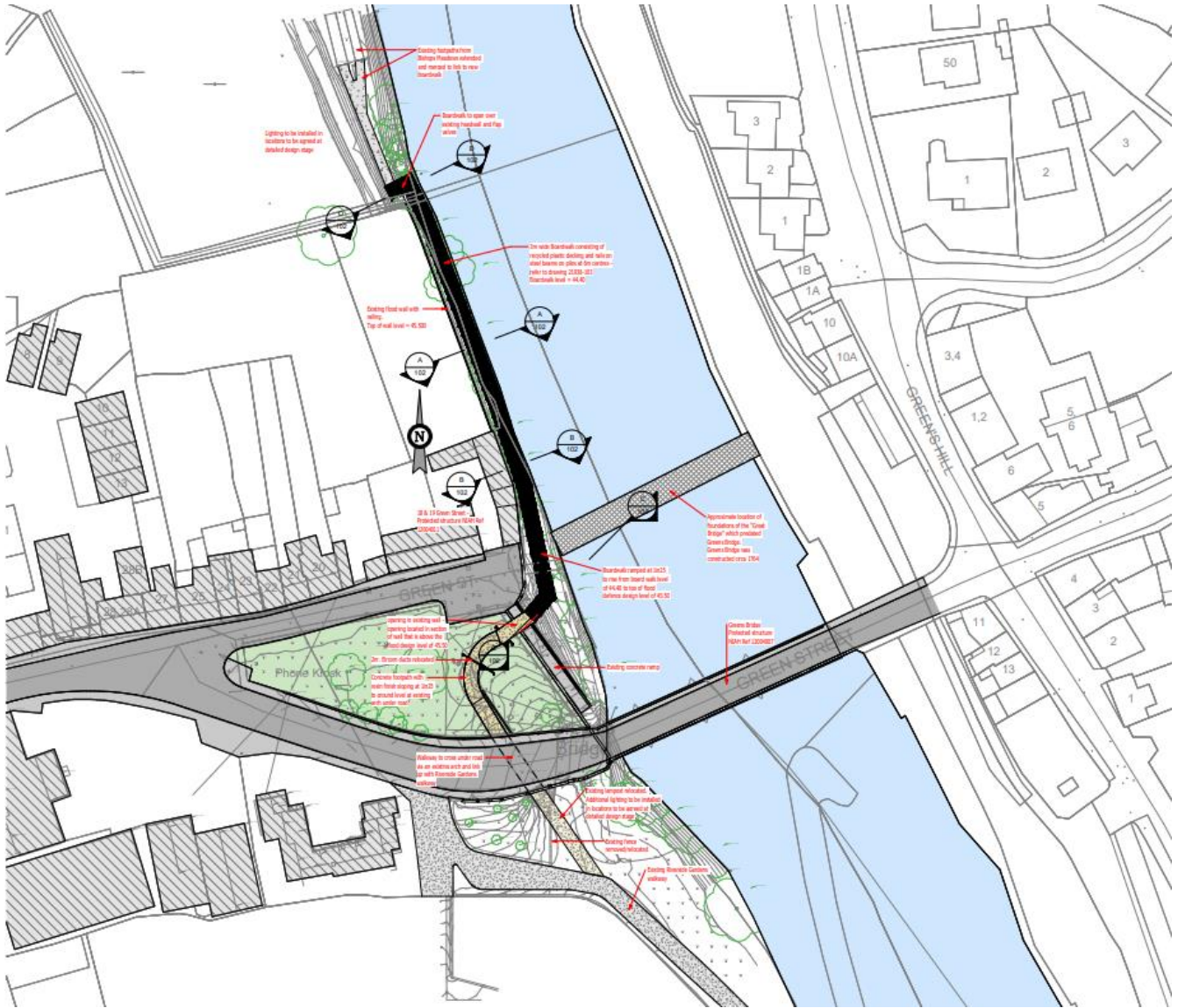
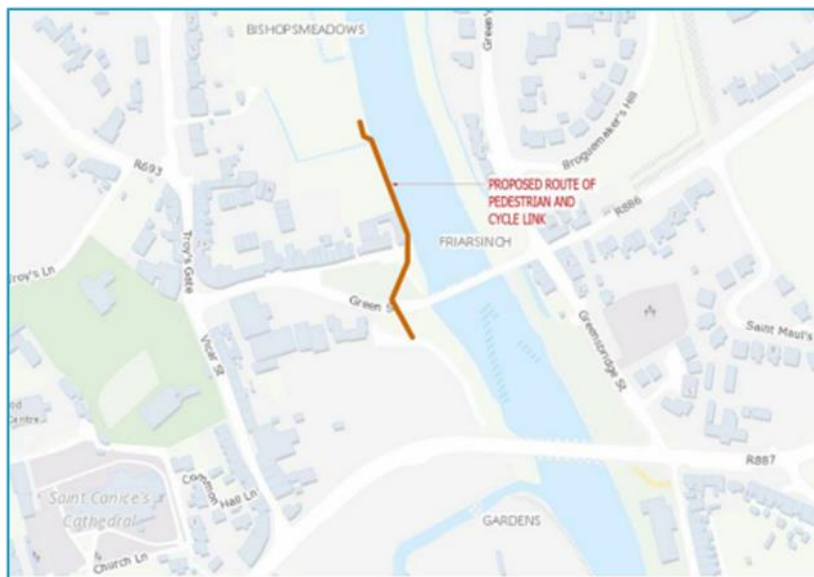


Figure 2-2



Figure 2-3



2.0 The EIA Screening Process

2.1 Introduction

This section of the report sets out the legislative basis for ‘EIA Screening’ to decide whether a proposed development would require the preparation of an Environmental Impact Assessment Report (EIAR).

2.2 Legislative Requirements

EIA requirements derive from Council Directive 85/337/EEC (as amended by Directives 97/11/EC, 2003/35/EC and 2009/31/EC) and as codified and replaced by Directive 2011/92/EU of the European Parliament and the Council on the assessment of the effects of certain public and private projects on the environment (and as amended in turn by Directive 2014/52/EU). Directive 2014/52/EU is transposed into Irish law under the European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018.

Projects can be placed into one of the following categories:

- those that exceed the thresholds laid down and therefore have a mandatory requirement to prepare an EIAR;
- those projects that are sub-threshold and must be assessed on a case-by-case basis to determine whether or not they are likely to have significant effects on the environment; and
- projects that fall under Annex II (13) (a) of the Directive for any change or extension of projects listed in Annex I or Annex II, already authorised, executed in the process of being executed.
- Projects that fall under Article 120 of the Planning and Development Regulations 2001 (as amended) with respect to Sub-threshold EIAR.

2.3 Methodology

Screening is the process of deciding whether a development requires an EIAR. The particulars of the assessment procedure are adopted through European Directives and correlate to the provisions set out in the Planning and Development Act 2001 (as amended). An EIA is required to be carried out as part of an application whereby the proposed development exceeds the limitations of Schedule 5 of the Planning and Development Regulations 2001 (as amended). The methodology for screening generally considers the following documents:

- Guidelines on the information to be contained in Environmental Impact Assessment Reports (Environmental Protection Agency, May 2022);
- Environmental Impact Assessment Screening, Practice Note PN02 (OPR, June 2021).
- Guidelines on EIA Screening (The European Commission, June 2017).
- Interpretation of definitions of project categories of annex I and II of the EIA Directive (European Commission 2015);
- Environmental Impact Assessment (EIA), Guidance for Consent Authorities regarding Sub-threshold Development (Environmental Protection Agency, 2003);

The ‘*Guidelines on the Information to be Contained in Environmental Impact Assessment Reports*’ (Environmental Protection Agency, May 2022) provide a flow diagram of the screening process which is provided in the figure below.

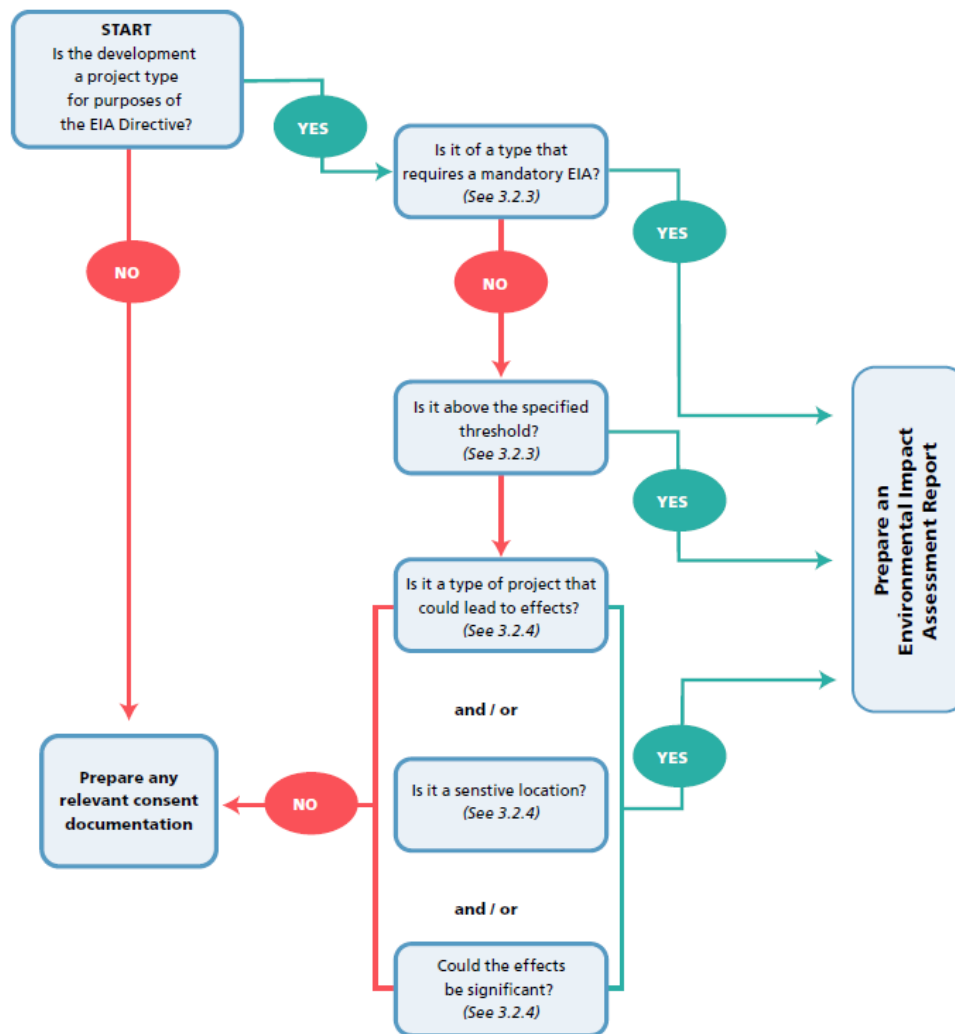


Figure 3:

Flow Diagram of the Screening Process (Source: *Guidelines on the Information to be Contained in Environmental Impact Assessment Reports*, Environmental Protection Agency, May 2022)

2.4 EIA Development

Environmental Impact Assessment is mandatory for specified project types which are likely to have significant effects on the receiving environment. These projects are listed in detail in the EIA Directive, Annex I, (85/337/EU – amended 97/11/EC, 2003/35/EC, 2009/31/EC, EC, 2014/52/EU), as well as in the Planning and Development Regulations, Schedule 5, Part 1 – Development for the purposes of Part 10.

The relevant class of projects referred to in article 4(1), have been provided in the table below. The proposed development has been screened against the types of development, various processes and activities listed in Schedule 5 Part 1 of the Planning and Development Regulations, 2001 (as amended). The proposed development does not fall within these project types.

Table 1-1: Projects Referred to in Article 4(1)

Projects referred to in article 4(1)
Crude-oil refineries and installations for the gasification and liquefaction of materials
Thermal power and nuclear power stations
Installations for the processing of irradiated nuclear fuel
Integrated works for the initial smelting of cast iron and steel, and installations for the production of non-ferrous crude metals from ore, concentrates or secondary raw materials
Installations for the extraction of asbestos and for the processing and transformation of asbestos and products containing asbestos
Integrated chemical installations
Construction of railway lines, airports, motorways, express roads, construction of new road with four or more lanes
Inland waterways and ports, trading ports, and piers
Waste disposal installations for the incineration and chemical treatment
Groundwater abstraction or artificial groundwater recharge schemes
Works for the transfer of water resources between river basins
Waste water treatment plants
Extraction of petroleum and natural gas for commercial purposes
Dams and other installations designed for the holding back or permanent storage of water
Pipelines with a diameter of more than 800 mm of more than 40 km
Installations for the intensive rearing of poultry or pigs
Industrial plants
Quarries and open-cast mining
Construction of overhead electrical power lines
Installations for storage of petroleum, petrochemical, or chemical products
Storage sites
Installations for the capture of CO ² streams for the purposes of geological storage

In addition, projects should be further considered under the relevant list of activities which warrant discretionary consideration for the requirement of an EIA. Subject to Article 2(4), for the projects listed in Annex II of the Directive¹.

¹ 85/337/EU – amended 97/11/EC, 2003/35/EC, 2009/31/EC, 2014/52/EU,

Schedule 5, Part 2 of the Planning and Development Regulations, 2001 (as amended) set out and define Development for the purposes of Part 10. Sub threshold development means development of a type set out in Part 2 of Schedule 5 which does not equal or exceed or, as the case may be, a quantity, area or other limit specified in that Schedule in respect of the relevant class of development.

Table 1-2: Schedule 5, Part 2 - Class of Development

Schedule 5, Part 2 - Class of Development
1) Agriculture, silviculture, and aquaculture
2) Extractive industry
3) Energy industry
4) Production and processing of metals
5) Mineral industry
6) Chemical industry
7) Food industry
8) Textile, leather, wood, and paper industries
9) Rubber industry
10) Infrastructure projects
11) Other projects
12) Tourism and leisure
13) Changes, extensions, development, and testing
14) Works of demolition
15) Any other project

For clarity, the relevant section of the Regulations in respect of Classes 10 and 15 *as highlighted above), which have been given further consideration are set out below:

10. Infrastructure projects

(b)(iv) Urban development which would involve an area greater than 2 hectares in the case of a business district, 10 hectares in the case of other parts of a built-up area and 20 hectares elsewhere.

In response, the subject site comprises a development area of 190m length x 3m width which constitutes an area of 570m² amounting to 0.057ha. and does not surpass the 2-hectare threshold. It is located in what can be considered part of a built-up area. The area of the subject site is zoned 'Z8 Georgian Conservation Areas' within the current Kilkenny City and County Development Plan 2021 – 2027.

The proposed project falls within a class of development specified in Part 2 of Schedule 5 of the Planning and Development Regulations, 2001 (as amended). The project does not meet or exceed the thresholds as defined under this class of development referred to in Schedule 5, Part 2 and as such is considered sub-threshold for the purposes of an EIA.

EIA Screening is therefore required having regard to Class 15. *Any other project, which states:*

Any project listed in this Part which does not exceed a quantity, area or other limit specified in this Part in respect of the relevant class of development but which would be likely to have significant effects on the environment, having regard to the criteria set out in Schedule 7.

This is considered in more detail in this report.

3.0 Sub - Threshold Development

EIA Screening for Sub-threshold development is provided for under Article 120 and Schedule 7A of the Planning and Development Regulations, 2001 (as amended).

Article 120 (Sub-threshold EIAR) of the Regulations states that:

(1)

(a) Where a local authority proposes to carry out a subthreshold development, the authority shall carry out a preliminary examination of, at the least, the nature, size or location of the development.

(b) Where the local authority concludes, based on such preliminary examination, that—

(i) there is no real likelihood of significant effects on the environment arising from the proposed development, it shall conclude that an EIA is not required,

(ii) there is significant and realistic doubt in regard to the likelihood of significant effects on the environment arising from the proposed development, it shall prepare, or cause to be prepared, the information specified in Schedule 7A for the purposes of a screening determination, or

(iii) there is a real likelihood of significant effects on the environment arising from the proposed development, it shall—

(I) conclude that the development would be likely to have such effects, and

(II) prepare, or cause to be prepared, an EIAR in respect of the development.

(1A)

(a) Where the local authority prepares, or causes to be prepared, the information specified in Schedule 7A, the information shall be accompanied by any further relevant information on the characteristics of the proposed development and its likely significant effects on the environment, including, where relevant, information on how the available results of other relevant assessments of the effects on the environment carried out pursuant to European Union legislation other than the Environmental Impact Assessment Directive have been taken into account.

(b) Where the local authority prepares, or causes to be prepared, the information specified in Schedule 7A, the information may be accompanied by a description of the features, if any, of the proposed development and the measures, if any, envisaged to avoid or prevent what might otherwise have been significant adverse effects on the environment of the development.

(1B)

(a) Where the information specified in Schedule 7A and sub-article (1A) is prepared in respect of a proposed subthreshold development, the local authority shall carry out an examination of, at the least, the nature, size or location of the development for the purposes of a screening determination.

(b) The local authority shall make a screening determination and —

(i) if such determination is that there is no real likelihood of significant effects on the environment arising from the proposed development, it shall determine that an EIA is not required, or

(ii) if such determination is that there is a real likelihood of significant effects on the environment arising from the proposed development, it shall—

(I) determine that the development would be likely to have such effects, and

(II) prepare, or cause to be prepared, an EIAR in respect of the development.

A full assessment is completed and set out in this report.

In accordance with Annex I & II of The Directive, Infrastructure projects, where they are sub-threshold, require the following assessment:

1. A description of the proposed development, including in particular:
 - a) a description of the physical characteristics of the whole proposed development and, where relevant, of demolition works;
 - b) a description of the location of the proposed development, with regard to the environmental sensitivity of geographical areas likely to be affected.
2. A description of the aspects of the environment likely to be significantly affected by the proposed development.
3. A description of any likely significant effects, to the extent of the information available on such effects, of the proposed development on the environment resulting from:
 - a) the expected residues and emissions and the production of waste, where relevant;
 - b) the use of natural resources, in particular soil, land, water and biodiversity.
4. The compilation of the information at paragraphs 1 to 3 shall take into account, where relevant, the criteria set out in Schedule 7.'

The criteria contained within Annex III, (i.e. the criteria that must be considered when making screening decisions on a case by case basis), as transposed in Irish legislation, for assessing sub-threshold development are grouped under three headings viz. (i) Characteristics of Proposed Development, (ii) Location of Proposed Development and (iii) Characteristics of Potential Impacts.

Competent/consent authorities must have regard to these criteria in forming an opinion as to whether or not a sub-threshold development is likely to have significant effects on the environment by virtue inter alia of its nature, size or location and should be subject to EIA. The key issue is: “are the likely effects ‘significant’ in the context of these criteria”.

Schedule 7 of the Regulations set out the criteria as follows:

Table 2 - 1: Criteria for the purposes of sub-threshold development

1. Characteristics of proposed development

The characteristics of proposed development, in particular to:

- the size and design of the whole of the proposed development,
- cumulation with other existing development and/or development the subject of a consent for proposed development for the purposes of section 172(1A)(b) of the Act and/or development the subject of any development consent for the purposes of the Environmental Impact Assessment Directive by or under any other enactment,
- the nature of any associated demolition works,
- the use of natural resources, in particular land, soil, water and biodiversity,
- the production of waste,
- pollution and nuisances,
- the risk of major accidents, and/or disasters which are relevant to the project concerned, including those caused by climate change, in accordance with scientific knowledge, and
- the risks to human health (for example, due to water contamination or air pollution).

2. Location of proposed development

The environmental sensitivity of geographical areas likely to be affected by proposed development, having regard in particular to:

- (a) the existing and approved land use,
- (b) the relative abundance, availability, quality and regenerative capacity of natural resources (including soil, land, water and biodiversity) in the area and its underground,
- (c) the absorption capacity of the natural environment, paying particular attention to the following areas:
 - (i) wetlands, riparian areas, river mouths;
 - (ii) coastal zones and the marine environment,
 - (iii) mountain and forest areas,
 - (iv) nature reserves and parks,
 - (v) areas classified or protected under legislation, including Natura 2000 areas designated pursuant to the Habitats Directive and the Birds Directive and;
 - (vi) areas in which there has already been a failure to meet the environmental quality standards laid down in legislation of the European Union and relevant to the project, or in which it is considered that there is such a failure,
 - (vii) densely populated areas,
 - (viii) landscapes of historical, cultural or archaeological significance.

3. Characteristics of potential impacts

The potential significant effects of projects in relation to criteria set out under paragraphs 1 and 2 above, and having regard in particular to:

- (a) the magnitude and spatial extent of the impact (for example, geographical area and size of the population likely to be affected).
- (b) the nature of the impact.
- (c) the transboundary nature of the impact.
- (d) the intensity and complexity of the impact.
- (e) the probability of the impact.
- (f) the expected onset, duration, frequency and reversibility of the impact.
- (g) the cumulation of the impact with the impact of other existing and/or development the subject of a consent for proposed development for the purposes of section 172(1A)(b) of the Act and/or development the subject of any development consent for the purposes of the Environmental Impact Assessment Directive by or under any other enactment, and
- (h) the possibility of effectively reducing the impact.

Table 2 - 2: Schedule 7A Information to be provided by the Applicant or Developer for the purposes of screening and sub-threshold development for Environmental Impact Assessment.

<p>1. A description of the proposed development, including in particular— (a) a description of the physical characteristics of the whole proposed development and, where relevant, of demolition works, and (b) a description of the location of the proposed development, with particular regard to the environmental sensitivity of geographical areas likely to be affected.</p>
<p>2. A description of the aspects of the environment likely to be significantly affected by the proposed development.</p>
<p>3. A description of any likely significant effects, to the extent of the information available on such effects, of the proposed development on the environment resulting from— (a) the expected residues and emissions and the production of waste, where relevant, and (b) the use of natural resources, in particular soil, land, water and biodiversity.</p>
<p>4. The compilation of the information at paragraphs 1 to 3 shall take into account, where relevant, the criteria set out in Schedule 7.</p>

4.0 Characteristics of the Proposed Development

Having regard to the sub-threshold criteria set out in Section 3 and Table 1, this section of the report addresses the assessment of sub-threshold development under the heading (i) Characteristics of Proposed Development.

4.1 The size of the proposed development

As stated in section 1.3, the site of the proposed pedestrian link is located on the west bank of the River Nore, as per Figure 2. The link is required to join up the existing River Nore Linear Park trail, approx. 160m upstream of Greens Bridge to the new Riverside Gardens walk, approx. 30m downstream of Greens Bridge. The overall length of the pedestrian link is approximately 190m or 0.057 hectares.

4.2 Description of Proposed Scheme

This link will make use of the existing westernmost spare arch beneath Greens Bridge (see Figure 2-2) and will necessitate the construction of a walkway structure to complete the link upstream of Greens Bridge. The walkway structure will be required alongside private property on the west bank of the River Nore. Landscaping, Street Furniture and Finishes will be consistent with the Riverside Garden Project.

Consideration will be given to how the new link could, in future, tie into the existing pedestrian walkway across Greens Bridge or a future variation of same. This connection will not form part of the current project, but consideration shall be given to same in the preparation of the detailed design.

Based on CFRAM mapping the 1 in 10-year flood level in the vicinity of Greens Bridge is 44.38m. The proposed boardwalk level is 44.40m, and therefore above the 1 in 10-year floor. It is not practical to set the deck level above the 1 in 100-year flood level (45.07m) as the deck will be elevated to such a level that tie ins to existing infrastructure at both ends will prove difficult. As with other riverside boardwalks in the city, Kilkenny County Council may choose to put a plan in place to prevent access to the boardwalk when in high flood. The proposed open deck and substructure nature of the boardwalk allows flood waters to flow through and beneath, thus ensuring that the impact of the proposal on flood levels is negligible.

The proposed width is generally 3m, with local short portions reduced to 2.2m at pinch points between existing trees and walls and the river's edge. Parapets are required to provide fall protection at the sides of the boardwalk. A parapet height of 1.5m is considered suitable in this case to cater for both cyclists and pedestrians. Painted mild steel vertical uprights are proposed to support recycled plastic horizontal rails.

The extension of the footpath link from Bishops Meadows will be lit with additional lamp standards, as will the footpath link to The Riverside Gardens. The locations for these will be agreed at detailed design stage. The boardwalk section will be lit with LED lighting incorporated into the parapet top rail.

The boardwalk structure will consist of 200mm diameter bottom driven tubular steel mini piles infilled in concrete pairs at 2m centres laterally and 6m centres longitudinally. Steel beams will span between the pile heads to support the boardwalk decking. The drawings included in Appendix B of this report show the preliminary design. 2nr. test piles were successfully installed to verify the viability of the proposed preliminary design.

The deck surface is proposed to be manufactured from recycled plastic. This is an environmentally friendly material with nonslip characteristics and is rot proof thus significantly reducing maintenance. Hardwood could be considered as an alternative however, would require additional maintenance.

At the southern end of the route, the link from the Riverside Gardens will cross under the road via an existing arch and ramp up through the existing green area at a fall of approx. 1 in 25. From the top of the existing concrete ramp the boardwalk will ramp down at a fall of 1 in 25. At the northern end, Bishops Meadows, the existing footpath will link to the boardwalk at existing levels. The boardwalk will span over the top of the existing headwall, ensuring that there is no impact on the existing flap valves.

It is proposed that the boardwalk deck would be constructed in slatted recycled plastic boards. Joints will be open, allowing rainwater to pass directly through the deck without the requirement for collection and disposal. At the northern end the extended concrete footpaths will drain to the grass verge. At the southern end, the ramped path will drain to the grass verge. On the southern side of the arch, some minor regrading works will be required to allow the footpath to drain freely to the grass verge.

A Ground Investigation was carried out at feasibility stage to establish if the ground was suitable for mini piles. The ground consisted of topsoil over gravelly silty clay fill over natural deposits of gravelly silt and sandy gravels with medium to high cobble content. The full geotechnical report is in the attached. Following completion of the initial ground investigation two test piles were driven at two separate locations along the river bank to establish if it were possible to drive the tubular steel mini piles through the ground. Both piles were driven successfully to a refusal depth of approximately 8 metres below bank level.



Figure 4:
Photo of test pile

5.0 The Location of the Proposed Development

The general location of the proposed pedestrian and cycle link is along the western bank of the River Nore, Kilkenny, to the north of greens bridge – see Figure 2, Section 1.3. At the southernmost end of the new route, the walkway will deviate away from the riverbank, across an existing green area, and under Green Street via an existing arch. On the southern side of Greens Bridge the new walkway will link to the recently completed Riverside Gardens.

Greens Bridge (RPS Reference, D4) was designed by George Smith. The bridge represents one of several bridges in County Kilkenny rebuilt by George Smith following the “Great Flood” of 1763. Castlecomer Bridge, Graiguenamanagh Bridge and Inistioge Bridge are other examples. No works or alterations to the existing bridge are considered as part of this report.

The second criteria for the evaluation of sub-threshold developments (referred to in section 4) relates to the environmental sensitivity of geographical areas likely to be affected by the proposed development.

5.1 The existing and approved land use

In terms of sensitivities to land use, site access, cramage and the temporary works requirements are the primary constraints in terms of the constructability of the boardwalk. The two options for works access are either via Bishops Meadows to the north of the boardwalk or via the small car park to the south of the boardwalk. The area for the proposed development is primarily located in two zonings.

- **Zone Z6 General Business:**
Whereby the Objective is to provide for general development. The Permitted uses are Dwellings, retailing, retail warehousing, wholesale outlets, offices, public buildings or places of assembly, cultural or educational buildings, recreational buildings, halting sites, hotels, motels, guest houses, clubs, private garages, open spaces, public service installations, medical and related consultants, restaurants, public houses, coffee shops/cafes, petrol stations, car parks, halls or discotheques, and other uses as permitted and open for consideration in residential zoning. Uses are outlined in the Abbey Quarter masterplan and Urban Design Code within the Abbey Quarter area. It is Open for consideration with regards to open space, workshop or light industry.
- **Z12 Amenity/ Green links/ Biodiversity conservation, Open space/ Recreation:**
Whereby the Objective is to allow for green links and biodiversity conservation and to preserve, provide and improve recreational open space. The permitted uses are Open space, sports clubs, recreational buildings, stands, pavilions, agricultural uses, halting site, and public service installations. With regards to Flood Risk, it is noted that all proposed developments within this zone which falls within flood zone A or B shall be subject to a site-specific flood risk assessment. No highly vulnerable uses (as set out in the Flood Risk Management Guidelines) other than extensions to existing structures and uses, will be permitted within Flood Zone A or B. Less vulnerable uses will also not be allowed within Flood Zone A other than extensions to existing structures and uses as set out in the Flood Risk Management guidelines.

Special Areas of Conservation (SAC) and Special Protection Areas (SPA) overlap with the site. The proposed link passes by a listed building at proximity, KK019-026208 House – 17th/18th century.

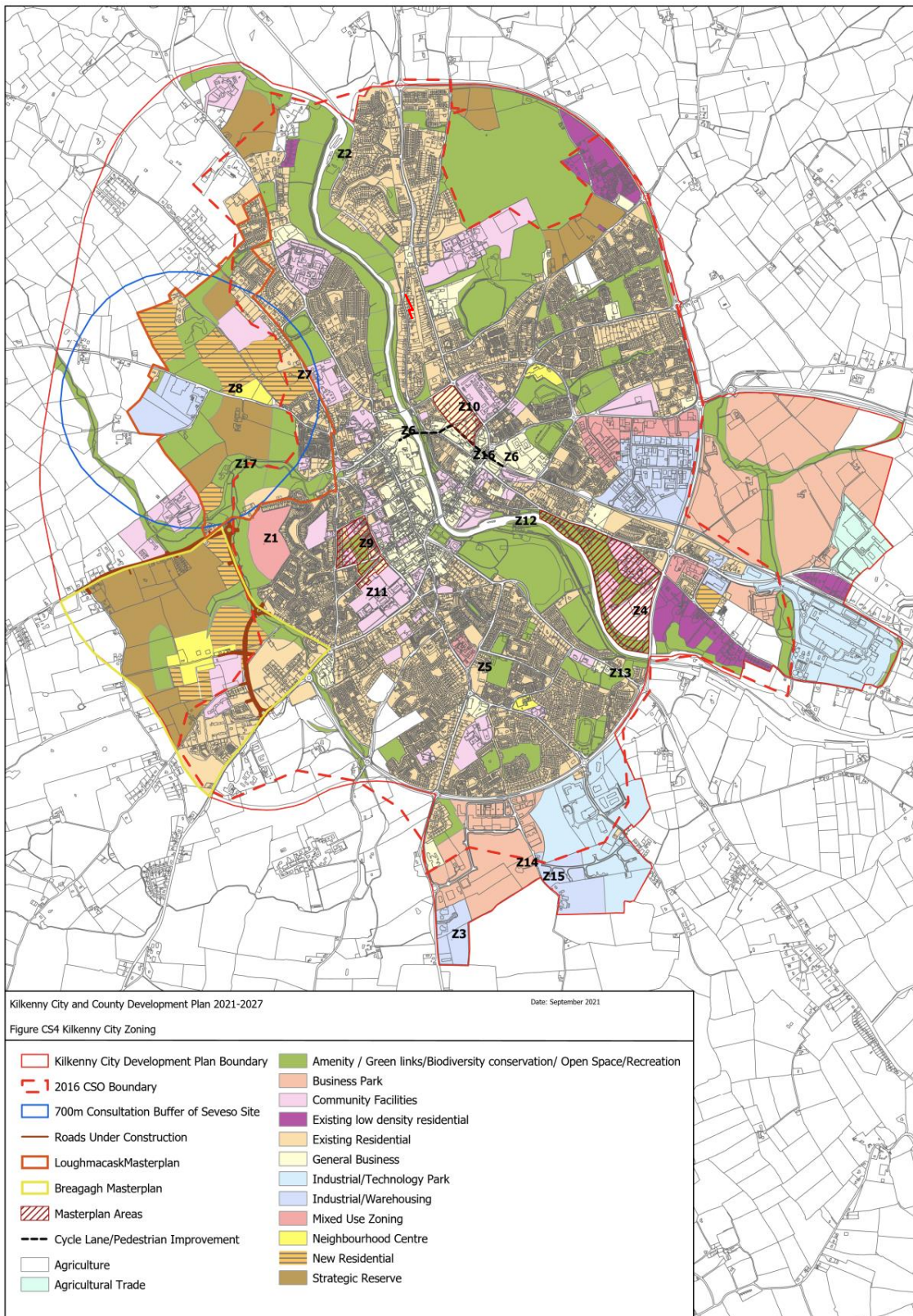


Figure 5:

Kilkenny City Zoning Map and Site marked in Red (Source Kilkenny City and County Development Plan 2021 – 2027)

5.2 The relative abundance, availability, quality and regenerative capacity of natural resources in the area and its underground

The pedestrian & cycle link will not have significant impact on the river ecology, as is set out in AA Screening and NIS. Ongoing liaison will be carried out with Inland Fisheries during design stage to arrive at a solution that is acceptable in terms of protection of fish life.

5.3 The absorption capacity of the natural environment

This subsection of the second criterion relates to the absorption capacity of the existing environment having particular regard to:

- I. wetlands, riparian areas, river mouths;
- II. coastal zones and the marine environment;
- III. mountain and forest areas;
- IV. nature reserves and parks;
- V. areas classified or protected under legislation, including Natura 2000 areas designated pursuant to the Habitats Directive and the Birds Directive;
- VI. areas in which there has already been a failure to meet the environmental quality standards laid down in legislation of the European Union and relevant to the project, or in which it is considered that there is such a failure;
- VII. densely populated areas;
- VIII. landscapes of historical, cultural, or archaeological significance.

With respect to wetlands, riparian areas and rivers mouths, the proposed boardwalk design has been issued to OPW as part of the feasibility stage process, and feedback was received, primarily relating to flood impact and maintenance requirements. At the detailed design stage, the impact of the proposal on the flood levels has been considered. The proposed open deck and substructure nature of the boardwalk allows flood waters to flow through and beneath, thus ensuring that the impact of the proposal on flood levels is negligible. Based on CFRAM mapping the 1 in 10-year flood level in the vicinity of Greens Bridge is 44.38m. The proposed boardwalk level is 44.40m, and therefore above the 1 in 10-year floor.

The proposed open deck and substructure nature of the boardwalk allows flood waters to flow through and beneath, thus ensuring that the impact of the proposal on flood levels is negligible. Ongoing liaison with the OPW will be required to address the issue of maintenance and possible build up of debris under the boardwalk.

The Nore River forms part of the River Barrow and River Nore Special Area of Conservation (SAC Site Code 002162). The proposed boardwalk design has been issued to National Parks and Wildlife Service (NPWS) as part of the feasibility stage process. Prior to detailed design stage careful liaison, design and planning in conjunction with the NPWS was undertaken to protect the ecology of the area and in order to ensure that delays do not occur during the construction stage of the proposed boardwalk. This is discussed in more detail in section 7.5.

With regards to the environmental quality of the River Nore, the Water Framework Directive and the Strategic Environmental Assessment from the Kilkenny City & County Development plan 2021-2027 refers to the river as having 'good' status. Measures to protect existing water quality have also been incorporated into the project design. This includes:

- **Flood Risk Assessment:**
The proposed development is located on the banks of the River Nore and is inside the Kilkenny City Flood Relief Scheme, constructed by the Office of Public Works (OPW). This scheme provides protection against a 1 in 100-year flood event. Therefore, a Site Specific Flood Risk Assessment (FRA) will be required, appropriate to the nature and scale of the development being proposed. This is in line with the OPW

guidance documents "The Planning System and Flood Risk Management – Guidelines for Planning Authorities".

- **Kilkenny City Flood Relief Scheme:**

Special consideration should be given to low impact construction design to minimize the impact on the existing channel width of the River Nore. The design of any path or walkway should not impact maintenance operations and access to the existing flood defence scheme, including flap valves. Maintenance of the boardwalk should consider potential debris or trees that could build up beneath and around the vertical piles. Designs should ensure they do not impact the structural stability or integrity of the existing flood defence.

- **Hydraulic Assessment:**

Where an encroachment into the channel can't be avoided, its impact should be minimized. A hydraulic assessment will need to be carried out by the designer to demonstrate that the scheme does not adversely affect the performance of the flood defence scheme or compromise the available freeboard in the 1% AEP event. A hydraulic assessment report should be prepared and submitted to the OPW for review.

- **Environmental Considerations:**

The site is located immediately adjacent to the River Nore in Kilkenny City. The River Nore is designated as part of the River Barrow and River Nore SAC (Site Code: 002162) and River Nore SPA (Site Code: 004233). These designations place significant environmental requirements on the development of the site.

- **Existing Services:**

The design team should note the presence of existing water mains and sewer pipelines in the vicinity of Greens Bridge. The location and level of these services should be taken into consideration in the design of the walkway.

As a result of these measures, any new development at proximity to the river would not pose any further damage to environmental quality standards.

With respect to the riverine environment, preliminary drawings were submitted to Inland Fisheries Ireland as part of the feasibility stage process. Ongoing liaison with the South Eastern Section of Inland Fisheries was carried out during the design stage and it was agreed with IFI that the construction work would be carried out in the summer months to minimise impact on the fish species migrating the river.

The Proposed Development is not located within mountain and forest areas. With regards to nature reserves and parks, the Proposed Development is located at the River Nore Linear Park trail, linking to the new Riverside Gardens walk, thus enhancing connectivity and amenity for a park.

With respect to landscapes of historical, cultural, or archaeological significance, the site is located within the St. Canices Architectural Conservation Area (ACA) and a Zone of Archaeological potential for the City Centre as outlined in the Kilkenny City & County Development Plan 2021 – 2027. The Proposed Development is also located within the Zone of Notification of Recorded Monuments for Kilkenny City and contains a number of significant heritage structures including:

- Greens Bridge (Protected Structure)
- No. 18 & 19 Green Street (Protected Structure)

An archaeological report has been prepared alongside this planning application which considers the archaeological impacts in further detail.

The site is within an area of low-density housing at proximity to Vicar Street, Tory's Gate and Green street, amenity/green links/ biodiversity conservation/ Open Space recreation within the Kilkenny City & County Development Plan 2021-2027. The intention of the development is to service the local population and enhance greenspace amenity of the area.

6.0 Characteristics of Potential Impact

The third criteria of for the evaluation of sub-threshold development (referred to in Section 4) relates to characteristics of potential impact.

