Comhairle Cathrach & Contae Luimnigh

Limerick City & County Council

LIMERICK CITY GREENWAY (UL TO NTP)

EIAR PART 3

Appendices

July 2025

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Comhairle Cathrach & Contae Luimnigh

Limerick City & County Council

ENVIRONMENTAL IMPACT ASSESSMENT SCOPING REPORT

UNIVERSITY OF LIMERICK
TO
NATIONAL TECHNOLOGY PARK
CYCLE PATH

April 2021

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ABBREVIATIONS

AA	Appropriate Assessment	NIAH	National Inventory of Architectural Heritage
AEP	Annual Exceedance Probability	NIS	Natura Impact Statement
AQIH	Air Quality Index for Health	NPWS	National Parks and Wildlife Service
CIEEM	Chartered Institute of Ecological and Environmental Management	NMS	National Monuments Service
CJEU	Court of Justice of the European Union	NWRM	Natural Water Retention Measures
CORINE	Coordinate Information on the Environment	LCCC	Limerick City & County Council
CSO-	Central Statistics Office	OPW	Office of Public Works
DoHLGH	Department of Housing, Local Government & Heritage	RMP	Record of Monuments and Places
CAFE	Cleaner Air for Europe	RPS	Record of Protected Structures
ED	Electoral Division	SAC	Special Area for Conservation
EIA	Environmental Impact Assessment	SPA	Special Protection Area
EIAR	Environmental Impact Assessment Report	UN	United Nations
EPA	The Environmental Protection Agency	UL	University of Limerick
EU	European Union	WFD	Water Framework Directive
GHG	Greenhouse Gases	WHO	World Health Organisation
GSI	Geological Survey of Ireland		

GLOSSARY OF TERMS

Appropriate Assessment: An assessment of the effects of a plan or project on sites designated for the conservation of birds and natural habitats known as European Sites (Special Areas of Conservation and Special Protection Areas).

Annual Exceedance Probability: the chance of a flood event occurring in any year, expressed as a percentage. For example, a large flood which may be calculated to have a 1% (1 in 100) chance to occur in any one year is described as 1% AEP.

Cleaner Air for Europe: CAFE Directive programme (2008/50/EC) was established in 2001 to support the European Commission's development of the Thematic Strategy on air pollution, the Directive on Ambient Air Quality and Cleaner Air for Europe and its Impact Assessment.

Electoral Division: Administrative areas used to define local electoral areas for elections to county and city councils and to define constituencies in elections to Dáil Éireann.

Environmental Impact Assessment: EIA is a process to be undertaken by a competent authority in respect of applications for specified classes of development listed in the EU EIA Directive (2014/52/EU) before a decision in respect of development consent is made. The process involves the preparation of an Environmental Impact Assessment Report (EIAR) by the applicant, consultations with the public, relevant prescribed bodies and any other affected Member States, and an examination and analysis of the EIAR and other relevant information leading to a reasoned conclusion by the competent authority on the likely significant effects of the proposed development on the environment.

Environmental Impact Assessment Report: An Environmental Impact Assessment Report (EIAR) is the document or statement produced by the applicant in respect of development of a type which is required to undergo an Environmental Impact Assessment.

Habitats Directive: European Community Directive (92/43/EEC) on the Conservation of Natural Habitats and of Wild Flora and Fauna and has been transposed into Irish law by the Planning and Development Act 2000 (as

amended) and the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. 477/2011). It establishes a system to protect certain fauna, flora and habitats deemed to be of European conservation importance.

National Inventory of Architectural Heritage: NIAH is a state initiative established under the provisions of the Architectural Heritage (National Inventory) and Historic Monuments (Miscellaneous Provisions) Act 1999 to identify, record, and evaluate the post-1700 built heritage of Ireland, uniformly and consistently as an aid to its protection and conservation. NIAH surveys provide the basis for the recommendations of the Minister for Housing, Local Government & Heritage to the planning authorities for the inclusion of particular structures in their Record of Protected Structures (RPS).

Natura Impact Statement: The statement prepared as required under the Habitats Directive which presents information on the assessment and the process of collating data on a project and its potential significant impacts on European sites.

National Parks and Wildlife Service: National Parks and Wildlife Service work under the Department of the Environment, Heritage and Local Government to manage and maintain State-owned national parks and nature reserves and protect and preserve Ireland's native animals and plants.

Natural Water Retention Measures: NWRMs are multi-functional measures that aim to protect and manage water resources using natural means and processes, therefore building up Green Infrastructure, for example, by restoring ecosystems and changing land use.

Record of Monuments and Places: A list of historic and archaeological Sites & Monuments established and protected under the National Monument (Amendment) Act 1994.

Record of Protected Structures: The Record of Protected Structures lists all protected structures and buildings in the administrative area of a planningl authority. This includes structures of architectural, historical, archaeological, artistic, cultural, social, scientific or technical importance. A planning authority is obliged to consider for inclusion in its Record of Protected Structures any buildings rated as being of Regional, National or International importance by the NIAH and give consideration to structures rated to be of local importance.

Special Area for Conservation: An SAC designation is an internationally important site, protected for its habitats and species. It is designated, as required, under the EC Habitats Directive (1992).

Special Protection Area: An SPA is a site of international importance for breeding, feeding and roosting habitat for bird species. It is designated under the EC Birds Directive (1979).

Water Framework Directive: An assigned acceptable/unacceptable waterbody status which either meets (high/good status) or does not meet (moderate/bad/poor status) the goals of the Water Framework Directive. 'Status' is considered to be the condition of the water in the waterbody. It is defined by its chemical status and its ecological status, whichever is worse. Waters are ranked in one of 5 status classes: High, Good, Moderate, Poor, Bad

1 Introduction and Background

Limerick City & County Council is progressing a proposed cycle path project from the Boat Club in the University of Limerick (UL), past the National Technology Park (NTP) and the UL Bohemians RFC club grounds, and along Mulcair Drive to Ashgrove, Annacotty, Co. Limerick. Ryan Hanley has been appointed by Limerick City & County Council to provide Engineering and Environmental Consultancy Services for the Project. Ryan Hanley will develop the detailed proposals for the proposed UL to NTP cycle path project and will provide all required Environmental services to the project, including the preparation an Environmental Impact Assessment Report (EIAR).

This Scoping Report forms the first stage in the preparation of an EIAR for the UL to NTP cycle path project. The purpose of this report is to introduce the proposed development, define its location and the extent of works, identify the key environmental issues and receptors in the vicinity, consider the potential impacts of the proposal, and identify the likely environmental studies that will be required to inform the EIAR.

1.1 Location & Study Area

The outline study area for the project is located along the banks of the River Shannon and River Mulkear, from the University of Limerick Boat Club to Annacotty village. The study area is the area within which physical works are proposed to be constructed, accessed, and maintained as part of any feasible scheme. This area is intended to benefit from the scheme. The study area is indicated below in **Figure 1.1**.

1.2 Description of the Proposed Cycle path Project

The proposed cycle path is a 3.5m wide path which will run primarily along an existing trail on the banks of the River Shannon and River Mulkear and four local roads. The works cross the old Plassey Millrace at two locations, and the cycle path will cross two local drainage streams. The cycle path is approx. 7.3km in length and provides a link from the banks of the River Shannon and River Mulkear to Mc Laughlan Road and Plassey Park Road in the NTP, and along Mulcair Drive to Annacotty village.

