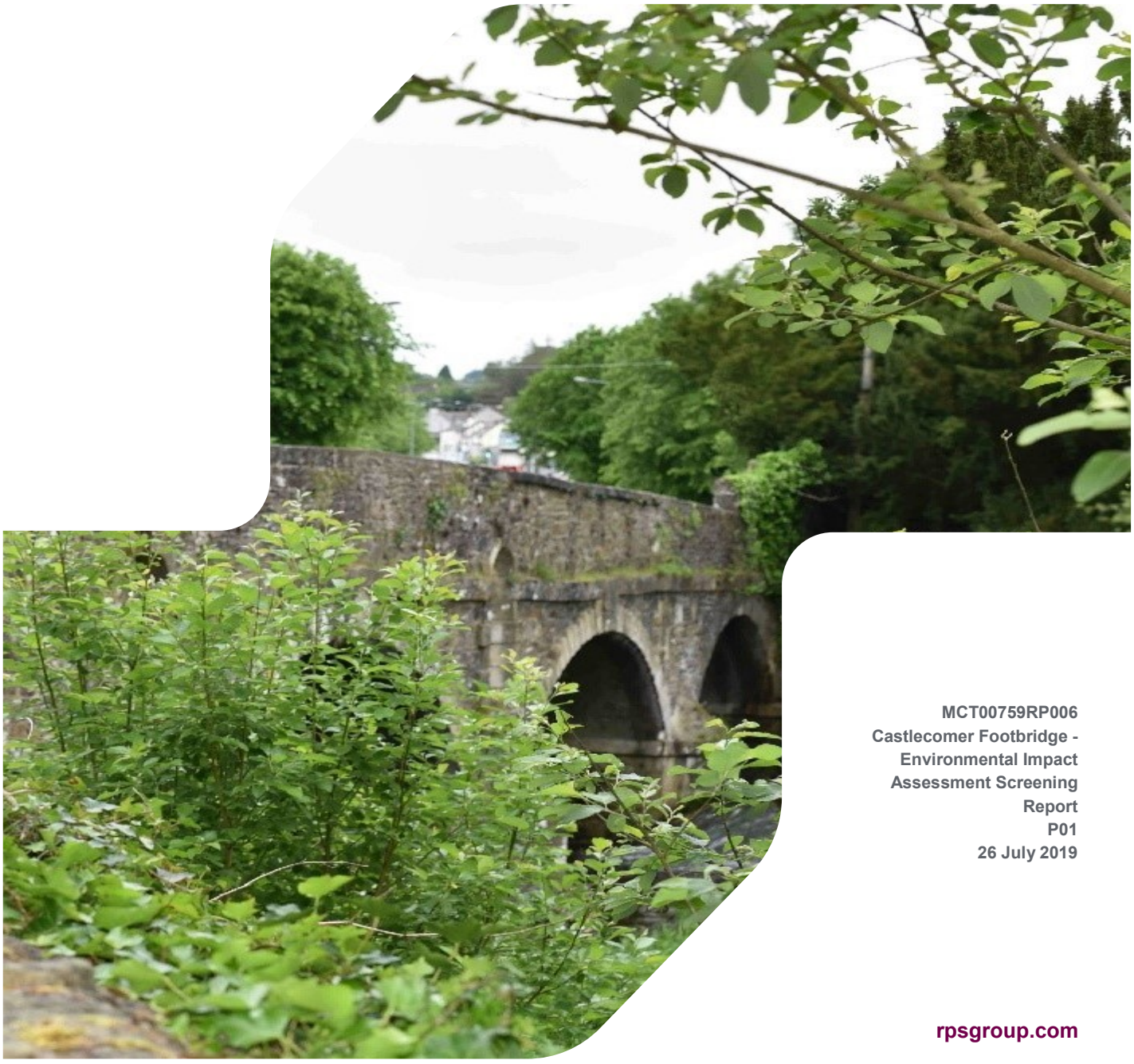
CASTLECOMER FOOTBRIDGE

Environmental Impact Assessment Screening Report



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1 INTRODUCTION

RPS has been commissioned by Transport Infrastructure Ireland (TII) and Kildare County Council acting as lead local authority through a Section 85 Agreement (Local Government Act, 2001) on behalf of Kilkenny County Council (KCC) under Eirspan Task Order 302 to provide technical consultancy services to examine options for an improved pedestrian link across the River Dinin in Castlecomer, Co. Kilkenny.

The scope of services includes the preparation of a Environmental Impact Assessment (EIA) Screening Report to ascertain whether a proposed footbridge requires an EIA and is determined by reference to mandatory and discretionary provisions. The footbridge will be located in the townlands of Ardra, Castlecomer and Drumgoole over the River Dinin immediately north of the existing River Dinin road bridge. The location of the proposed footbridge can be seen in **Figure 1-1**.

The intention of this EIA Screening Report is to detail findings from a desktop analysis (as well additional studies relating to ecological constraints, invasive species and archaeological assessment) of the receiving environment that may be affected by the proposed development and to further document the procedures and outcome of the process undertaken as part of the screening assessment. The report is to establish the likely significant effects of the proposal on the environment and advise if an Environmental Impact Assessment Report (EIAR) would be appropriate for the development proposal.

This EIA Screening Report is set out as follows:

- Section 1 – Introduction;
- Section 2 – Existing situation and proposed development;
- Section 3 – Legislative context of the screening exercise;
- Section 4 – Evaluation of the proposal in respect of relevant guidance in relation to screening for an EIA; and
- Section 5 – Location of the proposed project;
- Section 6 – Type and characteristics of potential environmental impacts; and
- Section 7 – Conclusions

It should be noted that a number of other documents have informed the considerations within this screening. These include:

- Drawing No. MCT0759BR0101, see **Appendix A**;
- Invasive Alien Species Management Plan for Castlecomer Footbridge (INVAS, 2019), see **Appendix B**;
- Outline Construction Environmental Management Plan, see **Appendix C**;
- Proposed Footbridge, Castlecomer, County Kilkenny, Archaeological and Architectural Heritage Assessment (John Cronin & Associates, 2019), see **Appendix D**;
- Landscape and Visual Appraisal (RPS, 2019), see **Appendix E**; and
- Bat Survey, N78 Castlecomer Footbridge, Castlecomer, Kilkenny, Draft Report, prepared for RPS Cork By Greenleaf Ecology, see **Appendix F**.

- Ortho-Rectified Elevations, see **Appendix G**.

In addition, consideration was given to associated cumulative impacts.

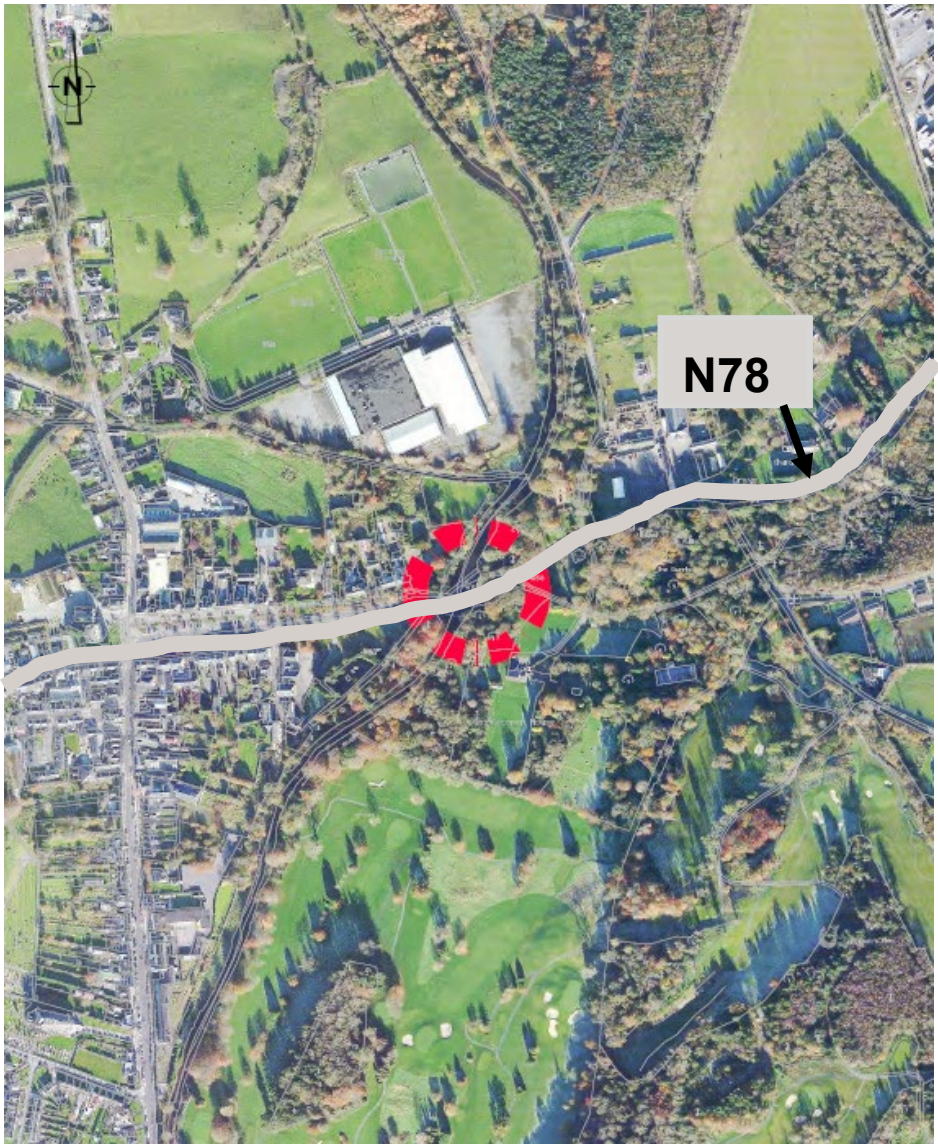
Figure 1-1: Site Location Castlecomer Footbridge

2 EXISTING SITUATION AND PROPOSED DEVELOPMENT

2.1 Site Location

The location of the proposed footbridge is approximately 0.3km east of Castlecomer Town, Co. Kilkenny as depicted in the aerial photograph in **Figure 2-1**. There is an existing River Dinin road bridge which form parts of the of the N78 national road and allows vehicles to cross the River Dinin in an east west direction as seen in **Figure 2-1** also. The lands immediately adjacent to the River Dinin primarily comprise woodland with some recreational riverine amenity area. Beyond the wooded area there are urban and recreational lands on the edge of the town. The wider area is characterised largely by open recreational lands including a golf course, Castlecomer Discovery Park, wooded areas and agricultural lands.

Figure 2-1: Aerial Photograph of Site Location Castlecomer Bridge



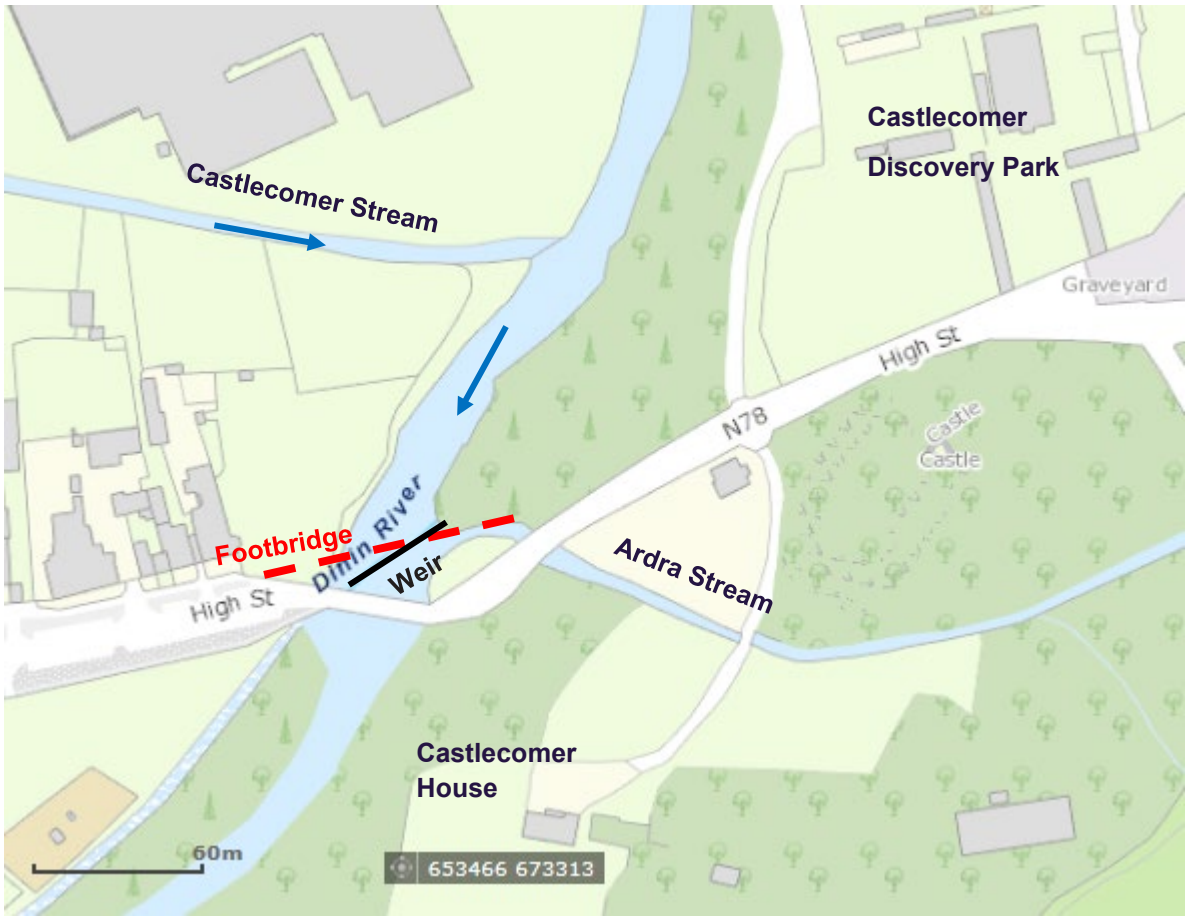
2.2 Existing Infrastructure and the River Dinin

The existing River Dinin road bridge was constructed in 1767. It is a five-arch road bridge approximately 6.7m wide between parapets as seen in **Figure 2-2.** The existing road bridge structure carries the N78 over the River Dinin.

Figure 2-2: Elevation of North Side of Existing N78 Castlecomer Bridge from Castlecomer Discovery Park

The existing River Dinin road bridge intersects two watercourses as seen in **Figure 2-3**. The 'Dinin [North]' River (EPA Code: 15D07) and 'Ardra' Stream (EPA Code: 15A15). The watercourses are all part of the Dinin [North]_SC_010 sub-catchment. To the immediate north east (upstream) of the existing bridge the Ardra stream confluences with the River Dinin and flows under the road bridge. A large weir is situated across the width of the River Dinin from the first abutment on the right hand side facing downstream at a 45º angle to the bridge. Where the proposed footbridge will span the River Dinin the river is a 4th Order river with a wet width of approximately 22m and 20-40cm deep. The substrate at the centre of the channel is dominated by gravels and cobbles while boulder is most common in the margins. The River Dinin flows under the existing bridge in a north south direction. The River Dinin continues to flow in a south westerly direction through Castlecomer Town before flowing into the River Nore. The River Nore then continues through Kilkenny City and eventually enters the Barrow Suir Nore Estuary approximately 90km downstream of Castlecomer Town.

Figure 2-3: Existing Infrastructure



Source: http://webgis.archaeology.ie/historicenvironment/

2.3 Scope and Purpose of the Project

The site of the proposed pedestrian bridge is on the eastern side of Castlecomer Town, Co. Kilkenny running parallel to the existing N78 bridge crossing of the River Dinin, see **Figure 1-1**.

As described in **Section 2.2** the bridge was constructed in the 18th Century and it was never intended to cater for modern vehicular traffic. Consequently, the existing bridge is too narrow to cater for a safe modern road cross section complete with footway.

There is only one footpath on the existing bridge which is sub-standard and varies 650-900mm in width. It is hazardous for both road users and pedestrians particularly on the east end of the bridge where the turning movements of HGV's encroach onto the footway due to the tight bend in the road. In order to improve safety at the location, KCC and TII intend to remove pedestrians from the existing bridge and provide a new dedicated facility for pedestrians to cross the River Dinin.

The need for improved pedestrian links over the River Dinin has been previously identified in the Castlecomer Local Area Plan (LAP) 2009-2018 and more recently has been identified as a key objective in the Castlecomer 2018-2024 LAP.

2.4 Description of Works

A Castlecomer Footbridge Options Report was prepared by RPS Design Team in conjunction with the project steering committee to assess a number of potential options for the footbridge. A copy of the report is available under a separate cover and will be submitted with the planning application.

The Options Report concluded that, a two-span steel footbridge independent of the existing bridge was the preferred option and it is the subject of this screening report. Details of the proposed bridge are provided in **Appendix A** and **Figure 2-4.** The proposed footbridge will be approximately 44m in length and will be located north of the existing River Dinin Bridge. In order to facilitate the footbridge, abutments will be constructed on either bank (west and east) of the existing river with one pier to be constructed within the river bed to provide structural support.

The bridge lighting has been designed to illuminate the deck of the pedestrian bridge and to softly light the niches/spandrel of the adjacent road bridge to avoid illuminating important foraging and commuting areas for bats, i.e. the river and river banks. The lighting design has taken into consideration the *Bat Conservation Trust & Institute of Lighting Professional Guidelines* (2018).

The works will include site investigation, vegetation removal (including Japanese knotweed), excavation, piling, river diversion, pouring of concrete, input of fill for embankments and erection of the bridge superstructure. A road closure for a period of up to 48 hours may be required and an appropriate Traffic Management Plan (TMP) will be prepared. Further details are provided in **Section 2.5**.

Figure 2-4: Two Span Steel Footbridge Elevation (North)

2.5 Proposed Sequence of Works and Methodology

In order to complete the detailed design of the scheme, site investigation works need to be completed in advance of the construction works as a separate work activity and are detailed hereafter:

2.5.1 Site Investigation Works

In order to access the river and complete the exploratory works in a safe manner, bunding shall be provided to form a low wall along the eastern river bank to protect the toe of the embankment and prevent material entering the watercourse.

The bunding shall be typically 1m by 1m in dimensions and will be sufficient for the predicted flow in the river, it shall extend from the eastern river bank (at the confluence of the adjoining tributary) to the first pier of the existing bridge. This will continue on the southern side of the bridge back to the eastern bank to ensure water cannot travel upstream into the area of works.

A temporary access structure will span across a small tributary between Castlecomer Discovery Park and the existing eastern bank of the bridge as a pipe or series of pipes subject to flow. It is envisaging that the watercourse will be flumed through the pipe(s) which will be backfilled to allow access over the tributary to the bunded area.

The proposed bunding and fluming of the watercourse shall be agreed in consultation with IFI in advance of the commencement of works.

It is envisaged that during the course of any bunding works electrofishing may be required. This shall be conducted by a competent expert in accordance with an agreed methodology with IFI.

The geotechnical borehole rig will mobilise to site and undertake the exploratory holes.

The borehole rig will de-mobilise from site and the temporary access and bunding will be subsequently removed.

2.5.2 Site Preparation of Main Works

Site clearance will be undertaken on the western and eastern banks in preparation for construction of foundations and bunding of riverbanks, including removal of existing vegetation under the footprint of the proposed embankments.

Prior to commencement of works, the compound will be set up and traffic management measures will be put in place.

Vegetation removal will also take place and will include the removal of trees along both the right and left banks. During the site preparation phase Japanese knotweed located on the left bank upstream of the existing bridge and at the base of the existing bridge (left bank) will also need to be managed. Japanese knotweed will be managed in accordance with the Invasive Alien Species Management Plan (IASMP) included in **Appendix B**.

It is envisaged that the compound will be located in the Castlecomer Discovery Park on the eastern side of the river (see **Figure 2-5**), the compound will be set back a minimum of 10m from the river. All plant and equipment will be maintained, refuelled and stored at the compound location. Oil will also be stored in appropriately contained bunded facilities.

Figure 2-5: Proposed Compound Location

2.5.2.1 River Diversion

In order to complete the works the watercourse will need to be locally diverted with bunding to allow for safe construction of the works.

The bunding shall be typically 1m by 1m in dimensions and will be sufficient for the predicted flow in the river, it shall extend from the eastern river bank (at the confluence of the adjoining tributary) to the first pier of the existing bridge. This will continue on the southern side of the bridge back to the eastern bank to ensure water cannot travel upstream into the area of works.

A temporary access structure will span across a small tributary between Castlecomer Discovery Park and the existing eastern bank of the bridge as a pipe or series of pipes subject to flow. It is envisaging that the watercourse will be flumed through the pipe(s) which will be backfilled to allow access over the tributary to the bunded area and eastern abutment.

The proposed bunding and fluming of the watercourse shall be agreed in consultation with IFI in advance of the commencement of works. It is envisaged that during the course of any bunding works electrofishing may be required. This shall be conducted by a competent expert in accordance with an agreed methodology with IFI.

2.5.3 Construction Works

- Excavation for the new footbridge piles, foundations and retaining walls shall be undertaken on the eastern and western banks.

- Excavators and piling rigs will be used during the works on these banks and caution must be taken with regard to utilities (buried Eir services, buried watermain, overhead electrical lines feeding the lighting columns east and west of the existing bridge in the vicinity of the bridge).

- The new pier (and associated piles) shall be shuttered, reinforcement placed and the concrete poured.
- The shutters on the pier shall then be struck (cast in-situ).
- Once all concrete works have been completed, waterproofing shall be applied to all buried surfaces before backfilling with 6N structural fill.
- Willow spilling and rock armour will be used for grading and river bank reinstatement.
- The existing river bed will generally be left in-situ, any river substrate material removed will be stockpiled and replaced as required within the river bed in line with IFI standards.
- A masonry wall will be constructed on either side of both embankments (on left and right bank).
- The new embankments shall be constructed by grading, levelling and compacting 6N structural fill before top soiling and grass seeding.
- Safety fencing, safety barriers and new raised concrete verges shall be completed in conjunction with top soiling and grass seeding of the verges.
- Temporary scaffolding shall be erected as required to facilitate access and the bridge sections shall be lifted into place using a mobile crane.
- For site security and safety purposes, temporary lighting will be used.

2.5.4 Completion of Works

- Once works are completed and the areas surrounded by the bunding are no longer required during construction, the watercourse diversion shall be removed.
- Damming measures will be removed in reverse order to the way they were put in.
- Traffic management measures shall then be removed and the pedestrian bridge shall be opened.
- The site compound shall be removed.
- The lands within the site boundaries shall be reinstated through top soiling and grass seeding as required.
- Materials arising from excavation/demolition to be segregated on site/be stored temporarily/ removed from site and disposed in an approved licenced facility.
- The area shall be snagged, tidied up and handed over to KCC.
- The western abutment will be approximately 75m^2 in size while the approaching footpath will be 44m^2.

Materials to be Used on Site will include:

- Reinforcement Steel
- Structural Steel (coatings to be applied offsite)
- Concrete
- Bridge Bearings

- Stone & Mortar
- Timber
- Light fittings and ancillary products required to install pedestrian/public lighting

Areas to be Removed/Changed will comprise:

- The pier will result in the permanent removal of 1m^2 of instream habitat;
- There will be removal/disturbance to a 3m wide riparian habitat along the eastern length of the works, with reinstatement where possible; and
- There will be the removal/disturbance of river bed from the bunding measure in the immediate area of the proposed works.

2.5.5 Programme and Phasing of Works

The following is an overview of the timing on the works however is subject to receipt of planning and statutory consents:

- Construction works are envisaged to last for a period of 6 months from mobilisation to completion commencing in Q2 2020.
- In-stream works to be completed during IFI approved seasonal window July - September.

This programme is indicative only at this time. The exact order and programme of works can only be determined by the Contractor following appointment. It will however be an objective and a requirement of the Contractor to minimise disruption to traffic, businesses and properties within the town.

2.5.6 Management and Organisation of Works

The proposed site compound for the works is anticipated to be located the Castlecomer Discovery Park on the eastern side of the river as set out in **Figure 2-5**. The size and precise location are subject to landowner agreement.

Materials and plant required for the works are anticipated to be stored in this compound at a minimum setback distance of 10m from the river bank. All storage areas shall be appropriately bunded where required. Fuelling of plant is anticipated to be in a designated fuelling area within the compound. The compound will provide for the following:

- Welfare/office facilities for site staff;
- Plant/machinery parking/storage area;
- Fuel storage/refuelling area;
- Segregated waste area; and
- Construction staff parking.

2.5.7 Working Hours

Normal construction working hours for the development will be:

- Monday to Friday: 08.00 - 18.00
- Saturday: 09.00 - 13.00

Most of the works can be undertaken while the road is in operation. However, some items - such as the installation of the sections of bridge with crane shall be undertaken during the 48 hour road closure.

2.5.8 Best Practice Construction Methods during Construction

An outline Construction Environmental Management Plan (CEMP) has been prepared for the proposed development which includes best practice design and construction methodology and is included in **Appendix C**.

The provisions of this outline CEMP have been considered as appropriate for this screening report. This outline CEMP will be updated by the Contractor following the receipt of planning approval or other relevant consents if necessary, to incorporate any additional or revised construction approaches required by condition.

The detailed CEMP shall be supported by the Contractor's Method Statements demonstrating how works are to be executed in accordance with the environmental management requirements set out within same.

Upon appointment, the Contractor will take ownership of the CEMP and will be responsible for the update of same. In addition, the detailed CEMP will be supported by the Contractor's detailed sub-plans, including a Surface Water Management Plan (SWMP), detailed Waste Management Plan (WMP) and detailed Construction Traffic Management Plan (CTMP).

3 LEGISLATION AND SCREENING FOR MANDATORY EIAR

3.1 European Legislation

EIA requirements derive from EU Directive 85/337/EEC (as amended by Directives 97/11/EC 2003/35/EC and 2009/31/EC and codified under 2011/92/EU) and further amended under 2014/52/EU. These Directives relate to the assessment of the effects of certain public and private projects on the environment. The primary objective of the EIA Directive is to ensure that projects which are likely to have 'significant effects' on the environment are subject to an assessment of their likely impacts.

The EIA Directives have been transposed into Irish law by reason of a number of statutory provisions. Key enacting legislation is provided in the Planning and Development Act, 2000 as amended and the Planning and Development Regulations 2001 - 2018.

This screening assessment has regard to the up to date requirements of the Directive, the Planning and Development Acts 2000 - 2018 and the Planning and Development Regulations 2000 - 2018.

3.2 EIA Screening Process and Guidelines

Screening is the first stage in the EIA process, whereby a decision is made on whether or not EIA is required. This screening assessment was undertaken with regard to the following legislation and guidance:

- EIA Directives;
- The Planning and Development Acts (2000-2018);
- The Planning and Development Regulations (2001-2018);
- *Environmental Impact Assessment of Projects Guidance on Screening*, European Commission (2017);
- *Environmental Impact Assessment (EIA), Guidance for Consent Authorities regarding Sub-threshold Development* (DoECLG, 2003);
- *Guidelines for Planning Authorities and An Bord Pleanála on Carrying out Environmental Impact Assessment* (Department of Housing, Planning and Local Government, 2018);
- *Guidelines on the Information to be contained in Environmental Impact Statements* (EPA, 2002);
- *Advice Notes on Current Practice in the preparation of Environmental Impact Statements* (EPA, 2003);
- *Revised Guidelines on the Information to be contained in Environmental Impact Statements,* Draft September 2017 (EPA, 2017); and
- *Advice Notes for Preparing Environmental Impact Statements* Draft September 2015 (EPA, 2015).

In August 2018, the Department of Housing Planning and Local Government published *Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment.* The Guidelines note *that screening is the initial stage in the EIA process and determines whether or not developments are likely to have significant effects on the environment and, as such, require EIA to be carried out.*

The Guidelines also note that the EIA screening exercise initially assesses the development for mandatory EIA using classifications of development specified in the relevant legislation. Where no mandatory requirement is identified, but where the development is of a class of development specified but of a lower threshold, screening advances to evaluate whether the sub-threshold development project would be likely to have a significant effect on the environment, with reference to its scale, nature, location and context.

The relevant legislative provisions are set out and considered below.

3.2.1 Requirement for EIA

The Planning and Development Act (Section 172(1)) states that EIA must be carried out in the case of either of the following two scenarios:

"(a) the proposed development would be of a class specified in -

(i) Part 1 of Schedule 5 of the Planning and Development Regulations 2001, and either –

(I) Such development would equal or exceed, as the case may be, any relevant quantity, area or other limit specified in that Part, or

(II) No quantity, area or other limit is specified in that Part in respect of the development concerned,

or

(ii) Part 2 of Schedule 5 of the Planning and Development Regulations 2001 and either –

(I) Such development would equal or exceed, as the case may be, any relevant quantity, area or other limit specified in that Part, or

(II) No quantity, area or other limit is specified in that Part in respect of the development concerned.

or

(b) (i) the proposed development would be of a class specified in Part 2 of Schedule 5 of the Planning and Development Regulations 2001 but does not equal or exceed, as the case may be, the relevant quantity, area or other limit specified in that Part, and

(ii) the planning authority or the Board, as the case may be, determines that the proposed development would be likely to have significant effects on the environment."

In the case of development falling within the provisions of sub-section 172(1)(a), EIA must be undertaken by the Planning Authority and/or An Bord Pleanála as appropriate. In support of this requirement, an EIAR must be submitted by an applicant with an application for consent for same. In the case of sub-section 172(1)(b), the Planning Authority, or An Bord Pleanála as appropriate, is required to undertake EIA for sub-threshold development which would likely have significant effects on the environment. In support of this requirement, the Planning Authority and/or An Bord Pleanála may require the submission of information for the purposes of a screening determination or of an EIAR by an applicant under Article 103 of the Regulations, where it considers that the development would be likely to have significant effects on the environment.

The various elements of the proposed development have been considered to determine if they fall within a class of development specified in Schedule 5 and for which a mandatory or a discretionary EIA may be required. The works as noted above comprises of a 44m length footbridge (see Drawings in **Appendix A**).

The development is not deemed to fall within any class of development specified under either Part 1 or Part 2 of Schedule 5 of the Planning and Development Regulations 2001. Therefore, neither mandatory nor discretionary EIA are necessary or potentially required for any of these elements of the development.

The development does not require a mandatory EIAR but could be considered to be a sub-threshold class of development under Schedule 5 Part 2.

As noted above, under Article 103 of the Regulations the Planning Authority and/or An Bord Pleanála may require the submission of information for the purposes of a screening determination or of an EIAR.

Article 103(1) provides that:

> *"(a) Where a planning application for sub-threshold development is not accompanied by an EIAR, the planning authority shall carry out a preliminary examination of, at the least, the nature, size or location of the development.*
>
> *(b) Where the planning authority concludes, based on such preliminary examination, that-*
>
> *(i) there is no real likelihood of significant effect 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, by notice in writing served on the applicant, require the applicant to submit to the authority the information specified in Schedule 7A for the purposes of a screening determination unless the applicant has already provided such information, 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) By notice in writing served on the applicant, require the applicant to submit to the authority an EIAR and to comply with the requirements of article 105."*

This current EIA screening report now comprises of the information required under Schedule 7A of the Planning and Development Regulations and will allow the Planning Authority to undertake its own screening determination.

Article 103(1A) further adds as follows:

> *"(a) Where an applicant is submitting to the planning authority 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 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 an applicant is submitting to the planning authority 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 effect on the environment of the development."*

This current screening report includes any additional information which has been identified by RPS as potentially relevant for the purposes of EIA Screening. As appropriate it references assessments undertaken under the Habitats Directive (92/43/EEC). It also identifies mitigation measures which will be applied to the proposed development which will reduce or eliminate potentially negative impacts. Mitigation measures are specified for a range of potentially adverse impacts, not only those which would otherwise have been 'significant' adverse.

To determine whether an EIAR is warranted then in respect of the sub-threshold development it is necessary to consider whether it is likely to have a significant effect on the environment. The Regulations make provisions for such consideration by a planning authority/competent authority.

When considering the need for an applicant to submit an EIAR in the case of sub-threshold development, Article 103 (3)(a) of the Planning and Development Regulations, requires the planning authority to have regard to likely significant impacts of the development on specified sites, areas, land

places and features in respect of a development which would be located on, or in, or have the potential to impact on any of the following:

- a European site;
- an area the subject of a notice under section 16 (2)(b) of the Wildlife (Amendment) Act 2000 (No. 38 of 2000);
- an area designated as a natural heritage area under section 18 of the Wildlife (Amendment) Act 2000;
- land established or recognised as a nature reserve within the meaning of section 15 or 16 of the Wildlife Act 1976 (No. 39 of 1976) (as amended by sections 26 and 27 of the Wildlife (Amendment) Act 2000);
- land designated as a refuge for flora or as a refuge for fauna under section 17 of the Wildlife Act 1976 (as amended by section 28 of the Wildlife (Amendment) Act 2000);
- a place, site or feature of ecological interest, the preservation, conservation or protection of which is an objective of a development plan or local area plan, draft development plan or draft local area plan, or proposed variation of a development plan, for the area in which the development is proposed; or
- a place or site which has been included by the Minister for Culture, Heritage and the Gaeltacht in a list of proposed Natural Heritage Areas published on the National Parks and Wildlife Service website.

In addition, Article 103(3) provides that the planning authority shall have regard to criteria as specified in Schedule 7 of the Regulations when determining whether the development would or would not be likely to have significant effects on the environment.

The criteria specified in Schedule 7 of the Regulations are based on the criteria set out in Annex III of codified Directive 2011/92/EU as amended by Directive 2014/52/EU. These criteria now provided for in a revised Schedule 7 (per European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018) form the basis for the detailed screening evaluation in **Section 4** below.

4 SUB-THRESHOLD DEVELOPMENT EIA SCREENING

4.1 Methodology / Approach

As stated in **Section 3** above, a mandatory EIAR is not required in this instance for any element of the proposed project but in order to consider whether a discretionary EIAR may be required in this instance for the proposed footbridge, a description and examination of the development with reference to the provisions of Annex IIA and III of the EIA Directive and Schedule 7 and 7A of the Planning and Development Regulations 2001 - 2018 is presented below.

With reference to Annex IIA of the Directive, the screening requires information on the following:

Characteristics of Project.

Location of the Project.

Type and Characteristics of Potential Impacts.

Thereafter, Annex III of the Directive and Schedule 7 of the Planning and Development Regulations set out criteria to be considered in determining whether or not the project should be subject to EIA.

To facilitate a logical approach to considering the characteristics of potential impacts we have undertaken this element of the screening on the basis of the various environmental topics set out in Article 3(1) of the 2014 EIA Directive. These are:

a) Population and human health;

b) Biodiversity, with particular attention to species and habitats protected under Directive 92/43/EEC and Directive 2009/147/EC;

c) Land, soil, water, air and climate;

d) Material assets, cultural heritage and the landscape; and

e) The interaction between the factors referred to in points (a) to (d).

A Screening for AA and NIS were also prepared by RPS in 2019 and are included under separate cover. A site visit was carried out on 24th September and an Aquatic Ecology Survey (Appendix B of the AA Screening) was conducted also on the 24th September 2018.

4.2 Consideration of Potential for Cumulative impacts

This screening assessment also has regard to any potential cumulative impacts that could arise from the proposed development in combination with other projects in the area.

The following plans were reviewed when considering in combination effects:

- Kilkenny County Development Plan (CDP) 2014-2020.
- Castlecomer Local Area Plan (LAP) 2018.
- Planning applications within the last 5 years within the vicinity of the proposed works.

There are no objectives in the KCDP that could act in combination with the proposed site investigations and construction works to give rise to significant effects on the environment.

Other projects of potential relevance were searched for by undertaking a desktop review of the Planning Enquiry System for KCC. No large-scale infrastructure projects have been granted

permission within the vicinity of the proposed works. Therefore, no large-scale infrastructure projects were identified as being of relevance for consideration for potential cumulative impact.

There are a number of small-scale planning applications that have been approved within the vicinity of the proposed footbridge. Some of which have been constructed and some which may be constructed in the future. The applications are predominantly for the construction of small scale projects or renovations to existing infrastructure. There is an application for planning permission Reg. Ref 19417 for an extension to the existing car park in Castlecomer Discovery Park which was lodged on the 13th June and a decision is pending. The planning applications reviewed are not considered likely to give rise to impacts that could act in-combination with the potential impacts of the proposed works to give rise to significant effects.

4.3 Characteristics of the Proposed Development

Annex IIA of the EIA Directive requires a description of the physical characteristics of the project as a whole to be provided. Annex III lists specific characteristic criteria of the development which may affect whether the development would or would not be likely to have significant impacts on the environment. The general physical characteristics of the development are described in **Section 2.5** of this report above. The development is further described and considered below with reference to the criteria of Annex III specifically.

4.4 The Size of the whole Project

The proposed footbridge as described in **Section 2.4** above will require site investigation works and the main construction works. The footbridge will be approximately 44m in length and span the River Dinin. A single pier will be required in the middle of the River Dinin to support the bridge. The footbridge will require the construction of two abutments, the eastern abutment is to be constructed on a raised bank to the side of the river. This bank is located on the left bank of the river and curves around the western most arch of the existing bridge. There is a raised section of river bed (sand and gravel) which is effectively an island formed by the main river channel and the Ardra tributary channel. The pier is to be constructed on this island. The proposed footbridge will require crossing of the Ardra.

4.5 Cumulation with Existing and/or Approved Projects

There are a number of planning applications approved, which may not have been implemented. No large-scale infrastructure projects have been granted permission within the vicinity of the proposed footbridge. There are no projects that could act in combination with the proposed site investigations and construction works to give rise to significant effects on the environment.

4.6 The nature of any Associated Demolition Works

As part of the proposed works, demolition of short sections of the existing masonry bridge will be required. These sections are located on the bridge's northern parapet wall and will have to be removed to create access to the new independent pedestrian bridge tie ins at the east and west ends of the bridge.

4.7 The Use of Natural Resources (in Particular Land, Soil, Water and Biodiversity)

To facilitate the footbridge there will be permanent/temporary loss of land/habitat as follows:

- The pier will result in the permanent removal of 1m^2 of instream habitat;
- There will be removal/disturbance to a 3m wide riparian habitat along the eastern length of the works, with reinstatement where possible; and
- There will be the removal/disturbance of river bed from the bunding measure in the immediate area of the proposed work, it will be reinstated on completion of the works.

- A parcel of land 100m^2 will be lost within the curtilage of the La Rive – the house on the western landing point of the bridge.

Where possible mature hedgerows, scrub and trees should be avoided and retained intact. Vegetation removal will include the removal of the invasive species, namely that of Japanese knotweed located on the left bank downstream of the existing bridge and at the base of the existing bridge (left bank).

Soil excavation works will be required primarily for the proposed footbridge. Any excess soil over and above that required on site for earthworks will be removed off site to a licenced facility. Importation of stone will be required to backfill the excavations and rock will be required for the purposes of rock armour and the masonry wall.

A temporary diversion of the River Dinin will be required. Water will not be extracted for use during the construction phase or any other use of the development from the River Dinin.

4.8 The Production of Waste

The construction phase of the development may generate waste such as plastic wrapping or wooden pallets but the waste will be removed off site to the site compound where it will be stored before it will be recycled or disposed of at a licensed waste facility.

A WMP will be developed by the Contactor for the site to promote minimization and reuse of materials. Freshly excavated spoil/topsoil will be retained in an area over 50m away from any water/drainage channels. Spoil storage will be for short term duration, will be reused in reinstatement works where possible and appropriate. Excess material will be reused on site or removed from site to an authorised facility. Sanitary waste and general construction waste will be managed in accordance with the Waste Management Act 1996 (as amended).

Japanese knotweed plant material or contaminated soil from the infested parts of the site will only be removed from site in accordance with Waste Management Act and in line with the recommendations set out in the IASMP.

4.9 Pollution and Nuisances

4.9.1 During Construction

The proposed works will be undertaken in the vicinity of the town of Castlecomer along the N78, a public road. Furthermore, the works will require the mobilisation of construction machinery along public roads, delivery of construction materials to the site and the removal of wastes. The main potential sources of pollution and nuisance arising from the construction stage of the development relate to temporary air quality (dust) and noise traffic and construction related activities. The main potential receptors will be local residents and wildlife. During the construction stage there is potential for temporary noise and dust impacts to receptors including houses and businesses in the built-up area of Castlecomer Town. The nearest residential property is located approximately adjacent to the west of the proposed footbridge. There is therefore potential for impact or interaction via pollution and nuisances with both neighbouring properties and the wider community.

There is a requirement for a 48-hour road closure which will cause inconvenience/nuisance to the road users on a temporary basis.

The proposed works have the potential to cause direct and indirect impacts to the water quality. There is potential for sediment to become entrained in the river and impact on the aquatic species. These impacts will be temporary and subject to best management practices as set out in the outline CEMP.

The proposed development has the potential to cause impacts to the River Barrow and River Nore SAC as a result of potential sedimentation, accidental spillages and spread of invasive species as the construction works are located within the boundary of the SAC. An NIS has been prepared and

concluded that with mitigation as set out in the CEMP the proposed footbridge will not result in significant impacts to the SAC.

4.9.2 During Operation

The operation of the footbridge will not give rise to any residues or emissions to humans or impact on the River Dinin during the operational phase as there will be no increase or change in movement of traffic as a result of the works. The footbridge will provide a positive impact for pedestrians through provision of a safer and more convenient access.

4.10 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

A major emergency is defined by the EPA as an event which, usually occurs with little or no warning, causes or threatens death or injury, serious disruption of essential services, or damage to property, the environment or infrastructure beyond the normal capabilities of the principal emergency services in the area in which the event occurs and requiring the activation of specific additional procedures to ensure an effective, co-ordinated response.

The proposed development will be constructed in accordance with the Safety and Health at Work Act 2005 and any subsequent regulations or amendments and with the requirements of the Health and Welfare at Work (Construction) Regulations, (SI 291 of 2013), any subsequent amendments and any other relevant Health and Safety legislation.

The site will be operated in accordance with an agreed HSQE Plan. A Safety File will be kept and updated throughout the development.

Overall the nature of construction works involved is standard and not particularly complex. Best practice measures will be followed. Therefore, the risk of accidents or disasters arising during construction, having regard to substances and technologies to be used, is not considered to be likely or significant.

The provision of a new footbridge will improve the safety for both pedestrians and motorists using the bridge.

4.11 Risk to Human Health

As outlined above in **Section 4.9** no sources of significant noise and air pollution or nuisances are identified during the construction or operation phase. Therefore, the potential for indirect impacts to human health from air and noise pollution is not considered significant.

The construction and maintenance works will require in-stream works which brings considerable risks although they can be readily mitigated through best practice. It should be noted that the works require instream construction works and erection of large precast elements, a significant portion of the construction has been transferred off site and will be conducted under factory conditions. The proposed works also requires shuttering the pier which shall then be struck (cast in-situ). The River Dinin 5.9km downstream of the proposed works is listed as a WFD Register of Protected Areas – drinking water rivers, however with implementation of the CEMP no impacts are predicted to drinking water.

In addition to the general obligations and duties under safety, health and welfare at work act, RPS will undertake the duties of Project Supervisor Design Process (PSDP) and prepare a Preliminary Health & Safety Plan for the works. The works will also be designed taking account of the principles of prevention.

5 LOCATION OF THE PROPOSED PROJECT

According to Annex IIA and III of the EIA Directive, the environmental sensitivity of geographical areas likely to be affected by projects must be described and considered, with particular regard to the following criteria:

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 Member States' legislation; Natura 2000 areas designated by Member States pursuant to Directive 92/43/EEC and 2009/147/EC;

   vi. areas in which there has already been a failure to meet the environmental quality standards laid down in Union legislation and relevant to the project, or in which it is considered there is such a failure;

   vii. densely populated areas; and

   viii. landscapes and sites of historical, cultural or archaeological significance.

The location of the proposed project is described and considered with reference to each of these criteria hereunder.

5.1 Existing and Approved Land Use

The land in the vicinity of the proposed footbridge is predominantly comprised of park, urban area and fields of improved pasture. There is an area of mixed woodland to the west of the project area comprised of Ash (*Fraxinus excelsior*), Sycamore (*Acer pseudoplatanus*), Beech (*Fagus sylvatica*) and Alder (*Alnus glutinosa*). The eastern landing of the bridge will be positioned in an area of parkland, Castlecomer Discovery Park. This parkland is comprised of mostly improved grassland and mature Ash (*Fraxinus excelsior*), Beech, Horse chestnut (*Aesculus hippocastanum*) and Sycamore (*Acer pseudoplatanus*). North of the existing bridge there is a small river marginal area close to the eastern bank. This area is comprised of mostly terrestrial plants including Alder, Willow herb, Bramble and Japanese knotweed and this area would likely flood when the river is in spate.

5.2 Abundance, Quality and Regenerative Capacity of Natural Resources

There will be a reduction in the aquatic habitat (1m^2) of the River Dinin which forms part of the River Barrow and River Nore SAC and a 3m wide stretch of terrestrial riparian habitat along the eastern bank of the Dinin River as a result of the proposed development as set out in **Section 2.4**. The area to be removed does not represent any aquatic Annex I habitat of the SAC. The SAC is not designated for terrestrial Qualifying Interests (QIs) and the NIS concluded no potential for significant effects on the River Barrow and River Nore SAC.

5.3 Absorption Capacity of Natural Environment

The design of the bridge has been informed by ongoing consultation with the Department of Culture, Heritage and the Gaeltacht (DoCHG). Representatives of the DoCHG attended Project Review Meetings along with a Project Archaeologist from TII the Conservation Officer of KCC. The input of representatives from DoCHG, TII and KCC influenced the selection of the preferred intervention/design of the proposed pedestrian bridge and critically, moved the design away from affixing a cantilevered structure to the existing bridge. Furthermore, John Cronin and Associates undertook an Archaeological and Architectural Heritage Assessment (**Appendix D**) of the proposed footbridge with a number of site visits (refer to **Section 6.9**) and Eimear O' Connor (Landscape Architect), carried out a Landscape and Visual Assessment (**Appendix E**) to inform the Landscape and Visual Assessment in **Section 6.10.**

In terms of the location of the proposed project there are a number of sensitivities in the study area of the existing bridge including:

- Ecology: the proposed bridge is located within the River Barrow and River Nore SAC however the NIS prepared for the bridge concluded no potential for significant effects on the River Barrow and River Nore SAC.

- Archaeology: the existing bridge is not a recorded archaeological monument, but it is located within the Zone of Notification (ZON), as designated by the National Monuments Service (NMS), surrounding the historic town of Castlecomer (KK005-082----). The bridge however is listed as a protected structure in the Record of Protected Structures (RPS Ref. no. D13) published in the current Kilkenny CDP (2014). The bridge is rated as being of national importance in the National Inventory of Architectural Heritage (NIAH no. 12301001) survey of bridges and other historic structures in County Kilkenny.

- Landscape: the site is within the Castlecomer Plateau Landscape Character Area which is described as having s*ignificant value and highly sensitive to change.*

The approach to the design and construction of the bridge has incorporated measures to protect the integrity of the River Dinin. In developing proposals for a new footbridge, the designers have sought to a high-quality contemporary form that is clearly legible as a modern intervention. Also, the design of the bridge has taken consideration of landscape and visual amenity together with the setting of the existing bridge.

6 TYPE AND CHARACTERISTICS OF POTENTIAL ENVIRONMENTAL IMPACTS

6.1 Introduction

As noted in **Section 4.1**, our description and assessment of potential impacts of the project is undertaken with reference to the various environmental topics set out in Article 3(1) of the EIA Directive. These are:

- Population and human health;
- Biodiversity, with particular attention to species and habitats protected under Directive 92/43/EEC and Directive 2009/147/EC;
- Land, soil, water, air and climate;
- Material assets, cultural heritage and the landscape; and
- The interaction between the factors referred to in points (a) to (d).

The description and assessment of impacts is presented in **Section 6.2** to **6.10**. Each of these descriptions and considerations of potential for likely significant effects on the environment has regard to the criteria identified in Annex III of the Directive and Schedule 7 of the Planning and Development Regulations as follows:

a. The magnitude and spatial extent of the impact;

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 approved projects; and

h. The possibility of effectively reducing the impact.

For ease of presentation some of the criteria listed above are combined in criteria sections presented below. It is noted that the current proposal does not have potential for transfrontier impacts given its location and the nature of the development.

6.2 Population and Human Health

6.2.1 Receiving Environment

The town of Castlecomer sits within the Electoral Division (ED) of Ballyanne and has a population of 2,318 recorded for the 2016 Census. Castlecomer town centre is located 0.3km to the west of the proposed footbridge. Deen Celtic sports grounds are located 0.15km to the north of the proposed footbridge. Approximately 0.15km to the north east there is a cluster of businesses/facilities including Castlecomer Discovery Park, Rosemarie Durr Pottery, Coach House Antiques and St Mary's Church of Ireland. Castlecomer Discovery Park is a major tourist attraction in the region and attracted 120,00 visitors in 2016.

The existing road bridge provides crossing of the N78 over the River Dinin. The road provides access to the town of Castlecomer form the east. Currently there is only one footpath on the existing bridge which is substandard and poses a hazard for both road users and pedestrians.

The nearest residential property to the proposed footbridge is located on the west bank of the river and will be adjacent to the western landing point of the proposed footbridge. This property is heavily screened with a substantial boundary wall and mature trees.

6.2.2 Potential for Significant Impact - Construction Phase

The proposal will remove pedestrians from the existing bridge and provide a safer dedicated facility for pedestrians to cross the River Dinin making for a safer environment for road and pedestrian users. The location of the independent bridge will not deviate significantly from the route of the existing bridge and will allow a smooth flow of pedestrian traffic across the River Dinin.

The construction phase will require in the region of up to 8 no. workers on site. While some will travel into the area daily it is possible that a number will stay within the area locally on a temporary basis and will have positive impacts for local businesses and accommodation. This is considered a minor local positive impact of a temporary nature and accordingly no mitigation measures are necessary.

There is potential for noise and dust generation during the construction phase from plant and construction traffic associated with excavation, piling, shuttering and concrete works. There is also potential for material in temporary exposed soil/stockpiles to become airborne and impact on human health. The noise and dust associated with the construction works have potential to impact on the neighbouring residential properties for the duration of construction works. The predicted potential impact is slight negative, brief to temporary in nature and not significant.

Normal construction hours for the works will be restricted to daytime hours only and the total construction period will be approximately 6 months. However, it will be necessary to undertake some works during a 48-hour road closure. Generally, the bridge sections will be placed between this road closure, as per the Contractor's programme. Temporary scaffolding shall be erected as required to facilitate access and the bridge sections shall be lifted into place using a mobile crane.

The road closure has potential to cause inconvenience, cause delays to drivers and potentially disrupt access to properties and businesses located in the vicinity. The potential impact then is slight negative, brief to temporary in nature and not significant.

There will be a permanent loss of 100m^2 of garden to the house located on the western side of the proposed bridge. There will be removal of two mature trees from the garden as part of this land take. The property will still be screened by the remaining trees resulting in a slight negative impact.

The construction works will also be undertaken in accordance with good practice measures specified in the outline CEMP. This includes good housekeeping practices which will minimise in particular potential for dust impacts and associated potential health implications. It also includes measures related to plant and vehicle maintenance which will minimise noise impacts. Given the limited duration of the construction works and the best practice measures specified the residual impact on the property close by and other nearby properties in the area would likely be not significant to imperceptible, local negative and over a brief to temporary duration.