6.1 The magnitude and spatial extent of the impact

The two options for construction works access are either via Bishops Meadows to the north of the boardwalk or via the small car park to the south of the boardwalk. Some preliminary civil works will be required to facilitate access for construction plant and operatives through Bishops Meadows.

The mini digger and mini piling rig for the ground investigation successfully used the access at the southern end. It is envisaged that the project would be carried out during the summer months when water levels are low and the ground is at its driest to minimise impact on the river bank. All of the required works can be undertaken from the river bank. No in river works are required or proposed. The proposed plastic and steel beam members can be transported along the river bank using small quad type vehicles within the 190m length (0.057 hectares) of the boardwalk.

6.2 The nature of the impact

The nature of the impact will be related to construction activity and short term and temporary in nature, the majority of which will be contained within the boundary of the subject site. During construction a slight negative effect to residential amenity is expected due to potential noise, dust and potential traffic diversions. However, the necessary construction activity is considered to be both short term and temporary and no lasting negative impacts are expected. Further information is found in the construction methodology technical note, 21038-TN01, which is included as an appendix to the Engineering Services Report.

6.3 The transboundary nature of the impact

The proposed development is located within the functional area of Kilkenny City Council. It is considered that the effects of the development are localised in nature and the Proposed Development will not have any transboundary impacts.

6.4 The intensity and complexity of the impact

The main potential impacts from the development arise from the construction stage and removal of waste material. During construction, temporary negative impacts are predicted due to noise, dust and visual impacts. It will also be required to remove excavated materials to licenced facilities where necessary. These impacts are not considered significant. During operation, the project is not projected to have a negative impact on adjoining land uses or road access due to the development of the link going under a bridge, thus mitigating any safety issues.

6.5 Designated Sites

To assess the results of the potential impacts, sites that have been designated for nature conservation within 2 km of the site are discussed in this section (see Table 1). A 2km radius is an appropriate radius given the localised nature and scale of the proposed works.

Table 3-1: Designated sites within 2km of the Proposed Development Site

Natura 2000 Site	Site Code	Location at Closest Point to Project Site
River Nore SPA	004233	Overlaps with the Site
River Barrow and Nore SAC	002162	Overlaps with the Site
Newpark Marsh pNHA	000845	710m north-east
Lough Macask pNHA	001914	1.3km north-west

Natura 2000 Sites

The Site is located within two Natura 2000 sites; River Nore SPA and River Barrow and Nore SAC. There is potential for impact on these sites through habitat loss and fragmentation. No habitats of significant concern were identified during the site visit. The proposed route is to be 190m in length and 3m in width. Therefore, the proposed development will result in the loss of approximately 570m² of non designated SAC habitat and thus having no qualifying interest). Where possible, trees and hedgerows should be retained to minimise this loss. Any opportunity for habitat enhancement or compensation should also be considered.

To avoid disturbance to nesting birds, no works should be undertaken during the bird nesting season, 1st March to 31st August.

The River Barrow & Nore SAC is designated for numerous aquatic species which rely on good water quality (e.g. lamprey species, freshwater pearl mussel, Nore pearl mussel, white-clawed crayfish, twaite shad and salmon). No in river works are required as part of this project. There will be no emissions to the river as a result of this project. Best practise should be used at all times considering proximity to the river to ensure that water quality is not impacted as a result of the proposed works.

The proposed development is located within the River Nore SPA and the River Barrow and Nore SAC. The qualifying features for both sites are set out in Table 2 below.

Table 3-2: Natura 2000 Sites within 2km of the Site and their Qualifying Interests

Natura 2000 Site	Qualifying Features
River Nore SPA 004233	<ul style="list-style-type: none"> Kingfisher (<i>Alcedo atthis</i>) [A229]
River Barrow and Nore SAC 002162	<ul style="list-style-type: none"> Estuaries [1130] Mudflats and sandflats not covered by seawater at low tide [1140] Reefs [1170] Salicornia and other annuals colonising mud and sand [1310] Atlantic salt meadows (<i>Glauco-Puccinellietalia maritima</i>) [1330] Mediterranean salt meadows (<i>Juncetalia maritimi</i>) [1410] Water courses of plain to montane levels with the <i>Ranunculion fluitantis</i> and Callitriche-Batrachion vegetation [3260] European dry heaths [4030] Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels [6430]

Natura 2000 Site	Qualifying Features
	<ul style="list-style-type: none"> • Petrifying springs with tufa formation (Cratoneurion) [7220] • Old sessile oak woods with Ilex and Blechnum in the British Isles [91A0] • Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (<i>Alno-Padion</i>, <i>Alnion incanae</i>, <i>Salicion albae</i>) [91E0] • <i>Vertigo moulinsiana</i> (Desmoulin's Whorl Snail) [1016] • <i>Margaritifera margaritifera</i> (Freshwater Pearl Mussel) [1029] • <i>Austropotamobius pallipes</i> (White-clawed Crayfish) [1092] • <i>Petromyzon marinus</i> (Sea Lamprey) [1095] • <i>Lampetra planeri</i> (Brook Lamprey) [1096] • <i>Lampetra fluviatilis</i> (River Lamprey) [1099] • <i>Alosa fallax fallax</i> (Twaite Shad) [1103] • <i>Salmo salar</i> (Salmon) [1106] • <i>Lutra lutra</i> (Otter) [1355] • <i>Trichomanes speciosum</i> (Killarney Fern) [1421] • <i>Margaritifera durrovensis</i> (Nore Pearl Mussel) [1990]

Natural Heritage Areas (NHAs) and proposed Natural Heritage Areas (pNHAs)

There are no designated Natural Heritage Areas (NHA) within 2km of the development site. There are two proposed Natural Heritage Areas (pNHAs) within 2km of the development site. These are the Newpark Marsh pNHA and Lough Macask pNHA. pNHAs are sites that have been formally proposed but not yet designated on a statutory basis.

Newpark Marsh pNHA (000845)

The Newpark Marsh pNHA is located c. 710m north-east of the Site. The pNHA site synopsis (NPWS, 2009) give the following account of the Newpark Marsh:

“Newpark Marsh is a small marsh on the outskirts of Kilkenny town, and although the water level seems to be falling at the moment, it still supports semi-natural fen vegetation dominated by Tufted-sedge (Carex elata) and including the notable Water Dock (Rumex hydrolapathum) amongst a suite of more typical species.

The area is used as a feeding site by three protected bat species, namely Leisler’s Bat (Nyctalus leisleri) Brown Long-eared Bat (Plecotus auratus) and Common Pipistrelle (Pipistrellus pipistrellus). Despite the location of this site, being so close to an urban population, it is very natural. This is unusual and increases the importance of this site.”

The River Nore is the closest freshwater source to the Newpark Marsh pNHA. Given the presence of three protected bat species at the Newpark Marsh, the short distance between the Site on the River Nore and Newpark Marsh and the potential for commuting corridors along urban treelines and hedgerows, it is possible that these species forage/ rehydrate at/ near the Site. Therefore, Newpark Marsh pNHA will be considered further in this report.

The main threats to the Newpark Marsh pNHA from the proposed development would be the potential for disturbance to bats commuting from the marsh to this section of the River Nore. The potential for this disturbance is a result of the proposed additional LED lighting along the route. This threat is also true for bat species/ populations not associated with the marsh but for which this section of the river provides commuting

and foraging habitat. Additional lighting along the route should be designed to be as bat friendly as possible. Good practice for minimising light impacts on bats include, but are not limited to, the following²;

- Avoid lighting along rivers, lakes & canals
- Avoid lighting along important commuting routes
- Avoid the use of mercury or metal halide lamps
- Minimise light spills using shields, masking & louvres
- Keep light columns as low as possible
- Restrict lights to ensure that there are dark hours.

Lough Macask pNHA (001914)

Lough Macask pNHA is located c. 1.3km north-west of the Site. The pNHA site synopsis (NPWS, 2009) give the following account of the Lough Macask:

“Lough Macask is a small pond north-west of Kilkenny that fluctuates in size over the year.

The vegetation shows that the site is similar in some ways to a turlough. It therefore differs from most other wetlands around Kilkenny and has a certain interest for this reason.”

Due to the distance and lack of connectivity between the project Site and Lough Macask and the localised nature of the proposed works (ground water levels will not be affected and there will be no air emissions as a result of the proposed works), it is not considered that there will be any impact on Lough Macask as a Rare, Protected and Invasive Species.

The National biodiversity data centre (NBDC) database was searched for records within the 100m grid squares within which the Site is located (squares S504565, S505565, S505564 & S504566). The records returned are of varying ages so for the purposes of preparing this report only the relevant records dated within the last 10 years have been considered (Table 7-3).

However, the absence of recent (within 10 years) records of species from the NBDC database does not necessarily imply that a species does not occur within the search area, rather it has not formally been recorded as present.

Table 3-3: Rare, Protected and Invasive Species Recorded Within 100m Grid Squares S504565, S505565, S505564 & S504566

Rare and/or Protected Species	Grid Square	Date of Last Record	No. of Records	Designation	Dataset
European Otter <i>Lutra lutra</i>	S504566	2013	1	EU Habitats Directive: Annexes II and IV Protected Species: Wildlife Act	Atlas of Mammals in Ireland 2010-2015

² Bats & Lighting. Guidance Notes for: Planners, engineers, architects and developers. Bat Conservation Ireland, 2010.

Rare and/or Protected Species	Grid Square	Date of Last Record	No. of Records	Designation	Dataset
Non-native/ Invasive Species					
Giant Hogweed	S505565	2020	1	Invasive Species: High Risk of Impact. Regulation S.I. 477	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards
Butterfly Bush Buddleja davidii	S505565	2022	2	Invasive Species: Medium Risk of Impact	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards
Winter Heliotrope <i>Petasites fragrans</i>	S504566, S505565	2021	4	Invasive Species; Low Risk of Impact	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards

No plant or animal invasive species listed under the Third Schedule of the Habitats Directive and subject to restrictions under Regulations 49 and 50 have been observed within the Proposed Development Site.

6.6 Otter

There was no evidence of otter observed during as carried out in the NIS and AA Screening, but high water levels could have washed away any spraints or recent footprints which may have been in the area. The NDBC data search returned results supporting evidence of the presence of otter close to the Site within the last 10 years. Otter is also listed as a qualifying interest of the River Barrow & Nore SAC. However, there is no suitable habitat to support otter holts along the proposed walkway. The riverbank along the proposed route is shallow, prone to flooding and consists of an existing retaining wall in lieu of an earth embankment. While it is probable that otter is using this section of the River Nore for foraging, the Proposed Development is not considered likely to create significant disturbance to otter given the small extent of the Proposed Development (190m length) relative to the length of foraging habitat provided by the River Nore.

6.7 Bats

Three species of bats are known to be present at the Newpark Marsh pNHA, c. 710m north-east of the Site. Urban treelines and hedgerows provide potential commuting corridor between Newpark Marsh pNHA and the Site. Freshwater rivers and streams provide important sources of water and foraging potential for bats. The River Nore is the closest freshwater source to the Newpark Marsh pNHA.

Legislative Context

Bats are protected by law in the Republic of Ireland under the Wildlife Acts. This legislation states that it is an offence to intentionally disturb, injure or kill a bat or disturb its resting place and any work on a roost must be carried out with the advice of the NPWS. In addition to domestic legislation, bats are also protected under the EU Habitats Directive.

6.8 Birds

No rare/ protected bird species were observed on the Proposed Development Site. No records of rare/ protected bird species were returned during the NBDC data search. Kingfisher is listed as a qualifying interest for the River Nore SPA. It is not considered that the Proposed Development Site provides suitable nesting habitat for kingfisher. Where the route runs along the riverbank, it is bounded by a line of *Salix* trees to the east and an existing retaining wall to the west. The bank itself is shallow and prone to flooding. It is therefore not considered that the proposed works will create significant disturbance to kingfisher. The other habitats within the Site (treelines, hedgerows, stone walls) provide suitable breeding habitat for passerines.

The Irish bird nesting season is defined in Section 40 of the Wildlife Act 1976 and Section 46 of the Wildlife Act 2000 (as amended) as the period between 1st March and 31st August. This legislation states that:

- It shall be an offence for a person to cut, grub, burn or otherwise destroy, during the period beginning on the 1st day of March and ending on the 31st day of August in any year, any vegetation growing on any land not then cultivated, and;
- It shall be an offence for a person to cut, grub, burn or otherwise destroy any vegetation growing in any hedge or ditch during the period mentioned in paragraph (a) of this subsection"

6.9 Trees, Hedgerows and Vegetation

There is potential tree removal or pruning in the context of the boardwalk development, especially in areas where the boardwalk might clash with existing vegetation. The removal or pruning of trees will be assessed on a case-by-case basis, and it's specified that this might apply to a section of treeline approximately 100m long along the riverbank.

During the construction phase, the project aims to retain as many trees and hedgerows as possible. Where removal is deemed necessary, efforts will be made to ensure that it is minimal and localized. The use of specialized equipment and construction methodologies has been proposed to reduce the footprint of the construction activities, thereby preserving the integrity of the surrounding vegetation. The use of small quad-type vehicles for transporting materials along the river bank ensures minimal disturbance to the existing vegetation.

6.10 Invasive Species

The following invasive plant species, listed under the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations 2011, as amended and subject to restrictions under Regulations 49 and 50, have been recorded in the NBDC 100m grid squares S505565. This grid square covers a large portion of the southern extent of the Site;

- Giant hogweed

The NBDC dataset search also returned results showing evidence of the presence of two other invasive species which are not listed on the Third Schedule but still pose a risk to native species; butterfly bush and winter heliotrope.

No invasive species were identified. However, the site visit was conducted outside of the optimal season for invasive species surveys.

6.11 Water Quality

With respect to water quality impacts, all water policy and management is guided by the Water Framework Directive. Under the WFD, Ireland has been set a target of achieving at least ‘good status’ for all waters in the country, along with no deterioration.

The project method statement should refer to “Guidelines on Protection of Fisheries During Construction Works in And Adjacent to Waters (2016)”. These guidelines outline the best practices when carrying out works adjacent to waterways to prevent adverse impacts on water quality. These guidelines should be followed during the construction of the proposed pathway, with particular attention to the measures outlined in “Chapter 7: Construction Impacts”.

As stated in section 6.3, the WFD and the Strategic Environmental Assessment from the Kilkenny City & County Development plan 2021-2027 states the river as having ‘good’ status.

6.12 Invasive Species

Although no Third Schedule listed species were identified during the site visit, the visit was conducted outside of the optimal season for an invasive species survey and the high water levels prevented the identification of in stream vegetation or vegetation along the submerged pathway. The NBDC data search showed the possible presence of a Third Schedule listed invasive species. Given the proximity of the Site to the River Barrow & Nore SAC, and the sensitivity of watercourses to invasive species, a strict biosecurity protocol should be followed. This protocol should include measures that prevent the spread of invasive species both to and from the Site. The below list of biosecurity measures is advisable;

- All plant, equipment and boots to be disinfected before entering the Site and leaving the Site
- All plant to be inspected for cleanliness before arrival & before leaving site
- Once project is completed, all excess material to be removed from Site and appropriately disposed of.

6.13 Summary of all potential impacts

The boardwalk construction has two potential access points: Bishops Meadows and a smaller car park. Preliminary civil works are required for access through Bishops Meadows, and construction is planned for the summer to reduce river bank impact. The construction will be limited to the river bank, covering a length of 190m, and no in-river operations are planned. During the construction phase, temporary disturbances such as noise, dust, and potential traffic diversions are expected, but these are anticipated to be short-lived.

The effects of the development are localized, eliminating concerns about transboundary impacts. The primary challenges stem from the construction phase, notably waste removal. Temporary impacts, including noise, dust, and visual disturbances, are predicted. Once operational, the project is not expected to introduce negative impacts. The proximity of the site to two Natura 2000 sites indicates a potential for habitat loss and fragmentation. Construction activities are advised against during the bird nesting season, and the presence of otters and bats in nearby areas requires consideration.

Bird species, including the Kingfisher, might be affected, primarily due to the proposed additional LED lighting. The design aims to minimize disturbances to these species. Invasive plant species such as Giant hogweed, butterfly bush, and winter heliotrope have been recorded nearby. Although no invasive species were identified during a site visit, the survey was conducted outside the optimal season.

Tree removal will be limited as much as possible. It will be restricted to any branches/ trees hanging within the boardwalk boundary. Trimming will occur where possible instead of removal and it will mainly relate to the line of willows along the river.

Water quality management is guided by the Water Framework Directive. The project's method statement is recommended to adhere to the “Guidelines on Protection of Fisheries During Construction Works in And Adjacent to Waters (2016)”. This ensures adherence to best practices during construction, especially when working near waterways, to maintain water quality.

7.0 Conclusion

This report is the Environmental Impact Assessment (EIA) screening for a proposed Pedestrian & Cycle link between the River Nore Linear Park and the Riverside Gardens in Kilkenny City, Co Kilkenny. The EIA screening is related to a Part 10 planning application process. The proposed link aims to provide a safe pedestrian route along the river's edge, connecting the River Nore Linear Park to the Riverside Gardens. Currently, the connection is facilitated through various access routes that divert the public away from the river's edge.

The River Nore Linear Park, constructed in 2006, spans 2.6km in Bishops Meadows and is linked to the Peace Park Walk and Canal Walk. The Riverside Gardens project, completed in 2020, is part of the Abbey Quarter Masterplan, offering a pedestrian and cycle link between Greens Bridge and Bateman Quay. The proposed boardwalk will bridge these two walkways along the riverbanks.

The EIA Screening Process is rooted in the EIA Directive, categorizing projects based on their potential environmental impact. Projects can either have a mandatory EIA requirement, be sub-threshold requiring assessment, or pertain to changes or extensions of existing projects. The proposed development is deemed sub-threshold, necessitating EIA Screening.

The proposed development falls within a class of development specified in Part 2 of Schedule 5 of the Planning and Development Regulations, 2001 but does not meet or exceed the defined thresholds and is considered sub-threshold for EIA purposes. On completion of the screening assessment required for sub threshold developments, it is concluded that the project due to its nature, scale and location is not likely to have significant effects on the environment and therefore does not require EIA.

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Appendix F
AA Screening (Kilkenny County Council)
AA Screening & Natura Impact Statement (SLR Consulting)

AA: Screening Form

STEP 1. Description of the project/proposal and local site characteristics:

(a) File Reference No:	Application under Section 177 AE (1) of the Planning and Development Act 2000, as amended
(b) Brief description of the project or plan:	<p>Proposed pedestrian link between the River Nore Linear Park and the Riverside Gardens in Kilkenny City, Co. Kilkenny.</p> <p>The route of the proposed pedestrian link is along the western bank of the River Nore, north of Green's Bridge in central Kilkenny, joining up the existing Bishops Meadows Walk and the new Riverside Gardens Walk. The pedestrian link will pass under an archway beneath Greens Bridge and will continue north via an elevated board walk lit with LED lighting. The overall length of the proposed pedestrian link is approx.. 190 metres. The working area required for construction and the permanent footprint of the proposed pedestrian link comprise the proposed development site.</p>
(c) Brief description of site characteristics:	The site is located along the western bank of the River Nore
(d) Relevant prescribed bodies consulted: e.g. DHLGH (NPWS), EPA, OPW	None as part of the Screening Assessment
(e) Response to consultation:	N/a

STEP 2. Identification of relevant Natura 2000 sites using Source-Pathway-Receptor model and compilation of information on Qualifying Interests and conservation objectives.

Natura 2000 European Site	List of Qualifying Interest/Special Conservation Interest ¹	Distance from proposed development ² (km)	Connections (Source- Pathway- Receptor)	Considered further in screening Y/N
See tables 2 and 3 below	See tables 2 and 3 below	See tables 2 and 3 below	Yes	Yes
River Barrow and River Nore SAC	Alluvial Wet Woodland, (Lower River Suir and Nore), Dry Heath (some steep slopes along River Barrow and its tributaries) Rivers, Streams, Lakes and Lagoons, Old Oak Woodland, floating river vegetation, River Lamprey, Brook Lamprey, Freshwater Pearls	Adjacent to proposed development	Yes	Yes

	Mussel, Nore Freshwater Pearl Mussel, Crayfish, Twaite Shad, Atlantic Salmon, Otter, Vertigo Mouliniana,			
River Nore SPA	Kingfisher (Alcedo Atthis)	Nesting in river banks along the River – within the SPA designated area	Yes	Yes

- ¹ Short paraphrasing and/or cross reference to NPWS is acceptable – it is not necessary to reproduce the full text on the QI/SCI.
- ² If the site or part thereof is within the European site or adjacent to the European site, state here.

Table 2: Identification of Natura 2000 sites (SACs and SPAs) which may be impacted by the proposed development

Please answer the following five questions in order to determine whether there are any Natura 2000 sites which could potentially be impacted by the proposed development. If the answer to all of these questions is no, significant impacts can be ruled out for habitats and bird species. No further assessment is required. Please refer to tables 3 and 4 where the answer to any of these questions is yes.

	<i>Using the Source – Pathway- Receptor model, please consider the following</i>	Y/N
1	ONE- OFF HOUSE /SMALL EXTENSION/ ALTERATION TO EXISTING BUILDING	
1a	<p>Is the development a one- off house/small extension/alternation to existing building within an SAC/SPA or within 100m of an SAC/SPA and likely to discharge pollutants or nutrients of a significant nature and amount to surface water within catchments of and SAC/ SPA as part of its construction or operational phase (including the installation of waste water treatment systems; percolation areas; septic tanks within SAC/SPA or very close proximity)?.</p> <p>If the answer to the above question is: - no, then no appropriate assessment required - yes, then an appropriate assessment is required - not sure, then an appropriate assessment is required in accordance with the precautionary principle</p>	Y
2	DEVELOPMENTS OTHER THAN THOSE DESCRIBED IN 1 ABOVE	
2a	<p>Impacts On Freshwater Habitats <i>Is the development within a Special Area of Conservation whose qualifying interests include freshwater habitats, or in the catchment of same and does the development propose to discharge water to or abstract water from the habitat?</i></p> <p>Sites to consider: Lower River Suir, River Barrow, River Nore. (these sites also include many tributaries – check on NPWS website)</p> <p>Habitats to consider: Alluvial Wet Woodland, (Lower River Suir and Nore), Dry Heath (some steep slopes along River Barrow and its tributaries) Rivers, Streams, Lakes and Lagoons, Old Oak Woodland, floating river vegetation,</p> <p>Species to consider: River Lamprey, Brook Lamprey, Freshwater Pearls Mussel, Nore Freshwater Pearl Mussel, Crayfish, Twaite Shad, Atlantic Salmon, Otter, Vertigo Mouliniana,</p>	Y
2b	<p>Impacts On Wetland Habitats <i>Is the development within a Special Area of Conservation whose qualifying interests include wetland habitats, or likely to discharge water to or abstract water from the wetland?</i></p> <p>Sites to consider: Hugginstown Fen, Galmoy Fen, The Loughans, Flood Plain wetlands</p> <p>Habitats to consider: Bogs, Alkaline Fens (Hugginstown and Galmoy), Turloughs (The Loughans), wet grassland and Marsh (river floodplains)</p>	N

	Using the Source – Pathway- Receptor model, please consider the following	Y/N
2c	<p>Impacts on Intertidal and Marine Habitats <i>Is the development located within a Special Area of Conservation whose qualifying interests include intertidal and marine habitats and species, or within the catchment of same and likely to discharge water to or abstract water from the habitats.</i></p> <p>Sites to consider: Lower River Suir</p> <p>Habitats to consider: Atlantic Salt meadows, Mudflats, sandflats, saltmarsh, estuary</p> <p>Species to consider: Sea Lamprey, River Lamprey, Brook Lamprey, Freshwater Pearl Mussel, Crayfish, Twaite Shad, Atlantic Salmon, Otter.</p>	N
2d	<p>Impacts On Woodlands And Grasslands <i>Is the development within a Special Area of Conservation whose qualifying habitats include terrestrial habitats, or in close proximity to same with a likely ecological impact?.</i></p> <p>Sites to consider: Spa hill and Clomantagh Hill, Cullahil Mountain, River Barrow, River Nore, Lower River Suir</p> <p>Habitats to consider: <i>Alluvial Wet Woodlands</i> (River Nore below Inistioge and River Suir at Fiddown Island and Carrick on Suir), Eutropic tall herb vegetation (River Suir at Fiddown Island and Carrick on Suir), and grasslands (Spa hill and Clomantagh Hill, Cullahil Mountain)</p> <p>Oak Woodlands in old estates next to the Nore and Barrow</p> <p>Species to consider: Greenwinged, Frog and Bee Orchids (Cullahil and Clomantagh Hill), Nettle Leaved Bellflower and Autumn Crocus</p>	N
2e	<p>Impacts On Birds <i>Is the development within a Special Protection Area, or likely to discharge water to same or likely to have another significant impact on the habitats of Birds in same?.</i></p> <p>Sites to consider: River Nore</p> <p>Species to consider: River Nore: Kingfisher (Alcedo Atthis) – Nesting in river banks</p>	Y

Table 3: Determination of possible impacts on Natura 2000 sites.

Where it has been identified in table 2 that there is a Natura 2000 site within the potential impact zone of the proposed development, it is necessary to try to determine the nature of the possible impacts. Please answer the following questions as appropriate.

	Using the Source – Pathway- Receptor model, please consider the following- notwithstanding distance any direct link needs consideration	
1.	<p>Impacts on designated freshwater habitats (rivers, lakes streams and lagoons).</p> <p><i>Please answer the following if the answer to question 2a in table 2 was yes.</i></p> <p><i>Does the development involve any of the following:</i></p>	
1.1	Impacts on watercourses (tributaries, streams, drains) which are remote from the SAC/SPA but may still impact on the SAC/SPA by reason of the nature or quantity of the discharge	N
1.2	Abstraction from surfacewater or groundwater within 1km of SAC/SPA.	N
1.3	Removal of topsoil within 100 m of watercourses with potential for surface water runoff.	Y
1.4	Infilling or raising of ground levels within 100m of watercourses with potential for surface water runoff.	Y
1.5	Construction of drainage ditches within 1km of SAC/SPA.	N
1.6	Construction within a floodplain or within an area liable to flood.	Y
1.7	Crossing or culverting of rivers or streams within 1km of SAC/SPA.	N
1.8	Storage of chemicals hydrocarbons or organic wastes within 100 m of a watercourse.	Y
1.9	Development of a large scale which involves the production of an EIS.	N

1.10	Development of quarries, particularly where abstraction is below water table. Provision of process water silt management systems	N
1.11	Development of windfarms within 1km of an SAC or with the risk of runoff to an SAC/SPA, particularly during construction.	N
1.12	Development of pumped hydro electric stations.	N
2	Impacts on designated wetland habitats (bog, heath, marsh, fen). <i>Please answer the following if the answer to question 2b in table 2 was yes.</i> <i>Does the development involve any of the following:</i>	
2.1	Impacts on watercourses (tributaries, streams, drains) which are remote from the SAC/SPA but may still impact on the SAC/SPA by reason of the nature or quantity of the discharge.	N
2.2	Construction of roads or other infrastructure on peat habitats within 1km of a Natura 2000 site of which qualifying interests include peat, fen or marsh. (Only Peat habitat at Bruckana – consider Galmoy fen – impact unlikely)	N
2.3	Development of a large scale within 1km within a Natura 2000 site, whose qualifying features include fen or marsh, which involves the production of an EIS.	N
3	Impacts on designated intertidal and marine habitats (mudflats, sandflats, estuaries, reefs and sea cliffs). <i>Please answer the following if the answer to question 2c in table 2 was yes.</i> <i>Does the development involve any of the following:</i>	
3.1	Impacts on intertidal and marine habitats from potential development which are remote from the SAC/SPA but may still impact on the SAC/SPA by reason of the nature or quantity of the discharge	N
3.2	Development of piers, slipways, marinas, pontoons or any other infrastructure within 5km of a Natura 2000 site whose qualifying features include intertidal or marine habitats.	N
3.3	Dredging within 5km of a Natura 2000 site whose qualifying features include intertidal or marine habitats.	N
3.4	Impacts on watercourses (tributaries, streams, drains) which are remote from the SAC/SPA but may still impact on the SAC/SPA by reason of the nature or quantity of the discharge.	N
3.5	Removal of topsoil or infilling within 100m of Natura 2000 sites whose qualifying features include intertidal or marine habitats where potential for surface water runoff exists.	N
3.6	Development of a large scale within 1km of Natura 2000 sites whose qualifying features include intertidal or marine habitats, which involves the production of an EIS.	N
4	Impacts on other designated woodlands and grasslands (woodland, upland grassland, lowland grassland, coastal grassland including dunes). <i>Please answer the following if the answer to question 2d in table 2 was yes.</i> <i>Does the development involve any of the following:</i>	
4.1	Works within the boundary of a Special Area of Conservation whose qualifying interests include woodland or grassland habitat types.	N
4.2	Development within 200m of Natura 2000 site with woodland or grassland habitats.	N
4.3	Development of a large scale within 1km of Natura 2000 site with woodland, grassland or coastal habitats which involves the production of an EIS.	N
5	Impacts on birds in SPAs <i>Please answer the following if the answer to question 2e in table 2 was yes.</i> <i>Does the development involve any of the following:</i>	
5.2	Erection of wind turbines within 1km of an SPA.	N
5.3	All construction works within 100m of SPA (River Nore), including the development of cycle ways or walking routes	Y
5.4	Infilling of coastal habitats within 500m of intertidal SPA.	N
5.5	Works within 1km of coastal SPA which will result in discharges to rivers or streams that are directly connected to designated sites.	N

Conclusion: If the answer to question 1 and 2a-e are no or n/a, significant impacts on habitats within Natura 2000 sites and on SPAs can be ruled out. No further assessment is required in relation to habitats or birds. If the answer to any question in table 2 is yes, you may require further information, unless you are satisfied that the project proponents have incorporated adequate mitigation into their design to avoid impacts on the Natura 2000 site (eg water pollution protection measures). Such information should be provided in the form of a Natura Impact Statement which should address the particular issues of concern as identified through the above.

Table 4: Consideration of potential impacts on protected species

Many of our Special Areas of Conservation are designated for species as well as for habitats. These are listed below, alongside the sites for which they are designated. Included is a short list of the types of activities which could have an impact on these species. Please tick if you are concerned that the proposed development could have an impact on these species.

Species	Relevant Sites	Activities which could have impacts on species	Possible Impacts Identified? Y/N
Otter	River Nore River Barrow Lower River Suir Note: Otters are a strictly protected species. All breeding sites and resting places are protected regardless of whether or not they are within or external to Special Areas of Conservation.	Activities that interfere with river banks.	Y
Atlantic Salmon	River Barrow River Nore Lower River Suir	Activities that interfere with water quality, levels or the river bed;	Y
River Lamprey	River Barrow River Nore Lower River Suir	Activities that interfere with water quality, levels or the river bed;	Y
Brook Lamprey	River Barrow River Nore Lower River Suir	Activities that interfere with water quality, levels or the river bed;	Y
Sea Lamprey	River Barrow River Nore Lower River Suir	Activities that interfere with water quality or the river bed – estuarine areas;	Y
Twaite Shad	Lower River Suir	Activities that interfere with water quality or the river bed – estuarine areas;	Y
Crayfish	Lower River Suir	Activities that interfere with water quality or the river bed;	N
Freshwater Pearl Mussel	River Barrow River Nore Lower River Suir	Activities that interfere with water quality, levels or the river bed ;	Y
Nore Freshwater Pearl Mussel	River Nore	Activities that interfere with water quality, levels or the river bed ;	N

Conclusion: If the answer to all of the above is no, significant impacts on species can be ruled out. If the answer to any of the above is yes, then further information is likely to be required in relation to potential for impact on that particular species. Where potential impacts are identified on Otters or on Bats outside designated sites, then further information should be sought in the form of a species specific survey. In these cases, appropriate assessment is not required.

STEP 3. Assessment of Likely Significant Effects

(a) Identify all potential direct and indirect impacts that may have an effect on the conservation objectives of a European site, taking into account the size and scale of the project under the following headings:

Impacts:	Possible Significance of Impacts: (duration/magnitude etc.)
<p>Construction phase e.g.</p> <ul style="list-style-type: none"> • Vegetation clearance • Demolition • Surface water runoff from soil excavation/infill/landscaping (including borrow pits) • Dust, noise, vibration • Lighting disturbance • Impact on groundwater/dewatering • Storage of excavated/construction materials • Access to site • Pests 	<p>Potential impacts during the construction state in the absence of mitigation measures in relation to the following:</p> <ul style="list-style-type: none"> • Surface water runoff from soil excavation • Dust, noise, • Lighting disturbance • Storage of excavated/construction materials • Access to site
<p>Operational phase e.g.</p> <ul style="list-style-type: none"> • Direct emission to air and water • Surface water runoff containing contaminant or sediment • Lighting disturbance • Noise/vibration • Changes to water/groundwater due to drainage or abstraction • Presence of people, vehicles and activities • Physical presence of structures (e.g. collision risks) • Potential for accidents or incidents 	<p>Potential impacts during the construction state in the absence of mitigation measures in relation to the following:</p> <ul style="list-style-type: none"> • Surface water runoff containing contaminant or sediment • Lighting disturbance • Noise • Presence of people, vehicles and activities • Potential for accidents or incidents
<p>In-combination/Other</p>	<p>None anticipated</p>

(b) Describe any likely changes to the European site:


<p>Examples of the type of changes to give consideration to include:</p> <ul style="list-style-type: none"> • Reduction or fragmentation of habitat area • Disturbance to QI species • Habitat or species fragmentation • Reduction or fragmentation in species density • Changes in key indicators of conservation status value (water or air quality etc.) • Changes to areas of sensitivity or threats to QI • Interference with the key relationships that define the structure or ecological function of the site 	<p>Potential impacts in the absence of mitigation measures for impacts on water quality and disturbance to species</p>
---	--

(c) Are 'mitigation' measures necessary to reach a conclusion that likely significant effects can be ruled out at screening?

Yes

Step 4: Habitats Directive Screening Conclusion Statement

Conclusion:

	Tick as Appropriate:	Recommendation:
(i) It is clear that there is no likelihood of significant effects on a European site.	<input type="checkbox"/>	The proposal can be screened out: Appropriate assessment not required.
(ii) It is uncertain whether the proposal will have a significant effect on a European site.	<input type="checkbox"/>	<input type="checkbox"/> Request further information to complete screening <input type="checkbox"/> Request NIS <input type="checkbox"/> Refuse planning permission
(iii) Significant effects cannot be ruled out in the absence of mitigation measures	√	<input type="checkbox"/> Assessment to proceed to stage 2 and NIS required
Signature and Date of Recommending Officer:	 26 th April 2023	Claire Kelly Senior Executive Planner Kilkenny County Council

APPROPRIATE ASSESSMENT SCREENING AND NATURA IMPACT STATEMENT

Planning Ref: **22/204**

**Proposed Construction of Pedestrian link between
the River Nore Linear Park and the Riverside
Gardens**

Kilkenny City, Co. Kilkenny

Prepared for: Kilgallen & Partners Ltd

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BASIS OF REPORT

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CONTENTS

1	SUMMARY	1
2	INTRODUCTION	2
2.1	Background and Report Purpose	2
2.2	Brief Description of the Project.....	2
2.3	General Description of the Project Site.....	2
2.4	The Requirement for an AA Screening and NIS.....	2
2.5	Relevant Legislation	3
2.6	Evidence of Technical Competence and Experience.....	5
3	METHODOLOGY	6
3.1	General Approach.....	6
3.2	Stage One: Screening.....	6
3.3	Stage Two: Appropriate Assessment.....	6
3.4	Sources of Information	6
4	STAGE 1: APPROPRIATE ASSESSMENT SCREENING.....	8
4.1	Step 1: Management of Natura 2000 Sites.....	8
4.2	Step 2, Part 1: Project Description.....	8
4.3	Step 2, Part 2: Potential Impact Factors.....	9
4.4	Step 3: Identification of relevant Natura 2000 Sites	9
4.5	Step 4, Part 1: Assessment of Likely Significant Effects for Project Alone.....	15
4.6	Step 4, Part 2: Assessment of Likely Significant Effects for Project In Combination	17
4.7	Conclusions.....	17
5	STAGE 2: APPROPRIATE ASSESSMENT (NATURA IMPACT STATEMENT).....	18
5.1	Step 1, Part 1: Information on the Project	18
5.2	Step 1, Part 2: Description of the Natura 2000 sites.....	18
5.3	Step 2, Part 1: Effects of Project Alone	25
5.4	Step 2, Part 2: Effects of Project In Combination.....	28
5.5	Step 2, Part 3: Effects on the Conservation Objectives.....	29
5.6	Step 3: Effects on Integrity.....	33
5.7	Step 4, Part 1: Mitigation Measures.....	33
5.8	Step 4, Part 2: Effect of Mitigation Measures	34

5.9	Consideration of Findings	36
6	REFERENCES	38

TABLES

Table 4.1: Natura 2000 Sites and Interest Features initially considered for potential Source-Pathway-Receptor links	11
Table 5.1: Qualifying interest of the River Nore SPA and its conservation objectives	19
Table 5.2: Qualifying interests of the River Barrow and River Nore SAC and their specific conservation objectives	20
Table 5.3: Effects on Conservation Objectives River Nore SPA.....	29
Table 5.4: Effects on Conservation Objectives River Barrow and River Nore SAC.....	30

DRAWINGS

Drawing 1: 1 Proposed Site Layout and Habitat Map

Drawing 2: Location of Project Site Relative to Natura 2000 Sites

1 SUMMARY

SLR Consulting Ireland (SLR) was commissioned by Kilgallen & Partners Ltd. on behalf of Kilkenny County Council to prepare an Appropriate Assessment Screening Report (AA) and if needed a Natura Impact Statement Report (NIS) report for a proposed pedestrian link between the River Nore Linear Park and the Riverside Gardens in Kilkenny City, Co. Kilkenny.

The route of the proposed pedestrian link is along the western bank of the River Nore, north of Greens Bridge in central Kilkenny, joining up the existing Bishops Meadows Walk and the new Riverside Gardens Walk. The pedestrian link will pass under an archway beneath Greens Bridge and will continue north via an elevated boardwalk lit with LED lighting. The overall length of the proposed pedestrian link is approximately 190 metres. The working area required for construction and the permanent footprint of the proposed pedestrian link comprise the proposed development site.