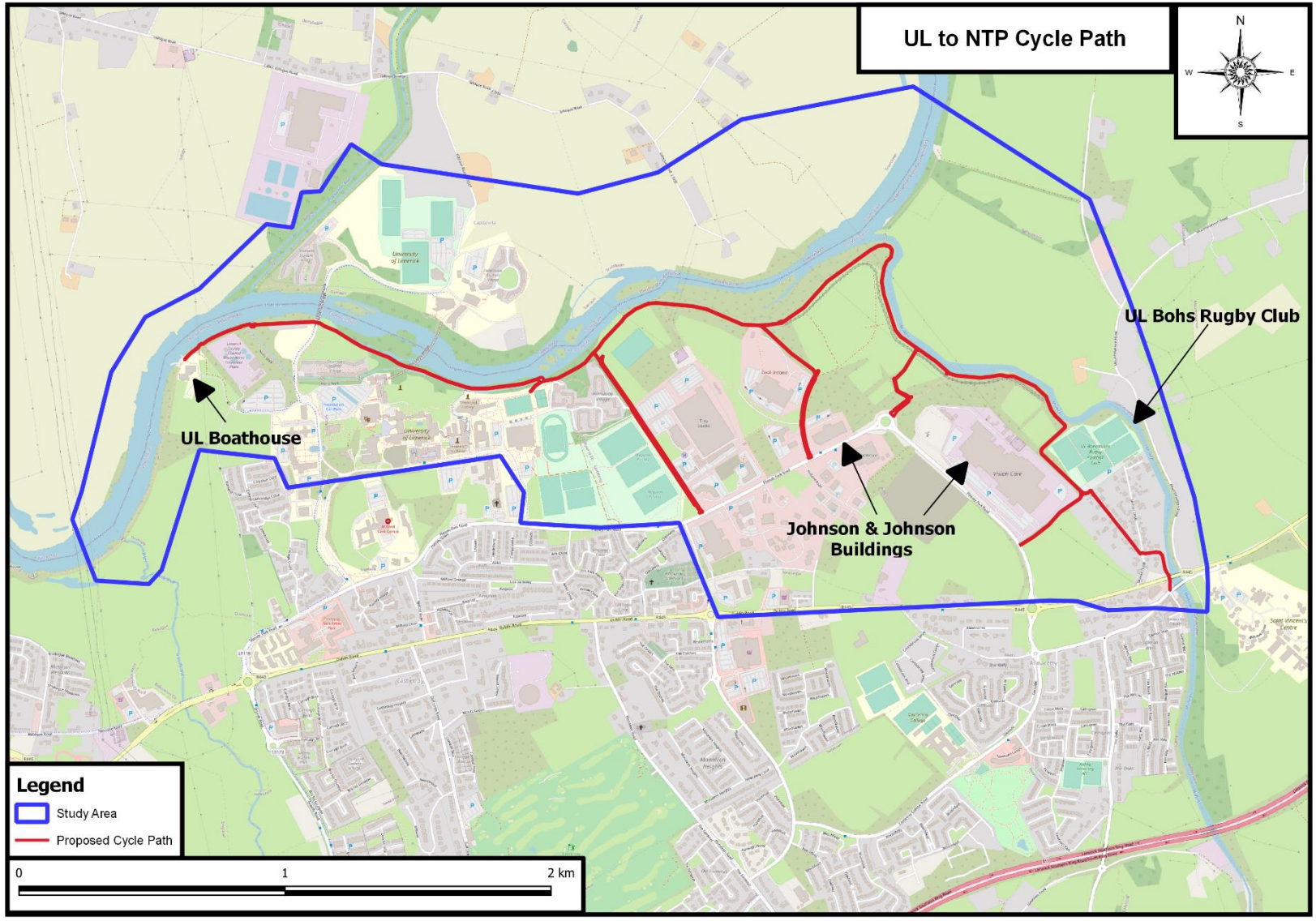

Figure 1.1 Map of University of Limerick to National Technology Park Cycle Path Study Area

2 Assessment of Alternatives

As part of the EIA process, a summary of alternatives will be included in the assessment as required by Directive 2014/52/EU and detailed in the EPA Draft Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (2017):

"A description of the reasonable alternatives (for example in terms of project design, technology, location, size and scale) studied by the developer, which are relevant to the proposed project and its specific characteristics, and an indication of the main reasons for selecting the chosen option, including a comparison of the environmental effects".

Limerick City has been designated as one of three centres in Ireland that are to become Ireland's first Smarter Travel Demonstration Areas. The Limerick submission was ranked 'first' of all submissions received by the Department of Transport. As a Demonstration City, Limerick will receive funding of €9 million over five years to roll out a wide range of measures and interventions targeted at encouraging people to use more sustainable modes of transport and to engage in transport planning in four Smarter Travel Hubs.

The four hubs comprise:

- The City and its core;
- Castletroy (including the University and the National Technology Park);
- Regeneration area of Southill (including a large inner-city community and an extensive employment centre, including light industry); and,
- Corbally (made up of a largely suburban community, separated from the city by two river crossings and restricted road capacity).

The Limerick Smarter Travel bid was a joint initiative by Limerick City Council and Limerick County Council in partnership with the University of Limerick. The main objective of the Limerick Smarter Travel (LST) Project is to connect the four key hubs of Limerick City and suburbs by the development and promotion of sustainable modes of transport for those living, working and studying in these areas.

Connectivity between Castletroy and the University of Limerick with Corbally and Limerick City Centre is essential to the future plans for the city as stated in Limerick 2030, an Economic and Spatial Plan for Limerick. The University of Limerick has committed to the creation of a new campus within the city core. This initiative will play a pivotal role in such a development allowing for a direct, safe, and enjoyable walking and cycling link from campus to campus.

The University of Limerick to National Technology Park Cycle Path is part of the Limerick Smarter Travel initiative and will form an extension to the already constructed Limerick Smarter Travel, Route 2, which involved the upgrade of an existing pathway, 1.5km in length, between University of Limerick and the Guinness Bridge along the bank of the River Shannon and connects directly into the city centre. This project proposal will extend the cycle path eastwards and as such forms an extension to the Limerick Smarter Travel Project which aims to greatly improve the accessibility to the riverside and to increase the number of people using sustainable transport to commute between the City Centre and the University of Limerick.

The cycle path route is to continue from the termination of Route 2 at the University of Limerick Boat Club and extend along an existing section of pathway at the River Shannon, providing for entrance and exit routes to the cycle path route from the University of Limerick and the Technology Park. The two preferred routes are detailed below and illustrated in **Figure 2.1**.

Preferred Cycle Path Route

The preferred cycle path route starts at an existing cycle path outside the University of Limerick Boat Club and continues east along the bank of the River Shannon then diverts south where the River Mulkear joins the River Shannon. The cycle path runs alongside the River Mulkear then crosses into the grounds of UL Bohemians

Rugby Club, continuing along the western perimeter of the playing fields. At the south-west corner of the UL Bohemians grounds the route joins Mulkear Drive and continues south as a shared surface on the public road until it meets a roundabout. A grade separated cycle path will be located alongside the existing footpath between the roundabout and the local road named Ashgrove in Annacotty village.

The preferred route also encompasses 4 no. links that provide access to the main body of the route from the National Technology Park and Plassey Park Road, as illustrated in **Figure 2.1**:

1. Path Link A connects to the cycle path along the River Shannon to the north of Kilmurry Village, in the University campus. This link continues south past Troy Studios along the boundary fence with Kilmurry Village and connects to an existing cycle path on Plassey Park Road;
2. Path Link B diverts from the cycle path along the River Shannon at the east of Cook Medical. Link B runs along the eastern boundary of Cook Medical, and terminates on Plassey Park Road;
3. Path Link C, deviates from the cycle path along the River Mulkear and connects into the existing cycle lanes at the new roundabout on Plassey Park Road to the North West of the large Johnson and Johnson campus in the NTP; and,
4. Path Link F, deviates from the cycle path in the UL Bohemians RFC club grounds and passes into the grounds of Johnson and Johnson / Vision Care where it continues south west connecting into an existing cycle lane on Plassey Park Road.