6.2.3 Potential for Significant Impact - Operational Phase

Residents, visitors and business owners in the vicinity will benefit from a secure pedestrian crossing of the River Dinin. Vehicular traffic will benefit from the removal of pedestrians from the existing road bridge on to an independent dedicated pedestrian crossing also. The footbridge represents a long term significant positive impact for both pedestrians using the new footbridge and road users using the existing road bridge.

6.2.4 Cumulative Impacts

No cumulative impacts are identified in relation to population and human health.

6.2.5 Conclusion

Overall the proposal has the potential for not significant to imperceptible impacts which will be brief to temporary in duration during the construction phase. The impacts are localised and are considered not significant with standard best practice measures adopted by the Contractor during the construction phase. The project has potential for significant positive long-term impacts on the local population and those travelling through the area. There will be a residual slight negative impact associated with the loss of 100m^2 of garden space.

6.3 Biodiversity (with particular attention to species and habitats protected under Directive 92/43/EEC and Directive 2009/147/EC – Terrestrial Biodiversity)

6.3.1 Receiving Environment

A general ecological constraints/walkover survey was conducted on the 24th September 2018 by an RPS Ecologist.

The land within the project area is predominantly comprised of park, urban area and fields of improved pasture. There is an area of mixed woodland to the west of the project area comprised of Ash (*Fraxinus excelsior*), Sycamore (*Acer pseudoplatanus*), Beech (*Fagus sylvatica*) and Alder (*Alnus glutinosa*). The eastern landing of the bridge will be positioned in an area of parkland. This parkland is comprised of mostly improved grassland and mature Ash (*Fraxinus excelsior*), Beech, Horse chestnut (*Aesculus hippocastanum*) and Sycamore (*Acer pseudoplatanus*). North of the existing bridge there is a small river marginal area close to the eastern bank. This area is comprised of mostly terrestrial plants including Alder, Willow herb, Bramble and Japanese knotweed and this area would likely flood when the river is in spate.

6.3.1.1 Invasive Alien Species

INVAS carried out a site visit in May 2019 and produced a report entitled *Invasive Alien Species Management Plan for Castlecomer Footbridge (*see **Appendix B)** which noted Japanese knotweed and Cherry laurel and Canadian pondweed (*Elodea Canadinses*) within the study area. Japanese knotweed was found on the left bank downstream of the existing bridge and at the base of the existing bridge (left bank). The Cherry laurel infestation was recorded growing in close proximity to the Japanese knotweed infestation. Canadian pondweed was detected throughout the river section immediately above the weir, however it was not detected immediately downstream.

6.3.1.2 Designated Sites

The NIS identified that there are two Special Area of Conservations (SACs) and one Special Protection Areas (SPAs) within the zone of influence (15km) or with hydrological connection of the proposed works for assessment in the AA process. The three designated sites are as follows:

1. The River Barrow and River Nore SAC (Site Code: 002162). Works on the proposed bridge are within the boundary of this SAC. No terrestrial qualifying habitats or species of the SAC were recorded from the site visit and the potential impacts to the aquatic species (QIs) of the SAC are discussed under **Section 6.4**.

2. The Lower River Suir SAC (Site Code: 002137). This SAC has a remote hydrological connection to the proposed work's site. The River Dinin discharges to the Nore and then flows to the Barrow/Nore/Suir estuary. No terrestrial qualifying habitats or species of the SAC are noted and potential impacts to the mobile aquatic species (QIs) of the SAC are discussed under **Section 6.4**.

3. The River Nore SPA (Site Code: 004233). This SPA is located 9.13km (as the crow flies) from the proposed works and shares a remote hydrological connection since it is located 17.21km downstream of the works. The SPA is designated for Kingfisher only.

During the site visit no habitats corresponding to Annex I designated habitats for the River Barrow and River Nore SAC or the Lower River Suir SAC were recorded. Habitats within the study area comprised mostly of mixed woodland and lowland river habitat. Bankside vegetation consisted of Horse chestnut, Ash (*Fraxinus excelsior*), Beech (*Fagus sylvatica*), Willow herb (*Chamerion angustifolium*), Water Mint (*Mentha Aquatica*), Butterbur (*Petasites hybridus*), Water Figwort (*Scrophularia auriculata*), Bramble (*Rubus fruticosus*).

6.3.1.3 Bats

A walkover survey of the site was conducted on 3rd May 2019 by Karen Banks of Greenleaf Ecology. A Bat Survey Report was produced in by Greenleaf Ecology in June 2019 and is included as **Appendix F** and the following section summarises the findings.

The riparian and woodland habitats adjacent to the footbridge are of high suitability for bats for foraging and commuting. The two trees scheduled to be felled, namely that of the Horse chestnut is considered to be of moderate suitability for bats and the Yew tree did not support any features of potential use by bats. The existing N78 Road Bridge at Castlecomer is not suitable for roosting bats.

6.3.2 Potential for Significant Impact - Construction Phase

The proposed works include site investigation, vegetation removal (including Japanese knotweed), excavation, piling, river diversion, pouring of concrete, input of fill for embankments and erection of the bridge superstructure. To facilitate the works there will be a direct ecological impact due to habitat loss associated with permanent land take in the River Dinin and 100m^2 of lawn and two mature trees in the La Rive garden. The removal of the two mature trees represents potential habitat removal. The habitat loss associated with the permanent land take and the two mature trees will be adverse but relatively small areas will be affected and any impact is likely to be not significant.

Vegetation and soil stripping will be kept to a minimum and will be reinstated following completion of the works which will minimise the impact of habitat loss. The nature of the habitats that will be lost, namely that of grassland and scrub are not sensitive habitat types. The overall impact associated with soil stripping and vegetation removal is likely to be slight negative only. Adherence to measures as set out in the outline CEMP will ensure that the residual impact is temporary adverse and not significant.

Movement of plant and vehicles during the construction phase has the potential to cause disturbance to wildlife through noise and vibration. Any disturbance from plant, vehicles and construction works will be localised and brief to temporary and slight negative. Impacts will be minimised by adherence to measures for machinery operation and maintenance set out in the Outline CEMP, such that residual impacts are predicted to be brief to temporary and not significant.

Air pollution and dust deposition as a consequence of the development has the potential for the construction phase to have a temporary slight negative impact on local terrestrial biodiversity. The implementation of construction management measures set out in the Outline CEMP however will minimise the potential for the generation of dust and the potential for impact is considered to be imperceptible.

While the works will not directly impact on Kingfisher within the SPA, there is the potential for indirect impact to Kingfisher as a result of the works through a potential reduction in food resources (fish) from indirect impact on water quality.

6.3.2.1 Invasive Alien Species

There is potential for spread of invasive plants as a result of vegetation and soil stripping. Best practice avoidance measures as set out in the IASMP shall be implemented by the Contractor which will help to contain and/or prevent the introduction of invasive species on the site. Adherence to the mitigation measures will ensure that there are no residual impacts.

6.3.2.2 Designated Sites

Potential impacts to the aquatic species (QIs) of the SACs are discussed under **Section 6.4**. **Table 6-3** sets out the only Special Conservation Interest (SCI) of the River Nore SPA.

Table 6-1: Summary of SCI Considered in Assessment of Potential Impacts

European Site	Qi or SCI
River Nore SPA	*Alcedo atthis* (Kingfisher) [A229]

6.3.2.3 Bats

A Bat Survey Report notes that while no tree roosts were identified during the course of the site visit, occupation of roosts in trees by bats may be very transient. Removal of the mature Horse chestnut has potential for adverse impacts to individual/ small numbers of bats which may use the tree as a roosting or nesting place. In the absence of mitigation, it is considered that the loss of potential or actual roosting sites would have a direct, significant negative permanent impact on bats at the local level. There will be no adverse impacts on roosting bats as a result of works occurring in close proximity to the road bridge.

Lighting during construction can cause avoidance of an area for commuting bats and can prevent or reduce foraging for *Myotis* species[1]. In the absence of mitigation, disturbance of bats due to construction lighting would have an indirect, significant negative impact at the local level. The impact would be temporary and would persist for the duration of construction.

Mitigation measures for the removal of the Horse Chestnut include being examined by an experienced bat ecologist prior to work commencing by any appointed contractor or subcontractor on any part of the construction phase of the proposed development. Following this examination, should the tree be identified as a bat roost then a derogation licence application will be made to the NPWS to exclude the bats and fell the tree. The roost must not be altered or affected in any way prior to works being undertaken as stipulated within the derogation licence. Felling must be carried out under the supervision of a bat specialist named on the licence.

Mitigation measures for lighting include ensuring all works should be restricted to daylight hours so as to minimise impacts to these nocturnal species. Should this not be feasible, the emanation of artificial lighting onto the River Dinin and the riparian treeline shall be kept to the minimum area feasible.

6.3.3 Potential for Significant Impact - Operational Phase

Movement of plant, vehicles and associated human activity will be required for the maintenance of the footbridge. These activities have the potential to cause disturbance to wildlife through noise and vibration. Vehicle activity and human activity will be intermittent, and impacts are predicted to be momentary to brief adverse and imperceptible. No mitigation is required.

6.3.3.1 Invasive Alien Species

No operational phase impacts are anticipated.

6.3.3.2 Designated Sites

No impacts to European Sites are predicted as a result of the operation of the proposed project.

[1] Stone E.L. (2013) Bats and Lighting: Overview of current evidence and mitigation.

6.3.3.3 Bats

Lighting can cause avoidance of an area for commuting bats and can prevent or reduce foraging for *Myotis* species. The proposals for the operational phase of the footbridge include the installation of lighting, to comprise the following:

- Low intensity linear lighting orientated on an inclined plane to illuminate the decking; and
- Illumination of the niches/spandrel of the road bridge.

The bridge lighting has been designed to illuminate the deck of the pedestrian bridge and to softly light the niches/spandrel of the adjacent road bridge. The lighting design will avoid illuminating important foraging and commuting areas for bats, i.e. the river and river banks. In accordance with *Bat Conservation Trust & Institute of Lighting Professional Guidelines* (2018), the following specifications will be followed when selecting the lighting luminaires:

- All luminaires should lack UV elements when manufactured;
- LED luminaires will be used where feasible;
- A warm white spectrum will be adopted to reduce blue light component;
- Luminaries will feature peak wavelengths higher than 550nm to avoid the component of light most disturbing to bats;
- Only luminaires with an upward light ratio of 0% and with good optical control should be used; and
- There should be no upward or downward tilt of the luminaire.

6.3.4 Cumulative Impact

No cumulative impacts are identified in regard to terrestrial biodiversity.

6.3.5 Conclusion

The project will give rise to permanent small scale loss of habitat. The overall impact to terrestrial biodiversity is likely to be temporary slight negative only. Adherence to the mitigation measures in the Outline CEMP will ensure any residual impacts on terrestrial biodiversity from construction works are likely to be temporary and not significant at worst case. The NIS concludes that with adherence to the mitigation measures it is not anticipated that the proposed upgrade works will not significantly impact the SCI, namely that Kingfisher for the River Nore SPA.

6.4 Biodiversity (with particular attention to species and habitats protected under Directive 92/43/EEC and Directive 2009/147/EC – Aquatic Biodiversity)

6.4.1 Receiving Environment

The site of the proposed footbridge works intersects two watercourses; 'Dinin [North]' (EPA Code: 15D07) and 'Ardra' (EPA Code: 15A15). The watercourses are all part of the Dinin [North]_SC_010 sub-catchment. The [Dinin North] flows in a south westerly direction through Castlecomer Town before flowing into the Nore. The Nore then continues through Kilkenny city and eventually enters the Barrow Suir Nore Estuary approximately 90km downstream of Castlecomer Town. The Dinin River is designated as a SAC for a number of water dependant habitat and species along with a small amount of terrestrial habitat. As detailed above the Dinin flows into the Nore which is a SPA and is designated for Kingfisher (*Alecdo atthis*).

Where the footbridge will span the River Dinin, the river is a 4th Order river with a wet width of approximately 22m and 20-40cm deep. At the time of the visit water levels were low. The substrate of the centre of the channel is dominated by gravels and cobbles while in the margins, boulder is most common. Aquatic habitats are primarily glides, riffles and runs.

6.4.1.1 Qualifying Interests of the European Sites

The proposed site is within the River Barrow and River Nore SAC and the Qualifying Species and Habitats are presented in **Table 6-2**. The Lower River Suir SAC has a remote hydrological connection with the proposed site and the Qualifying Species and Habitats are presented in **Table 6-3**.

Table 6-2: Qualifying Species and Habitats of the River Barrow and River Nore SAC

Species (Annex II) of the EU Habitats Directive	Habitats (Annex I) of the EU Habitats Directive
Vertigo moulinsiana (Desmoulin's Whorl Snail)	Estuaries [1130]
Margaritifera (Freshwater Pearl Mussel)	Mudflats and sandflats not covered by seawater at low tide [1140]
Margaritifera durrovensis (Nore Pearl Mussel)	Reefs [1170]
Austropotamobius pallipes (White-clawed Crayfish)	Salicornia and other annuals colonising mud and sand [1310]
Petromyzon marinus (Sea Lamprey)	Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) [1330]
Lampetra planeri (Brook Lamprey)	Mediterranean salt meadows (*Juncetalia maritimi*) [1410]
Lampetra fluviatilis (River Lamprey)	Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation [3260]
Alosa fallax (Twaite Shad)	European dry heaths [4030]
Salmo salar (Salmon)	Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels [6430]
Lutra lutra (Otter)	Petrifying springs with tufa formation (*Cratoneurion*) [7220]*
Trichomanes speciosum (Killarney Fern)	Old sessile oak woods with Ilex and Blechnum in the British Isles [91A0]
	Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion*, *Alnion incanae*, *Salicion albae*) [91E0]*

*Denotes Priority Habitat

Table 6-3: Qualifying Species and Habitats of the Lower River Suir SAC

Species (Annex II) of the EU Habitats Directive	Habitats (Annex I) of the EU Habitats Directive
Margaritifera margaritifera (Freshwater Pearl Mussel) [1029]	Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) [1330]
Austropotamobius pallipes (White-clawed Crayfish) [1092]	Mediterranean salt meadows (*Juncetalia maritimi*) [1410]
Petromyzon marinus (Sea Lamprey) [1095]	Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion vegetation* [3260]
Lampetra planeri (Brook Lamprey) [1096]	Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels [6430]
Lampetra fluviatilis (River Lamprey) [1099]	Old sessile oak woods with Ilex and Blechnum in the British Isles [91A0]
Alosa fallax fallax (Twaite Shad) [1103]	Alluvial forests with Alnus glutinosa and Fraxinus excelsior (*Alno-Padion, Alnion incanae, Salicion albae*) [91E0]*
Salmo salar (Salmon) [1106]	Taxus baccata woods of the British Isles [91J0]*
Lutra lutra (Otter) [1355]	

Owing to the potential presence of freshwater-dependent habitats and species, specialist Aquatic Ecology Surveys were commissioned to provide detail of the qualifying habitats and species of the River Dinin within the River Barrow and River Nore SAC. Surveys were carried out on the 24th of September 2018 and included the following; Water Quality (Q-Value), Annex II species habitat assessments (white-clawed crayfish, salmon and lamprey sp.) and Annex I habitat walkover survey.

The following section discusses the individual species and habitats of the SACs in greater detail.

Species

Desmoulin's Whorl Snail (*Vertigo moulinsiana*)

There is no record of Desmoulin's Whorl Snail on the National Biodiversity Database Centre (NBDC) within the Dinin River. During the walkover survey no Desmoulin's Whorl Snail were noted and the river did not contain favourable habitat for Desmoulin's Whorl Snail and so was not assessed further.

Freshwater Pearl Mussel (FWPM) (*Margaritifera margaritifera*) and Nore Freshwater Pearl Mussel (*Margaritifera durrovensis*)

The NIS notes that FWPM are not recorded in the Dinin at Castlecomer but have been recorded further downstream in the main channel near Dunmore. Under the Freshwater Pearl Mussel Regulations (S.I. No. 296/2009) the Dinin River is not designated for FWPMs and the desk top review revealed there are no known populations within this river[2]. FWPM populations are known within the Nore River which is listed within the Freshwater Pearl Mussel Regulations (S.I. No. 296/2009). The known populations are located upstream of the Gully-Nore confluence, upstream of the Dinin-Nore confluence Castlecomer Footbridge.

Margaritifera durrovensis (Nore Pearl Mussel) is also a QI of this SAC but is considered to only be present within the River Nore upstream of Ballyraggert within the adjoining Nore_080 sub catchment.

White-clawed Crayfish (*Austropotamobius pallipes*)

Good crayfish habitat was present with soft bank for burrowing downstream of the weir. Submerged roots and over hanging trees further downstream. Leaf litter was present for juvenile crayfish. Suitable boulder/rock was noted in abundance up and downstream. Siltation was high when substrate was disturbed limiting habitat quality. Crayfish have been recorded historically at this location in 2005 (NBDC online maps) however no crayfish were observed on the day of survey.

Lamprey sp.

During 2016 WFD monitoring carried out by the IFI on the Dinin River, it was found that lamprey sp. was recorded at the Dinin Bridge monitoring station downstream of the proposed works site. Within the Nore main channel at Quakers Bridge, upstream of the Dinin confluence, Lamprey sp. were identified in a 2008 IFI survey. In a survey report on the distribution of lamprey in Ireland, it is noted that “P. marinus and L. planeri appear to be common in the River Nore catchment. P. marinus usually spawn in the lower reaches of the River Nore between Thomastown and Inistioge (W. Kopke), but sometimes as far as Ballyragget (P. Fitzmaurice; W. Kopke).Unspecified lampreys were observed in the upper reaches of the Nore, the Kings and the Munster and in the lower reaches of the Dinin (Lucey, in prep)”(Kurz and Costello 1999). Therefore, there is a strong potential for salmon and lamprey sp. (brook and river) to use the habitat within the River Dinin. It is unlikely that P. marinus is present within the Dinin, but is known to regularly spawn in Thomastown, approximately 40km downstream of the proposed works (IFI, 2014). During the 2018 aquatic survey carried out by RPS, it was found that there was ‘Poor to None’ Lamprey spawning areas (i.e., no clean spawning gravels) within the works area. There was very limited lamprey nursery habitat, a small backwatered area on the left hand side of the bridge downstream, no mud/silt/sandy bed present but organic material such

[2] https://www.npws.ie/maps-and-data/habitat-and-species-data/article-17

as deposited leaves, etc. Again, there was limited adult lamprey habitat up and downstream of the Castlecomer bridge.

Twaite shad (*Alosa fallax*)

Estuaries provide important feeding, migratory and nursery grounds for the shads, including young-of-year shads. Spawning runs of adult twaite shad occur during April–June, and they are known to spawn at the upper tidal limit on the River Barrow just downstream of the weir at St Mullins. The overall lengths of the estuaries of the Barrow (36 km) and Suir (43 km), combined with that of Waterford Harbour (20 km) into which both estuaries discharge, creates an elongated sheltered habitat capable of supporting juvenile and adult life stages of the shad. During a desktop survey it was noted that Twaite shad have been captured by anglers at the top of the tide in the Nore, Suir and Munster Blackwater, but they are not generally found in the freshwater part of these rivers[3]. It is unlikely that Twaite shad occur within the River Dinin.

Atlantic salmon (*Salmo salar*)

The River Dinin is not a designated salmonid river under S.I. No. 293/1988 – European Communities (Quality of Salmonid Waters) Regulations, 1988. However, it does feed into the Nore which is protected under the Salmonid River Regs (S.I. 293). During WFD monitoring carried out by the IFI on the River Dinin, it was found that the River was of 'Good Status' for fish at the Dinin Bridge monitoring station downstream of the works site. The assessment was carried out in July 2016 using the area delineated electro-fishing method. *'Seven fish species were recorded at Dinin Bridge. Minnow was by far the most abundant species recorded in 2016, followed by salmon'*, (IFI, 2016). Brown trout, European eel, minnow, stone loach, 3-spined stickleback and lamprey sp. were also observe during the survey.

On foot of the Aquatic Survey conducted by RPS, salmonid spawning habitat present was rated as *'Poor to None'* salmonid habitat downstream or upstream of the bridge. This is due to the thick layer of silt under the river substrate and the lack of clean gravel areas. Downstream of the Castlecomer Road Bridge, there were some signs of juvenile salmonid habitat with submerged boulders and overhanging vegetation providing suitable cover, shallow fast flowing water and coarse substrate.

Otter (*Lutra lutra*)

No signs of otter activity (evidence of couches, slides, holts or spraints on either river bank upstream and downstream of the bridge) were identified during field walkover survey. It is noted from the NBDC that the works are located in a 10km square which has been identified as an area used by otter. Otters are widespread in Ireland and despite the lack of evidence it is likely that otter are present in the area.

Habitats

Emergent aquatic vegetation consisted of Common Reed (*Phragmites australis*), and *Carex sp.* Within the water column Common duck weed (*Lemna minor*), Kneiff's Feather-moss (*Leptodictyum riparium*), Wild Celery (*Apium*), Water Moss (*Fontinalis antipyretica*) and Red alga (*Hildenbrandia*) were common within the river.

In relation to the remaining Qualifying Habitats in **Table 6-3** and **6-4**, no Estuaries [1130] are present in the River Dinin but are downstream of the proposed works. Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels [6430] was not recorded within the proposed study area but may be present downstream. The habitat of Alluvial forests with Alnus glutinosa and Fraxinus excelsior (*Alno-Padion, Alnion incanae, Salicion albae*) [91E0] is not mapped within the River Dinin and was not observed on the site visit. This habitat is mapped in locations approximately 22km downstream in the Nore near Kilkenny. Water courses of plain to montane levels

[3] https://www.fisheriesireland.ie/fish-species/twaite-shad.html#ecology-life-history

with the Ranunculion fluitantis and Callitricho-Batrachion vegetation [3260] habitat was not recorded within the proposed study area but may be present downstream.

There are no records of Petrifying springs with tufa formation (*Cratoneurion*) [7220] within the River Dinin. This habitat may occur as clearly defined spring heads with consolidated tufa; spring heads with associated tufaceous flush; or seepage areas with tufa formation. The Dinin River has been heavily modified with artificial banks and two weirs (one upstream of the existing bridge and a smaller weir directly downstream), areas with groundwater seepage were not observed. It is unlikely for this habitat to be present within the proposed works area. The COs have mapped one location at Dysart Wood, this is located on a steep wooded hillside close to the River Nore at Dysart, Co. Kilkenny where a substantial tufa cascade has formed (Lyons and Kelly 2016). As these springs are not located within the River Nore it is considered that there is no hydrological connection between the proposed works and the springs.

The following QIs of the River Barrow and River Nore SAC are located 60-100km downstream of the proposed works in the Barrow/Nore Suir estuary. Due to the coastal/transitional location of these habitats the connection between them and the works is extremely tenuous. Any change to the Dinin River arising because of the works will not have an impact on the hydrological function and/or water quality of the marine/transitional environment and are not considered further; 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 (*Glauco-Puccinellietalia maritimae*) [1330] and Mediterranean salt meadows (*Juncetalia maritimi*) [1410].

6.4.2 Potential for Significant Impact - Construction Phase

The proposed works include site investigation, vegetation removal (including Japanese knotweed), excavation, piling, river diversion, pouring of concrete, input of fill for embankments and erection of the bridge superstructure.

Potential impacts from the works include;

Sediment and Pollution Spillages: The works have the potential to impact on water quality through the release of sediment or contaminants. Any potential for sediment and pollution spillages to enter the River Dinin could result in a slight negative impact of temporary duration to the water quality. The mitigation measures noted in the Outline CEMP would in turn minimise the potential for knock-on impacts on habitats and species. Potential residual impacts are deemed likely to be slight and temporary only.

Hydrological Regime Alterations: Works will require diversion of the River Dinin during the construction phase through use of bunding and fluming of the watercourse. The diversion also has potential to change the hydrological regime of the river resulting in reduced water flows which could impact on aquatic biodiversity. Any potential for changes in the hydrological regime are likely to be temporary, slight and negative.

Air Pollution and Dust Deposition: The construction phase has the potential to cause negative impacts on aquatic ecology as windborne particles are deposited on aquatic ecology or their habitats. Any potential for impacts as a result of air pollution and dust deposition are likely to be brief to temporary and slight negative.

The site compound is proposed to the east of the River Dinin. Inadequate treatment of onsite toilets and wash facilities has the potential to cause faecal contamination to nearby waterbodies, which would be a temporary negative, moderate impact on aquatic ecology. Any surface water at the compound will infiltrate to ground. No residual impacts are considered to be likely.

This following section comprises an evaluation of the potential significance of impacts of the construction phase of the proposed development on the conservation objectives of the QIs for the; River Barrow and River Nore SAC and Lower River Suir SAC as seen in **Table 6-4**. Note that certain QIs only have been brought forward for assessment for potential impacts please refer to the NIS document for further rational for this. Potential impacts include:

- Degradation of Annex I habitat;

- Disturbance of key species;
- Habitat fragmentation;
- Introduction or spread of invasive species during construction; and
- Changes in key indicators of conservation value.

Table 6-4: Summary of QIs Considered in Assessment of Potential Impacts

European Site	Qi or SCI
River Barrow and River Nore SAC	Estuaries [1130].
	Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation [3260].
	Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno Padion, Alnion incanae, Salicion albae*) [91E0].
	Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels [6430].
	Margaritifera durrovensis (Nore Pearl Mussel) [1990];
	Austropotamobius pallipes (White-clawed Crayfish) [1092];
River Barrow and River Nore SAC & Lower River Suir SAC	*Lampetra planeri* (Brook Lamprey) [1096];
	Lampetra fluviatilis (River Lamprey) [1099];
	Petromyzon marinus (Sea Lamprey) [1095];
	Alosa fallax fallax (Twaite Shad) [1103];
	Salmo salar (Salmon) [1106]; and
	Lutra lutra (Otter) [1355].
	Margaritifera margaritifera (Freshwater Pearl Mussel) [1029];
River Nore SPA	*Alcedo atthis* (Kingfisher) [A229]

The potential impacts of the proposed works on these QIs are detailed below.

Degradation of Annex I habitat: There will be no direct loss of Annex I habitats as a result of the proposed project. Although the site visit did not locate any of the following habitats listed below within the proposed works area they are located and/or have potential to be located downstream of the proposed works. In the absence of mitigation there is the potential for indirect impacts from sedimentation and/or water quality deterioration to the following habitats:

- Estuaries [1130];
- Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno Padion, Alnion incanae, Salicion albae*) [91E0];
- Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation [3260]; and
- Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels [6430].

Disturbance of key species: In the absence of appropriate mitigation the works have the potential to cause disturbance of crayfish. This may occur directly due to works within the riverbed or indirectly via sedimentation and/or water quality deterioration to crayfish habitat. There will be no direct disturbance to the two pearl mussel species. However, in the absence of mitigation measures the works have the potential to indirectly impact on these key species via sedimentation and/or water quality deterioration which may impact salmonid fish which form part of the life cycle of pearl mussel. In the absence of appropriate mitigation there is the potential for temporary direct disturbance due to works within the riverbed on the following;

- *Austropotamobius pallipes* (White-clawed Crayfish) [1092]
- *Lampetra planeri* (Brook Lamprey) [1096];
- *Lampetra fluviatilis* (River Lamprey) [1099]; and
- *Salmo salar* (Salmon) [1106].

In addition, there may be an indirect disturbance to the following fish species via sedimentation and/or water quality deterioration in the absence of appropriate mitigation.

- *Petromyzon marinus* (Sea Lamprey) [1095];
- *Alosa fallax fallax* (Twaite Shad) [1103];
- *Lampetra planeri* (Brook Lamprey) [1096];
- *Lampetra fluviatilis* (River Lamprey) [1099]; and
- *Salmo salar* (Salmon) [1106].

There is potential for direct disturbance of otter as otter may create holts in the riparian habitat set out for the abutment and pier works prior to the works commencing. There is also potential for temporary indirect disturbance due to the loss of freshwater habitat as a result of the diversion of the River Dinin. It is considered that any tree removal will not represent a significant loss as to impact upon Kingfisher populations. Further suitable perching habitat is present both upstream and downstream of the proposed project with a riparian margin of mature trees overhanging the river.

Habitat fragmentation: The partial damming of the river and construction within the river and along the bank site may cause temporary habitat fragmentation for the following species which have been recorded within the Dinin river. The proposed construction works may temporarily deter the following listed species from moving within the river corridor thus preventing them from reaching habitat up or downstream of the works.

- *Lampetra planeri* (Brook Lamprey) [1096];
- *Lampetra fluviatilis* (River Lamprey) [1099];
- *Salmo salar* (Salmon) [1106]; and
- *Lutra lutra* (Otter) [1355].

Introduction or spread of invasive species during construction: there is the potential for the proposed development to spread Japanese knotweed or other high impact IAS to downstream hydrologically connected European Sites.

Changes in key indicators of conservation value: there is potential for these to be impacted as a result of the modification of the structures of inland watercourses of the SAC and potential release of uncontrolled sediment.

The implementation of construction management measures set out in the outline CEMP and IASMP will minimise the potential impacts from the construction phase and thus the potential for residual impact on aquatic ecology is considered to be imperceptible.

The NIS concludes that there will be no potential for cumulative impacts arising in combination with any other plans or proposals, with the implementation of best practice and the recommended mitigation measures. It is considered that the proposed development will not adversely affect the integrity of River Barrow and River Nore SAC, Lower River Suir SAC and River Nore SPA.

6.4.3 Potential for Significant Impact - Operational Phase

No impacts to European Sites are predicted as a result of the operation of the proposed project.

6.4.4 Cumulative Impact

No cumulative impacts are identified regarding aquatic biodiversity.

6.4.5 Conclusion

The proposed works have the potential to cause habitat fragmentation, sediment and pollution spillages, hydrological regime alterations, air pollution and dust deposition faecal contamination from the site compound during the construction phase. With mitigation none of these impacts have been assessed as causing significant impacts on aquatic biodiversity. The project has the potential to impact on aquatic biodiversity of the SACs in the following ways: Degradation of Annex I habitat located downstream, disturbance of key species, habitat fragmentation, introduction or spread of invasive species during construction and changes in key indicators of conservation value. The NIS concludes that there will be no potential for cumulative impacts arising in combination with any other plans or proposals, with the implementation of best practice and the recommended mitigation measures. It is considered that the proposed development will not adversely affect the integrity of River Barrow and River Nore SAC, Lower River Suir SAC and River Nore SPA.

6.5 Land, Soil, Geology and Hydrogeology

6.5.1 Receiving Environment

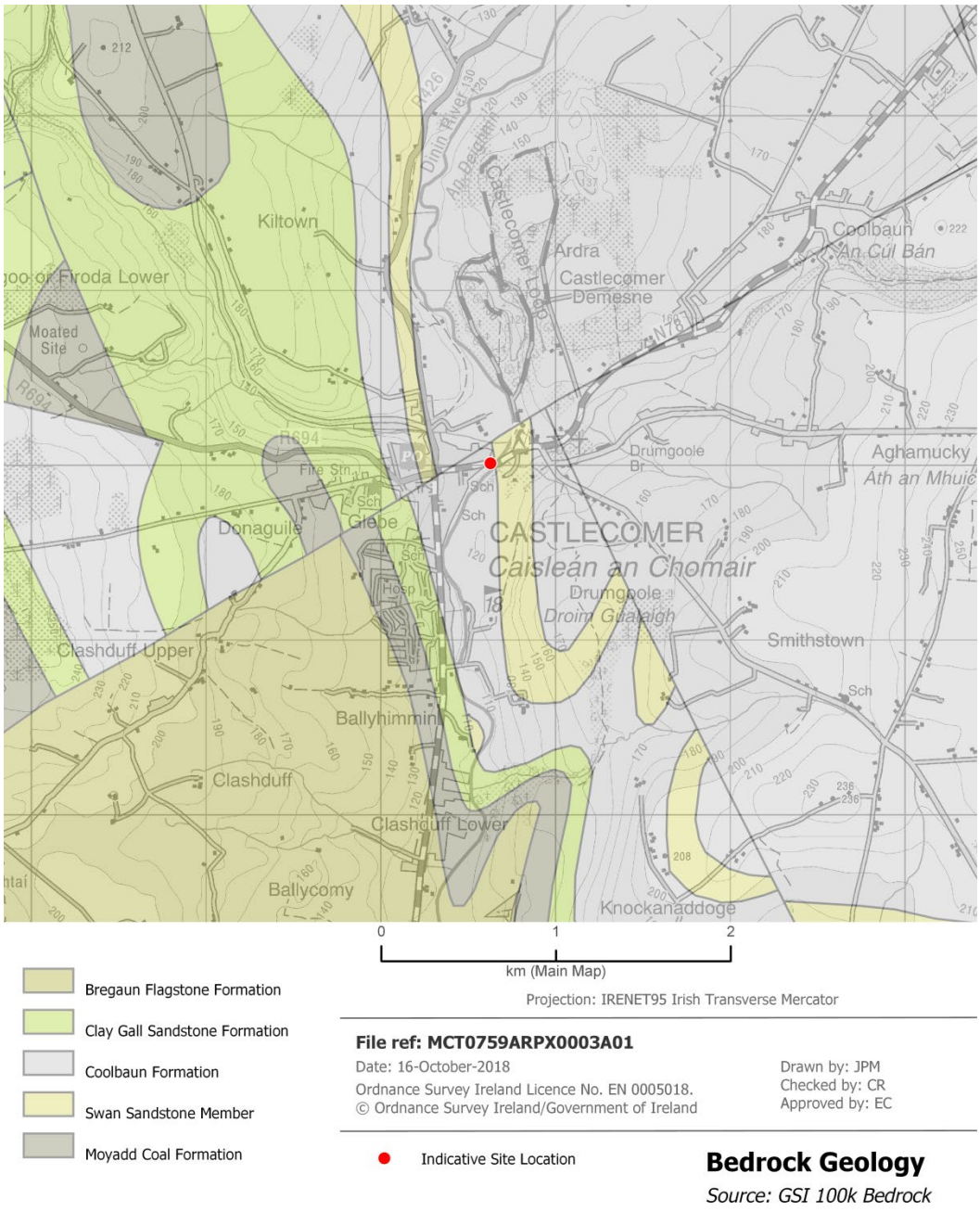
The majority of the site is underlain by *'Coolbaun Formation'* which is described as "*Shale and sandstone with thin coals"* as can be seen in **Figure 6-1**. The Coolbaun Formation is classified by the GSI as *Poor Aquifer (Pu) - Bedrock which is Generally Unproductive*. The eastern most section of the proposed bridge is underlain by Swan Sandstone Member which is described as 'L*aminated dark-grey siliceous sandstone*'. The Swan Sandstone Member is classed as a Locally Important Aquifer (Lm) - Bedrock which is Generally Moderately Productive. Both the Coolbaun Formation and the Swan Sandstone Member form part of the *Castlecomer Groundwater Body* is a large groundwater body which is characterised by a Productive fissured bedrock.

The immediate groundwater vulnerability at the site of the proposed works is mapped as '*high*'. To the south east and north east of the site there are sections of '*extreme*' and '*Rock at or near Surface or Karst*'.

The subsoils (Quaternary Geology units above the rock) at the site consist of alluvium. There are no karst features, groundwater drinking water protection areas within the area of the proposed works.

While there is a residential property on the west bank of the River Dinin which poses as a constraint to the proposed landing location of the footbridge and a 100m^2 parcel will be acquired. There is no constraint on the east bank of the river where there is ample land which comprises scrub land and offers no significant amenity.

Figure 6-1: Bedrock



6.5.2 Potential for Significant Impact - Construction Phase

There will be temporary and permanent loss of land due to the construction of the proposed footbridge. Instream works to construct the footbridge will be required for the two-span footbridge, including a pier to be introduced in the watercourse. The location of the proposed pier is a dry raised area in low flow conditions. Constructing the pier here will minimise the impact on the riverbed. The pier will result in the permanent removal of approximately 1m^2 of land in the centre of the River Dinin. Any potential impact of permanent land take will be imperceptible and over a small area. The potential impact associated with temporary land take for the compound or areas alongside the banks to facilitate the works will be imperceptible and temporary in nature.

The site is mapped as being located at the periphery of the Castlecomer Ground Water Body - however the Coolbaun Formation forms the bedrock which forms the aquifer lithology of the overlying poorly productive Newtown Ground Water Body - this is due to the site's location at the boundary of

the groundwater bodies. Groundwater flow paths at the site will be short and will occur in the upper few metres, recharging and discharging locally. Deeper groundwater flow will occur in the Clay Gall Sandstone Formation at the base of the Coolbaun Formation. Local, short term impacts as a result of foundations for pilings to groundwater flow within the gravelly alluvium overburden deposits will occur along the river if groundwater is met. No impact is envisaged to the deeper more productive aquifer (the Clay Gall Sandstone Formation of the confined Castlecomer Ground Water Body).

Also, as part of the site preparation works it will be necessary to undertake site clearance (soil and vegetation stripping) of existing grass and scrub along the western and eastern banks of the river to accommodate for the construction of foundations and bunding of riverbank. Removal of existing vegetation will also be necessary under the footprint of the proposed embankments and pier. The majority of vegetation removal/soil stripping will be permanent with a small section of habitat being reinstated. Japanese knotweed will be removed from two areas of the proposed site. Materials arising from excavations/soil stripping will be segregated on site/be stored temporarily/removed from site and disposed in an approved licenced facility. Any potential for exposed soil or stockpiles to be carried by wind or water and cause pollution or nuisance will be mitigated with strict measures outlined in the CEMP and the IASMP.

As part of the site investigation works and the construction works bunding as described in **Section 2.4** will be required along the eastern river bank to protect the toe of the embankment and prevent material entering the watercourse. A geotechnical borehole rig will undertake the exploratory boreholes as part of the site investigation works. A bund will be in place for the duration of the main construction works also. There is a potential slight negative temporary impact associated with sediment entering the River Dinin through inadequate protection measures both during the site investigation works and the main construction works. Mitigation measures as outlined in the CEMP will ensure that any residual impacts are slight and brief to temporary in nature.

The footbridge will require the construction of two abutments. The eastern abutment is to be constructed on a raised bank (scrub and Japanese knotweed) to the side of the river. The western abutment will replace existing lawn. The western abutment will be set back from the river significantly so as to maintain connectivity of habitat along the riparian zone and also to avoid erosion of the bank. Due to the constraints of the existing road into which the footbridge will tie in to it is not possible to set the eastern abutment significantly back from the river. On the completion of the concrete works, waterproofing shall be applied to all buried surfaces before backfilling with 6N structural fill.

Willow spilling or rock armour will be used for grading and river bank reinstatement. The existing river bed will be generally left in-situ and any extra material to be placed will be of similar nature. The new embankments shall be constructed by grading, levelling and compacting 6N structural fill before top soiling and grass seeding. A masonry wall is to be constructed on either side of the embankment. Safety fencing, safety barriers and new raised concrete verges shall be completed in conjunction with top soiling and grass seeding of the verges. The site compound will be removed and the lands within the site boundaries shall be reinstated through top soiling and grass seeding as required.

6.5.3 Potential for Significant Impact - Operational Phase

Willow spilling or rock armour will prevent bank erosion during the operation phase.

6.5.4 Cumulative Impact

No potential for cumulative impact on land, soils, geology and hydrogeology is identified.

6.5.5 Conclusion

There will be slight impacts on land, soils, geology and hydrogeology in terms of direct impacts due to excavation and requirement for disposal of some material off site.

6.6 Hydrology and Drainage

6.6.1 Receiving Environment

6.6.1.1 Surface Water Features

A part of the EPA's Water Framework monitoring of the Dinin River Q-value samples have been recorded upstream at the Massford Br. station and downstream at the Dysart Br. station with a Pre-Water Framework Directive (WFD) station at the works location at the 'Dinn (North) - Br in Castlecomer' (see **Table 6-2**). The overall WFD status for the Dinin (North)_040 waterbody for 2010-2015 was 'Good' status. The WFD parameters which contribute to this status and the results for this section of the Dinin River are detailed in **Table 6-2.**

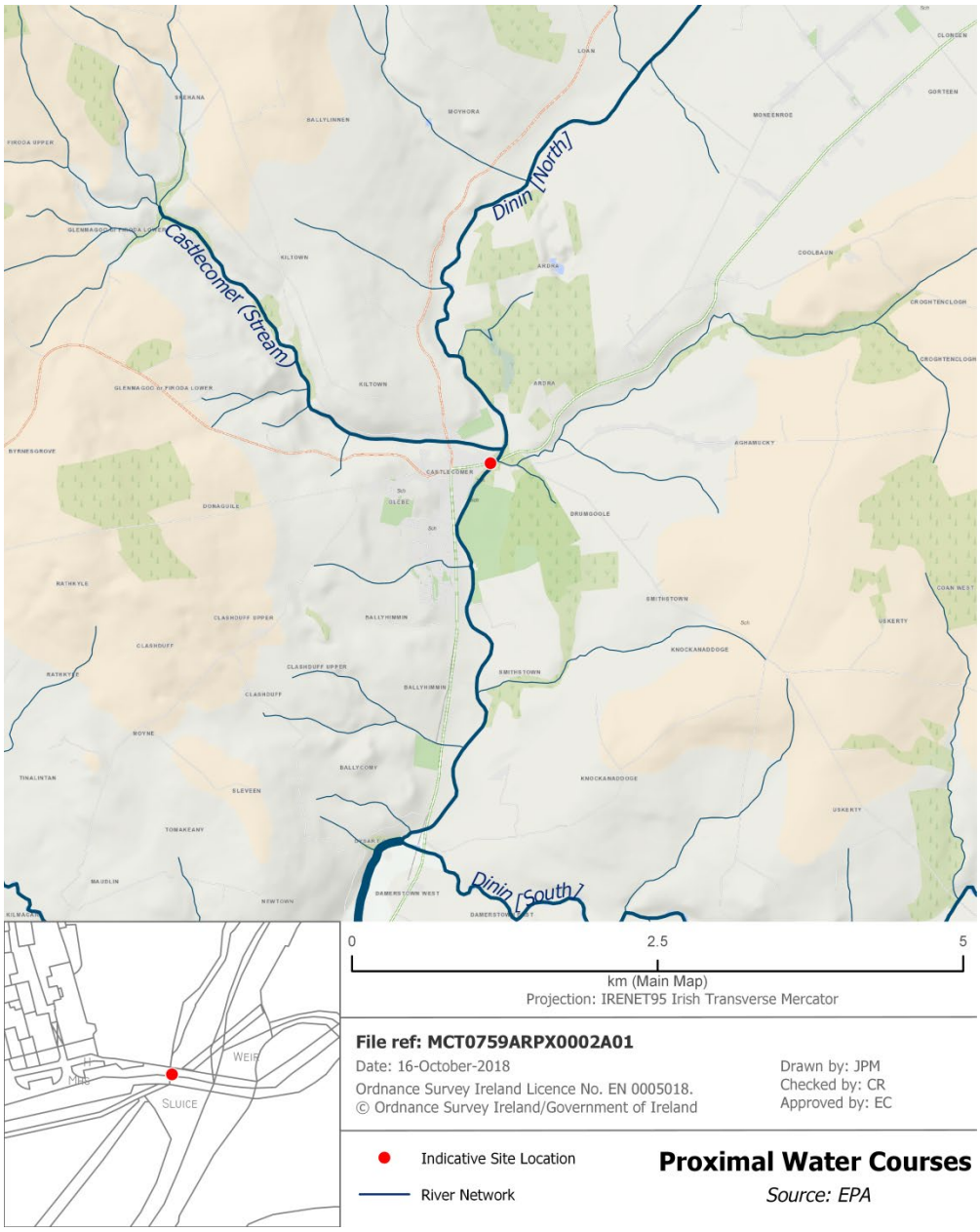
The Dinin (North)_040 risk characterisation is under review, further downstream of the Dinin (Main Channel) 010 *'Not At risk'* of failing to meet the WFD environmental objectives and currently there are no measures in place to improve its water quality to Good status (Areas for Action under the second cycle of the River Basin Management Plan 2018-2021).

Table 6-5: River Water Quality Through Time

EPA Waterbody Name	Code	Risk	WFD Status 2007-2009	WFD Status 2010-2012	WFD Status 2010-2015
Dinin (North)_040	IE_SE_15D020700	In review	Not monitored	Poor	Good

Figure 6-2 shows the proximal watercourses in relation to the proposed works.

Figure 6-2: Proximity to Watercourses

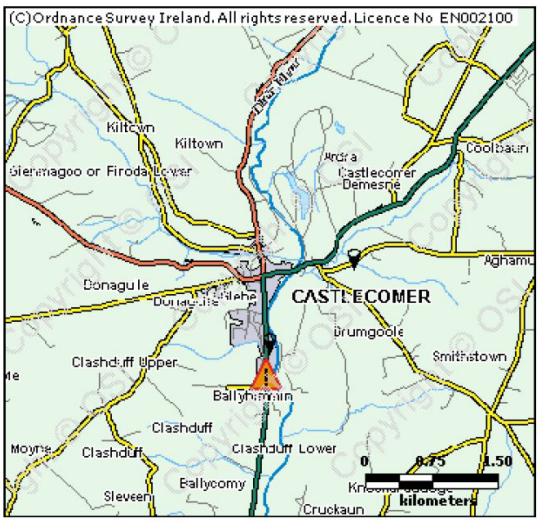


6.6.1.2 Flood Potential

There is a weir located on the River Dinin which runs northeast - southwest direction under the current road bridge. To the immediate north east (upstream) of the bridge the Ardra confluences with the River Dinin and flows under the existing bridge.

The Flood Hazard Mapping website (www.floodmaps.ie) is a record of historic flood events maintained by the OPW. This is not a complete record, but it is useful in identifying areas that may be at risk of flooding. RPS reviewed the data published by the OPW on this website and found that there was one historic flood event to the south of Castlecomer at Ballyhimmin in November 2000. **Figure 6-3** is an extract from the report generated by this website.

Figure 6-3: Flood Events in the Vicinity of the Proposed Works



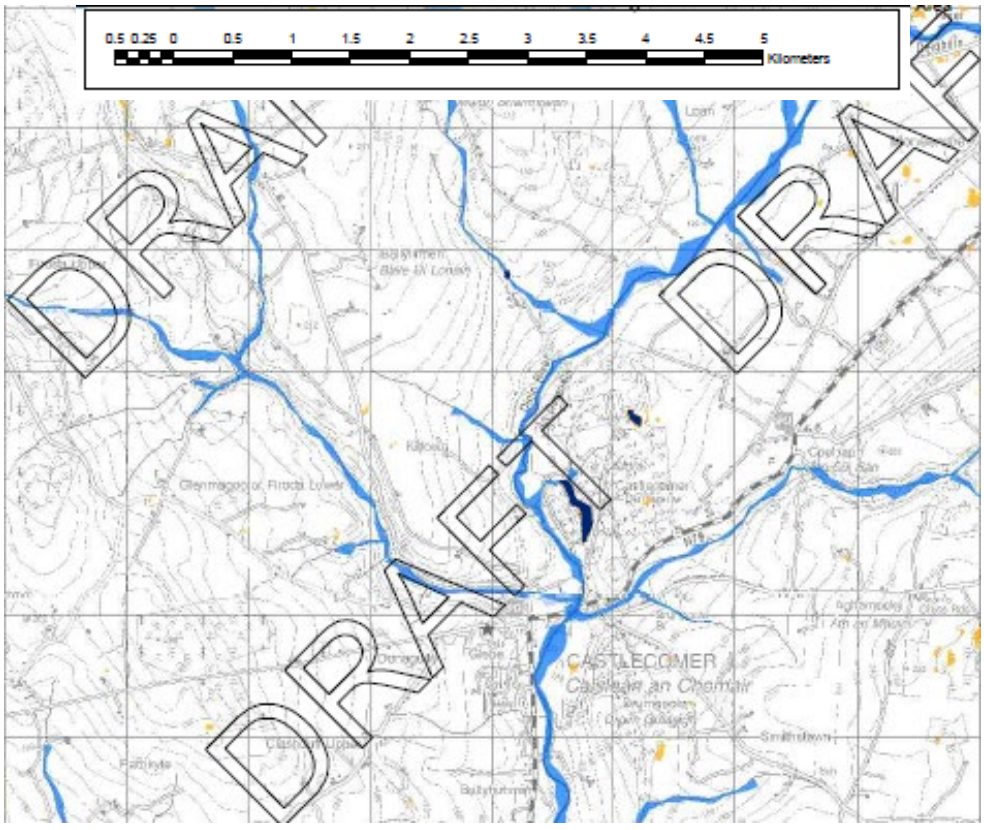
Map Scale 1:62,129

Map Legend	
	Flood Points
	Multiple / Recurring Flood Points
	Areas Flooded
	Hydrometric Stations
	Rivers
	Lakes
	River Catchment Areas
	Land Commission *
	Drainage Districts *
	Benefiting Lands *

* Important: These maps do not indicate flood hazard or flood extent. Thier purpose and scope is explained in the Glossary.

The CFRAM (Catchment Flood Risk Assessment and Management) programme is a national programme which produced a series of Preliminary Flood Risk Assessment (PFRA) which cover the entire country, see http://www.cfram.ie/pfra/interactive-mapping/. The PFRA mapping published for the Castlecomer area was reviewed to identify areas that may be at risk of flooding. **Figure 6-4** is an extract from the PFRA Figure No. 2019/Map/168/A mapping published for the area. The site is located in an area that is classed as Indicative 1% AEP (100 year) event.

Figure 6-4: Catchment Flood Risk Assessment and Management Mapping



6.6.2 Potential for Significant Impact - Construction Phase

The site investigation, pre-construction and the main construction works will all require bunding on the eastern bank of the river extending out to the first pier on the existing bridge to allow bore holes to be drilled. There is potential for a slight negative temporary impact associated with sediment entering the river.

A temporary access will span the Ardra stream and a solid plastic pipe(s) below the access bridge shall allow water to flow from the tributary to the main river, this will ensure no construction material enters the river. The temporary access will enable works to the eastern abutment and works to the pier to take place. This will change the hydrological regime and has the potential to result in reduced flows and increased siltation.

There is potential during construction works for sediment/concrete from the various works, such as drilling, piling, shuttering, concrete works and waterproofing to enter the watercourses and to reduce the water quality. General good practice site management measures as outlined in the CEMP will be implemented throughout the works areas which will minimise the potential for sediment release. The potential for such impacts arising thereafter is considered slight adverse and temporary.

There is potential for accidental spillage of oils, fuel, chemicals, hydraulic fluids etc. from the construction machinery to enter the neighbouring waterbodies. To minimise the potential for such impacts to arise the Contractor will be required to set up a site compound on the site and will be required to adhere to measures specified in the outline CEMP for the safe storage of chemicals and fuelling of plant and machinery. The potential for such impacts arising thereafter is considered slight adverse and temporary.

Excavated material will be reused on site where appropriate with residual material moved off site to a licenced facility in line with measures in the outline CEMP and standard practice. They are not occurring within an area of any particular soil or groundwater sensitivities. No potential for significant impact is identified.

During construction there is potential for sediment from exposed soil or stockpiles to be carried by wind or water and cause pollution or nuisance. The site management will be subject of strict measures outlined in the CEMP and therefore the potential for significant impacts will be avoided.

6.6.3 Potential for Significant Impact - Operational Phase

There is potential for oils, fuel, chemicals, hydraulic fluids etc. from plant and vehicles accessing the footbridge for maintenance. Best practice measures will be implemented to ensure no adverse impacts.

6.6.4 Cumulative Impact

No cumulative impacts are identified in relation to hydrology and drainage.