A desk study was carried out to collate available information on sites designated for nature conservation as well as records of rare and/or protected species within the potential zone of influence of the proposed development. There are two Natura 2000 sites overlapping the Site: River Nore SPA in which the Project site is inside and River Barrow and River Nore SAC where the project site is located on the riverbank adjacent to the European site. The Site was surveyed by SLR ecologist Michael Bailey (MCIEEM) on 24th November 2022. The aim of this report is to evaluate the possible impacts on protected Natura 2000 sites. The AA screening report examines the Conservation objectives of these sites in order to assess if any objectives could be undermined due to the proposed Project. The conclusion of the report identified likely significant effects on Qualifying Interests of the European Sites, therefore a Natura Impact Statement was prepared. In the NIS report adverse effects of the proposed project were examined and recommendations on appropriate mitigation measures were outlined.

Impacts during the construction, operation and decommissioning of the project were assessed. During construction and decommissioning the main concern were the effects on water quality due to the proximity of the proposed project to the River Nore. This has the potential to undermine conservation objectives for qualifying interests in both The River Nore SPA and the River Barrow and River Nore SAC, including kingfisher, otter, the lampreys, salmon, twaite shad and white-clawed crayfish. Fish, otter and kingfisher may be affected by vibrations and noise during construction and decommissioning. Habitat loss/disruption is a concern for the kingfisher and otter during the construction and decommissioning of the proposed project. Otters and fish may be affected by lighting of the walkway at night during the operation of the proposed project.

Suitable mitigation measures are outlined in the report covering all aspects of construction, operation, and decommissioning. These measures will ensure the integrity of the Natura 2000 sites is not undermined.

2 INTRODUCTION

2.1 Background and Report Purpose

SLR Consulting was commissioned by Kilgallen & Partners Ltd. on behalf of Kilkenny County Council to prepare an Appropriate Assessment (AA) screening report and, if necessary, a Natura Impact Statement, for a proposed pedestrian link, in the form of a boardwalk, between the River Nore Linear Park and the Riverside Gardens in Kilkenny City; the Project.

The purpose of this report is to provide supporting information to assist the Competent Authority, in this case Kilkenny County Council, to carry out an Appropriate Assessment screening for likely significant effects arising from the Project, and, if it is concluded one is required, a Stage 2 Appropriate Assessment.

2.2 Brief Description of the Project

The Project is the construction of a boardwalk in Kilkenny city. The purpose of the project is to create a pedestrian and cyclist route between the existing Nore Linear Park trail and the Riverside Gardens walk. The boardwalk structure will comprise 200mm diameter tubular steel mini piles, infilled with concrete, installed in pairs at 2m centres at intervals of 6m along the route. Steel beams will span the pile heads to support the boardwalk decking. The deck surface is proposed to be manufactured from recycled plastic. The proposed deck width is 3m, reduced to 2.2m at pinch points between existing trees and walls and the river's edge. An area of clearance of 1m is proposed at the western side of the boardwalk to allow for maintenance. Parapets are required to provide fall protection at the sides of the boardwalk to a height of 1.5m. The parapets will be constructed from painted mild steel vertical uprights supporting recycled plastic horizontal rails. No in-channel works are required or proposed. The construction materials can be transported along the riverbank using small quadbike type vehicles.

2.3 General Description of the Project Site

The Project Site is located at approximate ITM coordinates 650449 656562 on the western bank of the River Nore, in the townland of Gardens in the West of Kilkenny City. The Site comprises of 570m³ of land consisting of an existing footpath along the river bounded by a willow treeline and a mortared stonewall, amenity grassland and scrub. The site is divided by Greens Bridge, which spans the river in a West to East direction. There is a stone archway located underneath the bridge within the footprint of the proposed Project.

The site is bounded to the West by Green Street and residential properties which front onto Green Street. To the East is the River Nore, to the south is the Abbey Quarter/Riverside Garden area, and to the north the River Nore Linear Park at Bishops Meadows.

2.4 The Requirement for an AA Screening and NIS

The Habitats Directive promotes a hierarchy of avoidance, mitigation and compensatory measures to be addressed in the AA process¹² as follows:

- Firstly, a plan / project should aim to avoid any negative impacts on Natura 2000 sites by identifying possible impacts early and designing the project / plan to avoid such impacts.

¹ The objectives as outlined are based on those set out in Scott Wilson and Levett-Therivel, (2006).

² http://www.npws.ie/sites/default/files/publications/pdf/NPWS_2009_AA_Guidance.pdf

- Secondly, mitigation measures should be applied during the AA process (after Stage 1 Screening) to the point where no adverse impacts on the site(s) remain.

Thirdly a plan / project may have to undergo an assessment of alternative solutions. Under this stage of the assessment, compensatory measures are required for any remaining adverse effects, but they are permitted only if (a) there are no alternative solutions and (b) the plan / project is required for imperative reasons of overriding public interest (the 'IROPI test'). European case law highlights that consideration must be given to alternatives outside the plan / project boundary area in carrying out the IROPI test.

2.5 Relevant Legislation

2.5.1 European Nature Directives (Habitats and Birds)

The Habitats Directive (Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora) forms the basis for the designation of Special Areas of Conservation (SAC). Similarly, Special Protection Areas (SPA) are classified under the Birds Directive (Council Directive 2009/147/EEC on the Conservation of Wild Birds). Collectively, SACs and SPAs are referred to as the Natura 2000 network. The Natura 2000 Network is considered to be the minimum protected land area required to conserve certain habitats and species listed in the Directives.

Under Article 6(3) of the Habitats Directive, an Appropriate Assessment (AA) must be undertaken for any plan or project that is not directly connected with or necessary to the management of a Natura 2000 site but is likely to have a significant effect thereon, either individually or in combination with other plans or projects. An AA is an evaluation of the potential impacts of a plan or project on the conservation objectives of a Natura 2000 site, and the identification, where necessary, of mitigation or avoidance measures to preclude adverse effects on the integrity of the site.

Article 6, paragraph 3 of the European Commission Habitats Directive 92/43/EEC ("the Habitats Directive") states that:

"Any plan or project not directly connected with or necessary to the management of the site but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subject to appropriate assessment of its implications for the site in view of the site's conservation objectives. In the light of the conclusions of the assessment of the implications for the site and subject to the provisions of paragraph 4, the competent national authorities shall agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the site concerned and, if appropriate, after having obtained the opinion of the general public".

2.5.2 European Communities (Birds and Natural Habitats) Regulations 2011

Pursuant to the Habitats Directive, Part 5 of the European Communities (Birds and Natural Habitats) Regulations 2011, as amended, similarly sets out the requirements for screening assessments and the circumstances under which an AA is required.

Regulation 42(1) requires that 'a screening for Appropriate Assessment of a plan or project for which an application for consent is received, or which a public authority wishes to undertake or adopt, and which is not directly connected with or necessary to the management of the site as a European Site, shall be carried out by the public authority to assess, in view of best scientific knowledge and in view of the conservation objectives of the site, if that plan or project, individually or in combination with other plans or projects is likely to have a significant effect on the European site.' Regulation 42(2) expands on this, stipulating that a public authority must carry out a screening for AA before consent for a plan or project is given, or a decision to undertake or adopt a plan or project is taken.

Regulation 42(6) requires that *'the public authority shall determine that an Appropriate Assessment of a plan or project is required where the plan or project is not directly connected with or necessary to the management of the site as a European Site and if it cannot be excluded, on the basis of objective scientific information following screening under this Regulation, that the plan or project, individually or in combination with other plans or projects, will have a significant effect on a European site'*.

Regulation 42(3)(a) gives the public authority the power to direct a third party to provide a Natura Impact Statement (NIS) and Regulation 42(3)(b) allows it to request any additional information that it needs to complete the screening assessment or AA. Regulation 42(5) goes on to make clear that the NIS should include such information as the public authority considers necessary to enable it to undertake the AA and to ascertain if a project or plan will affect the integrity of a Natura 2000 site.

In addition to the information, Regulation 2(1) provides a definition of a Natura Impact Statement as *'a report comprising the scientific examination of a plan or project and the relevant European Site or European Sites, to identify and characterise any possible implications of the plan or project individually or in combination with other plans or projects in view of the conservation objectives of the site or sites, and any further information including, but not limited to, any plans, maps or drawings, scientific information or data required to enable the carrying out of an Appropriate Assessment'*.

Regulation 42(11) makes clear that the AA must be carried out by the public authority and that it must include its conclusion as to whether the project or plan would adversely affect the integrity of a Natura 2000 site, and that this must be done prior to consenting the project.

2.5.3 Planning and Development Act 2000 (as amended)

These processes have been further enshrined in the Planning and Development Act 2000 (as amended), in Sections 177T, 177U and 177V, which are reproduced below:

177T (1)(b) A Natura Impact Statement means a statement for the purposes of Article 6 of the Habitats Directive, of the implications of a proposed development, on its own or in combination with other plans or projects, for one or more than one European site, in view of the conservation objectives of the site or sites.

(2) Without prejudice to the generality of subsection (1), a Natura impact report or a Natura impact statement, as the case may be, shall include a report of a scientific examination of evidence and data, carried out by competent persons to identify and classify any implications for one or more than one European site in view of the conservation objectives of the site or sites.

177U. (1) A screening for appropriate assessment of a draft Land use plan or application for consent for proposed development shall be carried out by the competent authority to assess, in view of best scientific knowledge, if that Land use plan or proposed development, individually or in combination with another plan or project is likely to have a significant effect on the European site.

(4) The competent authority shall determine that an appropriate assessment of a draft Land use plan or a proposed development, as the case may be, is required if it cannot be excluded, on the basis of objective information, that the draft Land use plan or proposed development, individually or in combination with other plans or projects, will have a significant effect on a European site.

177V (1) An appropriate assessment carried out under this Part shall include a determination by the competent authority under Article 6.3 of the Habitats Directive as to whether or not a draft Land use plan or proposed development would adversely affect the integrity of a European site and an appropriate assessment shall be carried out by the competent authority, in each case where it has made a determination under section 177U(4) that an appropriate assessment is required, before —
... (b) consent is given for the proposed development.

2.6 Evidence of Technical Competence and Experience

This Report was prepared by Kieran Moynihan BSc. Stephanie Boocock and Richard Arnold conducted the technical review.

Kieran Moynihan BSc (Hons) - Ecologist

Kieran Moynihan is an Ecologist with SLR and has worked in ecological consultancy since July 2022. Kieran holds a BSc in Ecology from University College Cork. Since joining SLR Kieran has gained experience in Vantage Point surveys, plant identification and habitat surveys. He has helped prepare AA screenings for a range of projects.

Stephanie Boocock MCIEEM – Principal Ecologist

Steph Boocock is a Principal Ecologist based at our Bristol office. Steph has over nineteen years' experience in environment-based roles and is a Chartered Environmentalist and Full Member of the Chartered Institute of Ecology and Environmental Management (MCIEEM). Steph has led on medium-large scale development projects delivering Ecological Impact Assessments, Appropriate Assessments (in UK and Ireland) and developing mitigation strategies for a range of EPS, including obtaining licences for bats.

Richard Arnold BSc (Hons) MRes MCIEEM CEnv - Technical Director

Richard Arnold BSc (Hons) MRes MCIEEM CEnv - Richard Arnold is a Technical Director with SLR. Richard has a BSc (Hons) in Ecology, an MRes in Environmental Science, is a full member of CIEEM and a Chartered Environmentalist. Richard has 23 years of experience as a consultant ecologist, including projects of all sizes and stages of development in the UK and Ireland

3 METHODOLOGY

3.1 General Approach

The methodology used in this report is based on guidance provided by the National Parks and Wildlife Service (NPWS, 2010), the Office of the Planning Regulator (OPR, 2021) and EC Guidance (EC, 2018) (EC, 2020) (EC, 2021) on the application of Article 6 of the Habitats Directive.

The 2021 EC guidance describes a series of stages and steps which should be completed when carrying out the assessment and these are followed here with minor modifications. The assessment applies only to Natura 2000 sites (SPAs and SACs). More specifically, it only applies to the habitats and species listed as qualifying interests (QIs) of SACs and the bird species listed as Special Conservation Interests (SCIs) for SPAs. For the purposes of this report, both QIs and SCIs will be referred to as QIs.

3.2 Stage One: Screening³

Stage One is a screening assessment, the purpose of which is to determine whether a plan or project requires more detailed assessment. There are two principal tests. The first considers whether the plan or project is needed for the management of a European site for the purpose of maintaining or restoring its conservation interest. Any such plans or projects can usually be screened out of further assessment. The second test considers whether the plan or project, without specific mitigation measures, would be likely to have a significant effect on any European Site. This requires consideration of the project on its own and in combination with other plans or projects.

A project can only be screened out of further assessment if it is certain (beyond reasonable scientific doubt and on the basis of the best scientific knowledge) that there would be no significant effects on any Natura 2000 site without mitigation designed specifically to address potential impacts on the qualifying interest of such sites. Significant effects in this assessment are those which could undermine the conservation objectives of a qualifying interest feature. The process is used to determine which Natura 2000 Sites should be included in the later stages of the assessment. It can also be used to determine which qualifying interest features require further assessment.

3.3 Stage Two: Appropriate Assessment

Stage Two is a more detailed assessment, known as an “Appropriate Assessment” following the terminology in the legislation. This essentially repeats the second test of the screening assessment but in more detail and considers mitigation measures before reaching a conclusion. At this stage, the test is whether the project or plan will have an adverse effect on the integrity of any European site. This must be done in light of the conservation objectives for each of the sites and qualifying interest features that have been ‘screened in’ by the earlier stage of assessment. Any effect which could undermine the conservation objectives is considered an adverse effect on the integrity of the site, and vice versa. If the project is predicted to lead to adverse effects upon the integrity of the site, further stages of assessment are required before the project can be authorised.

3.4 Sources of Information

Sources of information for the assessment of the Project ‘alone’ include:

- Ecological Desk study completed by SLR

- Habitat Survey completed by SLR
- Article 17 and Article 12 reports completed by the National Parks and Wildlife Service.
- Site Synopses, Conservation Objectives and Standard Data Forms for the Natura 2000 sites
- Environmental Protection Agency (EPA) Maps⁴.
- National Biodiversity Data Centre Maps⁵

Sources of information for the plans and projects for the 'in-combination' assessment were as above and also include:

- Kilkenny County City and County Development Plan 2021-2027⁶
- Kilkenny County Council planning portal⁷ and myplan.ie⁸ were accessed for information on other projects and plans including environmental reports of other projects.

⁴ <http://gis.epa.ie/> (last accessed February 2023)

⁵ [Maps - Biodiversity Maps \(biodiversityireland.ie\)](https://maps.biodiversityireland.ie/) (last accessed February 2023)

⁶ <https://www.kilkennycoco.ie/eng/services/planning/development-plans/city-and-county-development-plan/adopted-city-and-county-development-plan.html> (last accessed February 2023)

⁷ [ePlan::Find a planning application \(kilkennycoco.ie\)](https://www.kilkennycoco.ie/eplan/find-a-planning-application) (last accessed February 2023)

⁸ <https://myplan.ie/> (last accessed February 2023)

4 STAGE 1: APPROPRIATE ASSESSMENT SCREENING

4.1 Step 1: Management of Natura 2000 Sites

The proposed Project consists of constructing a raised walkway to connect the existing River Nore Linear Park trail and the new Riverside Gardens walk in Kilkenny City. It is therefore not directly connected with, or necessary for, the management of any Natura 2000 site and cannot be screened out on that basis.

4.2 Step 2, Part 1: Project Description

4.2.1 The Project

Overview

The proposed pedestrian link is required to join up the existing River Nore Linear Park trail, ca. 160m upstream of Greens Bridge to the new Riverside Gardens walk, ca. 30m downstream of Greens Bridge. The pedestrian link will pass under the archway beneath Greens Bridge. To complete the link upstream of Greens Bridge, an elevated boardwalk will be constructed. The boardwalk section will be lit with LED lighting incorporated into the parapet top rail. The overall length of the pedestrian link is ca. 190m.

The existing River Nore Linear Park, which comprises of 2.6km of walkway in Bishops Meadows, was constructed in 2006 and is currently linked to the Peace Park Walk and Canal Walk through a series of access routes, which take the public away from the river's edge. The Riverside Gardens project, which was constructed in 2020/21, forms part of the Abbey Quarter Masterplan, providing a pedestrian link between Greens Bridge and Bateman Quay. The completion of the proposed development to link the River Nore Linear Park to the Riverside Gardens project is an objective of the Kilkenny City and County Development Plan 2021-2027.

Construction

The boardwalk structure will consist of 200mm diameter tubular steel mini piles, infilled with concrete, installed in pairs at 2m centres at intervals of 6m along the route. Steel beams will span between the pile heads to support the boardwalk decking. The deck surface is proposed to be manufactured from recycled plastic. The proposed deck width is 3m, reduced to 2.2m at pinch points between existing trees and walls and the river's edge. Parapets are required to provide fall protection at the sides of the boardwalk at a height of 1.5m. Painted mild steel vertical uprights are proposed to support recycled plastic horizontal rails.

For drainage purposes, the boardwalk deck would be constructed in slatted recycled plastic boards. Joints will be open, allowing rainwater to pass directly through the deck without the requirement for collection and disposal. At the northern end the extended concrete footpaths will drain to the grass verge. At the southern end, the ramped path will drain to the grass verge. On the southern side of the arch, some minor regrading works will be required to allow the footpath to drain freely to the grass verge.

Operation

The purpose of the Project in the operational phase is to provide a pedestrian and cycle link. During operation the Project will be lit with LED lighting incorporated into the parapet top rail. This will allow pedestrians and cyclists to use the boardwalk in the day and night time.

Decommissioning

The project is designed to be permanent. However, in the unlikely event of decommissioning only the above ground parts of the boardwalk will be removed.

Programme

The duration of works will be six months. Vegetation clearing and piling will be done in the summer months as to avoid excess risk of silt discharge into the River Nore.

4.2.2 The Project Site

Habitats (Annex I)

The River Nore is adjacent to the Project Site. The river may comprise the Annex I habitat 3260 Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitriche-Batrachion* vegetation. The habitats within the Project Site comprise of scrub WS1, stone walls BL1, treeline WL2, amenity GA2, scattered trees and parkland WDS, depositing/ lowland rivers FW2, buildings and artificial surfaces BL3 and earth banks BL2.

Species (Annex I birds and Annex II other species)

There are records of kingfisher (2 records) and otter (1 record) within the River Nore within 2km of the Project Site.

Ecological Connections

The Project site has a direct ecological connection with the River Nore as it is alongside the river and within bankside habitat.

Hydrology connections

The Project site has a direct hydrological connection with the River Nore as it is alongside the river; precipitation occurring on the Project site will drain directly to the River.

4.3 Step 2, Part 2: Potential Impact Factors

The proposed project has the potential to result in the following impacts:

- Habitat loss and damage during construction.
- Changes to water quality due to accidental silt discharge, pollution and dust during construction and decommissioning.
- Spread of Invasive Non-native Species (INNS) during construction and decommissioning
- Noise and vibration disturbance of fauna during construction, operation, and decommissioning.
- Visual disturbance of fauna during construction, operation, and decommissioning.
- Lighting disturbance of flora and fauna during construction, operation, and decommissioning.

The risks arising from these impact factors for the habitats and species listed as Qualifying Interest (QIs) of any Natura 2000 sites in proximity to the Project must therefore be assessed. These effects are considered further below.

4.4 Step 3: Identification of relevant Natura 2000 Sites

The first step in identification of relevant Natura 2000 sites for further assessment is to identify those that will be at risk from likely significant effects where a Source-Pathway-Receptor link exists between the proposed development and the Natura 2000 site.

The relevant Natura 2000 sites are identified through a review of the nature and scale of the project, the project location relative to Natura 2000 sites, presence of ecological and landscape connectivity, such as along waterways, hedgerows and treelines between the Site and the Natura 2000 sites, known impacts and

effects likely to arise as a result of this type of project, distance from Natura 2000 sites and the qualifying interests of the Natura 2000 sites.

Table 4.1: Natura 2000 Sites and Interest Features initially considered for potential Source-Pathway-Receptor links below provides a list of Natura 2000 sites which were selected for initial consideration of Source-Pathway-Receptor links which will be assessed as part of the screening process. These are also shown on Drawing 1.

The EPA Appropriate Assessment tool⁹ was used to assess the connectivity that exists between the Project Site and Natura 2000 sites. There is a direct hydrological link between the Project Site and both River Nore SPA and River Barrow and River Nore SAC, as the proposed Project is located on the Western bank of the River Nore. The Project Site is inside the SPA boundary but outside the SAC boundary; however, the exclusion of the Project site from the SAC may be due to mapping inaccuracies rather than intentional.

There are no other Natura sites within 15km of the Project site and no connectivity between the Site and any other Natura 2000 site. Therefore, all other Natura 2000 sites can be excluded from the screening process.

⁹ <https://gis.epa.ie/EPAMaps/AAGeoTool> (last accessed February 2023)

Table 4.1: Natura 2000 Sites and Interest Features initially considered for potential Source-Pathway-Receptor links

Site Name (Code)	Distance ¹⁰	Qualifying Interests ¹¹	Conservation Objective	Impact (Source-Pathway-Receptor)	Considered further in Screening Report Y/N
River Nore SPA [004233]	The proposed project is inside the SPA	Kingfisher (<i>Alcedo atthis</i>) [A229]	To maintain or restore the favourable conservation condition of Kingfisher. There is no recent data on population status however this species is declining in Ireland, and it is assumed that the objective is to restore the population.	The proposed project site is inside the River Nore SPA. There is potential for impacts arising from: Habitat loss and damage during construction. Changes to water quality due to accidental silt discharge, pollution and dust during construction and decommissioning. Noise and vibration disturbance during construction, operation, and decommissioning. Visual disturbance during construction, operation, and decommissioning. Lighting disturbance during construction, operation, and decommissioning. . The site visit did not identify suitable kingfisher nesting habitat however this species is known to occur locally. Due to the potential impacts on kingfisher mitigation measures are required.	Y
River Barrow and River Nore SAC [002162]	The proposed project site is adjacent to the the SAC	Estuaries [1130]	To maintain the favourable conservation condition of Estuaries in the River Barrow and River Nore Sac	Construction and decommissioning at the Project Site may cause aquatic pollution (source), there is a downstream hydrological link from the Project Site to the Estuary (pathway) and estuaries are sensitive to certain types of pollution (receptor). However the scale of the project (small), the length of the pathway 32km (long) and the scale of the estuary (very large) mean that any pollution arising at the Project Site alone would be imperceptible and make no meaningful contribution to in combination effects.	N
		Mudflats and sandflats not covered by seawater at low tide [1140]	Maintain		N

¹⁰ When measured in a straight line over the shortest distance between the site and Natura 2000 site.

¹¹ For SPAs, the bird species that are the reason for designation are Species of Conservation Interest (SCIs) and for SACs the habitats and species that are the reason for designation are its Qualifying Interests (QIs). For convenience, the term qualifying interest or QI is used here for both SPAs and SACs.

⁹ [Protected Sites in Ireland | National Parks & Wildlife Service \(npws.ie\)](https://www.npws.ie/Protected_Sites_in_Ireland_National_Parks_Wildlife_Service)

Site Name (Code)	Distance ¹⁰	Qualifying Interests ¹¹	Conservation Objective	Impact (Source-Pathway-Receptor)	Considered further in Screening Report Y/N
		Reefs [1170]	Maintain		N
		Salicornia and other annuals colonising mud and sand [1310]	Maintain		N
		Atlantic salt meadows (<i>Glauco-Puccinellietalia maritima</i>) [1330]	Restore		N
		Mediterranean salt meadows (<i>Juncetalia aritime</i>) [1410]	Restore		N
		Water courses of plain to montane levels with the <i>Ranunculion fluitantis</i> and <i>Callitricho-Batrachion</i> vegetation [3260]	Maintain	The Project Site is outside but adjacent to the SAC. Nevertheless, there is potential for impacts on Water courses of plain to montane levels with the <i>Ranunculion fluitantis</i> and <i>Callitricho-Batrachion</i> vegetation due to: Changes to water quality during construction and decommissioning and lighting disturbance of flora during construction, operation, and decommissioning. No pathway for lighting, habitat loss and noise.	Y
		European dry heaths [4030]	Maintain	No potential for impacts on European dry heaths due to being terrestrial and habitats outside of the proposed Project Site. No pathway.	N
		Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels [6430]	Maintain	There is potential for impacts on Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels occurring downstream of the site due to possible changes in water quality.	Y
		Petrifying springs with tufa formation (Cratoneurion) [7220]	Maintain	There is no potential for impacts on Petrifying springs with tufa formation. Springs are groundwater dependent terrestrial ecosystems. They are not dependent on river water. There is no pathway for effects as the River Nore is not connected to a spring other than those in its own headwaters.	N
		Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles [91A0]	Restore	No potential for impacts on Killarney fern due to being terrestrial and habitats outside of the proposed Project Site.	N

Site Name (Code)	Distance ¹⁰	Qualifying Interests ¹¹	Conservation Objective	Impact (Source-Pathway-Receptor)	Considered further in Screening Report Y/N
		Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (Alno-Padion, Alnion incanae, Salicion albae) [91E0]	Restore	There is no potential for impacts on Alluvial forests located approx. 3.77km downstream. The conservation objectives are concerned with direct habitat loss or changes and not water quality changes. The distance from the proposed site means there is no pathway.	N
		<i>Vertigo moulinsiana</i> (Desmoulin's Whorl Snail) [1016]	Maintain	There is no potential for impacts on the Desmoulin's Whorl Snail due to their locations upstream from the proposed site. No pathway.	N
		<i>Margaritifera margaritifera</i> (Freshwater Pearl Mussel) [1029]	N/A	The status of this species is under review. The results of this review will determine site specific Conservation objectives. However, they have been recorded in the SAC previously so potential impacts at this time cannot be ruled out.	Y
		<i>Austropotamobius pallipes</i> (White-clawed Crayfish) [1092]	Maintain	This species occurs upstream of the Project site and downstream as far as Thomastown on the River Nore. There could be impacts on white clawed crayfish due to changes in water quality, noise/vibration and lighting.	Y
		<i>Petromyzon marinus</i> (Sea Lamprey) [1095]	Restore	Three species of lamprey including: brook, sea and river could be affected by possible changes to water quality with construction planned on the riverbank. As it only occurs/occurred downstream sea lamprey could not be affected by habitat loss, noise/vibrations and lighting.	Y
		<i>Lampetra planeri</i> (Brook Lamprey) [1096]	Restore	As above, except Brook Lamprey could occur in proximity to the Project site and could therefore be affected by habitat damage, noise/vibration, and lighting.	Y
		<i>Lampetra fluviatilis</i> (River Lamprey) [1099]	Restore	As for sea lamprey.	Y
		<i>Alosa fallax fallax</i> (Twaite Shad) [1103]	Restore	Twaite Shad use the river for spawning so may be affected by possible changes to water quality. As this species only occurs/occurred downstream, Twaite shad could not be affected by habitat loss, noise/vibration, and lighting.	Y
		<i>Salmo salar</i> (Atlantic salmon) [1106]	Restore	Atlantic Salmon use the river for spawning and occur up- and downstream of the Project site so may be affected by changes	Y

Site Name (Code)	Distance ¹⁰	Qualifying Interests ¹¹	Conservation Objective	Impact (Source-Pathway-Receptor)	Considered further in Screening Report Y/N
				to water quality. Atlantic salmon could be affected by habitat damage, noise/vibration, and lighting.	
		<i>Lutra lutra</i> (Otter) [1355]	Restore	<p>Otter could be affected by</p> <p>Habitat loss and damage during construction.</p> <p>Changes to water quality due to accidental silt discharge, pollution and dust during construction and decommissioning.</p> <p>Noise and vibration disturbance during construction, operation, and decommissioning.</p> <p>Visual disturbance during construction, operation, and decommissioning.</p> <p>Lighting disturbance during construction, operation, and decommissioning.</p>	Y
		<i>Trichomanes speciosum</i> (Killarney Fern) [1421]	Maintain	No potential for impacts on Killarney fern due to being terrestrial and habitats outside of the proposed site area. No pathway.	N
		<i>Margaritifera durrovensis</i> (Nore Pearl Mussel) [1990]	Restore	There is no potential for impacts on the Nore Pearl mussel due to its location upstream from the proposed site. No pathway.	N

4.5 Step 4, Part 1: Assessment of Likely Significant Effects for Project Alone

There are two Natura 2000 sites for which there is a direct connection (source-pathway-receptor link) with the Site; River Nore SPA and the River Barrow and River Nore SAC. It has been identified that, for these sites, habitat loss/damage, changes in water quality and disturbance of fauna through noise, lighting and the presence of people may result in likely significant effects for some of the habitats and species for which these Natura 2000 sites are designated., as shown in Table 4.1: Natura 2000 Sites and Interest Features initially considered for potential Source-Pathway-Receptor links

The potential for likely significant effects on screened-in QIs from habitat loss, changes in water quality, noise, vibrations, spread of invasive species and lighting are considered further below.

4.5.1 River Nore SPA

The only QI for the River Nore SPA is the kingfisher. Kingfisher is at risk of disturbance while foraging during construction, operation, and decommissioning, and impacts on food source due to changes in water quality. Therefore, Likely Significant Effects cannot be excluded without further assessment and/or mitigation.

4.5.2 Rive Barrow and River Nore SAC

Killarney fern and Terrestrial Habitats

There is no potential for impacts on Killarney fern, Old sessile oak woods and European dry heaths due to these being terrestrial and habitats outside of the proposed site area.

There is also no potential for impacts on Alluvial forests the nearest of which located approx.. 3.77km downstream. The conservation objectives (NPWS 2011) are concerned with direct habitat loss or changes and not water quality changes which could not be undermined by the Project. Likely Significant Effects can therefore be excluded for Killarney fern, Old sessile oak woods and European dry heaths.

Marine and Coastal Habitats

There is no potential for impacts on tidal/ estuarine habitats due to the small scale of the project, the temporary construction and decommissioning activities, and the distance from proposed site and assimilation capacity of the river. These are:

- Estuaries.
- Mudflats and sandflats not covered by seawater at low tide.
- Reefs
- Salicornia and other annuals colonising mud and sand.
- Atlantic salt meadows.
- Mediterranean salt meadows.

There will be no direct loss or fragmentation of these habitats during construction of the Project. There will be localised habitat disruption during construction, this encompasses a mosaic of habitats of which none are listed as Qualifying Interest. The habitats at the Project Site include scrub WS1, stone walls BL1, treeline WL2, amenity GA2, scattered trees and parkland WDS, depositing/ lowland rivers FW2, buildings and artificial surfaces BL3 and earth banks BL2. Likely Significant Effects for Estuaries, Mudflats and sandflats not covered by seawater at low tide, Reefs, Salicornia and other annuals colonising mud and sand, Atlantic salt meadows, and Mediterranean salt meadows can therefore be excluded for the Project Alone.

Petrifying springs with tufa formation (Cratoneurion) [7220]

There is no potential for impacts on Petrifying springs with tufa formation. Springs are groundwater dependent terrestrial ecosystems. They are not dependent on river water. There is no pathway for effects as the River Nore is not connected to a spring other than those in its own headwaters. LSE on Petrifying springs with tufa formation can therefore be excluded.

Desmoulin's Whorl Snail

The conservation objectives for *Vertigo moulinsiana* (Desmoulin's Whorl Snail) include distribution, population size, population density, area of occupancy, habitat quality in terms of vegetation and soil moisture levels. The proposed project could not undermine the objectives for Desmoulin's Whorl Snail. This is because whorl snails are located upstream from the project site in a section of the SAC near Oldglass river which joins the River Erkina. The River Erkina joins the Nore at Durrow approx. 26.4km upstream from the proposed site. The other recorded area of whorl snails occurs on the River Barrow. The Nore joins the River Barrow 46.2km downstream of the site. The convergence is also downstream of the whorl snail populations. Due to the location of whorl snails up stream and in a different river system there will be no potential for direct or indirect impacts. LSE on Desmoulin's Whorl Snail can therefore be excluded.

Nore Pearl Mussel

The conservation objective is to restore the favourable conservation condition of the Nore freshwater pearl mussel in the River Barrow and River Nore SAC. The objectives are to maintain sufficient juvenile salmonids to host glochidial larvae, water quality, substratum quality in terms of filamentous algae, sediment, and oxygen availability and hydrological regime in terms of flow variability. NPWs have recorded Nore Pearl Mussel approx. 21.2km upstream of the proposed Project Site. Water quality, substratum quality and hydrological regime will not be affected due to the distance of the Nore Pearl Mussel upstream from the proposed site, therefore LSE can be excluded for the Nore Pearl Mussel.

LSEs White-clawed crayfish

White-clawed crayfish have been identified as being at risk of potential LSE due to changes in water quality, noise/vibration and lighting as a result of the project. As such in the absence of mitigation or further assessment there is potential for LSE on this QI and therefore stage 2 Appropriate Assessment is required.

LSEs on Otter

Otter has been identified as being at risk of potential LSE due to changes in water quality and lighting. Potential LSEs on otter are as follows:

- Habitat loss and damage during construction.
- Changes to water quality due to accidental silt discharge, pollution and dust during construction and decommissioning.
- Noise and vibration disturbance during construction, operation, and decommissioning.
- Visual disturbance during construction, operation, and decommissioning.
- Lighting disturbance during construction, operation, and decommissioning.

As such in the absence of mitigation or further assessment there is potential for LSE on this QI and therefore stage 2 Appropriate Assessment is required.

LSEs on QI fish arising from changes to water quality, lighting, noise and vibrations

The species of fish which have been identified as being at risk of LSE are Sea, brook and river lamprey, *Petromyzon marinus*, *Lampetra planeri*, *Lampetra fluviatilis* respectively, and Atlantic salmon *Salmo salar*. The potential impacts on fish species are as follows;

- Potential degradation of spawning and juvenile habitat and subsequent potential effects on population structures of all four of these fish species due to the potential of increased suspended solids.
- Direct effects on all four fish species due to impacts on water quality such as potential mortality or reduction in food availability.
- Disturbance caused by lighting, noise and vibrations during construction and decommissioning for brook lamprey and Atlantic salmon only.

In the absence of mitigation there is potential for LSE on QI fish species in the SAC, it is therefore not possible to exclude likely significant effects on these QIs as a result of the proposed project alone and second stage Appropriate assessment is required.

LSE on QI plant communities arising from changes to water quality

Potential LSEs on QI plant communities include:

Impacts on water quality as a result of the Project has the potential to alter nutrient concentrations which could potentially lead to LSE on the QI “water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation” and “Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels”.

As such, in the absence of mitigation or further assessment there is potential for LSE on this QI and therefore second stage Appropriate Assessment is required.

Freshwater Pearl Mussel

The Freshwater Pearl Mussel has been identified as being at risk of LSE as a result to changes in water quality. In absence of mitigation there is potential for LSE on Freshwater Pearl mussel. It is therefore not possible to screen out potentially significant effects on these Qis as a result of the proposed project alone and second stage Appropriate assessment is required.

4.6 Step 4, Part 2: Assessment of Likely Significant Effects for Project In Combination

Other projects or plans which are within the River Nore catchment area have the potential to act cumulatively with the proposed project to affect the River Barrow and Nore SAC and River Nore SPA. Therefore, LSE cannot be excluded for the River Barrow and Nore SAC and River Nore SPA when considered in combination with other plans and projects at this stage.

4.7 Conclusions

This screening report, based on the available scientific information and project details demonstrates, that “likely significant effects” on any Natura 2000 site due to the project cannot be excluded. Therefore, in the absence of consideration of suitable mitigation, likely significant effects on these two Natura 2000 sites cannot be excluded and the assessment must proceed to Stage 2: Appropriate Assessment and a Natura Impact Statement must be prepared.

5 STAGE 2: APPROPRIATE ASSESSMENT (NATURA IMPACT STATEMENT)

This Natura Impact Statement (NIS) was prepared as part of a planning application to Kilkenny County Council by Kilgallen & Partners Ltd in respect to the proposed construction of Pedestrian link between the River Nore Linear Park and the Riverside Gardens in Kilkenny City.

The Competent Authority, in this case Kilkenny County Council will therefore be required to carry out a Stage 2 Appropriate Assessment to determine whether the proposed project would adversely affect the integrity of the River Nore SPA and the River Barrow and Nore SAC. The '*integrity of the site*' can be defined as 'the coherence of the site's ecological structure and function, across its whole area, or the habitats, complex of habitats and / or populations of species for which the site is or will be classified'

The headings within the appropriate assessment report template provided in the European Commission guidance document on the assessment of plans and projects significantly affecting Natura 2000 sites have been used to provide a framework to examine the potential impacts of the proposed project on the River Nore SPA and River Barrow and Nore SAC. This section of the report sets out the potential implications of the plan or project (both alone or in combination with other projects or plans) on the integrity of the Natura 2000 site with respect to the conservation objectives of the site and to its structure and function. The precautionary principle should be applied when considering the potential implications and the focus should be on demonstrating, with supporting evidence, that there will be no adverse effects on the integrity of the River Nore SPA and the River Barrow and River Nore SAC. Where this is not the case, adverse effects must be assumed.

5.1 Step 1, Part 1: Information on the Project

The Project Site is located at approximate ITM coordinates 650449 656562 on the western bank of the River Nore, in the townland of Gardens in the West of Kilkenny City. The Site comprises of 570m³ of land consisting of an existing footpath along the river bounded by a willow treeline and a mortared stonewall, amenity grassland and scrub. The site is divided by Greens Bridge, which spans the river in a West to East direction. There is a stone archway located underneath the bridge within the footprint of the proposed Project.

The site is bounded to the West by Green Street and residential properties which front onto Green Street. To the East is the River Nore, to the south is the Abbey Quarter/Riverside Garden area, and to the north the River Nore Linear Park at Bishops Meadows. The boardwalk structure will comprise 200mm diameter tubular steel mini piles, infilled with concrete, installed in pairs at 2m centres at intervals of 6m along the route. Steel beams will span the pile heads to support the boardwalk decking. The deck surface is proposed to be manufactured from recycled plastic. The proposed deck width is 3m, reduced to 2.2m at pinch points between existing trees and walls and the river's edge. An area of clearance of 1m is proposed at the western side of the boardwalk to allow for maintenance. The deck surface is proposed to be manufactured from recycled plastic. This is an environmentally friendly material with excellent non slip characteristics and is completely rot proof thus significantly reducing maintenance. Parapets are required to provide fall protection at the sides of the boardwalk to a height of 1.5m. The parapets will be constructed from painted mild steel vertical uprights supporting recycled plastic horizontal rails. No in-channel works are required or proposed. The construction materials can be transported along the riverbank using small quadbike type vehicles.