Alternative Routes Considered

Within the study area, alternative route options have been investigated but they were deemed inferior to the preferred route due to wayfinding simplicity, current trails and desire lines, ongoing construction works, future land use, and safety issues associated with interfaces with existing traffic on local roads. The following link route options were considered and discounted:

1. Path Link D would divert from the river route at the abandoned Plassey Mill and run south alongside the existing mill race for approximately 529m. This route crosses an existing road, and two existing pedestrian footbridges. This alternative route diverts away from an existing walking track on one side of the existing mill race and transitions on to an existing access road to the northern side of an existing University Building. The route transitions to a green-field area, passing underneath the Living Bridge and follows the natural elevation changes of the green area to the north of Plassey House. From there the route transitions to an existing pedestrian walkway between the mill race and the UL Hockey Field before elevating to a high point north of the existing tennis court. At this location, the route slopes downwards to meet the existing riverside walk. This route is longer than the preferred route along the river and it is presumed that cyclists would continue to use the river side path (with no traffic lights or interactions with roads or bridges) rather than divert into the UL grounds.
2. Path Link E would cross directly from the primary route at the bank of the Mulkear River to the new roundabout north of Johnson & Johnson. This option was discounted because there is existing construction work ongoing in the Johnson & Johnson campus where the link was proposed.
3. Path Link G is a short section of existing one-way local road that allows traffic to pass from the Old Dublin Road into Mulcair Drive. This option was discounted because of safety and space reasons. Traffic leaving the Old Dublin Road would be travelling at a reasonable speed onto a narrow one-way local road. There is no space to separate cyclists and walkers from vehicles in this narrow road.

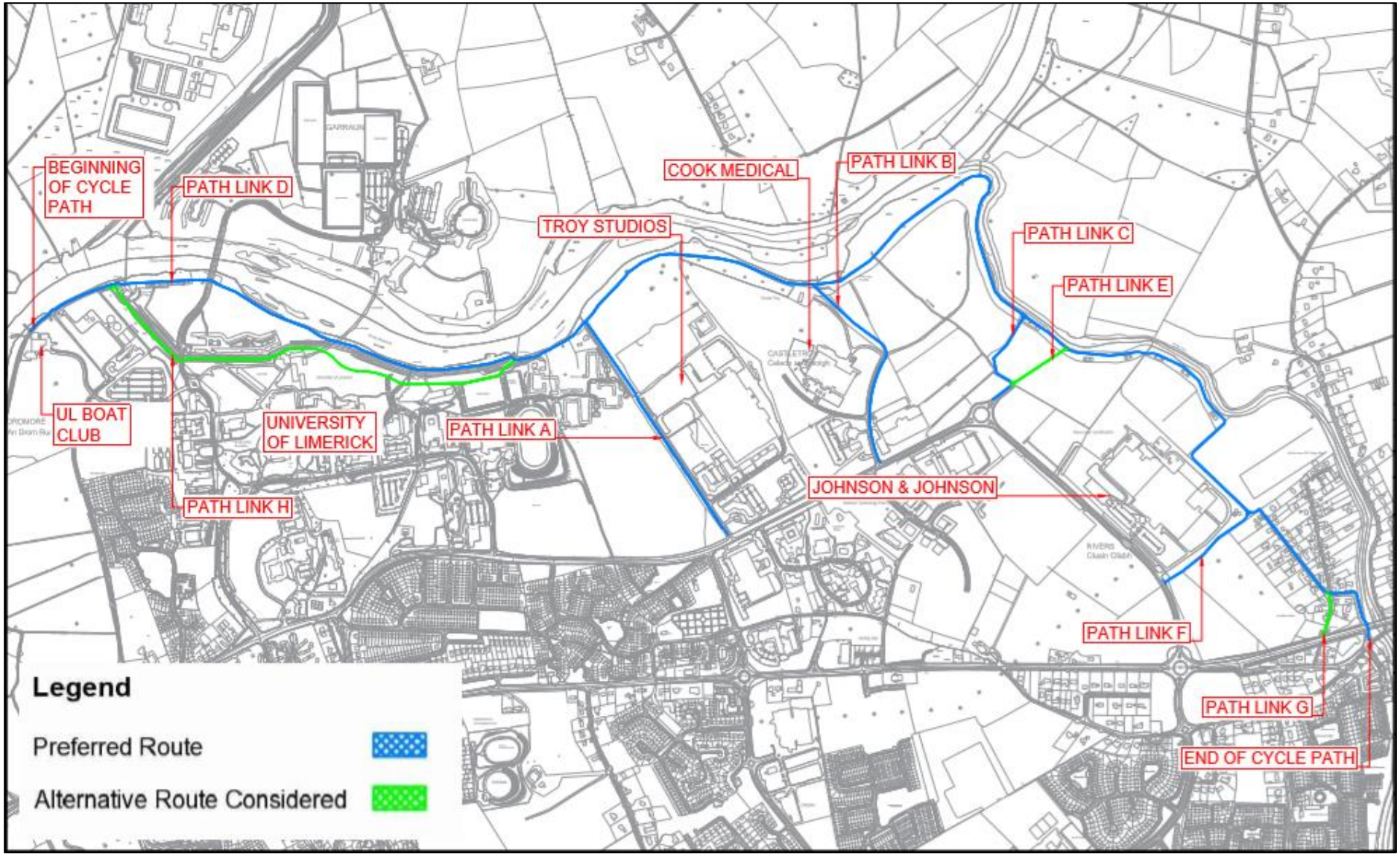

Figure 2.2 Map of University of Limerick to National Technology Park Cycle Path Route Options

3 Key Features of Proposed Scheme

The following are the key constituent parts of the proposed project:

- 3.5m wide Cycle path
- Drainage system
- 15 precast Culverts
- Bridges
- Street Lighting and CCTV
- Wooden Fence

The proposed project is outlined below in **Figure 3.1**. Detailed drawings of the proposed scheme are provided in Appendix A.

3.1 *Cycle path*

The composition of the cycle path track remains relatively consistent between the Boat Club and UL Bohemians RFC club grounds, but the composition changes to shared pavement along Mulcair Drive and then a raised cycle lane alongside the existing footpath for the last 200m of the cycle path until it reaches Annacotty village. Geotextile layer is included at all existing greenfield sites and tactile paving is included at junctions and the approach to junctions.

The proposed 3.5m width of the cycle path also remains relatively consistent along the route but there are some sections of varied width. These include some narrow sections where the design width is not achieved due to existing trees or structures, and sections where the width of the cycle path will be widened such as at Link junctions. There are also several locations where the cycle path will continue on a new bridge or culvert crossing.

The cycle path composition is in accordance with DN-GEO-03047 and generally includes the following layers:

- Anti-slip capping (where necessary)
- Approximately 20mm thin surface course tarmacadam
- Approximately 40mm – 50mm base course
- Approximately 300mm clause 804 sub-base (machine laid to achieve correct ride quality)
- Geotextile layer (where necessary)

3.2 *Drainage*

French drains to be laid to one side of the cycle path, where necessary. Provision for drains will be made in greenfield sites where existing drainage is not present.

3.3 *Culverts*

One precast culvert is to be included in a greenfield site which facilitates the cycle track passing over an existing drain.

A further 14 precast box culverts (1m x 2m) will be included to divert drainage from french drains under the cycle path. These are proposed for within greenfield sites and are located at 250m centre to centre (c/c).

3.4 *Bridges*

There are a range of bridge types which have been proposed as part of the project:

- A 15m long single span, steel frame diversion bridge is proposed (approx. CH 70) which will facilitate the cycle path while the existing narrow footbridge will remain intact for pedestrian use.
- A 38m long single span bridge will be run adjacent to the existing footbridge and Plassey Bridge on the side closest to the River Shannon.

- A circular, non-slip paved platform and viewing point bridge will replace the existing footbridge at the Plassey Beach. The steel framed decked bridge will have a radius of 9.5m.
- A concrete flat bridge (3.5m in width and 5m in length) crossing small canal.
- A concrete flat bridge (3.5m in width and 8m in length) crossing a drain.

3.5 *Street Lighting and CCTV*

Street lighting and CCTV will be included along the entire routes of the cycle path.