6.6.5 Conclusion

While there are potential negative construction impacts associated with the works such as changes to sedimentation and hydrological regime, with implementation of the CEMP any residual impacts will be negative temporary and not significant. There will be positive permanent operational changes to the hydrological regime once the works are completed.

6.7 Air, Noise and Climate

The potential for impact on air, noise and climate are previously discussed under the Population and Human Health section. No potential for significant impact is identified.

6.8 Material Assets

6.8.1 Receiving Environment

6.8.1.1 Traffic and Transportation

During the period of construction, it is anticipated that there will be some disruption to the existing N78 due to the construction of the proposed footbridge. There will be disruption to traffic during works at both ends of the bridge to accommodate the alteration to the existing bridge or the provision of a new bridge. It is not considered feasible to close the N78 for an extended period to facilitate the scheme as there is no suitable alternative route. A short duration closure of 48 hours will be required also.

The immediate surrounding environment is located east of the town of Castlecomer, generally built up on the western side and the Discovery Park to the east. The road bridge serves for passage of the N78 to/from the east/west. There are a number of residential properties in the vicinity of the bridge which are accessed from the N78. In addition, the N78 serves access to the town of Castlecomer.

6.8.1.2 Services and Utilities

There are a number of know utilities in the vicinity of the bridge including buried Eir Services, buried watermain, overhead electrical lines feeding the lighting columns east and west of the existing bridge.

6.8.2 Potential for Significant Impact - Construction Phase

6.8.2.1 Traffic and Transportation

During the construction period there will be a minor increase in traffic volumes on the local road network as a result of employees travelling to and from the site, construction/delivery trucks and trucks removing/disposing of waste and excess excavated material. There will also be restrictions on traffic flow on the road network when the road closure is in place. All restrictions will be carried out in accordance with traffic management measures to be agreed by the Contractor with KCC prior to the commencement of the development. These impacts have potential to cause delays and inconvenience to local road uses. The impacts will be short term and the majority of the construction activity will be restricted to normal working hours as set out in the outline CEMP and the TMP to be prepared by the Contractor. Combined with measures specified in the TMP this will ensure that residual impacts then are slight, short term and temporary.

It is anticipated that the local road network will also be physically capable of accommodating construction trucks with no mitigation works necessary. A crane will be necessary for the installation of the bridge and will be placed on the existing bridge. This activity will take place during the 48-hour road closure.

The construction traffic may have negative impacts on the local road surface. Any damage caused however will be made good on completion of the works and the road reinstated to its preconstruction condition. No residual adverse impacts are identified.

6.8.2.2 Services and Utilities

Existing services and utilities including buried Eir Services, buried watermain, overhead electrical lines feeding the lighting columns east and west of the existing road bridge. These services will continue to operate during the course of the works. No residual adverse impacts are identified.

6.8.3 Potential for Significant Impact - Operational Phase

6.8.3.1 Traffic and Transportation

There will be traffic associated with the maintenance of the footbridge. This increased level of vehicular activity and human activity is negligible. The works will have no impact on the capacity of

the local road and no access difficulties on the local road network are identified. The road is of sufficient width to accommodate such traffic. No mitigation is required.

6.8.3.2 Services and Utilities

No proposed operational impacts are predicted as a result of the proposed development.

6.8.4 Cumulative Impact

No cumulative impacts are identified in relation to material assets.

6.8.5 Conclusion

The project will see an increase in construction traffic volumes on the local road network and will cause restrictions on traffic flow and impacts will be mitigated through the measures in the Outline CEMP and the TMP and any residual impacts are likely to be not significant to imperceptible, local negative and over a short duration. There will be no significant impacts from the project on traffic due to the maintenance of the footbridge.

6.9 Cultural Heritage

6.9.1 Receiving Environment

John Cronin and Associates produced a report entitled *Proposed Footbridge, Castlecomer, County Kilkenny - Archaeological and Architectural Heritage Assessment* (2019). The assessment included a cultural heritage impact assessment of proposed Castlecomer Bridge.

6.9.1.1 Archaeological Heritage

The report notes that there are no known archaeological monuments located on the direct footprint of the proposed footbridge. The road bridge **is not a recorded archaeological monument**, but it is located within the Zone of Notification (ZON), as designated by the National Monuments Service (NMS), surrounding the historic town of Castlecomer (KK005-082----). The environs of the river have been identified as part of a battlefield site (RMP No. KK005-102---). In addition, the subject site is also located within the wider environs of an earlier 1641 Confederate conflict centred on 'the Garrison' or Castle located c. 155m to northwest of the subject site. The recent archaeological discovery of the remains a Bastion fort (RMP No. KK005-104) located 150m northwest of the current bridge and built to protect the river crossing in 17th century highlights the military and strategic significance of the bridge and its environs to the historical development of the town. There is a 16th/17th century house (KK005-081----) located 90m to the south east of the bridge. A Bastioned fort (KK005-104----) is located 150m to west of the bridge. Historical sources also attest to the presence of buildings destroyed during the 1790 battle on both sides of the bridge and sub-surface remains of these structures may survive.

6.9.1.2 Architectural Heritage

The road bridge is listed as a protected structure in the Record of Protected Structures (RPS Ref. no. D13) published in the current Kilkenny CDP (2014-2020). A further 17 protected structures are also listed within the study area.

The bridge is rated as being of **national importance** in the National Inventory of Architectural Heritage (NIAH no. 12301001) survey of bridges and other historic structures in County Kilkenny. There are a number of other NIAH buildings within the study area. The majority of these designated structures are located within the streets of the town and none are located within 30m of the bridge structure. The bridge is located outside the Castlecomer Architectural Conservation Area (ACA).

6.9.1.3 Excavations

The Excavation Database contains summary accounts of licensed archaeological investigations carried out in Ireland (North and South). A total of seven programmes of licenced archaeological investigations have been undertaken within the environs of Castlecomer town. There are no entries

for any licensed archaeological underwater surveys within the river channel and the most significant discovery in the area was a bastion fort uncovered at the Avalon Inn property within the town (Licence 16E0631). This has been designated as a recorded archaeological site (KK005-104----) and is located approximately 150m to the west of the bridge.

6.9.2 Potential for Significant Impact - Construction Phase

6.9.2.1 Archaeological Heritage

The proposed project will have no predicted impacts on any recorded archaeological sites. However, it is located within the Zone of Notification for the historic town of Castlecomer (KK005-082---) and forms part of the battlefield of a military engagement during the 1798 rebellion which has been designated as a recorded archaeological site (KK005-102----). The archaeological potential of the Castlecomer battlefield, including the areas within the environs of bridge is considered high.

Riverine crossing areas have the potential to contain the remains of earlier bridge or fording features as well as stray archaeological artefacts. Riparian settings are also suitable topographic locations for the site of Bronze Age *fulachta fia*. The potential therefore exists for the presence of features and artefacts associated with the battlefield site and other archaeological activity within the environs of the project area. The creation of landing areas for the new footbridge on the eastern and western side of the river, coupled with the pier to be situated on an islet in the river, have potential to result in direct negative impacts on any such archaeological features should they be present.

With implementation of mitigation measures outlined the outline CEMP the impacts will not be significant.

6.9.2.2 Architectural Heritage

The new footbridge has been designed to avoid any direct impacts on the fabric and architectural form of the existing protected bridge. The new footbridge is of a high-quality contemporary form and is clearly legible as a modern intervention. This approach is wholly consistent with the conservation principles espoused in the *Architectural Heritage Protection Guidelines* (DAHG, 2011). The design is in line with the development management standard for architectural conservation areas (ACA) outlined in Kilkenny CDP 2014-2020 which is to "*encourage high quality, contemporary design and materials where appropriate when new buildings are being introduced in to an ACA and the retention of the historical scale and plot size*".

Notwithstanding the design adopted the proposed footbridge will have an *indirect, slight negative impact* on the setting of Castlecomer Bridge however it will not give rise to direct impact on original fabric of note.

While the proposed pedestrian bridge will not be attached to the existing bridge structure, sections of the western and eastern approach walls on the northern side of the bridge will have to be removed to create access to the new independent pedestrian bridge. The proposed landing area on the western side of the river will be created on a small triangular parcel of the roadside ground within the garden of La Rive, No. 16 High Street (a protected structure). The land parcel will be acquired for the purpose of:

- Creating a new access through the existing masonry boundary wall.
- Creation of an access ramp and a new masonry wall between the existing roadside masonry gate pier and river.
- Provision of steel security mesh fencing 2.4m high between end of the new bridge and the existing riverside wall on new low-level wall.

The section of existing roadside masonry to be removed to facilitate the pedestrian connection is in relatively poor condition with a large concrete capping and it has likely been truncated to create present timber-sheeted gate which has stone-tiled concrete piers and appears to date from c.2000. East of the section to be removed, the existing wall height will be reduced in height to allow for

passive surveillance; the wall will be reduced to an earlier parapet height as defined by a row of vertical coping stones. This will result in a neutral impact as it will involve the removal of a portion of walling that is clearly not original to the construction of the bridge or the approach walls associated with same. Overall, the impact on the curtilage of La Rive, No. 16 High Street (Protected Structure) is considered to be a direct, moderate negative impact.

The proposed pedestrian bridge will not directly impact on the weir structure within the section of the channel on the north side of the bridge or the millrace to the southwest. However, the new footbridge will give rise to an indirect, slight negative impact on the setting of the weir.

The proposed development of a two-span bridge with an intermediate support between abutments allows for a reduced structural depth which in turn reduces the visual footprint of the structure on elevation albeit the provision of the pier will impinge on the view of the pier of the existing bridge. Therefore, the proposed visual impact on the existing bridge will be negative but slight in significance.

6.9.3 Potential for Significant Impact - Operational Phase

No operational impacts of the works are predicted on cultural heritage.

6.9.4 Cumulative Impact

No cumulative impacts are identified in relation to cultural heritage.

6.9.5 Conclusion

While there is the potential to discover unknown finds during the excavation works associated with the project. Mitigation measures outlined in the outline CEMP will ensure there are no residual significant impacts on archaeology during the construction phase.

6.10 Landscape and Visual

6.10.1 Receiving Environment

RPS carried out a Landscape and Visual Impact Assessment (LVIA) in June 2019. The purpose of the LVIA was to identify, describe and evaluate potential impacts and effects arising from the proposed development on the landscape and visual receptors in the study area. The LVIA assessment process commenced with documenting the baseline, which included providing descriptive data on the existing landscape and its constituent elements, fabric, and character and the baseline visual amenity as experienced by different groups of people located within the study area. Subsequently a site visit was conducted on 31st May 2019 and a report entitled "*Castlecomer Footbridge Landscape and Visual Appraisal"* was produced. The landscape and visual receptors documented in the baseline section of the LVIA were then evaluated in terms of their sensitivity. The following sections provide a summary of the baseline as set out in the LVIA under the headings of Landscape and Visual.

6.10.1.1 Landscape Character / Designations

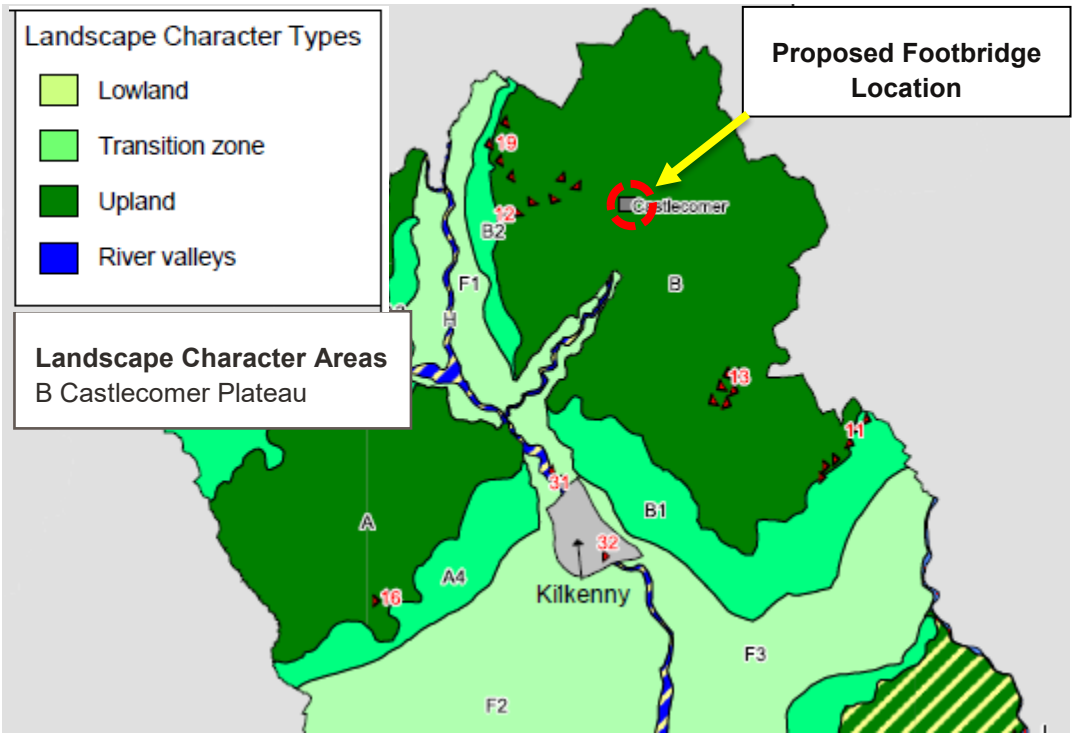
The LVIA noted that the site of the proposed footbridge is located close to the eastern edge of the urban area of Castlecomer town. The main elements in the landscape of the study area comprise the built-up area associated with the eastern edge of Castlecomer town and the wooded open space associated with the Castlecomer Discovery Park featuring a range of active recreation facilities. The N78 extends in a broadly east west direction. An extensive enclosed wooded area associated with Sawney's Wood is located immediately south of the N78 and the site of the proposed footbridge. Further east, the site of St. Mary's church of Ireland and graveyard is located on slightly elevated ground as a focal point in the area. The north eastern bank of the River Dinin features a wooded area with woodland paths and picnic sites associated with the Castlecomer Discovery Park close to and within viewing distance of the old stone bridge which presents as a focal point.

The site of the proposed footbridge lies within the Castlecomer Plateau Landscape Character Area according to the Kilkenny County Landscape Character Assessment (2003) (which formed Appendix C of the Kilkenny CDP 2008-2014). The Castlecomer plateau comprises an elevated landscape

between the River Nore and River Barrow Valleys. The plateau and wooded environs form the setting of the town of Castlecomer and as a landscape in its own right, it is considered to be of *significant value and highly sensitive to change.*

An extract from Figure 8.2 of the Kilkenny CDP is seen in **Figure 6-5** below.

Figure 6-5: Landscape Character Types and Area – Kilkenny CDP 2014-2020



The Kilkenny CDP refers to landscape designations, namely '*Areas of Highly Scenic and Significant Visual Amenity Value'* and *'Areas of Greater Sensitivity.'* There are no such designated landscapes within the study area.

6.10.1.2 Trees and Woodlands

Trees and woodlands which are the subject of a Tree Preservation Order (TPO) under the Planning and Development Act 2000 as amended are designated as such for the amenity value and cannot be felled without planning permission. Hedgerows are afforded protection under the Wildlife Act 2000 as amended and whilst designated for their biodiversity value, they are also key features that contribute to landscape character. The Kilkenny CDP and Castlecomer LAP contain policies for the protection of trees. The LAP refers to *'Protected tree stands on Castlecomer golf course (creamery house behind). A Tree Preservation Order (TPO) currently applies to an area of Sawney's Wood/Hill (TPO 1/67 – See Fig 6.8) both of which are located to the south of the proposed bridge. The TPO comprises of 41 individual trees, four tree groupings and an area of specified woodland. The trees comprise a mixture of deciduous trees and conifers with species including beech, ash, cedar, oak and sycamore.'*

6.10.1.3 Designed Landscapes

Castlecomer House features in the inventory of gardens and designed landscapes held by the NIAH and includes lands located to the north and south of the N78 road and the site for the proposed footbridge. The site extents today feature contemporary land uses which have replaced many of the features associated with the historic parkland. The Castlecomer golf course and Sawney's wood are located south of the site and the Castlecomer Discovery Park, and woodland walk (The Castlecomer Loop) are located to the north. Much of the woodland associated with the original demesne has been replaced by commercial forestry.

6.10.1.4 Castlecomer Architectural Conservation Area (ACA)

The town of Castlecomer is a designated Architectural Conservation Area (ACA), the eastern boundary of which is located c. 100m from the site of the proposed footbridge.

6.10.1.5 Visual (Views and Prospects)

Consultation with Kilkenny CDP reveals there are no designated views and prospects within the study area. The closest of these is view V12 located c. 1.7km north west of the site for the proposed development. This is described as '*V12. Views overlooking Castlecomer and Ballyragget on the Castlecomer/Ballyragget Road (R694) between its junctions with road no.s. LT5852 and LT5847'* The application site is screened from view by intervening vegetation.

The LVIA notes that the receptors with existing views of the area and proposed views of the new bridge comprise road users, pedestrians and recreational visitors at a small number of locations within the study area as seen in **Table 6-6**. The influence of the mature wooded vegetation around Castlecomer generally is such that visibility of the application site is very limited.

Table 6-6: Visual Receptors

ID	Location	Viewer Types	Description of Existing View
A	Eastern edge of Castlecomer Town	Road users Pedestrians approaching Castlecomer Town	Views are available of the existing N78 road and heavy traffic. The stone bridge crossing including stone approach walls, stone arches and parapets is clearly visible together with part of the wooded river setting. Glimpse views of Castlecomer Town are available in the distance.
B	Castlecomer Discovery park	Recreational users of the picnic area in Castlecomer Discovery Park	Views are available of the River Dinin and woodland setting. The stone arched bridge crossing presents as a focal point in the existing view.
C	St Mary's Church	Visitors	Distant views of the existing N78 bridge crossing are available albeit with a busy road and on street car parking facilities in the foreground. These views are attained against the backdrop of Castlecomer Town in the distance.
D	Western edge of Castlecomer Town	Residents of Dwelling Road users	Views are available of the existing N78 road and heavy traffic. The stone bridge crossing including stone parapet walls are clearly visible along with mature trees. Timber double gate entrance clearly visible in the foreground.
E	Existing bridge over River Dinin	Recreational walkers	Views in a northerly direction of the River Dinin and mature riverside woodland and open space picnic site at Castlecomer Discovery Park.

6.10.2 Potential for Significant Impact - Construction Phase

During construction, small areas of woodland and scrub on western and eastern banks of the river would be lost. A relatively small amount of grassland along the river bank would also be lost. The vegetation clearance would be followed by bridge construction works during which, a range of temporary structures including bunds and temporary access bridge over the Ardra stream would be introduced into this landscape along with the presence of moving plant and machinery. These activities are expected to last 6 months after which, the landscape would be restored. These direct changes to the landscape during construction represent a very minor alteration to key elements, namely loss of riverside vegetation which would be discernible only in the landscape immediately surrounding the works. Due to the nature of the change, being very small in scale and of short-term duration (6 months), significant effects on the character of the landscape surrounding the site and the wider setting of the town and on visual amenity experienced by viewers within the study area are not expected to arise.

Mitigation measures proposed in the LVIA for the construction stage include implementation of measures set out in *BS 5837 Trees in Relation to Design, Demolition and Construction – Recommendations* are included in the outline CEMP and will be implemented by the Contractor.

6.10.3 Potential for Significant Impact - Operational Phase

The operational phase effects on landscape are discussed in terms of direct changes to the landscape and indirect effects on surrounding landscape character within the 1km study area under the following headings.

6.10.3.1 Landscape Character / Designations

With regards to the Castlecomer Plateau LCA designation direct changes would occur to the landscape of the site on the River Dinin at the eastern edge of Castlecomer within the wider context of the Castlecomer Plateau LCA. These changes relate to the introduction of a new permanent footbridge. The change would be apparent in the landscape only in the immediate vicinity of the proposed footbridge due to the visual screening provided by woodland cover in the study area generally along with the built-up area of Castlecomer.

The Castlecomer Plateau LCA is considered to be of significant value and highly sensitive to change according to the Kilkenny CDP. The scale of the proposed changes comprising loss of a very small area of woodland and introduction of a new bridge which would be apparent only from the immediate vicinity of the river crossing is such that the magnitude of impact is expected to be negligible resulting in a minor and not significant impact on the Castlecomer Plateau LCA where this occurs within the study area.

6.10.3.2 Trees and Woodlands

No effects are predicted to arise to the protected woodland associated with Sawney's Wood or Castlecomer Golf Club.

6.10.3.3 Designed Landscapes

The proposed footbridge would be located within the boundary of the Castlecomer Demesne, in a part of the site which features woodland trails and picnic areas associated with the Castlecomer Discovery Park. As the demesne is much altered with much of the original woodland replaced with commercial forestry and featuring various activity structures associated with its current recreational use. It is considered to be tolerant of the scale and nature of the change proposed and consequently of low sensitivity to the proposed change.

The proposed footbridge will be apparent only from the picnic area in the immediate vicinity and will be screened from view from the wider demesne area (now Castlecomer Discovery Park) by woodland and commercial forestry. A negligible magnitude of impact is predicted resulting in a negligible to minor and not significant effect.

6.10.3.4 Castlecomer Architectural Conservation Area (ACA)

Significant effects on the setting of the Castlecomer ACA are not predicted to arise. The proposed change would be apparent only from the eastern edge of the ACA at a distance of 0.3km. Slight changes in terms of very small amounts of mature vegetation losses and the introduction of the pedestrian access opening along the existing parapet stone wall of the existing bridge would be scarcely apparent from the ACA in the context of the busy N78 road.

6.10.3.5 Visual (View and Prospects)

Effects on visual amenity at selected viewpoint locations as set out in the LVIA are presented below. An evaluation of sensitivity at each viewpoint location is presented is seen in **Table 6-7**.

Table 6-7: Visual Receptor Sensitivity

ID	Evaluation	Sensitivity Ranking
A	Road users are of low sensitivity as the view is incidental to the journey.	Low
A	Pedestrians approaching Castlecomer Town are of high sensitivity as the surrounding landscape is an important part of the experience and the existing view is of some value owing to the scenic quality.	High
B	Recreational users of the picnic area in Castlecomer Discovery Park are of high sensitivity as the surrounding landscape is an important part of the experience and the existing view is of some value owing to the scenic quality.	High
C	Recreational visitors at the entrance to St Mary's Church of Ireland are of high sensitivity as the surrounding landscape is an important part of the experience and the existing view is of some value owing to the scenic quality.	High
D	Residents of dwelling are of high sensitivity due to continued and proprietary interest in their surroundings and the existing view is of some value owing to the scenic quality.	High
E	Recreational walkers are of high sensitivity as the surrounding landscape is an important part of the experience and the existing view is of value owing to the scenic quality.	High

In addition, the magnitude of impact at each viewpoint is discussed below. Magnitude of impact is determined with reference to the size and scale, geographical extent and duration/reversibility of the proposed change. Finally, the significance of visual effects at each viewpoint is documented.

At viewpoint A, viewers would see the pedestrian access to the proposed footbridge. This would be seen as an opening or gap in the stone wall approach to the existing bridge crossing. It is expected that the stonework would be reinstated such that the access would be present as a new feature that is consistent with the character of the area. Viewers would also attain partial views of the proposed bridge against the wooded riverine backdrop. In this regard a medium magnitude of impact is predicted to arise. This would result in a minor and not significant effect for road users of low sensitivity and a moderate to major significant effect for pedestrians of high sensitivity approaching Castlecomer Town.

At viewpoint B, recreational viewers at the picnic area would experience considerable change to the existing view. The proposed footbridge would be clearly visible at short range as a new structure including stone abutments, central pier and bridge with a light railing (handrail) parapet. The proposed footbridge will be visible, in front of the existing stone bridge. It will partially obstruct views of the parapet of the original bridge however the stone arches will be clearly visible below the line of the proposed pedestrian bridge deck. In this regard, the proposed structure with its central pier and symmetrical arrangement has been designed to minimise visual conflict with the existing stone bridge and to present as a light and aesthetically pleasing structure with colour renders including green to complement the wooded context. The magnitude of impact is considered to be large due to the change to one of the key elements in the existing view, namely the introduction of the proposed bridge. A major to substantial and significant effect is predicted to arise for the recreational viewers of high sensitivity at the picnic site.

Due to the efforts to design a structure that is sympathetic with its surroundings, the proposed footbridge may be viewed as either an adverse or a beneficial visual change from both viewpoints A and B. In this regard the moderate to major significant visual impact and viewpoint A and the major to substantial visual impact at viewpoint B could be deemed to be beneficial, adverse or neutral dependant on the viewer.

At **viewpoint C**, elements of the proposed change, namely the new pedestrian access, would be partially visible as a very small element in the distance. A negligible magnitude of impact is predicted to arise to viewers of high sensitivity resulting in a minor and not significant effect.

At **viewpoint D**, the proposed bridge access on the western side would be clearly visible in the foreground adjacent to the double gate entrance. This would be present as an opening in the existing

stone parapet wall with timber surfacing along with new parapet wall faced in matching stone. New and reinstated parapet walls in the vicinity of the pedestrian access would be faced in stone to match existing. A medium magnitude of impact is predicted to arise to residents of high sensitivity resulting in a moderate to major and significant visual impact. Due to the efforts to design a structure that is sympathetic with its surroundings, the proposed footbridge may be viewed as a beneficial, adverse or neutral change dependant on the viewer.

At **viewpoint E**, recreational walkers will clearly see the new footbridge in the foreground in the context of the existing view of the River Dinin framed with woodland. The proposed bridge would be clearly apparent but would not intrude upon the existing view of the river because the parapet would be below eye level, i.e., the viewer would have to look down towards the riverbed to see the proposed footbridge. The footbridge would be visible however at short range albeit designed in sympathy with its immediate context. A large magnitude of impact is predicted to arise to recreational walkers of high sensitivity resulting in a major to substantial effect. Due to the efforts to design a structure that is sympathetic with its surroundings, the proposed footbridge may be viewed as a beneficial, adverse or neutral change dependant on the viewer.

The assessment concludes that views of the proposed change would be attained only at locations in very close proximity to the site due to screening afforded by mature woodland and the built up area of Castlecomer. In general, viewers would experience notable changes to the existing view at short range. Such changes could be viewed as adverse, beneficial or neutral owing to the efforts to design the bridge as an aesthetically pleasing structure which is sympathetic to the surrounding context.

Operational measures include design of the bridge which has taken consideration of landscape and visual amenity together with the setting of the existing bridge. These relate to the structure itself as well as the colour finish.

6.10.4 Cumulative Impact

No cumulative impacts are identified in relation to landscape and visual.

6.10.5 Conclusion

Construction impacts will be very small in scale and of short-term duration (6 months) and are not predicted to have significant effects on the character of the immediate or wider landscape.

Efforts have been made to design a structure that is sympathetic with its surroundings. In this regard the moderate to major significant visual impact at viewpoint A and D and the major to substantial visual impact at viewpoint B and E could be deemed to be beneficial, adverse or neutral dependant on the viewer.

6.11 Interrelationship Between the Environmental Topics

The greater the number of different aspects of the environment which are likely to be affected and the greater the links between the effects, the more likely significant effects may occur.

Impact interrelationships/interactions relate to the reactions between impacts within a project and the interrelationship between impacts identified under one topic with impacts identified under another topic.

The consideration of impact interrelationships and interactions provides an opportunity to consider the overall impacts of a project which might not be immediately apparent.

The most important interaction in this case is that between ecology including the River Barrow and Nore SAC and water quality. It is very important that the development is undertaken in such a manner so as to ensure that water quality of the River Dinin is not unduly harmed. It is considered that the development as outlined contains such safeguards as integral components of the overall project, such as to minimise potential for impact in this regard.

There will also be potential for interrelationships between air, noise and traffic related impacts and human beings as a result of construction stage impacts. However overall these impacts are unlikely to be significant due to the scale of the development proposed and given the protective environmental measures proposed as part of the CEMP to be prepared by the Contractor in agreement with TII which will be implemented as part of the development.

7 CONCLUSIONS

The development, namely that of the proposed footbridge over the River Dinin in Castlecomer was assessed to determine if an EIA is required.

The proposed development does not fall within the threshold of any of the classes of development prescribed by Parts 1 or 2 of Schedule 5 (and Article 93) of the Planning and Development Regulations 2001-2018 and therefore an EIS is not mandatory with reference to section 172(1)(a)(ii) of the Act.

The proposed development was also screened in respect of sub-threshold development based on the criteria set out in Annex IIA and III of the Directive and Schedule of the Regulations. This EIA screening assessment determines that the development is not considered likely to have significant effects on the environment. Therefore an EIAR is therefore not required.

Appendix A

Drawings

KILKENNY COUNTY COUNCIL

KILDARE COUNTY COUNCIL

Eirspan Task Order No. 302 N78, Castlecomer Footbridge

July '19

PLANNING DRAWINGS

DRAWINGS :-

MCT0759PL0100-01	INDEX SHEET
MCT0759PL0101-01	LOCATION PLAN
MCT0759PL0102-01	PROPOSED OPTION (Sheet 1 of 3)
MCT0759PL0102-02	PROPOSED OPTION (Sheet 2 of 3)
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Sheets: 01 of 1

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Title: INDEX SHEET

File Identifier: MCT0759PL0100 - 01

Status: S4

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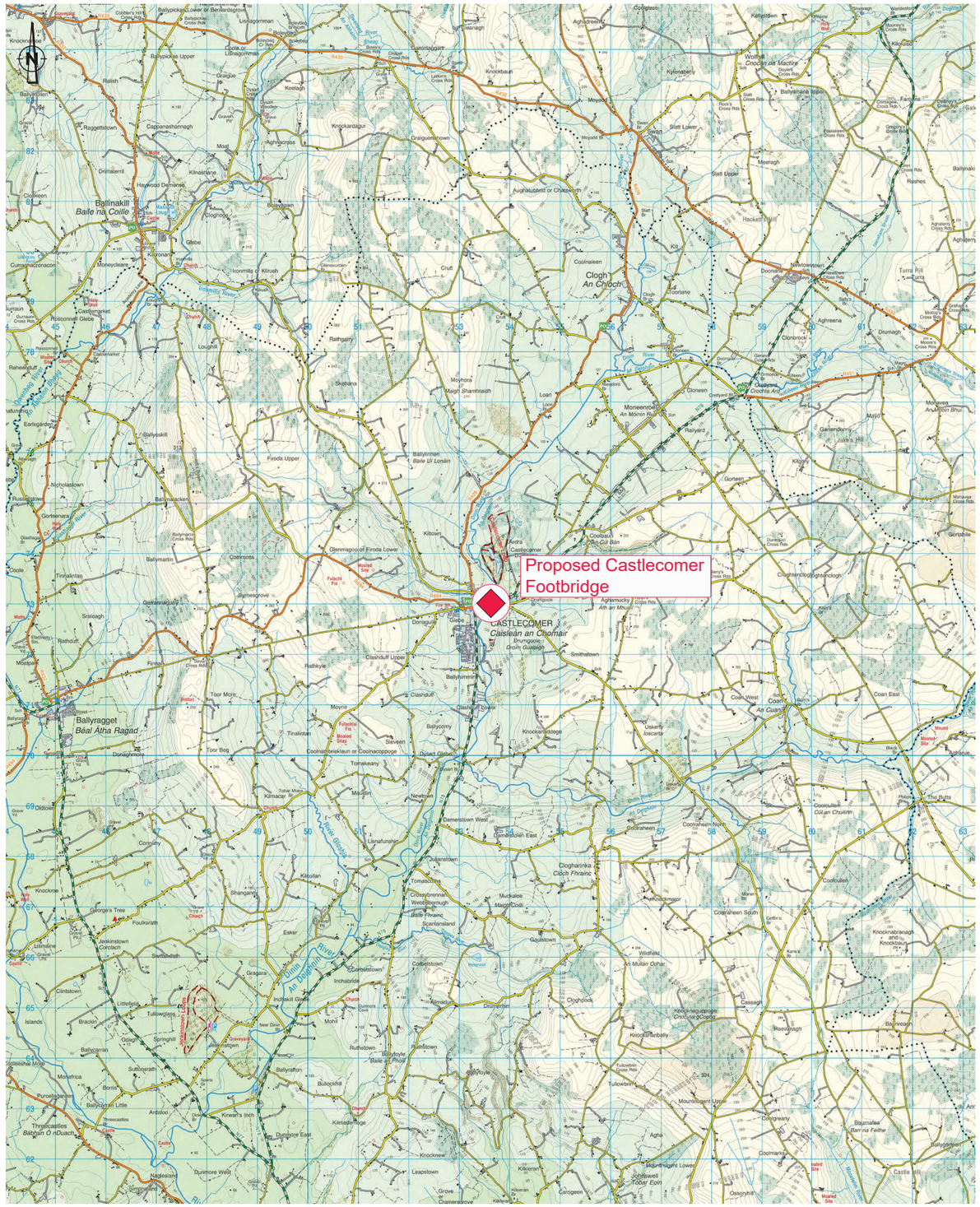

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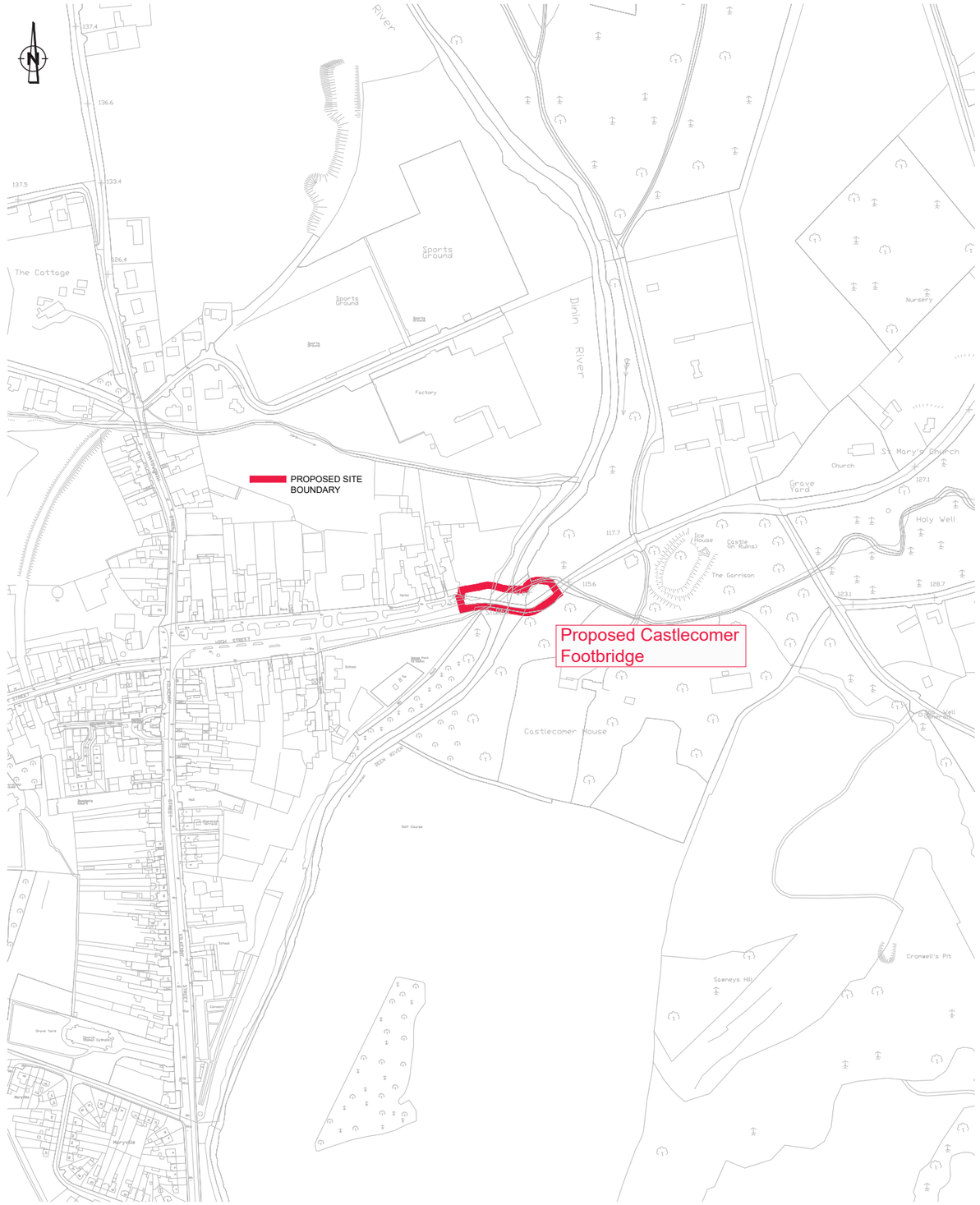

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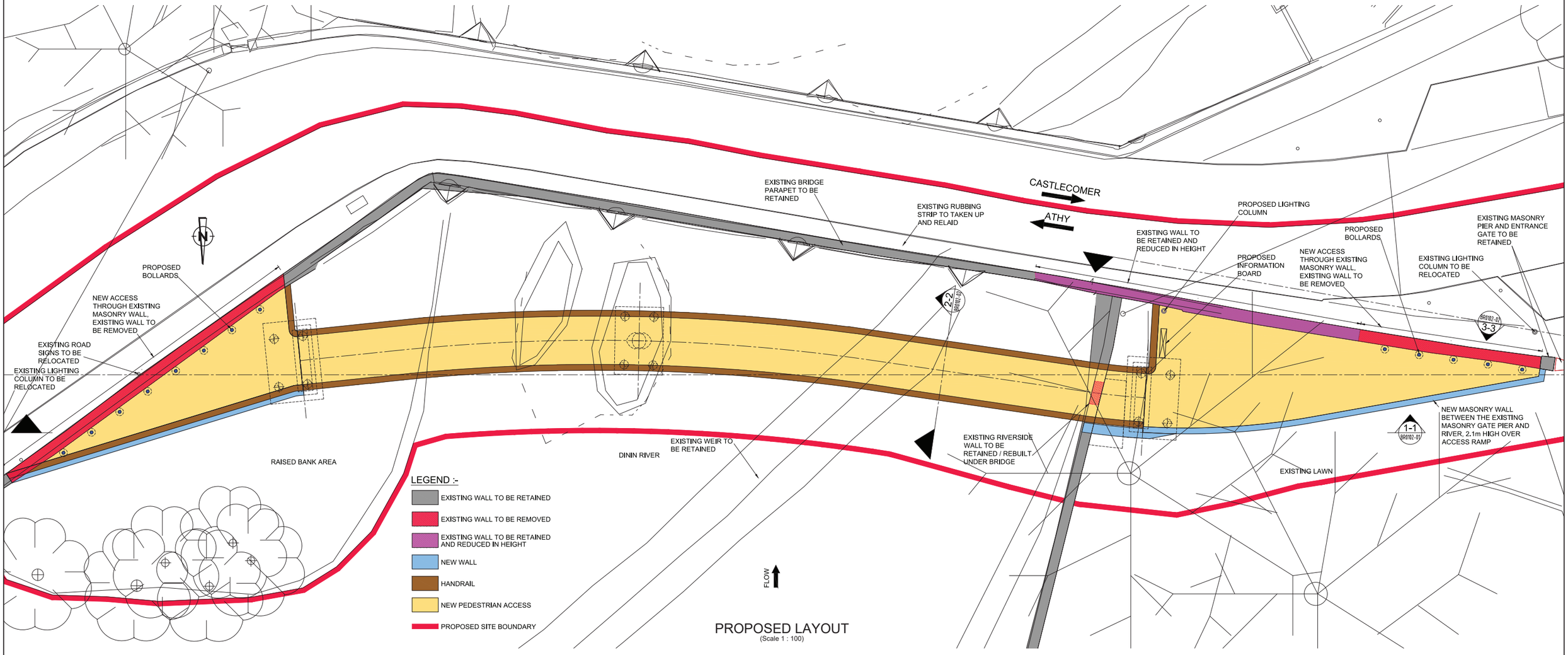
Created on: June 2019	Title: LOCATION PLAN
Sheets: 01 of 1	

File Identifier	Status	Rev
MCT0759PL0101 - 01	S4	P01



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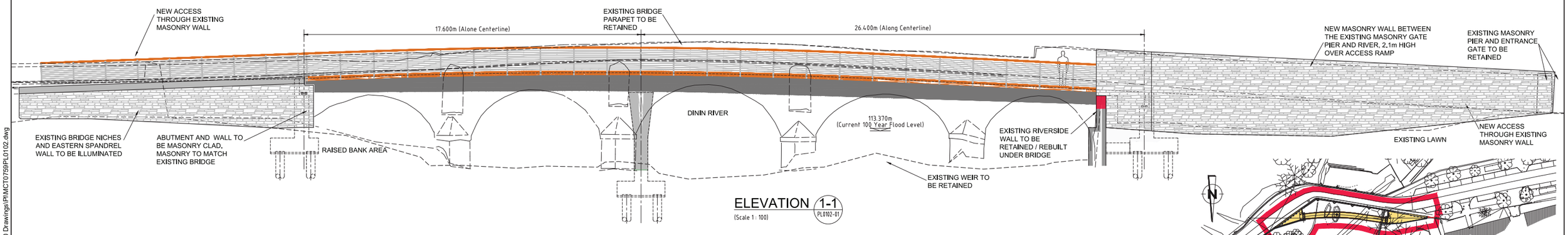

ELEVATION 1-1
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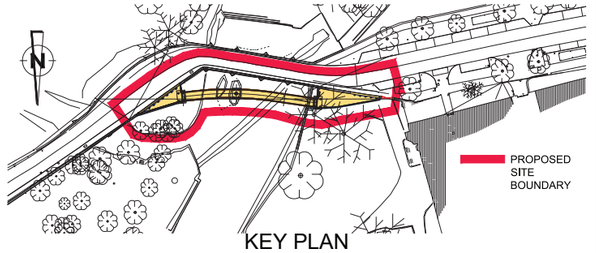
PL0102-01



KEY PLAN
(Scale 1 : 1000)

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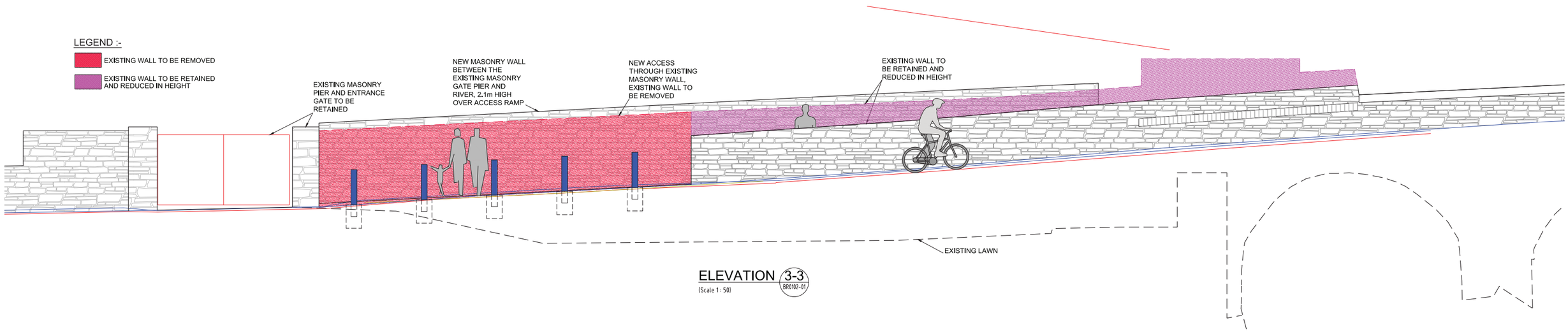
Title	PROPOSED OPTION (Sheet 1 of 3)
Model File Identifier	MCT0759PL0102
File Identifier	MCT0759PL0102 - 01
Status	S4
Rev	P01

LEGEND :-

EXISTING WALL TO BE REMOVED

EXISTING WALL TO BE RETAINED AND REDUCED IN HEIGHT



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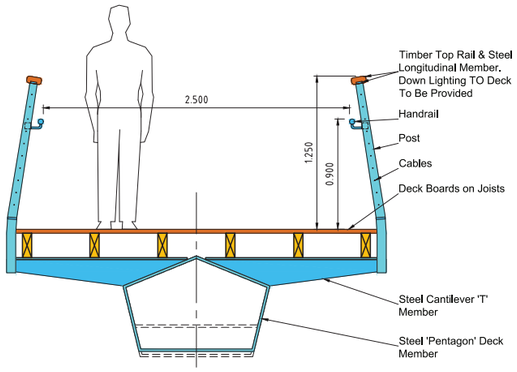

SECTION 2-2 (PL0102-01)

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PHOTOMONTAGE 1 PROPOSED OPTION

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N78, Castlecomer Footbridge

Title: PROPOSED OPTION
(Sheet 3 of 3)

File Identifier: MCT0759PL0102 - 03
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Rev: P01

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Appendix B

Invasive Alien Species Management Plan for Castlecomer Footbridge

Invasive Alien Species Management Plan for Castlecomer Footbridge

July 2019

Prepared by: INVAS Biosecurity
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Rev	Date	Details	Prepared by	Checked by	Approved by
1	July 2019	IAS Management Plan	Dr. William Earle (Biosecurity Manager)	Tom Donovan (Director)	Prof Joe Caffrey (Director)

Table of Contents

1. INTRODUCTION

At the request of RPS Group, INVAS Biosecurity (INVAS) was commissioned to carry out a follow up invasive alien species (IAS) survey and provide supporting information to facilitate the construction of a pedestrian bridge adjacent to the N78 near Castlecomer. An Outline Invasive Species Management Plan prepared by RPS has highlighted several infestations of IAS in the works area of the proposed pedestrian bridge.

1.1. Project Background

The project will consist of vegetation removal, excavation, piling, pouring of concrete, input of fill for embankments and installation of bridge sections. To date no groundworks have taken place at this location. The Outline IAS Management Plan (RPS, 2019) raises specific concerns in relation to infestations of Japanese knotweed (*Fallopia japonica*), Cherry laurel (*Prunus laurocerasus*) and Canadian pondweed (*Elodea canadensis*) detected in close proximity to the north side of the existing bridge and within the River Barrow and River Nore SAC.

1.2. Legal Requirements and Implications for Management

Japanese knotweed is subject to restrictions under Regulations 49 and 50 (the latter not currently commenced) of the European Communities (Birds and Natural Habitats) Regulations 2011 (SI No. 477), being listed in the Third Schedule (Part 1) of this legislative Act. Soil taken from a place that is infested with Japanese knotweed (vector material) is also restricted under Part 3 of this Third Schedule. The law relating to Japanese knotweed is primarily contained in Regulation 49 (2), which states that it is an offence to 'allow or cause to disperse' plants listed in the Third Schedule, of which Japanese knotweed is one. As such, any Japanese knotweed plant material or contaminated soil that is to be removed from an infested site can only be done so under a licence issued by the National Parks and Wildlife Service (NPWS).

1.3. Objectives

The aim of this Management Plan is to provide further detail on the extent of IAS and the recommendations proposed in the Outline Management Plan. It sets out a detailed methodology for the management of IAS including measures to protect the adjoining watercourse and

outlines biosecurity measures that must be implemented to prevent the spread of IAS beyond their current distributions.

2. SURVEY RESULTS

The survey was conducted on the 24th May 2018 by INVAS Biosecurity personnel. Survey points were recorded using a Garmin® GPSmap78 at a height of one meter. Points were recorded at 0.5-meter intervals around the perimeter of the infestation and where the accuracy of the survey was not impacted the interval spacing was increased. An SUAV survey was not carried out at this time due to the presence of mature trees and the proximity to a live road. Digital photographs were taken at each site to show the full extent of the IAS infestation at each location. Survey observations and photographs illustrating each IAS infestation have been provided in the following sections of this document.

2.1. Japanese Knotweed

The Japanese knotweed infestations were recorded growing in two main areas north of the N78 bridge (Figure 2.1). The first dense infestation of *circa*. 60m² is the site identified in the Outline Management Plan document, located on the bank of the river Dinin extending about 2 meters from the water's edge (Plate 1). The herbicide management carried out in October 2018 has achieved a good level of control with some small sporadic regrowth throughout the infestation (Plate 2). The Japanese knotweed infestation has resulted in the erosion of soils at this point on the riverbank and left exposed rhizomes in this area (Plate 3). These rhizomes are inherently brittle and may become detached following flow action by the river or other interference. This would increase the risk of spread of Japanese knotweed to suitable habitat further downstream. The second infestation comprises of just two small plants growing at the base of the wall circa 8 meters away from the main infestation (Plate 4). These plants were growing beneath dense vegetation and were not observed or treated with herbicide in October 2018.

Plate 1: The large infestation of Japanese knotweed at the N78 bridge near Castlecomer in May 2019.

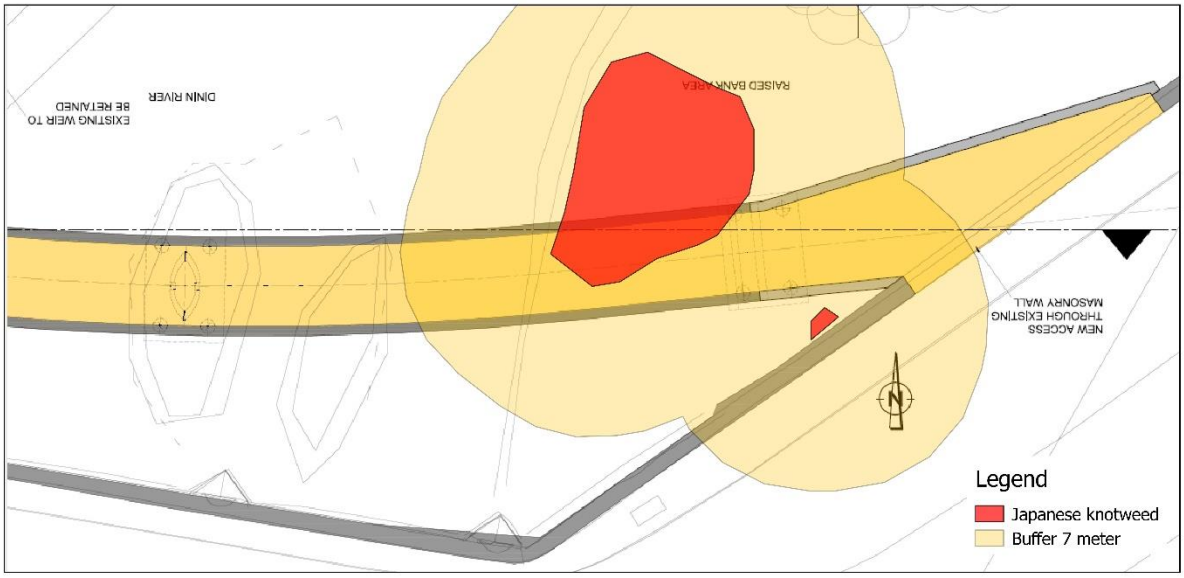

Figure 2.1: An extract from the proposed layout drawing with the location of Japanese knotweed infestations at the N78 bridge near Castlecomer in May 2019.

Plate 2: Some of the minor regrowth of Japanese knotweed among native vegetation at the N78 bridge near Castlecomer in May 2019.