5.2 Step 1, Part 2: Description of the Natura 2000 sites

A description of each of the Natura 2000 sites screened in for further assessment, River Nore SPA and the River Barrow and River Nore SAC is provided in **Table 2.1** above and detail on the conservation objectives for each site are provided below. The Qualifying Interests and Species conservation interests listed are those which the project may potentially affect.

5.2.1 River Nore SPA [004233]

Brief Description

The River Nore SPA is a long, linear site. The site is a Special Protection Area (SPA) under the E.U. Birds Directive of special conservation interest for the following species: Kingfisher. The River Nore SPA is of high ornithological importance as it supports a nationally important population of Kingfisher, a species that is listed on Annex I of the E.U. Birds Directive.

Qualifying Interest Screened in for Assessment

Kingfisher(*Alcedo atthis*) [A229]

Conservation Objectives

The conservation objectives (COs) for the River Nore SPA are as follows:

To maintain or restore the favourable conservation condition of the bird species listed as Species conservation interests for this SPA i.e. restore the breeding baselin in 2010.Kingfisher(Alcedo atthis) [A229]

Table 5.1: Qualifying interest of the River Nore SPA and its conservation objectives

Qualifying Interests	CO	Attributes	Targeted Objectives
Kingfisher (<i>Alcedo atthis</i>) [A229]	Maintain or restore, assumed restore due to declining population in Ireland	Assumed to be Population size and distribution	Assumed to be restore population to 16-20 territories, with breeding territories throughout the SPA.

5.2.2 River Barrow and River Nore SAC

Brief Description

This site consists of the freshwater stretches of the River Barrow and River Nore catchments as far upstream as the Slieve Bloom Mountains, and it also includes the tidal elements and estuary as far downstream as Creadun Head in Waterford. The site passes through eight counties – Offaly, Kildare, Laois, Carlow, Kilkenny, Tipperary, Wexford and Waterford.

Qualifying Interest Screened in for Assessment

The Qualifying Interest Screened in for Assessment were:

- 1092 White-clawed crayfish *Austropotamobius pallipes*
- 1095 Sea lamprey *Petromyzon marinus*
- 1096 Brook lamprey *Lampetra planeri*
- 1099 River lamprey *Lampetra fluviatilis*
- 1103 Twaite shad *Alosa fallax*

- 1106 Atlantic salmon (*Salmo salar*) (only in fresh water)
- 1355 Otter *Lutra lutra*
- 3260 Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation
- 6430 Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels
- *Margaritifera margaritifera* (Freshwater Peral Mussel)

Conservation Objectives

The conservation objectives (Cos) for the River Barrow and River Nore SAC are as follows:

To maintain or restore the favourable conservation condition of the habitats and species listed as Qualifying interests for this SAC.

The Conservation Objectives specific to each Qualifying Interest feature included in the assessment is provided in Table 5.2.

Table 5.2: Qualifying interests of the River Barrow and River Nore SAC and their specific conservation objectives

Qualifying Interests	CO	Attributes	Targeted Objectives
Water courses of plain to montane levels with the <i>Ranunculion fluitantis</i> and <i>Callitricho-Batrachion</i> vegetation [3260]	Maintain	<ol style="list-style-type: none"> 1. Hydrological regime: river flow. 2. Substratum composition: particle size range 3. Water quality: suspended sediment 4. Water quality: nutrients 	<ol style="list-style-type: none"> 1. The groundwater and surface water should have sufficient concentrations of minerals to allow deposition and persistence of tufa deposits. 2. The concentration of suspended solids in the water column should be sufficiently low to prevent excessive deposition of fine sediments. 3. The concentration of nutrients in the water column should be sufficiently low to prevent changes in species composition or habitat condition. 4. Typical species of the relevant habitat sub-type should be present and in good condition

Qualifying Interests	CO	Attributes	Targeted Objectives
			<ol style="list-style-type: none"> The area of active floodplain at and upstream of the habitat should be maintained
Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels [6430]	Maintain	Hydrological regime: Flooding depth/height of water table	<ol style="list-style-type: none"> No decline, subject to natural processes Area stable or increasing, subject to natural processes. Maintain appropriate hydrological regimes. 30-70% of sward is between 40 and 150cm in height. Broadleaf herb component of vegetation between 40 and 90%. At least 5 positive indicator species present. Negative indicator species, particularly non-native invasive species, absent or under control- NB Indian balsam (<i>Impatiens glandulifera</i>), monkeyflower (<i>Mimulus guttatus</i>), Japanese knotweed (<i>Fallopia japonica</i>) and giant hogweed (<i>Heracleum mantegazzianum</i>).
<i>Austropotamobius pallipes</i> (White-clawed Crayfish) [1092]	Maintain	<ol style="list-style-type: none"> Distribution. Population structure: recruitment. Negative indicator species. Disease. Water quality. Habitat quality: heterogeneity 	<ol style="list-style-type: none"> No reduction from baseline Juveniles and/or females with eggs in at least 50% of positive samples. No alien crayfish species. No instances of disease. At least Q3-4 at all sites sampled by EPA.

Qualifying Interests	CO	Attributes	Targeted Objectives
			6. No decline in heterogeneity or habitat quality.
<i>Petromyzon marinus</i> (Sea Lamprey) [1095]	Restore	<ol style="list-style-type: none"> 1. Distribution: extent of anadromy. 2. Population structure of juveniles. 3. Juvenile density in fine sediment. 4. Extent and distribution of spawning habitat. 5. Availability of juvenile habitat. 	<ol style="list-style-type: none"> 1. Greater than 75% of main stem length of rivers accessible from estuary. 2. At least three age/size groups present. 3. Juvenile density at least 1/m². 4. No decline in extent and distribution of spawning beds. 5. More than 50% of sample sites positive.
<i>Lampetra planeri</i> (Brook Lamprey) [1096]	Restore	<ol style="list-style-type: none"> 1. Distribution. 2. Population structure of juveniles. 3. Juvenile density in fine sediment. 4. Extent and distribution of spawning habitat. 5. Availability of juvenile habitat. 	<ol style="list-style-type: none"> 1. Access to all watercourses down to first order streams. 2. At least three age/size groups of brook/river lamprey present. 3. Mean catchment juvenile density of brook/river lamprey at least 2/m². 4. No decline in extent and distribution of spawning beds. 5. More than 50% of sample sites positive.
<i>Lampetra fluviatilis</i> (River Lamprey) [1099]	Restore	<ol style="list-style-type: none"> 1. Distribution: extent of anadromy. 2. Population structure of juveniles. 3. Juvenile density in fine sediment. 4. Extent and distribution of spawning habitat. 5. Availability of juvenile habitat 	<ol style="list-style-type: none"> 1. Greater than 75% of main stem and major tributaries down to second order accessible from estuary. 2. At least three age/size groups of river/brook lamprey present. 3. Mean catchment juvenile density of brook/river lamprey at least 2/m².

Qualifying Interests	CO	Attributes	Targeted Objectives
			<ol style="list-style-type: none"> No decline in extent and distribution of spawning beds. More than 50% of sample sites positive.
<i>Alosa fallax fallax</i> (Twaite Shad) [1103]	Restore	<ol style="list-style-type: none"> Distribution: extent of anadromy. Population structure: age classes. Extent and distribution of spawning habitat. Water quality: oxygen levels. Spawning habitat quality: Filamentous algae; macrophytes; sediment. 	<ol style="list-style-type: none"> Greater than 75% of main stem length of rivers accessible from estuary. More than one age class present. No decline in extent and distribution of spawning habitats. No lower than 5mg/l. Maintain stable gravel substrate with very little fine material, free of filamentous algal (macroalgae) growth and macrophyte (rooted higher plants) growth.
<i>Salmo salar</i> (Salmon) [1106]	Restore	<ol style="list-style-type: none"> Distribution: extent of anadromy. Adult spawning fish Number. Salmon fry abundance. Out-migrating smolt abundance. Number and distribution of redds. Water quality. 	<ol style="list-style-type: none"> 100% of river channels down to second order accessible from estuary. Conservation Limit (CL) for each system consistently exceeded. Maintain or exceed 0+ fry mean catchment-wide abundance threshold value. Currently set at 17 salmon fry/5 min sampling. No significant decline. No decline in number and distribution of spawning redds due to anthropogenic causes. At least Q4 at all sites sampled by EPA.
<i>Lutra lutra</i> (Otter) [1355]	Restore	<ol style="list-style-type: none"> Distribution. 	<ol style="list-style-type: none"> No significant decline.

Qualifying Interests	CO	Attributes	Targeted Objectives
		2. Extent of terrestrial habitat. 3. Extent of marine habitat. 4. Extent of freshwater (river) habitat. 5. Extent of freshwater (lake) habitat. 6. Couching sites and holts. 7. Fish biomass available.	2. No significant decline. Area mapped and calculated as 122.8ha above high water mark (HWM); 1136.0ha along river banks / around ponds. 3. No significant decline. Area mapped and calculated as 857.7ha. 4. No significant decline. Length mapped and calculated as 616.6km. 5. No significant decline. Area mapped and calculated as 2.6ha. 6. No significant decline. 7. No significant decline.
<i>Margaritifera margaritifera</i> (Freshwater Peral Mussel) [1029]	Under review	Under review	Under review

5.3 Step 2, Part 1: Effects of Project Alone

The elements of the project identified as having potential to affect the River Nore SPA and River Barrow and River Nore SAC are as follows:

- Habitat loss and damage during construction.
- Changes to water quality due to accidental silt discharge, pollution and dust during construction and decommissioning.
- Noise and vibration disturbance of fauna during construction, operation, and decommissioning.
- Visual disturbance of fauna during construction, operation, and decommissioning.
- Lighting disturbance of flora and fauna during construction, operation, and decommissioning.

5.3.1 River Nore SPA

5.3.2 Kingfisher

The only QI for the River Nore SPA is the kingfisher. The conservation objective from (NPWS 2022) is assumed to be restore its favourable conservation condition. Kingfisher build nests in burrows excavated into stone free vertical banks with very little to no vegetation¹². The site survey confirmed that the Project Site is not suitable as a nest site for kingfisher due to the existing retaining wall running the length of the route to the west and the bank is shallow and prone to flooding. However, kingfisher is recorded widely in the SPA, including within Kilkenny City, and will forage in proximity to the Project site.

Kingfisher is at risk of disturbance while foraging during construction, operation and decommissioning. This species flies away on approach and repeated disturbance could reduce the time available for foraging, which may be especially important during the breeding season. However, this species is relatively tolerant of human activity, being found commonly on urban rivers with footpaths alongside provided the water quality is high enough. It has long territories of over 1km and therefore it is readily able to avoid localised human activity. The boardwalk is just 100m in length and on one bank only, therefore less than 10% of a single kingfisher territory. Disturbance in this location would not be sufficient to prevent successful kingfisher territory along this stretch of the river.

Kingfisher is also at risk from impacts on food source due to changes in water quality because of suspended solid pollution during the construction and decommissioning of the project. The kingfisher is a carnivorous bird which preys mainly on small fish and crustacea and requires clear water to be able to hunt (Al-Zahaby & Elsheikh, 2014). Given the small scale and temporary nature of the works, unmitigated releases of suspended solids will be of small quantity and duration, and therefore unlikely to have population level effects on kingfisher. This can be made certain through mitigation.

5.3.3 River Barrow and Nore SAC

White-clawed crayfish

White-clawed crayfish have been recorded by NPWS approx. 3.77km downstream of the project site. The conservation objective is to maintain the favourable conservation condition of white-clawed crayfish in the River Barrow and River Nore and the attributes and targets are focused on maintaining favourable habitat, water quality, distribution, population structure, negative indicator species, and disease. Larger crayfish must

¹² [Kingfisher Breeding, Feeding and Territory - The RSPB](#) (31/01/2023)

have stones to hide under, or an earthen bank in which to burrow. Hatchlings shelter in vegetation, gravel and among fine tree-roots. Smaller crayfish are typically found among weed and debris in shallow water. The white-claw crayfish are present throughout most of the SAC. The proposed project will not directly affect the habitat of this species as works will be conducted on an existing path between the slope of the riverbank and the existing retaining wall. This area is not suitable habitat for white-clawed crayfish. Due to the location of works not in channel this will prevent the possible spread of disease and/or alien crayfish species and no machinery will be used in the water. Water quality must remain at least Q3-4 to remain suitable for this species. There is a risk of accidental silt runoff during the construction of the project due to the proximity of the proposed site and the Nore river. Due to the potential for undermining the conservation objectives, adverse effects on site integrity cannot be excluded without mitigation.

Otter

Otter is also listed as a qualifying interest of the River Barrow and River Nore SAC. The conservation objective is to restore favourable condition of the otter population and the attributes and targets include, distribution, extent of terrestrial habitat, extent of marine habitat, extent of freshwater habitat (river), extent of freshwater habitat (lake), couching sites and holts, and fish biomass available. There is no suitable habitat to support otter holts along the proposed walkway. The riverbank along the proposed route is shallow, prone to flooding and consists of an existing retaining wall in lieu of an earth embankment. While it is probable that otter is using this section of the River Nore for foraging, the proposed works will not create significant disturbance to otter given the short extent of the proposed development (c.100m length) relative to the length of foraging habitat provided by the River Nore. Moreover, the otter is relatively tolerant of human presence and this is not a factor that would hinder the restoration of the otter population (Chanin, 2003). The proposed project may affect the target concerning fish biomass in the river which the otter feeds on. Changes in water quality may impact on fish stocks which is the primary prey species for otter (Lanszki & Sallai, 2006). Lighting the boardwalk at night and the use of the boardwalk by people may affect the nocturnal habits of the otter. Noise/vibrations during construction and decommissioning may affect the otters foraging. Due to the potential for adverse effects undermining conservation objectives of Otter, adverse effects on site integrity cannot be screened out without mitigation.

Sea Lamprey

Conservation objective for sea lamprey is restore the favourable conservation condition of sea lamprey in the River Barrow and River Nore SAC. This can be defined by the following the attributes and targets s: Distribution: extent of anadromy, Population structure of juveniles, juvenile density in fine sediment, extent and distribution of spawning habitat and availability of juvenile habitat. There will be no artificial barrier put in place to disrupt the distribution and extent of anadromy and juvenile habitat therefore it will not affect population structure of juvenile's and the juvenile density in fine sediment. There will be no direct in channel works to disrupt spawning grounds. Due to the proximity of the proposed site to the River Nore there is a risk of indirect impacts of water quality in the event of silt run off or pollution during construction. The silt may affect spawning habitats of sea lamprey. Therefore, population structure of juveniles and juvenile density in fine sediment may be affected.. Due to the potential for this to undermine the conservation objectives, adverse effects on site integrity without mitigation.

River Lamprey, Brook Lamprey

Conservation objectives for river lamprey and brook lamprey are to restore the favourable conservation condition of River lamprey in the River Barrow and River Nore SAC. This can be defined by the following the attributes and targets: distribution in terms of the extent of anadromy, population structure of juveniles, juvenile density in fine sediment, extent and distribution of spawning habitat and availability of juvenile habitat. There will be no artificial barrier put in place to disrupt the distribution and extent of anadromy and

juvenile habitat therefore it will not affect population structure of juvenile's and the juvenile density in fine sediment. There will be no in channel works to directly disrupt spawning grounds. Due to the proximity of the Project Site to the River Nore there is a risk of silt run off during construction. This may affect the spawning sites of river and brook lamprey. Therefore, population structure of juveniles and juvenile density in fine sediment may be affected.

Brook lamprey is the only lamprey species known to occur in proximity to the Project site, the other species occur only downstream. Brook lamprey may be affected by noise and vibrations during construction. Fish are sensitive to noise and vibrations. Sound is used for fish in orientation, migration and avoiding predators (Popper & Hawkins, 2019). Noise and vibrations could have an effect on the ability of the fish to move through the river and therefore undermining conservation objectives. Fish may also be affected by lighting during the operation of the project. Fish can migrate in the night-time and this extra lighting could affect this.

Therefore mitigation is required to ensure that the conservation objectives would not be undermined.

Twaite Shad

The conservation objectives for *Alosa fallax fallax* (Twaite Shad) is to restore the favourable conservation condition of Twaite shad in the River Barrow and River Nore SAC. This can be defined by the following the attributes and targets distribution: extent of anadromy, population structure, extent and distribution of spawning habitat, water quality, in terms of oxygen levels and spawning habitat in terms of habitat quality, filamentous algae, macrophytes and sediment quality. The proposed project could not undermine the conservation objective because it will not affect these targets. There will be no artificial barriers put in place for the proposed project. This will ensure the extent of anadromy will not be affected. No works will be carried out within the channel so spawning sites and population structure will not be affected directly. There is a risk of accidental silt discharge during construction due to the proximity of the site to the River Nore which may affect the habitat quality and spawning sites indirectly. Due to the potential for this to undermine the conservation objectives, adverse effects on site integrity without mitigation, This species only occurs downstream and therefore would not be affected by other activity at the Project site.

Atlantic salmon

Salmo salar (Atlantic salmon) are a QI of this SAC. The conservation objective is to restore the favourable conservation condition of Salmon in the River Barrow and River Nore SAC. The the attributes and targets include: the distribution in terms of the extent of anadromy, adult spawning fish numbers, salmon fry abundance, out-migrating smolt abundance, number and distribution of redds and water quality. There will be no artificial barriers in place as all works will be conducted on the riverbank resulting in no impacts on the extent of anadromy. There will be no direct effects on spawning sites as all works will be conducted during the summer months which is outside of the spawning season. The works will be conducted on the riverbank and not in channel resulting in no direct significant effects on water quality, spawning sites and the population of salmon in the SAC. However, there is a risk of increased sedimentation due to accidental runoff from the proposed site during construction. This increased sedimentation could impact on salmon spawning sites. Salmon spawn in clean gravels and an increase in sedimentation could cause an indirect adverse effect on salmon spawning sites. Atlantic salmon may be affected by noise and vibrations during the construction and decommissioning phase of the project. During the operational phase of the project the lighting of the boardwalk may cause an effect on salmon migration during the night. Due to the potential for this to undermine the conservation objectives, adverse effects on site integrity cannot be screened out at this stage.

Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels, and Water courses of plain to montane levels with the *Ranunculus fluitantis* and Callitricho-Batrachion vegetation

There is potential for water quality impacts on Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels, and Water courses of plain to montane levels with the *Ranunculus fluitantis* and Callitricho-Batrachion vegetation. During the site visit these habitats were not recorded however they may occur downstream and be affected by changes in water quality. These riverine habitats are affected by water quality. Changes in alkalinity, pH, nitrate, phosphate, potassium, suspended solids and lighting can influence species composition and extent of these habitats.. The proximity of the Project site to the River Nore creates a potential risk of changes in water quality during the construction and decommissioning of the project. Due to the potential for this to undermine conservation objectives, adverse effects on integrity cannot be excluded for these habitats without mitigation.

Freshwater Pearl Mussel

Currently there are no conservation objectives for the Freshwater Pearl mussel. Works will be undertaken in The River Barrow and Nore SAC. Using the precautionary approach, it is possible that they may be impacted by changes in water quality during the construction phase. Likely significant effects on cannot be excluded for the Freshwater Pearl Mussel at this stage.

5.4 Step 2, Part 2: Effects of Project In Combination

In combination effects can result from individually insignificant but collectively significant actions taking place over a period of time or concentrated in a location which affect the same Natura 2000 sites. In combination effects can occur where a proposed development results in individually insignificant impacts that, when considered in-combination with impacts of other proposed or permitted plans and projects, can result in significant effects.

Other plans and projects that should be considered when establishing in combination effects are:

- proposals for which consent has been applied but which are awaiting determination;
- projects which have been granted consent, but which have not yet been started or which have been started but are not yet completed (i.e., under construction);
- proposals which have been refused permission, but which are subject to appeal, and the appeal is undetermined;
- constructed developments whose full environmental effects are not yet felt and therefore cannot be accounted for in the baseline; or
- developments specifically referenced in a National Policy Statement, a National Plan or a Local Plan.

Myplan.ie¹³ and Kilkenny County Council ¹⁴planning portals were accessed to examine planning applications upstream and downstream of the proposed site with potential to act in combination with the proposed development at the Site. Active (i.e., within 6 years) planning applications in the surrounding area consist of several single house extensions, demolitions and renovations of commercial buildings.

¹³ [National Planning Application Map Viewer - My Plan](#) (last accessed 31/01/23)

¹⁴ [2022 - Kilkenny County Council \(kilkennycoco.ie\)](#) (last accessed 31/01/23)

- The River Court Hotel was granted permission to modify the existing structure an Environmental Impact assessment was carried out and it was accepted that it would not pose any likely significant effects to the SPA and SAC.
- Saint Lukes General hospital was granted permission to erect a single ground storey floor extension of 292sq.m to the existing radiology department. This is an extension within the grounds of the existing building, and it was accepted that it would not affect the integrity of the European sites.
- The existing Troyswood Water Treatment plant is a large development located North of the proposed site. The existing plant located approx. 4.8km upstream of the proposed site location is currently under development after planning permission was granted by An Bord Pleanala under conditions. An NIS report was conducted and direct impacts to the River Nore SPA and River Barrow and River Nore SAC were highlighted. In the report mitigation measures were outlined to address concerns over possible significant direct and indirect effects on the protected areas given the nature of works involving direct water abstraction from the River Nore, direct in channel works and habitat loss. These mitigations measures were accepted and the development by itself or in combination with other projects was deemed to not adversely affect the integrity of the European sites. The development started in December 2021; it is estimated to take approx. 2.5 years to complete.

5.5 Step 2, Part 3: Effects on the Conservation Objectives

5.5.1 River Nore SPA

There is the potential for direct impact on Kingfisher habitat in the River Nore SPA. The proposed site is located on the banks of the river Nore where there is a possibility that Kingfisher use this area for foraging. The habitat loss/disruption, and issues with water quality affecting fish biomass due to the construction and decommissioning of the proposed project could undermine the conservation objectives of the Natura 2000 site.

Table 5.3: Effects on Conservation Objectives River Nore SPA

Ref	Objective	Alone	In Combination
Kingfisher (<i>Alcedo atthis</i>) [A229]	Restore the Kingfisher Population	Changes in water quality and habitat disruption has potential to effect: <ul style="list-style-type: none"> • Foraging habitat. • Reduction of prey species. 	Potential to exacerbate effects of changes in water quality by acting in – combination with other projects

5.5.2 River Barrow and River Nore SAC

There is the potential for indirect impacts on the River Barrow and Nore SAC during construction by accidental run off of silt into the River Nore. This could lead to indirect impacts on species of lampray, salmon, otter, white-clawed crayfish and twaite shad. It could also affect hydrophilous tall herb fringe communities of plains and of the montane to alpine levels and Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation that may occur downstream of the site. The main concern for lamprey, salmon, twaite shad and salmon is changes to water quality due to silt run off during construction. Silt runoff causes an increase in suspended solids and can cause increased sedimentation in spawning sites. White-claw crayfish are very sensitive to changes in water quality. Water quality levels need to remain at Q3-

4 to remain suitable for this species. Otter may be affected by changes in water quality due to the effects of silt runoff on fish biomass.

Table 5.4: Effects on Conservation Objectives River Barrow and River Nore SAC

Ref	Objective/ Target	Attribute/ Alone	In Combination
<i>Lutra lutra</i> (Otter)	Restore the Otter Population	Changes in water quality has potential to effect: <ul style="list-style-type: none"> • Fish biomass available 	Potential to exacerbate effects of changes in water quality by acting in – combination with other projects
<i>Salmo salar</i> (Salmon) [1106]	Restore favourable conservation condition of Atlantic Salmon.	Changes in water quality has potential to effect: <ul style="list-style-type: none"> • Conservation Limit (CL) for each system consistently exceeded. • Maintain or exceed 0+ fry mean catchment - wide abundance threshold value. Currently set at 17 salmon fry/5 min sampling. • No significant decline. • No decline in number and distribution of spawning redds due to anthropogenic causes. • At least Q4 at all sites sampled by EPA. <p>Lighting during operation has the potential to effect:</p> <ul style="list-style-type: none"> • Fish Migration during the night <p>Vibrations during construction and decommissioning has the potential to effect:</p> <ul style="list-style-type: none"> • Fish migration 	Potential to exacerbate effects of changes in water quality by acting in – combination with other projects
<i>Alosa fallax fallax</i> (Twaite Shad) [1103]	Restore favourable conservation condition of Twaite Shad.	Changes in water quality has potential to effect: <ul style="list-style-type: none"> • More than one age class present. • No decline in extent and distribution of spawning habitats. • No lower than 5mg/l. • Maintain stable gravel substrate with very little fine material, free of filamentous algal (macroalgae) growth and 	Potential to exacerbate effects of changes in water quality by acting in – combination with other projects

Ref	Objective/ Target	Attribute/ Alone	In Combination
		macrophyte (rooted higher plants) growth.	
<i>Lampetra fluviatilis</i> (River Lamprey) [1099]	Restore favourable conservation condition of River Lamprey	<p>Changes in water quality has potential to effect:</p> <ul style="list-style-type: none"> • At least three age/size groups of river/brook lamprey present. • Mean catchment juvenile density of brook/river lamprey at least 2/m². • No decline in extent and distribution of spawning beds. • More than 50% of sample sites positive. 	Potential to exacerbate effects of changes in water quality by acting in – combination with other projects
<i>Lampetra planeri</i> (Brook Lamprey) [1096]	Restore favourable conservation condition of Brook Lamprey	<p>Changes in water quality has potential to effect:</p> <ul style="list-style-type: none"> • At least three age/size groups of brook/river lamprey present. • Mean catchment juvenile density of brook/river lamprey at least 2/m². • No decline in extent and distribution of spawning beds. <p>More than 50% of sample sites positive.</p> <p>Lighting during operation has the potential to effect:</p> <ul style="list-style-type: none"> • Fish Migration during the night <p>Vibrations during construction and decommissioning has the potential to effect:</p> <p>Fish migration</p>	Potential to exacerbate effects of changes in water quality by acting in – combination with other projects
<i>Petromyzon marinus</i> (Sea Lamprey) [1095]	Restore favourable conservation condition of Sea Lamprey	<p>Changes in water quality has potential to effect:</p> <ul style="list-style-type: none"> • At least three age/size groups present. • Juvenile density at least 1/m². 	Potential to exacerbate effects of changes in water quality by acting in – combination with other projects

Ref	Objective/ Target	Attribute/ Condition	Alone	In Combination
			<ul style="list-style-type: none"> No decline in extent and distribution of spawning beds. More than 50% of sample sites positive. 	
<i>Austroptamobius pallipes</i> (White-clawed Crayfish) [1092]	Maintain favourable conservation condition of White-clawed Crayfish		<p>Changes in water quality has potential to effect:</p> <p>At least Q3 - 4 at all sites sampled by EPA.</p>	Potential to exacerbate effects of changes in water quality by acting in – combination with other projects
<i>Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels</i> [6430]	Maintain favourable conservation condition of habitat.		<p>Changes in water quality has potential to effect:</p> <ul style="list-style-type: none"> No decline, subject to natural processes 	Potential to exacerbate effects of changes in water quality by acting in – combination with other projects
<i>Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation</i> [3260]	Maintain favourable conservation condition of habitat		<p>Changes in water quality has potential to effect:</p> <ul style="list-style-type: none"> The groundwater and surface water should have sufficient concentrations of minerals to allow deposition and persistence of tufa deposits. The concentration of suspended solids in the water column should be sufficiently low to prevent excessive deposition of fine sediments. The concentration of nutrients in the water column should be sufficiently low to prevent changes in species composition or habitat condition. 	Potential to exacerbate effects of changes in water quality by acting in – combination with other projects
<i>Margaritifera margaritifera</i> (Freshwater Peral Mussel) [1029]	Under review		Changes in water quality	Potential to exacerbate effects of changes in water quality by acting in – combination with other projects

5.6 Step 3: Effects on Integrity

As shown in the table above the project has the potential to undermine conservation objectives in both the River Nore SPA and River Barrow and River Nore SAC. As a result, there is potential to undermine the integrity of these Natura 2000 sites without mitigation.

5.7 Step 4, Part 1: Mitigation Measures

To mitigate against the risk of undermining the conservation objectives during the construction, operation and decommissioning stages, the following mitigation measures will be implemented.

5.7.1 Water Quality

Water quality is a concern for kingfisher, otter, the lampreys, salmon, twaite shad and white-clawed crayfish. The following management measures will ensure that water quality is not affected during the construction and decommissioning of the proposed project.

- Standard best practices as laid out by Inland Fisheries Ireland (IFI) will be used during the construction of the proposed project which include the following (IFI 2016).
- Topsoil only be removed during periods of dry weather.
- Topsoil will be removed in a staged process to reduce the amount of potential run-off.
- Silt fencing will be put in place along the riverbank between the waterway and the zone of works to prevent accidental silt run-off during construction.
- Spill kits to be used when machinery is working near the river.
- All machinery to be stored and refuelled off site.
- Only use cutting, grinding, or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays.

5.7.2 Habitat Loss

Habitat loss/disruption is a concern for the kingfisher and otter during the construction and decommissioning of the proposed project. The following management measures will be implemented:

- Pruning of vegetation instead of clearing will be done where possible to avoid excessive disruption to the local habitat.
- A pre-construction survey for otter holts will be carried before construction begins.

5.7.3 Lighting

Otters and fish may be affected by lighting of the walkway at night. Mitigation measures include:

- Minimise light spills using shields, masking & louvres.
- Restrict lights to ensure that there are dark hours.

5.7.4 Vibrations and noise

Fish, otter and kingfisher may be affected by vibrations and noise during construction and decommissioning. Any piling done during construction will use the screw piling method. This method produces minimal noise and vibrations during construction (Mohajerani et al., 2016).

5.8 Step 4, Part 2: Effect of Mitigation Measures

5.8.1 River Nore SPA

Table 4.1 Mitigation Measures River Nore SPA

Ref	Objective	Mitigation	Alone	In Combination
Kingfisher	Restore the kingfisher population	<p>Water quality control measures;</p> <ul style="list-style-type: none"> • Standard best practices as laid out by Inland Fisheries Ireland (IFI) will be used during the construction of the proposed project which include the following (IFI 2016). • Topsoil only be removed during periods of dry weather. • Topsoil will be removed in a staged process to reduce the amount of potential run-off. • Silt fencing will be put in place along the riverbank between the waterway and the zone of works to prevent accidental silt run-off during construction. • Spill kits to be used when machinery is working near the river. • All machinery to be stored and refuelled off site. • Only use cutting, grinding, or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays. 	No risk	No risk,

Ref	Objective	Mitigation	Alone	In Combination
		Habitat control measures: Pruning instead of clearing vegetation where possible. Noise and vibration Control measures: Use of screw piling		

5.8.2 River Barrow and River Nore SAC

Table 4.2 Mitigation Measures 5.8.2 River Barrow and River Nore SAC

Ref	Objective/ Target	Attribute/ Target	Mitigation	Alone	In Combination
Otter	Maintain the Otter Population		Water quality control measures: As above Lighting control measures: <ul style="list-style-type: none"> Minimise light spills using shields, masking & louvres. Restrict lights to ensure that there are dark hours. A pre-construction survey for otter holts should be carried before construction begins as water levels were high during the site survey.	No risk.	No risk,
Migratory Fish	Restore favourable conservation conditions of all migratory fish species.		Water quality control measures: As above Noise and vibration control: Use of screw piling Lighting control: <ul style="list-style-type: none"> Minimise light spills using shields, 	No risk	No risk

Ref	Objective/ Target	Attribute/ Mitigation	Alone	In Combination
		masking & louvres. <ul style="list-style-type: none"> Restrict lights to ensure that there are dark hours. 		
White-clawed Crayfish	Maintain favourable conservation conditions	Water quality control measures: As above	No risk	No risk
<i>Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels</i>	Maintain favourable conservation conditions	Water quality control measures: As above	No risk	No risk
<i>Water courses of plain to montane levels with the Ranunculion fluitantis and Callitriche-Batrachion vegetation</i>	Maintain favourable conservation conditions	Water quality control measures: As above	No risk	No risk
Freshwater Pearl Mussel	Under review	Water quality measures: As above.	No risk	No risk

5.9 Consideration of Findings

The above-listed mitigation measures will ensure that there will be no adverse effects on the integrity of any Natura 2000 site. On this basis, this report to inform the Appropriate Assessment, based on the best scientific knowledge, shows that, considering the project with mitigation measures, the proposed project will not undermine the conservation objectives for the River Nore SPA or the River Barrow and Nore SAC either alone or in-combination with other projects or plans.

Based on the information set out in this report we submit that the competent authority has sufficient information to allow it to determine that the proposed construction of the Pedestrian link between the River

Nore Linear Park and the Riverside Gardens, individually or in combination with other plans or projects, will not have an adverse effect on the integrity or pose a risk of likely significant effects on the Natura 2000 sites: River Nore SPA and River Barrow and River Nore SAC.

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DRAWINGS

650300

650400

650500

650600

656700

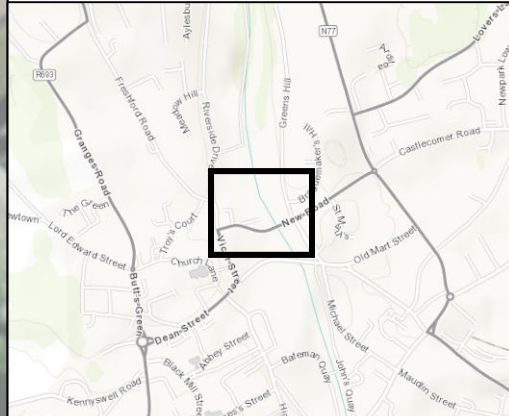
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425.064454.00001.0001.0 Habitat Map



LEGEND

- Proposed Infrastructure
- Fossitt Habitat Classification**
- BL1 - Stone Walls & Other Stoneworks
- BL2 - Earth Banks
- BL1 - Stone Walls & Other Stoneworks
- BL3 - Buildings & Artificial Surfaces
- FW2 - Depositing / Lowland Rivers
- GA2 - Amenity
- WD5 - Scattered Trees & Parkland
- WL2 - Treeline
- WS1 - Scrub



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NORE BOARDWALK
ECOLOGY
HABITAT MAP

FIGURE 1





Scale 1:1,000 @ A3 Date JANUARY 2023

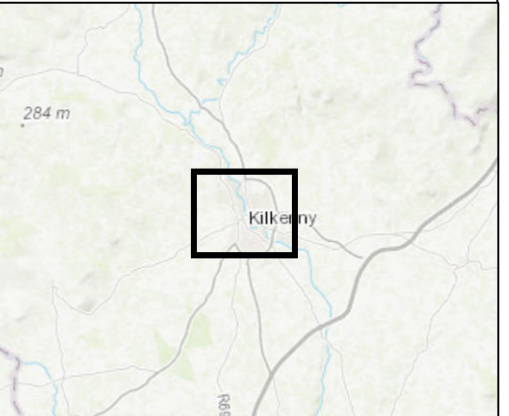
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- LEGEND**
-  Proposed Infrastructure
 -  Proposed Infrastructure 2 km Buffer
 -  Special Area of Conservation (SAC)
 -  Special Protection Area (SPA)



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SLR 7 DUNDRUM BUSINESS PARK
 WINDY ARBOUR
 DUBLIN D14 N2Y7
 IRELAND
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NORE BOARDWALK
 ECOLOGY
 NATURA 2000 SITES WITHIN 2 KM

FIGURE 2
 Scale 1:18,000 @ A3 Date JANUARY 2023

EUROPEAN OFFICES

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AYLESBURY

T: +44 (0)1844 337380

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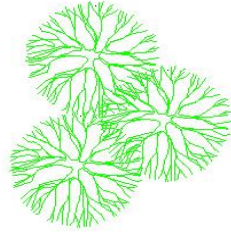
France

GRENOBLE

T: +33 (0)4 76 70 93 41

Appendix G

Tree Survey Report



Independent Tree Surveys Ltd

Tree Survey Report River Nore Boardwalk Kilkenny Co. Kilkenny

June 2023



Independent Tree Surveys Ltd
Our Lady's Cottage,
Drummond
Rosenallis
Co. Laois
T: 057 8628597
M: 087 1380687
www.independenttreesurveys.ie

Contents

1.0 Introduction	1
2.0 Report Limitations.....	1
3.0 Survey Methodology	2
3.1 Survey Key	2
3.2 Tree Retention Category (Cat) (BS5837: 2012 Trees in relation to design, demolition and construction – Recommendations)	3
3.3 Root Protection Area	3
4.0 Findings	4
5.0 Comments and Conclusions.....	6
6.0 Recommendations	7
7.0 Site Photographs	8

1.0 Introduction

It is proposed to construct a new section of boardwalk along the west bank of the River Nore in Kilkenny City to link up with the existing pathways. The route of the proposed boardwalk follows a section of the riverbank that includes numerous self-sown trees and bushes. This report has been commissioned to provide an arboricultural assessment of the trees and to assess any potential impact on the trees from the construction of the new boardwalk and to input into the design and methodology for the project.

2.0 Report Limitations

- The inspection has been carried out from ground level using visual observation methods only.
- No digging or below ground investigation of any kind was carried out.
- Trees are living organisms whose health and condition can change rapidly. Trees should be checked on a regular basis, preferably once a year. The conclusions and recommendations of this report are valid for one year.
- The fruiting bodies of some important species of decay fungi only emerge at certain times of the year and may not have been visible during this inspection.
- There is no such thing as a 100% safe tree in all conditions, since even perfectly healthy trees may fall or suffer branch break.

Report Prepared by

John Morgan
BSc (Hons) Tech Cert (Arbor A)
M Arbor A (Membership number PR407)

June 25th 2023

3.0 Survey Methodology

The riverside trees were assessed from ground level using Visual Tree Assessment (VTA) techniques and relevant observations and findings were recorded in compliance with the industry standard document BS5837: *Trees in relation to design, demolition and construction (2012)*. The trees along the proposed route of the boardwalk were inspected and assessed during a site visit on the 16th of June 2023.

3.1 Survey Key

Tree Species

Common and botanical names of the tree species were recorded.

Tree Crown Dimensions

Tree height (Ht) measurements are in metres and are estimated.