3.6 *Wooden Fences*

Wooden fences will be erected where the cycle path runs close to open water, at the approach and exit from bridges or stone archways, and at points where the path narrows.

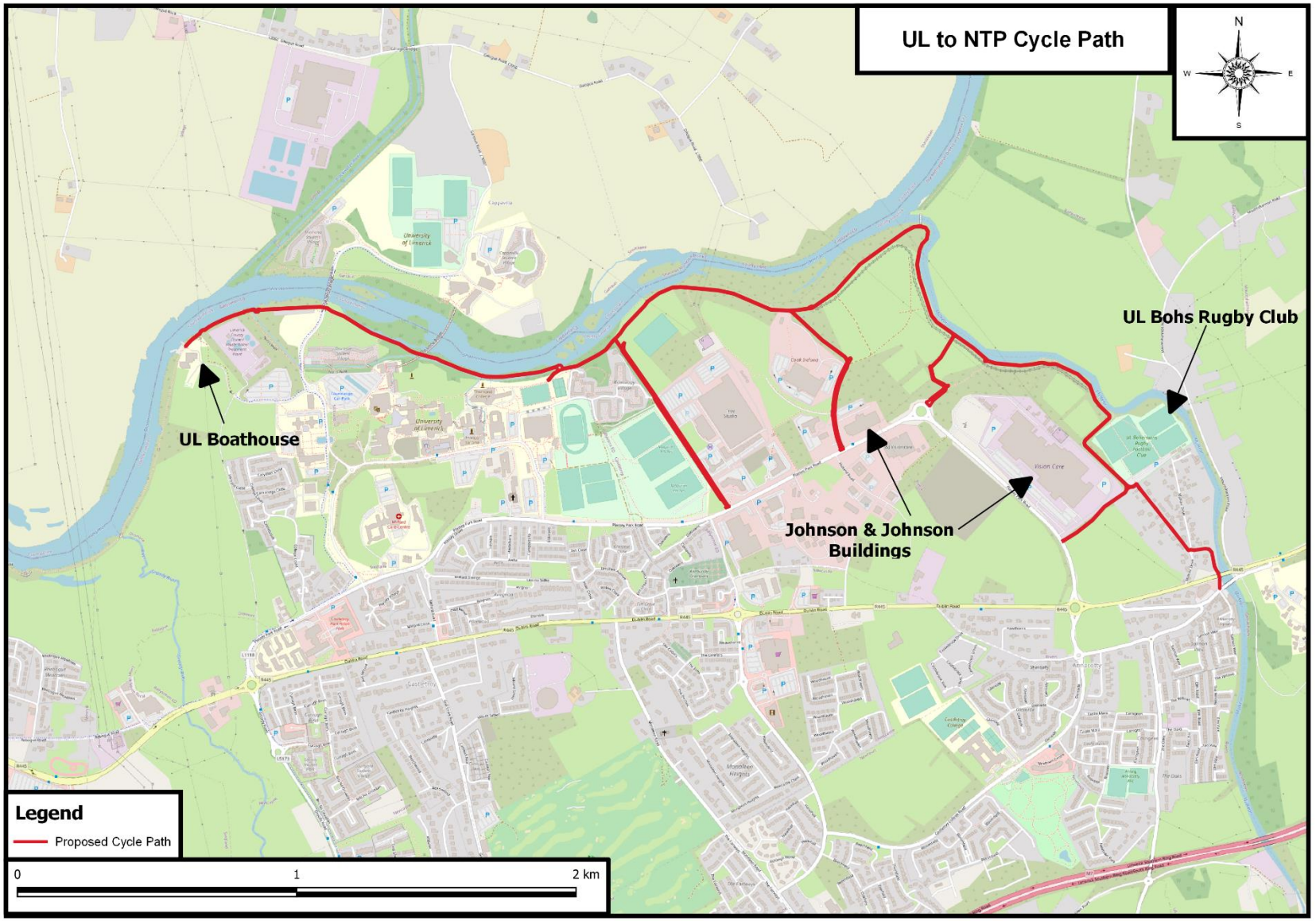

Figure 3.3 Map of University of Limerick to National Technology Park Cycle Path

4 Regulatory Context

The EIAR and AA Screening for the proposed UL to NTP cycle path project will be prepared in line with current relevant policy and legislation, detailed as follows:

4.1 Environmental Impact Assessment (EIA)

The process of carrying out an Environmental Impact Assessment Report (EIAR) in respect of certain developments was initially introduced by way of Council Directive 85/337/EEC. That Directive was subsequently amended by Directive 97/11/EC, 2003/35/EC and 2009/31/EC with those amendments being codified into Directive 2011/92/EU. In 2014 the Codified EIA Directive was amended by Directive 2014/52/EU (the "2014 EIA Directive"), which had a transposition date of 16th May 2017.

S.I. No. 469/2012 - European Union (Environmental Impact Assessment) (Arterial Drainage) Regulations 2012 gives effect to Directive 2011/92/EU of the European Parliament and of the Council of 13 December 2011. In addition, S.I. No. 472/2019 - European Union (Environmental Impact Assessment) (Arterial Drainage) Regulations 2019 give further effect to Directive 2011/92/EU as amended by Directive 2014/52/EU.

The EIAR will be prepared in accordance with the above legislation and all relevant statutory guidelines, including the:

- Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (August 2018)[1];
- EPA, Guidance on the preparation of the Environmental Impact Assessment Report (2017)[2].

4.2 Appropriate Assessment Screening

The requirements for Appropriate Assessment are set out in the EU Habitats Directive (92/43/EEC) in Article 6 (3) which states:

"*Any plan or project not directly connected with or necessary to the management of the [Natura 2000] site but likely to have a significant effect thereon, either individually or in combination with other plans and projects, shall be subjected to appropriate assessment of its implications for the site in view of the site's conservation objectives.*"

The Habitats Directive is transposed in Ireland by the European Communities (Birds and Natural Habitats) Regulations, 2011 (consolidating the European Communities (Natural Habitats) Regulations 1997 to 2005 and European Communities (Birds and Natural Habitats) (Control of Recreational Activities) Regulations 2010, as well as addressing transposition failures identified in recent CJEU Judgements (referred to as the Habitats Regulations) and the Planning and Development (Amendment) Act, 2010.

The AA Screening will be prepared in accordance with the above legislation and all relevant statutory guidelines, including the:

- DoEHLG Circular NPWS 1/10 & PSSP 2/10 Appropriate Assessment under Article 6 of the Habitats Directive: Guidance for Planning Authorities.
- DoEHLG (2010) Appropriate Assessment of Plans and Projects in Ireland. Guidance for Planning Authorities. Department of the Environmental Heritage and Local Government.
- European Commission (2018) Managing Natura 2000 sites: the provisions of Article 6 of the 'Habitats' Directive 92/43/EEC;
- European Commission (2000) Communication from the Commission on the Precautionary Principle. Office for Official Publications of the European Communities, Luxembourg. European Commission.

[1] Published by the Dept of Housing, Planning and Local Government.
[2] Published by the EU Commission.

- European Commission (2001) Assessment of plans and projects significantly affecting Natura 2000 sites: Methodological guidance on the provisions of Articles 6(3) and (4) of the Habitats Directive 92/43/EEC;
- European Commission (2007b) Guidance document on Article 6(4) of the 'Habitats Directive' 92/49/EEC; clarification of the concepts of: Alternative solutions, Imperative reasons of overriding public interest, Compensatory Measures, Overall Coherence, Opinion of the Commission;
- European Communities (Birds and Natural Habitats) Regulations, 2011 (S.I. No.477 of 2011).

4.3 Local Planning Policy Context

The University of Limerick to National Technology Park Cycle Path will be closely informed by national, regional and local planning objectives. The following sets out the main provisions of each of the relevant documents at national, regional, and local levels.