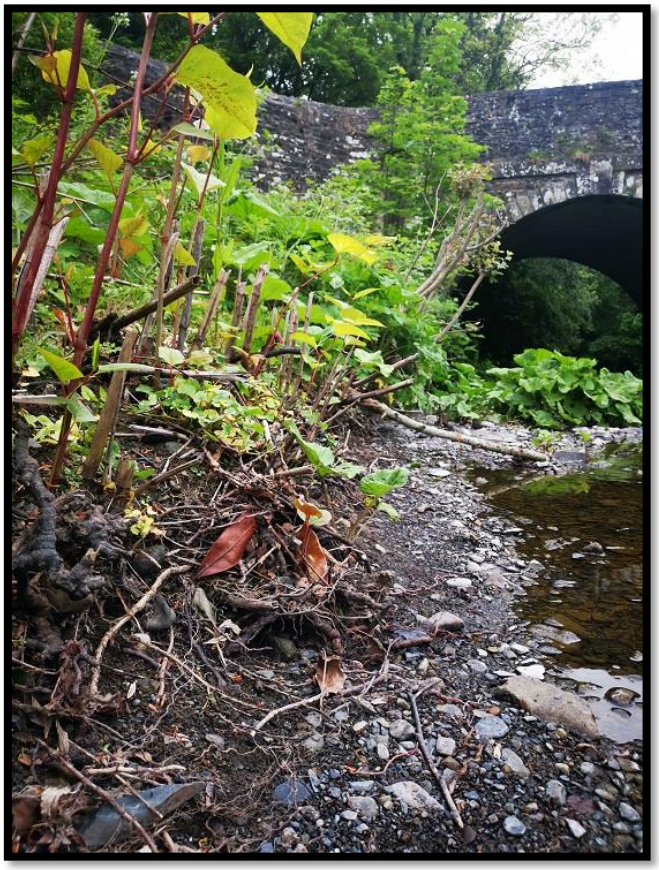

Plate 3: Exposed Japanese knotweed rhizomes on the banks of the river Dinn at the N78 bridge near Castlecomer in May 2019.

Plate 4: Two small Japanese knotweed plants close to the foundation wall of the N78 bridge near Castlecomer in May 2019.

2.1.1. Control options and recommendations

Below is a description of the combined control methods required to facilitate construction of the pedestrian bridge north of the N78.

In the Outline Management Plan, it has been suggested that instream works will take place between July and September 2019.

- It is recommended that a herbicide application to kill off surface vegetation of the Japanese knotweed and reduce the viability of root crowns/rhizomes be carried out at least 4 weeks prior to any excavation works within 7 meters of the infested areas. A targeted herbicide solution of glyphosate (Roundup Biactive which has an aquatic approval) will be applied by injection to minimise any collateral damage to surrounding vegetation, by qualified personnel. (NPTC, PA1, PA5A, PA6A, PA6AW)
- Works will be carried out when there is minimum flow in the river. (July/Sept dependent on weather conditions)
- The infested zones must be clearly demarcated.
- A silt trap, approximately 5 meters long, will be installed on the south side of the bridge.
- The excavation area will be de-watered to 2m from bank to maintain good biosecurity in the SAC. (Japanese knotweed does not grow in water).
- The infested area that encroaches at the footing of Castlecomer road (which is located to the east of the main infestation (Figure 2.1) will be excavated by a long reach excavator to a distance and depth that will not compromise the integrity of the structure. The infested area will then be excavated back from this venerable area to a minimum depth of 1.8m and a minimum 7m radius (to be determined by onsite EcOW).
- A vertical root barrier membrane will be installed against the road.
- The main infestation area will then be excavated to a depth of 1.8m and 7m radius. (This radius will extend 2m into river to edge of the dewater barrier).
- Where a 7m radius cannot be maintained from the edge of the infestation or a depth of 1.8m cannot be achieved, an approved impermeable root barrier membrane must be installed.
- All contaminated soil will be removed to licenced landfill in accordance with the provisions of the Waste Management Act and under license from the NPWS.
- Reinstate bank and backfill with approved material.

- Excavation works will be supervised by an Ecological Clerk of Works. (Ecologist)
- A monitoring program will be maintained over the following three years to ensure that any regrowth between the vertical barrier and the bridge footing is treated.

Due to the extent of underground rhizome growth and its highly invasive capacity, control of Japanese knotweed following herbicide treatment in a single season is rarely possible. It generally takes three to four seasons of herbicidal treatment to deplete the rhizome reserves and to effectively control the target vegetation. Treatment using a glyphosate-based herbicide has proved to be highly effective. Herbicide application should be carried out to the manufacturer's guidelines and by staff wearing suitable PPE and in possession of the relevant qualifications. Records of herbicide application should be kept in accordance with relevant legislation and retained after each treatment. Strict biosecurity protocols must be adhered to in all follow up surveys and treatments.

An area will be excavated to install the bridge footing on the east side of the river Dinin. This bridge footing will be located to the east of the main infestation (Figure 2.1) and will encroach on the main infestation and the 7meter buffer zone where rhizomes are likely to be present.

In order to install footings for the proposed bridge some excavation work will be carried out in the area containing Japanese knotweed plant material and associated contaminated soil. Prior to any personnel or machinery entering the infested area or buffer zone, these locations must be clearly demarcated. All staff involved in the works must have been given a toolbox talk regarding Japanese knotweed and the risks associated with the works to take place.

It is deemed prudent to remove soil in the infested areas to a depth of at least 1.8 metres and 7 metres from the last visible plant in order to be certain that no rhizomes remain in the soil following excavation operations. The material must be disposed of at a licenced landfill subject to acquiring a licence. Where a 7meter radius cannot be maintained from the edge of an infestation or a depth of 1.8 meters cannot be achieved approved impermeable root barrier membranes must be installed.

In the case of the Castlecomer footbridge it is likely that only a small area will need to be completely excavated to install the bridge footing on the east side of the river Dinin. This bridge footing will be located to the east of the main infestation (Figure 2.1) and will encroach on the main infestation and the 7meter buffer zone where rhizomes are likely to be present. If an

excavator with a long arm is available to dig out this section from the adjacent road (N78) it will greatly reduce the risk of the vehicle becoming contaminated with Japanese knotweed rhizomes. This may be possible from the area where the boundary wall of the N78 is to be removed for access to the new footbridge. It will also reduce the need for extensive decontamination of an excavator in close proximity to both rivers.

If an excavator must be brought down to the river this process may become more complicated and require further excavation of contaminated soil from the infestation. It is also likely that the bank (already destabilised by exposed Japanese knotweed rhizomes (Plate 3) will require further excavation of contaminated soil, installation of impermeable root barrier membranes on the river's edge and some form of reinforcement to stabilise the bank (gabion basket, mass concrete wall, large boulders). In any case, it would be considered good practice to provide bankside reinforcement and root barrier at the location of the exposed rhizomes to prevent spread and dispersal downstream of the infestation Silt traps must be installed at strategic locations downstream of any bankside excavation works

The contaminated soil must be carefully loaded into bio-secure trucks taking care not to spill any debris from the bucket of the excavator. These truck operators will then cover the load with a tarpaulin and transport the contaminated material to the appropriate location. Strict biosecurity protocols to be confirmed with the haulier and landfill must be adhered to at all times during this process.

The decontamination process for vehicles involved in the excavation works must consider the proximity of the adjacent stream and river Dinin. The process will generally take place at the site of the excavation works to reduce the risk of transporting Japanese knotweed rhizomes beyond the area of current infestation. If an excavator must enter the area of infestation or 7 meter buffer zone the vehicle will require a full decontamination of all tracks and undercarriage. This will result in a significant volume of water and silt entering the watercourse.

Detailed records of all operations should be maintained throughout the project. This should specifically focus on the exact areas excavated, the method of excavation, the depth of excavation, the volume of material (as numbers of truck loads) removed, an inventory of personnel and equipment entering and leaving the Japanese knotweed demarcated areas, and

the operation of cleaning and disinfection facilities provided at each area. Any problems encountered during the operation should also be recorded.

2.2. Cherry laurel

The Cherry laurel infestation was recorded growing in close proximity to the Japanese knotweed infestation (Figure 2.2) during the survey on the 24th of May. The infestation, identified in the Outline Management Plan and updated from the surveys undertaken for this Plan, is located on the bank of the river Ardra (Plate 5) in close proximity to the N78 road. The infestation is becoming established but growth has probably been limited due to shading by mature trees in the area. It is currently overhanging above the Ardra river, but no management or control appears to have taken place in recent years. This infestation may have arisen from dense stands of Cherry laurel upstream on the river Ardra bridge on the N78 (Plate 6).

Figure 2.2: The location of Cherry laurel infestations at the N78 bridge near Castlecomer in May 2019.

Plate 5: The Cherry laurel infestation close to the N78 bridge near Castlecomer in May 2019.

Cherry laurel growing in close proximity to JKO.

Plate 6: The Cherry laurel infestation on the river Ardra upstream of the N78 bridge near Castlecomer in May 2019.

2.2.1. Control options and recommendations

Manual pulling of plants that are less than 20cm high can be successful, once all of the roots are removed. It will be important to knock the soil from the roots to minimise the possibility of re-rooting. Exposure of the root system to air and sunlight will result in dehydration and death of the plant.

Large plants can be cut down, if access for machinery is available. It is possible to mechanically uproot mature Cherry laurel plants due to the relatively shallow nature of the root system (most roots are in the top 40cm of soil). Stump extraction may be necessary and will prove problematic due to the presence of mature trees and Japanese knotweed infestations, if required. This is generally only appropriate for sites where access to machinery is possible and at sites of low ecological interest where damage to existing native vegetation is not a concern. Any cut material will need to be removed from the site to avoid resprouting or suckering, which will produce new plants and potential infestations. Mulching is a good option for disposal, with mulch disposed of in an appropriate landfill.

With small infestations such as the one in Castlecomer, effective control can be achieved by cutting the plant to the stump and immediately treating the latter with herbicide (cut-stump treatment). The use of an inert dye mixed with the herbicide will ensure that no stumps are missed. This type of treatment is effective all year-round, although it is deemed to be most effective when conducted between November and April.

Monitoring should take place between November and February, looking for any new seedlings or regrowth. To achieve long-term control of this invasive plant, it will be important to factor in a number of work phases over several years. A monitoring program should focus on areas where Cherry laurel has been previously recorded and is likely to be present in the seed bank.

2.3. Canadian pondweed

As part of the surveys carried out for this Plan, Canadian pondweed was detected growing in continuous stands and some smaller clumps throughout the river section immediately above weir. The weed was growing in the photic zone between circa 0.3 and 1.5meters in depth and was most dense on the shallower east riverbank and close to the edge of the weir. Despite the prevalence of the weed in the slow-moving area above the weir it was not detected immediately downstream or immediately downstream of the bridge in relatively deep and turbulent water.

This species is considered to be naturalised in Ireland and is likely to be present throughout the river system downstream from the location presented in the Outline Plan and the surveys undertaken for this Plan.

2.3.1. Control options and recommendations

Canadian pondweed is dispersed solely by the fragmentation of existing plants. As the infestation of this species is upstream of the proposed works it is suggested to avoid encroachment on these infestations. Where infestations must be interfered with it may be prudent to manually remove vegetation in the work area. This material should be cut at the base or uprooted and disposed of in an appropriate landfill. Any machinery and equipment that comes into contact with Canadian pondweed will be subject to strict biosecurity protocols and should be thoroughly cleaned before leaving the works area.

Plate 7: Canadian pondweed infestations at the N78 bridge near Castlecomer in May 2019.

3. SPECIES DESCRIPTION

3.1. Japanese knotweed

Japanese knotweed is a non-native and highly invasive perennial plant that spreads rapidly *via* rhizome growth and fragmentation. Only female plants have been recorded in Ireland and, although the plant can produce seeds, they rarely survive. The plant overwinters as an extensive and intricate underground rhizome matrix. The rhizome system may achieve a depth of 2 metres and can extend up to 7 metres from the visible parent plant. Japanese knotweed rhizomes have extremely high regenerative potential and a fragment as small as 1 cm in length can produce a new population. Rhizomes may remain dormant for many years.

The robust and extensive woody rhizomes of Japanese knotweed are capable of penetrating asphalt, cracked foundations, walls, land drainage works and other built structures, causing significant structural damage. By eliminating native vegetation on roadsides and river banks, the plant can also cause seriously damaging subsidence. Failure to manage Japanese knotweed would result in its spread and proliferation in the infested area.

3.2. Cherry laurel

Cherry laurel (*Prunus laurocerasus*) is a fast-growing evergreen shrub that can grow to 15m tall and is tolerant of a wide range of habitat conditions and soil types. Its leaves are hairless, dark green and glossy above, with a paler underside. Leaves are arranged alternately on the stems, ending with a single leaf. Flowering occurs in spring and summer with white flowers being produced on racemes (upright spikes). Seeds are produced in black berries. Cherry laurel is well adapted to the understory of forestry and woodlands. It also thrives in areas of rocky banks and hillsides, gardens and riparian zones.

It is a non-native species (originally South-West Asia) that has become widespread in forestry and estates throughout Ireland. Cherry laurel is hardy and is tolerant of drought and shade. It has become highly invasive in Ireland. It's rapid growth rate and the toxicity of its leaves give it a competitive advantage over native species. This aids in the creation of dense thickets that can cover large areas. These thickets can reduce access and make it difficult to implement control measures. Because of the dense vegetation that the weed produces it can easily outcompete native species and becomes abundant. Cherry laurel has a significant adverse

impact on native floral (and associated faunal) biodiversity. The leaves contain toxins (cyanide) that result in herbivore avoidance and suppresses regeneration of native understorey species. Cherry laurel can spread primarily by suckers and seeds.

3.3. Canadian pondweed

Canadian pondweed (*Elodea canadensis*) is a submerged, perennial plant that can grow in deep (to 3m) water. The long stem is brittle and easily broken (aiding dispersal). Canadian pondweed will grow in lakes, rivers, streams, wetlands, reservoirs, canals and ponds. It's preferred habitat is still water between 0.5 and 2m deep. Canadian pondweed is a non-native (North America) species. Plant stands produce dense stands of vegetation and reach up to the water surface. The most common mode of spread and dispersal is by fragmentation or vegetative reproduction. The stem fragments are dispersed by the wind, by boat movement, angling equipment and, possibly, birds. Detached stems, when they sink, root from the nodes and establish new populations. Although this species is now considered to be naturalised in Ireland infestations can exclude light to indigenous macrophytes and alter native macroinvertebrate community structure. This species is not included in relevant Irish or European legislation.

4. BIOSECURITY

For the purposes of this document, biosecurity refers to all practical measures used to manage and prevent the introduction and spread of IAS.

A number of high impact aquatic and riparian IAS are currently present in Ireland and most are continuing to spread aggressively. Prominent among the terrestrial IAS are: Japanese knotweed (*Fallopia japonica*), Giant knotweed (*Fallopia sachalinensis*), Bohemian knotweed (*Fallopia* x *bohemica*), Giant hogweed (*Heracleum mantegazzianum*) and Himalayan balsam (*Impatiens glandulifera*). All of the above are listed in the Third Schedule (Parts 1 and 2) of the Habitats Directive (S.I. 477/2011) and some are included among the list of 49 EU IAS of Union Concern (http://ec.europa.eu/environment/nature/pdf/IAS_brochure_species.pd) in the EU Invasive Alien Species Regulations (1143/2014).

The ecological effects of IAS are often irreversible and, once established, they are extremely difficult and costly to control and eradicate; hence, the urgent need to prevent their introduction and spread. Prevention is clearly more cost-effective and less environmentally damaging than long-term containment, control or eradication. The most effective measure to reduce introductions and halt spread of IAS in aquatic situations is to promote and implement good biosecurity practice.

4.1. Biosecurity Standard Operating Procedure for Personnel and Equipment

This Biosecurity SOP applies to all equipment (sampling devices, hand tools, buckets, boots and PPE) that are used during the control of IAS. The purpose of this SOP is to provide standardised practical methods for cleaning and disinfecting all equipment that comes into contact with IAS while carrying out control works. This Biosecurity SOP will enhance the contractors existing biosecurity activity to deliver an improved biosecurity system that will help stop the introduction and spread of IAS during operations conducted by the contractors.

All staff that are involved in the control operations should have access to disinfection facilities that include but is not limited to:

- Detailed guide to proper cleaning and disinfection procedure and instructions for making the correct disinfection concentration

- A solution of clean water and Virkon Aquatic tablets or powder for the disinfection of equipment and PPE
- Hard-bristle brushes
- Disposable non-latex gloves for equipment and PPE
- Plastic bags and cable ties (for disposing of IAS material removed from equipment).

[* Disinfectants must be used with care and in strict accordance with the manufacturer's instructions. Disposable gloves should be worn when using the disinfectant solution.]

Before commencing operations, a 1% Virkon Aquatic disinfection solution (10g Virkon Aquatic powder in 1 litre of clean water) should be prepared for staff working in infested areas. The disinfectant solution will remain pink in colour while it is still active. Additional clean water should be readily available for further disinfectant solution as required.

It is important that all PPE and equipment used are cleaned and disinfected according to the procedures below. These biosecurity measures should be conducted before leaving each site.

- Put on disposable gloves before cleaning and disinfecting the equipment.
- Visually inspect all equipment that has come into contact with water for evidence of attached IAS material, or adherent mud or debris. Remove any such material before cleaning and disinfecting the equipment and leaving the site.
- Dispose of any IAS material taken from the equipment using the plastic bags provided.
- Spray equipment with the disinfection solution to the point of run-off. Do not rinse in clean water for at least 15 minutes.
- Use the hard-bristle brush to remove all mud and debris from boots and equipment. Then spray with the prepared disinfectant solution onto the cleaned surfaces to the point of run-off. During inspection and cleaning, pay particular attention to places where IAS could be accidentally trapped, such as the treads of boots and attachment points on equipment.
- Visually inspect all PPE that has been in contact with vector material and remove any attached IAS material, or adherent mud or debris. Wipe down this PPE with an absorbent cloth soaked in the prepared disinfectant solution.

- Where time permits and it is practical, it is good biosecurity practice to air dry equipment following cleaning and disinfection.
- Remove disposable gloves and dispose of safely.

4.2. Biosecurity Standard Operating Procedure for Vehicles

An exclusion zone will be put in place around the infestations and only those that are involved in the excavation and removal will be allowed enter this zone. Prior to the commencement of works all personnel involved in the works will be presented with a toolbox talk. Biosecurity Disinfectant Stations will be established at the exit points and all personnel must disinfect their boots and any equipment used on site at these stations. All machinery that will be used on the site must be thoroughly cleaned before entering the site (to avoid contaminating the site with invasive species from elsewhere) and again sprayed with a solution of Virkon Aquatic Disinfectant and cleaned before leaving the works area. A designated route will be marked out from which vehicles will not deviate. Trucks will enter the site and be loaded directly from the dig site. The trucks will be loaded to a maximum level of 100cms below the top sides of truck. The load will be covered over by a tarpaulin before exiting the site. The trucks wheels and undercarriage will be inspected to ensure that they are fully biosecure and will be washed down with a solution of Virkon Aquatic before exiting the site. On completion of the works the load area of the trucks will be washed out using a solution Virkon Aquatic disinfectant. All machinery used in the excavation process must be washed and disinfected before exiting the site. Following the excavation and removal of all contaminated material the area will be handed back to the contractor to progress with the upgrade. All personnel including drivers must disinfect their boots and any equipment used at the disposal site. Following the completion of the excavation and disposal works an end of contract report detailing the specifics and metrics of the operations will be drawn up.

Appendix

Appendix 1: Survey details for the infestations at Castlecomer bridge in May 2019.

Contactor name	INVAS Biosecurity
Surveyor name	William Earle
Survey date/time	07:00 – 24/05/2019
County	Kilkenny
Area	Castlecomer bridge, N78. River Dinn
Site ID	JKO_Castlecomer_RPS
Risk assessment (Potential hazards)	Live traffic, river, slips/trips/falls
Health and safety (PPE required)	Safety boots, Hi-viz
Species recorded	Japanese knotweed, Cherry laurel, Canadian pondweed
GPS details	801-814
Area located	North of existing bridge (N78) over River Dinn
Site details	One large and one small infestation of Japanese knotweed Cherry laurel growing in close proximity to JKO Canadian pondweed throughout water above weir, not detected immediately downstream of weir.
Pervious treatment/Interference	Herbicide treatment (OCT 2018 by INVAS)
Infestation beyond fence line	Yes, on riverbank of the river Dinn. Small infestation close to the wall of N78.
Notes	2 small plants growing against the edge of the wall. Main infestation being eroded by river
Photos	07:00 – 08:30
Is the site within or proximate to an ecologically sensitive area (SAC/SPA)	Yes, the River Barrow and River Nore SAC.
Other invasive species observed	JKO, CHL, ELO

Appendix 2: Decontamination record sheet for the Japanese knotweed infestation at Castlecomer during works.

Daily Biosecurity Record Sheet	
Site ID	JKO_Castlecomer_RPS
Project details	Footbridge construction
Biosecurity supervisor	
Date	

Infestation /works boundary in place (Yes/No)		Vehicle access demarcated (Yes/No)	
Staff access/egress decontamination in place (Yes/No)		Vehicle/equipment decontamination in place (Yes/No)	

Vehicle (description/reg)	Activity	Time decontaminated	Picture	Driver signature

Notes/Comments:

Signed:_____ **Date:**_____

Appendix 3: Treatment details for the Japanese knotweed infestation at Castlecomer in Oct 2018.

Site ID	KK_78_5001
Treatment Company	INVAS Biosecurity
Treated By	Bryan Ward
Treatment Date/Time	12/09/2018
Weather conditions	Dry, calm, overcast
Treatment method	Stem injection
Herbicide used	Roundup gold
PCS number	02314
Calibration rate/Ha	5:1
Total concentrated product used	10ml
Water volume used per Hectare	250L
Nozzle type	Low drift Beta nozzle
Calibration used in compliance with sustainable use directive	Yes
Qualified & registered adviser	Yes
Qualified & registered professional user	PU 025465
Notes	Stem Injected

Appendix 4: Schedule of activities for the Japanese knotweed infestation at Castlecomer.

Schedule of Activities			
Site ID	JKO_Castlecomer_RPS		
Project details	Footbridge construction		
Biosecurity supervisor			
Date			
	Phase	Date	Additional comments
Site survey and development of Management Plan	1	May 2019	
Establish and implement biosecurity protocol	2		
Toolbox talks to appropriate staff	3		
Implementation of Management Plan	4		
Decontamination of vehicles and equipment	5		
Sign off	6		

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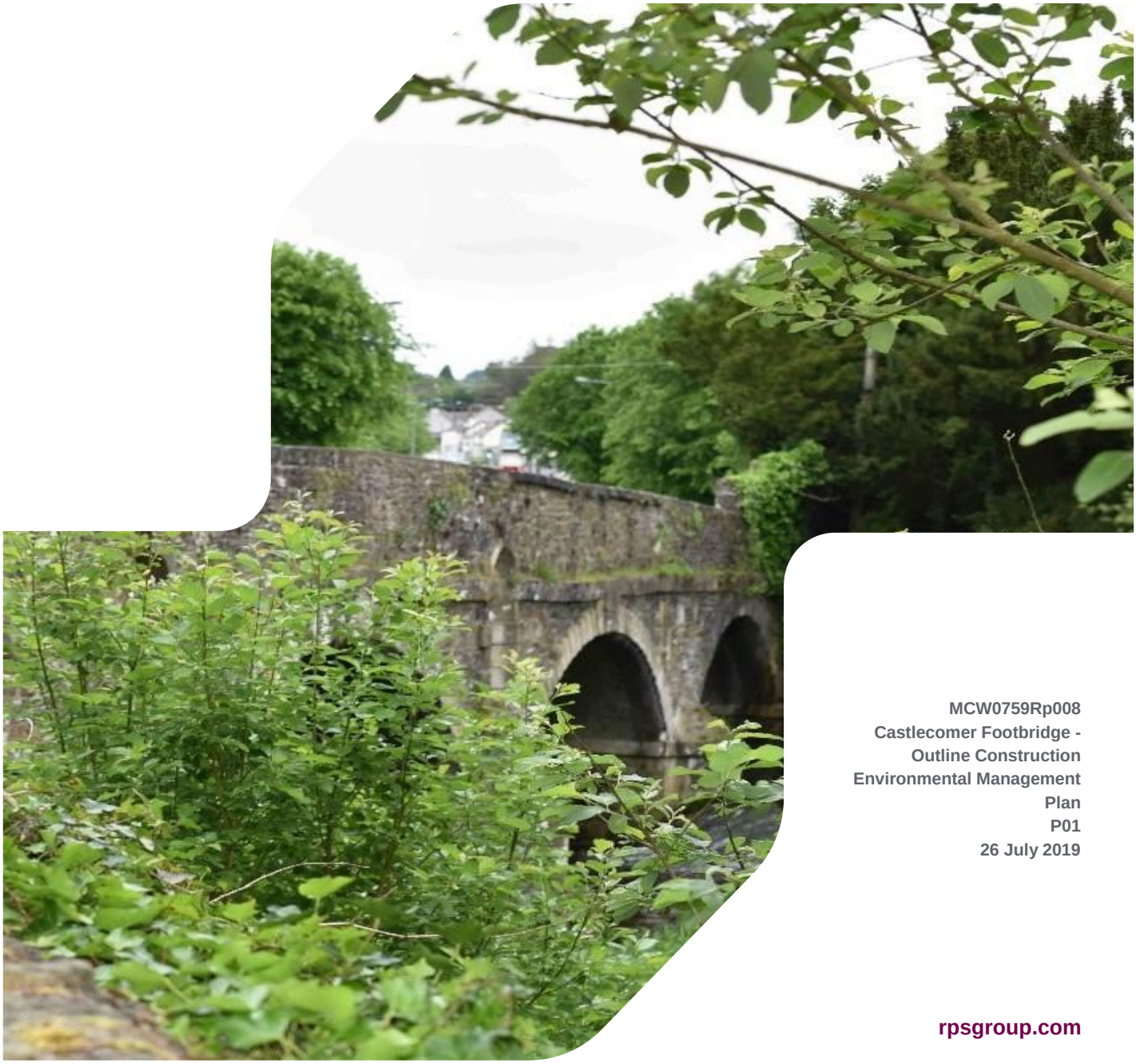
VAT Number: Ie 98205960

Appendix C

Outline Construction Environmental Management Plan

CASTLECOMER FOOTBRIDGE

Outline Construction Environmental Management Plan



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Outline Construction
Environmental Management
Plan
P01
26 July 2019

rpsgroup.com

Document status

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P01	For Planning	K. Dineen	A. Fitzgerald	A O'Brien	26.07.19

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Contents

Figures

1 INTRODUCTION

RPS has been commissioned by Transport Infrastructure Ireland (TII) and Kildare County Council acting as lead local authority through a Section 85 Agreement (Local Government Act, 2001) on behalf of Kilkenny County Council (KCC) under Eirspan Task Order 302 to provide technical consultancy services to examine options for an improved pedestrian link across the River Dinin in Castlecomer, Co. Kilkenny.

The scope of services includes the preparation of an Outline Construction Environmental Management Plan (CEMP) for a proposed footbridge spanning the Dinin River c.0.3km north-east of Castlecomer Town, Co Kilkenny, herein referred to as the proposed works. TII intends to construct the proposed footbridge over the River Dinin immediately north of the Castlecomer Road vehicular bridge (N78).

1.1 Site Location

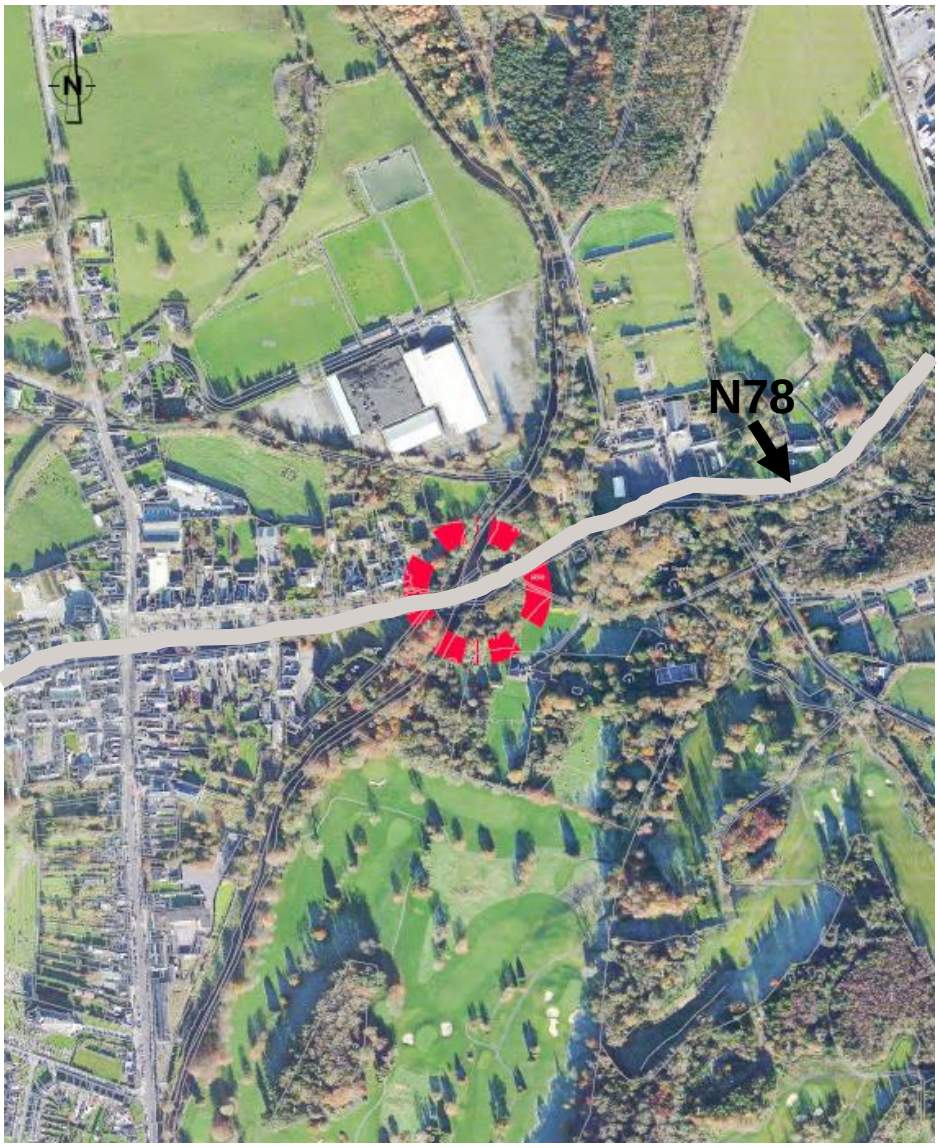
The footbridge will be located in the townlands of Ardra, Castlecomer and Drumgoole over the River Dinin immediately north of the existing River Dinin road bridge. The location of the proposed footbridge can be seen in **Figure 1-1**.

Figure 1-1: Site Location of Footbridge

1.2 Environmental Receptors

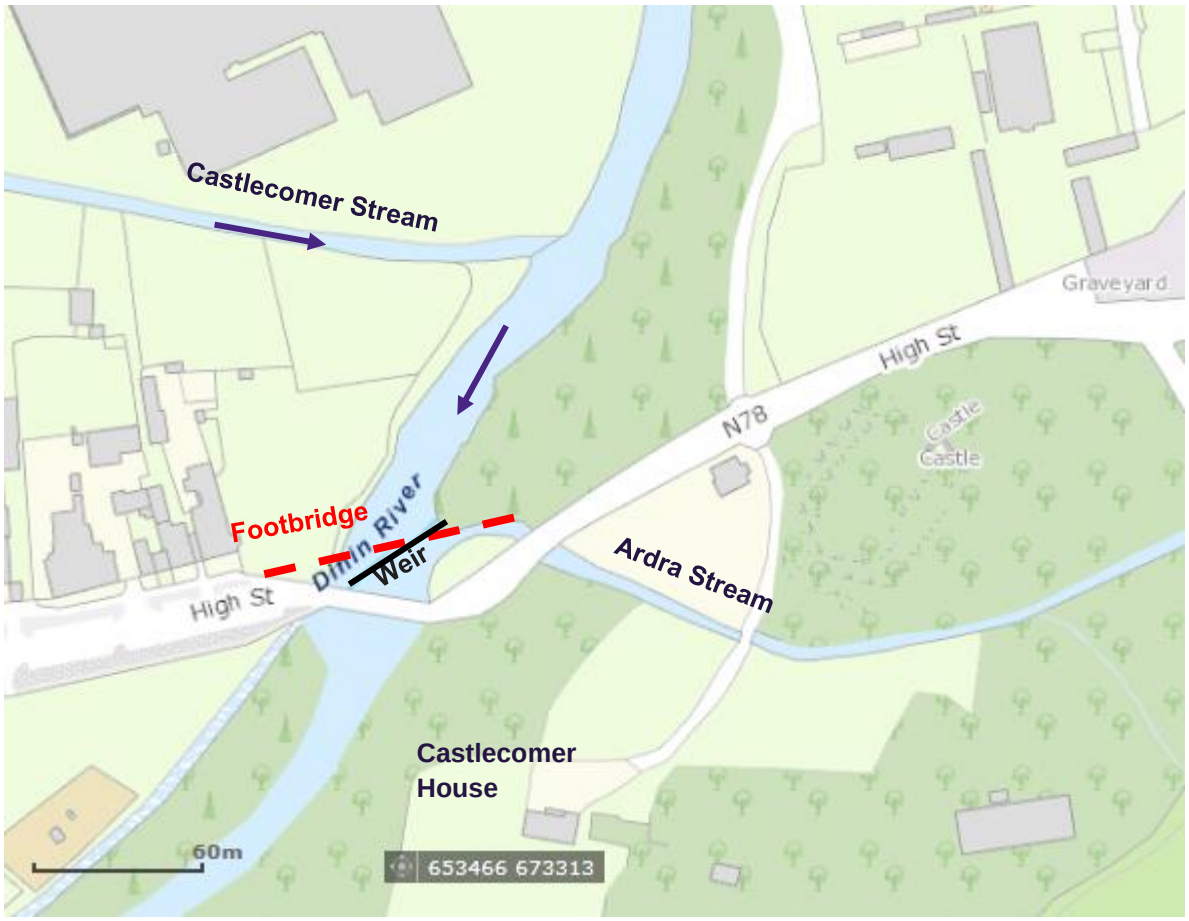
The proposed works location is within the settlement of Castlecomer, where residential, commercial and community facilities are located. There is an existing River Dinin road bridge which forms part of the N78 national road and allows vehicles to cross the River Dinin in an east west direction as seen in **Figure 1-2** also. The lands immediately adjacent to the River Dinin primarily comprise woodland with some recreational riverine amenity area. Beyond the woodland there are urban and recreational lands on the edge of the town. The wider area is characterised largely by open recreational lands including a golf course, Castlecomer Discovery Park, wooded areas and agricultural lands.

Figure 1-2: Aerial Photograph of Site Location Castlecomer Bridge



The existing River Dinin road bridge intersects two watercourses as seen in **Figure 1-3.**

Figure 1-3: **Existing Infrastructure**



The River Dinin, which the proposed footbridge is to traverse forms part of the River Barrow and River Nore Special Area of Conservation (SAC). The Natura Impact Statement (NIS) for the project sets out details on the sensitive ecological receptors associated the River Barrow and River Nore SAC. Mitigation measures as set out in the NIS to protect the Qualifying Interests of the River Barrow and River Nore SAC and the Lower River Suir SAC are described in **Section 4.4** of this CEMP.

2 BASIS OF OUTLINE CONSTRUCTION AND ENVIRONMENTAL MANAGEMENT PLAN

2.1 Scope of the Outline CEMP

This Outline CEMP has been designed to set out environmental measures and construction approaches which will minimise the potential for impact of the development on various aspects of the environment. It incorporates the standard work methodologies that are to be applied to ensure that the work is carried out in an appropriate manner to protect the environment. The Contractor will be required to comply with the requirements and constraints set forth in the Outline CEMP and its supporting documentation and to prepare a Final CEMP prior to construction taking account of the content herein.

This document will be updated following the receipt of planning approval or other relevant consents if necessary, to incorporate any additional or revised construction approaches required by condition.

This document will also be subject to ongoing independent audit in consultation with the National Parks and Wildlife Service (NPWS) and Inland Fisheries Ireland (IFI). Any alterations will be for the improvement of the CEMP.

It will be the appointed Contractor's responsibility to implement an effective construction management system to ensure that planning and environmental requirements for the construction of this project are met. The project team, including the supervisory team of KCC, as well as Contractors and Sub-Contractors staff, must comply with the requirements and constraints included within the CEMP and its supporting documentation.

All site personnel will be required to be familiar with the CEMP requirements as related to their role on site. The CEMP shall describe the project organisation and list those procedures that will be developed and adopted on site. The CEMP shall also define the roles and responsibilities of the various parties to the construction contract.

The detailed CEMP shall be supported by Contractor's Method Statements demonstrating how works are to be executed in accordance with the environmental management requirements set out within same.

Upon appointment, the Contractor will take ownership of the CEMP and will be responsible for the update of same. In addition, the detailed CEMP will be supported by the Contractor's detailed sub-plans (refer to Section 4.2), including a Surface Water Management Plan (SWMP), detailed Waste Management Plan (WMP) and detailed Construction Traffic Management Plan (CTMP).

2.2 Objectives and Targets of Outline CEMP

The objective of this Outline CEMP is to ensure that the development works take place with no likely significant impact on the environment or the surrounding areas and that all environmental conditions that may be outlined as part of a future planning consent and any other consents are adhered to. It will provide the structure with which all site stakeholders must adhere to.

Work methodologies and approaches to minimise environmental impact have been established which are consistent with relevant Irish and European environmental guidelines and policies. It is intended that these environmental controls and works methodologies will be the focal point of the environmental management of the project and will ensure the successful environmental performance activities during the proposed works.

Environmental controls for the development and the suitable best practice control measures to be adopted by the Contractor have been identified under the following categories, for which preliminary sub-plans have been prepared:

- General Environmental Management.

- People and the Community.
- Noise and Vibration.
- Air and Climate.
- Landscape and Site Reinstatement.
- Biodiversity, particularly in the form of a Surface Water Management Plan for the protection of Aquatic Ecology of the River Barrow and River Nore SAC.
- Traffic.
- Waste.

2.3 Best Practice Guidance Notes to Be Followed

All works carried out on the project will comply with all applicable Irish and European Environmental legislation and all other applicable policies, standards, documents and procedures whether from the Planning Authority or other recognised authorities or bodies such as IFI or the NPWS.

2.4 Management Structure, Roles and Responsibilities

This section shall set out the roles and responsibilities of the principal parties involved in the construction of the proposed project. In addition, it shall outline the lines of communication between the various parties. The roles and responsibilities outlined below are indicative and will be updated upon appointment of Employer's Representatives, Designers and the Contractor.

2.4.1 Project Owner

KCC shall be the project owner. A Client Project Manager shall be nominated and contact details will be confirmed within the detailed CEMP.

2.4.2 Supervising Engineer

A Supervising Engineer and team shall be appointed to act as agent for the Project Owner on site.

2.4.3 Contractor

The Contractor has yet to be appointed. Contact details will be confirmed within the detailed CEMP.

2.4.3.1 Contractor's Site Staff

The responsibilities of the Contractor's site staff shall be outlined in the detailed CEMP to be developed by the Contractor; it is possible that some roles may overlap or be carried out by the same person. The staff shall generally entail a Contract Project Manager, a Health and Safety Officer, an Environmental Officer / Engineer and an Environmental Clerk of Works. The latter may also be appointed independently by the project owner.

2.4.3.2 Responsibilities to be Assigned

Key responsibilities to be assigned include:

a) Liaison with Client's Project Manager and Supervising Engineer;

b) The implementation of the CEMP;

c) Management of the overall Project Programme;

d) Co-ordinating the construction teams/contractors;

e) Implementing the Contractor's Safety and Health Plan;

f) Liaison with the client representative staff;

g) Production of construction programmes;

h) Liaison with local stakeholders and dealing with any complaints or queries from the public;

i) Maintaining a project diary; and

j) Carrying out duty of Health & Safety Coordinator Construction Stage, implementing the Contractor's Safety and Health Plan and auditing and updating same as necessary.

Particularly with respect to the implementation of environmental protection measures, the following responsibilities are to be assigned:-

a. Implementing the Environmental Requirements of the CEMP and updating it as necessary;

b. Management of all environmental aspects of the construction works;

c. Ensuring all relevant mitigation measures are implemented as required, particularly those set out within the NIS (subject to any modifications by statutory consent) and the measure set out in **Section 4** of this Outline CEMP;

d. Ensuring any monitoring requirements are implemented as required;

e. Reviewing monitoring results if required;

f. Training of staff in all environmental issues;

g. Provision of Tool Box talks to contractors / construction workers as required;

h. Ad hoc environmental inspections;

i. Liaison with the client representative staff;

j. Auditing the construction works from an environmental viewpoint;

k. Maintaining regular contact and liaison with environmental specialists as appropriate;

l. Producing update reports on environmental compliance, if required;

m. Reporting on any non-compliances; and

n. Implementing measures for ensuring close out of non-compliances.

2.5 Non-Conformance, Corrective and Prevention Action Plan

Non-conformances are generally issued where there is a situation where legal or contractual limits associated with activities on the project are exceeded, or there is an internal/external complaint associated with environmental performance.

Non-Conformance within the CEMP system is the situation where essential components of the CEMP are absent or dysfunctional, or where there is insufficient control of the activities and processes to the extent that the functionality of the CEMP in terms of the policy, objectives and management programmes, is compromised. Correction is the act of developing or improving where non-conformances have been identified. Prevention is the act of ensuring that non-conformance does not occur.

The CEMP and all its components must conform to the environmental policy, objectives and targets and the requirements of the ISO 14001 management standard. In the event of non-conformance with any of the above, the following must be investigated:

- Cause of the non-compliance;
- Develop a plan for correction of the non-compliance;
- Determine preventive measures and ensure they are effective;
- Verify the effectiveness of the correction of the non-compliance; and
- Ensure that any procedures affected by the corrective action taken are revised accordingly.

Responsibility must be designated for the investigation, correction, mitigation and prevention of non-conformance. The Supervising Engineer will monitor and investigate non-conformances relating to environmental issues.

2.6 Accident Prevention and Emergency Response Plan

The development of an accident prevention and emergency response plan (including environmental emergencies) shall be the responsibility of the appointed Contractor and PSCS. This plan shall be appended to the detailed CEMP as an Appendix and shall include all relevant contact details.

2.7 Records Procedure

The Contractor shall establish, implement and maintain procedure(s) for the identification, storage, protection, retrieval, retention and disposal of records.

2.8 Audit and Review Procedure

Audit programmes shall be planned, established, implemented and maintained taking into consideration the environmental importance of the operation(s) concerned and the results of previous audits. At a minimum there will be a requirement for daily checks and inspections and for weekly audits. The scope of these audits will be set out in the final detailed CEMP.

The selection of auditors and conduct of audits shall ensure objectivity and the impartiality of the audit process. The purpose of an audit includes:

- Ensuring that Environment Control Plans are adhered to and that control forms are completed;
- Ensuring that Environmental Objectives and Targets are met;

- Ensuring that legislation is complied with; and
- Audit report documents and records will be kept in the relevant site office.

3 DESCRIPTION OF PROJECT

3.1 Scope and Purpose of the Project

The site of the proposed pedestrian bridge is on the eastern side of Castlecomer Town, Co. Kilkenny running parallel to the existing N78 bridge crossing of the River Dinin, see **Figure 1-1**.

The bridge was constructed in the 18th Century and it was never intended to cater for modern vehicular traffic. Consequently, the existing bridge is too narrow to cater for a safe modern road cross section complete with footway.

There is only one footpath and is located on the northern side of the existing bridge which is sub-standard and varies 650-900mm in width. It is hazardous for both road users and pedestrians particularly on the east end of the bridge where the turning movements of HGV's encroach onto the footway due to the tight bend in the road. In order to improve safety at the location, KCC and TII intend to remove pedestrians from the existing bridge and provide a new dedicated facility for pedestrians to cross the River Dinin.

The need for improved pedestrian links over the River Dinin has been previously identified in the Castlecomer Local Area Plan (LAP) 2009-2018 and more recently has been identified as a key objective in the Castlecomer 2018-2024 LAP.

3.2 Description of Works

A Castlecomer Footbridge Options Report was prepared by RPS Design Team in conjunction with the project steering committee to assess a number of potential options for the footbridge. A copy of the report is available under a separate cover and will be submitted with the planning application.

The Options Report concluded that, a two-span steel footbridge independent of the existing bridge was the preferred option and it is the subject of this Outline CEMP. Details of the proposed bridge are provided in **Appendix A** of the EIA Screening and seen in **Figure 3-1**. The proposed footbridge will be approximately 44m in length and will be located north of the existing River Dinin Bridge. In order to facilitate the footbridge, abutments will be constructed on either bank (west and east) of the existing river with one pier to be constructed within the river bed to provide structural support.

The bridge lighting has been designed to illuminate the deck of the pedestrian bridge and to softly light the niches/spandrel of the adjacent road bridge to avoid illuminating important foraging and commuting areas for bats, i.e. the river and river banks. The lighting design has taken into consideration the *Bat Conservation Trust & Institute of Lighting Professional Guidelines* (2018).

The works will include site investigation, vegetation removal (including Japanese knotweed), excavation, piling, river diversion, pouring of concrete, input of fill for embankments and erection of the bridge superstructure. A road closure for a period of up to 48 hours may be required and an appropriate Traffic Management Plan (TMP) will be prepared. Further details are provided in **Section 3.2.1**.

Figure 3-1: Two Span Steel Footbridge Elevation (North)

3.2.1 Proposed Sequence of Works and Methodology

In order to complete the detailed design of the scheme site investigation works need to be completed in advance of the construction works as a separate work activity and are detailed hereafter:

Site Investigation Works

- In order to access the river and complete the exploratory works in a safe manner, bunding shall be provided to form a low wall along the eastern river bank to protect the toe of the embankment and prevent material entering the watercourse.
- The bunding shall be typically 1m by 1m in dimensions and will be sufficient for the predicted flow in the river, it shall extend from the eastern river bank (at the confluence of the adjoining tributary) to the first pier of the existing bridge. This will continue on the southern side of the bridge back to the eastern bank to ensure water cannot travel upstream into the area of works.
- A temporary access structure will span across a small tributary between Castlecomer Discovery Park and the existing eastern bank of the bridge as a pipe or series of pipes subject to flow. It is envisaging that the watercourse will be flumed through the pipe(s) which will be backfilled to allow access over the tributary to the bunded area.
- The proposed bunding and fluming of the watercourse shall be agreed in consultation with IFI in advance of the commencement of works.
- It is envisaged that during the course of any bunding works electrofishing may be required. This shall be conducted by a competent expert in accordance with an agreed methodology with IFI.
- The geotechnical borehole rig will mobilise to site and undertake the exploratory holes.
- The borehole rig will de-mobilise from site and the temporary access and bunding will be subsequently removed.

Site Preparation for Main Works

Site clearance will be undertaken on the western and eastern banks in preparation for construction of foundations and bunding of riverbanks, including removal of existing vegetation under the footprint of the proposed embankments.

Prior to commencement of works, the compound will be set up and traffic management measures will be put in place.

Vegetation removal will also take place and will include the removal of trees along both the right and left banks. During the site preparation phase Japanese knotweed located on the left bank upstream of the existing bridge and at the base of the existing bridge (left bank) will also need to be managed. Japanese knotweed will be managed in accordance with the Invasive Alien Species Management Plan (IASMP) included under a separate cover.

It is envisaged that the compound will be located in the Castlecomer Discovery Park on the eastern side of the river (see **Figure 3-2**). The compound will be set back a minimum of 10m from the river. All plant and equipment will be maintained, refuelled and stored at the compound location. Oil will also be stored in appropriately contained bunded facilities.

Figure 3-2: Proposed Compound

River Diversion

- In order to complete the works the watercourse will need to be locally diverted with bunding to allow for safe construction of the works.
- The bunding shall be typically 1m by 1m in dimensions and will be sufficient for the predicted flow in the river, it shall extend from the eastern river bank (at the confluence of the adjoining tributary) to the first pier of the existing bridge. This will continue on the southern side of the bridge back to the eastern bank to ensure water cannot travel upstream into the area of works.
- A temporary access structure will span across a small tributary between Castlecomer Discovery Park and the existing eastern bank of the bridge as a pipe or series of pipes subject to flow. It is envisaging that the watercourse will be flumed through the pipe(s) which will be backfilled to allow access over the tributary to the bunded area and eastern abutment.
- The proposed bunding and fluming of the watercourse shall be agreed in consultation with IFI in advance of the commencement of works. It is envisaged that during the course of any bunding works electrofishing may be required. This shall be conducted by a competent expert in accordance with an agreed methodology with IFI.

Construction Works

- Excavation for the new footbridge piles, foundations and retaining walls shall be undertaken on the eastern and western banks.
- Excavators and piling rigs will be used during the works on these banks and caution must be taken with regard to utilities (buried Eir services, buried watermain, overhead electrical lines feeding the lighting columns east and west of the existing bridge in the vicinity of the bridge).
- The new pier (and associated piles) shall be shuttered, reinforcement placed and the concrete poured.
- The shutters on the pier shall then be struck (cast in-situ).
- Once all concrete works have been completed, waterproofing shall be applied to all buried surfaces before backfilling with 6N structural fill.
- Willow spilling and rock armour will be used for grading and river bank reinstatement.
- The existing river bed will generally be left in-situ, any river substrate material removed will be stockpiled and replaced as required within the river bed in line with IFI standards.
- A masonry wall will be constructed on either side of both embankments (on left and right bank).
- The new embankments shall be constructed by grading, levelling and compacting 6N structural fill before top soiling and grass seeding.
- Safety fencing, safety barriers and new raised concrete verges shall be completed in conjunction with top soiling and grass seeding of the verges.
- Temporary scaffolding shall be erected as required to facilitate access and the bridge sections shall be lifted into place using a mobile crane.
- For site security and safety purposes, temporary lighting will be used.

Completion of Works

- Once works are completed and the areas surrounded by the bunding are no longer required during construction, the watercourse diversion shall be removed.

- Damming measures will be removed in reverse order to the way they were put in.
- Traffic management measures shall then be removed and the pedestrian bridge shall be opened.
- The site compound shall be removed.
- The lands within the site boundaries shall be reinstated through top soiling and grass seeding as required.
- Materials arising from excavation/demolition to be segregated on site/be stored temporarily/ removed from site and disposed in an approved licenced facility.
- The area shall be snagged, tidied up and handed over to KCC.
- The western abutment will be approximately 75m^2 in size while the approaching footpath will be 44m^2.

Materials to be Used on Site will include: -

- Reinforcement Steel
- Structural Steel (coatings to be applied offsite)
- Concrete
- Bridge Bearings
- Stone & Mortar
- Timber
- Light fittings and ancillary products required to install pedestrian/public lighting.

Areas to be Removed/Changed will comprise: -

- The pier will result in the permanent removal of 1m^2 of instream habitat;
- There will be removal/disturbance to a 3m wide riparian habitat along the eastern length of the works, with reinstatement where possible; and
- There will be the removal/disturbance of river bed from the bunding measure in the immediate area of the proposed works.

High Level Programme

The following is an overview of the timing on the works, however this is subject to receipt of planning and statutory consents:

- Construction works are envisaged to last for a period of 6 months from mobilisation to completion commencing in Q2 2020.
- In-stream works to be completed during IFI approved seasonal window July – September.