Stem Diameter (Dbh)

Measurements are in millimetres and taken at 1.5m from ground level, multiple stems (St) are recorded as a function of the BS:5837 RPA formulae described below. Where tree stems could not be directly accessed; the stem diameters were estimated.

Tree age classes

Y	Young	Recently planted (with 5 years or so)
SM	Semi-Mature	Well established young tree
EM	Early Mature	Established tree not yet fully grown
M	Mature	Full or near full grown tree
LM	Late Mature	Older specimen in full maturity
OM	Over Mature	Full maturity now declining through natural causes
Vet	Veteran	Notable due to large size, old age, ecological importance

Tree Physiological and Structural condition

Good:	No obvious defects visible, vigour and form of tree good.
Fair:	Tree in average condition for its age and the environment.
Poor:	Tree shows signs of ill health/structural defect
Bad:	Tree in seriously bad health/major structural problem

3.2 Tree Retention Category (Cat) (BS5837: 2012 Trees in relation to design, demolition and construction – Recommendations)

The tree retention category system grades a tree's suitability for retention within a development:

- A** Indicates a tree of high quality and value. These are trees that are particularly good examples of their species, which also provide landscape value. These trees are in such a condition as to be able to make a substantial contribution. (A minimum of 40 years is suggested)
- B** Indicates a tree of moderate quality and value. Trees that might be included in the high category, but are downgraded because of impaired condition. These trees are in such a condition as to make a significant contribution. (A minimum of 20 years is suggested)
- C** Indicates a tree of low quality and value - trees with an estimated remaining life expectancy of at least 10 years, or younger trees with a stem diameter of below 150mm and/or <10m in height.
- U** Trees that are in such a condition that they cannot realistically be retained as living trees in the context of the current land use for longer than 10 years.

Sub Categories

Tree categories may be further categorised using the following sub-categories (e.g. C1, C2 or C3) - 1 mainly Arboricultural qualities, 2 mainly landscape qualities, 3 mainly cultural values.

3.3 Root Protection Area

The Root Protection Area (RPA) is the minimum area around individual trees to be protected from disturbance during construction works; RPA is recorded as a radius in metres measured from the tree stem and is shown on the tree survey/constraints drawing as a circle with the tree stem in the centre.

For single stem trees, the root protection area (RPA) should be calculated as an area equivalent to a circle with a radius 12 times the stem diameter.

For trees with more than one stem, one of the two calculation methods below should be used.

The calculated RPA for each tree should be capped to 707 m².

a) For trees with two to five stems, the combined stem diameter should be calculated as follows:

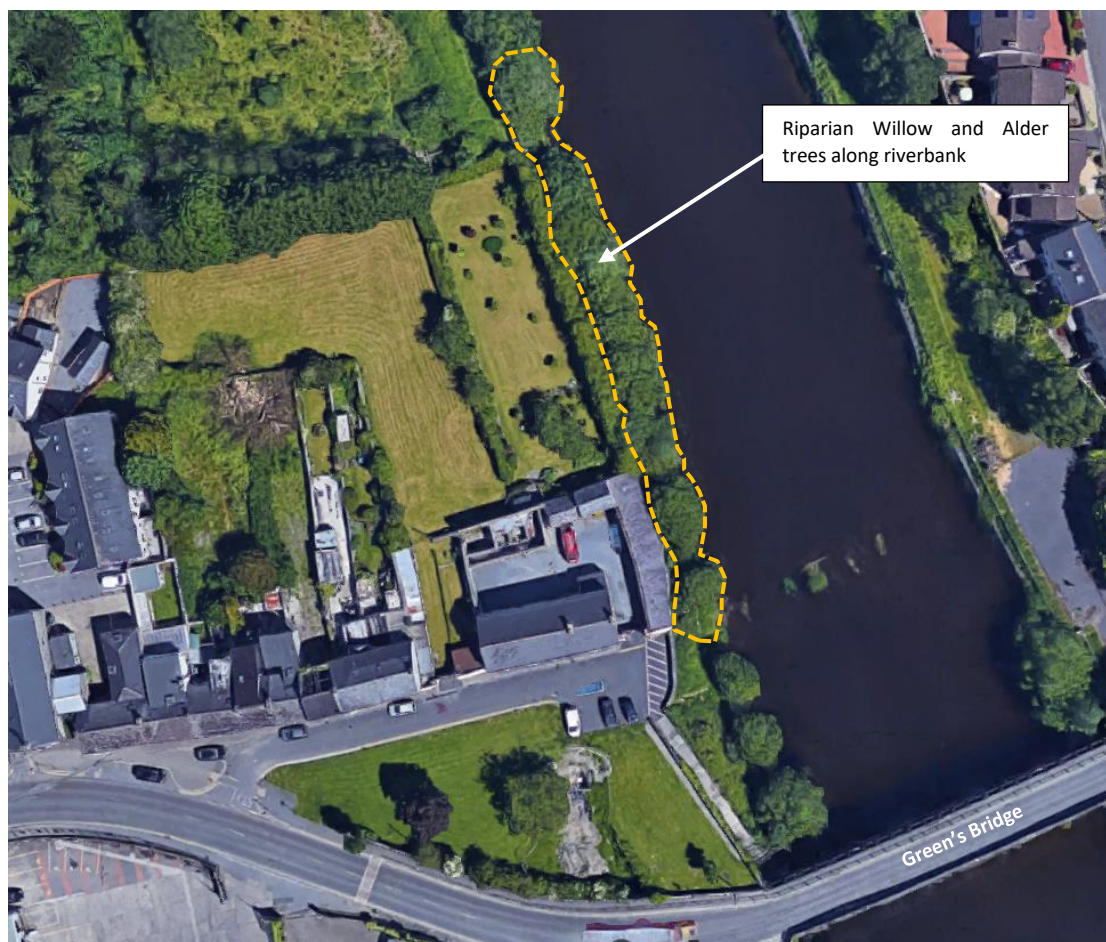
$$\sqrt{(\text{stem diameter } 1)^2 + (\text{stem diameter } 2)^2 \dots + (\text{stem diameter } 5)^2}$$

b) For trees with more than five stems, the combined stem diameter should be calculated as follows:

$$\sqrt{(\text{mean stem diameter})^2 \times \text{number of stems}}$$

4.0 Findings

The survey area covered an approximately 90m section of riverbank along the western side of the River Nore, just north of Green's Bridge, Kilkenny City. The area included the strip of land between the flood wall and river channel. The location and extent of the trees included in the survey is shown on the aerial image (photo 1) below.



1. Aerial image showing the location of the trees assessed; just north of Green's Bridge, Kilkenny City

The trees are mostly growing along the edge of the riverbank, between the existing footpath and the river channel itself, a small number of saplings and young trees are growing along the left-hand (western) side of the pathway and within the footprint of the path (shown in photo 4 below).

The vast majority of the trees within the survey area are Willow (*Salix spp*) trees, comprised of a mix of Goat Willow (*Salix caprea*) and Crack Willow (*Salix fragilis*). The Willows trees are mostly multi-stemmed bushes from ground level, with 3-12 (or more) stems growing out of a shared base or 'stool'. The Goat Willow bushes are somewhat smaller in height (6-8m tall) than the Crack Willow (8-10m) and are made up of multiple smaller diameter stems (mostly 100-200mm diameter), whereas the Crack Willows are generally larger individual stems (400mm diameter). Almost all of the stools are growing out of the very edge of the bank, with considerable stem and branch growth extending out over the river channel itself.

The Willow trees are semi-mature and early mature in age class, and are in mostly good or fair physiological condition, with only some minor deadwood and dieback seen. There are some broken stems and branches in some of the stools, and at least one of the larger Crack Willows was noted to have a severe split up through the lower stem (see photo 6 below). Some stems appear to have been cut back in recent times (perhaps to obtain access to the river for fishing).

A small number of Common Alder (*Alnus glutinosa*) are also growing along the riverbank, these are semi-mature, and around 200mm stem diameter. One Alder towards the northern end of the survey area has clear crown dieback. There are several young Sycamore (*Acer pseudoplatanus*) saplings growing out of the higher ground to the west of the footpath. Some light growth from Hawthorn (*Crataegus monogyna*) bushes originating from the west side of the flood defence wall extends east over the survey area, but this is not significant.

The pathway is unsurfaced and follows bare ground, where the soil has been worn by use and weathering, many woody roots that clearly originate from the Willow and Alder trees have been partly exposed.

5.0 Comments and Conclusions

The trees along the survey area are a mix of young and semi-mature trees that appear to become established by natural regeneration (self-seeded) along the riverbank following the construction of the flood defence structures several years ago. The trees are of comparatively low arboricultural value on account of their young age and small size and would be graded as category C under the BS5837 categorisation system; that said, they are mostly native species well-suited to the riparian environment and even though they are relatively young, they do provide some habitat and landscape value to the locality.

The stem size and crown spread of the trees indicate that they will have considerable root spread along the riverbank, effectively making the zone between the river channel and the flood defence wall a single root zone. This is backed up by the visible presence of woody roots on the pathway surface.

Tree roots are concentrated in the upper 600mm of soil and will underlay the entire survey area. Tree roots are vital to the trees for anchorage, energy storage, and for water and nutrient transport; if the root systems are badly damaged by root severance or damage through soil compaction, this can seriously impair the health of the affected tree and can cause premature death or collapse.

The proposed route of the new boardwalk as shown on the project drawings and as marked out on the ground indicate that a significant number of the trees will have to be cut back to facilitate the new structure and that the supporting piles will be located into the root spread of the adjacent trees, potentially severing or damaging roots through the drilling and installation process.

Construction activity and traffic will have to work along the narrow strip of land between the river channel and flood wall, this has potential to further compact the soil and cause damage to the root spread of the riparian trees. The extent of damage will depend on the severity of the compaction (some of the ground appears to already be compacted by foot traffic) caused by machinery and excavation etc. The young age and species of the trees also should provide some resilience to some degree of compaction (other species such as Beech *Fagus sylvatica* for example are much more sensitive to compaction and root damage).

The tree species (*Salix* and *Alnus*) growing along the proposed route of the new boardwalk respond well to cutting back to stump and will grow back vigorously with fresh shoots if the main stems are cut back to near ground level. There is evidence of such fresh sprouting apparent along the riverbank where stems have been cut or damaged. This characteristic of both the species has led to them being traditionally managed by repeat cutting (known as 'coppicing'), with Alder coppiced for charcoal production and Willow for basket making products for example. Where Willow and Alder trees are cut back along the route of the new boardwalk and the stumps are left in place untreated, they *will* produce vigorous regrowth and re-establish as trees within a few years.

6.0 Recommendations

Enabling works to prepare the site for the new boardwalk should include the cutting back of all tree stems within the footprint of the new structure. The stems should be cut back to close to ground level, and not left as stubs or sticks. This may appear drastic at first viewing, but as described above, these tree species will produce copious regrowth following coppicing and such work will not kill the trees.

Where cut stems of individual trees are located underneath the new boardwalk, it may be necessary to prevent regrowth from the stumps by use of an approved herbicide on the cut stump, or by repeated pruning if this is not practicable.

Construction activity should be planned to try and minimise the impact of the work on the soils and tree roots along the route. Machinery should be as lightweight as possible and the number of journeys across the ground limited as much as is practicable. It may not be feasible to use methodology such as ground protection mats etc. because of the location, however, geotextiles and a protective layer of stone/gravel may help reduce the direct impact of the works. Such material could then be removed as the works are completed.

Education of the work force as to the importance of reducing ground damage should also help limit any impact on the long-term health of the trees.

It may be necessary to leave some of the outer stems from some of the multi-stemmed trees in place over the riverbank and river channel to act as a protective barrier to river borne material that could damage the new structure for the first few years following completion of the boardwalk; these could then be coppiced later if desired to re-balance the stools.

All tree work should be carried out by qualified and experienced tree surgeons working in accordance with *BS3998 (2010) Tree Work – Recommendations*. Suitable safety precautions will have to be in place because of the location of the work area and changing river levels etc.

The tree felling work should be timed to avoid the bird nesting season (1st March-August 31st).

Where the works result in unavoidable damage to trees and where gaps are created in the tree-line, these should be infilled by new planting of Willow and Alder whips where practicable.

7.0 Site Photographs



2. Southern end of the survey area, with Alder and Willow trees along the riverbank



3. Multi-stemmed Willow bushes along the riverbank, with young Sycamore sapling on the left (west) side of the path



4. Multi-stemmed Willow bushes along the riverbank, looking north



5. Multi-stemmed Willow bushes along the riverbank, looking north



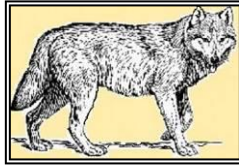
6. Major crack in the in the lower stem of one of the larger Willow trees; this tree will collapse into the river channel



7. Multi-stemmed Willow bushes along the riverbank at the northern end of the survey area

Appendix H

Archaeological Impact Assessment Report



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**ARCHAEOLOGICAL IMPACT ASSESSMENT
REPORT ON RIVER NORE PEDESTRIAN &
CYCLE LINK**

**BISHOPSMEADOWS AND GARDENS
KILKENNY CITY, CO. KILKENNY**

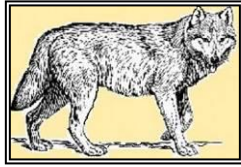
Author: Colm Flynn, Archaeological Consultant

Client: Kilgallen CE / Kilkenny County Council

Date: July 2023

ABSTRACT

This report details the results of an archaeological impact assessment for the proposed River Nore Pedestrian and Cycle Link, Kilkenny City, Co. Kilkenny.



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CONTENTS

1.0	Introduction	4
2.0	The Proposed Development	9
3.0	Location	11
4.0	Archaeological & Historical Background	11
5.0	Archaeological Impact Assessment Result	31
6.0	Conclusions & Recommendations	36

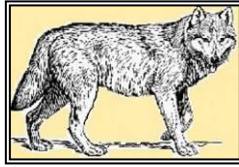
Bibliography

Appendix 1 3-D view of River Nore Pedestrian and Cycle Link by Kilgallen CE.

Appendix 2 Report by Kilgallen CE outlining OPW works carried out as part of the Kilkenny Flood Relief Scheme 2001-2004.

Figures

- Figure 1 Showing location of proposed River Nore Pedestrian and Cycle Link Project and former location of historic Greensbridge AH03 (after Kilgallen CE).
- Figure 2 Showing location of River Nore Pedestrian and Cycle Link, Kilkenny City.
- Figure 3 Extract from Down Survey maps (dating to 1654) showing bridge at Green's Bridge.
- Figure 4 Pratt's View of Kilkenny, dating to 1708.
- Figure 5 Extract from Rocque's Map of Kilkenny of 1758 showing Greensbridge. Note north to right of image.
- Figure 6 Extract from historic Ordnance Survey maps of Kilkenny dating to 1842 (after Irish Historic Town Atlas).
- Figure 7 Extract from first edition 25" to a mile scale Ordnance Survey map showing development area.
- Figure 8 Showing location of excavations carried out by Paul Stevens and Ian Doyle at Greensbridge as part of the Kilkenny Flood Relief Scheme (after Margaret Gowan & Co Ltd).



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- Figure 9 Cross section representative drawing of River Nore Pedestrian and Cycle Link (after Kilgallen CE).
- Figure 10 Detail of proposed River Nore Pedestrian and Cycle Link (after Kilgallen CE).
- Figure 11 Extract from report PGL for the River Nore Pedestrian and Cycle Link showing location of geotechnical works at location of old Greensbridge AH03.
- Figure 12 Figure 12 Extract from PGL report detailing results of TP05.
- Figure 13 Showing cross section by Kilgallen CE of OPW Flood Wall construction on west bank of River Nore, for Kilkenny Flood Relief Scheme.

Plates

Plate 1 Showing existing stone arch of Greensbridge with tarmac path, facing south.

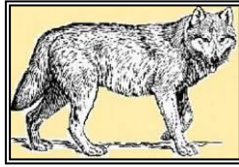
Plate 2 Showing existing riverbank and earth-worn path at Greensbridge, facing north.

Plate 3 Showing water breaking in the River Nore, where surviving piers of Greensbridge AH03 remains under the water, facing east.

Plate 4 Showing culvert forming townland boundary between Gardens and Bishopsmeadows.

Plate 5 Showing northern extent of project area at River Nore Linear Park, Bishopsmeadows, facing north.

Plate 6 Image of haul road for Kilkenny Flood Relief Scheme on west bank of River Nore at location of proposed River Nore Pedestrian and Cycle Link Project. Note abutments of Greensbridge AH03 in river (courtesy OFW).



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1.0 Introduction

This Archaeological Impact Assessment Report (AIAR) has been completed by Colm Flynn of Colm Flynn Archaeology in relation to the proposed River Nore Pedestrian and Cycle Link, Kilkenny City (see Figures 1-3). The report assesses the possible and likely impacts that the proposed development may have on the existing archaeology. The research that forms the basis of this report is influenced by the Urban Archaeological Survey of Kilkenny (Bradley, 1984), Irish Historic Towns Atlas No. 10 Kilkenny (Bradley, 2000), the Kilkenny Archaeological Project (KKAP, 2008), and the files of the National Monuments Service (NMS). Recommendations are contained within this report to ameliorate any impact the proposed River Nore Pedestrian and Cycle Link Project may have on the archaeological heritage. This report was commissioned by Kilgallen & Partners CE on behalf of Kilkenny County Council to fulfil planning requirement Section 8 of the Planning and Development Act 2000.

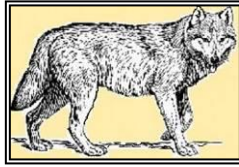
This report examines the construction effects of the proposed new River Nore Pedestrian and Cycle Link Project including the installation of mini piles and the construction of a pedestrian walkway, based on desktop research (non-invasive methods). The report assesses the existing archaeological and historical background of the receiving environment, and examines the proposed construction methodology, and establishes if this activity will likely result in any impact on known or unknown (subterranean) archaeology.

This report has been prepared according to the following documents:

- Framework and Principles for the Protection of Archaeological Heritage (DAHG, 1999).
- Guidelines on the Information to be contained in Environmental Impact Statements (EPA 2002, 2003, 2017, 2022).

Any impacts that the proposed development may have on the existing archaeology were assessed as direct or indirect, and positive or negative in nature. The significance of any impact was judged depending on whether the impact was to the entirety or a portion of an archaeological site, or archaeological feature. Each impact was classified according to Environmental Protection Agency guidelines (2022) as set out below:

- Profound: this applies where mitigation would be unlikely to remove the adverse effects. These profound impacts arise where an archaeological site is completely and irreversibly destroyed by a proposed development.

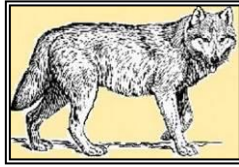


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- Significant: this applies when an impact which, by its magnitude, duration or intensity, alters an important aspect of the archaeological feature/site. An impact like this would be where part of a site would be permanently impacted upon, leading to a loss of character, integrity and data about the archaeological feature/site.
- Moderate: this applies when a change to the site is proposed which though noticeable, is not such that the archaeological integrity of the site is compromised, and which is reversible. This arises where an archaeological feature can be incorporated into a development without damage and that all procedures used to facilitate this are reversible.
- Slight: this applies when the proposed works will result in an impact which causes changes in the character of the archaeology which are not significant or profound and do not directly impact or affect an archaeological feature or monument.
- Imperceptible: this applies when the proposed development will have an impact on the archaeology capable of measurement but without noticeable consequences.
- Uncertain: this applies when the extent or nature of possible impacts on archaeological is unknown. This is particularly relevant where the extent of the known archaeology within the proposed development area has not been established.

This archaeological assessment concludes that the proposed development will result in ground disturbance and riverbank disturbance works in the vicinity of known and legally protected archaeological sites identified as a Historic Town (RMP KK019-026) and bridge (RMP No KK019-026040). The works will also take place in the environs of the extant Green's Bridge, that is contained in the RPS for Kilkenny (RPS D4) and the NIAH (No 12004007). Previously, archaeological excavations have been carried out as part of the River Nore Flood Alleviation Scheme, on sections of the east and west bank of the River Nore, north of Greensbridge (see Section 4 below). The location of the known archaeological and architectural heritage assets has been taken into account during the design of this project, and consequently, the works have been finalised sensitive to the receiving archaeological and architectural heritage environment. The proposed River Nore Pedestrian and Cycle Link will not directly impact on any known archaeology. However, the development will result in changes in character to the environs of known archaeology, which constitutes a slight impact on the archaeological heritage.

Consequently, archaeological mitigation measures are recommended as below:



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- Pre-construction Written and Photographic Surveys, and 3-D Laser Scan or Photogrammetry Surveys of the stone arch (both elevations) of Greensbridge AH04 where the River Nore Pedestrian and Cycle Link will pass through, should be compiled prior to the commencement of any works.
- Pre-construction targeted test trenching at the location of the proposed mini piles for the new River Nore Pedestrian and Cycle Link, in the vicinity of the former location of the original Greensbridge AH03 RMP No KK019-026040.
- Construction stage archaeological monitoring of all groundworks including site investigation works, compound set-up, landscaping, installation of mini piles and street furniture.

Sources and Methodology

Archaeological sites identified during the research or the site inspection for this report were assigned Archaeological Heritage numbers (AH XX) for the purposes of this report.

Site Visit / Inspection

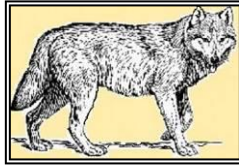
During the site visit / inspection the author assesses the extant ground conditions of the proposed development and its environs, and establishes if any known archaeological sites will be impacted by the proposed works. The site visit resulted in photographic records, notes and measurements being taken.

Record of Monuments & Places (RMP)

The RMP is a list of archaeological monuments, generally predating AD1700, known to the National Monuments Service (NMS). This list was in many cases based initially on cartographic, documentary and aerial photographic sources. By inclusion in the RMP an archaeological site is protected by law under the National Monuments Acts (1930-2014). Any works that may impact on an RMP site has to be approved by the NMS prior to the work commencing. Each entry in the RMP receives an individual identification number with a two letter prefix which denotes the county that the archaeological site is in (e.g. the RMP number for Kilkenny City is KK019-026).

Topographical Files

The topographical files of the National Museum of Ireland were consulted for this report. The topographical files identify recorded stray archaeological artefacts that have been donated to or purchased by the State in accordance with National Monuments legislation. The files are



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given individual numbers, and are identified by townland, and county, and in urban locations, by street number, street, and townland. The proposed development is situated in Bishopsmeadows and Gardens townlands and the Topographical Files contains several entries for these townlands which are outlined in Section 4.

Archaeological Excavations Database (www.excavations.ie)

The Archaeological Excavations Database was consulted for this report. This database lists all archaeological excavations carried out in Ireland that were licensed under the National Monuments Acts. The Database is organised on a county by county basis, and allows for searches of individual addresses and street names in an urban context. The excavations that were carried out in Bishopsmeadows and Gardens townlands that are relevant to this project are outlined in Section 4.

National Inventory of Architectural Heritage

The National Inventory of Architectural Heritage (NIAH) is an ongoing survey commissioned by Department of Housing, Local Government and Heritage. The NIAH aims to promote the appreciation of, and contribute to, the protection of the architectural heritage by systematically recording the built heritage on a nation-wide basis. The proposed development includes a potential impact on a NIAH site identified as Greens Bridge (NIAH 12004007).

Kilkenny City and County Development Plan 2021-2027

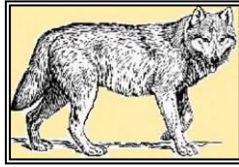
Kilkenny County Council have previously published the Kilkenny City and County Development Plan 2021-2027. This plan was consulted for this project. It contains a list of buildings called the Record of Protected Structures (RPS) which are protected by law under Part IV of the Planning and Development Act 2000. Developments which affect buildings on the Record of Protected Structures must be approved by the appropriate planning authority.

The stated strategic aim of the Kilkenny City and County Development Plan 2021-2027 is:

‘To seek the protection and sustainable management of Kilkenny’s heritage for the benefit of current and future generations; to encourage the collection of knowledge to inform its protection; and to promote access to, awareness of and enjoyment of heritage.’

The proposed River Nore Pedestrian and Cycle Link Project will impact on the known RPS site of Greens Bridge (RPS No D4).

The Urban Archaeological Survey:



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The Urban Archaeology Survey was established in 1982 to record known information relating to Irish towns and to present it to the public. One of the main objectives was to produce a zone of archaeological potential, based on the available evidence, which could be used for planning purposes. Historical sources of information were compiled and known archaeology of the towns was evaluated. The Urban Archaeological Survey of County Kilkenny prepared by John Bradley was published in 1993 for the Royal Irish Academy, and was consulted for this report. The proposed development area is situated within the zone of archaeological potential of Kilkenny City, identified in the Urban Archaeological Survey of Kilkenny, and also partly within the zone of potential for several other archaeological sites.

The Kilkenny Archaeological Project

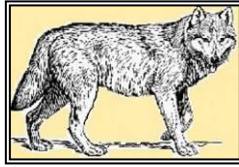
The Kilkenny Archaeological Project (KKAP) is a Heritage Council and Kilkenny County Council funded project, compiled by Kilkenny Archaeology, and John Bradley, to publish information on the over 250 archaeological excavations carried out in Kilkenny City since 1968. This resource was consulted in detail, to help identify the known archaeological heritage in the environs of the proposed River Nore Pedestrian and Cycle Link.

Literary Sources

Various literary and online sources were consulted, a full list of which is provided in the bibliography. The journal of the Kilkenny Archaeological Society, published as the Old Kilkenny Review was consulted for this report, and provided valuable information on the historical development of the study area.

Cartographic Sources

A wide range of maps were consulted, including the Down Survey (1650s), private surveyors maps from the 18th century including Rocque's Map of Kilkenny (1758, see Figure 5) which is the earliest surviving detailed map of Kilkenny City, and Ordnance Survey maps dating from the mid-19th century onwards (see Figure 6-7).



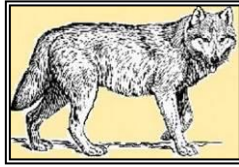
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2.0 The Proposed Development

The River Nore Pedestrian and Cycle Link, Kilkenny City, will involve the construction of a pedestrian link on the west bank of the River Nore between the existing Riverside Gardens walk, situated 30m south of Green's Bridge in Gardens townland, and the River Nore Linear Park trail, situated in Bishopsmeadows townland 160m north (upstream) of Green's Bridge. The overall length of the River Nore Pedestrian and Cycle Link project is approximately 190m (north to south). The project will see the construction of an elevated 3m wide pedestrian route comprised of a steel structure founded on concrete filled steel mini-piles, which will support a recycled plastic decking, along the west bank of the River Nore. At its southern extent the River Nore Pedestrian and Cycle Link will join the gravel pedestrian Riverside Gardens walk. The project will traverse under a stone and concrete arch of the extant Green's Bridge. A new concrete path with resin finish will be constructed between Green's Bridge and Green's Street. The project will then turn to the east and travel closer to the riverbank. A new elevated 3m wide recycled plastic decking on steel beams, will be constructed on a series of concrete filled steel mini piles (each steel mini pile will be 200mm in diameter). The mini piles will be installed in pairs every 6m along a section of the west bank of the River Nore. At the former location of the historic Greensbridge (AH03), the mini piles will be in pairs 10m apart, thus spanning over any subterranean archaeology. The project will also see some new landscaping, path finishes and street furniture, which will be consistent with the Riverside Garden Project. A detailed 3-D view of the proposed River Nore Pedestrian and Cycle Link project by Kilgallen CE is included as Appendix 1 at the end of this report.

As part of the advanced design works for this project geotechnical site investigation works were carried out by Priority Geotechnical Ltd, on behalf of Kilkenny County Council and Kilgallen CE. These works included the mechanical excavator of 1 slit trench, 5 trial holes, and 6 dynamic probes, at locations along the proposed River Nore Pedestrian and Cycle Link. The results of the geotechnical site investigation work is outlined in a report by Priority Geotechnical Ltd, and this report has been consulted in the preparation of this AIAR, and is discussed in Section 5 below.

The Office of Public Works (OPW) carried out extensive works to the River Nore in Kilkenny City in 2001-4 as part of the Kilkenny Flood Relief Scheme. These works included archaeological excavations and surveys (on land and in-river) along the west and east banks of the River Nore upstream and downstream from Greens Bridge. Following the completion of the archaeological works, the OPW completed flood alleviation works which resulted in the



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Kilkenny City (from 650467E, 656560N, in the south, to 650410E, 656739N, in the north, see Figure 1-3 & Plates 1-5).

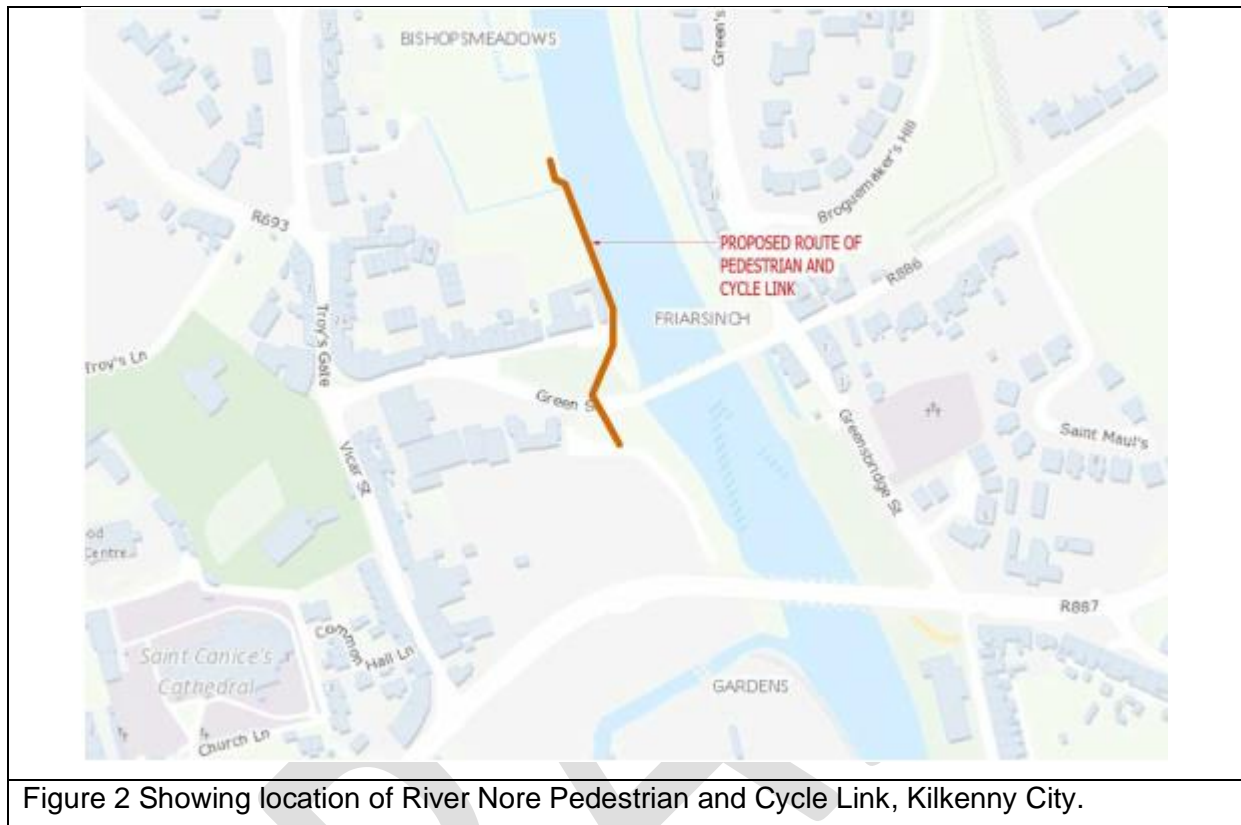
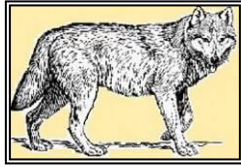


Figure 2 Showing location of River Nore Pedestrian and Cycle Link, Kilkenny City.

4.0 Archaeological & Historical Background

The underlying bedrock geology of Kilkenny City and its environs consists of limestone and calcareous shale that formed during the Carboniferous age (circa 530-390 million years ago). The proposed development site for the River Nore Pedestrian and Cycle Link Project includes brownfield and greenfield areas, comprising existing modern paths and an eighteenth-century stone bridge (Green's Bridge), and a section of the west bank of the River Nore.

Little is known about the pre-Christian history of the area of modern-day Kilkenny City. Archaeological evidence of Mesolithic (7000-4000 BC) activity near the River Nore in Kilkenny City is supported by the discovery of a Mesolithic flint tool called a microlith, that was found in 2001 by archaeologists near Bateman Quay (Lohan 2005). Archaeological monitoring of works for the Kilkenny River Nore Flood Alleviation Scheme resulted in the recovery of several Mesolithic flint tools, and a Neolithic polished stone axe (Excavation Licence No. 01E0909 Ian W. Doyle). Although there are no known archaeological settlement sites dating from the



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Neolithic (4000-2000 BC) known in Kilkenny City, a Bronze Age (2000-800 BC) house site consisting of a post and wattle structure and a fish trap were excavated at John's Bridge, Kilkenny (Doyle 2003). Excavations of Fulacht fia in Dukesmeadows indicate hot stone activity was taking place in Kilkenny City in the Bronze Age (Excavation Licence No. 02E1237 Paul Stevens). Also, pre-development works by John Cronin and Associates at Lousybush, Kilkenny City, northwest of the proposed development, resulted in the identification and archaeological excavation of a fulacht fia and ring-barrow, that likely date to the Bronze Age.

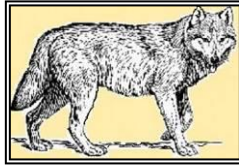
Kilkenny City (RMP KK019-026, AH01) originated in the fifth or sixth century as an Early Christian settlement. This settlement was established on and around several rises or hillocks situated on the west bank of the River Nore. These rises or hillocks provided commanding views over the surrounding area, and would eventually be home to St. Mary's Church, St. Canice's Cathedral, and Kilkenny Castle.

The first church in Kilkenny City was St. Patrick's – represented today by a D-shaped graveyard in Patrick Street. By the seventh century, however, the influence of this church was eclipsed by the new church of St. Canice at the northern side of the present-day city.

Kilkenny City, the principal town of County Kilkenny, is situated on the confluence of the Breaghagh and Nore rivers. This location has been of paramount importance to the development of the town, which received its first charter in the thirteenth century. Two separate derivations have been suggested for the name of the city; the Church of St. Canice, "or the wooded head or hill near the river."

Recent archaeological excavations have provided some evidence of early medieval activity in and around Kilkenny City. Excavations carried out by Patrick Neary (Archaeological Licence No. 06E0075), Andrew Gittins (Archaeological Licence No. 02E0845), and by Coilín Ó Drisceoil (Archaeological Licence No. 06E0306), at Coach Road, Kilkenny, identified an earthen bank, human skeletal remains, and evidence of antler working, all believed to date to the early medieval period. Excavations by Judith Carroll and John Tierney for the Ormonde Hotel and Leisure Centre, and Ormonde St. development identified possible early medieval human burials (Archaeological Licence 97E0468).

It is likely that St. Canice's followers or disciples introduced his cult to the area. Canice's principal church was at Aghaboe in Co. Laois. Both Aghaboe and Kilkenny were within the territory of an ancient people known as the Osraige ('Deer People'). During the 6th and 7th centuries the tribal grouping that controlled Aghaboe, who became known as Mac Gilla Pátraic



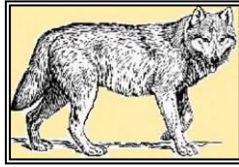
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or FitzPatrick, expanded their power to Kilkenny and founded a monastery there. In subsequent years a town developed around the monastery of St. Canice's. Remains of this monastic period may be identified in the presence of the round tower and the evidence of a previous Romanesque Cathedral.

After the Norman invasion of 1169, Strongbow established a camp outside the precincts of the church of St. Canice's, on the southern bank of the Breagh River. This fortification was later to form the nucleus for the development of the City of Kilkenny. In 1173, Donald O'Brien forced Strongbow to retreat to Waterford. This was only a temporary setback for the Normans. In 1189, William Marshall came into possession of Strongbow's Leinster lands by marrying Strongbow's daughter. William Marshall was subsequently appointed to the Chief Governorship of Ireland. Through this appointment, Kilkenny was to become one of the most important political towns in Ireland in the medieval period. Marshall began building a castle in Kilkenny in 1195. This became the focal point for Kilkenny Hightown. The original town around the existing monastery became known as Irishtown.

Irishtown and Hightown had different municipal authorities. Irishtown was governed by the Bishops of Ossory, while Kilkenny Hightown was controlled by Marshall. In 1207, Kilkenny received its first charter, which protected its trading rights. Around this time Marshall purchased land from the Bishop of Ossory to facilitate the expansion of Kilkenny City. This land was situated to the south of the Breagh River and to the north of Kilkenny Hightown. The land was to incorporate a continuation of Hightown, with shops and dwellings facing onto the street, and burgage plots which were to be 20ft wide, situated to the rear of these buildings (Bradley 2000, p2). At some time in the thirteenth century the earlier defensive features of Hightown were replaced with masonry walls and stone gates. Prior to this time, they consisted of an outer fosse and earthen banks, possibly topped with timber palisades. Evidence of this outer fosse (ditch) was identified during archaeological excavations (E535) by John Bradley and Heather King at the western end of Ormonde St.

During the early part of the thirteenth century, the town grew dramatically; three monasteries including the Black Abbey were built, as were St. Canice's Cathedral, and a parish church. Following the arrival of the Franciscans to Kilkenny in 1230 AD, St. Francis Abbey was one of the three monasteries founded in the city (circa 1234 AD), when Richard Marshall 3rd Earl of Pembroke was given a royal grant. St. Francis Abbey grew throughout the fourteenth century, due to income derived from leases and burial rights. Buildings were added to the abbey, and



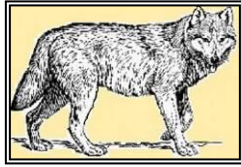
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such was its prestige, it held the Provincial Chapters of the friars in 1267 and 1308 (Williams 2007, p10-13).