Smarter Travel: A Sustainable Transport Future 2009-2020

The Policy outlines a major goal of transport policies in advancing the development of an integrated and sustainable transportation system for Ireland. This document adopts a multidimensional approach to transportation and recognises the need to achieve a significant move to sustainable transportation. It recognises the vital importance of continued investment in transport to ensure an efficient economy and continued social development, but it also sets out the necessary steps to encourage people to change their travel behaviour and choose more sustainable transport modes such as walking, cycling and public transport.

To achieve its vision for sustainability in transport the Government sets out five key goals to:

(i) reduce overall travel demand,

(ii) maximise the efficiency of the transport network,

(iii) reduce reliance on fossil fuels,

(iv) reduce transport emissions and

(v) improve accessibility to transport.

Limerick City Development Plan 2010-2016

The City Development Plan for Limerick 2010-2016 sets out an overall vision for the county and a range of goals supported by specific aims and objectives. Some polices included in the plan include:

Policy TR.1 Strategic Transportation Issues - Objectives:

- Limerick City Council will co-operate with Limerick County Council, Clare County Council, Tipperary-North County Council, The Department of Transport, other Government Departments and The National Roads Authority in the delivery of an integrated transport system for Limerick and the Region as a whole.
- Develop specific plans and timetables for the delivery of the Mid-West Area Strategic Plan 2012-2030 (MWASP) implementation mechanisms.
- Prioritise and promote essential schemes so as to inform reviews of the National Development Plan and Transport 21.
- Work with adjoining authorities and other national implementation agencies to deliver the relevant transport infrastructure to develop Limerick's potential and position it for sustainable growth subject to Appropriate Assessment screening under the Habitats Directive in compliance with European Directives.

Policy TR.9 Cycling & Walking - Objectives:

- Promote cycling and walking as healthy modes of transport.

- Implement the measures contained in the National Cycle Policy Framework (NCPF) and the Smarter Travel Policy
- Framework produced by the Department of Transport.
- Establish a complete network of cycle paths throughout the City.
- Update and implement the Limerick Cycle Strategy.
- Design a city cycle network with emphasis placed on promoting safety and shortening journey time. The cycle network will be a combination of dedicated cycle lanes on the road and dedicated off road cycle-lanes. The network will be clearly identifiable through signposting and road marking. Continually upgrade the condition of existing footpaths and cycle paths.

Limerick County Development Plan 2010-2016

Similarly, the following policy & objectives set down in the Limerick City Development Plan, and Limerick County Development Plan (2010-2016) also support the implementation of smarter travel objectives.

Policy IN P4: Promotion of sustainable patterns of transport use

It is policy of the Council to seek to implement in a positive manner, in cooperation with other Authorities and agencies, the policies of the Mid-Western Regional Planning Guidelines, and the Department of Transport Policy 'Smarter Travel, A Sustainable Transport Future 2009-2020' to encourage more sustainable patterns of travel, and greater use of sustainable forms of transport, including public transport, cycling, and walking.

Objective COM O28: Encourage Active and Healthy Lifestyle

- It is the objective of the Council to promote the development of safe and convenient pedestrian and cycling facilities in the towns and villages to minimise the dependence on private motor vehicles and to encourage an active and healthy lifestyle. New and upgraded road developments will be encouraged to integrate cycle lanes. These will include urban/village developments and short distance routes.
- It is the objective of the Council to promote and support the County Limerick Sports Partnership Strategic Plan 2008 – 2011 and the pending County Recreational Strategy 2010 – 2014 when fully assessed and adopted by elected members.

Other plans informing the project were the Castletroy Local Area Plan (2019 – 2025) Limerick City Bio-diversity Plan, Limerick and Clare Sports and Physical Recreational Strategy 2013.

5 Consultation Process

5.1 Requirements for Consultation

The EIAR requirements for consultation are defined in the EIA Directive (85/337/EEC) as amended in 2011 Directive 2011/92/EU and 2014 Directive 2014/52/EU under Article 6;

"*Member States shall take the measures necessary to ensure that the authorities likely to be concerned by the project by reason of their specific environmental responsibilities are given an opportunity to express their opinion on the information supplied by the developer and on the request for development consent.*"

Statutory Authorities referred to in Article 6 (1) will be consulted on the specific characteristics of the project; including its location, purpose, role, and its likely impacts on the environment.

Also, to allow for the sustainable implementation of environmental management, and in accordance with the requirements of the Aarhus Convention; public, statutory authorities, and relevant stakeholders will be given the opportunity to participate in the decision-making process.

This Scoping Report will be issued to all relevant stakeholders that have been identified as likely concerned by the project. Sufficient time will be allocated to ensure clarity and consistency of the consultation and ensure that relevant statutory consultees have had the opportunity to participate. All submissions (responses, comments, and recommendations) will be appended to the final version of this document, will inform the final scope of the EIAR, and will be acknowledged in the EIAR.

6 Scoping of the EIAR

6.1 Introduction

Scoping is carried out in accordance with the '*Environmental Impact Assessment of Projects - Guidance on Scoping*' (EPA, 2017), '*Advice Notes on Current Practice in the preparation of Environmental Impact Statements*' (EPA, 2015) and the '*Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment*' (DoHPLG, 2018).

The EIAR will be carried out in accordance with Annex IV(4) of Directive 2014/52/EU. It will address the following environmental factors individually and cumulatively:

- Population and Human Health;
- Biodiversity, Flora and Fauna;
- Land use, Soils and Geology;
- Water, Hydrology and Hydrogeology;
- Air Quality, Climate Change and Noise;
- Landscape and Visual;
- Archaeology, Architectural and Cultural Heritage;
- Material Assets;
- Cumulative Impact Assessment;
- Interaction of The Foregoing.

The EIAR will discuss general information in Part 1 of the document under the headings Introduction, Background, Description of Existing Environment, Description of the Proposed Project and Assessment Methodology.

These general description and background sections will provide information in relation to the following:

- Introduction and Need for EIAR;
- Legislative Context;
- Strategic Planning Context;
- Justification and Rationale for the Project;
- Alternatives and Selection of the Optimum Site;
- Site Design, Constraints and Facilitators Methodology;
- Site Description;
- Scoping and Consultation.

6.2 Population and Human Health

As human beings form a major part of the environment, it is essential to assess any potential effect a project might have upon the local community and the population as a whole. This chapter of the EIAR will evaluate the impacts, if any, to the "Population and Human Health" as defined in the EPA '*Guidelines on the Information to be contained in Environmental Impact Assessment Reports*' (Draft–August 2017) and Guidelines for Planning Authorities, '*Advice Notes on Current Practice in the preparation of Environmental Impact Statements*' (EPA, 2015) and '*Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment*' (August 2018).

6.2.1 Potential Impacts

A decrease in air quality during the construction phase is possible and will be discussed in the EIAR. Increased levels of dust in the air are possible during construction and/or operation of the proposed cycle path. However, it is not anticipated that this would have a significant negative impact. There is potential for minor disruption to a small number of residents and walkers where sections of the existing gravel trail/desire line will be closed during the construction phase.

There also is the potential for a disturbance impact to the local community due to increases in ambient noise levels, traffic volumes, road closures and diversions. Once complete, there are potentially numerous significant positive impacts including socio-economic benefits to the region, human health benefits and a reduction of commuter traffic which could aid in the growth of the local economy.

6.2.2 Assessment Methodology

A desktop study will be carried out to establish the baseline associated with economic activity, employment opportunities, settlement, and social patterns. Site visits to the area will identify local facilities, amenities and infrastructure which may be impacted by the proposed development.

To collect information related to employment statistics, demographic statistics, and aspects of the community; records from Governmental and Public Bodies, such as the Central Statistics Office (CSO) and Limerick City & County Council, will be consulted together with any published feasibility studies and reports for the region.

6.2.3 Conclusion

There is the potential for impacts on population and human health during the construction and operational phases of the scheme. These may be both positive and negative and will be considered fully in the EIAR.