This programme is indicative only at this time. The exact order and programme of works can only be determined by the Contractor following appointment. It will however be an objective and a requirement of the Contractor to minimise disruption to traffic, businesses and properties within the town.

3.2.2 Proposed Working Hours

Normal construction working hours for the development will be:

- Monday to Friday: 08.00 - 18.00
- Saturday: 09.00 - 13.00

Most of the works can be undertaken while the road is in operation. However some items, such as the installation of the sections of bridge with crane shall be undertaken during the 48 hour road closure.

3.2.3 Best Practice and Construction Methodology

This Outline CEMP proposes best practice design and construction methodology.

3.3 General Construction Site Organisation

The Contractor will visit the site prior to mobilisation to become familiar with the layout and ground conditions on site.

Upon mobilisation to site the Contractor will firstly demarcate a lay-down area for materials deliveries and site compound area. This will be agreed with the Environmental Manager / Ecological Clerk of Works.

The compound will provide for the following:

- Welfare / office facilities for site staff;
- Plant / machinery parking / storage area;
- Fuel storage / refuelling area;
- Segregated waste area; and
- Construction staff parking.

This compound will be located as shown in **Figure 3-2**.

In the event that toilet facilities are required, temporary self-contained units will be utilised.

The proposed development will require some spoil and materials storage. The volumes of any such storage will be low and will be temporary only. It is a requirement of the NIS that spoil from the river is checked for lamprey.

Freshly excavated spoil / topsoil will be retained in an area over 10m away from any water / drainage channels. Spoil storage will be for short term duration, will be reused in reinstatement works where possible and appropriate. Excess material will be removed from site to an authorised facility.

The works will be carried out on and adjacent to public paved roads. These existing routes are suitable for use by construction traffic. No other temporary haul routes or local work areas / staging areas around the proposed construction areas are considered necessary.

4 ENVIRONMENTAL CONTROLS AND MANAGEMENT MEASURES

4.1 Guidance Documents

The following guidelines and documents have been consulted to draw up general and specific construction management measures:

- H. Masters-Williams et al (2001) *Control of water pollution from construction sites. Guidance for Consultants and Contractors* (C532). CIRIA;
- Construction Industry Guidelines (such as CIRIA C502 Environmental Good Practice on site);
- BS 5228-1:2009+A1:2014 Code of Practice for Noise and Vibration Control on Construction and Open Sites – Part 1: Noise and BS 5228-2:2009+A1:2014 Code of Practice for Noise and Vibration Control on Construction and Open Sites – Part2: Vibration (together referred to as B.S. 5228);
- *Control of Dust from Construction and Demolition Activities* (BRE 2003);
- *Guidelines on Protection of Fisheries during Construction Works in and Adjacent to Water* (IFI, 2016);
- Environment Agency (2013) *The Knotweed Code of Practice. Managing Japanese knotweed on Development Sites* (Version 3);
- E. Murnane, A. Heap and A. Swain. (2006) *Control of Water Pollution from Linear Construction Projects.* Technical Guidance (C648). CIRIA;
- E. Murnane et al., (2006) *Control of Water Pollution from Linear Construction Projects. Site Guide* (C649). CIRIA;
- Murnane et al (2002) *Control of Water Pollution from Construction Sites - Guide to Good Practice.* SP156;
- Murphy, D. (2004) Requirements for the Protection of Fisheries Habitat during Construction and Development Works at River Sites. Eastern Regional Fisheries Board, Dublin;
- DOMNR (1998). Fishery guidelines for Local Authority works. Department of the Marine and Natural Resources, Dublin;
- Site Procedure 6 (Above-Ground Oil Storage Tanks) from CIRIA C532 *Control of Water Pollution from Construction Sites;*
- *Pollution Prevention Guidelines No.2 (Above Ground Oil Storage Tanks)* from the UK Environment Agency.
- Enterprise Ireland (Anon) Best Practice Guide (BPGCS005) Oil storage guidelines.
- *Guidelines for the Crossing of Watercourses during the Construction of National Road Schemes* (NRA, 2008a);
- *Guidelines for the Treatment of Otters during the Construction of National Road Schemes* (NRA, 2008b); and
- *Guidelines on the Management of Noxious Weeds and Non-Native Invasive Plant Species on National Roads* (NRA, 2010, rev. 1.).

4.2 General Environmental Procedures

The following (minimum) project specific procedures will be developed and employed by the Contractor and their subcontractors for each environmental aspect while working on the project.

Outline of Potential Environmental Procedures

- ENV-01 Awareness & Training
- ENV-02 Environmental Emergency Response
- ENV-03 Record Keeping, Auditing and Monitoring
- ENV-04 Environmental Complaints Procedure
- ENV-05 Protection of Biodiversity
- ENV-06 Surface Water Management Plan
- ENV-07 Construction Traffic Management Plan
- ENV-08 Waste Management Plan
- ENV-09 Landscape and Site Reinstatement Plan
- ENV-10 Accident Prevention and Emergency Response Plan
- ENV-11 Invasive Alien Species Management Plan

These procedures are listed in this document for illustrative purposes. The Contractor, when appointed, will be responsible for formulating these procedures, and may wish to amend these procedures when appointed. These procedures will form part of the detailed CEMP and will be continually updated where necessary. These procedures can only be amended by improvement with regards to environmental protection and must take cognisance of all relevant conditions of planning permission.

The proposed project will be carried out in accordance with the following best practice construction measures:

- The works will be undertaken under the regular supervision of an Environmental Clerk of Works.
- Site office and staff welfare facilities will be installed and will be clearly signed. Visitors to the site will report to the site office on arrival and will undergo an induction process.
- The Contractor shall ensure that all personnel working on site are trained in pollution incident control response. A regular review of weather forecasts of heavy rainfall is required and the Contractor is required to prepare a contingency plan for before and after such events.
- All construction materials and plant shall be stored at the designated contractor compound and transported to the works zone immediately prior to construction.

4.2.1 Method Statements

As advised above, the Contractor is required to supply detailed method statements for proposed activities on site which demonstrate how the management requirements set out in the CEMP and all requirements as detailed in contract documents are to be achieved on site.

4.3 People and The Community

The proposed works will be undertaken within the town of Castlecomer along public roads, including a national road N78. Furthermore, the works will require the mobilisation of construction machinery along these public roads, delivery of construction materials to the site and the removal of wastes. There is a requirement for a road closure. There is clear potential for impact or interaction with neighbouring properties and the wider community.

The following measures should be provided for:

- All works shall be carried out in accordance with the relevant Health and Safety legislation, and in accordance with the site specific Safety and Health Plan;
- Works will be managed appropriately to keep members of the public away from work areas;
- Strategy for timely notification of works to landowners adjacent to the works locations and in wider area that may be affected by the works adjacent to the public road or occasional large deliveries; and
- Traffic Management Planning and Control, liaison with KCC, to warn people of presence of construction site and traffic and particularly of pending road closure.

4.4 Biodiversity

4.4.1 General

The proposed works will be carried out in accordance with the following Best Practice general construction measures:

- KCC, or any Contractor appointed by KCC will appoint a suitably qualified person(s), to the role of Ecological Clerk of Works (ECoW). The role of the ECoW will be to monitor the construction works, appoint the relevant specialists required and to ensure compliance with relevant legislation, planning conditions and associated documents (e.g. IASMP);
- The ECoW will have the authority to review the CEMP and method statements, advise the Contractors on the contract/project requirements, decide on elements that require direct supervision and instruct action, as appropriate, including the authority to require the temporary cessation of works, where necessary;
- All of the Contractor's site staff will be briefed regarding the biodiversity value of the surrounding landscape. This will include particular reference to the sensitive habitats and species within the River Barrow and River Nore SAC and the potential for these to be present within the works area i.e. salmon, lamprey (river and brook), otter and crayfish;
- All of the Contractor's site staff will be briefed regarding habitats; trees, treelines to ensure that there are no accidental or unintentional actions conducted during the project construction that could lead to a reduction in water quality/damage to same. Such matters often arise accidentally through lack of awareness rather than as a result of an intentional action;
- The contractors briefing should also include emphasis on the presence of IAPS present on site. This includes the stand of Japanese knotweed to avoid the unintentional disturbance and spread of this IAPS prior to its removal;
- A surface water management plan will be prepared by the Contractor and agreed with the ECoW, KCC, IFI prior to the commencement of works. An outline of surface water management measures is detailed below and has been devised to ensure the protection of downstream European Sites and its surface water dependent Annexed species and habitats. Any changes in locations of any of these measures

including attenuation features, silt fencing etc. are required to be shown for prior approval from KCC and the ECoW;

- Any excavations will be left open for minimal periods to avoid acting as a conduit for surface water flows;
- Any diesel or fuel oils stored on site will be bunded to 110% of the capacity of the storage tank. Re-fuelling of plant will not occur within 50m of any watercourse or surface water feature (specifically the Dinin and Ardra watercourses). Drip trays and spill kits will be kept available on site;
- Fuels, lubricants and hydraulic fluids for equipment used on the site, as well as any solvents, oils, and paints will be carefully handled to avoid spillage, properly secured against unauthorised access or vandalism, and provided with spill containment according to codes of practice;
- Any spillage of fuels, lubricants of hydraulic oils will be immediately contained, and the contaminated soil removed from the site and properly disposed of;
- Waste oils and hydraulic fluids will be collected in leak-proof containers and removed from the site for disposal or re-cycling;
- The Contractor shall ensure that all personnel working on site are trained in pollution incident control response. A regular review of weather forecasts of heavy rainfall is required, and the Contractor is required to prepare a contingency plan for before and after such events.
- Only emergency breakdown maintenance will be carried out on site. Emergency procedures and spillage kits will be readily available at strategic site locations and construction staff will be familiar with emergency procedures;
- Where dust suppression is considered to be required by the Contractor or as instructed by appointed ECoW, such requirements and methodology shall be subject to the agreement with the KCC. Notwithstanding this fact, water will not be abstracted from or discharged the Dinin and Ardra watercourses;
- Contaminated soil, including spoil contaminated with invasive species (defined as those species listed on the Third Schedule of the Birds and Natural Habitats Regulations), shall only be disposed of at an appropriately licenced facility. The necessary licences permit and permissions will be required for this activity and it will be the responsibility of the appointed Contractor to arrange for same;
- All water used in the cleansing, testing or disinfection of structures shall be rendered safe prior to discharge to the environment. None shall be permitted to be returned directly to the Dinin or Ardra watercourses or to percolate to ground in the vicinity of these watercourse;
- No works will be permitted within the area of the Dinin and Ardra watercourses during excessive weather events as defined by Met Eireann;
- The Contractor shall ensure that no harmful materials shall be deposited into nearby watercourses, including drainage ditches/pipes, on or adjacent to the site; and
- The Contractor shall comply with the requirements of the Public Health Acts and Fisheries Acts.

4.4.2 Mitigation Measures for stream diversions and bridge construction

Consultation with IFI has stipulated that the following document should be adhered to IFI *Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters* (2016). Within these guidelines clear span structures with no in-stream works is the preferred option however the site options selection process did not find this to be a viable option. A single pier is to be constructed within the Dinin River which will require in-stream works.

In-stream works should be carried out in dry conditions effectively isolated from any flowing water and instream works will only occur during the permitted summer period of July-September inclusive outside of the Annual Close Season.

Works will require the bunding and diversion of the River Dinin along the eastern bank to facilitate instream pier placement. This will be followed by reinstatement of the River Dinin once works have been completed. To facilitate works a temporary crossing will be placed within the Ardra stream consisting of pipe(s) to convey any flow.

The following as stipulated in consultation with IFI will be adhered to;

- The construction of the abutments should always take place in the dry. Where possible the abutments should be set back from the river bank sufficiently to maintain connectivity of habitat along the river bank and to avoid erosion of the bank;
- In some cases where the abutments cannot be set back the area should be isolated from the watercourse using bunding. The area within the bund must be electro-fished and any remaining water must be pumped to grassland or a filtration system before returning to the river; and
- No work should take place within the live water environment.

In addition to the above bullet points stipulated by IFI the following will also be adhered to;

- The area to be dewatered must be electro-fished to translocate any fish/lamprey/crayfish present.
- The ECoW shall engage a suitability qualified and experienced ecologist to prepare a detailed translocation plan for fish/crayfish/lamprey in consultation with the ECoW and IFI;
- The ECoW will appoint a suitability qualified and experienced ecologist(s) to conduct the electro fishing and fish/lamprey/crayfish translocations;
- Fish translocation can only be conducted by qualified ecologists under licence. This is issued under Section 14 of the Fisheries (Consolidation) Act, 1959 as substituted by Section 4 of the Fisheries (Amendment) Act, 1962. Licences can take a number of weeks to obtain so the Contractor will need to be appointed well in advance of works;
- During hot weather conditions work may have to be suspended. The electrofishing team will monitor dissolved oxygen levels in the buckets and tanks and if 90% levels are difficult to maintain, or if there are mortalities, then the operation will have to be suspended;
- Once the works area is dewatered a visual inspection will be carried out by a competent and qualified ecologist for presence of lamprey, crayfish or any fish left in the works area. Any identified will be translocated. Works are only to be undertaken during the month of July – September to mitigate on impacts of potential spawning of adult brook and river lamprey in the River Dinin;
- Any spoil removed from the river bed and bank will be checked for lamprey. Any protected species found in the spoil will be released downstream away from the works; and
- Records of all captured fish must be kept.

Although no crayfish were located at the time of survey there is the possibility for this Annex II species to be present within either the Dinin or Ardra watercourse. Good crayfish habitat was found during the Aquatic survey. The following measures should be adopted;

- The bunding area must also be examined for crayfish prior to dewatering. An ECoW or the appointed suitably qualified ecologist must be present on site during the dewatering activities and can stop dewatering should any crayfish be revealed. Any crayfish found must be removed and translocated to a suitable habitat as stipulated within the translocation plan;

- The survey, handling and translocation of crayfish must be conducted by a qualified person who has relevant licence issued by NPWS for such activities; and

- All those working in-stream shall be aware of the current outbreak of crayfish plague and employ strict biosecurity measure to prevent its introduction and spread to the Dinin/ Ardra watercourses.

4.4.3 Mitigation measures for temporary stream crossing

A temporary structure will be installed to span the Ardra stream as a pipe or series of pipes subject to flow. It is envisaged that the watercourse will be flumed through the pipe(s) which will be backfilled to allow access over the tributary to the bunded area and eastern abutment.

- The ECoW will be responsible for liaising with IFI and ensuring the installation and removal of this structure adheres to IFI requirements.

IFI (2016) *Guidelines on Protection of Fisheries during Construction Works in and Adjacent to Waters* will be adhered to which includes the following;

- The crossing should be in place prior to the commencement of works;

- Flow should be maintained through the structure;

- The structure must provide for the passage of fish and macroinvertebrates;

- No temporary crossing shall be installed without the approval of IFI as regards sizing, location, duration and timing;

- The crossing must be laid in such a manner as to maintain the existing stream profile;

- Ensure no significant alteration in current speed or hydraulic characteristic, in particular not to result in scouring, deposition or erosion upstream or downstream of the temporary crossing location;

- Have capacity to convey the full range of flows including flood flows likely to be encountered without the crossing being overtopped;

- Be covered with clean inert material such as to allow for the safe crossing of the widest items of plant and equipment without cover material being dislodged and entering waters;

- The approach and departure routes to the temporary crossing shall be designed and installed so that drainage will fall away from the watercourse being crossed. In the event that the fall of the ground does not permit sufficient control on drainage, additional earthworks settlement areas shall be provided;

- The temporary crossing structure shall be fenced terram or similar material to prevent wind blow carrying dust and other potentially polluting matter to water; and

- Side armour (or reinforced concrete traffic barriers) shall be provided to ensure machinery cannot drive over its edge or force the discharge of material from the bridge deck to waters.

4.4.4 Sediment and erosion management measures

This section describes a number of general mitigation measures which will be implemented by KCC's appointed Contractor to minimise the effects of sediment and erosion during the construction activities. Indirect impacts to downstream European Sites arise from the potential for sediment/ pollutant release from construction activities. Construction of the proposed works will be restricted to the minimum area necessary as shown in drawing in **Appendix A** of the EIA Screening. Mitigation measures have been specified in the NIS to ensure that there will be no negative impact on the integrity of the European Sites during the

construction of the proposed project. The following mitigation measures, as a minimum, will be implemented, to reduce the risk of pollution of water bodies during construction:

- Dewatering will involve the removal and collection of water from the area, and the treatment and disposal of the collected water;
- The dewatering technique used will aim to reduce the amount of sediment extracted at source e.g. by dewatering through a filter. The water removed from the areas will be treated to remove sediment to an acceptable level (less than 25mg/l suspended solids), before being discharged;
- When damming and dewatering to maintain dry conditions by pumping, any silt contaminated water from the works area must be treated prior to discharge;
- The Contractor will employ best practice settling systems to ensure maximum removal of suspended solids prior to discharge of any surface water or groundwater from excavations to receiving waterbodies. This may include treatment via settlement tanks;
- There will be no direct pumping of sediment laden water from the works to the active watercourse at any time;
- The installation and removal of temporary structures, river diversions and installation of the bridge pier will be done under the supervision of an ECoW and adhere to IFI requirements within the guidelines and also include followings from the consultation response;
- Any topsoil shall be maintained separate from general spoil in a tidy condition with side slopes not steeper than 1 in 3 and shall be maintained in good condition keeping weeds under control and preventing vermin infestation. The Contractor will take all necessary precautions to avoid run off resulting from topsoil stripping from polluting neighbouring watercourses;
- Stockpiling of construction materials, particularly in relation to the excavation for the bridge pier will be strictly limited to specific areas within the study area including low lying ground.
- Elsewhere, stockpiling of construction materials is strictly prohibited within 5m of any ditch or water-laden channel and appropriate management of excess material stockpiles to prevent siltation of watercourses;
- Temporary construction compounds will not be located close to watercourses and set back as far as possible;
- Riparian vegetation will be left intact where practicable. Protection will be afforded to riparian vegetation by fencing prior to commencement of any works. Where practicable, the fencing will be set a minimum distance of 5m from the bank of the watercourse or at the edge of a woody canopy, whichever is the greatest;
- Before earthworks commence on site and before they are needed - drainage, erosion control and sediment control measures must be in place and functioning;
- Watercourse diversion will be done in a manner so as to minimise suspended solids entering the watercourse in line with IFI guidelines;
- The Contractor must specify specific sediment control measures in relation to the construction of the footbridge and river bed channel and agreed with the ECoW; and
- The downstream end of the diversion will be opened up first. Works will be carried out during low flow periods to minimise silt disturbance, and during specified times permitted by IFI for instream works i.e. 1st July to 30th September.

4.4.5 Mitigation Measures for the avoid hydrocarbon loss and other waterborne pollutants

- All oils, solvents and paints will be stored within suitably designed bunded areas with a bund volume of 110% of the capacity of the largest tank/container;
- Refuelling will only take place in designated hard standing areas. A supply of spill kits and hydrocarbon adsorbent packs will be stored along the construction areas. Personnel will be trained in the use of this equipment. Waste oils and hydraulic fluids will be collected in suitable leak-proof containers and transported from the site and off-site areas for disposal or recycling;
- Machinery used on site will be regularly inspected to ensure there is no leakage from them and to ensure the machinery will not cause contamination of watercourses;
- Where required, fuel will be transported in a mobile, double skinned tank and a spill tray will be used when refuelling (if taking place outside a compound area);
- Concrete, including, but not limited to, waste and wash-down water, will be contained and managed appropriately to prevent pollution of watercourses. Concrete pouring will be prevented during periods of heavy rainfall; quick setting mixes will be used;
- Protection measures will be put in place to ensure that all hydrocarbons used during the construction are appropriately handled, stored and disposed of in accordance with recognised standards as detailed by the EPA and/or KCC e.g. approved waste Contractor, off-site treatment/recycling/disposal etc.;
- Guidelines for minimising impacts on water quality and fisheries in relation to construction will be implemented including, but not limited to, CIRIA C532 "*Control of Water Pollution from Construction Sites - Guidance for Consultants and Contractors*", IFI guidelines and TII Guidelines; and
- Runoff and wash down water from exposed aggregate surfaces, cast in place concrete and from concrete trucks will be trapped on-site to allow sediment to settle out and reach neutral pH. KCC and its Contractor will consult and comply with the requirements of the NPWS and the IFI. Waste products and pollutants associated with the works will not be permitted to enter watercourses or groundwater and all precautions necessary will be taken to prevent the spillage of diesel fuel or other solvents.

4.4.6 Environmental Incidents and Accidents

In the case of environmental incidents or accidents occurring during the construction phase of the proposed project, the following measures will help to prevent/ contain the contamination of the watercourses:

- An emergency-operating plan will be established to deal with incidents or accidents during construction that may give rise to pollution in the Dinin or Ardra watercourses. This will include means of containment in the event of accidental spillage of hydrocarbons or other pollutants (e.g. oil booms, soakage pads);
- Throughout all stages of the construction phase of the proposed project the Contractor will ensure that good housekeeping is maintained at all times and that all site personnel are made aware of the importance of the freshwater environments and the requirement to avoid pollution of all types;
- All hazardous materials on site will be stored within secondary containment designed to retain at least 110% of the storage contents;
- Temporary bunds for oil/diesel storage tanks will be used on the site during the construction phase of the project as appropriate;
- Safe handling of all potentially hazardous materials will be emphasised to all construction personnel employed during this phase of the project and an emergency response plan shall be in place in case of accidental spillage;

- Raw or uncured waste concrete will be disposed of by removal from the site;
- Any spillage of fuels, lubricants or hydraulic oils will be immediately contained, and the contaminated soil removed from the site and properly disposed of; and,
- There will be no discharge of un-attenuated water to the nearby watercourses.

4.4.7 Measures to Avoid the Spread of Invasive Species

The presence of Invasive Alien Plant Species (IAPS) has the potential to lead to an offence under the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. No. 477 of 2011). Regulation 49 of the 2011 Regulations prohibits (unless under licence) the breeding, release, or allowing or causing the dispersal from confinement of any animal listed in the Third Schedule of the Regulations; or the planting, allowing or causing dispersal, and spreading of any plant listed in the Third Schedule. Japanese knotweed is a plant listed in the Third Schedule.

It is an offence to plant or encourage the spread of any third schedule invasive species by moving contaminated soil from one place to another, or incorrectly handling and transporting contaminated material or plant cuttings. Persons must therefore take all reasonable steps and exercise due diligence to avoid committing an offence under the 2011 Regulations.

The RPS survey conducted in 2018 identified IAPS within or upstream of the proposed works area. The species recorded included Japanese knotweed (*Fallopia japonica*), Cherry laurel (*Prunus laurocerasus*) and Canadian pondweed (*Elodea canadensis*). Construction to facilitate the footbridge will require works in the vicinity of a stand of Japanese knotweed. Aside from unintended or non–project related dispersal of IAPS seed or viable plant material, there remains the potential for the proposed development to spread Japanese knotweed or other high impact IAPS to downstream hydrologically connected European Sites.

As a result, an Invasive Alien Species Management Plan (IASMP) has been prepared by INVAS and is presented as an appendix to the EIA Screening. This IASMP presents the methodology for the treatment of IAS located on site and the best practice measure to avoid the spread of invasive species. In addition to this plan the following presents the general mitigation and best practice methods to prevent the introduction and spread of IAS.

- KCC, its appointed Contractor and ECoW will comply with IASMP;
- It will be the responsibility of the ECoW to appoint a suitable and qualified person(s) to treat the IAPS onsite as per the management plan;
- Further stands of Japanese knotweed or other third schedule IAPS may have become established in the interim. It will be the responsibility of the ECoW to appoint a suitable qualified person to conduct a preconstruction Invasive Species Survey to assess this and to inform a finalised control programme. The person(s) appointed to treat the known IAPS on site should be informed of any further IAPS present;
- Signs will be erected at the site entrances to alert site users that the area is contaminated with Japanese knotweed, Cherry laurel and Canadian pondweed. Currently, signage confirming the presence of and ongoing treatment of Japanese knotweed is displayed at the Bridge;
- Before any site activities take place (including site compounds, facilities, machinery or vehicles being brought on site) an ‘exclusion zone’ should be clearly demarcated. In effect this will include the site entrance and other areas where works are planned to take place. It should include a visible cordon, including on all visible stands of Japanese knotweed or other third schedule species, with a precautionary 7m buffer to take account of underground spread to prevent further spread on site or until such time that a treatment specialist can confirm that the treatment regime has been successful. This could include PVC windbreak mesh or similar material to prevent unwitting spread by damage or dislodgement. This will not be possible along public roads unless these roads are partially closed to

facilitate the works. Where the road remains open, fencing along the existing wall should be provided for to prevent access to and disturbance of the Japanese knotweed;

- Dedicated exclusion zone entry and exit points should be created for operators on foot and for mobile equipment. The appointed Contractor and suitably qualified person shall agree the working area required to allow for the works to commence unhindered;

- Biosecurity facilities must be installed on-site prior to site works commencing. This must include facilities for wheel brushing, brushing down of vehicle and cleaning of footwear prior to arrival on site and on leaving site to prevent the spread of IAPS. It must also include an area where bushing can be directed into a dedicated and contained area. A sign-off sheet must be maintained by the Contractor to confirm cleaning;

- Vehicles leaving the site should be inspected for any plant material and cleaned down in the biosecurity containment area;

- Loose or dislodged material should be gathered in the dedicated and contained quarantine/clean down area will need to be appropriately treated as contaminated material. This can include plant material, contaminated soil etc;

- Any potential IAPS contaminated material being transported off-site will require licences from NPWS, separate of waste collection permit and/or licenced/permitted waste acceptance facility. It will be the responsibility of the appointed Contractor to arrange;

- For any material entering the site, particularly soils, the supplier must provide an assurance that it is free of non-native invasive species;

- All Contractors and site operatives working on-site should receive training on identification of Japanese knotweed and all potential third schedule IAPS that they might encounter; and site practices immediately on commencement on-site; and

- The appointed Contractor must ensure all site users are aware of the finalised IASMP and treatment methodologies. This can be achieved through “toolbox talks” before works begin on the site.

4.4.8 Mitigation for Protected Species and Habitats

The measures outlined in **Section 4.4.2** to **4.4.7** are put in place to protect water quality and also the following protected aquatic species; Salmon (Salmo salar) [1106], Twaite shad (Twaite shad) [1103] and lamprey (Lampreta spp., *Petromzon marinus*) [1095,1096,1099] *Margaritifera margaritifera* (Freshwater Pearl Mussel) [1029], *Margaritifera durrovensis* (Nore Pearl Mussel) [1990], and *Austropotamobius pallipes* (White-clawed Crayfish) [1092] no further measures are required for these species.

Lutra lutra (Otter) [1355]

While no holts or signs of otter were found during either site visit in 2018, otter are widespread in Ireland and have a transitional nature. There is a possibility that otter could use the banks around the site for breeding in the period leading up to the works.

- Pre-construction otter surveys shall be undertaken prior to the commencement of any works in order to identify any changes in otter activity, holt locations, etc., since the original surveys.

- While there are no seasonal constraints around otter surveying timeframes it is preferable to carried this out during the winter month when vegetation is less dense and tracks are not noticeable.

Derogations are required for any works likely to cause disturbance to active breeding holts (when present within c.150m of a scheme). The removal of otters from affected holts, and the subsequent destruction of these holts, must be conducted under a Section 25 derogation under the 1997 Habitats Regulations. The NPWS, of the Department of the Environment, Heritage and Local Government, is responsible for

processing these licenses. An application for a Section 25 derogation should be submitted to the NPWS along with the relevant ecological information from otter surveys. Closure of holts requires a monitoring period to ensure that there is no current otter activity at the holt. Derogations may not be provided by the NPWS for the closure of holts containing a breeding female or young otters.

Annex I Habitats

There will be no direct loss of any Annex I habitat. The measures outlined in **Section 4.4.2** to **4.4.7** are put in place to protect water quality and prevent the release of contaminates into the Dinin and Ardra watercourses. This will then in turn prevent degradation of any Annex I habitats downstream of the works.

4.4.9 Bats Construction Phase Mitigation

A walkover survey of the site was conducted on 3rd May 2019 by Karen Banks of Greenleaf Ecology and subsequently a Bat Survey Report was produced and notes that there is a Horse Chestnut identified for removal. The Horse Chestnut is identified as supporting bat roost potential and shall be examined by an experienced bat ecologist prior to work commencing by any appointed contractor or subcontractor on any part of the construction phase of the proposed project. Following this examination, should the tree be identified as a bat roost then a derogation licence application will be made to the NPWS to exclude the bats and fell the tree. The roost must not be altered or affected in any way prior to works being undertaken as stipulated within the derogation licence. Felling must be carried out under the supervision of a bat specialist named on the licence.

All works should be restricted to daylight hours so as to minimise impacts to these nocturnal species. Should this not be feasible, the emanation of artificial lighting onto the River Dinin and the riparian treeline shall be kept to the minimum area feasible.

4.5 Noise and Vibration

4.5.1 Noise

The Contractor shall ensure that noise levels emanating during site operations when measured at noise sensitive receptors shall not exceed 55dBA (30 minute Leq) between 08.00 hours and 18.00 hours, and shall not exceed 45 dBA (15 mm Leq) at any other time.

During construction works, the Contractor shall utilise the following noise abatement measures and comply with the recommendations of *BS 5228:2009*+A1:2014 - *Noise Control on Construction and Open Sites*. These measures will ensure that:

- No plant used on site will cause a public nuisance due to fumes, noise, leakages or by causing an obstruction;
- The best means practical, including proper maintenance of plant, will be employed to minimise the noise produced by on-site operations;
- All vehicles and mechanical plant will be fitted with effective exhaust silencers and maintained in good working order for the duration of the contract;
- Compressors will be of the “sound reduced” models fitted with properly lined and sealed acoustic covers which will be kept closed whenever the machines are in use and all ancillary pneumatic tools shall be fitted with suitable silencers;
- Machines, which are used intermittently, will be shut down or throttled back to a minimum during those periods when they are not in use;
- Any plant, such as generators or pumps, which are required to work outside of normal working hours, will be surrounded by an acoustic enclosure; and

- Throughout the contract, the supervision of the works will include ensuring compliance with the limits using the methods set out in BS:5228.

4.5.2 Vibration

The vibration thresholds in the following guidelines shall be followed and adhered to with regard to any potential vibration impacts during construction:

- *BS6472: 2008. Guide to Evaluation of Human Exposure to Vibration in Buildings. Part 1: Vibration Sources other than Blasting*; and

- *BS7385: Part 2 1993: Evaluation and Measurement for Vibration in Buildings-Guide to Damage Levels from Ground-borne Vibration*.

In general, the Contractor shall limit the hours of site activities which are likely to create high levels of noise or vibration. This will be of particular relevance if out of hours/night time work is required.

4.6 Air and Dust Management

Good practice site procedures will be adopted to limit dust at the construction site itself and to minimise potential for secondary impacts due to dust and dirt being transported onto the surrounding road network. The degree of active control measures necessary to be adopted at the subject site will depend on the time of year and the weather conditions prevalent at that time. The following 'good practice' measures will be adopted:

- Where dust suppression is considered to be required by the contractor or as instructed by the Environmental Clerk of Works (EnCoW), such requirements and methodology shall be subject to the agreement with the KCC. Notwithstanding this fact, water will not be abstracted from or discharged to the River Dinin.

- Adjacent road surfaces and construction areas will be regularly cleaned and maintained as appropriate. Hard surface roads will be swept to remove mud and aggregate materials from their surface. Any site roads with the potential to give rise to dust will be regularly watered, as appropriate, during dry and/or windy conditions (also applies to vehicles delivering material with dust potential);

- Wheel cleaning facilities will be provided at the site if the need arises;

- A mechanised road sweeper will be used on the public roads if and as mud transfer is identified as an issue;

- Dust suppression by water spray to be employed on surrounding roads and other areas, in particular spoil storage areas, if dust becomes an issue;

- Vehicles on site accessing the compound and bridge locations will have their speed restricted and this speed restriction must be enforced rigidly;

- Material handling systems and stockpiling of materials shall be designed and laid out to minimise exposure to wind and proximity to nearby residents. Water misting shall be applied as required if particularly dusty activities are required during dry or windy periods; and

- All complaints to be reported to the Site Manager and also logged within an on-site register.

4.7 Traffic Management

A Traffic Management Plan (TMP) shall be prepared by the Contractor prior to the commencement of construction works and shall be agreed in advance with KCC. The main purpose of this TMP is to ensure works adjacent to the public road are undertaken safely and to provide suitable notice to road users that they are approaching a construction site/construction site entrance.

The TMP shall seek to minimise disruption to road users, local residents, businesses and all relevant stakeholders in the area. Local peak traffic times shall be confirmed and avoided as necessary. In particular, provision shall be made and agreed with respect to the management of the proposed road closure.

It shall seek to ensure public safety and eliminate potential for hazard.

Access points to the works areas shall be clearly identified on a map of suitable scale and background detail. Any areas that are identified as exclusion zones shall be clearly marked on this map.

All relevant construction traffic routes (including in particular routes between the site compound and the works areas) shall be identified. Any relevant haul routes, including routes related to the import of materials to the site and the export of materials off site shall be identified and agreed with the local authority Area Engineer.

It shall ensure that damage does not occur to the public road network and that adequate measures are taken by the Contractor to reinstate road surfaces following completion of the works to the satisfaction of the local authority.

In the event of damage occurring to the public road network or associated infrastructure as a result of the works, such damage shall be made good in accordance with the requirements of and to the satisfaction of the planning authority.

Temporary staff parking will be provided for within the site compound or other proximate designated area in the vicinity of the works but away from watercourses as specified elsewhere in this Outline CEMP.

4.8 Waste

The following waste management measures will be adopted at the site:-

- All waste arising during the construction phase will be managed and disposed of in a way that ensures compliance with the requirements of the Waste Management Act 1996 and associated amendments and regulations and the Contractor's Final WMP;
- A segregated waste area will be set up at the compound to ensure waste is segregated at source and to maximise the potential for reuse or recovery (by licensed operators off site as appropriate);
- All construction related wastes e.g. plastics, cable ties, geotextiles etc. will be removed and recycled and/or disposed of in an appropriate segregated manner. This is to prevent any accidental inputs into the existing landscape and/or watercourses nearby;
- Any waste material generated during the construction period that is not required for/is unsuitable for reinstatement shall be removed off-site and disposed of in a licensed facility in accordance with current legislation; and
- Japanese knotweed will be taken off site under license from the NPWS and in accordance with the Waste Management Act as amended.

4.9 Cultural Heritage

John Cronin and Associates carried out an assessment entitled *Architectural Heritage Assessment* and notes that the bridge **is not a recorded archaeological monument**, but it is located within the Zone of Notification (ZON), as designated by the National Monuments Service (NMS), surrounding the historic town of Castlecomer (KK005-082----). The proposed project can therefore be considered to be located in an area of moderate to high archaeological potential. While the proposed project will have no predicted impacts on any recorded archaeological sites. There is potential to result in direct negative impacts on any such archaeological features should they be present.

The bridge is listed as a protected structure in the Record of Protected Structures (RPS Ref. no. D13) published in the current Kilkenny County Development Plan (2014). The bridge is rated as being of **national importance** in the National Inventory of Architectural Heritage (NIAH no. 12301001) survey of bridges and other historic structures in County Kilkenny. The proposed bridge will not have any significant effects on the designated architectural heritage resource other than the Castlecomer Bridge. The predicted impact relates to the alteration to the setting of the bridge.

In order to mitigate the above potential impacts the following mitigation is proposed:

Archaeological Heritage

The following mitigation measures will be implemented in full:

- An Underwater Archaeological Impact Assessment (UAIA) of the in-channel areas (including riverbanks) to be impacted by the proposed bridge structure shall be carried out prior to the construction phase. This will include a dive/wading survey of the river channel licenced by the NMS which will incorporate an inspection of the bridge structure, weir and adjacent millrace.

- Any greenfield areas on either side of the river bank that will be impacted by ground works associated with the project such areas (if accessible) should be subject to pre-construction archaeological test trenching.

- Given the archaeological potential of the area, archaeological monitoring of all ground and in-channel excavation works shall be carried out during the construction phase. This is particularly important on the eastern side of the riverbank within the raised bank area as this bank is effectively an island formed by the main river channel and a tributary channel. Archaeological monitoring of the demolition of the embanking wall to the west will also be undertaken.

- All phases of archaeological investigations shall be augmented by the use of a metal-detector (under licence by the NMS) to assist in the recovery of archaeological artefacts.

- In the event that any archaeological features and/or artefacts are uncovered during any phase of site investigations, the NMS and the TII Project Archaeologist must be notified and consulted to determine appropriate further mitigation measures.

Architectural Heritage

The following mitigation measures will be implemented in full:

- Prior to commencement of works and following removal of vegetation at the areas where the new pedestrian bridge is to connect with existing pavements, a full record of the sections of walling to be removed will be undertaken by a suitably qualified built heritage specialist. The record will include full description (i.e. construction, composition and style, etc.) and interpretation of any distinctive phases evident in the walling. This record shall include annotated drawings to be produced from photogrammetry or laser scanner survey.

- Prior to commencement of works, a conservation method statement shall be prepared by a suitably qualified conservation consultant/architect to specify (a) works for the planned interventions so that the interface between historic masonry to be removed and retained will be effectively repaired and made good and (b) the form/design of the new wall that present to the garden of La Rive (formerly No. 16 High

Street). This is to ensure that the new wall is built in a manner consistent in form and materials with adjoining masonry walls.

- Any proposed conservation or repair works will be (a) undertaken by a contractor with proven experience of the conservation and repair of historic masonry structures and (b) under supervision of a suitably qualified conservation consultant/architect. The appointed conservation consultant/architect shall carry out periodic inspections and will approve workmanship. At the discretion of the conservation consultant/architect, the contractor may be directed to prepare sample work for approval (such as repointing and sample masonry panels).

- All masonry removed during the course of works shall be retained by the contractor for the duration of works. The retained material will be reused, where practicable, for the planned programme of repairs and in a new walling. Samples of an additional masonry/stone required for the completion of the planned works shall be reviewed and approved by the appointed conservation consultant/architect

The Final CEMP will take account of any requirements of the Development Applications Unit of the Department of Culture, Heritage and the Gaeltacht such as may be conditioned by a planning consent with respect to the protection of archaeological, architectural or cultural heritage.

4.10 Landscape and Visual Management and Site Reinstatement Plan

RPS carried out an Landscape and Visual Impact Assessment (LVIA) in June 2019. The purpose of the LVIA was to identify, describe and evaluate potential impacts and effects arising from the proposed bridge on the landscape and visual receptors in the study area. Based on the LVIA and general best practice construction, the following mitigation measures are proposed:

- Construction plant and machinery shall be parked within designated areas (site compound) on site when not in use.

- When works are completed on site, the Contractor shall clean-up all areas affected by construction operations. That will include removal of all plant, equipment and materials no longer required on site.

- The appointed Contactor shall be responsible for the implementation of measures outlined within this Plan to ensure that the site is left in a visually acceptable manner. This will particularly relate to the river bank and its revegetation.

- Any necessary restoration of fences, walls, services or land will be completed as soon as practicable after main remediation works have concluded.

- Measures outlined in BS 5837 Trees in relation to construction will be implemented by the Contractor to protect vegetation to be retained during construction.

4.11 Monitoring

4.11.1 Objective

The objective of monitoring during the construction phase is to ensure that relevant environmental controls are in place and being implemented and adhered to in order to prevent environmental impact.

4.11.2 Monitoring Requirements

The following monitoring be undertaken during the construction process:

The Contractor will appoint a suitably qualified person, or persons, to the role of EnCoW to monitor the construction works. Any non-compliance issues shall be identified to the developer's site supervisory team as soon as it is identified to ensure timely corrective actions.

Furthermore, an ECoW will be appointed by KCC to oversee the project from an ecological perspective. The ECoW will work closely with the contractor's EnCoW to monitor activities and ensure compliance with all relevant environmental legislation and that the requirements of the finalised CEMP are implemented. The ECoW will have the authority to review the CEMP and method statements, advise the EnCoW and the Contractors on the contract/project requirements, decide on elements that require direct supervision and instruct action, as appropriate, including the authority to require the temporary cessation of works, where necessary.

4.12 Conclusion

Any other monitoring requirements such as may be required by the conditions of a planning consent are to be included within the Final CEMP.

Appendix D

Archaeological and Architectural Heritage Assessment

JOHN CRONIN & ASSOCIATES
ARCHAEOLOGY | CONSERVATION | HERITAGE | PLANNING

Proposed footbridge, Castlecomer, County Kilkenny

Archaeological and architectural heritage assessment

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Contents

1. Introduction

Kilkenny County Council intends to make an application for approval to An Bord Pleanála to carry out a proposed development adjacent to Castlecomer Bridge in the townlands of Drumgoole, Castlecomer and Ardra in the County of Kilkenny. The proposed development would consist of the construction of a two-span steel footbridge over the River Dinin adjacent to the north (and upstream) of the existing masonry bridge (a protected structure) and the making of alterations to existing stone masonry walls associated with two further protected structures to facilitate the footpath approaches to the proposed footbridge. The existing bridge forms the N78 crossing of the River Dinin. The new structure will not be attached to the existing bridge but will be supported by a central pier and two landing areas on either side of the river. The central pier will sit on a rectangular pile-cap of 4 no. piles. The top of the pile-cap will be set just below bed level of the river to ensure no impact on flow.

John Cronin & Associates have been commissioned by RPS Group on behalf of their client Kildare County Council[1] to undertake an archaeological and architectural heritage impact assessment of the proposed works. The assessment was prepared by Padraig Dunne, Eamonn Hunter and John Cronin.

Castlecomer Bridge is included in the Record of Protected Structures (RPS Reference D13) within the current Kilkenny County Development Plan (2014 – 2020). The bridge is rated as being of *national* importance by the National Inventory of Architectural Heritage (NIAH no. 12301001). The bridge is not a recorded archaeological monument, but it is located within the *Zone of Notification* (ZON), as designated by the National Monuments Service (NMS), surrounding the historic town of Castlecomer (Monument Number KK005-082----).

This assessment has been informed by desktop research and site inspections undertaken at various junctures between September 2018 and June 2019. The extent of the study area reviewed for this assessment comprised the existing bridge, its close environs and surrounding lands within a 250m wide area extending in all directions. Detail on the design of the proposed scheme presented within this report is based on available information provided to John Cronin & Associates in June 2019.

The report seeks to assess the impacts of the proposed development on the bridge and on other known and potential elements of the archaeological and architectural heritage resources within the area. Based on this assessment, appropriate mitigation strategies are then recommended. It is recommended that this report be read in conjunction with the 'Landscape and Visual Impact Assessment' prepared by RPS Group.

Section 2 of this report provides a summary of the methodology used in its compilation. **Section 3** then provides a summary of the Irish legal and policy frameworks designed to protect the archaeological and architectural heritage resources. This section also identifies the designated archaeological and architectural heritage constraints within the study area as well as the results a desktop study and site inspection undertaken to assess potential impacts, including those on hitherto undesignated or unrecorded features within the project area. A description of the bridge

[1] There is a Section 85 Agreement (Local Government Act, 2001) between Kildare County Council and Kilkenny County Council whereby Kildare County Council are taking on the role of Lead Authority. Statutory functions are retained by Kilkenny County Council.

and its immediate environs is outlined in **Section 4** and the text is cross-referenced to photographs contained in **Appendix 1** of this document. A summary of potential impacts is then presented in **Section 5** and this is followed by **Section 6** which collates the assessment conclusions and recommends appropriate mitigation measures to be adopted prior to and during the construction phase of the proposed project. A list of consulted sources is provided in **Section 7**. Extracts of the photographic record compiled during separate site inspections are provided in **Appendix 1** and extracts from relevant consulted datasets are presented in **Appendix 2**.

2. Methodology

Desktop Study

The assessment commenced with a programme of desktop research on the study area which was undertaken in order to identify known and potential archaeological and architectural heritage constraints. The Sites and Monuments Record (SMR) and the Record of Monuments and Places (RMP) for County Kilkenny, both published by the Archaeological Survey of Ireland, were the principal sources consulted for identifying known archaeological sites. The Record of Protected Structures (RPS) and the National Inventory of Architectural Heritage (NIAH) were consulted to assess the designated architectural heritage resource. Details on the legal and planning frameworks designed to protect these elements of the archaeological and architectural heritage resources are presented in Section 3 of this report.

In addition, the following sources were consulted as part of the desktop study:

- *Historic Environment Viewer:* This online resource presents available summary descriptions of recorded archaeological sites and the relevant entries are presented in **Appendix 2**. Current information was reviewed at www.archaeology.ie on 07/05/19.

- *Cartographic Sources* - The cartographic sources examined for the study area include the Down Survey (1650s), the 1st edition of the 6-inch Ordnance Survey (OS) maps (surveyed and published in the 1830s-40s) and the 25-inch OS maps (surveyed and published 1887-1913).

- *Aerial photography* –A review of publicly-accessible aerial photographic sources from the Ordnance Survey, Google and Bing Maps was undertaken.

- *Literary Sources* - various published sources were consulted and references are provided in Section 7 of this report

- *Development Plans* - These plans outline local authorities' policies for the conservation of the archaeological and architectural heritage resource and include the Record of Protected Structures (RPS) and any designated Architectural Conservation Areas (ACAs). The Kilkenny County Development Plan 2014-2020 and the Castlecomer Local Area Plan 2018-2024 were reviewed as part of the assessment.

- *Dictionary of Irish Architects* - The Dictionary of Irish Architects contains biographical and bibliographical information on architects, builders and craftsmen born or working in Ireland during the period 1720 to 1940, and information on the buildings on which they worked. This biographical index of architects, builders and craftsmen was created and compiled by Ann Martha Rowan of the Irish Architectural Archive.

- *Database of Irish Excavation Reports* - This online database contains summary accounts of licensed archaeological excavations carried out in Ireland. The database entries for investigations carried out within the vicinity of the subject area are provided in **Appendix 2** of this report. Current data was accessed via www.excavations.ie on 07/05/19.

- *UNESCO World Heritage Sites and Tentative List:* UNESCO seeks to encourage the identification, protection and preservation of cultural and natural heritage around the world considered to be of outstanding value to humanity. There are two world heritage sites in Ireland and a number of other significant sites are included in a Tentative List (2010) that has been put forward by Ireland for inclusion.

- *National Inventory of Architectural Heritage* - The function of the National Inventory of Architectural Heritage (NIAH) is to record built heritage structures within the Republic of Ireland and to advise local authorities in relation to structures of interest within their areas. Listing on the NIAH does not necessarily carry any statutory protection but does highlight the architectural, historical archaeological, artistic, scientific, technical and social special interest of a structure which ought to be conserved.

- *Irish Heritage Council: Heritage Map Viewer* - This online mapping source collates various cultural heritage datasets and includes extracts from the National Museum of Ireland's records of artefact discovery locations as well as datasets provided by, among others, the National Monuments Service, local authorities, the Royal Academy of Ireland and the Office of Public Works. Current data was accessed via www.heritagemaps.ie

Site inspection

A total of five different site inspections were undertaken by staff members of John Cronin & Associates between September 2018 and June 2019.

Assessment of impact types

The methodology used to assess potential impacts has been informed by guidelines published in the Transport Infrastructure Ireland (TII) *Guidelines for the Assessment of Archaeological /Architectural Heritage Impacts of National Road Schemes*.

Consultation

The design of the bridge has been informed by ongoing consultation with the Department of Culture, Heritage and the Gaeltacht (DoCHG). Representatives of the DoCHG attended Project Review Meetings along with a Project Archaeologist from Transport Infrastructure Ireland (TII) and the Conservation Officer of Kilkenny County Council. The input of representatives from DoCHG, TII and Kilkenny County Council influenced the selection of the preferred intervention/design of the proposed pedestrian bridge and, critically, moved the design away from affixing a cantilevered structure to the existing bridge.

3. Context

General Location

The bridge is located at the east end of the High Street on the eastern approach from Athy into Castlecomer in County Kilkenny and carries the N78 two-way road across the Dinin River. The bridge extends from the townland of Castlecomer on the west bank of the River Dinin to Castlecomer Demesne (spanning the townlands of Ardra and Drumgoole) on the east bank.

From its earliest development, the topography and geology of the area has defined Castlecomer town's history. The Castlecomer Plateau is an upland plateau that surrounds the town to form a discrete landscape unit within the region and its coal deposits have meant that it is one of the few areas in Ireland with a history of coalmining. The plateau is bounded on the east by the River Barrow, the west by the River Nore and is bisected by the Dinin River.

Figure 1: *Location of Castlecomer Bridge (Reproduced under Ordnance Survey Ireland Licence No. SU 0003319)*

Legal and Policy Framework

The management and protection of cultural heritage in Ireland is achieved through a framework of national laws and policies which are in accordance with the provisions of the Valetta Treaty (1995) (formally the *European Convention on the Protection of the Archaeological Heritage, 1992*) ratified by Ireland in 1997; the *European Convention on the Protection of Architectural Heritage* (Granada Convention, 1985), ratified by Ireland in 1997; and the *UNESCO Convention for the Safeguarding of the Intangible Cultural Heritage, 2003*, ratified by Ireland in 2015.

The locations of World Heritage Sites (Ireland) and the Tentative List of World Heritage Sites submitted by the Irish State to UNESCO were reviewed and none are located within the region of the country containing the study area.

The national legal statutes and guidelines relevant to this assessment include:

- National Monuments Act (1930) (and amendments in 1954, 1987, 1994 and 2004);
- Heritage Act (1995);
- National Cultural Institutions Act (1997);
- Architectural Heritage (National Inventory) and Historic Monuments (Miscellaneous Provisions) Act (1999);
- Planning and Development Act (2000);
- *Architectural Heritage Protection: Guidelines for Planning Authorities*, Department of Arts, Heritage, and the Gaeltacht (2011); and
- *Framework and Principles for the Protection of the Archaeological Heritage*, Department of Arts, Heritage, Gaeltacht and the Islands, 1999.
- *TII Guidelines for the Assessment of Archaeological Impacts of National Road Schemes*
- *TII Guidelines for the Assessment of Architectural Heritage Impacts of National Road Schemes.*

Archaeological Heritage

This project is covered by the Code of Practice for Archaeology agreed between the Minister for Arts, Heritage, Regional, Rural and Gaeltacht Affairs and Transport Infrastructure Ireland (TII). An overview of the legal framework designed to protect the Irish archaeological resource is available in the TII *Guidelines for the Assessment of Archaeological Impacts of National Road Schemes*[2] and a summary follows hereafter.

The administration of national policy in relation to archaeological heritage management is the responsibility of the National Monuments Service (NMS) which is currently based in the Department of Culture, Heritage and the Gaeltacht. The National Monuments Act of 1930, and its Amendments, are the primary means of ensuring the satisfactory protection of the archaeological resource. They include a number of provisions that are applied to secure the protection of archaeological monuments. These include the designations of nationally significant sites as National Monuments, the Register of Historic Monuments (RHM), the Record of Monuments and Places (RMP), the Sites and Monuments Record (SMR), and the placing of Preservation Orders and Temporary Preservation Orders on endangered sites.

Section 2 of the National Monuments Act, 1930 defines a National Monument as *'a monument or the remains of a monument, the preservation of which is a matter of national importance'*. The State may acquire or assume guardianship of examples through agreement with landowners or under compulsory orders. Archaeological sites within the ownership of local authorities are also deemed to be National Monuments. There are no National Monuments in the ownership or guardianship of the State within the study area.