Although it is not known when the first masonry town defences were constructed around Hightown, Kilkenny City, it is likely that Hightown had walled defences from the thirteenth century. Surviving records from the Calendar of Deeds relating to Ireland indicate that nine separate grants for murage (which was a toll for the upkeep and repair to the town walls) were issued to the inhabitants of Kilkenny City between 1250-1460. Access into the medieval town was controlled via several gates and gatehouses. The Urban Archaeological Survey of Kilkenny refers to a gatehouse (RMP KK019-026001, AH02) situated on the west bank of Nore at Green's Bridge, known as Green's Gate (Bradley 1984), which was likely near the east end of Green's Street, but the exact location of this building AH02 is not known.

Sometime during the thirteenth century the Anglo-Normans constructed a bridge (RMP KK019-026040, AH03) across the River Nore near Green's Street, situated to the north of modern-day Green's Bridge AH04. It is not known if this bridge AH03 was the first at this location. This bridge was known as 'The Big Bridge of Kilkenny' c.1223 (Farrelly et al 1993, 35-6; Bradley 2000, 21). It is also not known if this bridge AH03 was solely constructed with stone, or timber, or a combination of both. Surviving records from the medieval chronicler Friar Clyn indicate that the Big Bridge of Kilkenny was destroyed by flooding in 1338 (Sparks and Bligh 1926, p56), and subsequently rebuilt. A further flood event in the late fifteenth century resulted in the bridge being destroyed again. In the early sixteenth century Bishop Oliver Cantwell commissioned a new stone bridge at Green's Bridge. However, this bridge is recorded as being in a state of disrepair by the mid seventeenth century (Bradley 2000, 21).

It is known that the hinterland around the medieval city was used for farming, hunting and for social activities. The surrounding environs of the city to the east of Green's Bridge was farmland and crop fields, and the Liberties of the city, which would have attracted those looking for work in the city. The commonage, i.e. the land held in common by the burgesses of the town, stretched for two miles outside the town walls. Its use was strictly controlled. Digging was prohibited and tenants were required to keep the land 'playne and grene' so that it could be used for shooting and archery by the townspeople (Bradley 2000, 18). This commonage outside the town walls was in place until the expansion of the town in post medieval period. Fields for grain-growing and mills for flour-milling constituted an important part of the medieval economy of Kilkenny and its hinterland.

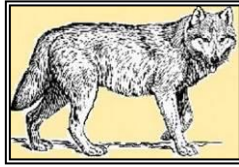


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During the fifteenth and early sixteenth centuries, Kilkenny continued to prosper, although the religious wars of the seventeenth century caused severe damage and loss of life to the city. Between 1536-41, Henry VIII dissolved the monasteries and St. Francis Abbey was granted to Walter Archer the Sovereign of the City and to the Corporation of Kilkenny, while Blackfriars was granted to the Corporation of Kilkenny, on condition that they provide accommodation to the Chief Governor. Towards the end of the sixteenth-century, both municipalities in Kilkenny, Kilkenny Hightown and Irishtown, became a single municipal entity. Subsequently in 1690, James I made Kilkenny a free City.

The Confederation of Kilkenny (Confederate Parliament) was the title given to the alliance between the native Irish nobility and the Catholic Anglo-Irish lords of the Pale in support of Charles I against the Parliamentarians. The years of the Confederacy were to give Kilkenny enormous prosperity and wealth and it ended unable to come to an agreement, with one faction supporting the Papal Nuncios position of war and the other faction suing for peace. In the aftermath of the collapse of the Confederacy, Kilkenny began to decline in both economic and political powers. This process was further exacerbated by Cromwell's siege of 1650, when the city was ravaged by plague and was only able to put up a limited resistance. Due to the city's involvement with the Confederacy, much of the property was confiscated. On the restoration of Charles II in 1660, some of the property was returned to the citizens.

The Down Survey maps of Kilkenny depict the medieval bridge AH03 at Greensbridge (see Figure 3). This map is schematic and does not provide any information about the condition of the bridge. However, it is recorded that in the seventeenth century, the bridge was in poor condition (Ainsworth 1978, 70). In the early eighteenth century, the Kilkenny Corporation Minute Books record that Greensbridge was 'out of repair' (Bradley 2000, 21). The Civil Survey (1654-6) describes the mill AH05 on the east side of Greensbridge as belonging to the Bishop of Ossory and others when Cromwellian troops took the town in 1650 (Simington (ed.) 1942, vol. 6, 549).



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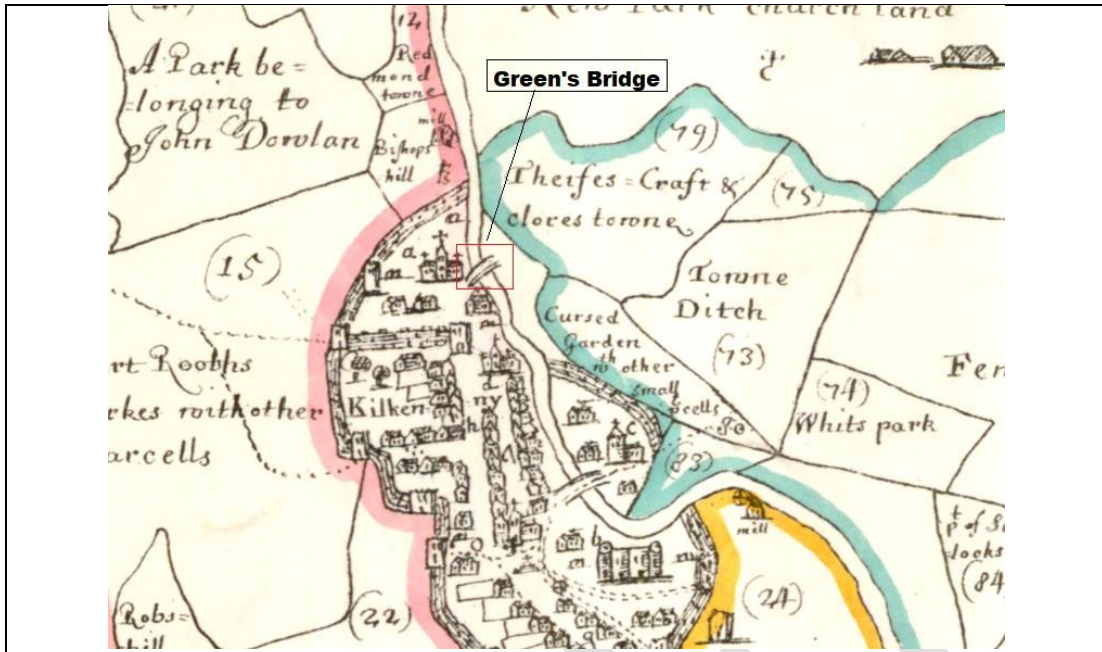


Figure 3 Extract from Down Survey maps (dating to 1654) showing bridge at Green's Bridge.

The early eighteenth-century drawing of Kilkenny City by Pratt shows a six-arch bridge at Greensbridge (see Figure 4). This image is drawn from the location of modern-day Wolfe Tone Street, facing west. The bridge AH03 is to the right (north) of this image, and a mill (RMP KK019-026042, AH05) and millrace (RMP KK019-026077, AH06) are depicted at the east end of the bridge. There is no obvious depiction of Green's Gate in this drawing.

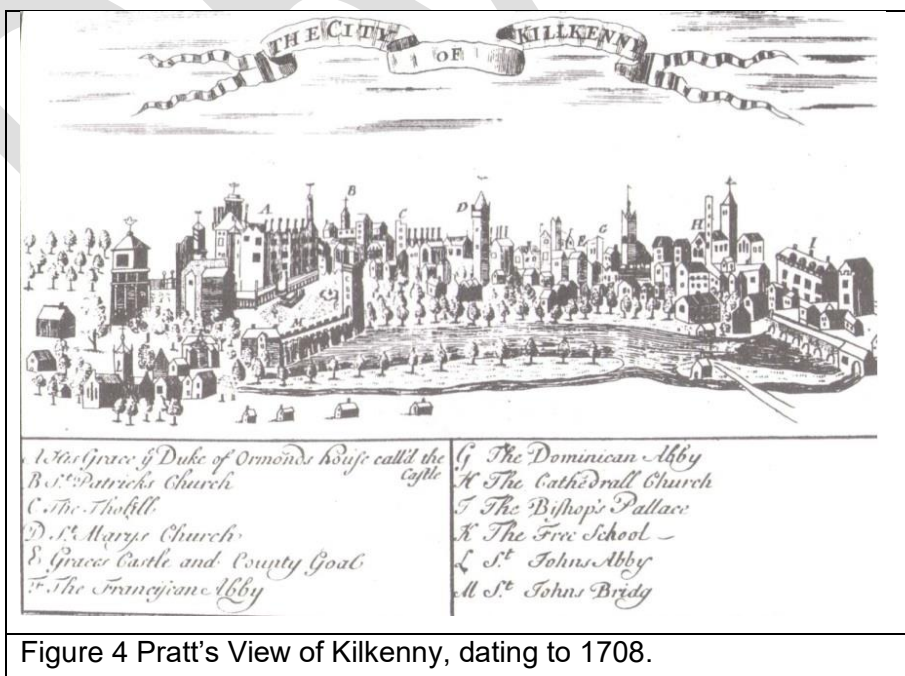
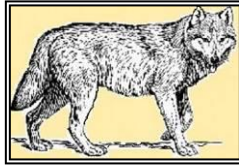


Figure 4 Pratt's View of Kilkenny, dating to 1708.



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Rocque's detailed map of Kilkenny (dating to 1758, see Figure 5) depicts the bridge at Greensbridge AH03. In this drawing Greensbridge is depicted as being constructed on top of five cut-waters or piers. The mill AH05 and millrace AH06 are depicted at the east end of the bridge. The millrace, on the east bank of the Nore. Several weirs are depicted downstream of the bridge.

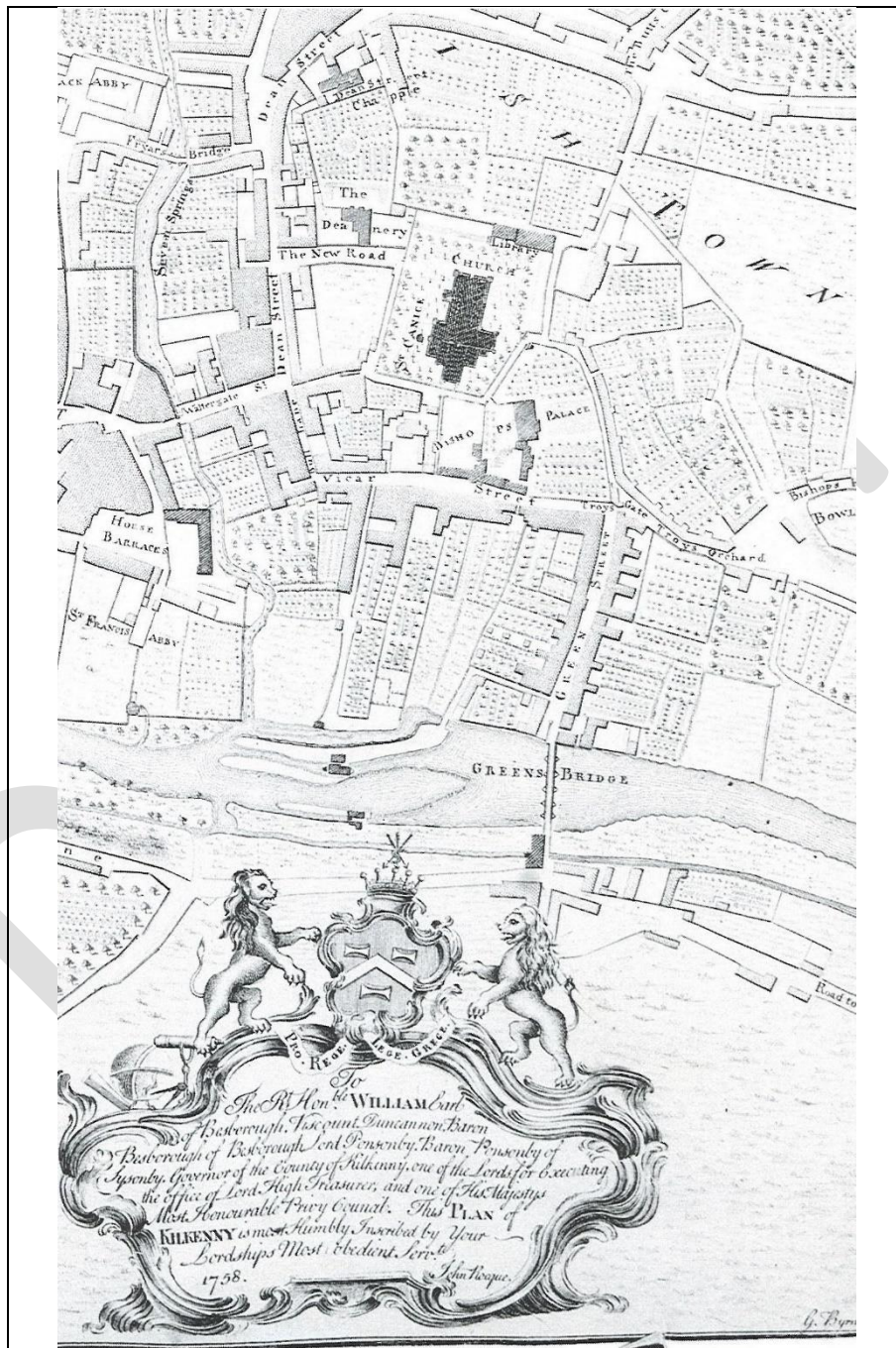
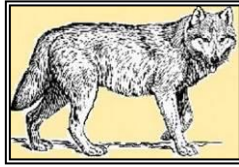


Figure 5 Extract from Rocque's Map of Kilkenny of 1758 showing Greensbridge. Note north to right of image.



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Five years after the publishing of Rocque's map of Kilkenny, the Great Flood of 1763 resulted in catastrophic damage to the city, resulting in both Greensbridge and John's Bridge being destroyed. Work to raise finances to replace the bridge at Greensbridge began quickly, and eventually the architect George Smith designed a new bridge, that was modelled on the Ponte di Tiberio in Italy. This new Greensbridge AH04 was completed by 1766, under the direction of builder William Colles. As the existing eastern approach (known as Broguemaker's Hill) to the destroyed bridge was too narrow for the carriages and trade making use of this route, a new approach road was required to be constructed. This New Road was constructed to the south of Broguemaker's Hill. The Irish Historic Town Atlas annotated first edition Ordnance Survey maps of the area dating to 1842 depict the 'new' Greensbridge and the New Road to the east (see Figure 6). This map depicts the west end of Greensbridge as meeting a dog-leg of Green's Street (then Green Street). A lime quarry (lime holes) is depicted just southwest of the west end of the bridge. The millrace AH06 is also depicted at the east end of the bridge. Various weirs and other mills are depicted to the south (downstream) of Greensbridge. These mills are evidence of the industrial use of the Nore, and the introduction of new treatments for textiles and the development of a brewing industry in the city in the eighteenth to early twentieth centuries.

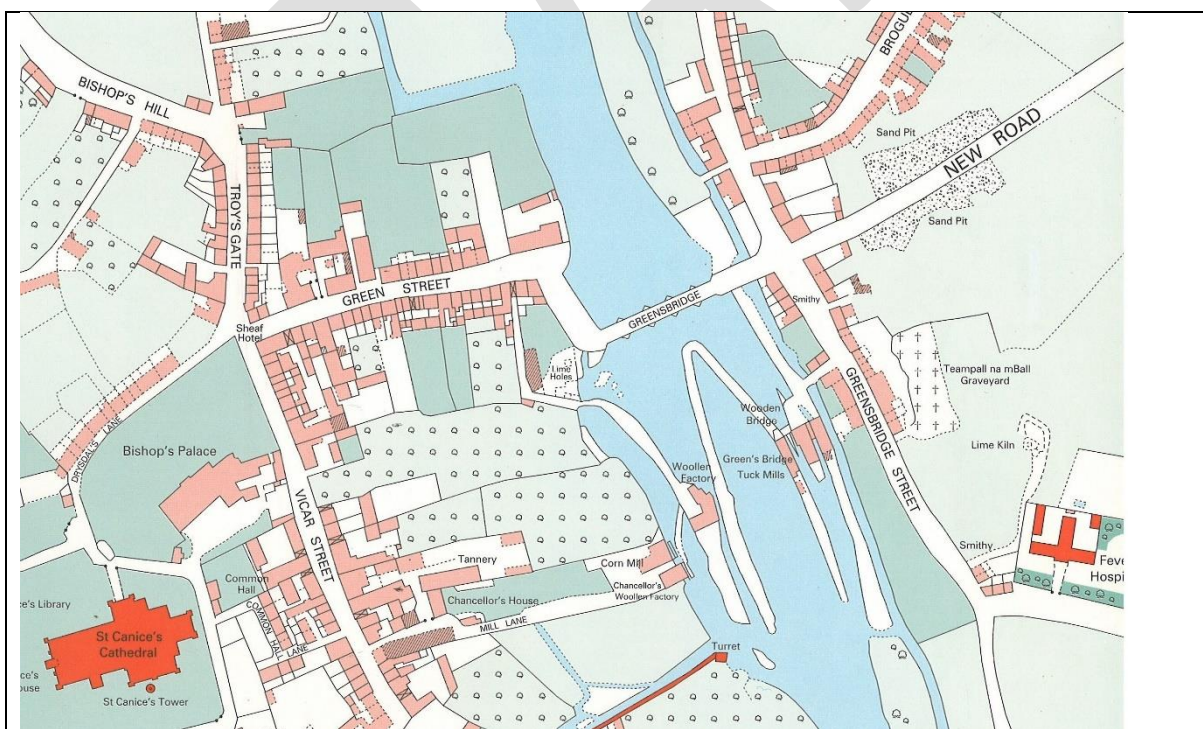
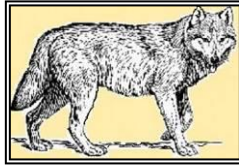
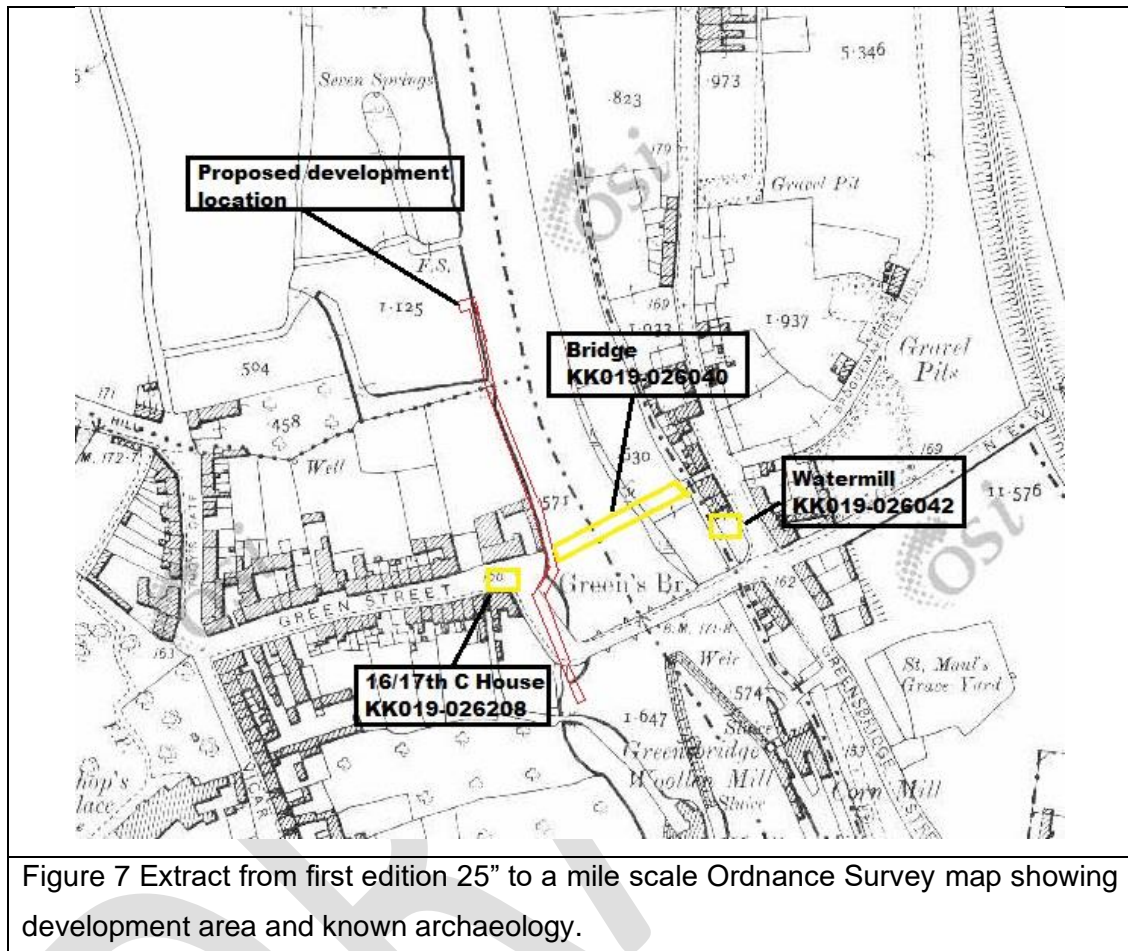


Figure 6 Extract from historic Ordnance Survey maps of Kilkenny dating to 1842 (after Irish Historic Town Atlas).



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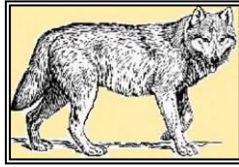
The early twentieth century first edition 25" to a mile scale Ordnance Survey maps of Kilkenny date to circa 1900 (see Figure 7). In this map the extant Greensbridge AH04 is depicted.



In 1969, Greensbridge AH04 was widened to allow for the increased levels of traffic, to use this bridge to access the city (Lanigan & Tyler 1987, 92).

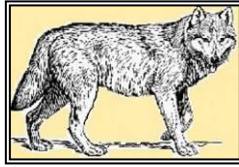
Known Archaeological Sites

The proposed development location is within of the Zone of Protection for the known archaeological site RMP No KK019-026 that is identified as the historic town of Kilkenny. The development will take place in the vicinity of several known and legally protected archaeological sites. These sites are detailed in the table below.



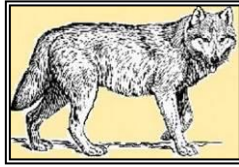
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AH Number / RMP number / RPS number / NIAH number	Location	Description	Impact Assessment	Proposed Strategy Mitigation
AH01, KK019-026	Kilkenny City	Medieval City of Kilkenny contained within city walls as defined by the River Breagagh to the south of the development.	No impact	Construction stage Archaeological Monitoring of ground disturbance works.
AH02 KK019-026001,	East end of Green's Street	Medieval gatehouse known as Green's Gate, at west end of Greensbridge. Removed prior to the 18 th century.	No impact	Construction stage Archaeological Monitoring of ground disturbance works.
AH03, KK019-026040	Traverses River Nore between west end of Broguemakers Hill and east end of Green's Street,	16 th century bridge constructed by Bishop Cantwell at location of earlier medieval bridge. Destroyed during the Great Flood of 1763. Archaeological excavations (licence 01E0326) at this site were carried out by Paul Stevens as part of the Kilkenny Flood Relief scheme, in 2001. The excavation identified five surviving sections of the collapsed bridge, including two piers, two sections of collapsed masonry and a bridge abutment.	Slight impact	Avoidance. The project has been designed to avoid direct impacts on the bridge AH03. Pre-construction archaeological test trenching at location of proposed mini piles in vicinity of bridge AH03. Construction stage Archaeological Monitoring of ground disturbance works.



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AH Number / RMP number / RPS number / NIAH number	Location	Description	Impact Assessment	Proposed Strategy Mitigation
AH04, D4, 12004007	Extant Greensbridge spanning River Nore between the New Road (R886) and Green Street.	Constructed in the mid 18 th century by William Colles to designs by George Smith. This limestone bridge features a series of five elliptical arches with cut- limestone blocked archivolts.	Slight impact	Preconstruction Written and Photographic Survey of extant arch of bridge which new pedestrian route will travel through. Construction stage Archaeological Monitoring of ground disturbance works.
AH05, KK019- 026042	Situated on the east bank of the River Nore, at the east end of the medieval Greensbridge AH03, and 50m north of the extant Greensbridge AH04.	Watermill described in the Civil Survey as a corn mill owned by the Bishop of Ossory. Unknown date of construction. Functioned with a millrace AH06. The 16 th century Greensbridge AH03 constructed by Bishop Cantwell respected the millrace AH06 of this mill.	No impact	None required.
AH06, KK019- 026077	Situated on the east bank of the River Nore, at the east end of the medieval Greensbridge AH03, and to the north of the extant Greensbridge AH04.	Millrace of unknown date, but associated with watermill AH05. The 16 th century Greensbridge AH03 constructed by Bishop Cantwell respected the millrace.	No impact	None required.



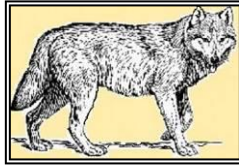
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AH Number / RMP number / RPS number / NIAH number	Location	Description	Impact Assessment	Proposed Strategy Mitigation
AH07, KK019-026208	East end of Green's Street.	17 th / 18 th century house identified by Patrick Neary during excavations at Green's Street (Licence 07E1146). An L-shaped building is depicted in this location of Rocque's Map of Kilkenny (1758), and Neary identified a similar shaped building layout.	No impact	None required.

Table 1: Record of Monuments and Places monuments in the vicinity of the scheme.

The medieval gatehouse known as Green's Gate AH02 was of unknown size and extent. This gatehouse is not depicted on Rocque's map of Kilkenny, indicating it was removed prior to the eighteenth century, possibly during the construction of Bishop Cantwell's Greensbridge AH03 in the sixteenth century. The development will not extend to the location of the gatehouse. Cantwell's bridge AH03 was one of a number of bridges that were constructed across the Nore at this location; the previous structures having suffered from flood damage, and a lack of upkeep and repair. Previous archaeological excavations have examined and identified the remaining elements of the bridge AH03. The proposed development has been designed to avoid any impacts on this bridge AH03. The development will see some localised ground disturbance works resulting in a slight impact.

The extant Greensbridge AH04 is an eighteenth-century structure, and is not included in the RMP, but is included in the RPS. The development will see the construction of a new pedestrian pathway through an existing stone arch at the west end of this bridge AH04, however there will be no direct impacts. The new path will see localised ground disturbance resulting in a slight impact.



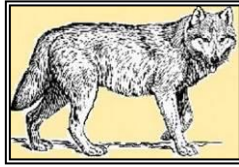
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Previous Archaeological Investigations

The following archaeological investigation is included in the in the online excavations database www.excavations.ie, or the Kilkenny Archaeological Project, and are listed for the area around the proposed River Nore Pedestrian and Cycle Link.

As part of the Kilkenny Flood Relief Scheme (later Kilkenny Main Drainage Scheme) Dr. Niall Brady carried out underwater assessments (licence 00E0790, 00D033) upstream and downstream in the Nore, and along the east and west banks at Greensbridge, where the medieval bridge AH03, was located. This survey was used to identify the surviving elements of the medieval bridge AH03. Brady identified that there were five stone piers along the riverbed. Three timber piles were recorded and sampled for dating purposes. One of the timber samples from the piles returned a 17th century date, indicating that the bridge had experience some repair works, possibly after storm and flood damage. A stone abutment was also identified on the east bank.

Following the survey by Brady, excavations by Paul Stevens and Ian Doyle (Licence 01E0326, see Figure 8) in the River Nore and along the riverbank for the Kilkenny Flood Relief Scheme, resulted in the identification and recording of surviving elements of the sixteenth century bridge constructed by Bishop Cantwell. These elements comprised two stone piers, two sections of collapsed masonry, and a bridge abutment. The bridge was constructed on large rectangular ashlar stone piers, which supported stone arches. The foundations of an abutment (the point where the bridge reaches dry land) was revealed on the eastern bank of the river. Stevens confirmed that the location of these bridge elements corresponded to the depiction of the bridge AH03 by Rocque in the mid 18th century. The abutment was constructed from a series of timber piles supporting a mortared masonry raft. The bridge pier identified during the excavations by Stevens on the west riverbank comprised a limestone ashlar-faced rectangular bridge section. The archaeological excavations took the form of targeted test trenches. These utilised a temporary colfer damn and pumps, and continued to a maximum depth of 3m below existing ground level. The test trenches were situated to the north and south of the historic Greensbridge AH03 (see Figure 8). Once the excavation was completed, the surviving masonry of the bridge AH03 was preserved in situ, and the excavation area was backfilled with imported engineered stone and sand deposits. The completion of the excavation works facilitated the OPW flood relief works. Details of the works carried out by the OPW following the completion of the excavation are outlined in the letter by Kilgallen CE included as Appendix 2 at the end of this report. The OPW installed a temporary hall road along the west shore of



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the Nore, and constructed an anchored sheet pile wall along the west bank of the Nore upstream of Greensbridge AH04, within the development area for the proposed River Nore Pedestrian and Cycle Link (see Figure 8). This activity saw the removal of existing deposits of silt, gravel and stone, prior to the construction of the haul road and anchored sheet pile wall.

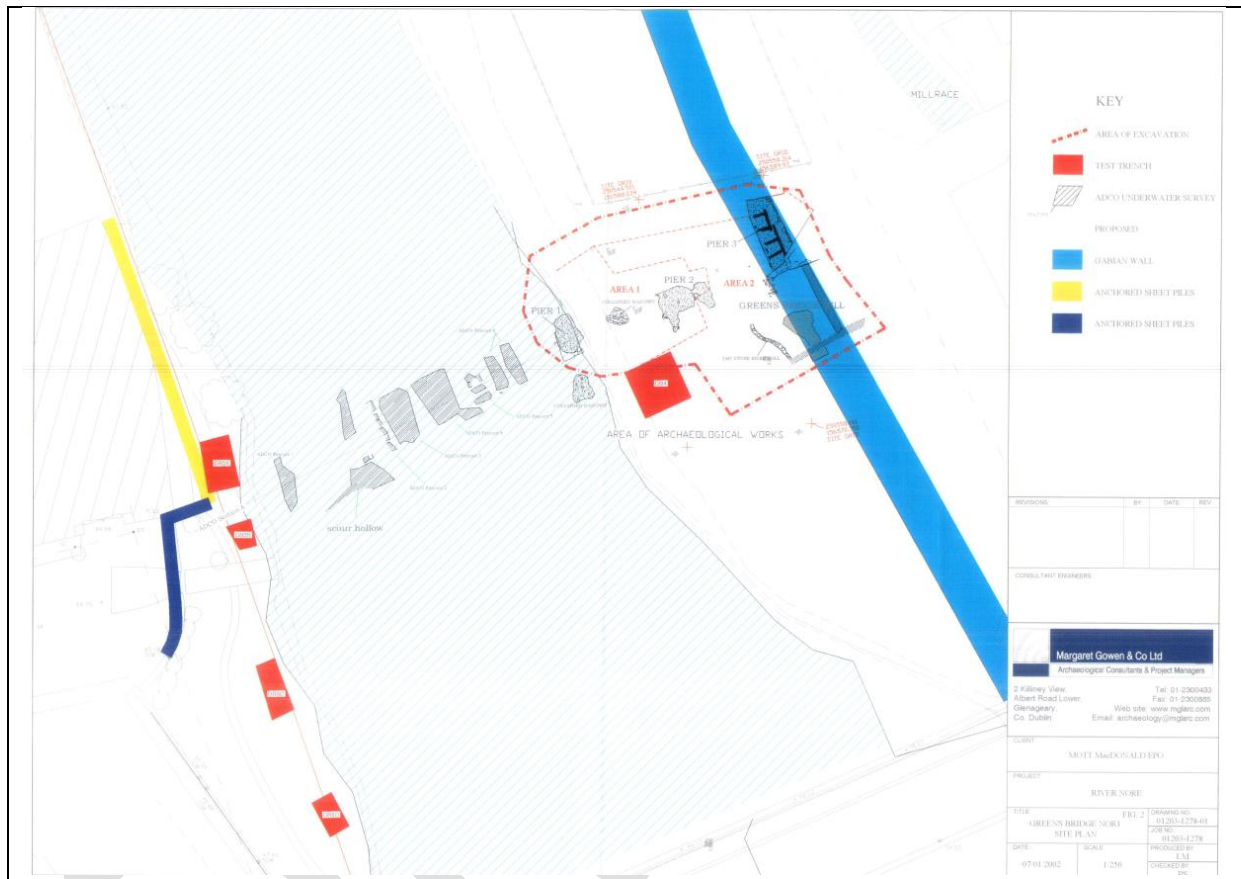
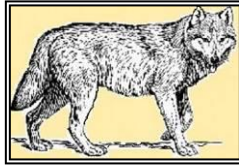


Figure 8 Showing location of excavations carried out by Paul Stevens and Ian Doyle at Greensbridge as part of the Kilkenny Flood Relief Scheme (after Margaret Gowan & Co Ltd).

Excavations by Patrick Neary (licence 07E1146) at the East end of Green Street, Kilkenny, resulted in the identification of the foundations of a series of 17th/18th century houses. These foundations correspond to a large L-shaped block shown fronting a plot between the river and a N-S running lane, that is depicted on John Rocque's 1758 map of Kilkenny.

Topographical Files of the National Museum of Ireland

The following entries for the townlands of Gardens and Bishopsmeadows, Kilkenny are contained in the Topographical files of the National Museum of Ireland.

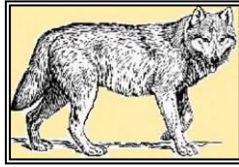


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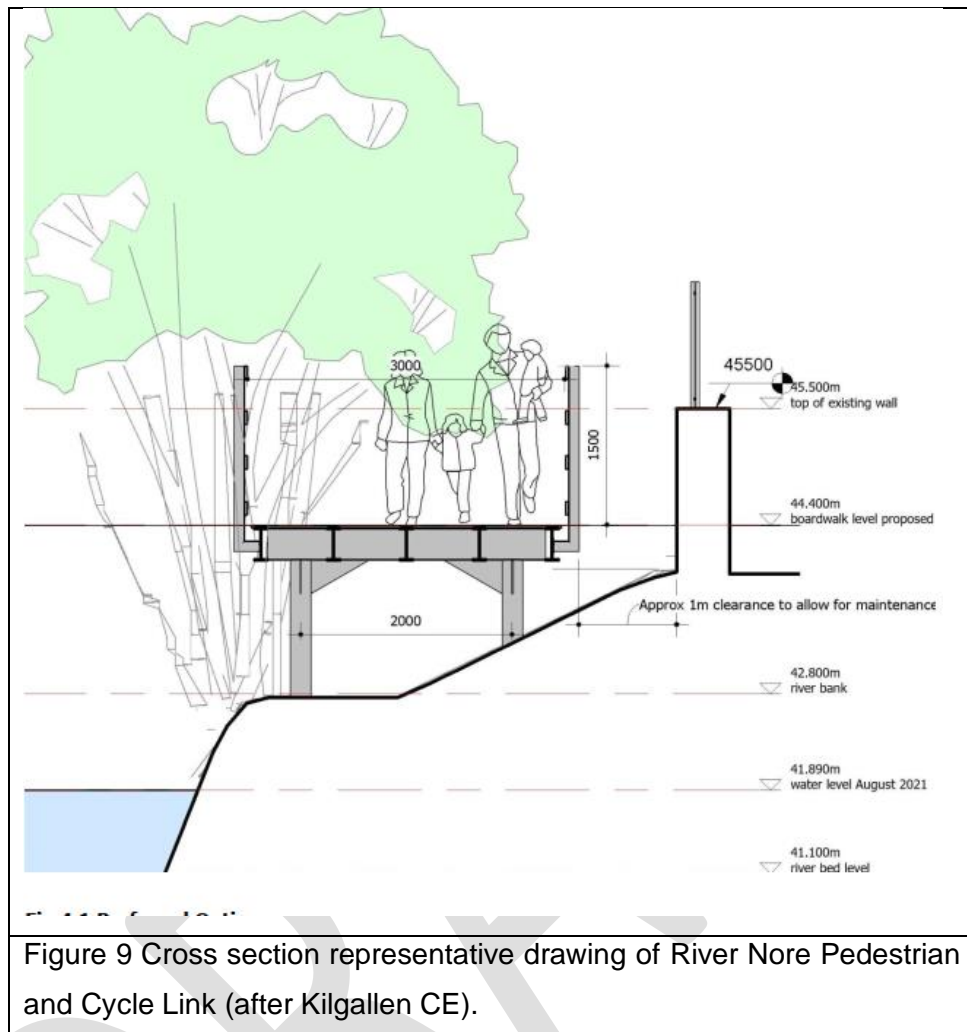
Topographical File Number	Townland	Parish	Description	Other Info
1887:447	Gardens	St. Mary's	Stone Capital	
1887:449	Gardens	St. Mary's	Carved Capital	
1977:2339-2343	Gardens	St. Mary's	Human Remains	Fill of chancel in Black Abbey
1977:2090-2167	Gardens	St. Mary's	Pottery, Lead, Stone, Iron, Clay Pipes and Tiles	Medieval and post medieval
1977:2351-2354	Gardens	St. Mary's	Medieval Finds	
1976:606-7	Gardens	St. Mary's	2 sherds of pottery	Post medieval from Abbey St 0.65-1.7m deep
1976:608	Gardens	St. Mary's	Human skeleton	Abbey St 0.65-0.75m deep
E590:1-30	Gardens	St. Mary's	Excavation finds from house site	Post medieval, Dean St
2011:138	Gardens	St. Mary's	Glass	St. Canices Cathedral
RSAI 116:23-27	Gardens	St. Mary's	Ceramic Tiles	St. Canices Cathedral

Site Inspection

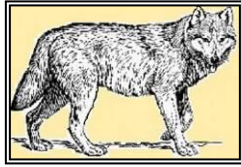
A site inspection of the proposed development was carried out on 16th November 2022 in overcast, wet conditions. The proposed River Nore Pedestrian and Cycle Link commences to the south of Greensbridge where it will join the existing Riverside Gardens walk, situated 30m south of Green's Bridge in Gardens townland. It continues under an arch of Greensbridge and along the riverbank northwards for 130m, until it joins the River Nore Linear Park trail at Bishopsmeadows. The new elevated pedestrian boardwalk will be 3m wide, and will be constructed on steel beams, supported by 200mm diameter concrete mini piles/pillars (see Figure 9). The project will also see some groundworks for landscaping and the installation of street furniture along the route. All of the works for the development will be carried out on the west bank of the River Nore upstream and downstream from Greensbridge AH04.