6.3 Biodiversity, Flora and Fauna

6.3.1 Description of Existing Environment

The proposed works lie within an area of existing pathway for part of the route while the remainder lies within a mixture of amenity and agricultural areas adjacent to the Rivers Shannon and River Mulkear. The surrounding area is a mixture of built land in the form of private dwellings, educational buildings, recreational and industrial areas, and agricultural fields. The works cross the old Plassey Millrace at two locations, and the cycle path will cross two local drainage streams. The proposed cycle path will run parallel alongside the south bank of the River Shannon (Lower) for approximately 3km. The proposed cycle path will run parallel to the east bank of the River Mulkear for approximately 1.2km.

The proposed cycle path is directly adjacent to, and partially within, the Lower River Shannon SAC. Due to the proximity of this site to the proposed cycle path it is considered that there is potential for this site to be directly affected by the proposed works during construction and as such, the Lower River Shannon SAC is considered as a constraint to this project.

The proposed cycle path is located approximately 4kms upstream of the River Shannon and River Fergus Estuaries SPA. The proposed cycle path is adjacent to the River Shannon and there is hydrological connectivity to the River Shannon and River Fergus Estuaries SPA downstream. Due to the hydrological connectivity of this site to the proposed cycle path, it is considered that there is potential for this site to be directly affected by the proposed works during construction and as such, the River Shannon and River Fergus Estuaries SPA should be considered as a constraint to this project.

The full extent of the ecological significance for the two watercourses within the cycle path study area is currently unknown. These watercourses are important for migratory fish including Salmon and provide habitat for a range of other species listed on Annex II of the EU Habitats Directive and Annex I of the Birds Directive including Otter, Salmon and Kingfisher.

The invasive species, Giant Hogweed (*Heracleum mantegazzianum*) and Himalayan balsam (*Impatiens glandulifera*) are prevalent within the study area as identified during initial walkover surveys.

Impacts on biodiversity, both in relation to European Sties and habitats and species of conservation importance, will be assessed in the EIAR. A Natura Impact Statement will be undertaken which will focus on the potential impact on European Sites and their conservation objectives.

6.3.2 Potential Impacts

Potential construction impacts include the direct loss of fauna and habitats within the SAC because of construction works within the works area. Indirect potential construction impacts include the impacts on

habitats within the SAC by hydrological linkage because of increased deposition of suspended sediments arising from construction operations associated with the proposed works. Deterioration of habitats within the SAC may also occur by hydrological linkage because of pollution incidents arising from construction of the proposed works. During the operational phase there is a potential for a disturbance impact to the local fauna due to increases in ambient noise and light levels. The design, siting, and construction of the cycle path is being currently developed with careful regard to the SAC and its conservation objectives.

The areas in and around the Shannon and Mulkear waterbodies provide suitable habitats for otter as breeding or resting locations. A potential impact during construction includes the loss of suitable habitats for otter in proximity to the works. The loss of this habitat could have a long-term negative impact on local otter populations. Works could result in disturbance of otter during both the construction and operational phases and appropriate mitigation will be required to ensure no long-term adverse impacts on local otter populations.

The Lower Shannon catchment is important for salmonid and other fish populations. Permanent modification of channel banks or bed could have an adverse impact on aquatic populations and water quality. This could arise directly through damage to in-channel habitats during ground preparation and bridge installation during the construction phase or indirectly during the construction phase through impacting upon water quality from sediment release during ground excavations and pollution incidents resulting from the release of hydrocarbons.

Trees along the study area watercourses and old buildings and bridges along the proposed cycle path provide potential roosting opportunities for bats, with the surrounding habitat providing good foraging and commuting routes. Options that require the removal of mature trees or works to riverine built structures with the potential to support roosting bats shall be assessed for bat potential. National Parks and Wildlife data indicates the presence of the Annex I species, *Rhinolophus hipposideros* (Lesser Horseshoe Bat) at Mountshannon House, Co. Limerick which is located approximately 1km from the proposed project. Construction resulting in the loss of trees and habitats along the route could result in the loss of roost sites, the disruption of foraging corridors or direct disturbance to these species. During the operational phase there is a potential for a disturbance impact to bat species due to increases in ambient noise and light levels.

The areas in and around the Shannon and Mulkear waterbodies could provide suitable habitats for wintering birds. Consultation with the NPWS will be necessary, together with appropriate surveys to establish a baseline for wintering birds' presence and numbers. Potential construction impacts include the direct loss of habitats because of construction works within the works area. Indirect potential construction impacts include disturbance to foraging and roosting bird species from construction operations associated with the proposed works. During the operational phase there is a potential for a disturbance impact to the local fauna due to increases in ambient noise and light levels. Constraints may be placed on the times of year that works in the proximity of the SAC may be carried out depending on the results of the various surveys and the requirements of the NPWS.

There is potential for the spread of invasive species during the construction phase of the project in the absence of mitigation. Therefore, an Invasive Species Management Plan will be prepared in advance of the works. Pre-treatment of invasive species through chemical spraying and manual pulling will be undertaken and site hygiene measure will be established for the construction phase.

The impacts and interaction between hydrology/hydrogeology and geology/soils on water dependant ecology will be further discussed within the EIAR.

6.3.3 Assessment Methodology & Guidelines

Ecological surveys of the study area are ongoing and are being carried out to establish the baseline environments associated with habitats, flora, and fauna in the area, including but not limited to, botanical, terrestrial, tree, bird, bat, aquatic, and fisheries. Impact assessment will follow CIEEM (2018) 'Guidelines for Ecological Impact assessment in the UK and Ireland (Terrestrial, Freshwater, Coastal and Marine)' with consideration also given to EU (2012) 'Guidance on Aquaculture and Natura 2000'.

The guidelines below will be used in the preparation of the Biodiversity: Flora and Fauna chapter of the EIAR:

- Guidelines for Ecological Impact Assessment in the UK and Ireland. Terrestrial, Freshwater and Coastal (CIEEM, 2016).
- Advice Notes on Current Practice (in preparation of Environmental Impact Statements) (Environmental Protection Agency (EPA), 2003).
- Guidelines on the information to be contained in Environmental Impact Statements (EPA, 2002).
- Draft Revised guidelines on the information to be contained in Environmental Impact Statements (EPA, 2015).
- EPA Draft Guidelines on the information to be contained on Environmental Impact Statements (EPA 2017).
- Environmental Impact Assessment of National Road Schemes – A Practical Guide (NRA, 2009).
- Guidelines for Assessment of Ecological Impacts of National Road Schemes, (NRA, 2009).
- Environmental Assessment and Construction Guidelines (NRA, 2006).

Impacts on flora and fauna will be assessed in terms of the construction and operational phase of the proposed development. Potential cumulative impacts with other projects will also be assessed.

6.3.4 Conclusion

There is the potential for impacts on flora and fauna during both the construction and operational phases of the scheme. Therefore, these will be considered further in the EIAR.

6.3.5 Natura Impact Assessment

The proposed development will be subject to the Article 6(3) Appropriate Assessment (AA) Process. An AA Screening, and if required following screening a Natura Impact Statement, will be prepared in accordance with the European Commission guidance document Assessment of Plans and Projects Significantly affecting Natura 2000 Sites: Methodological Guidance on the provisions of Article 6(3) and 6(4) of the Habitats Directive 92/43/EEC (EC, 2001) and the Department of the Environment's Guidance on the Appropriate Assessment of Plans and Projects in Ireland (December 2009, amended February 2010).