[2] http://www.tiipublications.ie/downloads/SRM/22-Archaeology-Planning-Guidelines-2005.pdf

The National Monuments (Amendment) Act, 1994 made provision for the establishment of the RMP, which comprises the known archaeological sites within the State. The RMP, which is based on the earlier RHM and SMR, comprises county-based lists of all recorded archaeological sites with accompanying maps. All RMP sites receive statutory protection under the National Monuments Act 1994 and the NMS must be given two months' notice in advance of any works proposed at their locations. The NMS have applied designated areas surrounding the recorded locations of archaeological sites known as Zones of Notification (ZON) and the extent of these are indicated on the Historic Environment Viewer. There are seven recorded archaeological sites, and one redundant record, located within the study area boundary (**Table 1** and **Figure 2**).

The *Kilkenny County Development Plan 2014-2020* includes the following objective in relation to the protection of the archaeological resource:

> *8I Protect archaeological sites and monuments (including their setting), underwater archaeology, and archaeological objects, including those that are listed in the Record of Monuments and Places, and in the Urban Archaeological Survey of County Kilkenny or newly discovered sub-surface and underwater archaeological remains.*

In Section 8.3.1 of the County Development Plan, Development Management Standards in relation to archaeological heritage are stated as follows:

- *Endeavour to preserve in situ all archaeological monuments, whether on land or underwater, listed in the Record of Monuments and Places (RMP), and any newly discovered archaeological sites, features, or objects by requiring that archaeological remains are identified and fully considered at the very earliest stages of the development process and that schemes are designed to avoid impacting on the archaeological heritage.*
- *To require archaeological assessment, surveys, test excavation and/or monitoring for planning applications in areas of archaeological importance if a development proposal is likely to impact upon in-situ archaeological monuments, their setting and archaeological remains.*
- *Ensure that development within the vicinity of a Recorded Monument is sited and designed appropriately so that it does not seriously detract from the setting of the feature or its zone of archaeological potential. Where upstanding remains of a Recorded Monument exist a visual impact assessment may be required to fully determine the effect of any proposed development.*
- *Require the retention of surviving medieval plots and street patterns and to facilitate the recording of evidence of ancient boundaries, layouts etc. in the course of development.*
- *Safeguard the importance of significant archaeological or historic landscapes from developments that would unduly sever or disrupt the relationship, connectivity and/or inter-visibility between site*

The *Castlecomer Local Area Plan 2018* includes the following objectives in relation to both the archaeological and architectural heritage resources:

> *H6 To protect and preserve items of both architectural and archaeological heritage from inappropriate development that would adversely affect and/or detract from the interpretation and setting of these sites. These include recorded monuments, structures contained in the Record of Protected Structures, the National Inventory of Architectural Heritage and structures within the Architectural Conservation Area.*

HDMS10 Require consultation with the Council's Heritage and Conservation Officers to ensure the protection of archaeological heritage of the town and the associated historic landscape. This includes terrestrial archaeology and underwater archaeology for in river works.

HDMS11 Ensure that all applications within the zone of archaeological interest or in close proximity to monuments are referred for archaeological assessment and also in accordance with national policy on large scale development sites where there are no previous recorded monuments.

Architectural heritage

An overview of the legal framework designed to protect the Irish architectural heritage resource is presented in the TII *Guidelines for the Assessment of Architectural Heritage Impacts of National Road Schemes*[3]. In summary, protection of architectural heritage is provided for through a range of legal instruments that include the Heritage Act (1995), the Architectural Heritage (National Inventory) & National Monuments (Misc. Provisions) Act (1999), and the Planning and Development Act (2000).

The Heritage Act (1995) (as amended) defines architectural heritage as including: *all structures, buildings, traditional and designed, and groups of buildings including streetscapes and urban vistas, which are of historical, archaeological, artistic, engineering, scientific, social or technical interest, together with their setting, attendant grounds, fixtures, fittings and contents.*

The National Inventory of Architectural Heritage (NIAH) was established under the Architectural Heritage Act (1999), to record architectural heritage structures within the State and to advise local authorities in relation to structures of architectural heritage significance within their administrative areas. Castlecomer Bridge is included in the County Kilkenny NIAH (ref 12301001) which rates the structure as being of national significance. The other NIAH structures within the study area are listed in **Table 2** and their locations are indicated on **Figure 2**.

The conservation principles of care and protection of architectural heritage and the facilitation of the listing of significant buildings of architectural merit are set out in Part IV of the Planning and Development Act (2000). This requires Local Authorities to maintain a Record of Protected Structures (RPS) of structures with special architectural, historical, archaeological, artistic, cultural, scientific, social or technical interest, to be included in their Development Plans. Any changes that materially affect the character of a protected structure require planning permission. In addition, Local Authorities must provide for the preservation of townscapes of heritage significance through the designation of Architectural Conservation Areas (ACAs). As previously noted, Castlecomer Bridge is listed as a protected structure (RPS D13) in the current *Kilkenny County Development Plan 2014-2020*. The bridge is located outside the Castlecomer ACA as delimited in the *Castlecomer Local Area Plan 2018-2024*, which shows the east end of the ACA boundary terminating at the west end of the bridge structure.

The *Kilkenny County Development Plan 2014-2020* includes the following relevant objective in relation to the protection of the architectural heritage resource within the County:

[3] http://www.tiipublications.ie/downloads/SRM/24-Architectural-Planning-Guidelines-2005.pdf

8K To ensure the protection of the architectural heritage of County Kilkenny by including all structures considered to be of special architectural, historical, archaeological, artistic, cultural, scientific, social or technical interest in the Record of Protected Structures.

In relation to Record of Protected Structures, 8.3.5.1 of the current County Development Plan's development management standards are as follows:

- *The Council will have regard to the Architectural Heritage Protection Guidelines when assessing proposals for development affecting a protected structure.*
- *To encourage the sympathetic retention, reuse and rehabilitation of protected structures and their setting*

Archaeological and historical context

The following section provides a summary of the development of Castlecomer town with reference to recorded archaeological sites located within the study area. The dating framework used for archaeological periods is based on *Guidelines for Authors of Reports on Archaeological Excavations* as published by the National Monuments Service (NMS).

Datasets have been interrogated and retrieved from State and Local authorities and are considered accurate and current per publicly available sources (Archaeological datasets Historic Environment Viewer at www.archaeology.ie; archaeological excavation results at www.excavations.ie, NIAH datasets at www.buildingsofireland.ie as well as the RPS published in the Kilkenny Development Plan 2014-2020).

In summary, there are seven recorded archaeological sites located within the study area, including the *Zone of Notification* (ZON) surrounding the historic core of Castlecomer town, and these all date from the medieval period onwards (**Table 1**). A battlefield site (KK005-102----) is indicated immediately to the east of the bridge on the Historic Environment Viewer (**Figure 2**). This comprises an indicative location for this recorded archaeological site which encompasses various townlands in the surrounding landscape. There are no other recorded archaeological sites located within 90m of the bridge (**Table 1**).

Figure 2: *Extract from Historic Environment Viewer showing the location of archaeological sites within study area (red line) and their surrounding Zones of Notification (shaded). NIAH listed structures are indicated with blue dots and bridge location with an arrow*

Table 1*: Recorded archaeological sites located within study area*

Monument No.	***Class***	***ITM ref***	***Approx. distance from bridge***
KK005-102----	*Battlefield*	*653610, 673050*	*Extends throughout study area*
KK005-104----	*Bastioned fort*	*653780, 673101*	*150m to west*
KK005-082----	*Historic town*	*653389, 673030*	*ZON extends over bridge*
KK005-081----	*House 16th/17th century*	*653662, 672969*	*90m to southeast*
KK005-057----	*Redundant record*	*653780, 673039*	*180m to east*
KK005-033001-	*Castle – unclassified*	*653756, 673088*	*160m to east*
KK005-033002-	*Castle – motte*	*653756, 673088*	*160m to east*
KK005-033003-	*Outwork*	*653779, 673102*	*180m to east*

The historic core of Castlecomer town has been designated as a recorded archaeological site by the Archaeological Survey of Ireland (KK005-082----). The town takes its name from a motte (KK005-033002-) and castle (KK005-033001-) constructed in lands to the east of the river to

control a crossing point. The motte was probably erected during the initial Anglo-Norman incursions in the late 12th century (Carrigan 1905, vol .2 158-9). The *'Liber Primus Kilkenniensis'* records that in *c.*1200 the castle and an associated settlement were burned by the O'Brenans (Orpen 1909, 318-19). Although the exact location of the settlement is unclear, tradition links it with the 'Garrison' located near Castlecomer House. Orpen also records the following, 'just before the death of the younger William Marshal in 1231, he obtained a grant for forty days of his service due to the king to enable him "to fortify his castle of Cumbre [Castlecomer]". In 1295, Edward I gave the custody of the castle of Combre to Richard le Erecedekne [Archdeacon], to fight the enemies of the king. The first actual mention I have noted of a [stone] castle here was in 1289' *(ibid*.). In 1328 Castlecomer was burned by William de Bermingham and in 1374, a now unlocated church at Castlecomer was recorded as being in the possession of St. John's Abbey in Kilkenny (Carrigan 1905, vol .2 157-8).

In 1635, Sir Christopher Wandesforde began the construction of a new settlement, the design of which was based on the Italian town of Alsinore and also contained a new church building (*ibid.*, 158). He also planted English colonists, exploited the local anthracite mines and introduced haymaking to the district. In 1641, the new town came under siege from forces loyal to the Confederation Parliament in Kilkenny and the castle which stood on the motte, or the 'Garrison', to the east of the river was besieged by the Confederate army in 1641 for over three months (*ibid.* 158-9). The church was destroyed as many settlers had taken refuge there and, while its former location is unknown, it is possible that the existing Church of Ireland graveyard and church (RMP Nos. KK005-03401- and KK005-03402-) were built on its former site. The 17th century Down Survey mapping shows a castle structure in the area, which is named 'Castle Comber'. The mapping shows no bridge extending over the adjacent section of the river or major routeways leading to the settlement.

The following summary of the battle of Castlecomer during the 1798 rebellion is based on Musgrave's *Memoirs of the Different Rebellions in Ireland, Vol. 2* (1802) and a report on the battlefield prepared for the National Monuments Service (NMS) by Eneclann and Headland (2008). The NMS kindly provided a copy of the latter report to Kilkenny County Council who made it available to the authors for review as part of this assessment.[4]

Musgrave (1802) overview of the battle recounts that in the aftermath of the defeat at Vinegar Hill on June 21st, 1798, the United Irishmen left County Wexford and set towards Castlecomer with a force of 5,000 men. Major General Charles Asgil then advanced from Kilkenny City with about 1,000 men to relieve the Castlecomer garrison and sent an advance force of approx. 100 men to augment the 300 or so already there who were under the command of Walter Butler, the future 18th Earl of Ormonde. On June 24th the advancing United Irishmen defeated a force of about 250 men at Coolbawn located a mile and a half from Castlecomber town. They then advanced to the town in two columns, one under Father Murphy and the other under Miles Byrne. The columns eventually joined forces within the town, and it has been recorded that 50 Loyalists were killed in the fighting which caused much damage to the town with much of it burnt down. They then set out to assault Castlecomer House, which was also burnt, and diverted to meet Asgil's relief force which had arrived on the heights outside the town. Asgil's artillery covered the retreat of the trapped garrison and held the high ground until they had made their escape.

[4] In circulating the report to Kilkenny County Council, the NMS commented "This material has not yet been reviewed by the staff of the National Monuments Service and is provided for information purposes to the Local Authority."

The following direct extract from the Eneclann and Headland (2008) report presents a summary of the engagements within the environs of bridge during the battle:

> *After a clash with Murphy's forces that lasted about 15 minutes the commander of the town garrison, a Captain Green, concluded that his position was hopeless and immediately ordered a retreat….Some troops of the Waterford and Downshire Militias, along with some 30 loyalists, refused to abandon the bridge however, and took shelter in the houses that surrounded it.*
>
> *Meanwhile, Byrne's column continued on the road into eastern Castlecomer. They encountered approximately 60 Militia troops on the way, who immediately attempted to surrender. They were, they claimed, the remnants of the troops retreating from Coolbaun. Byrne went forward to accept their capitulation but in the confusion one of the Militia officers was killed, causing the rest of that troop to flee with their firearms. Many were pursued and caught, but those who did escape took shelter in large stone houses surrounding the bridge into the eastern side of Castlecomer; the very same buildings where the remnants of the Waterford and Downshire Militias were stationed. Amongst these buildings was Castlecomer House, the abode of Lady Anne Butler. Byrne's troops, on arriving there, attacked the bridge at the town's eastern entrance. These troops encountered greater difficulties than Murphy's did, however. Their assault on the residences overlooking the bridge proved difficult. This was especially true of Castlecomer House, as its strength, height and isolated nature made it difficult to attack. Many insurgents were shot on the bridge during their advance at this end of town. Indeed, many of Byrne's troops could not even get over the bridge to attack the houses. A stratagem of pushing carts loaded with burning hay and straw towards the bridge to try and set it on fire proved ineffectual also, as the carts did not provide sufficient cover for those pushing them. Byrne eventually sent a prisoner under a white flag to the House to negotiate a surrender. Having informed the commander of the Castlecomer House defenders that the town itself was in Fr. Murphy's hands, and that this priest's troops were attacking Castlecomer House (and the other houses) from the rear and were intent on burning them down, Byrne was able to agree that the defenders should surrender to him, once Fr. Murphy had signed a letter guaranteeing their protection. This surrender, after some drawn-out negotiations, was being finalised when General Asgill arrived at the town from Kilkenny.*
>
> *Asgill's troops immediately lined the hills overlooking the bridge and opened fire on the left flank of the insurgents, using both muskets and grapeshot. Artillery fire was also mistakenly directed onto the town. The insurgents momentarily withdrew in the face of this new challenge. This allowed those Crown troops in Castlecomer House enough time to escape. The houses in which they had sheltered continued to burn though, and were soon destroyed. Asgill also sent troops from the Wexford and Wicklow Militias to secure the bridge and to evacuate that part of the town. The General was to later claim that he killed 400 insurgents in this assault. The insurgent withdrawal was only temporary however, and the two columns began to organise themselves for battle. Murphy and Byrne's troops faced Asgill's forces and drew up into battle lines on rising ground. It has been asserted that this may have been on a rise known as Wolf's Hill, however, given the distance between this hill and Castlecomer, it would seem unlikely. In all probability, the insurgents are likely to have placed themselves on the rising ground north of the Coolbaun road and just east of the old Castlecomer demesne as this would position them across from Asgill's troops. Unaccountably, Asgill allowed them to assemble unopposed, despite having the insurgents in his sights, although Musgrave asserts that the General was obliged to move his artillery as the heat generated by the fires in the town was threatening to cause his cannons to explode. Then, possibly on seeing the insurgents' advantageous position, the General decided to retreat along the road back to Kilkenny, leaving the town in insurgent hands.*

The National Folklore Collection UCD Digitization Project (www.duchas.ie) records the following local story relating to the battle[5]:

> *Just about 200 yards beyond the Deer-Park Castlecomer there is a bridge and in that very spot some of the men of the rebellion of 1798 fought. There was a fierce battle fought and a lot of the men of 1798 were killed. In the field at the far side there are a few bushes grown up, and there are two or three head stones in the middle of the bushes.*

As a result of the conflict, little remains of the town from the period prior to 1800 and it was thereafter extensively redeveloped by the Wandesforde family in the general form that currently exists. As the Wandesforde family intended to develop their land acquisitions commercially, the emphasis of the new town was on commerce with a central axis centred on a large marketplace, which corresponds to the present square. A number of houses were built to provide for workers in the coal mining and iron smelting enterprises that were developed in the 19th century. These houses have consistency in character, all having been built around the same time after 1800.

A weir within the section of the river channel on the north side of the bridge is aligned towards a millrace that extends to the southwest from a sluice on the south side of the bridge towards a former riverside mill site in the southern end of the town. The mill is listed in the NIAH (ref. 12301058) which records that it was constructed as a flour mill in *c.*1800 and was later adapted to be used as a saw mill in 1902. The weir and the mill race are shown on the first-edition 6-inch and 25-inch OS maps and are features of local industrial heritage significance. While neither are listed on the RMP or recorded by the NIAH, the mill race is a protected structure (Ref. C67).

Castlecomer experienced rapid population growth in the early 19th century and the effects of the Famine in the middle of the century were particularly severe in the area[6]. In an effort to cope with the ensuing crisis, a workhouse was opened in 1853. The Roman Catholic Church of the Immaculate Conception was constructed in the 1840s and the Presentation Sisters set up the present convent on the site of the old fever hospital in 1885. The town's principal economic drivers included the wealth generated from the mining resources of the immediate area in addition to its role as a principal market town for North Kilkenny. Since the loss of the mining industry as a major employer in 1969, the town's main role has been as a service centre for its rural hinterland.

The following extract from Samuel Lewis' 1837 *Topographical Dictionary of Ireland* describes the history, civic amenities and geography of Castlecomer and its hinterland, in the early part of the 19th century:

> *CASTLECOMER, a market and post-town, and a parish, in the barony of FASSADINING, county of KILKENNY, and province of LEINSTER, 9.50 miles from Kilkenny city, and 46 (S. W.) from Dublin ; containing 13,242 inhabitants, of which number, 2436 are in the town.*
>
> *This town is situated on the river Deen, and on the road from Kilkenny by Athy (Co. Kildare), to Dublin. It suffered greatly in the disturbances of 1798, from the violence of a party of the insurgents, by whom a considerable portion of the town was destroyed. It was, however, soon restored, and at present consists of one wide main street and several smaller, containing, in 1831, 455 houses, chiefly inhabited by persons engaged in the extensive collieries in the parish and neighbourhood. The infantry barracks, a, neat range of buildings, are adapted for 8 officers and 126 non-commissioned officers and privates, with suitable offices. The market is chiefly for provisions, and some neat shambles have*

[5] https://www.duchas.ie/en/cbes/4758573/4755880/4922870

[6] http://www.askaboutireland.ie/reading-room/environment-geography/physical-landscape/castlecomer-plateau/the-wandesforde-legacy/evolution-of-castlecomer-/

been erected. Fairs are held on March 27th, May 3rd, June 2lst, Aug. 10th, Sept. l4th, Oct. 28th, and Dec. 14th. A constabulary police force is stationed here; the quarter sessions for the county once in the year (in June,) and petty sessions every Friday, are held in the town; and a court for the recovery of small debts is held by the seneschal of the manor.

The parish comprises 21,708 statute acres and contains the principal portion of the extensive coal field of the district…. These collieries have been worked for more than a century: the regular strata were first discovered in digging of iron-ore in that part of the territory of Ida which belonged to the Brenans, and which was purchased from that sept, in the reign of Chas. I., by Sir Christopher Wandesford, and erected into a lordship by charter of the same monarch. Its extent at that time was estimated at 13,400 plantation acres; and the father of the last Lord Wandesford was the first who worked the pits to any advantage. The principal workings are all between the small river Deen, which flows by the towns and the hills to the east and north-east, extending towards Donane. The substratum on which the coal rests is remarkable for withstanding the agency of fire, and has been used with great success in the making of fire-bricks; the depth of the pits varies from 31 to 39 yards. The chief property in these mines was vested in the Wandesford family, to whom this place gave the title of Earl, now extinct, and whose representative, the Hon. Charles Butler Wandesford, brother of the Marquess of Ormonde, inherited in right of his mother, the sister of the late Lord Wandesford, and has a handsome modern residence adjoining the town. A great portion of the coal is conveyed through the southern counties by the rivers Suir and Barrow, and by the Grand Canal to Dublin. …There are a bleach-green and a grist-mill in the parish.

The living is a rectory and vicarage, in the diocese of Ossory and in the patronage of the Crowns the tithes amount to £969. 4s. 7.50 d. The church, situated in the town, is a neat edifice with a tower; and there is a chapel of ease at Mooneenroe, in the collieries, built by subscription aided by a grant from the late Board of First Fruits, in 1818. Lectures on religious subjects are delivered also in the school-rooms adjoining the church and chapel of ease. The glebe-house was built by aid of a gift of £100 and a loan of £1500 from the same Board, in 1819.

In the Roman Catholic divisions the parish forms part of the three several unions or districts of Castlecomer, Clough, and Muckalee, the first of which comprises about one-half of it: there are four chapels belonging to these unions, one of which is in the town. There is also a place of worship for Wesleyan Methodists.

Near the R. C. chapel is a convent and adjoining it a school under the care of the nuns. The schools adjoining the parish church and chapel of ease are supported by an annual donation of £100 from the Hon. C. B. Wandesford, and £34 from the rector; an infants' schooled also supported by subscription. In these schools about 380 children receive gratuitous instruction; and there are also eight pay schools, in which are about 330 children, and three Sunday schools. A dispensary was elected by the Countess of Ormonde, and an auxiliary branch of the Hibernian Bible Society has been established in the town.

History of the bridge

The existing bridge was erected by George Smith between 1763 and 1767 to replace an earlier bridge which had washed away during a great flood which occurred on 2nd October 1763. It was one of a number of bridges on the Nore and its main tributaries that were rebuilt or replaced in the 1760s under the administration of the Inland Navigation Corporation (O'Keeffe & Simmington 2016, 282).

Smith was an engineer with the Inland Navigation Corporation and in 1761 he succeeded William Ockenden as the engineer in charge of the Kilkenny Canal (*ibid*). Smith is reputed to have worked with George Semple (fellow engineer and architect who was the author of *A Treatise of Building on Water* in 1776) on Essex Bridge in Dublin (later remodelled as Grattan Bridge). Smith incorporated Palladian-styled niches in the spandrels between the five segmental arches of

Castlecomer Bridge. These are reminiscent of the pedimented niches seen on Green's Bridge in Kilkenny, which was also constructed to his designs in the 1760s. The extract reproduced below from the 1801 record of Presentments (payments for works) from the Grand Jury[7] in Kilkenny County documents repairs to the bridge costing £41 6S.

To the Hon. James Butler, David Ryan, Esq. and Ambrose L. Williams, to repair the bridge of Castlecomer, on the mail-coach road from Castlecomer to Athy, -	41	6	0

In 1896, Susannah Proctor Flory published a book titled *Fragments of Family History* in which she describes houses situated adjacent to the bridge prior to their destruction during the 1798 rebellion. These descriptions were sourced from first-hand accounts of occupants and include several sketches drawn based on their descriptions. The sketch shown in **Figure 3** shows the existing bridge structure and the houses to the east and west which were burned to the ground in 1798. The current house (La Rive) to the north-west of the bridge was built after the rebellion.

The bridge and the existing road approaches on both sides are present on the Taylor and Skinner 1777 Road Map of Ireland (**Figure 4**) as well as on the first edition 6-inch OS map (surveyed 1830s-40s) and the 25-inch edition map (1888-1913 series), both of which show a weir in the channel to the north (**Figures 5** and **6**).

Figure 3: *The bridge of Castlecomer prior to the rebellion of 1798 (after Proctor Flory 1896) – the building on the left of the picture does not correspond to the current building at this location*

[7] https://books.google.ie/books?id=ZwEIAAAAQAAJ&pg=RA1-PA35&lpg=RA1-PA35&dq=castlecomer+bridge+repair&source=bl&ots=TlhbIcIEcZ&sig=bJlwu3YPaBWDjXZ6stZtv-bmq7c&hl=en&sa=X&ved=2ahUKEwiQi6fK3o3eAhWKLsAKHUVnBBUQ6AEwBXoECAQQAQ#v=onepage&q=castlecomer%20bridge%20repair&f=false

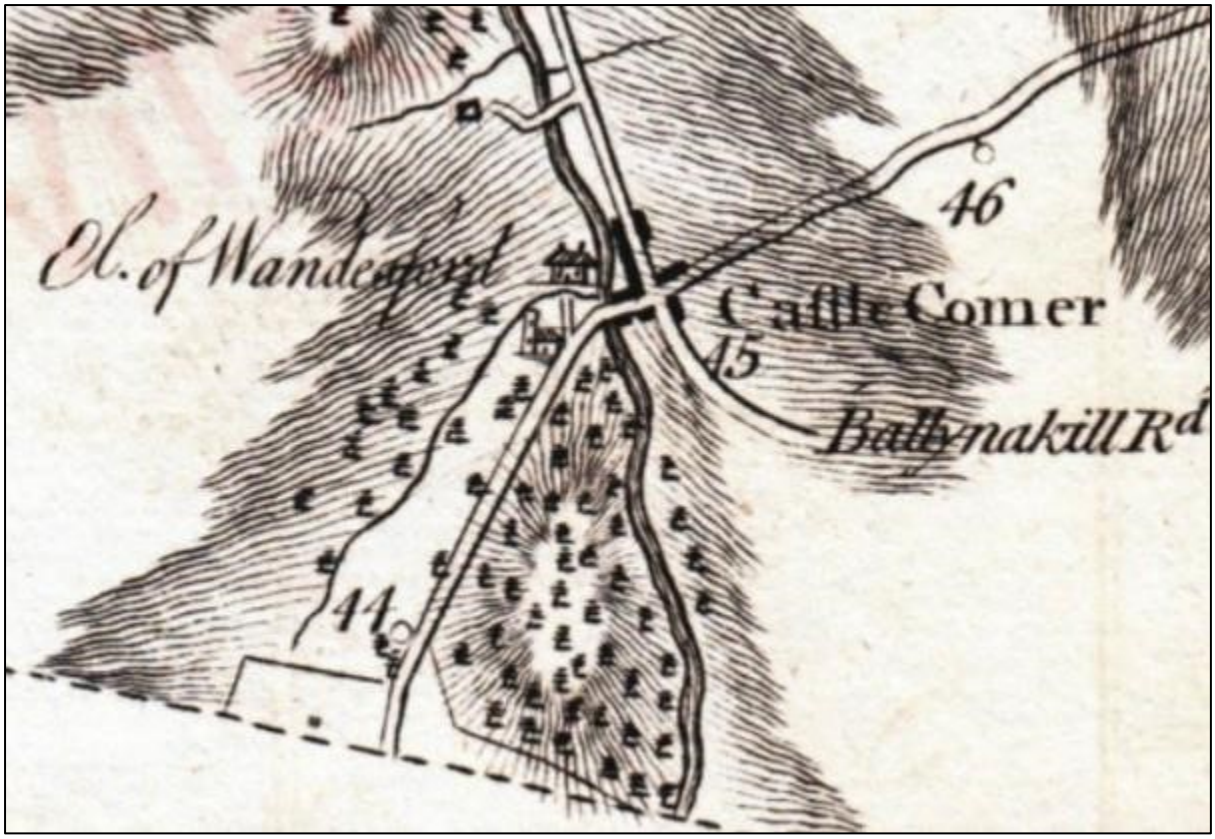

Figure 4: *Extract from Taylor and Skinner's 1777 Road Map of Ireland showing Castlecomer Bridge*

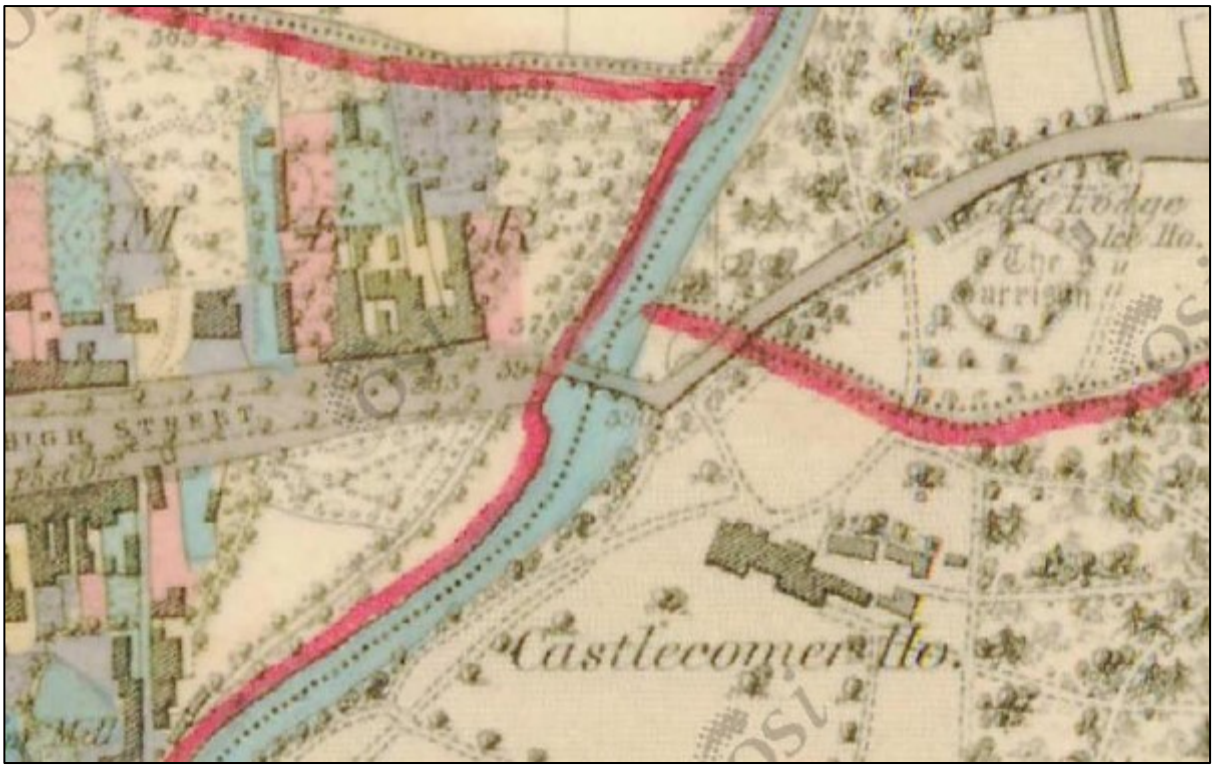

Figure 5: *Extract from the first edition Ordnance Survey map showing Castlecomer Bridge (Reproduced under Ordnance Survey Ireland Licence No. SU 0003319)*

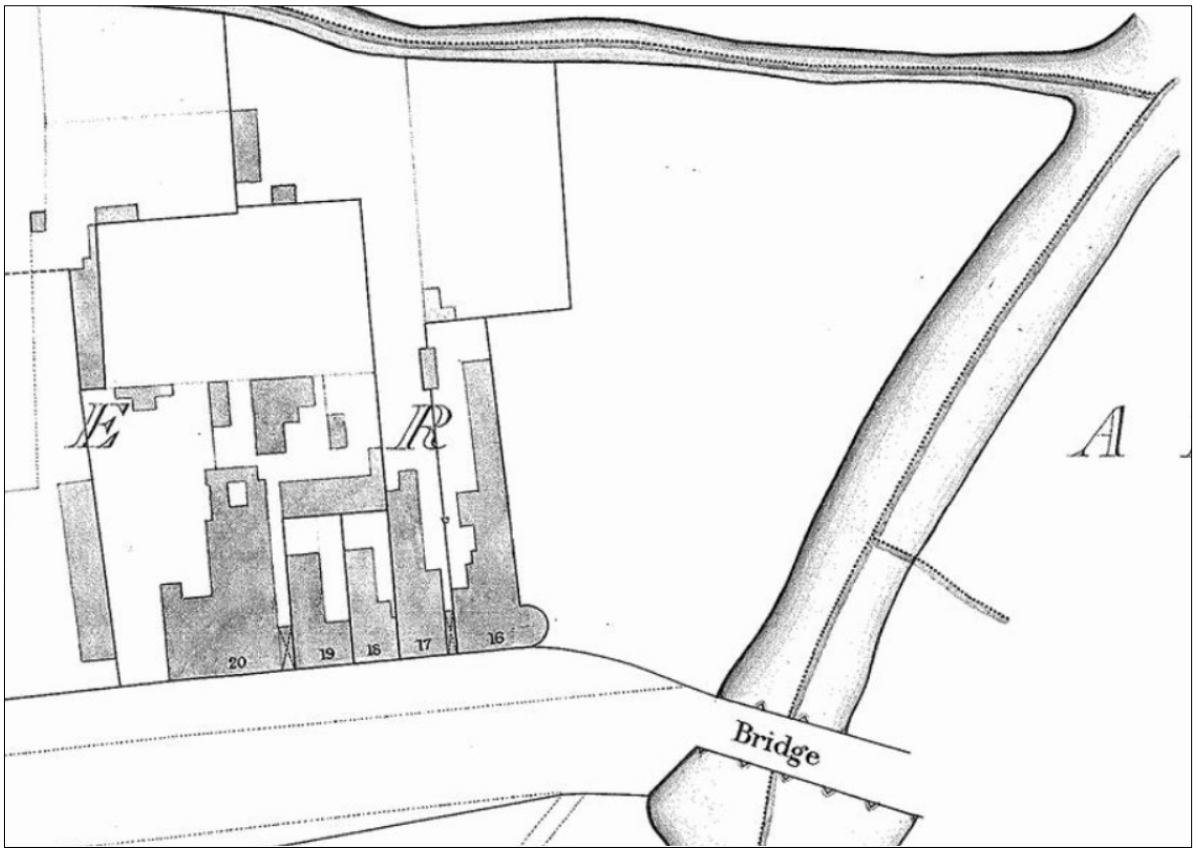

Figure 6: *Griffith's Valuation town plan of Castlecomer Bridge and adjoining property (No. 16 High Street; La Rive) from c.1860.*

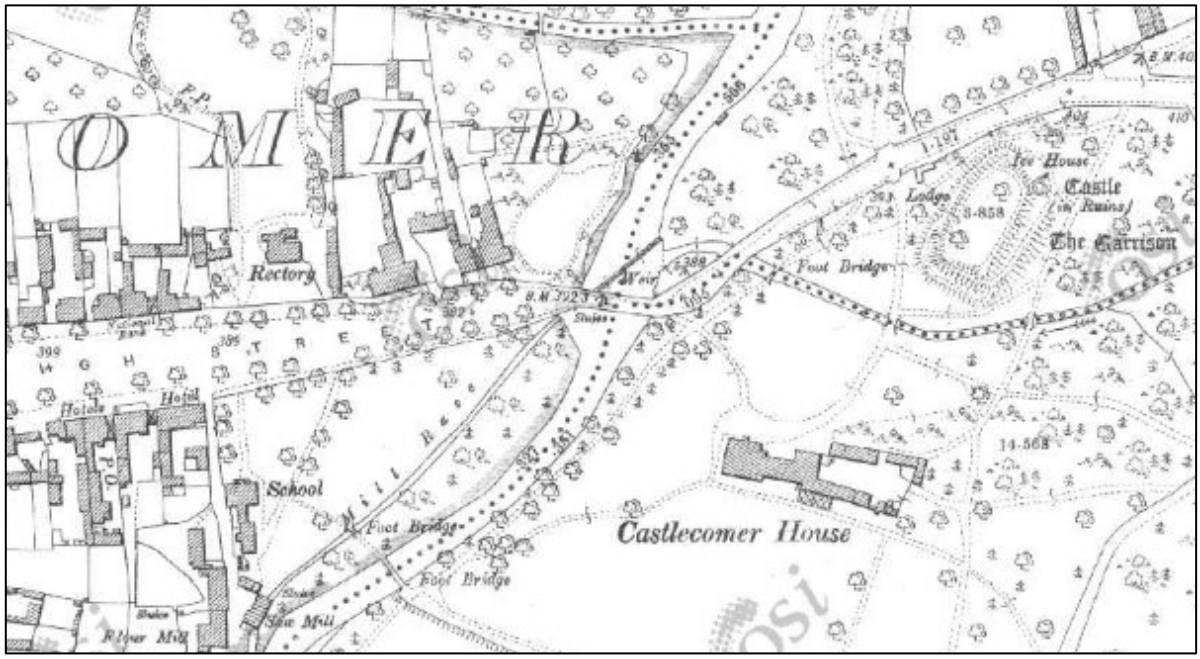

Figure 7: *Extract from the 25-inch edition Ordnance Survey map showing Castlecomer Bridge (Reproduced under Ordnance Survey Ireland Licence No. SU 0003319)*

The excavations database

The Excavation Database contains summary accounts of licensed archaeological investigations carried out in Ireland (North and South) and the relevant entries are presented in **Appendix 2**. There are no entries for any licensed archaeological underwater surveys within the river channel and the most significance discovery in the area was a bastion fort uncovered at the Avalon Inn property within the town (**Appendix 2**; Licence 16E0631). This has been designated as a recorded archaeological site (KK005-104----) and is located approx. 150m to the west of the bridge.

Designated architectural heritage resource

The *Kilkenny County Development Plan* (2014-2020) and the *Castlecomer Local Area Plan (2018-2024)* provide details on the protected structures within the county of Kilkenny and the town of Castlecomber respectively. The bridge is listed as a Protected Structure (RPS Ref. D13) as is the mill race (RPS Ref. C67) and a further 29 protected structures are also listed within the study area. All save of one of these structures (the mill race) have been recorded by the NIAH (both RPS and NIAH references are provided in **Table 2** below)). The majority of these designated structures are located within the streets of the town or are associated with the estate of Castlecomer House,

***Table 2**: Designated architectural heritage structures within study area*

NIAH Ref	*RPS No*	*Name*	*Townland*	*Structure Type*
12301001	D13	Castlecomer Bridge	Ardra, Castlecomer, Drumgoole	Bridge
12301002	C491	La Rive	Castlecomer	House
12301003	C492	High Street	Castlecomer	House
12301004	C493	High Street	Castlecomer	House
12301005	C494	Avalon Inn Hotel	Castlecomer	House (now hotel)
12301006	C679	The Square	Castlecomer	House
12301007	C495	Orton House	Castlecomer	House
12301008	C44	Bank of Ireland	Castlecomer	House
12301009	C45	Londis, High Street	Castlecomer	House
12301010	C44	M Harrington	Castlecomer	House
12301011	C47	High Street (N)	Castlecomer	House
12301012 & 12301013	C48	High Street (N)	Castlecomer	Pair of houses
12301051	C48	High Street (N)	Castlecomer	House
12301052	C53 & C489	The Lime Tree	Castlecomer	House
12301053	C54	High Street (N)	Castlecomer	House
12301054	C55	Holland Condon	Castlecomer	House
12301055	C56	Moran's	Castlecomer	House
12301056	C56	McKenna	Castlecomer	House
12301057	C56	King's	Castlecomer	House
12301058	C497	Castlecomer Flour/Saw Mill	Castlecomer	Mill Building

NIAH Ref	*RPS No*	*Name*	*Townland*	*Structure Type*
12301059	C490	Wandesford National School	Castlecomer	School
12301060	C681	Riverside (House)	Castlecomer	House
12301061	C331	Castlecomer House	Ardra	Gate Lodge
12301061 (& 12301081)	C66	Entrance gate and lodge to Castlecomer House.	Ardra	Entrance gate and lodge
12301065	C853	Gateway	Ardra	Gateway
N/A	C67	The Old Mill Race, Athy Road	Castlecomer	Mill race
12301080	C682	The Square (off High Street)	Castlecomer	House
12301081	C509	Castlecomer House	Drumgoole	Entrance gates and railings
12301085	C854	Castlecomer House	Ardra	Icehouse
12301086	C856	Bridge (Castlecomer House Estate)	Ardra. Drumgoole	Single-arch road bridge
12301088	C852	Bridge (Castlecomer House Estate)	Ardra. Drumgoole	Single-span road bridge

4. Description of the site

Castlecomer bridge was described in 2004/5 in the National Inventory of Architectural Heritage (NIAH) as follows;

> *Five-arch road bridge (with slight hump-back) over river, built 1763. ... (uncoursed rubble sandstone) walls centred on granite ashlar triangular cutwaters to piers having pyramidal capping* [see **Appendix 1: Plate 22**] *with lichen-spotted cut-granite stringcourses supporting parapets having lichen-spotted cut-granite coping (several sections of which have been replaced with cast concrete). Series of five round or segmental arches between round-headed niches* [see **Plate 20**] *with rusticated granite ashlar crow stepped voussoirs centred on lichen-spotted cut-granite triple keystones* [see **Plate 15**]. *Sited spanning Dinin River with wooded banks to river.*

The bridge is situated perpendicular to the Dinin River with the N78 continuing at angles from each end of the crossing. The eastern-most archway actually extends north under the road which turns north-eastward at this side of the bridge and a galvanised security fence has been erected over the upstream opening of the effectively dry archway (***Plate 12***). All arch soffits on the bridge have been gunited with sand and cement from the cut granite springing of each arch to the outer edge of the arch intrados (***Plate 17***). A stone-built weir (***Plate 11***), originally constructed to take water for the nearby saw and flour mills is situated across the river on the north side of the bridge and directs water through the western archway to a separate mill race with a sluice gate for separating the mill race from the river (***Plate 19***). On the south, downstream side of the bridge, there are a number of steps (***Plate 18***) facilitating the change of levels from the partially stone-floored bed of the river beneath the bridge arches to the natural riverbed further downstream of the widened channel around the crossing. Just north of the bridge, a small watercourse from the east joins the Dinin, passing beneath the N78 road through a pair of skewed three-centred archways (***Plate 41***). While not named on cartographic sources, this watercourse appears to be known locally as the Brukagh River[8].

The NIAH appraised the significance of the bridge as follows:

> *A bridge erected by George Smith (----) representing an important component of the mid eighteenth-century civil engineering heritage of County Kilkenny with the architectural value of the composition, one succeeding a bridge washed away during the so-called "Great Flood of 1763" (cf. 12004007; 12318004; 12323011), confirmed not only by the silver-grey granite dressings demonstrating good quality workmanship, but also by the elegant "sweep" of the arches making a pleasing visual statement at a crossing over the Dinin River: meanwhile, a benchmark remains of additional interest for the connections with cartography and the preparation of maps by the Ordnance Survey (established 1824).*

This appraisal references how the bridge at Castlecomer is one of a number that were rebuilt in County Kilkenny after the 'Great Flood' of 1763; the new bridges were designed by George Smith (*fl*. 1763-7), a pupil of George Semple (*fl*. 1753-82). The bridges built in the 1760s include those at Graiguenamanagh (NIAH Ref. 12318004), Inistioge (NIAH Ref. 12323011), Thomastown (NIAH Ref. 12317011), and Green's Bridge (NIAH Ref. 12004007) in Kilkenny City. Each of these bridges are informed and influenced by the writings of Alberti and Palladio and Classical detailing are evident in each bridge. O'Keeffe and Simmington (2016, 283) state that the engineering aspects

[8] https://www.duchas.ie/en/cbes/4758570/4755758/4823853
https://www.duchas.ie/en/cbes/4758570/475581

of this group of bridges have been 'overshadowed by their aesthetic properties, but they are no less significant'. This collection of 'Kilkenny bridges' is discussed in an international context by Ruddock in his *Arch Bridges and their Builders 1735*-1835 (1979). On the basis of their architectural, scientific and technical interest, these are considered by the National Inventory of Architectural Heritage to be of national significance.

Adjacent to the west of the bridge, on the northern side of the N78 (High Street) is 'La Rive', an end-of-terrace house (see **Plate 24**) which is a protected structure (RPS Ref. C491), whose front garden boundary wall (see **Plates 25 – 28**) and mature roadside planting will be impacted by the works. The house is described by the NIAH as follows:

> *End-of-terrace two-bay three-storey house, c.1800, with shared single-bay three-storey bay to left having segmental-headed carriageway to ground floor. Extended, c.1875, comprising single-bay single-storey flat-roofed end bay to right. One of a pair. Pitched (shared) slate roof with clay ridge tiles, rendered chimney stacks, and cast-iron rainwater goods on rendered eaves. Flat roof to end bay not visible behind parapet. Unpainted roughcast walls with rendered coping to parapet to end bay. Square-headed window openings (one in tripartite arrangement to ground floor having panelled mullions) with cut-limestone sills, six-over-six (two-over-two sidelights to tripartite opening) and six-over-three (top floor) timber sash windows. Round-headed door opening with cut-limestone Gibbsian surround, and timber panelled door having fanlight. Square-headed opening to end bay in square-headed recess with hood moulding over, and replacement glazed uPVC door having overlight. Segmental-headed carriageway (shared) to left ground floor with no fittings. Interior with timber panelled shutters to window openings. Set back from line of road in own grounds with forecourt having cast-iron railings to perimeter on limestone ashlar plinth, open work piers, and cast-iron gate.*

The house was constructed *c.* 1800 and has a large garden that fronts onto the western bank of the river. The boundary to the street displays a number of phases of construction: the westernmost section (to be removed as part of the planned works) is much altered and accommodates a modern entrance gate. As the boundary wall approaches the western abutment of the bridge, two distinct phases of construction are evident (see **Plates 26**, **27** and **28**): the lower portion is topped with a course of vertical coping stones; this is surmounted by random sandstone rubble – this appears to represent the top of the northern wing wall and likely dates to the 1760s. The upper portion of the wall appears to represent a raising of the height of the wall for the provision of increased privacy and amenity of the garden area to the north (whilst the lower portion appears to be remains of the original western approach wall to the bridge itself). On the northern face of the wall (within the garden), there is a 'step' in the facing (see **Plates 29** and **30**): the portion to the east (towards the bridge) is marginally recessed and whilst the section extending westward stands marginally proud. This would appear to suggest that the roadside boundary wall largely post-dates the construction of the bridge and abuts against and over the older and lower western wing wall[9].

Along the riverside is a portion of low walling which has had modern masonry built atop it (see **Plate 31**). The southern portion of the garden is dominated by mature trees (see **Plate 35**) and shrubbery that, coupled with riverside planting, screens the lawn of the garden (**Plate 37**) and the eastern/garden elevation of house (**Plate 38**) from the street and the bridge.

[9] The relevant wall section is overshadowed and over-sailed by the limbs of mature trees and a detailed examination was not practicable or feasible. At the request of Kilkenny County Council, a series of ortho-rectified elevations have been prepared and are included in **Appendix G** of the EIA Screening. It is recommended that if the development is approved that a more detailed supplementary examination and survey of the walling be undertaken when vegetation is removed.

Adjoining the bridge on its north-eastern side is a section of walling (see **Plates 39** and **42**) that extends to a gateway on the Athy Road that is a protected structure (RPS Ref. C853); whilst the gateway will not be directly affected by the proposed works, a section of this associated boundary wall will be removed to accommodate the eastern landing area for the new footbridge and the associated approach footpath. This section of a walling is crowned with a coping similar to that evident within the body of the walling fronting the garden of La Rive on the western side of the river. However, it is evident that the section of walling has been altered (and possibly rebuilt) in recent decades; the coping only presents to the public road and it is crudely set in concrete (**see Plate 40**).

5. Assessment of the proposed development

The proposed development consists of the construction of a two-span footbridge over the River Dinin adjacent to the north (upstream) of the existing N78 Castlecomer Bridge and alterations to existing stone masonry walls to facilitate the footpath approaches to the proposed footbridge.

Castlecomer Bridge, as noted previously, is a protected structure (RPS Ref. D13). Adjoining the bridge to the west is 'La Rive', an end-of-terrace house and protected structure (RPS Ref. C491), whose front garden boundary wall and mature roadside trees will be impacted by the works. Adjoining the bridge to the east is a section of walling that extends to a gateway on the Athy Road that is a protected structure (RPS Ref. C853); whilst the gateway will not be affected by the proposed a section of this associated boundary wall will be impacted by the proposed works.

The new structure will run-east west roughly adjacent to the upstream side of the existing bridge and will not be attached to the structure. The new bridge structure will comprise a two-span steel bridge with a central pier set on an islet in the river channel. The overall length of the proposed bridge is approximately 44m with the eastern and western spans measuring 17.4m and 26.4m respectively and the pedestrian walkway will be 2.5m wide. It is proposed that the central pier will be supported on a rectangular pile-cap of 4 no. piles. The top of the pile-cap will be set just below bed level of the river to ensure no impact on river flow.

***Figure 8**: Photomontage image of the proposed footbridge, as viewed from the north east*

The proposed pedestrian bridge will not directly impact on the weir structure within the section of the channel on the north side of the bridge or the millrace to the southwest.

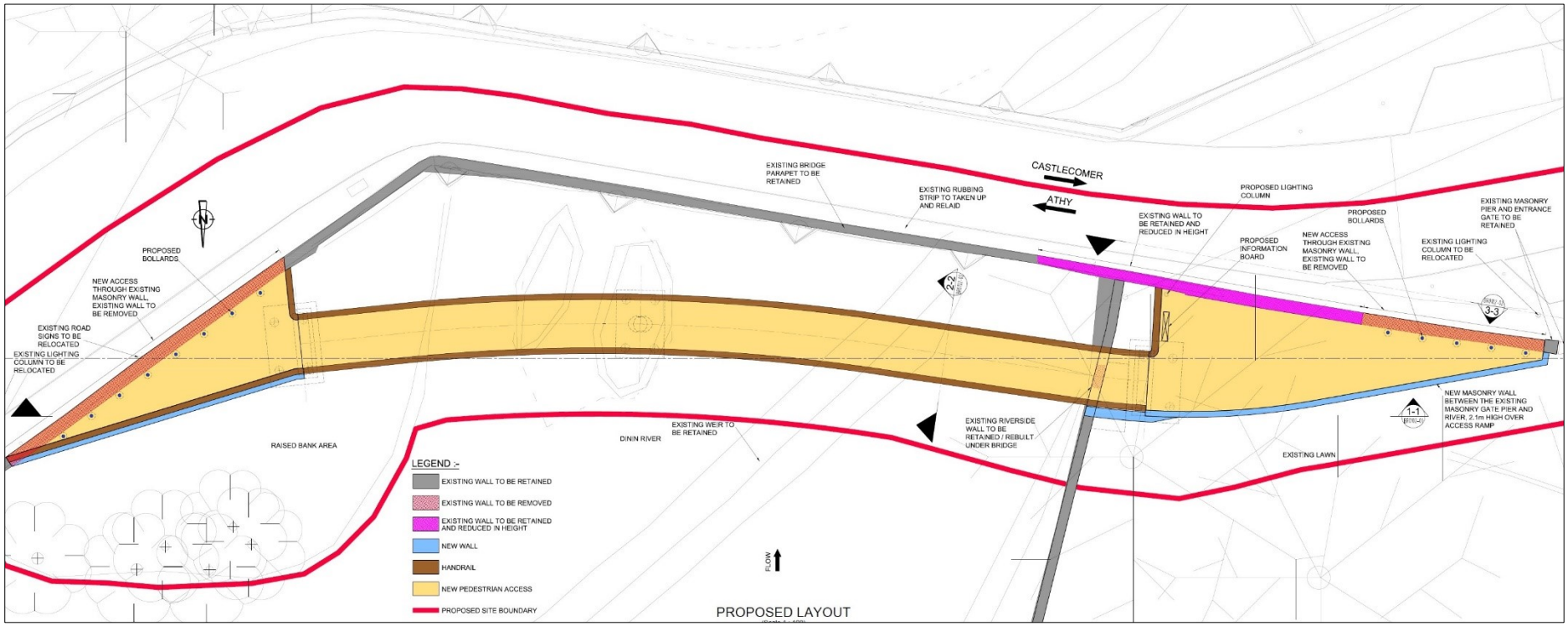

***Figure 9**: Scheme drawing of the proposed independent two-span steel bridge*

Archaeology

While there are no known archaeological monuments located on the direct footprint of the proposed project, research undertaken for this assessment revealed that the existing bridge site and the environs of the river have been identified as part of a battlefield site (KK005-102----). As noted in the Eneclann and Headland (2008) report, the archaeological potential of the Castlecomer battlefield, including the areas within the environs of the bridge, is considered high and it is likely that future archaeological work could add to our knowledge of the battle.