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At the southern end of the project, the development will see the removal of some existing ground materials (concrete, stone and soil), and the construction of a new resin coated concrete path that will traverse Greensbridge AH04 using an existing disused stone arch (see Plate 1). The southern extent of this stone arch was amended and extended using concrete during the extension works to Greensbridge AH04 carried out in 1969.



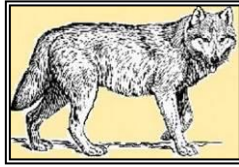
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Plate 1 Showing existing stone arch of Greensbridge with tarmac path, facing south.

The proposed new path will then turn to the east and continue to the riverbank, where it will turn northwards. The new elevated pedestrian riverwalk will be constructed along the existing riverbank at this location (see Plate 2). There is an existing well-worn path at this location, which utilises a blocked-up underpass under Greensbridge AH04. Some pedestrians use this as an unofficial route linking the Linear Park and the city. As part of the development of this project PGL excavated a slit trench (ST01) at the location of the grass lawn and blocked-up bridge underpass. This slit trench identified modern made ground to a depth of 1m below existing ground level, which was 45.53m OD.

The proposed elevated riverwalk will be constructed on mini piles, above the flood level of the Nore. The mini piles will require some localised ground disturbance, during their construction. This location was subject to a previous archaeological excavation (licence 01E0326) that was conducted as part of the Kilkenny Flood Relief Scheme. This excavation resulted in the identification and preservation in situ of elements of the sixteenth century bridge AH03. The excavation report for licence 01E0326 states that the excavation removed soils and deposits within the excavation area to a depth of up to 3m. This indicates that the likelihood of non-masonry archaeological features remaining undiscovered within this section of the riverbank, is low.

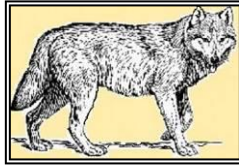


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Plate 2 Showing existing riverbank and earth-worn path at Greensbridge, facing north.

During periods of low water level, the surviving piers of the bridge AH03 are visible in the river. At the time of the site inspection (November 2022) the water level was high, but the location of the piers was still identifiable, as the water visibly broke where it encountered the piers (see Plate 3). The excavations carried out by Stevens and Doyle (licence 01E0326) at Greensbridge examined the west riverbank of the Nore where the River Nore Pedestrian and Cycle Link will be constructed. To ensure that the proposed construction works for the River Nore Pedestrian and Cycle Link project do not result in direct impacts on the surviving subterranean masonry of the bridge AH03, the design has been finalised with mini piles that will be 10m apart along the riverbank, at the location of the bridge AH03, thus spanning over the archaeology. The localised construction works for the mini piles and elevated path will result in a slight impact on the archaeological heritage.

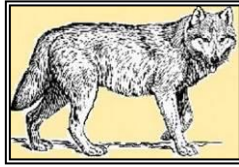


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Plate 3 Showing water breaking in the River Nore where surviving piers of Greensbridge AH03 remains under the water, facing east.

The new elevated route will continue northwards along the west riverbank of the Nore and will cross the townland boundary between Gardens townland and Bishopsmeadows townland. A culverted stream forms the townland boundary at this location. This stream is depicted on historic maps of the area and is annotated as 'Seven Springs'. The culvert is formed by a modern stone recessed drainage pipe and metal fence (see Plate 4). The new pedestrian walkway will be constructed at the height of the existing ground at the Linear Park.



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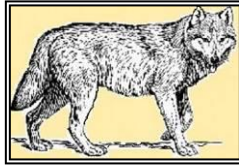


Plate 4 Showing culvert forming townland boundary between Gardens and Bishopsmeadows.

At its northern extent the River Nore Pedestrian and Cycle Link will tie in with the existing River Nore Linear Park in Bishopsmeadow. The existing path is modern tarmac. There will be limited localised groundworks for the project in this location.



Plate 5 Showing northern extent of the development area where it meets joins the River Nore Linear Park, Bishopsmeadows, facing north.



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5.0 Archaeological Impact Assessment

The proposed development of the River Nore Pedestrian and Cycle Link will see localised ground disturbance works in an area of Kilkenny City that has been used for human activity since at least the medieval period. That there are historical references to successive iterations of bridges at Greensbridge, is evidence of the significance of the location, since at least the thirteenth century.

The proposed new River Nore Pedestrian and Cycle Link will be constructed on the western riverbank of the river (see Figure 10). This section of the River Nore was part of the development works area for the Kilkenny Flood Relief Scheme, which saw flood alleviation measures carried out by the OPW between 2001 and 2004.

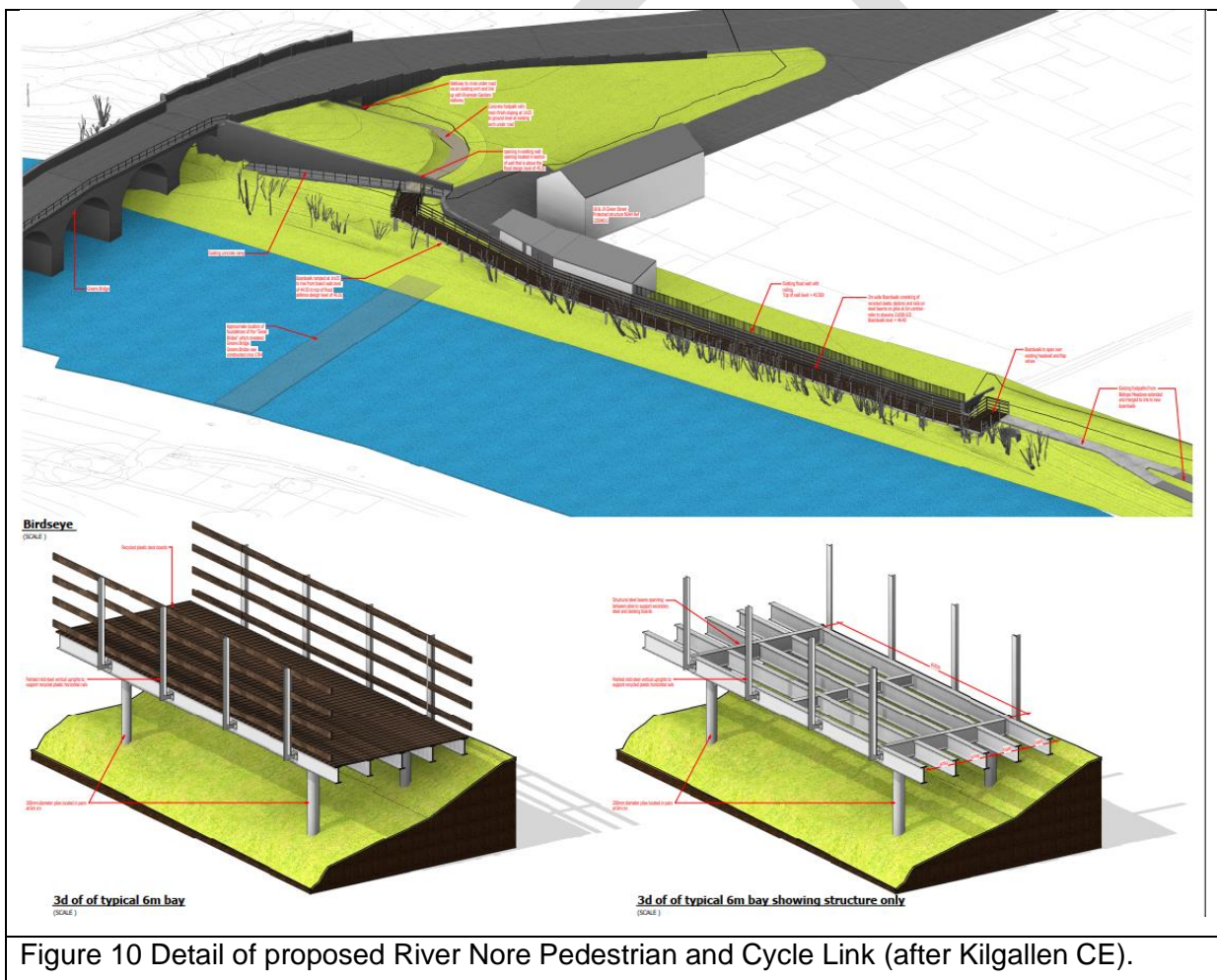
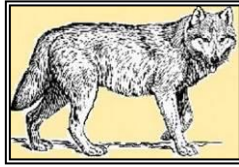


Figure 10 Detail of proposed River Nore Pedestrian and Cycle Link (after Kilgallen CE).

The Kilkenny Flood Relief Scheme included the temporary diversion of the River Nore in Kilkenny City, followed by significant ground disturbance activities. Following the completion of an underwater archaeological survey by ADCO Ltd, a temporary colfer dam was



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constructed in the river, where the old Greensbridge AH03 made landfall. The excavation by Stevens and Doyle (licence 01E0326) states that the excavation removed soils and deposits within the excavation area to a depth of up to 3m. This included the area where the River Nore Pedestrian and Cycle Link will span over the old Greensbridge AH03 (see Figure 8). Following the completion of the excavation (licence 01E0326), the area was backfilled with engineered stone. The presence of this engineered stone was confirmed in the geotechnical survey works carried out by Priority Geotechnical (PGL) for the River Nore Pedestrian and Cycle Link. The geotechnical survey included one dynamic probe (DP05) along the west bank of the Nore, where Greensbridge AH03 had stood, at 650452.4E 656606.7N, and 42.91m OD. This dynamic probe (DP05) returned a refusal at a depth of 0.9m below existing ground level (42.91m OD). Consequently, a second dynamic probe (DP5A) was attempted just southwest of the location of dynamic probe (DP05), at 650451.2E 656606.1N. This probe returned a refusal at a depth of 1.9m below existing ground level. Both refusal depths of the dynamic probes (DP05) and (DP5A) were likely the result of imported stone deposits, stockpiled during the construction of the Kilkenny Flood Relief Scheme.

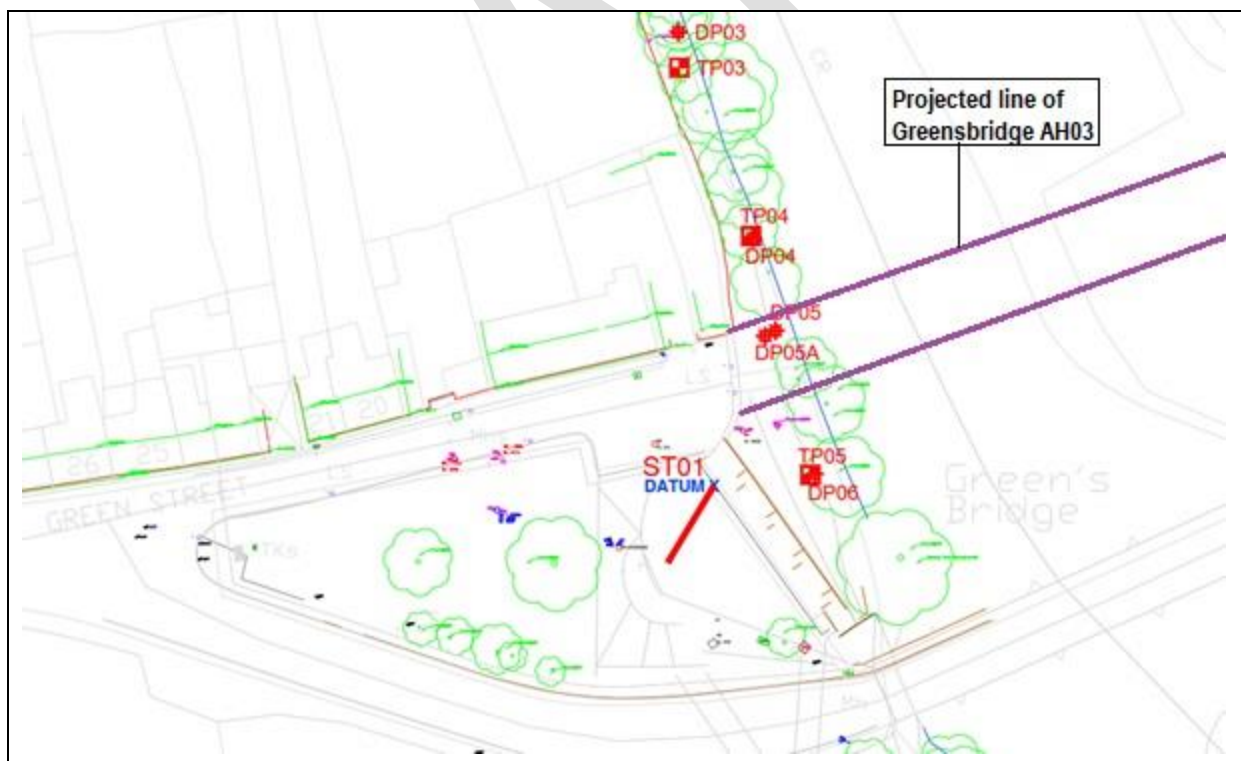
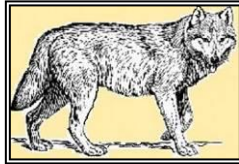








Figure 11 Extract from report PGL for the River Nore Pedestrian and Cycle Link showing location of geotechnical works at location of old Greensbridge AH03.

A Trial Pit (TP05) was excavated by PGL on the west bank of the Nore and to the south of the former location of Greensbridge AH03. This Trial Pit TP05 identified imported made ground to



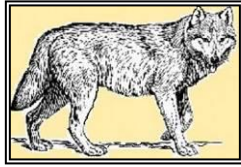
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a depth of 0.9m (42.06m OD), and underlying this, a deposit of soft grey black slightly sandy gravelly silt, which continued to 41.55m OD.

		Priority Geotechnical Ltd. Tel: 021 4631600 Fax: 021 4638690 www.prioritygeotechnical.ie			Trial Pit No TP05 Sheet 1 of 1		
Project Name: River Nore Boardwalk Feasibility Study		Project No.: P21232	Co-ords: 650456E - 656590N Level: 42.96m OD		Date: 01/11/2021		
Location: Co. Kilkenny		Dimensions (m): 1.70 0.60		Scale: 1:25			
Client: Kilkenny County Council		Depth: 1.60m BGL		Logged: EK			
Water Strike & Backfill	Samples & In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.10			0.10	42.88		(MADE GROUND) CLAUSE 804 or similar.
	0.50 0.50	B D					
	0.90			0.90	42.06		Soft, grey black, slightly sandy gravelly SILT. Sand is fine to coarse. Gravel is fine to coarse, sub-rounded to rounded.
	1.10 1.10	B D					
	1.50	B			1.50	41.38	
				1.80	41.38		

Stability: Poor
Plant: 3t tracked excavator.
Backfill: Arisings
Remarks: Trial pit terminated at 1.60m bgl, water ingress.
Groundwater: 0.80m: Fast rate of flow.

Figure 12 Extract from PGL report detailing results of TP05.



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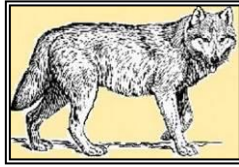
The Kilkenny Flood Relief Scheme project necessitated the construction of a temporary haul access road on the west bank of the River Nore between the confluence of the Breaghagh and the Nore rivers to the south of the proposed River Nore Pedestrian and Cycle Link, and Bishopsmeadows, to the north of the proposed River Nore Pedestrian and Cycle Link. Imported engineered stone and soil was infilled along a section of the west bank of the Nore (see Plate 6 below).



Plate 6 Image of haul road for Kilkenny Flood Relief Scheme on west bank of River Nore at location of proposed River Nore Pedestrian and Cycle Link Project. Note abutments of Greensbridge AH03 in river (courtesy OFW).

Between 2002 and 2004 the OPW designed and constructed a flood wall at the northern end of the haul road for the Kilkenny Flood Relief Scheme. This flood wall is situated at the northern end of the proposed River Nore Pedestrian and Cycle Link project area. Kilgallen CE have reviewed the OPW drawings relating to the construction of the flood wall and identified that the OPW works necessitated the removal of underlying soils along a section of the west bank of the Nore and the importation of engineered stone (see Figure 13 below).

The mini piles which will be constructed to support the River Nore Pedestrian and Cycle Link will be installed at the location of the temporary works for the Kilkenny Flood Relief Scheme.



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Consequently, most of the underlying original ground material at the location of the mini piles has been removed, during previous construction activities.

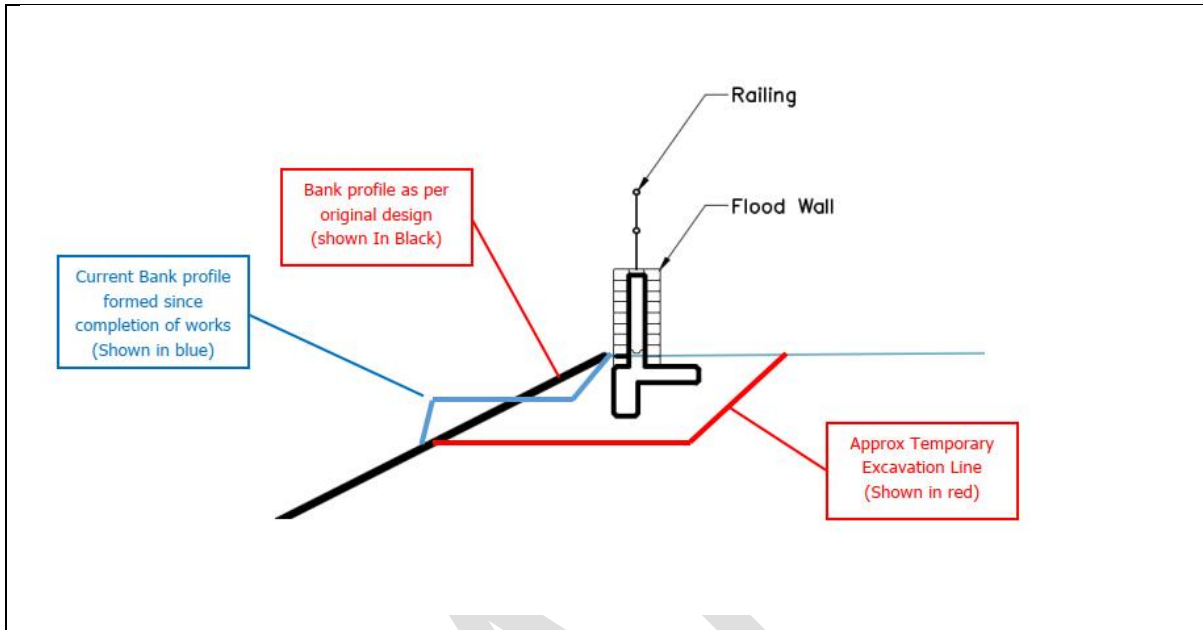
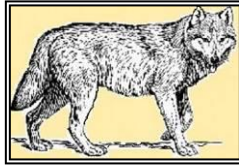


Figure 13 Showing cross section by Kilgallen CE of OPW Flood Wall construction on west bank of River Nore, for Kilkenny Flood Relief Scheme.

Historic maps, written sources, previous archaeological excavations and surveys, and visible evidence, indicates that elements of the sixteenth century bridge AH03 may survive within the proposed development area. However, the previously completed engineering works for the Kilkenny Flood Relief Scheme, likely impacted on the existing soils and any associated archaeology along the west bank of the Nore.

The most archaeologically sensitive part of the proposed development area is where the sixteenth century Greensbridge AH03 made land on the west bank of the Nore (see Figure 1). The design team for the River Nore Pedestrian and Cycle Link considered the sensitivities of extant archaeology within the development location, and finalised the design to minimise the extent of groundworks, and consequently, reduce the risk of impact on archaeology. By increasing the span of the proposed mini piles to a 10m interval at the location of the bridge AH03, the proposed development will avoid any direct impacts on the archaeology. The landscaping and works for new street furniture will see localised ground disturbance works, and these will not take place near the bridge AH03.

Consequently, the impact level of the proposed development on the archaeological heritage is slight. A slight impact is judged to apply when the proposed development will not directly



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impact on any known archaeology, but will result in changes to the environs or character of known archaeology. Archaeological mitigation measures are recommended to ameliorate the risk of impact on the archaeological heritage.

6.0 Conclusions and Recommendations

Conclusions

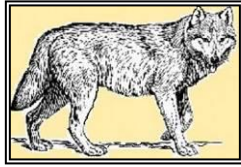
The proposed River Nore Pedestrian and Cycle Link will see construction works take place at and near known and legally protected archaeology. The development will not directly impact on any known legally protected archaeology. Much of the ground disturbance works that will take place will be shallow impact, and some of the development area has already been subject to archaeological excavation and previous construction activity.

All of the works on the riverbank near the bridge AH03 location are considered to be of potentially impactful, regarding archaeological heritage, and should be subject to appropriate mitigation.

Any works that take place near or impact on the extant Greensbridge AH04 should be sensitive to archaeological and architectural heritage, and should be subject to appropriate mitigation.

Recommendations

- Pre-construction Written and Photographic Surveys, and 3-D Laser Scan or Photogrammetry Surveys of the stone arch (both elevations) of Greensbridge AH04 where the River Nore Pedestrian and Cycle Link will pass through, should be compiled prior to the commencement of any works.
- Pre-construction targeted test trenching at the location of the proposed mini piles for the new River Nore Pedestrian and Cycle Link, in the vicinity of the former location of the original Greensbridge AH03 RMP No KK019-026040.
- Construction stage archaeological monitoring of all groundworks including site investigation works, compound set-up, landscaping, installation of mini piles and street furniture.



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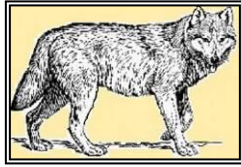
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Appendix I

Architectural Heritage Impact Assessment

HERITAGE IMPACT ASSESSMENT

Proposed pedestrian & cycle link between the River Nore Linear Park and Riverside Gardens (Abbey Quarter), Kilkenny.



On the instructions of Kilkenny County Council

Date : 15th May 2023

OUR REF: C23-005

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HERITAGE IMPACT ASSESSMENT

Proposed pedestrian & cycle link between the River Nore Linear Park and Riverside Gardens (Abbey Quarter), Kilkenny.

CONTENTS

1. Introduction & Background
2. Heritage/Planning Context
3. Heritage Significance
4. The Design Process, Proposed Development
& Heritage Impact Assessment
5. Conclusion

1. Introduction & Background

This Heritage Impact Assessment comprises part of the documentation for public consultation relating to the proposed pedestrian & cycle link between the River Nore Linear Park and Riverside Gardens (Abbey Quarter) in Kilkenny, in accordance with Section 179 of the Planning and Development Act 2000 (as amended) and Articles 81 & 120(3) of Part 8 of the Planning and Development Regulations 2001 (as amended).

This report has been prepared at the request of Kilkenny County Council by Cormac O’Sullivan (accredited in Conservation at Grade 3) with input by Peter Bluett, Conservation Architect Grade 2.

The methodology of this assessment follows the guidance set out in the Dept. of the Environment, Heritage and Local Government “*Guidelines for Planning Authorities on Architectural Heritage Protection, Appendix B; Architectural Heritage Assessment Reports*”.

The Nore Linear Park follows the path of the river through the centre of Kilkenny. It follows the west bank from Talbotsinch as far as Bishop’s Meadows but within the city centre it follows the east bank of the river through the Peace Park and along John’s Quay, then via John’s Bridge to the Canal Walk back on the west bank. See Fig 1.

At the moment, it is necessary to use the trafficked routes of Riverside Drive, Troy’s Gate, Green Street, and Green’s Bridge to reach the Peace Park from Bishop’s Meadows. However, the redevelopment of the Smithwicks’ Brewery site on the west bank of the Nore in the city centre (the Abbey Quarter) including the development of the Riverside Gardens provides the opportunity to create an off-street pedestrian and cycle route on the west side of the Nore from Talbotsinch right through the city centre and onwards to the Ossory footbridge.



Figure 1 Nore Linear Park

To achieve this, a pedestrian and cycleway link between Bishop's Meadows and the Abbey Quarter is proposed on the west bank of the River Nore and is the subject of this Heritage Impact Assessment.

This link takes the form of a riverside boardwalk, offset from No.18 /19 Green Street, a protected structure, and a road underpass through an existing arch on the western approach road to Green's Bridge, also a protected structure.

2. Heritage/Planning Context

2.1 Archaeology

The part of the boardwalk site located beside No.18/19 Green Street lies within the zone of notification of recorded monuments of Kilkenny City.

There are two recorded monuments in the vicinity of the site.

- The foundations of a 17th / 18th Century house on the southside of Green Street on the approach to the 'Great Bridge' (RMP Ref. KK019-026208).
The 'Great Bridge' preceded Green's Bridge but was washed away in the great flood of 1763.
- The remains of the abutments of the 'Great Bridge' can still be seen when the river is low or perceived as breakwaters on the surface otherwise. (RMP Ref. KK-019-026040).
Ref. photos 1,2,3 & cover photo.

2.2 Protected Structures

There are 3 buildings in the vicinity of the site which are included in the Record of 'Protected Structures' (RPS) in the City Development Plan.

- Green's Bridge, dating from 1764 – 66, was constructed after the great flood 1763. It is considered to be a near-perfect copy of Palladio's Ponte de Tiberio in Italy and is rated as being of national importance in the National Inventory of Architectural Heritage (NIAH).
RPS Ref. D4, NIAH Ref. 12004007.
Ref. photos 4,5,6 & 7.
- The round-arched tunnel under the approach to Green's Bridge which is contemporary with the bridge and can be considered to be a part of it. (1766) RPS Ref. B37.
Ref. photos 8,9 & 10.
- No.18 /19 Green Street dating from c.1875. This building incorporates the fabric of an earlier inn of c.1800 and is rated as being of regional importance in the NIAH.
RPS Ref. B35, NIAH Ref. 12004011. *Ref. photo 11.*
The principal façade of this building, including the shop front, is onto Green Street. There are a number of outbuildings to the rear and the high boundary wall to the Nore has a steel-framed lean-to canopy. The NIAH also identifies the limestone kerbs outside the building, dating from c.1900 as being of regional importance, NIAH Ref. 12004016.
Ref. photos 12 & 13.

2.3 Architectural Conservation Area (ACA)

The site lies at the edge of the St Canice's architectural conservation area (ACA) which contains St Canice's Cathedral and its close, the narrow streets and lanes around it, and the remnants of the medieval walls of Irishtown. The ACA Development Management Requirements in the City Development Plan note the large zone of visual influence of the Cathedral across the area.
Ref. photo 14.

Archaeology

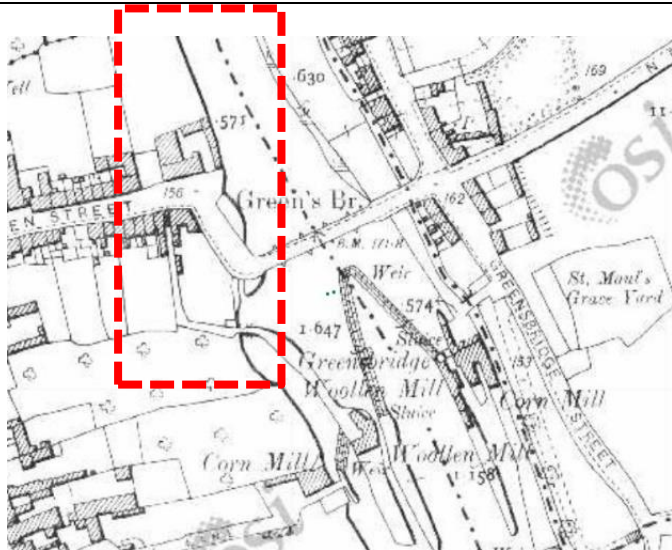


Figure 2. Extract from the 1st.edition Ordnance Survey 1840's showing the offset access to the bridge from Green street



1. Contemporary aerial view of bridge showing the new road link to the greens bridge, demolition of South side of Greens Street also has been undertaken Forming a park between the new Road and Green Street.



2.

The remains of the abutments of the Great Bridge (pre-1763 flood) align with Green Street and can still be perceived in the river.

(ref. cover photo also)

The boardwalk project presents the opportunity to explain and interpret this archaeology by means of an information panel.



3. The remains of the abutments of the Great Bridge (pre-1763 flood)

Protected Structures



4. Greens bridge from north prior to construction of temporary extended walkway



5. Greens bridge from south side



6.

Green's Bridge was designed by George Smith in the Palladian style with elliptical limestone arches and pedimented panels above the cutwaters.

The north parapet was taken down and stored and the bridge widened in 1969 when John's Bridge was closed.

Unfortunately, this alteration was never reversed and the upstream elevation of the bridge is severely compromised. (Photo 7)



7. Extended walkway at side of Greens Bridge to North



8. Northern opening to tunnel under Green's bridge

The tunnel below the approach road or sixth arch of Green's Bridge

8 – northern opening

9 – southern opening

10 - view through the tunnel



9. South opening



10. View through tunnel



11. 18 /19 Green Street

No.18/19 Green Street is a two-storey farmhouse of 1875 incorporating a very finely crafted shopfront (12)

Note the historic limestone kerbing and jostle stone to the yard entrance (13)



12. 18 /19 Green Street



13. 18 /19 Green Street

Architectural Conservation Area



14. Left: View from Green's Bridge over the St. Canice's Architectural Conservation Area, which is dominated by the Cathedral and the Bishop's Palace

3. Heritage Significance

The environs of the site are of heritage significance because of:

1. The special archaeological interest of the remnants of the abutments of the Great Bridge.
2. The special architectural and technical interest of Green's Bridge, including the tunnel or 'sixth arch', designed in the Palladian style by George Smith and constructed by William Colles.
3. The special architectural and artistic interest of 18/19 Green Street, most evidently in the finely crafted shopfront with wrought-iron work, pilasters, panelled risers and a moulded cornice.
4. They are a part of the setting of St. Canice's Cathedral upon approach towards the cathedral precinct over Green's Bridge.



1.



2.



3.



4.

4. The Design Process, Proposed Development & Heritage Impact Assessment

The route of the pedestrian & cycle link is indicated in photos 15-21 below.



15.

The ends of the footpath and cycleway in Bishop's Meadows will be continued as a boardwalk on a steel frame at the level of the headwall over the stormwater valves.

16.

Thereafter, the boardwalk follows the west bank of the river beside the high stone boundary wall to the rear grounds of 18/19 Green street.



16.



17.

The boardwalk continues between the trees and the walls of the yard outbuildings of 18/19 Green Street.



18.

The boardwalk terminates at the slipway to the river in line with the gateway to the rear yard of 18/19 Green Street. This is within the grassed area c. 14m from the protected structure.



19.

19. The link continues as a surface footway/cycleway through the modern underpass of the approach road onto Green's Bridge.

20. Northern entrance/exit of the underpass

21. Southern entrance/exit of the underpass which will connect at grade to the Riverside Gardens/Abbey Quarter, passing under the new St. Francis' Bridge on-route.



20.



21.

The Design Process

A number of potential engineering design options were considered for the proposed boardwalk.

Option 1 explored spanning the boardwalk between a new concrete beam at the foot of the riverside boundary wall of 18 / 19 Green Street and a new steel frame set into the riverbank. However, a cautious approach in line with conservation principles¹ ruled out this option due to the unpredictable impact on the structural integrity of the masonry wall.

Option 2 considered forming the boardwalk on a solid base retained by rock filled gabion baskets. However, to remain structurally independent of the boundary wall of 18 – 19 Green Street, deep excavation would be necessary, and the exposed woven PVC gabions would be visually incongruous in the context of an Architectural Conservation Area and this option was ruled out.

Option 3 considered forming the boardwalk on a solid base retained by a reinforced concrete wall faced with natural stone. Although the excavation could be shallower than the gabion option, it would be necessary to underpin the existing boundary wall of 18 – 19 Green Street. This intervention was not justified if other less invasive options were possible and option 3 was ruled out for this reason.

Option 4 considered eliminating excavation of the riverbank entirely by using a piling rig to retain the boardwalk by driving sheet piles. But besides being very difficult logistically, the effect on the boundary wall and on 18/19 Green Street itself, of the vibration and repeated impact inherent to sheet piling was deemed too uncertain and option 4 was ruled out for this reason.

Option 5 considered placing the boardwalk as a bridge on a series of large (750mm diameter) piles driven into the riverbank. This option would be structurally independent of the boundary wall of 18 – 19 Green Street and set well off it but, as with option 4, the implications of using a large piling rig in the river was unpredictable, including the possible impact on 18 – 19 Green Street and on the abutments of the Great Bridge in the riverbed.

Although none of these options were suitable, the process of exploring all options was a valuable and important exercise. It served to identify the conservation and aesthetic issues to be addressed in order to take the project forward and to arrive at the most appropriate solution.

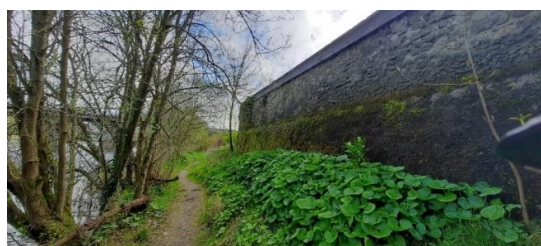
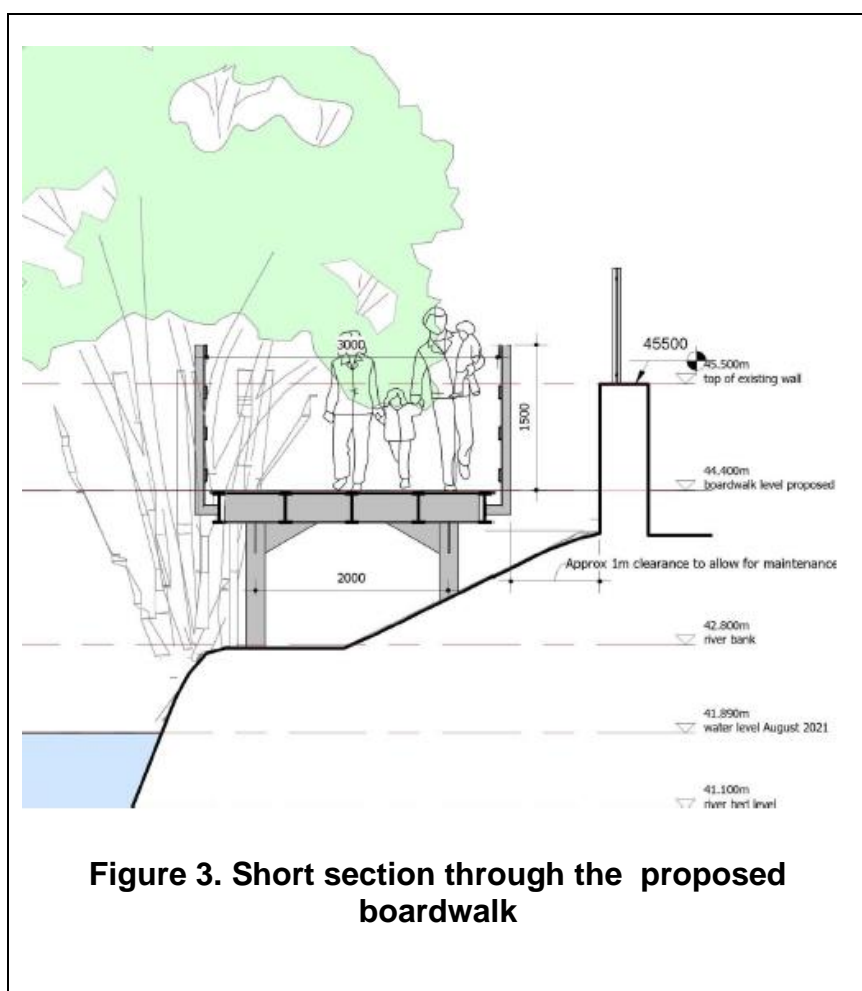
¹ The Burra Charter 2013, Article 3

The Proposed Development

The design finally selected was informed by this process and comprises a boardwalk set a minimum of 1 metre off the boundary wall of 18 – 19 Green Street with the deck supported on a frame of paired 200mm tubular steel piles spaced at 6 metres intervals. This construction will be structurally independent of the boundary wall and the small piles can be bottom-driven using small plant and machinery and without entering the water. See Fig. 3 under.

Using this technique, the pile driver strikes a pointed concrete plug at the bottom of the 200mm diameter hollow steel tube casing for the pile, with minimal vibration and noise compared to conventional top-driven piles.

As a precautionary measure, 2 test piles were successfully driven on the riverbank and demonstrated the technical feasibility of the proposed construction methodology.



22.

The boardwalk will be 3m wide, set above the water's edge and held approximately 1m off the boundary wall of 18/19 Green Street.

Heritage Impact Assessment




The International Conservation Charters and Conventions set out principles which provide a sound basis for considering the impact of any intervention on a place of cultural significance, whether large or small.

In this case, relevant Articles adopted under the ICOMOS Charter for the conservation of places of cultural significance (The Burra Charter) include:

- That works should have only minimal impact on the heritage asset, “changing as much as necessary but as little as possible” (Article 3).
- That works which dilute the heritage significance should be substantially reversible without the loss or damage of historic fabric, (Article 15).
- That the setting of the heritage assets should not be adversely affected, (Article 8)
- That any new use should be compatible with the place of heritage significance, (Article 7)
- As the heritage significance of many places is not readily apparent, it should be explained by *interpretation*, (Article 25)
- That works be properly documented and recorded, (Article 32)
- That works be implemented under the competent direction and supervision of persons with appropriate knowledge and skills, (Article 30)

The heritage impact assessment of the proposed pedestrian and cycle link is set out below and is guided by the principles of the Burra Charter.