In addition to the guidelines referenced above, the following relevant guidance will be followed:

- DoEHLG (2010) Appropriate Assessment of Plans and Projects in Ireland Guidance for Planning Authorities. Department of the Environment, Heritage and Local Government,
- European Communities (2000) Managing Natura 2000 Sites: the provisions of Article 6 of the 'Habitats' Directive 92/43/EEC, Office for Official Publications of the European Communities, Luxembourg. European Commission,
- Directive 92/43/EEC, Office for Official Publications of the European Communities, Luxembourg. European Commission,
- EC (2007) Guidance document on Article 6(4) of the 'Habitats Directive' 92/43/EEC – Clarification of the concepts of: alternative solutions, imperative reasons of overriding public interest, compensatory measures, overall coherence, opinion of the commission. European Commission,
- EC (2013) Interpretation Manual of European Union Habitats. Version EUR 28. European Commission

This assessment will be carried out in tandem with the EIA of the proposed development. The AA Screening Report and NIS, if required based on the results of the AA Screening Report, will be submitted to the Planning Authority as stand-alone documents as part of the planning application.

6.4 Land use, Soils and Geology

This section of the EIAR will evaluate the available information on the soils and geology of the study area along and in the vicinity of the proposed cycle path project. It will investigate how the existing soil and geological environment may be altered in both the short and long-term by the construction and operation

of the proposed project. The methodology for assessment of the impacts on the soil and geology will be undertaken in accordance with recommendations in '*Geology in Environmental Impact Assessment Report - A Guide from the Institute of Geologists of Ireland*' (2002).

6.4.1 Description of Existing Environment

According to EPA subsoil maps, "Marine/Estuarine Sediments" are located along the banks of the River Shannon. "Alluvial Mineral" is located to the east of the cycle path and along the River Mulkear with sections of "Made Ground" and "Mineral Poorly Drained" ground throughout the University Campus. The EPA also designates the site as "Locally Important Aquifer - Bedrock which is Generally Moderately Productive".

The Geological Survey of Ireland (GSI) Online Database Bedrock maps (500k) indicates that the study area is underlain by two bedrock classifications: Visean Limestones (undifferentiated) on the western side of the study area and the Rathkeale Formation which is comprised of dark muddy limestone & shaly mudstone on the eastern side of the study area.

6.4.2 Potential Impacts

Permanent or temporary removal of soils/excavation of bedrock may be necessary during the construction of the proposed project which could potentially impact bedrock and alter drainage patterns. There is potential risk of contamination of groundwater through spills or leaks from hazardous substances used on site during construction. Best site practice should be implemented on-site and appropriate mitigation measures should be implemented where works are hydrologically connected to groundwater bodies. There is also potential for soil contamination due to the extent of Himalayan Balsam and other invasive species, across the proposed cycle path site. Appropriate mitigation measures will need to be established to prevent the spread of invasive species through soil excavation and removal.

6.4.3 Assessment Methodology

A desktop study shall gather information from historic site investigations, Teagasc soils maps and GSI bedrock geology maps. Walkover surveys, along with trial pit excavations and boreholes, will also be carried out as part of site investigations, to provide vital information which will be assessed in the EIAR.

The interaction between effects on geology/soils and hydrology/hydrogeology with effects on water, water-dependant ecology and air quality will be further considered within the EIAR under both relevant individual chapters and "Interaction of the Foregoing" chapter.

The land, soils, and geology section of the EIAR will be carried out in accordance with guidance contained in the following documents:

- EPA Draft Guidelines on the information to be contained on Environmental Impact Statements (EPA 2017).
- Environmental Protection Agency (September 2015): Draft - Advice Notes for Preparing Environmental Impact Statements.
- Environmental Protection Agency (September 2015): Draft – Revised Guidelines on the Information to be Contained in Environmental Impact Statements.
- Environmental Protection Agency (2003): Advice Notes on Current Practice (in the Preparation on Environmental Impact Statements).
- Environmental Protection Agency (2002): Guidelines on the Information to be Contained in Environmental Impact Statements.
- Institute of Geologists of Ireland (2013): Guidelines for Preparation of Soils, Geology & Hydrogeology Chapters in Environmental Impact Statements; and,
- National Roads Authority (2005): Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes

6.4.4 Conclusion

There is potential for impacts on soils and geology during the construction phase of the scheme. These topics will be considered further in the EIAR.

6.5 Water Quality, Hydrology and Hydrogeology

This section of the EIAR will evaluate the existing water baseline conditions and character of the study area in line with the requirements of Annex IV of Directive 2014/52/EU.

6.5.1 Description of Existing Environment

The proposed cycle path runs adjacent to two watercourses, the River Shannon for approximately 3km and the River Mulkear for approximately 1.2km. Neither of these Rivers are assigned a Water Framework Directive (WFD) Status and are identified by the EPA as being "not at risk". The study area overlies a locally important aquifer which is generally moderately productive with variable recharge rates of 50-400mm/yr. Vulnerability is generally moderate but ranges over the extent of the study area from low on the western end of the proposed cycle way to moderate and high towards the east. OPW National Flood Hazard Mapping shows that almost the entire cycle path is within Flood Zone A and several historical flood events have been recorded in the area. However, on review of the Planning System and Flood Risk Management Guidelines for Planning Authorities, a cycle path falls under the category of development classified as "Amenity, open space, outdoor space and recreation" and is considered a flood compatible development. As such a 'Stage 3 detailed flood risk assessment' is not likely to be deemed necessary.

6.5.2 Potential Impacts

The installation of a bridge during the construction phase could potentially have a direct negative impact on the water quality of the River Shannon. During construction there is also an indirect risk of pollution incidences through the release of hydrocarbons and increased deposition of suspended sediments arising from construction activities of the proposed cycle path and bridge installation. The potential for flood risk will also require consideration at an early stage and, indeed, assessment has already begun.

No operational impacts associated with the proposed development are anticipated on Water Quality, Hydrology, and Hydrogeology.

The River Shannon forms part of the Lower River Shannon SAC and the River Shannon and River Fergus Estuaries SPA which has several water dependent species and habitats which will be also assessed in the EIAR under the "Biodiversity, Flora and Fauna" chapter and in the NIS.

6.5.3 Assessment Methodology & Guidelines

A review of the construction methodologies and activities will be undertaken. Impacts will be assessed using the source-pathway-receptor model for this section of the EIAR. The interaction between water/groundwater and water dependant habitats and species will be explored from the site investigations and boreholes. A flood risk assessment has finalised to inform this chapter of the report. Consultation will be undertaken with the National Parks & Wildlife Service (NPWS) and Inland Fisheries Ireland (IFI).

The interaction between hydrology/hydrogeology and geology/soils on water dependant ecology will be further discussed within the EIAR under the "Interaction of the Foregoing" chapter.

This section of the EIAR will be carried out in accordance with guidance contained in the following:

- EPA Draft Guidelines on the information to be contained on Environmental Impact Statements (EPA 2017).
- Environmental Protection Agency (September 2015): Draft - Advice Notes for Preparing Environmental Impact Statements;
- Environmental Protection Agency (September 2015): Draft – Revised Guidelines on the Information to be Contained in Environmental Impact Statements;
- Environmental Protection Agency (2003): Advice Notes on Current Practice (in the preparation on Environmental Impact Statements);

- Environmental Protection Agency (2002): Guidelines on the Information to be Contained in Environmental Impact Statements;
- Institute of Geologists Ireland (2013): Guidelines for Preparation of Soils, Geology & Hydrogeology Chapters in Environmental Impact Statements;
- National Roads Authority (2005): Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes;
- Eastern Regional Fisheries Board (not dated): Requirements for the Protection of Fisheries Habitat during Construction and Development Works at River Sites;
- PPG1 – Understanding your environmental responsibilities (UK Guidance Note);
- GPP5 – Works or Maintenance in or Near Water (UK Guidance Note);
- CIRIA (Construction Industry Research and Information Association) 2006: Guidance on 'Control of Water Pollution from Linear Construction Projects' (CIRIA Report No. C648, 2006); and,
- CIRIA 2001: Control of Water Pollution from Construction Sites - Guidance for Consultants and Contractors. CIRIA C532. London, 2001.

6.5.4 Conclusion

There is potential for impacts on water quality, hydrology, and hydrogeology during the construction phase of the scheme. These aspects will be assessed in the EIAR.