In addition, the subject area is also located within the wider environs of an earlier 1641 Confederate conflict centred on 'the Garrison' or castle located c. 155m to northwest of the bridge. The recent archaeological discovery of the remains of a bastion fort (KK005-104----) located 150m northwest of the bridge and built to protect the river crossing in the 17th century highlights the military and strategic significance of the bridge and its environs to the historical development of the town (**Appendix 2**; Licence 16E0631). Historical sources also attest to the presence of buildings destroyed during the 1790 battle on both sides of the bridge and sub-surface remains of these structures may survive.

Riverine crossing areas also have the potential to contain the remains of earlier bridge or fording features as well as stray archaeological artefacts. Riparian settings are also suitable topographic locations for the site of Bronze Age *fulachta fia*.

The potential, therefore, exists for the presence of features and artefacts associated with the battlefield site and other archaeological activity within the environs of the project area. The creation of landing areas for the new footbridge on the eastern and western side of the river, coupled with the pier to be situated on an islet in the river, have the potential to result in *direct negative impacts* on any such archaeological features should they be present.

Built heritage

The existing masonry bridge is of great significance to the built heritage of Castlecomer and it is included in the Record of Protected Structures (RPS ref. D13) within the *Kilkenny County Development Plan 2014-2020*. The bridge was rated as being of national importance in the National Inventory of Architectural Heritage (NIAH ref. 12301001) survey of bridges and other historic structures in County Kilkenny. In developing proposals for a new footbridge, the designers have sought to achieve a high-quality contemporary form that is clearly legible as a modern intervention. This approach is wholly consistent with the conservation principles espoused in the *Architectural Heritage Protection Guidelines* (2011) issued by the Department of Arts, Heritage and the Gaeltacht (now the Department of Culture, Heritage and the Gaeltacht) such as promoting minimum intervention (Section 7.7 of the guidelines), promoting honesty of repairs and alterations (Section 7.10 of the guidelines), ensuring reversibility of alterations (Section 7.12 of the guidelines) and avoiding incremental damage (Section 7.13).

Furthermore, the approach adopted by the design team corresponds with the most applicable development management standard for architectural conservation areas (ACA) outlined in Kilkenny County Council's County Development Plan, namely:

To encourage high quality, contemporary design and materials where appropriate when new buildings are being introduced into an ACA and the retention of the historic scale and plot size

As documented in the 'Landscape and Visual Impact Assessment' prepared by RPS Group (June 2019), significant effects on the setting of the Castlecomer ACA are not predicted to arise. The proposed change would be apparent only from the eastern edge of the ACA at a distance of 0.3km. Slight changes in terms of very small amounts of mature vegetation losses and the introduction of the pedestrian access opening along the existing parapet stone wall of the existing bridge would be scarcely apparent from the ACA in the context of the busy N78 road

Notwithstanding the design approach that has been adopted, the proposed development will have an *indirect*, *slight negative impact* on the setting of Castlecomer Bridge however it will not give rise to direct impact on original fabric of note (as opposed to other design interventions that had been under the review during the design process).

While the proposed pedestrian bridge will not be attached to the existing bridge structure, sections of the western and eastern approach walls on the northern side of the bridge will have to be removed to create access to the new independent pedestrian bridge. Furthermore, on the western side of the river, the proposed landing area will be created on a small triangular parcel of the roadside ground within the garden of La Rive (a protected structure). The land parcel will be acquired for the purpose of:

- Creating a new access through existing masonry boundary wall
- Creation of an access ramp and a new masonry wall between the existing roadside masonry gate pier and river (the new wall will be 2.1m high over proposed access ram)
- Provision of steel security mesh fencing 2.4m high between end of the new bridge and the existing riverside wall on new low-level wall

The section of existing roadside masonry to be removed to facilitate the pedestrian connection is in relatively poor condition with a large concrete capping and it has likely been truncated to create present timber-sheeted gate which has stone-tiled concrete piers and appears to date from *c.*2000. East of the section to be removed, the existing wall will be reduced in height to allow for passive surveillance; the wall will be reduced to an earlier parapet height as defined by a row of vertical coping stones (see **Plate 27**). With regard to the bridge, this will result in a *neutral impact* as it will involve the removal of a portion of walling that is clearly not original to the construction of the bridge or the approach walls associated with same. Overall, the impact on the curtilage of La Rive (Protected Structure Ref. C491) is considered to be a *direct, moderate, negative impact*. The loss of mature trees such as a horse chestnut and removal of the boughs of a mature yew tree will contribute to this alteration of the setting of the house. Nevertheless, the amenity value of the garden will not be impacted to significant, negative degree.

Adjoining the bridge to the east is a section of walling that extends to a gateway on the Athy Road that is a protected structure (RPS Ref. C853); whilst the gateway will not be affected by the proposed a section of this associated boundary wall will be removed. The section to be removed is much altered and of limited heritage value. The loss represents an *indirect, slight, negative impact on the gateway which is located over 100 metres to the north-east.*

The proposed pedestrian bridge will not directly impact on the weir structure within the section of the channel on the north side of the bridge or the millrace (a protected structure (Ref. C67)) to

the southwest. However, the new footbridge will give rise to an *indirect*, *slight negative impact* on the setting of the weir.

The proposed development of a two-span bridge with an intermediate support between abutments allows for a reduced structural depth which in turn reduces the visual footprint of the structure on elevation albeit the provision of the pier will impinge on the view of the pier of the existing bridge. Therefore, the proposed visual impact on the existing bridge will be *negative* but *slight* in significance.

6. Mitigation measures

Archaeology

The proposed project will have *no predicted impacts* on any recorded archaeological sites. However, it is located within the *Zone of Notification* for the historic town of Castlecomer (KK005-082---) and forms part of the battlefield of a military engagement during the 1798 rebellion which has been designated as a recorded archaeological site (KK005-102----). In addition, a number of archaeological monuments within the wider area are connected with an earlier Confederate siege of Castlecomer in 1641. Finally, the proposed development works will include in channel works within the River Dinin which *may* have a direct negative impact on any previous unrecorded archaeological features, deposits or artefacts which have the potential to survive within the riverbed. The proposed project can therefore be considered to be located in an area of *moderate* to *high archaeological potential.* The following mitigation measures are proposed:

- It is recommended that an Underwater Archaeological Impact Assessment (UAIA) of the in-channel areas (including riverbanks) to be impacted by the proposed bridge structure should be carried out prior to the construction phase. This should include a dive/wading survey of the river channel licenced by the NMS which will incorporate an inspection of the bridge structure, weir and adjacent section of millrace.

- It is recommended that if any greenfield areas on either side of the riverbank will be impacted by ground works associated with the project such areas (if accessible) should be subject to pre-construction archaeological test trenching.

- Given the archaeological potential of the area, it is recommended that archaeological monitoring of all ground and in-channel excavation works should be carried out during the construction phase. This is particularly important on the eastern side of the riverbank within the raised bank area as this bank is effectively an island formed by the main river channel and a tributary channel. Archaeological monitoring of the demolition of the embanking wall to the west to also be undertaken.

- It is recommended that all phases of archaeological investigations should be augmented by the use of a metal-detector (under licence by the NMS) to assist in the recovery of archaeological artefacts.

- In the event that any archaeological features and/or artefacts are uncovered during any phase of site investigations, the NMS and the TII Project Archaeologist should be notified and consulted to determine appropriate further mitigation measures.

Built heritage

The proposed development will have an *indirect slight negative impact* on the existing Castlecomer Bridge and its setting. The existing bridge is a protected structure included on the Record of Protected Structures (RPS Ref. no. D13) within the current *Kilkenny County Development Plan*. The bridge was rated as being of *National* importance in the National Inventory of Architectural Heritage (NIAH Reference: 12301001). Furthermore, the planned works will result in a *direct, moderate, negative impact* on the curtilage of La Rive (formerly known as No. 16

High Street) (Protected Structure Ref. C491). Significant effects on the setting of the Castlecomer ACA are not predicted to arise; the proposed change would be apparent only from the eastern edge of the ACA at a distance of 0.3km

The predicted impact relates to the alteration to the setting of the bridge and the removal of localised sections of (a) a rubble parapet wall to the north-east of the bridge and (b) a section of street-frontage garden walling associated with La Rive (formerly No. 16 High Street); these interventions are required to facilitate connection to existing pavements from the new footbridge. The following mitigation measures have and will be adopted:

- Prior to commencement of works and following removal of vegetation at the areas where the new pedestrian bridge is to connect with existing pavements, a full record of the sections of walling to be removed will be undertaken by a suitably qualified built heritage specialist. The record will include full description (i.e. construction, composition and style, *etc*.) and interpretation of any distinctive phases evident in the walling. This record shall include annotated drawings to be produced from photogrammetry or laser scanner survey.

- Prior to commencement of works, a conservation method statement shall be prepared by a suitably qualified conservation consultant/architect to specify (a) works for the planned interventions so that the interface between historic masonry to be removed and retained will be effectively repaired and made good and (b) the form/design of the new wall that present to the garden of La Rive (formerly No. 16 High Street). This is to to ensure that the new wall is built in a manner consistent in form and materials with adjoining masonry walls.

- Any proposed conservation or repair works will be (a) undertaken by a contractor with proven experience of the conservation and repair of historic masonry structures and (b) under supervision of a suitably qualified conservation consultant/architect. The appointed conservation consultant/architect shall carry out periodic inspections and will approve workmanship. At the discretion of the conservation consultant/architect, the contractor may be directed to prepare sample work for approval (such as repointing and sample masonry panels).

- All masonry removed during the course of works shall be retained by the contractor for the duration of works. The retained material will be reused, where practicable, for the planned programme of repairs and in a new walling. Samples of an additional masonry/stone required for the completion of the planned works shall be reviewed and approved by the appointed conservation consultant/architect.

Residual impacts

The application of the aforementioned mitigation measures will reduce impacts on archaeological and built heritage resources. In addition, the new footbridge has been designed to avoid any direct impacts on the fabric and architectural form of the existing protected bridge and the built heritage significance of Castlecomer.

The new footbridge is of a high-quality contemporary form and will be clearly legible as a modern intervention. This approach is consistent with the Planning Authority's policy in relation to new

development within an Architectural Conservation Area (ACA); namely, to encourage high quality, contemporary design and materials when new buildings are being introduced into an ACA. Nevertheless, on completion the setting of both the bridge and the curtilage of La Rive will have been impacted to a *slight negative* degree.

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http://www.askaboutireland.ie

https://dcenr.maps.arcgis.com/apps/webappviewer/index.html

http://www.excavations.ie/

http://www.geohive.ie/

http://gis.teagasc.ie/soils/map.php

https://heritagemaps.ie/WebApps/HeritageMaps/index.html

http://landedestates.nuigalway.ie:8080/LandedEstates/jsp/index.jsp

https://www.logainm.ie/en/

www.duchas.ie

https://digitalcollections.tcd.ie/home/index.php?DRIS_ID=LCN14679989_001 (Taylor & Skinner Road Maps)

8. List of appendices

Appendix 1: Photographic Record

Appendix 2: Recorded Datasets

Appendix 1: Photographic record

***Plate 1**: Western approach to Castlecomer Bridge from High Street.*

***Plate 2**: View over road deck from south-west corner*

***Plate 3**: Detail of inner face of the north parapet wall*

***Plate 4**: Detail of inner face of the south parapet wall*

***Plate 5**: Approach to bridge from east with some ongoing damage to deck surface above springing point above east-most pier.*

***Plate 6**: View along south elevation from south-west end – note the millrace that starts at the western archway of the bridge and then heads towards a former milling complex approximately 200 metres to the south-west*

***Plate 7**: West abutment from north parapet of bridge; the garden area behind this riverside section is associated with La Rive, an end-of-terrace house and protected structure. The western landing area for the proposed pedestrian bridge will be accommodated in this location.*

***Plate 8**: View to north-east from the bridge towards the weir and riverside amenity area associated with Castlecomer Discovery Park.*

***Plate 9**: View of riverside area where the eastern landing area for the proposed footbridge is to be accommodated; the area is heavily overgrown*

***Plate 10**: North elevation from the Dineen riverbed with weir to right of photograph which is centred on central arch of bridge.*

***Plate 11**: West half of north elevation with stone weir in foreground.*

***Plate 12**: East half of north elevation*

***Plate 13**: North opening of central archway*

***Plate 14**: Detail of north elevation of spandrel and 2nd pier from west abutment*

***Plate 15**: Keystone, voussoirs, string course and exterior parapet detail over 2nd arch from west abutment*

***Plate 16**: Pier closest to west abutment. Weir in foreground*

***Plate 17**: West shoulder of arch soffit within 2nd arch from west abutment. Limited moisture ingress from bridge deck is escaping through pier masonry and also through cracks in gunited arch soffit.*

***Plate 18**: South elevation*

***Plate 19**: Sluice at west end of south downstream side of bridge.*

***Plate 20**: South elevation of central archway*

***Plate 21**: Detail of spandrel over 2nd pier from east abutment. Parapet here was partially reconstructed with concrete blocks sometime within last 30 years*

***Plate 22**: Detail of downstream cutwater on south elevation*

***Plate 23**: Detail of downstream cutwater cap (on south elevation). Inappropriate cement pointing here and over all elevations poses a long-term risk to the proper performance of masonry.*

***Plate 24**: View from south of La Rive; an end-of-terrace dwelling and protected structure on High Street; the western landing area of the proposed footbridge (and the western approach pathway) is to be accommodated within the southwest portion of the riverside garden of this property*

***Plate 25**: View from west of the roadside frontage of the garden area of La Rive – the closest wall section is clearly rebuilt and incorporates a portion of cast-concrete capping*

***Plate 26**: View of the north approach wall to west abutment of the bridge. Masonry above arrowed line appears to be more modern with more face-bedded stones and longer vertical joints than historic masonry below. This is most likely to have been the result of raising the original approach wall to the bridge in the last 100 years to provide privacy to the garden of La Rive.*

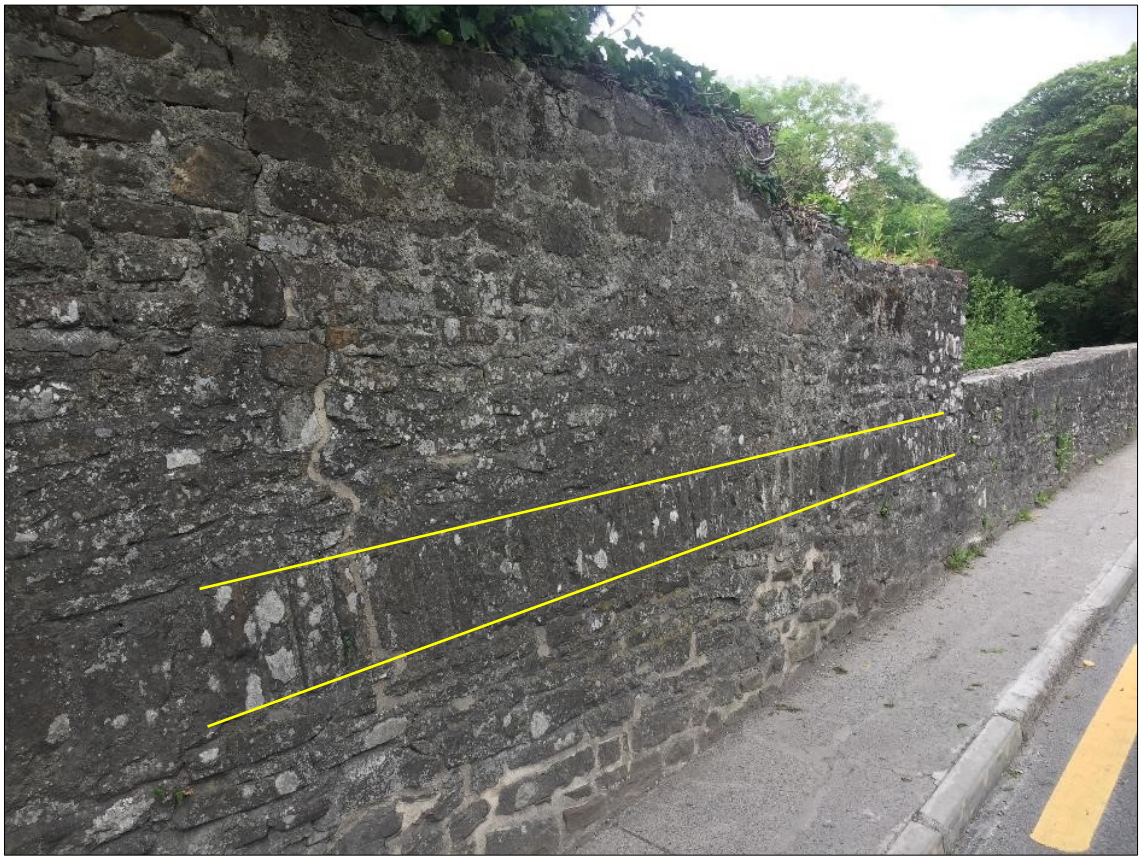

***Plate 27**: Original approach parapet to north-west abutment with original low-level course of vertical coping stones (highlighted by the yellow lines) surmounted with random sandstone rubble wall.*

***Plate 28**: Original approach parapet to north-west abutment with original low-level course of vertical coping stones surmounted with random sandstone rubble wall. This illustrates that the visible face of this wall section consists of at least two distinct phases of construction*

Plate 29*: North elevation of west abutment with small step visible in wall just right of ranging rod. ESB pole left of centre is at corner where the river-bank wall abuts wing wall of bridge. No evidence of a structure having existed was uncovered during the inspection*

Plate 30: *North elevation of west abutment with small step visible in wall just right of ranging rod. No evidence of a structure having existed here (such as joist sockets)*

***Plate 31**: Modern (c.2000) stone masonry on top of older lower portion of riverside wall on west bank of Dineen River extending to abut north elevation of west abutment of bridge through vegetation to centre of photograph.*

***Plate 32**: Mature horse chestnut tree within the proposed western landing area and approach footpath*

***Plate 33**: View from the proposed western landing area towards house (which is not visible due to screening by trees and shrubs)*

***Plate 34**: View from tree and shrub belt towards La Rive*

***Plate 35**: Aerial view area to be impacted by the construction of the western landing area and approach footpath*

***Plate 36**: Aerial view area of garden area of La Rive*

***Plate 37**: Form garden entrance looking north*

***Plate 38**: Side elevation of La Rive, from garden entrance; the single-storey annex visible was added in the late-nineteenth century*

***Plate 39**: View from east of the roadside wall on the north-east approach to bridge. A new new opening is proposed to provide the eastern approach footpath to the new footbridge. This wall appears to have been consolidated with concrete in recent years and the vertical coping stones which only face onto the roadside place at the same time.*

***Plate 40**: Roadside wall to north-east approach to bridge where new opening is proposed onto Athy Road. This wall appears to have been consolidated with concrete in recent years and the vertical coping stones which only face ontpo the roadside place at the same time.*

***Plate 41**: North-west openings of skewed archways carrying N78 over watercourse approximately 50m east of main bridge structure. The base of the new footbridge is to be positioned to the west*

***Plate 42**: View along Athy Road towards bridge with subject wall to be broken through on right side of photograph; the wall runs north-east and connects with a gateway to Castlecomer Discovery Park; the gateway is a protected structure (RPS Ref. C853) but it will not be impacted by the proposed works.*

Appendix 2: Recorded datasets

Archaeological excavations within study area

At total of seven programmes of licenced archaeological investigations have been undertaken within the environs of Castlecomer town and the following summaries of the results have been published in the Excavations Database (www.excavations.ie)

Site Name	*Licence*	*Summary*
Ardra	-	A stone slab was dislodged in the course of laying a Telecom cable trench revealing a cist slightly trapezoidal in plan, wider at the east end. It consisted of 4 principal side-stones set on edge, leaning inwards. On all sides a series of packing stones were visible. The covering stone – a large triangular shaped slab – lay directly on these. The cist itself measured 1m in length and 0.5m in width at the base. The long bones which had been removed were, according to the finder, lying parallel to one another close to the northern edge of the grave. The jaw bone had been removed and replaced but lay originally in the centre of the cist Portions of human long bones were visible in various parts of the cist. Excavation soon revealed that the bone was in a poor state of preservation and that the burial had been placed in a disarticulated position. Fragments of the skull were found at the eastern end of the cist. There was no trace of a vessel or other accompanying objects. The floor of the cist consisted of a very fine grey sandy gravel and the bones lay directly on this.
Ardra, Clogh Road, Castlecomer	08E0762	An assessment was carried out in a greenfield site at Ardra, Clogh Road, Castlecomer, Co. Kilkenny, measuring 220m by 190m east–west and located to the north of Castlecomer town. Eighteen test-trenches were mechanically excavated to a depth of c. 0.65m across the proposed development site. Two areas (A and B) were extended to establish nature and extent of two deposits. In Area A, within Trench 6, one small deposit was recorded. An area of 8m2 was opened and no other features were found associated with this deposit. In Area B, within Trench 18, two shallow burnt spreads were exposed towards the southern end of the trench, measuring 1.8 long, 1m wide and 0.03m deep and 2m long, 1.2m wide and 0.04m deep respectively. This area was extended 8m west and 10m north and south; due to the presence of two water services crossing the proposed development this area was not extended to the east. These features appear to be modern in origin, although this was not definitely confirmed due to limitations as a result of the presence of water services. The full nature and extent of these spreads can be recorded during monitoring of topsoil-stripping in advance of or as part of the construction programme.
Ballyhimmin	08E0316	It was proposed to redevelop a greenfield site at Ballyhimmin, Castlecomer, with a shop and store building, bulk stores as well as ancillary facilities including signage, drainage, car-parking, landscaping and associated siteworks. Five trenches each over 200m long were excavated to give comprehensive site coverage. Trenches 1 to 4 were excavated on the level ground above the river valley, while Trench 5 was excavated between the foot of a steep hill and the bank of the River Deen. The entire field had been subject to regular deep ploughing and large quantities of fieldstone are dumped above the steep-sided slope of the river valley. A ridge of stony gravel was apparent in the ploughed soil prior to the testing. No finds or features of archaeological significance were uncovered in the course of the testing.
Castlecomer	07E1145	A small-scale test excavation was undertaken at a proposed development site on Main Street, Castlecomer. A single test-trench was excavated to

Site Name	*Licence*	*Summary*
		the rear of an existing premises. A single feature of archaeological significance was exposed during the excavation. A disused box drain, following a north-east/south-west orientation, was identified across the northern section of the trench c. 2–3m from its northern terminus. The drain consisted of two courses of limestone spaced 0.3m apart and at a depth of 0.15–0.3m below the natural clay surface. The base of the drain was unlined and cut directly out of the natural clay. The interior of the drain was filled with a grey/black silty deposit with no inclusions. No artefacts were recovered from the excavated section of the drain.
The Avalon Inn, Castlecomer	16E0183	A series of test excavations were undertaken in advance of proposed renovations and an extension to The Avalon Inn, Castlecomer, Co. Kilkenny. The development was located within the area of constraint for KK005-082, the historic town of Castlecomer. It was also located close to KK005-102 – Battlefield, c. 214m north-west of KK005-081 – House 16th/17th Century and c. 381m west of KK005-033001-002 – Motte and Castle. The desk study of the development area indicated that the current Avalon Inn building was built around the year 1800, on the site of an earlier house and gardens, possibly destroyed during the 1798 uprising. The area within which the proposed development lies was therefore considered to be an area of high archaeological potential. This was confirmed during test excavations, which revealed a total of nine potential archaeological features across the proposed development area. This included evidence of a demolished house to the east of the current Avalon Inn building (Feature 9), some previously demolished outbuildings of uncertain date (Features 3, 6, 8), a stone- and brick-lined culvert (Feature 1), cobbled yard surfaces (Feature 5 and Feature 7), and a large garden feature (Feature 2). No finds predating the post-medieval period were uncovered from the cleanback of the above features. The findings suggest that substantial remains of the foundations of a demolished house survive below ground to the south-east of the development area. It is possible that these represent the remains of an earlier house destroyed during the 1798 rebellion. To the rear of the current Avalon Inn building, evidence was uncovered of demolished outbuildings, culverts, yard surfaces and a garden feature, which were most likely associated with the existing early 19th-century building. However it may also be possible that some of these features were associated with the earlier house at this site.
Avalon Inn, Castlecomer	16E0631	A programme of excavation and further testing, in advance of permitted renovations and an extension to The Avalon Inn, Castlecomer County Kilkenny, was carried out in May 2017. A desk study of the development area indicated that the current Avalon Inn building was built around the year 1800, on the site of an earlier house and gardens, possibly destroyed during the 1798 uprising. The area was therefore considered to be an area of high archaeological potential. This was confirmed during a previous programme of test excavations, carried out by the author in 2016, which revealed a total of nine potential archaeological features across the entirety of the permitted development area. Features uncovered included evidence of a demolished house to the east of the current Avalon Inn building (Feature 9), some previously demolished outbuildings of uncertain date (Feature 3, 6, 8), a stone- and brick-lined culvert (Feature 1), cobbled yard surfaces (Feature 5 and Feature 7), and a large garden feature (Feature 2). No finds predating c.1700 were uncovered from the cleanback of the above features. The findings suggested that substantial remains of the foundations of a demolished house survived below ground to the south-east of the development area. It was deemed possible that these represent the remains of an earlier house that had been destroyed during the 1798 rebellion. To the rear of the current Avalon Inn building, evidence was uncovered of demolished outbuildings, culverts, yard surfaces and a garden feature,

Site Name	Licence	Summary
		which were most likely associated with the existing early 19th-century building. However it may also be possible that some of these features were associated with the earlier house at this site. These excavations suggested that the subsurface remains of the demolished house (Feature 9), that predated the current Avalon Inn building, were largely destroyed by a series of modern pipe trenches and concrete foundations. While the exact relationship between the structure and the current Avalon Inn building could not be ascertained, it is still likely that the surviving features represented the remains of the earlier house, possibly the one destroyed during the 1798 rebellion. To the rear of the Avalon Inn building, further evidence was uncovered of demolished structures predating the most recent rear extension to the Avalon Inn. One of these walls (Feature 19) appeared to follow the line of a wall projecting from the north side of the early-19th-century building and are therefore likely to date from the same phase of construction or later. The possibility still exists however that some of these features were associated with the earlier house at this site. To the north of the development area, test excavations revealed a series of intact garden horizons and probable garden features (Features 11, 12, 13, 14, 15 and 16). These features consisted of several possible planting beds as well as some internal dividing walls. While a garden is shown at this location on the first edition OS map (1838), no walls are depicted on it or any subsequent editions. It is possible that these garden features therefore predate the 1838 map and relate to the Georgian/early Victorian house that formerly stood on the site.
Market Square, Castlecomer	01E1203	Kilkenny County Council requested that a pre-development assessment should be undertaken in advance of the erection of an extension to a fruit and vegetable shop. The site lay within the zone of archaeological potential as outlined in the Urban Archaeology Survey of Castlecomer. The square and its surrounding streetscape were developed in the 17th century by Lord Wandsford. Five test-trenches were opened by hand in the area of the proposed development. Nothing of archaeological significance was uncovered.

Archaeological Survey of Ireland (ASI) site descriptions

The following table presents the available Archaeological Survey of Ireland inventory descriptions of the recorded archaeological monuments within the study area (source: www.archaeology.ie).

Monument No.	Type	Townland	Description
KK005-033001-	*Castle unclassified*	*Ardra*	In the grounds of Castlecomer House, on elevated ground lying at the confluence of the Dinin River, c. 120m to the W, with a tributary river immediately to the S, to the E of Castlecomer. Orpen (1909, 318-19) writes that, 'From an entry in the Liber Primus of Kilkenny it appears that a castle of some sort was erected here prior to the year 1200, as it is said to have been burned in that year by the O'Brenans'. He goes on to add that, 'just before the death of the younger William Marshal in 1231, he obtained a grant for forty days of his service due to the king to enable him "to fortify his castle of Cumbre [Castlecomer]"' (ibid.). In 1295, Edward I gave the custody of the castle of Combre to Richard le Erecedekne [Archdeacon], to fight the enemies of the king. The first actual mention I have noted of a [stone] castle here was in 1289' (ibid.). Both Carrigan (1905, vol. 2, 159) and Orpen (1909, 319) mention that the castle

Monument No.	Type	Townland	Description
			which stood on the motte, or the 'Garrison', was besieged by the Confederate army in 1641 for over three months. Carrigan adds that it,'has been entirely demolished'. The motte is heavily overgrown with trees and there is no visible trace of a stone medieval castle on the top. The only upstanding building is an angled structure (KK005-033003-) at the NE end which possibly dates to the 17th century and this seems to be the 'Castle (in Ruins)' indicated on the 1899 revision of the 6-inch OS map (Farrelly, O'Reilly and Loughran 1993, 127).
KK005-033002-	*Castle - motte*	*Ardra*	In the grounds of Castlecomer House, on elevated ground lying at the confluence of the Dinin River, c. 120m to the W, with a tributary river immediately to the S, to the E of Castlecomer. Orpen (1909, 318-19) writes that, 'From an entry in the Liber Primus of Kilkenny it appears that a castle of some sort was erected here prior to the year 1200, as it is said to have been burned in that year by the O'Brenans'. He goes on to add that, 'just before the death of the younger William Marshal in 1231, he obtained a grant for forty days of his service due to the king to enable him "to fortify his castle of Cumbre [Castlecomer]"' (ibid.). In 1295, Edward I gave the custody of the castle of Combre to Richard le Erecedekne [Archdeacon], to fight the enemies of the king' (ibid.). The monument is heavily overgrown with trees. Carrigan (1905, 157), describes it as being, 'about 25ft. [7.62m] high, and flat at the top, where it is 60 [54.86m] yards long and 30 [27.43m] yards wide'. Orpen (1909, 319), states that the 'original earthen defences, which we may presume once surrounded the mote, have been obliterated by public road and private avenue, and the mound itself is traversed by modern paths, and obscured by trees and shrubs'. There is no visible trace at ground level of the medieval castle (KK005-033001-) which probably stood on top of the motte. At the NE end of the top of the motte there is an angled structure (KK005-033003-) which possibly dates to the 17th century. Built into the base of the motte at the NE is an icehouse associated with Castlecomer House c. 170m to the SW (Farrelly, O'Reilly and Loughran 1993, vol. 1, 127)..
KK005-033003-	*Bastioned fort*	*Ardra*	No description available
KK005-057----	*Redundant record*	*Drumgoole*	In 1955, during land clearance works on the Wandesforde estate, old walls were covered. Following an inspection (OPW files, 21 November 1955), it was reported that, the 'walls turned out to be embanking walls on either side of the stream which flows through the demesne, running between Castlecomer House [KK005-081----] and the mote [KK003-033002-]. The stream brought down so much silt that it narrowed its bed and these walls were rendered unnecessary and the upper parts removed and the remaining parts sodded over and hidden from view until rediscovered in the last few months. The walls are of smallish, flat stones of about 2' [0.6m] thick. They bear no relation to the mote, as far as can be ascertained', the report goes on to say that an 18th-century date is the more probable for work of this kind. The evidence does not warrant their inclusion as an archaeological monument.
KK005-081----	*House - 16th/17th century*	*Drumgoole*	In 1635 Castlecomer was granted to Christopher Wandesforde, who established a town there and in 1638 built Castlecomer House. However, according to Nolan (1979, 78, 112), the family did not establish their principal residence here until c. 1694. Castlecomer House was burned down in 1798 during the Battle of Castlecomer (http://archiseek.com/2014/1802-castlecomer-house-co-kilkenny/, viewed 12 June 2017). In 1802 Lady Anne Ormonde rebuilt the house (ibid.). According

Monument No.	*Type*	*Townland*	*Description*
			to Bence-Jones (1988, 64), this house dated to the 18th and 19th centuries. Castlecomer House lay vacant during the 1960s and into the 1970s until it was almost completely demolished in 1975 (http://archiseek.com/2014/1802-castlecomer-house-co-kilkenny/, viewed 12 June 2017). In 1979 a two-storey house was built on part of the site (Farrelly et al. 1993, 128).
KK005-082----	*Historic town*	*Castlecomer*	No description available

Appendix E

Landscape and Visual Assessment

CASTLECOMER FOOTBRIDGE

Landscape and Visual Assessment

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Castlecomer Footbridge - Landscape and Visual Assessment
P01
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16.1 Introduction

This report documents the likely landscape and visual effects associated with the proposed footbridge over the River Dinin in Castlecomer Co. Kilkenny. It has been prepared to inform a screening determination of the requirement for and EIAR and as supplementary information to accompany the planning application for the proposed development.

The site for the proposed footbridge is located approximately 0.3km east of the town of Castlecomer Co. Kilkenny, specifically adjacent to the existing N78 road bridge crossing over the River Dinin and tributary Ardra Stream.

16.1.1 Scope of Landscape and Visual Impact Assessment

The scope of the landscape and visual impact assessment and structure of this report is as follows:

- Approach and Methodology;
- Planning Policy of relevance to Landscape and Visual Amenity as documented in the Kilkenny County Development Plan (CDP) 2014-2020 and the Castlecomer Local Area Plan (LAP) 2018;
- Landscape and Visual Baseline;
- Assessment;
- Mitigation measures; and
- Residual impact assessment.

16.2 Approach and Methodology

The methodology for the landscape and visual impact assessment (LVIA) was informed by best practice guidance published in *Guidelines for Landscape and Visual Impact Assessment*, Landscape Institute and Institute of Environmental Management & Assessment, Third Edition, 2013, hereafter referred to as GLVIA 3.

16.2.1 Study Area

A study area measuring 1km from the centre of the application area was identified for the purpose of capturing potential significant landscape and visual effects that may arise from a development of the nature and scale proposed and having regard for the baseline informed by desk based and field based study. The study area extents have been defined based on the extent of the likely visual influence of the proposed footbridge and is relatively confined due to the screening afforded by the extensive woodland cover nearby and the built up area of Castlecomer.

16.2.2 Field Survey

A site based assessment was carried out and concentrated on publicly accessible locations such as the surrounding road network and publicly accessible recreational facilities.

16.2.3 Assessment of Significance

The purpose of the landscape and visual impact assessment (LVIA) is to identify, describe and evaluate potential impacts and effects arising from the proposed development on the baseline landscape and visual receptors in the study area which have the potential to be affected by the proposed development. The assessment process starts with documenting the baseline. This includes descriptive data on the existing landscape including its constituent elements, fabric, and character and the baseline visual amenity as experienced by different groups of people located within the study area. The landscape and visual receptors documented in the baseline are then evaluated in terms of their sensitivity as described in the following paragraphs.

16.2.3.1 Landscape Sensitivity

The sensitivity of landscape receptors to change of the nature arising from the proposed footbridge is defined as very high, high, medium, low and negligible based on professional interpretation, combining judgements of their susceptibility to the type of change or development proposed and the value attached to the landscape. Landscape receptors include the different landscape character types or areas which may be affected by the proposed development, as well as landscape designations within the study area.

Susceptibility to change means the ability of the landscape receptor to accommodate the proposed development without undue consequences for the maintenance of the baseline.

The value attached to landscape receptors reflects landscape designations where applicable and level of importance of the designation (national, regional, local authority and community).

The levels of sensitivity for landscape receptors are broadly defined in accordance with the following table.

Table 1: Sensitivity of Landscape Receptors

Landscape Sensitivity	Description
Landscape Sensitivity	**Description**
Very High	Key characteristics of the landscape are highly vulnerable to the type of change proposed (have little or no tolerance to change). May be a landscape designated as being of international or national importance with features of international or national importance that has rarity and of very high scenic quality.
High	Key characteristics of the landscape are vulnerable to the type of change proposed (have limited or low tolerance to change). May be a landscape designated as being of national or regional importance with key features of national or regional importance which is uncommon and of high scenic quality.
Medium	Key characteristics and attributes of the landscape are reasonably resilient to the type of change proposed (have medium tolerance to change). May be a landscape designated as being of local importance with features of local importance and of medium scenic quality.
Low	Key characteristics and attributes of the landscape are resilient to the type of change proposed (are tolerant of change). Not usually designated but may have characteristics or elements of local value.
Negligible	Key characteristics and attributes are unlikely to be affected by the type of change proposed. Not designated and little or no characteristics or elements of value.

16.2.3.2 Visual Receptor Sensitivity

Visual receptors consist of an individual person or group of people likely to be affected by the proposed development at a specific viewpoint. Sensitivity of visual receptors is arrived at by combining judgements concerning their susceptibility to the type of change or development proposed and the value attached to the particular views.

The susceptibility of visual receptors to change in views is mainly a function of:

- The occupation or activity of people experiencing the view; and
- The extent to which their attention or interest may therefore be focused on the views and the visual amenity they experience.

The value attached to views experienced by people takes account of a number of factors including planning designations, such as protected views and other indicators of the value attached to views, for example through appearance in guidebooks, tourist maps and signage (parking places, signboards) at recreational facilities.

The levels of sensitivity for visual receptors are broadly defined in accordance with the following table.

Table 2: Visual Receptor Sensitivity

Visual receptor Sensitivity	Description
Visual Receptor Sensitivity	**Description**
Very High	People with proprietary interest in their surroundings or whose attention is likely to be focused on enjoyment of the view. Views are usually of value as recognised by international or national designation or promoted nationally or internationally for their scenic quality. Examples include residents positioned to take advantage of scenic views and recreational visitors at nationally promoted viewpoints.
High	People with proprietary interest in their surroundings or whose attention is likely to be focused on enjoyment of the view. Views are usually of value as reflected in local designations and promoted at local level, for example, in local guidebooks and maps. Examples include residents of dwellings positioned to view and enjoy the wider countryside, viewers on long distance walking routes or cycle tracks and viewers at locally promoted viewpoints.
Medium	People with passing interest in their surroundings for example those travelling in vehicles on scenic routes. Views attained may be locally valued.
Low	People with limited interest in their surroundings such as commuters travelling on major road and rail routes. Views attained are not necessarily of any particular scenic quality or value.
Negligible	People who are not focused on their surroundings, for example, those at work or engaged in active recreation where the setting is of little relevance to their activity. Views, where available, are not of any particular scenic quality or value and may feature detracting elements.

16.2.3.3 Magnitude

The changes caused to landscape and visual receptors as a result of the proposed development is evaluated in terms of their size or scale, geographical extent and duration and reversibility. Duration is defined as short term lasting 0-5 years, medium term lasting 5-10 years, long term lasting 10-20 years and permanent lasting more than 20 years. Levels of magnitude of impact on landscape and visual receptors are defined in **Tables 3** and **4** below.

Table 3: Magnitude of Impact on Landscape Receptors

Magnitude	Description
Magnitude	**Description**
Large	Total loss or extensive alteration to key elements/features/characteristics of the landscape resulting in a large change to the baseline conditions that is likely to be irreversible, long term or permanent.
Medium	Moderate partial loss or alteration to key elements/features/characteristics of the landscape resulting in a medium change to the baseline conditions that is likely to be, long term but may be partly reversible.
Small	Some loss or alteration to key elements/features/characteristics of the landscape resulting in a small change to the baseline conditions that is likely to be, short or medium term and at least partly reversible.
Negligible	Limited loss or alteration to key elements/features/characteristics of the landscape resulting in a negligible change to the baseline conditions that is likely to be, short or medium term and fully reversible.
No change	No change to the landscape baseline.

Table 4: Magnitude of Impact on Visual Receptors

Magnitude	Description
Magnitude	Description
Large	Total loss or extensive alteration to key elements/features/characteristics of the view experienced by a particular viewer type resulting in a large change to the baseline conditions that is likely to be irreversible, long term or permanent.
Medium	Moderate partial loss or alteration to key elements/features/characteristics of the view experienced by a particular viewer type resulting in a medium change to the baseline conditions that is likely to be, long term but may be partly reversible.
Small	Some loss or alteration to key elements/features/characteristics of the view experienced by a particular viewer type resulting in a medium change to the baseline conditions that is likely to be, short or medium term and at least partly reversible.
Negligible	Limited loss or alteration to key elements/features/characteristics of the view experienced by a particular viewer type resulting in a small change to the baseline conditions that is likely to be, short or medium term and fully reversible.
No change	No change to the existing view.

16.2.3.4 Significance of Effect

The significance of the effect of the proposed development on landscape and visual receptors is arrived at by combining judgements concerning the sensitivity of the landscape or visual receptor with judgements concerning the predicted magnitude of impact as indicated in the table below. It is important to note that significance is determined on a case by case basis using professional judgement with the diagram below as a guide and this approach accords with the guidance in GLVIA 3.

The guidance also states that *'The regulations require that a final judgement is made about whether or not each effect is likely to be significant. There are no hard and fast rules about what effects should be deemed significant but LVIAs should always distinguish clearly between what are considered to be significant and non-significant effects.'*

Table 5: Significance of Landscape and Visual Effects

		Sensitivity				
Magnitude of Impact		**Negligible**	**Low**	**Medium**	**High**	**Very High**
	No change	None	None	None	None	None
	Negligible	Negligible	Negligible to Minor	Negligible to Minor	Minor	Minor
	Small	Negligible to Minor	Negligible to Minor	Minor	Minor to Moderate	Moderate to Major
	Medium	Negligible to Minor	Minor	Moderate	Moderate to Major	Major to Substantial
	Large	Minor	Minor to Moderate	Moderate to Major	Major to Substantial	Substantial

16.3 Planning Policy

Planning policy of relevance to landscape and visual amenity is set out below with reference to the Kilkenny County Development Plan and the Castlecomer Local Area Plan.

16.3.1 Kilkenny County Development Plan 2014-2020

The Kilkenny County Development Plan 2014-2020 (CDP) is the statutory plan which documents the policies and objectives of relevance to landscape and visual amenity. Those policies and objectives which are of relevance are outlined below.

16.3.1.1 Landscape Character

Policies of relevance to landscape and visual amenity are documented in chapter 8 Heritage in the CDP.

Objective 8G of the CDP relates to landscape character and states *'To protect and sustainably manage the landscape character of County Kilkenny, having regard to the findings of the landscape character assessment and the development management standards as set out in this chapter for the sustainable development of the county and appropriate conservation of its landscape character.'*

In this regard, the site for the proposed development, located in the town of Castlecomer, lies within the Castlecomer Plateau Landscape Character Area according to the Kilkenny County Landscape Character Assessment. The Castlecomer plateau comprises an elevated landscape between the River Nore and River Barrow Valleys. The plateau and wooded environs form the setting of the town of Castlecomer and as a landscape in its own right, it is considered to be of significant value and highly sensitive to change.

16.3.1.2 Landscape Designations

The CDP refers to landscape designations, namely '*Areas of Highly Scenic and Significant Visual Amenity Value'* and *'Areas of Greater Sensitivity.'* There are no such designated landscapes within the study area for the assessment.

16.3.1.3 Views and Prospects

The CDP refers to the need to protect and conserve views of high amenity value. In this regard, Objective 8H states *'To preserve and improve places or areas from which views or prospects of special amenity value exist, as identified in Appendix H and on Figure 8.2.'*

There are no designated views and prospects within the study area for the assessment. The closest of these is view V12 located c. 1.7km north west of the site for the proposed development. This is described as '*V12. Views overlooking Castlecomer and Ballyragget on the Castlecomer/Ballyragget Road (R694) between its junctions with road nos. LT5852 and LT5847'* The application site is screened from view by intervening vegetation.

16.3.1.4 Development standards relating to landscape character and views

The development management standards refer to a number of requirements relating to landscape and visual amenity including river valleys for which it states, *'To ensure that development in the River Valleys will not adversely affect or detract from either protected view (see Appendix H) (especially from bridges) or distinctive linear sections of river valleys (especially open floodplains) when viewed from settlements.'*

16.3.1.5 Trees and Woodlands

Trees and woodlands which are the subject of a Tree Preservation Order (TPO) under the Planning and Development Act 2000 as amended are designated as such for the amenity value and cannot be felled without planning permission.

Hedgerows are afforded protection under the Wildlife Act 2000 as amended and whilst designated for their biodiversity value, they are also key features that contribute to landscape character.

Objective: 8F of the CDP states that *'Kilkenny County Council will promote the planting of native tree and shrub species, by committing to using native species (of local provenance wherever possible) in its landscaping work and on County Council property.'*

16.3.1.6 Designed Landscapes

The CDP refers to inventory. Castlecomer House features in the inventory of gardens and designed landscapes held by The National Inventory of Architectural Heritage and includes lands east of the River Dinin and located to the north and south of the N78 Road and the site for the proposed footbridge. The site extents today feature contemporary land uses which have replaced many of the features associated with the historic parkland. The Castlecomer golf course and Sawney's wood are located south of the site and the Castlecomer Discovery Park, and woodland walk (The Castlecomer Loop) are located to the north. Much of the woodland associated with the original demesne has been replaced by commercial forestry.

16.3.2 Castlecomer Local Area Plan 2018

The Castlecomer LAP refers to the County Landscape Character Assessment, specifically the Castlecomer Plateau LCA comprising a large area of upland lying between the river valleys of the Barrow and Nore which forms the setting of the town of Castlecomer in which the proposed footbridge will be located.

16.3.2.1 Trees and Woodlands

The LAP refers to *'Protected tree stands on Castlecomer golf course (creamery house behind). A Tree Preservation Order (TPO) currently applies to an area of Sawney's Wood/Hill (TPO 1/67 – See Fig 6.8). The TPO comprises of 41 individual trees, four tree groupings and an area of specified woodland. The trees comprise a mixture of deciduous trees and conifers with species including beech, ash, cedar, oak and sycamore.'*

The LAP cites objectives in respect of protected trees as follows.

- *'Objective H3 Protect the Mixed Broadleaved Woodland Tree Protection Order site(s) identified on Figure 6.8'*
- *'Objective H4 to protect and incorporate existing biodiversity features such as hedgerows and surface water features into the design and construction of new development and public realm. Where the loss of the existing boundary is unavoidable as part of developments, to ensure that a new hedgerow is planted using native species, and species of local provenance to replace the existing hedgerow'*

The above referenced protected trees comprise an extensive woodland located east of the River Dinin on the south side of the N78 road adjacent to the site for the proposed footbridge.

16.3.2.2 Castlecomer ACA

The town of Castlecomer is a designated Architectural Conservation Area, the eastern boundary of which is located c. 100m from the site for the proposed footbridge.

16.4 Landscape and Visual Baseline

16.4.1 Landscape Character of the site and study area

The site for the proposed footbridge is located close to the eastern edge of the urban area of Castlecomer. The main elements in the landscape of the study area comprises the built up area associated with the eastern edge of Castlecomer and the wooded open space associated with the Castlecomer Discovery Park featuring a range of active recreation facilities. The N78 extends in a broadly east west direction and is a very busy road route carrying both passenger vehicles and frequent lorries. An extensive enclosed wooded area associated with Sawneys Wood is located immediately south of the N78 and the site for the proposed footbridge. Further east, the site of St Mary's Church of Ireland and graveyard is located on slightly elevated ground as a focal point in the area.

The existing N78 road crossing comprises a stone arched bridge built of limestone which crosses both the River Dinin and its tributary, The Ardra Stream. The north eastern bank of the River Dinin features a wooded

area with woodland paths and picnic sites associated with the Discovery Park close to and within viewing distance of the old stone bridge which presents as a focal point.

16.4.2 Visual Baseline

The visibility of the application site was initially assessed by a desktop study of OSI Discovery Maps (1:50,000) and available aerial photography, followed by a field survey.

The influence of the mature wooded vegetation around Castlecomer generally is such that visibility of the application site is very limited.

The receptors with existing views of the planning application area and/or potential views of the proposed development comprise road users, pedestrians and recreational visitors at a small number of locations within the study area. The location of each of the viewpoints is indicated on **Figure 1** and described in **Table 6** below. The table lists the viewer types at each viewpoint and describes the nature of existing views. Photographs depicting the existing visual amenity at each viewpoint location are presented in **Figures 2**, **3** and **4**.

Table 6: Visual Receptors

ID	Location	Viewer Types	Description of Existing View
A	Eastern edge of Castlecomer Town	Road users Pedestrians approaching Castlecomer Town	Views are available of the existing N78 road and heavy traffic. The stone bridge crossing including stone approach walls, stone arches and parapets is clearly visible together with part of the wooded river setting. Glimpse views of Castlecomer Town are available in the distance.
B	Castlecomer Discovery park	Recreational users of the picnic area in Castlecomer Discovery Park	Views are available of the River Dinin and woodland setting. The stone arched bridge crossing presents as a focal point in the existing view.
C	St Mary's Church	Visitors	Distant views of the existing N78 bridge crossing are available albeit with a busy road and on street car parking facilities in the foreground. These views are attained against the backdrop of Castlecomer Town in the distance.
D	Western edge of Castlecomer Town	Residents of Dwelling Road users	Views are available of the existing N78 road and heavy traffic. The stone bridge crossing including stone parapet walls are clearly visible along with mature trees. Timber double gate entrance clearly visible in the foreground.
E	Existing bridge over River Dinin	Recreational walkers	Views in a northerly direction of the River Dinin and mature riverside woodland and open space picnic site at Castlecomer Discovery Park.