	Aspects of Heritage Significance	Heritage Impact	Recommended mitigation measures
1.	Abutments of the Great Bridge	None, subject to due care and competent direction during the works	<p>The archaeological interest and historical role of the Great Bridge is not apparent to the general public.</p> <p>The project presents the opportunity to explain and interpret the heritage significance of the abutments at close quarters in the spirit of Article 25 of the Burra Charter.</p> <p>It is recommended that the scope of the project include a suitably composed interpretive panel on the boardwalk overlooking the abutments.</p> <p>It is recommended that the piling for the boardwalk be monitored by a licenced archaeologist as more evidence of the Great Bridge may be revealed and should be professionally recorded</p>
2.	Green’s Bridge	No impact	

<p>3.</p>	<p>18/19 Green Street</p> <p>In the Planning and Development Act, the definition of a protected structure includes,</p> <ul style="list-style-type: none"> • The interior • The land within the curtilage • Any other structures within that curtilage and their interiors • All fixtures and features which form part of the interior or exterior of any structure 	<p>There is no impact on the fabric main building, including the shopfront, which is the principal aspect of heritage significance.</p> <p>The outbuilding backing onto the river is also protected by legislation by virtue of being within the curtilage of the main structure.</p> <p>The boardwalk is held approximately 1m off the back wall of this outbuilding and is structurally independent of it.</p> <p>Subject to due care and competent direction during the course of the works, no material impact on the fabric of the outbuilding is anticipated.</p>	<p>It is recommended that vibration monitors and movement tell-tales be attached to the protected structures.</p> <p>If vibration exceeds agreed limits or if cracks or settlement are detected, works should be suspended pending expert advice on how best to proceed.</p>
		 <p>23.</p>	 <p>24.</p>
		<p>The impact on the setting of the protected structure is modest and is therefore considered to be acceptable.</p> <p>The boardwalk section of the link will terminate at the top of the slipway from Green Street to the river where the existing guardrails end at a distance of c.4m from No. 18/19.</p> <p><i>Ref. photos 23 & 24</i></p> <p>The boardwalk guardrails will end in line with the rear(river-facing) elevation of the yard outbuilding and will not affect the setting of the front elevation of the protected structure to Green Street.</p> <p><i>Ref. photo 25</i></p>	 <p>25.</p>

4. **St. Canice's ACA & the setting of the Cathedral precinct**

Landscape setting



The scrub along the river bank will be cleared as part of the works to allow access for materials and equipment.

Compatible Use

The boardwalk will formalise a walk which already exists but which can only be undertaken at present in an ad-hoc and unsafe manner. The extension of the Nore Linear Park by means of a public pedestrian and cycle route is compatible with the character of the ACA and it presents the opportunity to highlight the remains of the Great Bridge by placement of interpretive material above the abutments.

The regular structural grid of the boardwalk frame and the linear form of the guardrails, akin to a marina, is an appropriate form of construction in the riverine context and will enhance the appearance of the riverbank.

Public Lighting

Adequate public lighting is proposed for safety purposes.

This includes column mounted general lighting and low-level LED lighting set into the underside of the parapet top rail

Reinstatement of the planting beneath the boardwalk will be carried out in accordance with the recommendations contained in the ecological impact assessments.

Compensatory planting of new trees in Bishop's Meadows will provide an equivalent amount of woodland and scrub habitat to that which is required to be removed.

No mitigation required.

The impact of the lighting scheme will be mitigated by use of Dark Skies Association (DSA) rated downlighters, on black columns, with directional hoods to minimize light spillage.

The operation of the lighting will also be controlled to align with the current timings in use along the Bishop's Meadows linear walk and photo sensors will ensure that the lighting will only operate when natural daylighting is inadequate.

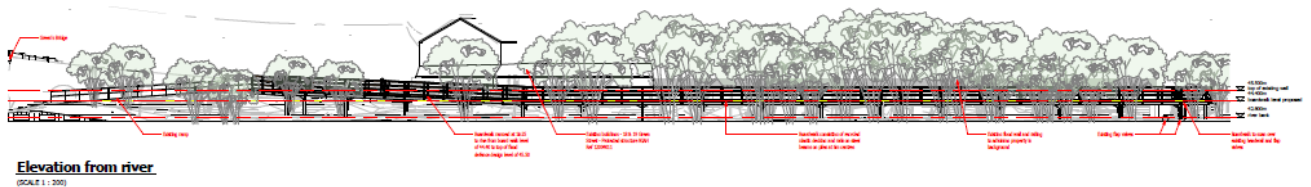


Figure 4 elevational view of proposed board walk

5. Conclusion

This report provides the background to the River Nore Linear park & Riverside Gardens Link Project and explains how the proposed link can complete a continuous off-road pedestrian and cycle path from Talbotsinch through the city centre to the Ossory Bridge along the west bank of the River Nore.

It summarises the heritage attributes of the area surrounding the project site, which include archaeology, protected structures and the St. Canice's Architectural Conservation Area and explains the heritage significance.

It describes the proposed works and the underlying design process which involved the investigation of a range of options for the boardwalk element in order to arrive at the most appropriate solution.

The impact of the final design on the heritage significance of the area is assessed and, where appropriate, mitigation measures are recommended.

It is noted that;

- The project will link two public amenity areas and present the opportunity to explain the significance of the abutments of the Great Bridge at close quarters to those using the boardwalk.
- The boardwalk element will formalise a walk which already exists but which can only be undertaken at present in an ad-hoc and unsafe manner.
- The boardwalk is structurally independent of 18/19 Green Street, a protected structure, and its boundary wall to the river bank.
- The design of the boardwalk is appropriate to the riverine context and will enhance the appearance of the river bank.

The assessment concludes that the design of the works has had due regard to the historic character of the area and will make its heritage assets more accessible to the public.

Appropriate mitigation measures are included in the scope of works and overall, the heritage impact is justified and acceptable.

SIGNED

CORMAC O'SULLIVAN,
B.Arch, M.Phil, MRIAI, MIPI, IHBC.
Architect/Planner, Grade 3 Conservation

BLUETT & O'DONOGHUE

SIGNED

PETER BLUETT
DipArch B(Arch)Sc MSc(Fire Eng) C Eng FRIAI MIFireE MIEI
Conservation Arch' RIAI Grade 2
Registered Architect, Conservation Architect (Grade 2), Chartered Fire Engineer

BLUETT & O'DONOGHUE

Appendix J

Correspondence



Your Ref: 21038-069

Our Ref: G Pre00043/2023

(Please quote in all related correspondence)

28 March 2023

Kilgallen & Partners Consulting Engineer
3 Danville Business Park
Kilkenny
R95 VH33

Via email: rkelly@kilgallen.ie

Re: Proposed River Nore Boardwalk at Green Street, Kilkenny.

A chara

I refer to correspondence received in connection with the above.

Outlined below are heritage-related observations/recommendations of the Department under the stated heading(s).

Archaeology

The Department has reviewed the report titled *Kilkenny County Council River Nore Boardwalk, Green Street, Kilkenny DAU Pre-application Consultation Report* that has been compiled by Kilgallen & Partners Consulting Engineers. Appendix B comprises a report titled *Archaeological Impact Assessment Report on River Nore Pedestrian & Cyle Link Bishopsmeadows and Gardens Kilkenny City, Co. Kilkenny* by Mr Colm Flynn of Colm Flynn Archaeology.

According to the report:

'the proposed development will result in ground disturbance and riverbank disturbance works in the vicinity of a known and legally protected archaeological site identified as a bridge (RMP No KK019-026040). The works will also take place in the environs of the extant Green's Bridge, that is contained in the RPS for Kilkenny (RPS D4) and the NIAH (No 12004007)' (pp5).



It is further asserted in the report that:

‘The proposed River Nore Pedestrian and Cycle Link will not directly impact on any known archaeology. However, the development will result in a slight impact on the archaeological heritage’ (p5).

It is recommended in the report that:

- *‘Pre-construction Written and Photographic Surveys, and 3-D Laser Scan or Photogrammetry Surveys of the stone arch (both elevations) of Greensbridge AH04 where the River Nore Pedestrian and Cycle Link will pass through, should be compiled prior to the commencement of any works.*
- *Construction stage archaeological monitoring of all groundworks including site investigation works, compound set-up, landscaping, installation of mini piles and street furniture’ (pp5-6).*

While the Department does not necessarily disagree with these mitigation recommendations, the Department is of the opinion that these recommendations are pre-emptive at pre-planning consultation stage given the absence of any physical investigations of the known archaeological potential and in advance of the submission of a planning application.

The Department also questions the contradictory assertions in the submitted report that the Proposed River Nore Boardwalk will not directly impact on any known archaeology but that it will result in a slight impact on the archaeological heritage.

The Department notes that the proposed development area is situated within the Zone of Archaeological Protection for the Recorded Monument KK019-026---- Historic Town, as defined in the Urban Archaeology Survey of Kilkenny. Recorded Monuments are subject to statutory protection in the Record of Monuments and Places established under Section 12 of the National Monuments (Amendment) Act 1930-2014. Under Section 12(c) of the National Monuments (Amendment) Act 1994 any person (including a landowner) proposing to carry out, or to cause or to permit the carrying out of, any work at or in relation to a Recorded Monument must give notice in writing to the Minister for Housing, Local Government and Heritage two months before commencing that work. Receipt of planning consultation is regarded as compliance with the Section 12 requirements.



Situated 30m upstream of the present 18th-century Greens Bridge (Kilkenny RPS D4 / NIAH 12004007) are what remains of its 16th-century precursor, listed in the Sites and Monuments Record (SMR) as KK019-026040- Bridge, which was destroyed in the 'Great Flood' of 1763. The first record of a bridge crossing at this location occurs c.1200 and it is referred to as the 'big bridge of Kilkenny' c.1223. In 1338 this bridge was destroyed and its replacement was removed in c.1443. The bridge that prefaced the present Greens Bridge was built by Bishop Oliver Cantwell before 1526, and it is recorded as being in a 'decayed state in 1623. The first allusion to the name 'Grines Bridge', presumably in reference to a personal name, dates to 1623 and it is marked, schematically, on the 1654 Down Survey map. In 1710 the Cantwell bridge was 'out of repair' and it is marked on John Rocque's 1758 map shortly prior to its destruction in 1763. One Gothic arch of the medieval Cantwell bridge spans the medieval millrace (RMP No. KK019-026077-) on the east bank of the River Nore.

An archaeological excavation of part of the remainder of the collapsed bridge, within the River Nore, was carried out as part of the Kilkenny Flood Relief scheme. Five surviving sections, including two piers, two sections of collapsed masonry and a bridge abutment, were revealed in excavations (**Error! Reference source not found.**; Licence No. 01E0326; Paul Stevens). An underwater survey of the bridge remains has also been previously undertaken, identifying further sections of masonry and related artefacts. Section 3 of the National Monuments (Amendment) Act 1987 is the primary piece of legislation for the protection of wrecks over 100 years old and archaeological objects underwater irrespective of age. Additional remains of the bridge, and the historically documented Green's Gate, a gatehouse on the west side of the bridge, and previously unrecorded archaeological deposits, features and structures are likely to survive within the proposed development area.

In light of the above, and given the potential of the Proposed River Nore Boardwalk to impact archaeological features both on the river bank and within the river, it is the recommendation of the Department that an Archaeological Impact Assessment (AIA), to include Archaeological Testing, and an Underwater Archaeological Impact Assessment (UAIA), as described below, should be carried out in advance of the submission of a planning application. Furthermore, Archaeological Monitoring, licensed by this Department should be carried out at all Site Investigation works for the Proposed River Nore Boardwalk. The Department is happy to provide further advice and clarification as and if required in relation to the preparation of suitably comprehensive assessments as outlined below, with particular regard to the scope and locations for any advance test excavation that would be appropriate to inform the assessment of this proposed scheme.



Notwithstanding the above, the Department awaits the submission of this assessment before commenting further.

Archaeological Recommendation:

The developer shall engage suitably qualified archaeologists to carry out an Archaeological Impact Assessment (AIA) and Underwater Archaeological Impact Assessment (UAIA) which shall include the following:

1. A desktop assessment that addresses the archaeological, including underwater, and built heritage of the proposed development area. The assessment shall include a full inventory and mapping of the sites of all identified archaeological/cultural heritage features and structures (including those identified underwater) and shall also include maps/drawings that clearly indicate any proposed impacts on these assets/areas of archaeological potential arising from the proposed project. Written and photographic Surveys, and 3-D Laser Scan / Photogrammetry Surveys of the stone arch (both elevations) of Greensbridge AH04 where the River Nore Pedestrian and Cycle Link will pass through shall also be included.
2. The AIA shall include:
 - a. Archaeological testing (licensed as required under the National Monuments Acts). The purpose of the testing will be to establish suitable areas of zero to minimum potential archaeological impact for the proposed steel beams supported by 200mm diameter concrete mini piles/pillars and all other groundworks.
 - b. The archaeologist shall prepare a comprehensive report, including an archaeological impact statement and mitigation strategy, to be submitted for the written agreement of the planning authority in advance of any site preparation works, groundworks and/or construction works.
 - c. Where archaeological remains are shown to be present, preservation in-situ, establishment of 'buffer zones', preservation by record (archaeological excavation), the re-design of the proposed piling layout or archaeological monitoring may be required and mitigatory measures to ensure the preservation and/or recording of archaeological remains shall be included in the AIA. Any further archaeological mitigation requirements specified by the planning



authority, following consultation with this Department, shall be complied with by the developer.

- d. The planning authority and this Department shall be furnished with a final archaeological report describing the results of any subsequent archaeological investigative works and/or monitoring following the completion of all archaeological work on site and the completion of any necessary post-excavation work. All resulting and associated archaeological costs shall be borne by the developer.
3. The UAIA shall include:
- a. A licensed dive assessment centered on (but not confined to) the area(s) where in-water works are proposed, accompanied by a hand-held metal detection survey, undertaken by a suitably licensed and experienced underwater archaeologist with metal detection experience. All archaeological remains, including masonry belonging to the former bridge structure, shall be surveyed in detail (details to be set out in a method statement). A Dive Survey Licence (Section 3 1987 National Monuments Act) and Detection Device consent (Section 2 1987 National Monuments Act) will be required for all of these works. All archaeological diving should comply with the Health and Safety Authority's Safety, Health and Welfare at Work (Diving) Regulations 2018/2019. Please allow 3-4 weeks to facilitate the processing of archaeological licences.
 - b. Having completed the work, the archaeologist shall submit a written report to this Department describing the findings of the UAIA, including the results of the dive survey. The report should comment on the degree to which the extent, location and levels of all proposed works, including piling and excavations, and other sub-surface/in-water works required for the development may impact upon any archaeological remains. This report should be illustrated with appropriate plans, sections and photographs. Where archaeological materials are shown to be present, further mitigation measures will be required. These may include recommendations for institution of appropriate buffer zones, engineering and architectural redesigns to allow for preservation in situ, excavation and/or monitoring as deemed appropriate. This Department will advise the proponent with regard to these matters. No construction works shall commence until this Department have had the opportunity to fully evaluate the findings of the UAIA and our recommendations have been received and agreed by the proponent.



4. Archaeological Monitoring

Archaeological monitoring of all Site Investigative works that may impact to the river bed/banks, should be carried out as described below:

- a. The services of a suitably qualified and suitably experienced archaeologist and/or underwater archaeologist shall be engaged to carry out the archaeological monitoring.
- b. The archaeological monitoring shall be licensed by this Department and a detailed method statement that sets out the monitoring strategy is to accompany a licence application.
- c. A Finds Retrieval Strategy shall be included in the methodology and all excavated deposits shall be spread and metal detected (under licence) to recover any archaeological objects that they may contain.
- d. The monitoring archaeologist shall obtain a monitoring licence and/or a dive survey licence in order to facilitate investigation of riverbank and/or underwater archaeological materials should they be uncovered/identified.
- e. Please note vetting of licence applications by the Department takes 3-4 weeks.
- f. A communication strategy is to form part of the monitoring strategy to ensure full communication is in place between the monitoring archaeologist and the plant operator(s) at all times during works. The archaeological personnel undertaking the monitoring will be in a position to monitor directly all elements of the works, to ensure they have unobstructed views of the excavations, and the plant and machinery operators shall be prepared to facilitate the archaeological personnel in the undertaking of their monitoring work.
- g. Should archaeological materials be found during the course of monitoring, the archaeologist shall have work on the affected area of the site stopped pending further archaeological investigation and a decision by the Department regarding appropriate mitigation. The developer shall be prepared to be advised by this Department with regard to any mitigating action (preservation in-situ and/or excavation). The developer shall facilitate the archaeologist in recording any material found.



- h. The planning authority and this Department shall be furnished with a final archaeological report describing the results of the monitoring and any subsequent required archaeological investigative work/excavation required, following the completion of all archaeological work on site and any necessary post-excavation specialist analysis. All resulting and associated archaeological costs shall be borne by the developer.

5. Construction Environment Management Plan

- a. Construction Environment Management Plan should incorporate any significant findings that emerge from the AIA and UAIA processes, including but not limited to, the location of any archaeological or cultural heritage constraints relevant to a proposed development and present appropriate mitigation measures to protect the archaeological or cultural heritage environment.

Reason: To ensure the continued preservation (either in situ or by record) of places, caves, sites, features or other objects of archaeological interest.

You are requested to send any further communications to this Department's Development Applications Unit (DAU) at manager.dau@npws.gov.ie.

Is mise, le meas

Edel Griffin
Development Applications Unit
Administration

Robert Kelly

Subject: FW: RE: Proposed Noreside Riverwalk, Kilkenny City NMS Ref: G Pre00043/2023

Subject: RE: Proposed Noreside Riverwalk, Kilkenny City NMS Ref: G Pre00043/2023

Date: 14/08/2023 15:59

From: "Niall Garahy (Housing)" <Niall.Garahy@housing.gov.ie>

To: "info@colmflynnarchaeology.ie" <info@colmflynnarchaeology.ie>

Copy: C  il  n   'Drisceoil (Housing) <Coilin.ODrisceoil@housing.gov.ie>

Hi Colm,

Apologies for the late reply to your queries below.

C  il  n and I have discussed.

We advised testing to ensure that there would be no impact on potential subsurface archaeological remains.

While we understand that the possible impacts would be minimal, a monitoring strategy would only be suitable if topsoil were stripped in advance of piling and the piling layout could be adjusted to avoid any potential impacts.

Advance testing would allow for a suitable piling layout that avoids any archaeological impact.

We agree that a UAIA is not necessary for this project.

Kind regards,

N  all

N  all Garahy

Archaeologist

Seirbhís na Séadchomharthaí Náisiúnta

National Monuments Service

An Roinn Tithíochta, Rialtais Áitiúil agus Oidhreacht

Department of Housing, Local Government and Heritage

Teach an Chustaim, Baile Átha Cliath 1, D01 W6X0

Custom House, Dublin 1, D01 W6X0

Landline +353 1 539 3372

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From: Cólín Ó'Drisceoil (Housing) <Coilin.ODrisceoil@housing.gov.ie>

Sent: Friday 28 April 2023 11:36

To: Niall Garahy (Housing) <Niall.Garahy@housing.gov.ie>

Subject: FW: Proposed Noreside Riverwalk, Kilkenny City NMS Ref: G Pre00043/2023

Níall

See below from Colm Flynn re Greens Bridge.

C

From: info@colmflynnarchaeology.ie <info@colmflynnarchaeology.ie>

Sent: Friday 28 April 2023 11:30

To: Cólín Ó'Drisceoil (Housing) <Coilin.ODrisceoil@housing.gov.ie>

Subject: Proposed Noreside Riverwalk, Kilkenny City NMS Ref: G Pre00043/2023

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Dear C il n,

Many thanks for the recent pre-planning correspondence from the NMS regarding the proposed Noreside Riverwalk, Kilkenny City (NMS Ref: G Pre00043/2023). I understand that you, on behalf of the NMS, have reviewed the project, with regard to possible impacts on underwater / riverbank archaeological heritage. Having reviewed the correspondence from the NMS regarding the project, Kilkenny County Council have raised some queries that I hope you can help with. The correspondence from the NMS requests that advanced archaeological mitigation measures be undertaken as part of a revised Archaeological Impact Assessment report as follows:

'The AIA shall include:

a. Archaeological testing (licensed as required under the National Monuments Acts). The purpose of the testing will be to establish suitable areas of zero to minimum potential archaeological impact for the proposed steel beams supported by 200mm diameter concrete mini piles/pillars and all other groundworks. '

The proposed mini piles / pillars will be driven from a tracked piling rig. The proposed test trenching will likely be more invasive in terms of the impact than that of the driven piles, due to the machine excavation of trenches. To minimise the potential impacts (albeit very localised) of the works on the receiving ground, would monitoring of piling not be more appropriate than test trenching?

The correspondence from the NMS (NMS Ref: G Pre00043/2023) requests that an underwater archaeological impact assessment should be carried out as follows:

'A licensed dive assessment centered on (but not confined to) the area(s) where in-water works are proposed, accompanied by a hand-held metal detection survey, undertaken by a suitably licensed and experienced underwater archaeologist with metal detection experience. All archaeological remains, including masonry belonging to the former bridge structure, shall be surveyed in detail (details to be set out in a method statement). A Dive Survey Licence (Section 3 1987 National Monuments Act) and Detection Device consent (Section 2 1987 National Monuments Act) will be required for all of these works. All archaeological diving should comply with the Health and Safety Authority's Safety, Health and Welfare at Work (Diving) Regulations 2018/2019. Please allow 3-4 weeks to facilitate the processing of archaeological licences.

b. Having completed the work, the archaeologist shall submit a written report to this Department describing the findings of the UAIA, including the results of the dive survey. The report should comment on the degree to which the extent, location and levels of all proposed works, including piling and excavations, and other sub-surface/in-water works required for the development may impact upon any archaeological remains. This report should be illustrated with appropriate plans, sections and photographs. Where archaeological materials are shown to be present, further mitigation measures will be required. These may include recommendations for institution of appropriate buffer zones, engineering and architectural redesigns to allow for preservation in situ, excavation and/or monitoring as deemed appropriate. This Department will advise the proponent with regard to these matters. No construction works shall commence until this Department have had the opportunity to fully evaluate the findings of the UAIA and our recommendations have been received and agreed by the proponent.'

Whilst the project will see works take place along the riverbank, there are no in river works. However, the terms of the UAIA appear to consider that there are in-river works. Can you advise as to why the UAIA is necessary as outlined above as no in-river works are planned?

I would very much appreciate your comments regarding the above points. Please feel free to contact me on 0868701578 to discuss this.

Kind regards,

Colm

--

www.colmflynnarchaeology.ie

--

www.colmflynnarchaeology.ie

RE: Proposed Noreside Riverwalk, Kil...



From Niall Garahy (Housing) <Niall.Garahy@housing.gov.ie>
To info@colmflynnarchaeology.ie <info@colmflynnarchaeology.ie>
Copy C il n  'Drisceoil (Housing) <Coilin.ODrisceoil@housing.gov.ie>
Date 31/08/2023 17:12

Hi Colm,

Thanks for sending on the proposed test trenches. C il n and I have reviewed and we agree with your approach.

I would also agree with NPWS not to remove topsoil from the stone flood alleviation embankment.

FYI – I will be on leave from mid-Sep to early Oct – just in case you are waiting on responses for licence applications.

Kind regards,

N all

From: info@colmflynnarchaeology.ie

info@colmflynnarchaeology.ie



Your Ref: 21038-069

Our Ref: G Pre00043/2023

(Please quote in all related correspondence)

15 May 2023

Kilgallon & Partners Consulting Engineer
3 Danville Business Park
Kilkenny
R95 VH33

Via email: rkelly@kilgallen.ie

Re: Proposed River Nore Boardwalk at Green Street, Kilkenny.

A chara

Further to the observations that were issued to you on 28/03/2023 please find attached further observations of the Department in relation to Nature Conservation.

All proposed methodologies should be screened for potential to impact on the Special Area of Conservation/Special Protected Area and appropriate mitigation should be adhered to.

All mitigation should be added as conditions to any planning permissions which follow.

Vegetation removal should be kept to a minimum and should be carried out between the months of September through March.

You are requested to send any further communications to this Department's Development Applications Unit (DAU) at manager.dau@npws.gov.ie.

Is mise, le meas

Edel Griffin



Development Applications Unit
Administration

Robert Kelly

From: Cormac Goulding <Cormac.Goulding@fisheriesireland.ie>
Sent: Friday 22 September 2023 16:35
To: Niall O'Callaghan
Cc: Alan Cullagh; Robert Kelly; Pete Cowman
Subject: RE: 21038 Nore Boardwalk - IFI observations

Hi Niall,

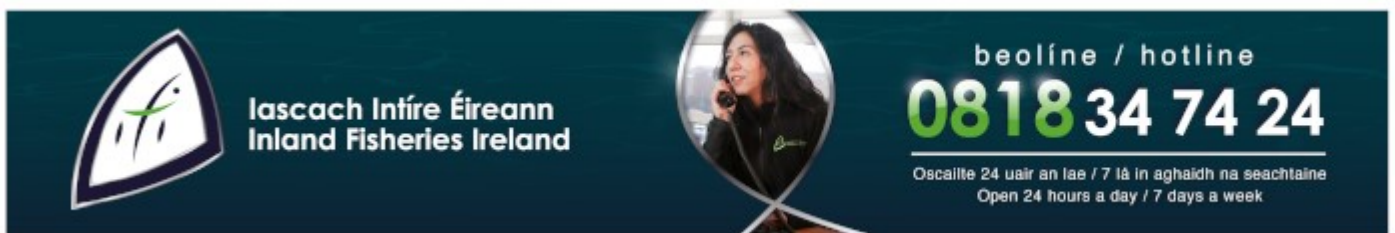
I am generally happy with the points below. Regarding the decking I think we agreed that no material from the works would be allowed to enter the water. Also, that a net or some other suitable barrier would be placed below the works area to prevent any cuttings or shavings from the recycled plastic entering the river. As long as these conditions are observed then I cannot see a problem with the construction of the prefabricated decking proceeding outside of the close season.

Regards,

Cormac

Cormac Goulding
Fisheries Environmental Officer

✉ Cormac.Goulding@fisheriesireland.ie • ☎ +353 (0)52 6180 055 • 🌐 www.fisheriesireland.ie • 🏠 E91 RD25



Help us protect Ireland's rivers, lakes and coastlines by reporting illegal fishing, water pollution or invasive species. Our confidential phone number is 0818 34 74 24, which is open 24 hours a day / 7 days a week.

To read our Privacy Policy and Email Disclaimer Notice, Please visit www.fisheriesireland.ie

From: Niall O'Callaghan <nocallaghan@kilgallen.ie>
Sent: Thursday, September 21, 2023 5:48 PM
To: Cormac Goulding <Cormac.Goulding@fisheriesireland.ie>
Cc: Alan Cullagh <Alan.Cullagh@fisheriesireland.ie>; Robert Kelly <rkelly@kilgallen.ie>; Pete Cowman <pcowman@kilgallen.ie>
Subject: 21038 Nore Boardwalk - IFI observations

Hi Cormac,

I am following up on our call a couple of weeks ago in relation to the Nore Boardwalk project. I have highlighted our response to your observations in blue text below and as discussed on the phone. We have only one response item for consideration and that is in relation to point 2 (bankside works) If you have any further comments please feel free to call or email.

We are planning to submit the planning application next week.

Regards,

Niall O' Callaghan

Kilgallen & Partners Consulting Engineers

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From: Alan Cullagh <Alan.Cullagh@fisheriesireland.ie>
Sent: Thursday 12 May 2022 15:55
To: Niall O'Callaghan <nocallaghan@kilgallen.ie>
Subject: FW: 21038 Nore Boardwalk Feasibility - Proposal

Dear Niall,

Please see below bullet points on observations for your proposal on the Nore Boardwalk.

Thanks,
Alan

From: Cormac Goulding <Cormac.Goulding@fisheriesireland.ie>
Sent: Thursday 28 April 2022 16:56
To: Alan Cullagh <Alan.Cullagh@fisheriesireland.ie>
Cc: Declan Cullagh <Declan.Cullagh@fisheriesireland.ie>
Subject: RE: 21038 Nore Boardwalk Feasibility - Proposal

Hi Alan,

Just a few standard observations / requirements

- Works, especially piling, to be done in the dry - **Agreed**
- Bankside works should only take place during the close season 1 July to 30 September. **All works in the bank i.e. piling will be completed in the close season. The assembly of the prefabricated boardwalk deck boards will be approx. 1m above the existing bank level and will need to carry on past the end of the close season as there is approx. 2 to 3 months work in the assembly of the boardwalk deck elements. None of this work will penetrate the bank. Is this acceptable to IFI?**
- Method statement to be provided before works commence outlining mitigation measures to prevent pollution occurring – **agreed, we will forward the method statement.**
- Requirement for silt fencing alongside works area - **agreed**
- Storage of materials, fuels etc to be done away from the watercourse with minimum setback distances to be specified - **agreed**
- More detail required by IFI on proposed temporary platform for works on river bed adjacent to works – **There is no requirement for a temporary platform or any other works in the river bed.**

Regards,

Cormac

From: Alan Cullagh <Alan.Cullagh@fisheriesireland.ie>
Sent: Monday 11 April 2022 16:01
To: Cormac Goulding <Cormac.Goulding@fisheriesireland.ie>
Cc: Declan Cullagh <Declan.Cullagh@fisheriesireland.ie>
Subject: Fw: 21038 Nore Boardwalk Feasibility - Proposal

Hi lads,

Can ye have a look at this at your convivence?

Thanks,

Alan

From: Niall O'Callaghan <nocallaghan@kilgallen.ie>
Sent: 23 March 2022 17:43
To: Alan Cullagh
Cc: Pete Cowman
Subject: 21038 Nore Boardwalk Feasibility - Proposal

*****CYBER SECURITY WARNING***:** This email originated from outside of Inland Fisheries Ireland email system and contains an attachment(s). Do not open attachments from unknown sources.

Our Ref. 21038-048

Hi Alan,

Following on from our conversation earlier this week regarding the proposed boardwalk along the Nore, I have set out the proposal in brief below.

On behalf of Kilkenny County Council we are preparing a feasibility study/design options report for a pedestrian/cycle link between Bishops Meadows and the Riverside Gardens along the bank of The River Nore. A previous report was prepared in 2009 (attached for reference). The 2009 project never came to fruition, but the new proposed project will include this element of the works and go a step further, by linking through to the new Riverside Gardens Project at the Abbey Quarter, using a spare arch in the adjoining Greens Bridge.

As part of our work we are reviewing the 2009 report, and developing a preliminary design for an alternative option – a boardwalk supported off mini piles. The mini pile option is preferred as it eliminates the need for the significant excavation works that would be required for many of the options considered in the 2009 report. The structure for the preferred option would consist of pairs of 200mm diameter mini piles 2m apart at 6m centres along the route. The mini piles are steel tubes with sealed ends with concrete inside the tube.

The boardwalk will link to The Riverside Gardens via the existing spare arch in Greens Bridge. No works are required to the arch, or to Greens Bridge in general. There are no proposed in stream works.

I attach the following –

- Site layout plan showing the route and general arrangement of the boardwalk
- Elevations & sections
- indicative 3d views.

We would appreciate if you could review the attached and revert with any comments that you may have.

Regards,

Niall O' Callaghan

Kilgallen & Partners Consulting Engineers

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From: Niall O'Callaghan
Sent: Wednesday 27 September 2023 17:42
To: OPW (noel.fitzpatrick@opw.ie)
Cc: 'Brendan O'Brien'
Subject: Our Ref. 21038-116 Nore Boardwalk - OPW requirements
Attachments: 21038-000 - Cover.pdf; 21038-100-PL1-Site Location Map.pdf; 21038-101-PL1 - Site Layout.pdf; 21038-102-PL1 - Elevations & Sections.pdf; 21038-103-PL1 - 3d Views.pdf

Good afternoon Noel,

Thank you for meeting with myself and Brendan O'Brien from KCC on Monday 18th September and walking the route of the proposed Nore Boardwalk link.

The two main points of discussion on the day are outlined below.

1. Flap Valve Future Maintenance Access

We can confirm that your request regarding future maintenance access to the existing flap valves at the upstream end of the boardwalk will be accommodated in the design.

The section of the boardwalk at the valves will be a removable bolted section (as is the case for the entire boardwalk). This section can be removed to facilitate maintenance access for the OPW as required. There will be no legs in front of the valves allowing unhindered access.

In addition, KCC have confirmed that any removal of the boardwalk which may be required by OPW will be carried out by KCC.

2. Flap Valve Head Wall

We discussed the nominal reduction in height of the headwall (approx. 300 to 400mm) to allow the boardwalk to pass over the headwall without a ramp. It was agreed in principle that this would be possible as the upper part of the headwall is not retaining ground and has no effect on the flap valve function.

Further details relating to the above will be provided for review as design progresses following the planning stage.

The planning submission will be forwarded to KCC for review today with formal submission to An Bord Pleanála planned for the end of this week.

The draft planning drawings have been attached for your record.

Should you wish to discuss any of the above please do not hesitate to contact me.

Regards,

Niall O' Callaghan

Kilgallen & Partners Consulting Engineers

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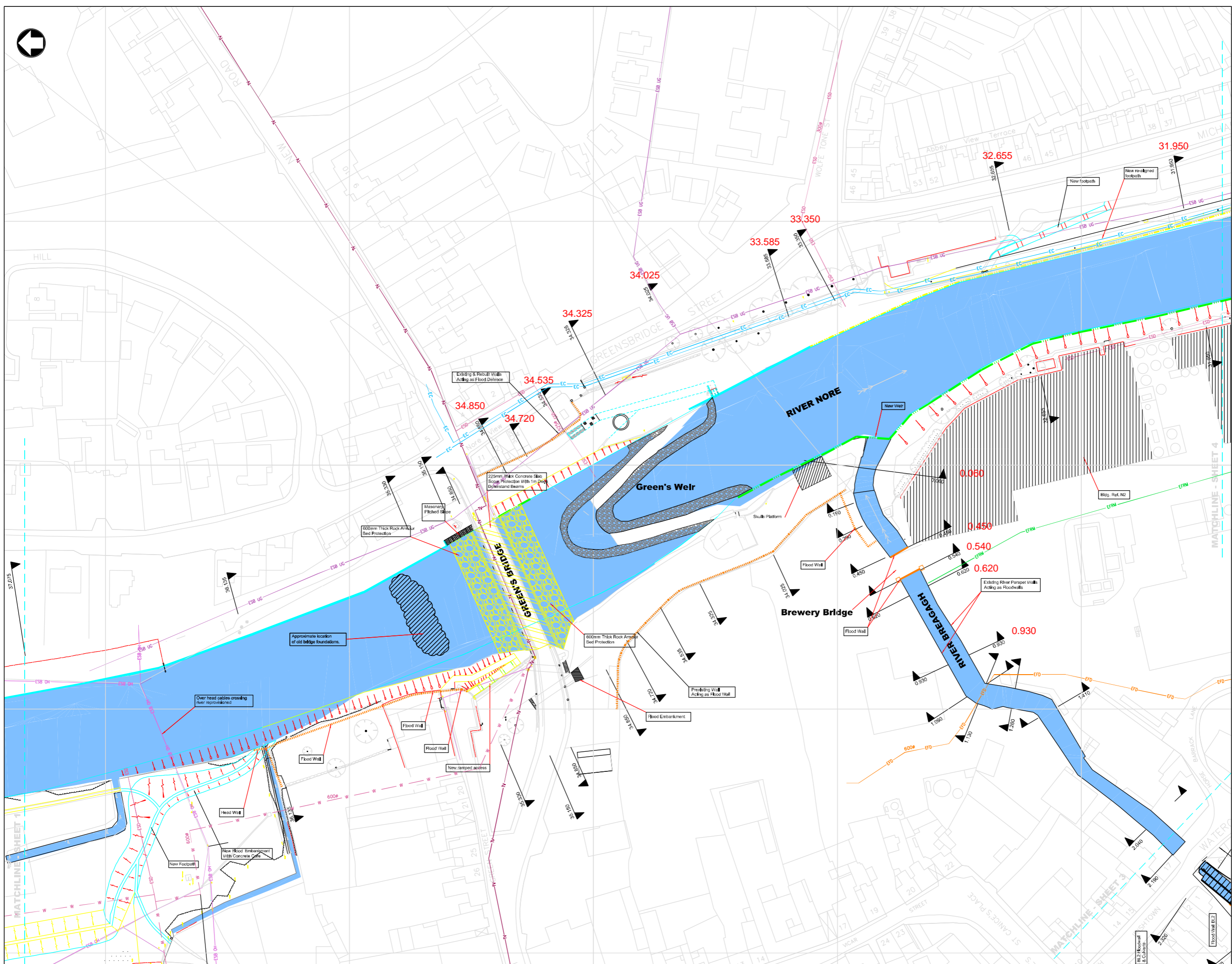
E: nocallaghan@kilgallen.ie

W: www.kilgallen.ie



Appendix K

As-Built Drawings of Kilkenny Flood Alleviation Scheme (2006)

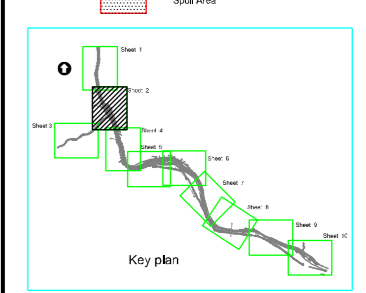


Notes

- For general notes refer to drg. no. 24203/DUB/001
- Position of services and supplies approximate only.

- Key to symbols
- Existing & Retain Walls Acting as Flood Defence
 - Anchored Sheet Piles
 - Cantilevered Sheet Piles
 - Rock Armour
 - Anchored King Post Wall
 - Gabion Walls
 - Secant Piles
 - Existing Storm Drainage
 - ESRM - Existing Storm Rising Main
 - EFD - Existing Foul Drainage
 - EFRM - Existing Foul Rising Main
 - EC - Fibrom Cables
 - W - Watermain
 - TV - Sur - Nore TV Cables
 - ESB Above Ground Power Lines
 - ESB Under Ground Power Lines
 - Setting Out Line

- BH = Borehole
- TP = Trial Pit
- New 1 in 2 Embankment
- +48.0m OD Proposed Level
- +44.36 Existing Level
- Existing Fence
- Section at Chainage 37.075
- Spill Area



AB	Apr '06	CMcA	As Built	R.C.	G.P.
Rev	Date	Drawn	Description	Checked	Approved

abc
 Client: OPW Engineering Services
 Design Section
 Dublin.

Title: RIVER NORE (KILKENNY CITY) DRAINAGE SCHEME
 General Layout Plan
 Sheet 2 of 10

Designed	P.A.	Eng. Chk.	P.A.	
Drawn	A.L.	Coordination		
Drawn Chk.	P.A.	Approved	G.R.	
Scale:	1:500	Project:	24203	Status:
Drawn No:	24203/DUB/003	CAD file:		ASB
				Rev:
				AB

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