Figure 1: Visual Receptors

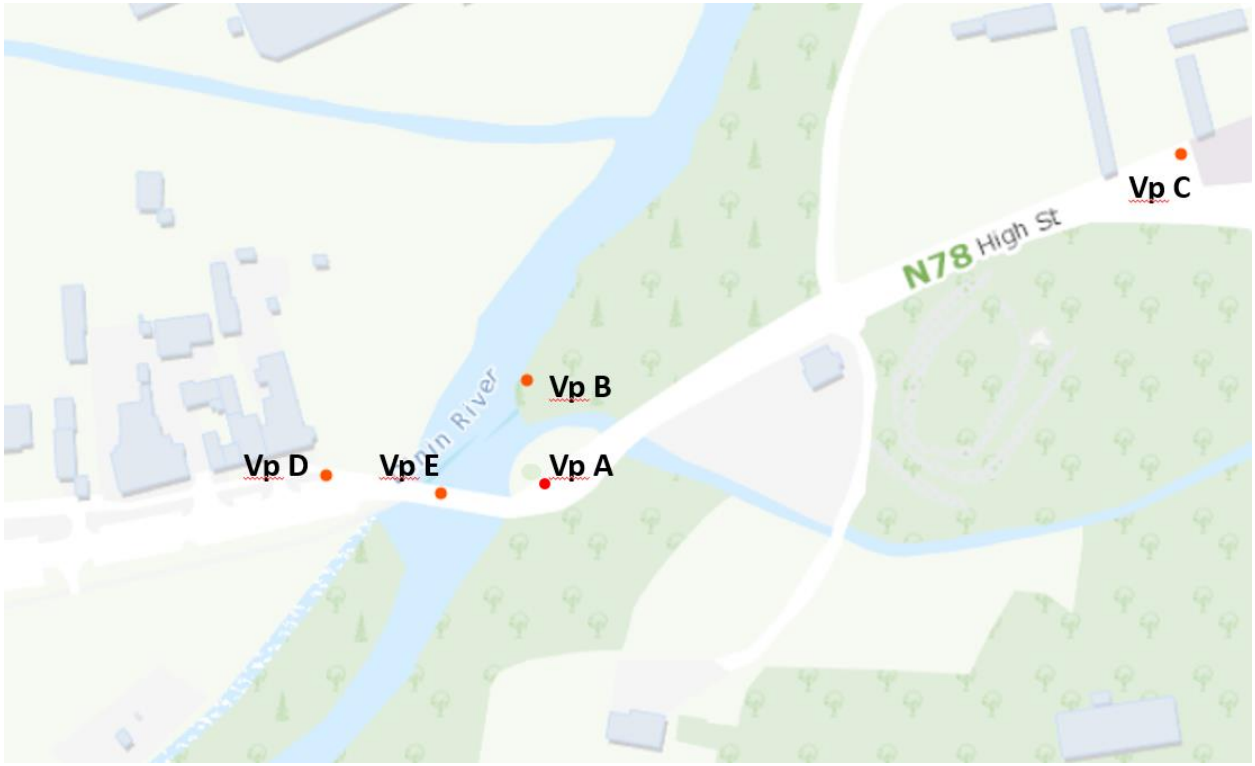

Figure 2: Viewpoint A

Figure 3: Viewpoint B

Figure 4: Viewpoint C

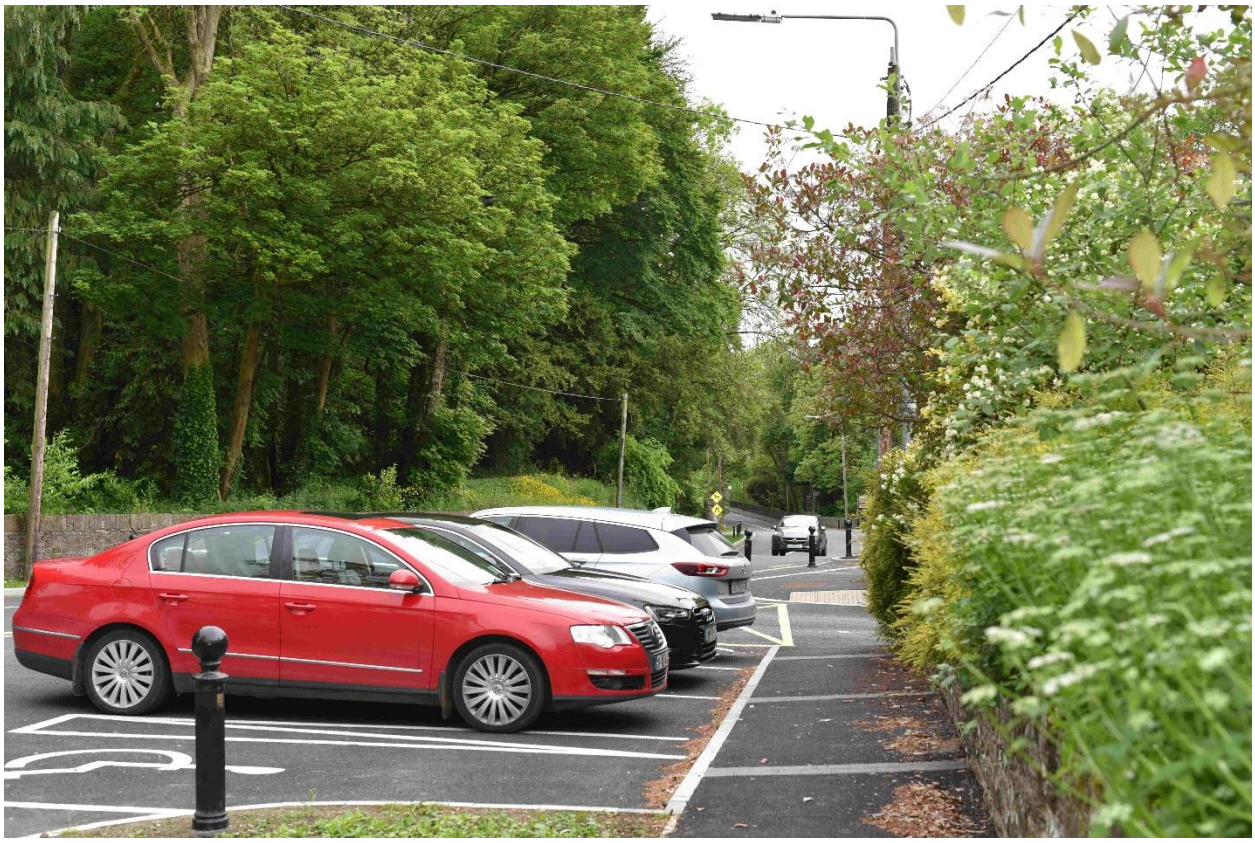

Figure 5: Viewpoint D

Figure 6: Viewpoint E

16.5 Assessment

This section of the report presents the assessment of effects on landscape and visual amenity during construction and operational stages.

The proposed change comprises the introduction of a footbridge as a new structure crossing the River Dinin on the eastern edge of the town of Castlecomer.

16.5.1 Construction Stage Impacts

The impacts and effects on landscape character and visual amenity during the construction stage are documented below.

During construction, small areas of woodland and scrub on western and eastern banks of the river would be lost. A relatively small amount of grassland along the river bank would also be lost. The vegetation clearance would be followed by bridge construction works during which, a range of temporary structures including bunds and temporary access bridge over the Ardra Stream would be introduced into this landscape along with the presence of moving plant and machinery. A site compound would be located on the eastern bank of the river, immediately north of the existing bridge. The construction activities are expected to last 6 months after which, the landscape would be restored. These direct changes to the landscape during construction represent a very minor alteration to key elements, namely loss of riverside vegetation which would be discernible only in the landscape immediately surrounding the works. Due to the nature of the change, being very small in scale and of short term duration (6 months), significant effects on the character of the landscape surrounding the site and the wider setting of the town and on visual amenity experienced by viewers within the study area are not expected to arise.

16.5.2 Operational Stage Impacts

The impacts and effects on landscape character and visual amenity during the operational stage are documented below.

16.5.2.1 Landscape and Landscape Character

Effects on landscape are discussed in terms of direct changes to the landscape and indirect effects on surrounding landscape character within the 1km study area with reference to the landscape baseline already described above.

An evaluation of landscape sensitivity is presented. The magnitude of impact on landscape character is also presented with reference to the size and scale, geographical extent and duration/reversibility of the proposed change resulting in a judgement of the overall magnitude of landscape change.

16.5.2.1.1 Castlecomer Plateau LCA

Direct changes would occur to the landscape of the site on the River Dinin at the eastern edge of Castlecomer within the wider context of the Castlecomer Plateau LCA. These changes relate to the introduction of a new permanent footbridge. The change would be apparent in the landscape only in the immediate vicinity of the proposed footbridge due to the visual screening provided by woodland cover in the study area generally along with the built up area of Castlecomer.

The Castlecomer Plateau LCA is considered to be of significant value and highly sensitive to change according to the CDP. The scale of the proposed changes comprising loss of a very small area of woodland and introduction of a new bridge including accesses which would be apparent only from the immediate vicinity of the River crossing is such that the magnitude of impact is expected to be negligible resulting in a minor and not significant impact on the Castlecomer Plateau LCA where this occurs within the study area.

Effects on the landscape setting of the existing bridge would arise as a result of the introduction of the new pedestrian footbridge, pedestrian accesses on both west and east sides and consequent loss of vegetation on the riverbank. These changes would be very localised due to the screening afforded by existing woodland

and buildings in close proximity to the site. The proposals have been designed to be sympathetic to existing landscape character including the existing stone bridge. Effects on local landscape character are therefore not considered to be significant.

16.5.2.2 Protected Trees and Woodland

No effects are predicted to arise to the protected woodland associated with Sawney's Wood.

16.5.2.3 Designed Landscapes

The proposed footbridge would be located within the boundary of the Castlecomer Demesne, in a part of the site which features woodland trails and picnic areas associated with the Castlecomer Discovery Park. As the demesne is much altered, with much of the original woodland replaced with commercial forestry and featuring various activity structures associated with its current recreational use, it is considered to be tolerant of the scale and nature of the change proposed and consequently of low sensitivity to the proposed change.

The proposed footbridge will be apparent only from the picnic area in the immediate vicinity and will be screened from view from the wider demesne area (now Castlecomer Discovery Park) by woodland and commercial forestry. A negligible magnitude of impact is predicted resulting in a negligible to minor and not significant effect.

16.5.2.4 Castlecomer ACA

Significant effects on the setting of the Castlecomer ACA are not predicted to arise. The proposed change would be apparent only from the eastern edge of the ACA at a distance of 0.3km. Slight changes in terms of very small amounts of mature vegetation losses and the introduction of the pedestrian access opening along the existing parapet stone wall of the existing bridge would be scarcely apparent from the ACA in the context of the busy N78 road.

16.5.2.5 Visual Amenity

Effects on visual amenity at selected viewpoint locations presented in the baseline are documented below. An evaluation of sensitivity at each viewpoint location is presented along with an evaluation of magnitude of impact which is determined with reference to the size and scale, geographical extent and duration/reversibility of the proposed change resulting in a judgement of the overall magnitude of visual change.

Table 7: Visual Receptor Sensitivity

ID	Evaluation	Sensitivity Ranking
A	Road users are of low sensitivity as the view is incidental to the journey.	Low.
A	Pedestrians approaching Castlecomer Town are of high sensitivity as the surrounding landscape is an important part of the experience and the existing view is of some value owing to the scenic quality.	High
B	Recreational users of the picnic area in Castlecomer Discovery Park are of high sensitivity as the surrounding landscape is an important part of the experience and the existing view is of some value owing to the scenic quality.	High
C	Recreational visitors at the entrance to St Mary's Church of Ireland are of high sensitivity as the surrounding landscape is an important part of the experience and the existing view is of some value owing to the scenic quality.	High
D	Residents of dwelling are of high sensitivity due to continued and proprietary interest in their surroundings and the existing view is of some value owing to the scenic quality.	High
E	Recreational walkers are of high sensitivity as the surrounding landscape is an important part of the experience and the existing view is of value owing to the scenic quality.	High

16.5.2.5.1 Magnitude of Impact and Significance of Visual Effects

The magnitude of impact at each viewpoint is discussed below. For each viewpoint the size and scale of the change to the existing view is described together with the extent of the view that would be affected by the change and the duration, concluding with an overall magnitude of impact. Finally, the significance of visual effects at each viewpoint is documented.

At viewpoint A, viewers would see the pedestrian access to the proposed footbridge. This would be seen as an opening or gap in the stone wall approach to the existing bridge crossing. It is expected that the stonework would be reinstated such that the access would be present as a new feature that is consistent with the character of the area. Viewers would also attain partial views of the proposed bridge against the wooded riverine backdrop. In this regard a medium magnitude of impact is predicted to arise. This would result in a minor and not significant effect for road users of low sensitivity and a moderate to major significant effect for pedestrians of high sensitivity approaching Castlecomer Town.

At viewpoint B, recreational viewers at the picnic area would experience considerable change to the existing view. The proposed footbridge would be clearly visible at short range as a new structure including stone abutments, central pier and bridge with a light railing (handrail) parapet. The proposed footbridge will be visible, in front of the existing stone bridge. It will partially obstruct views of the parapet of the original bridge however the stone arches will be clearly visible below the line of the proposed pedestrian bridge deck. In this regard, the proposed structure with its central pier and symmetrical arrangement has been designed to minimise visual conflict with the existing stone bridge and to present as a light and aesthetically pleasing structure with colour renders including green to complement the wooded context. The magnitude of impact is considered to be large due to the change to one of the key elements in the existing view, namely the introduction of the proposed bridge. A major to substantial and significant effect is predicted to arise for the recreational viewers of high sensitivity at the picnic site.

Due to the efforts to design a structure that is sympathetic with its surroundings, the proposed footbridge may be viewed as either an adverse or a beneficial visual change from both viewpoints A and B. In this regard the moderate to major significant visual impact and viewpoint A and the major to substantial visual impact at viewpoint B could be deemed to be beneficial, adverse or neutral dependant on the viewer.

At viewpoint C, elements of the proposed change, namely the new pedestrian access, would be partially visible as a very small element in the distance. A negligible magnitude of impact is predicted to arise to viewers of high sensitivity resulting in a minor and not significant effect.

At viewpoint D, the proposed bridge access on the western side would be clearly visible in the foreground adjacent to the double gate entrance. This would be present as an opening in the existing stone parapet wall with timber surfacing along with new parapet wall faced in matching stone. New and reinstated parapet walls in the vicinity of the pedestrian access would be faced in stone to match existing. A medium magnitude of impact is predicted to arise to residents of high sensitivity resulting in a moderate to major and significant visual impact. Due to the efforts to design a structure that is sympathetic with its surroundings, the proposed footbridge may be viewed as a beneficial, adverse or neutral change dependant on the viewer.

At viewpoint E, recreational walkers will clearly see the new footbridge in the foreground in the context of the existing view of the River Dinin framed with woodland. The proposed bridge would be clearly apparent but would not intrude upon the existing view of the river because the parapet would be below eye level, i.e., the viewer would have to look down towards the riverbed to see the proposed footbridge. The footbridge would be visible however at short range albeit designed in sympathy with its immediate context. A large magnitude of impact is predicted to arise to recreational walkers of high sensitivity resulting in a major to substantial effect. Due to the efforts to design a structure that is sympathetic with its surroundings, the proposed footbridge may be viewed as a beneficial, adverse or neutral change dependant on the viewer.

The assessment concludes that views of the proposed change would be attained only at locations in very close proximity to the site due to screening afforded by mature woodland and the built up area of Castlecomer. In general, viewers would experience notable changes to the existing view at short range. Such changes could be viewed as adverse, beneficial or neutral owing to the efforts to design the bridge as an aesthetically pleasing structure which is sympathetic to the surrounding context.

16.5.3 Do Nothing Scenario

If none of the proposed works were carried out, there would be no change to the baseline and no effects on landscape and visual amenity.

16.6 Mitigation Measures

16.6.1 Construction Stage

Measures outlined in BS 5837 Trees in relation to construction would be implemented to protect vegetation to be retained during construction.

16.6.2 Operational Stage

The measures implemented to enhance the design of the proposed footbridge have been considered with landscape and visual amenity in mind together with the setting of the existing bridge. These relate to the structure itself as well as the colour finish.

16.7 Residual Impact Assessment

16.7.1 Construction Stage

As the effects during construction take account of the mitigation measures, namely the protection of existing vegetation to be retained, the residual effects are the same as that documented under construction stage impacts.

16.7.2 Operational Stage

As the effects during operation take account of the mitigation measures, inherent in the design of the proposed footbridge, the residual effects are the same as that documented under operational stage impacts.

16.8 References

The Landscape Institute with the Institute of Environmental Management and Assessment (2013), *Guidelines for Landscape and Visual Impact Assessment*, Third Edition, Routledge.

The Landscape Institute (June 2018) Draft Technical Guidance Note – *Photography and photomontage in Landscape and Visual Impact Assessment*, The Landscape Institute

Environmental Protection Agency (EPA) (May 2017) *'Guidelines on the Information to be contained in Environmental Impact Assessment Reports'*, EPA Ireland

Appendix F

Bat Survey

Bat Survey

N78, Castlecomer Footbridge

Castlecomer

Kilkenny

Draft Report, prepared for RPS Cork

By Karen Banks MCIEEM

19th June, 2019

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Contents

Figures

Tables

1 Introduction

Greenleaf Ecology was appointed by RPS to carry out a bat survey and assessment in relation to a proposal for a footbridge on the N78, Castlecomer, Co. Kilkenny. The proposed footbridge will span the Dinin River to the east of Castlecomer.

1.1 Brief Description of Proposed Project

In order to improve safety at the existing bridge Kilkenny County Council (KCC) and TII intend to remove pedestrians from the existing bridge and provide a new dedicated facility for pedestrians to cross the River Dinin.

The preferred option is a two-span steel footbridge. The design of the two span steel footbridge can be seen in **Figure 1.1**. Full details of the proposals are seen in the drawing in Appendix A of the Environmental Impact Screening Report.

Figure 1-1: Two Span Steel Footbridge Elevation (North)

The proposed footbridge will be constructed as a stand-alone structure to the north of the existing River Dinin road bridge. Since the proposed footbridge will be located close to the northern side of the existing bridge it will intersect two watercourses, namely the River Dinin and the Ardra Stream. Where the bridge will span the Dinin River the river is a 4th Order river with a wet width of approximately 22m and 20-40cm deep. The footbridge will also span the weir and the Ardra Stream which enters the River Dinin just north of the proposed footbridge.

Abutments will be constructed on either bank (east and west) with a pier to be constructed within the river bed to provide additional support. The abutment on the left bank and the right bank will be 13m and 22m in length respectively. The pier is to be located in the centre of the channel where the channel is dominated by gravels and cobbles.

The works will include site investigation works and main construction works. The works will generate the following list of activities: vegetation removal, excavation, piling, pouring of concrete, fill for embankments, installation of bridge sections and demobilisation.

As part of the site preparations it will be necessary to undertake site clearance on the western and eastern banks in preparation for construction of foundations. Removal of existing vegetation under the footprint of the proposed embankments and pier will also be required. There will also be the removal of trees along both the right and left banks.

1.2 Objectives

The objectives of this bat survey and assessment were to:

- Determine the current use or otherwise of the site by bats;
- Determine the current value of the site to bats;
- Make an assessment of the potential impacts of the proposed works on bats; and
- To provide appropriate mitigation measures to remove or reduce impacts.

1.3 Legislative Context

Wildlife Acts 1976 (Revised)

The Acts provide for *inter alia* the protection of wildlife. The Acts prohibit the intentional killing, taking or injuring of certain wild birds or wild animals; or the intentional destruction, uprooting or picking of certain wild plants.

The Wildlife (Amendment) Act, 2000 makes legal provision for the designation and protection of a national network of Natural Heritage Areas (NHAs). These are areas considered important for the habitats present or which hold species of plants and animals whose habitat needs protection.

European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. No. 477 of 2011)

The Regulations give effect to requirements relating to the designation of protected sites under the Birds Directive and Habitats Directive. The Regulations provide for the protection and management of European Sites and place obligations on all competent authorities to have regard to the requirements of the Habitats Directive. The Regulations also provide for the protection of species of European importance.

The European Communities (Birds and Natural Habitats) (Amendment) Regulations 2015 (S.I. No. 355 of 2015)

The Regulations provide that The Wildlife Act, 1976, the Wildlife (Amendment) Act, 2000, the Wildlife (Amendment) Act 2010, the Wildlife (Amendment) Act 2012, the European Communities (Birds and Natural Habitats) (Restrictions of the Use of Poison Bait) Regulations 2010 (S.I. 481 of 2010), the European Communities (Birds and Natural Habitats) Regulations 2011, the European Communities (Birds and Natural Habitats) (Amendment) Regulations 2013 (S.I. No. 499 of 2013), and the European Communities (Birds and Natural Habitats) (Amendment) Regulations 2015 themselves shall be construed together as one.

2 Methodology

2.1 Statement of Authority

The site surveyor and report author is ecologist Ms. Karen Banks. Karen holds a BSc in Environment and Development and is a full member of the Chartered Institute of Ecology and Environmental Management (CIEEM).

The information prepared and provided is true and accurate at the time of issue of the report and has been prepared and provided in accordance with the CIEEM Code of Professional Conduct (CIEEM 2013).

2.2 Assessment Guidance Methodology

The assessment had regard to the following guidelines:

- Bat Tree Habitat Key (2018) *Bat Roosts in Trees- A Guide to Identification and Assessment for Tree-Care and Ecology Professionals.* Exeter: Pelagic Publishing.
- Bat Conservation Ireland, (2010). *Guidance notes for Planners, Engineers, Architects, and Developers*;
- CIEEM (2016) *Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater and Coastal, 2nd edition*. Chartered Institute of Ecology and Environmental Management, Winchester;
- Collins, J. (ed.) (2016). *Bat Surveys for Professional ecologists: Good Practice Guidelines* (3rd ed.). The Bat Conservation Trust, London;
- EPA (2002) *Guidelines on the Information to be Contained in Environmental Impact Statements*, Environmental Protection Agency;
- EPA (2003), *Advice Notes on Current practice in the Preparation of Environmental Impact Statements*, Environmental Protection Agency;
- Kelleher, C. & Marnell, F. (2006). *Bat Mitigation Guidelines for Ireland*;
- NRA[1] (2009) *Guidelines for the Assessment of Ecological Impacts of National Road Schemes Rev. 2*, National Roads Authority;
- NRA (2008) *Ecological Surveying Techniques for Protected Flora and Fauna During the Planning of National Road Schemes*, National Roads Authority; and
- NRA (2006). *Guidelines for the Treatment of Bats During the Construction of National Road Schemes*.

The assessment was carried out in two stages, firstly through a desktop study and secondly by field survey work in order to identify, describe and map locations of known or potential value to bats.

2.3 Desk Study

In addition to those listed in the References Section, the sources of published material that were consulted as part of the desk study for the purposes of this protected species survey and assessment are as follows:-

- Review of Ordnance Survey maps and ortho-photography;
- Review of the National Biodiversity Data Centre (NBDC) database for records of protected species in the 2km Grid Square within which the proposed bridge works are located (S57G);
- Aerial Photography; and

[1] Now Transport Infrastructure Ireland (TII)

- 1:50,000 Ordnance Survey (OS) Map; Discovery Series.

2.4 Field Survey

2.4.1 Preliminary Survey

A preliminary walkover survey of the site was conducted on 3rd May, 2019. The site and its environs were walked and habitats, including trees and structures, of potential value to bats were noted and marked on a map. The value of each feature was noted according to its potential for use by bats for roosting, foraging or commuting. The value of habitat features for bats was defined in accordance with *Bat Surveys: Good Practice Guidelines* publication[2], as shown in Table 2-1**.**

Table 2-1: Potential suitability of habitats for bats

Suitability	**Description** **Roosting Habitats**	**Commuting and Foraging Habitats**
Negligible	Negligible habitat features on site likely to be used by roosting bats.	Negligible habitat features on site likely to be used by commuting or foraging bats.
Low	A structure with one or more potential roost sites that could be used by individual bats opportunistically. However, these potential roost sites do not provide enough space, shelter, protection, appropriate conditions and/or suitable surrounding habitat to be used on a regular basis or by larger numbers of bats (i.e. unlikely to be suitable for maternity or hibernation). A tree of sufficient size and age to contain PRFs but with none seen from the ground or features seen with only very limited roosting potential.	Habitat that could be used by small numbers of commuting bats such as gappy hedgerow or un-vegetated stream, but isolated, i.e. not very well connected to the surrounding landscape by other habitat. Suitable, but isolated habitat that could be used by small numbers of foraging bats such as a lone tree (not in a parkland situation) or a patch of scrub.
Moderate	A structure or tree with one or more potential roost sites that could be used by bats due to their size, shelter, protection, conditions and surrounding habitat but unlikely to support a roost of high conservation status (with respect to roost type only- the assessments in this table are made irrespective of species conservation status, which is established after presence is confirmed).	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. Habitat that is connected to the wider landscape that could be used by bats for foraging such as trees, scrub, grassland or water.
High	A structure or tree with one or more potential roost sites that are obviously suitable for use by larger numbers of bats on a more regular basis and potentially for longer periods of time due to their size, shelter, protection, conditions and surrounding habitat.	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. High quality habitat that is well connected to the wider landscape that is likely to be used regularly by foraging bats such as broadleaved woodland, tree-lined watercourses and grazed parkland. Site is close to and connected to known roosts.

[2] Collins, J. (ed.) (2016) Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edn). The Bat Conservation Trust, London.

2.4.2 Preliminary Roost Assessment of Trees

Two trees located to the west of the site will be felled to facilitate construction of the proposed footbridge. A preliminary ground level roost assessment of the 2no. trees proposed for clearance was undertaken on 3rd May, 2019. A detailed inspection of the exterior of trees was undertaken to look for features that bats could use for roosting (Potential Roost Features, or PRFs) from ground level. The aim of the survey was to determine the actual or potential presence of bats and the need for further survey and/or mitigation. The inspection was carried out in daylight hours from ground level, and information was compiled about the tree, PRFs and evidence of bats. A description of each PRF observed was recorded. PRFs that may be used by bats include:

- Rot holes;
- Hazard beams;
- Other horizontal or vertical cracks or splits (e.g. frost cracks) in stems or branches;
- Lifting bark;
- Knotholes arising from naturally shed branches or branches previously pruned back to the branch collar;
- Man-made holes (e.g. flush cuts) or cavities created by branches tearing out from parent stems;
- Cankers in which cavities have developed;
- Other hollows or cavities;
- Double leaders forming compression forks with included bark and potential cavities;
- Gaps between overlapping stems or branches;
- Partially detached ivy with stem diameters in excess of 50mm; and
- Bat or bird boxes.

Signs of a bat roost (excluding the actual presence of bats), include:

- Bat droppings in, around or below a PRF;
- Odour emanating from a PRF;
- Audible squeaking at dusk or in warm weather; and
- Staining below the PRF.

It should be noted that bats or bat droppings are the only conclusive evidence of a roost and many roosts have no external signs. Therefore, this survey and evaluation was relatively basic as only those PRFs at ground level could be inspected closely to ascertain their true potential to support roosting bats. Trees were categorised according to the highest suitability PRF present. The criteria for categorisation of suitability for bats is described further in Table 2.1.

2.4.2 Preliminary Roost Assessment of Bridge

The existing N78 road bridge at Castlecomer was subject to a visual inspection for evidence of and potential for bats. The exterior of the bridge was visually assessed for bat access points and evidence of bat activity using close focus binoculars. Features such as crevices and small gaps in the bridge structure were inspected. Evidence that these features/ access points were actively being used by bats includes staining within the gaps, urine staining and bat droppings. Indicators that potential access points are not actively used by bats include general detritus and cobwebs within the access point. A note of potential features used by bats was taken where present.

2.4.3 Emergence and Activity Survey

A dusk emergence survey of a Horse Chestnut tree that was identified during the preliminary survey as supporting potential roosting features was undertaken on 3rd May, 2019. The emergence survey commenced approximately 15 minutes before sunset and continued for c. 90 minutes after sunset The emergence survey was followed by an activity survey using a handheld Anabat Walkabout detector, which records bat echolocation calls directly on to an internal SD memory card. Each time a bat is detected, an individual time-stamped (date and time to the second) file is recorded. Data was then downloaded and bat calls were later analysed by the Anabat Insight sound analysis software version 1.2.

Dusk surveys enable the identification of any obvious roost sites, a determination of the approximate numbers and species of bats present within the proposed site and its environs, areas used for foraging and commuting routes to and from roosts. The approximate flying height and direction taken by bats were estimated and detailed where possible.

The activity survey was conducted in suitable weather conditions (10°C at dusk, no rain, Beaufort Force 1).

3 Results

3.1 Desktop Study

3.1.1 Bat Records

A review of existing bat records within 2km Grid Square S57G (sourced from Bat Conservation Ireland's National Bat Records Database and the National Lesser Horseshoe Bat Database) reveals that, currently, five of the ten known Irish bat species have been observed within the vicinity of the site. These include soprano pipistrelle and pipistrelle sp. (*Pipistrellus pygmaeus*, & *P. pipistrellus sensu lato* respectively), Leisler's (*Nyctalus leisleri*), brown long-eared (*Plecotus auritus*) and Daubenton's (*Myotis daubentonii*) bat as shown in **Table 3.1** below. A soprano pipistrelle roost has also been identified within 2km Grid Square S57G (as indicated in **Table 3.1**).

Nathusius' pipistrelle (*P. nathusii*), Natterer's bat (*Myotis nattereri*), Whiskered bat (*M. mystacinus*) and Brandt's (*M. brandtii*) bats have not been recorded in the vicinity of the site to date.

There are no records of Nathusius' pipistrelle from Castlecomer and its environs. This species is associated with broadleaved woodland, wetlands and waterbodies[3].

Brandt's bat is rare in Ireland (only a single confirmed specimen of Brandt's bat has been found in Ireland (Mullen 2007)) and is therefore less likely to be present within the study area.

There are no records on the NBDC database of Whiskered bat from Castlecomer and its environs. Records from Ireland suggest that this species is associated with woodland cover, small areas of pasture, urban and scrub land cover[4].

Natterer's bat is widespread in Ireland but is much less common in the Castlecomer area. This species is associated with broadleaved woodland, riparian habitats and areas with a larger scale provision of mixed forest[5].

Bat records from within 2km Grid Square S57G were obtained from the NBDC online database and are detailed in Table 3-1**.**

Table 3-1: Bat Records from 2km Grid Square S57G

Species	**Date of last record**	**Known Roost**	**Protection**
Brown long-eared bat (*Plecotus auritus*)	06/07/2009	-	Annex IV; Wildlife Acts
Daubenton's bat (*Myotis daubentonii*)	01/07/2013	-	Annex IV; Wildlife Acts
Leisler's bat (*Nyctalus leisleri*)	01/07/2013	-	Annex IV; Wildlife Acts
Pipistrelle (*Pipistrellus pipistrellus sensu lato*)	01/07/2013	-	Annex IV; Wildlife Acts
Soprano Pipistrelle (*Pipistrellus pygmaeus*)	22/05/2016	√	Annex IV; Wildlife Acts

[3] Roche *et al.* 2014 Irish Bats in the 21st Century. Bat Conservation Ireland.

[4] *Ibid 3*

[5] *Ibid 3*

3.1.2 Bat Habitat Suitability

The bat landscape association model[6] suggests that the proposed site is part of a landscape that is of moderate suitability for bats in general (Table 3-2). However, the landscape model shows a high suitability for soprano pipistrelle and there is high potential for this species to forage and commute along the Dinin River and its associated riparian woodland.

Table 3-2: Bat Suitability Index

Species	Suitability Index
All Bats	32.44
Pipistrellus pygmaeus	43
Plecotus auritus	44
Pipistrellus pipistrellus	53
Rhinolophus hipposideros	2
Nyctalus leisleri	44
Myotis mystacinus	33
Myotis daubentonii	33
Pipistrellus nathusii	3
Myotis nattereri	37

3.2 Field Survey

3.2.1 Preliminary Survey

At the location of the proposed footbridge the banks of the Dinin River are lined by riparian woodland, with amenity grassland present in adjacent domestic gardens and public areas on all sides. The riparian and woodland habitats are of high suitability for bats for foraging and commuting.

3.2.2 Preliminary Roost Assessment of Trees

Two trees are scheduled for removal to facilitate the construction of the proposed footbridge; one Horse Chestnut and one Yew. The Horse Chestnut supported potential roosting features in a knot hole, damaged limb, cut damage and lifting bark. As such, this Horse Chestnut is considered to be of moderate suitability for bats. The Yew tree did not support any features of potential use by bats.

3.2.3 Preliminary Roost Assessment of Bridge

The existing N78 road bridge is a stone bridge with three arches. The bridge parapets had been mortared and the bridge arches 'shotcreted' (i.e. sprayed with concrete) and as such did not support any cracks or crevices of potential use by bats. No features of potential use by bats as roosting or resting places were observed within the existing N78 road bridge. As such it is categorised as Grade 0 for bats (no crevices with potential for day roosting)[7].

3.2.4 Emergence and Activity Survey

No bats were observed emerging from the Horse Chestnut during the dusk emergence survey. While no bats were recorded roosting at the proposed site, three species of bat were recorded foraging in the vicinity of the existing N78 Road Bridge. A high level of activity of common pipistrelle (*Pipistrellus pipistrellus*) and soprano pipistrelle (*P. pygmaeus*) was recorded as these species foraged along the

[6] Lundy MG et al (2011) Landscape conservation for Irish bats & species specific roosting characteristics. Bat Conservation Ireland.

[7] Billington, G. & Norman, G. (1997) The Conservation of Bats in Bridges Project: A report on the Survey and Conservation of Bat Roosts in Bridges in Cumbria. English Nature.

riverbanks and over the river. Daubenton's bat (*Myotis daubentonii*) was also recorded foraging over calm stretches of the Dinin River upstream of the bridge.

3.3 Interpretation and Evaluation of Survey Results

The existing N78 Road Bridge at Castlecomer is not suitable for roosting bats. While the trees scheduled to be felled in order to facilitate the proposed N78 footbridge did not support roosting bats at the time of survey, the section of the Dinin River at the proposed site provides an important area for foraging and commuting bats.

4 Impact Assessment

4.1 Construction Phase

The principle potential impacts on bats from the construction phase of the proposed works, in the absence of mitigation, are described in this section.

While no tree roosts were identified during the course of the preliminary tree roost survey within the footprint of the proposed development, occupation of roosts in trees by bats may be very transient and there is potential that the mature Horse Chestnut scheduled for removal may be used occasionally as a roosting or resting place by individual/ small numbers of bats. Therefore, there is potential for adverse impacts to individual/ small numbers of bats as a result of the removal of the mature Horse Chestnut during the construction phase. In the absence of mitigation, it is considered that the loss of potential or actual roosting sites would have a direct, significant negative impact on bats at the local level. In the absence of mitigation this impact would be permanent.

The proposed footbridge will be located close to the northern side of the existing N78 road bridge. The existing road bridge is not suitable to support roosting bats. As such, there will be no adverse impacts on roosting bats as a result of works occurring in close proximity to the road bridge.

Lighting during construction can cause avoidance of an area for commuting bats and can prevent or reduce foraging for *Myotis* species[8]. In the absence of mitigation, disturbance of bats due to construction lighting would have an indirect, significant negative impact at the local level. The impact would be temporary and would persist for the duration of construction.

4.2 Operational Phase

The principle potential impacts on bats from the operational phase of the proposed works, in the absence of mitigation, are described in this section.

As noted in Section 4.1, lighting can cause avoidance of an area for commuting bats and can prevent or reduce foraging for *Myotis* species. The proposals for the operational phase of the footbridge include the installation of lighting, to comprise the following:

- Low intensity linear lighting orientated on an inclined plane to illuminate the decking; and
- Illumination of the niches of the road bridge from the pedestrian bridge.

[8] Stone E.L. (2013) Bats and Lighting: Overview of current evidence and mitigation.

5 Recommendations and Mitigation

5.1 Construction Phase

5.1.1 Loss of Potential Roosts

The Horse Chestnut identified as supporting bat roost potential shall be examined by an experienced bat ecologist prior to work commencing by any appointed contractor or subcontractor on any part of the construction phase of the proposed project. Following this examination, should the tree be identified as a bat roost then a derogation licence application will be made to the NPWS to exclude the bats and fell the tree. The roost must not be altered or affected in any way prior to works being undertaken as stipulated within the derogation licence. Felling must be carried out under the supervision of a bat specialist named on the licence.

5.1.2 Lighting

All works should be restricted to daylight hours so as to minimise impacts to these nocturnal species. Should this not be feasible, the emanation of artificial lighting onto the Dinin River and the riparian treeline shall be kept to the minimum area feasible.

5.2 Operational Phase

5.2.1 Lighting

The bridge lighting has been designed to illuminate the deck of the pedestrian bridge and to softly light the niches of the adjacent road bridge. The lighting design will avoid illuminating important foraging and commuting areas for bats, i.e. the river and river banks. In accordance with Bat Conservation Trust & Institute of Lighting Professional Guidelines (2018), the following specifications will be followed when selecting the lighting luminaires:

- All luminaires should lack UV elements when manufactured
- LED luminaires will be used where feasible
- A warm white spectrum will be adopted to reduce blue light component
- Luminaries will feature peak wavelengths higher than 550nm to avoid the component of light most disturbing to bats
- Only luminaires with an upward light ratio of 0% and with good optical control should be used
- There should be no upward or downward tilt of the luminaire

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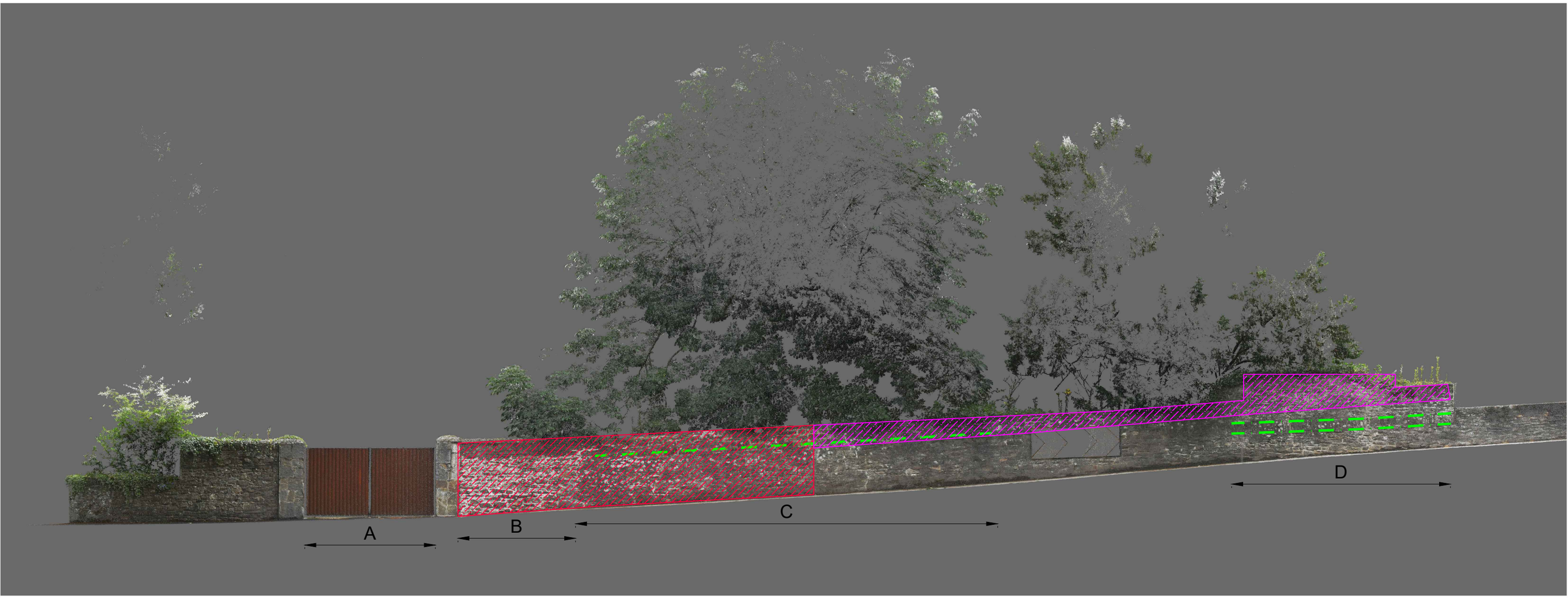
Appendix G

Ortho-Rectified Elevations



A. VEHICULAR ACCESS (MODERN)

B. REBUILT (MODERN) SECTION OF WALLING INCORPORATING A PORTION OF CAST-CONCRETE CAPPING

C. UPPER COURSES CONSIST OF MORE FACE-BEDDED STONES AND LONGER VERTICAL JOINTS THAN HISTORIC MASONRY BELOW

D. ORIGINAL LOW-LEVEL COURSE OF VERTICAL COPING STONES SURMOUNTED WITH RANDOM SANDSTONE RUBBLE WALL

LEGEND :-

EXISTING WALL TO BE REMOVED

EXISTING WALL TO BE RETAINED AND REDUCED IN HEIGHT

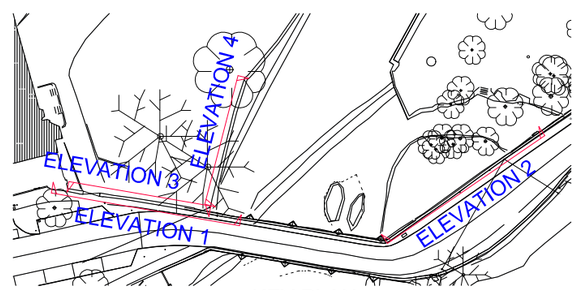
AREA OF INTEREST

SCALE BAR 1:100

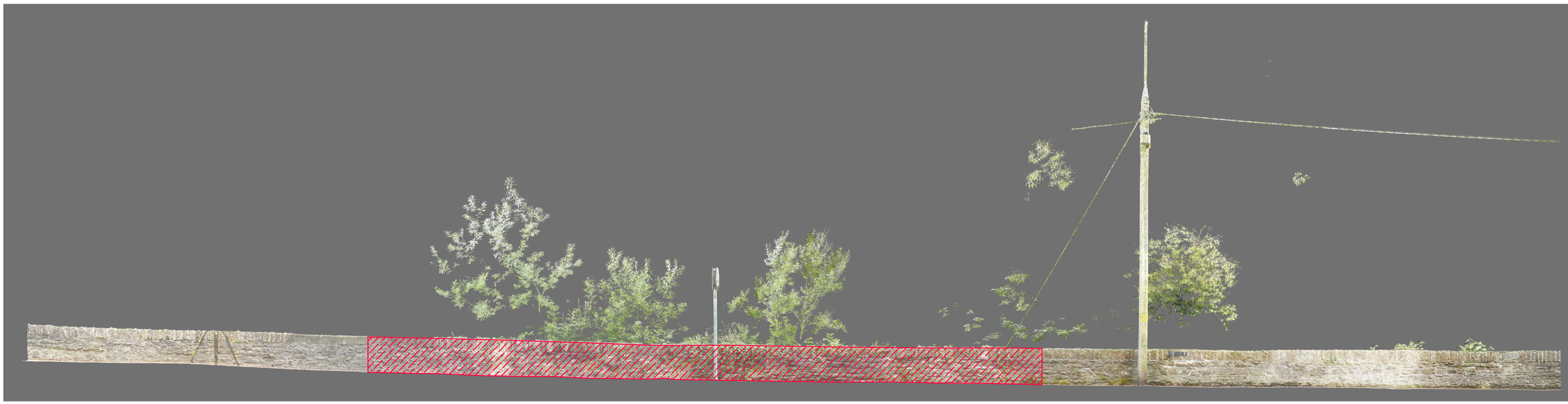
0 5 10 15 20

ELEVATION 1

(Scale 1 : 100)



KEY PLAN



VARIOUS SECTIONS OF THIS WALL APPEAR TO HAVE BEEN CONSOLIDATED WITH CONCRETE IN RECENT YEARS; MAJORITY OF VERTICAL COPING STONES ONLY PRESENT TO ROADSIDE. THE BODY OF THE WALL APPEARS TO BE NINETEENTH-CENTURY IN DATE BUT IT HAS BEEN SUBSTANTIALLY REBUILT AT VARIOUS JUNCTURES

LEGEND :-

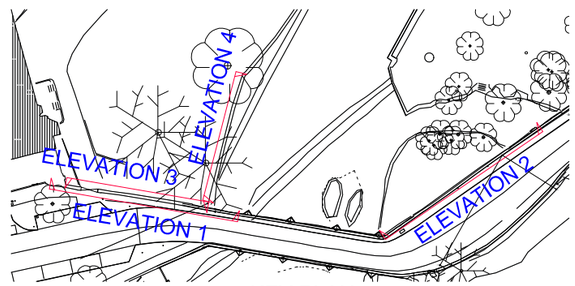
EXISTING WALL TO BE REMOVED

SCALE BAR 1:100

0 5 10 15 20

ELEVATION 2

(Scale 1 : 100)



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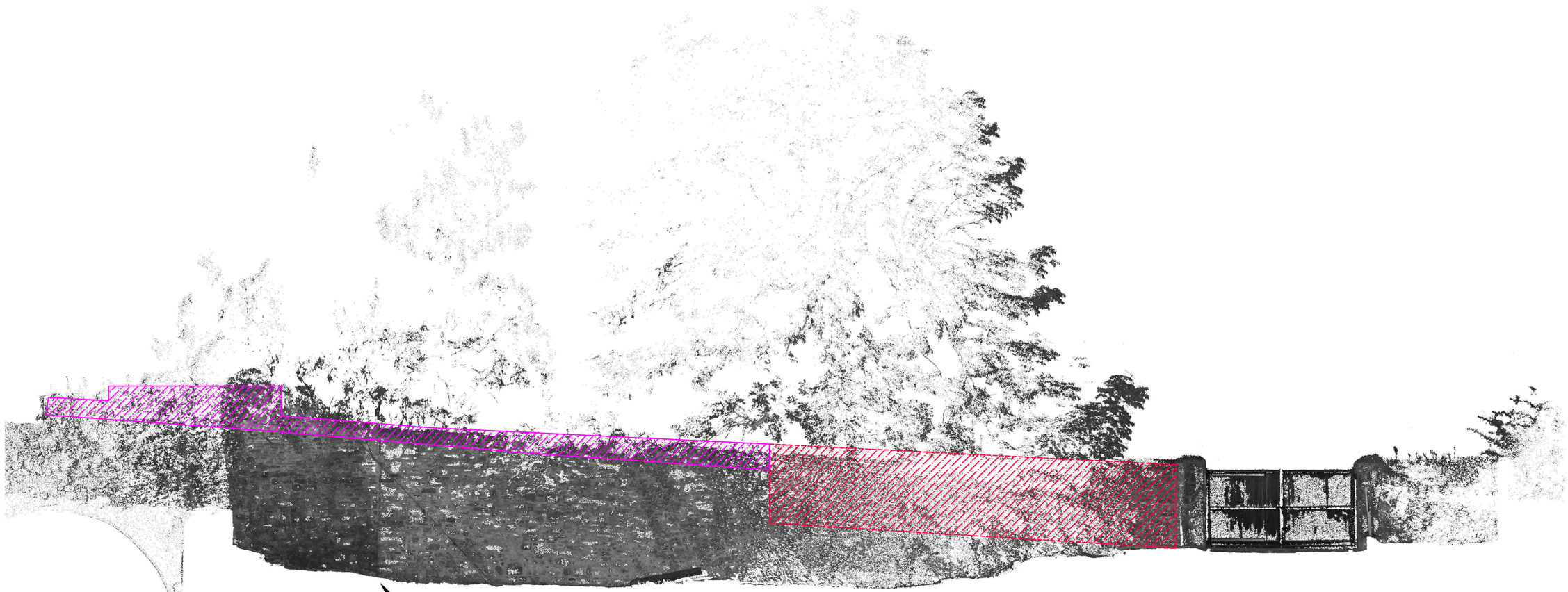


VERTICAL LINE INDICATES WHERE TWO FACES OF MASONRY ABUT ONE ANOTHER (PORTION TO LEFT RELATES TO BRIDGE WHILST SECTION TO RIGHT APPEARS TO BE LATER ADDITION)

LEGEND :-

EXISTING WALL TO BE REMOVED

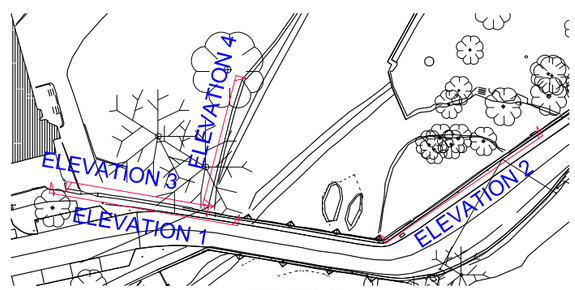
EXISTING WALL TO BE RETAINED AND REDUCED IN HEIGHT

SCALE BAR 1:100

0 5 10 15 20

ELEVATION 3

(Scale 1 : 100)



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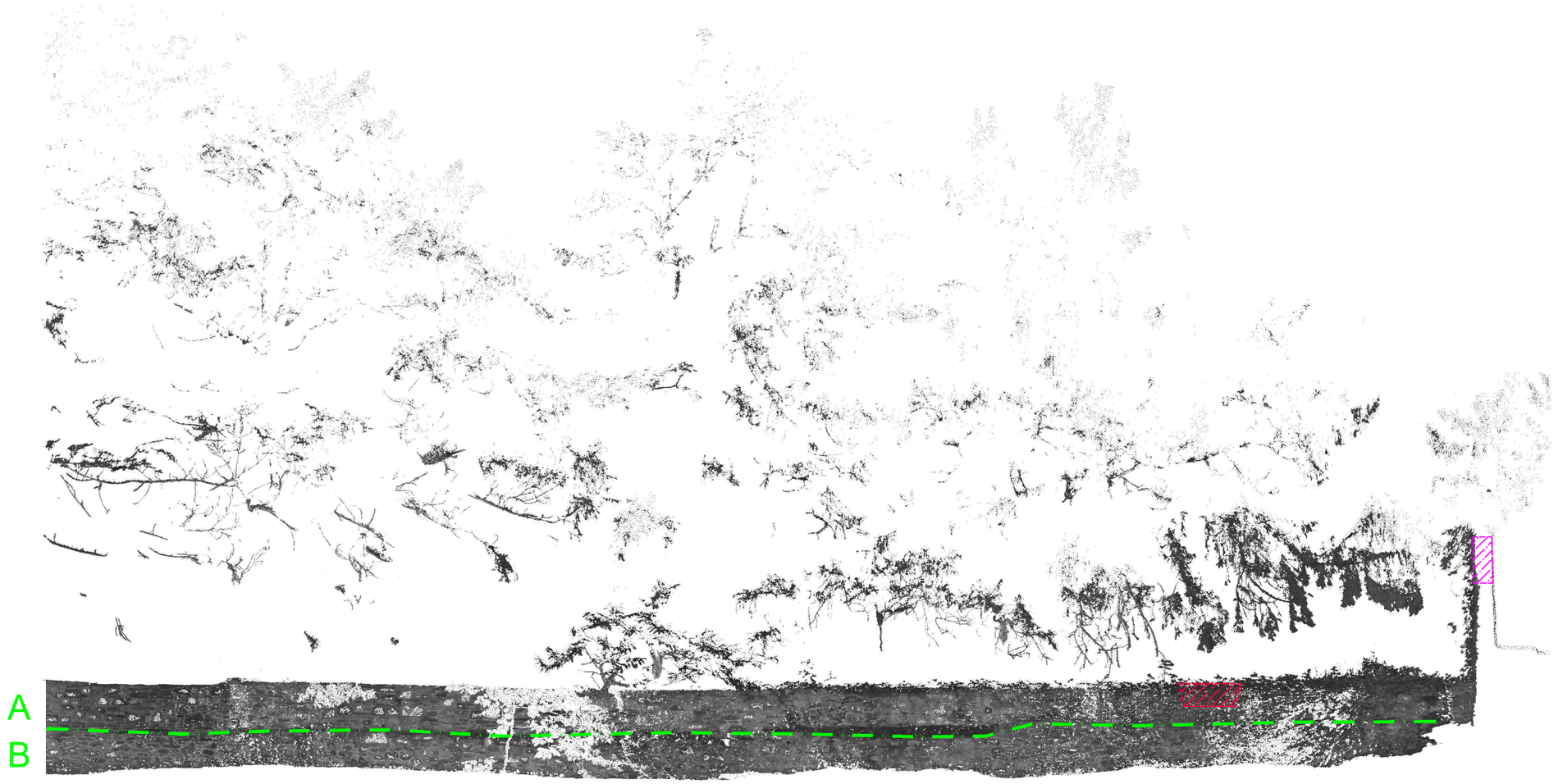


A. MODERN (C.2000) STONE MASONRY

B. LOWER (THICKER) PORTION OF RIVERSIDE MORTARED RUBBLE WALL

LEGEND :-

EXISTING WALL TO BE REMOVED

EXISTING WALL TO BE RETAINED AND REDUCED IN HEIGHT

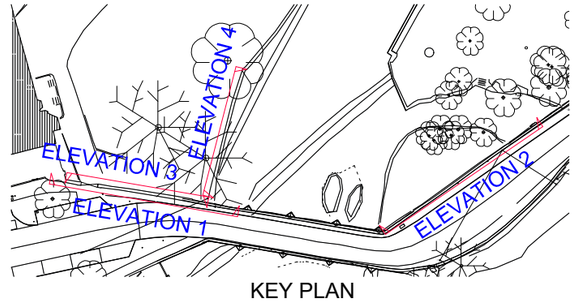
AREA OF INTEREST

SCALE BAR 1:100

0 5 10 15 20

ELEVATION 4

(Scale 1 : 100)



KEY PLAN