6.6 Air Quality, Climate

This section of the EIAR will evaluate the air quality and climate impacts of the proposed works in the context of current relevant standards and guidance.

6.6.1 Description of Existing Environment

Under the Clean Air for Europe (CAFE) Directive (2008/50/EC), the EPA manages the national ambient air quality network under four zones. The UL cycle path falls into Zone C: Other cities and large towns. The closest Air Quality monitoring station is at People's Park, Limerick City, located 3.5km south west of the proposed development. This monitoring site has real time data available on the EPA website and gave an AQIH (Air Quality Index for Health) reading of "Good" (10:34, Fri 05-March-2021). The AQIH readings are based on five air pollutants which can harm human health: ozone gas, nitrogen dioxide gas, sulphur dioxide gas, $PM_{2.5}$ particulate matter and PM_{10} particulate matter. AQIH values determine if the air quality is good, fair, poor, or very poor.

The upsurge of the building industry in Ireland during the boom years, resulted in an increase in energy consumption and, in turn, an increase in green-house gas (GHG) emissions. There are two options recommended by the Environmental Protection Agency (2016), in their report 'An Assessment: Ireland's Environment', in response to issues related to climate change. These are firstly, mitigation of emissions of GHGs that are driving climate change and secondly, to reduce vulnerability to the adverse impact of climate change though adaptation.

6.6.2 Potential Impacts

A decrease in air quality during the construction phase is possible and will be assessed in the EIAR. Increased levels of dust in the air during construction because of excavations and machinery movements may require consideration and the formulation of a dust management plan. Potential impacts on air quality could arise during the construction phase due to exhaust emissions from construction machinery.

Potential climatic factors and air quality impacts will be considered in its interaction with other factors such as human health.

6.6.3 Assessment Methodology

Baseline levels have already been established for the air quality of the area. Dust levels will be compared to the EPA dust deposition guidelines and mitigation measures to reduce the level of dust generation during construction, will be detailed in the EIAR. The assessment of the impact will primarily be by reference to the

Air Quality Standards (S.I. 180 of 2011). Air dispersion modelling is being carried out to assess emissions from activities proposed on site.

A review will be carried out of the construction methodologies/activities, along with government strategies and plans which deal with climate change, such as:

- National Policy Position on Climate Action and Low Carbon Development (2014);
- Climate Action and Low Carbon Development Act, 2015 (No. 46 of 2015);
- National Mitigation Plan (2017);
- National Adaptation Framework (2018);
- Climate Action Plan (2019).

6.6.4 Conclusion

There is potential for impacts on climate and air quality, both positive and negative, during both the construction and operational phases of the scheme. These topics will be considered further in the EIAR.

6.7 Noise and Vibration

This section of the EIAR will evaluate the impacts of noise and vibration within the context of the proposed project and against the current relevant standards and guidance.

6.7.1 Description of Existing Environment

Most of the noise/ vibration-sensitive receptors in the study area are concentrated in the residential area of the University campus and to a lesser extent the residential developments in the townlands of Castletroy and Annacotty.

6.7.2 Potential Impacts

Noise during the construction phase of the project may have a temporary adverse impact on the environment. Vibration during construction has the potential to cause damage to structures, such as buildings, bridges, and walls in the vicinity of the works. During the operational phase there is a potential for increased noise levels due to increased levels of people in the area using the cycle path.

6.7.3 Assessment Methodology

A review of the construction methodologies and activities is being undertaken, along with a noise assessment which will identify the baseline and model for potential future noise levels. The assessment of the likely impact will involve both an assessment of construction and operational related activities on the scheme.

The assessment of the impact of different activities will be in accordance with recognised industry standards to estimate the propagation of noise into the surrounding areas and the impact at local receptors.

The noise and vibration assessment of the EIAR will be carried out in accordance with the following guidance:

Construction Phase

- British Standard BS 5228:2009 (+A1:2014) Code of practice for noise and vibration control on construction and open sites – Part 1: Noise;
- BS 7385 – "Evaluation and measurement for vibration in buildings – Part 2: Guide to damage levels from ground-borne vibration" (1993);
- BS 5228:2009 (2009+A1:2014); "Code of practice for noise and vibration control on construction and open sites – Part 2: Vibration" and
- NRA - Guidelines for the Treatment of Noise and Vibration in National Road Schemes.

Operational Phase

- ISO 1996: 2016: Acoustics – Description, measurement, and assessment of environmental noise.
- ISO 9613-2: 1996 Acoustics – Attenuation of sound outdoors, Part 2: General method of calculation, 1996.

6.7.4 Conclusion

There is potential for impacts due to noise and vibration during both the construction and operational phases of the scheme. This will be considered further in the EIAR.

6.8 Landscape and Visual

This section of the EIAR will evaluate the landscape and visual aspects of the proposed project within the study area. The study area is described with reference to landscape character and type as well as the relevant landscape policy recommendations in terms of landscape and visual characteristics.

6.8.1 Description of Existing Environment

The study area is located within the Shannon Coastal Zone Landscape Character Area. In Section 7.3.4.6 of the Limerick County Development Plan 2010-2016 the Shannon Coastal Zone Landscape Character Area is described as follows: '*The landscape itself is generally that of an enclosed farm type, essentially that of a hedgerow dominant landscape. This differs from the other agricultural landscapes of the County in that the field patterns, particularly close to the estuary, tend to be less regular than those elsewhere in the County.*'

The landscape of the area is further described in Section 8.4 of the Castletroy Local Area Plan 2019-2025, where it is referred to more specifically as the Lower Shannon landscape character area. '*The river forms a natural boundary for the area and endows it with many natural resources. Scattered throughout the area are many impressive trees, both individual and parts of larger stands and groups. Within open space and other areas zoned in the LAP are field boundaries, which, while lacking mature impressive trees nonetheless form an essential part of the natural fabric of the area.*' The river corridors offer the area ecological value, provides opportunities for walkways and undeveloped banks offer flood protection for nearby infrastructure. However, the low-lying land of the area, which was a former floodplain of the Groody, Shannon and Mulkear rivers and local tributaries places limits on development and provision of space for active recreation such as playing pitches in the area.

The CORINE land cover data for the study area was obtained from the Environmental Protection Agency (EPA). CORINE land cover is a map of the environmental landscape based on the interpretation of satellite images. It provides comparable digital maps of land cover for each country for much of Europe.

The CORINE data for the study area shows that there is a mixture of land cover within the study area which includes:

- artificial surfaces of 'industrial, commercial and transport units' and 'discontinuous urban fabric'.
- agricultural areas of 'land principally occupied by agriculture with significant areas of natural vegetation' and 'pastures'.

6.8.2 Potential Impacts

During both the construction and operational phases of the project the landscape character and visual amenity will be impacted (for example with lighting), during the construction phase with the presence of cranes, machinery, construction compounds, site offices, etc. However, the majority of these will be temporary in nature.

There is potential for negative visual impacts with the clearance of vegetation and treelines during construction which could result in disrupting scenic views of the river. Policies and Objectives of LCCC with a focus on scenic amenity for the Castletroy area include the planting and preservation of trees and vegetation. The design of the cycle path will minimise disturbance on existing hedgerows, trees, and stone walls in the area as they form defining features of the landscape character of the area and are under pressure from population growth. Where tree felling is required to facilitate the cycle path, planting schemes should be included to compensate for the loss of existing trees in the area.

After construction, there will be a permanent alteration of the views towards the River Shannon which will be discussed in the EIAR. The design of the cycle path will include the development of viewing points as part of the cycle path route which will improve the amenity value of the area.

6.8.3 Assessment Methodology & Guidance

The potential effects of the proposed project on views from residential properties and tourist routes, in terms of visual intrusion and visual obstruction and the impact on landscape character areas from the permanent physical changes to the site brought about by the development will be assessed in the EIAR. Assessment will be carried out through site visits, photography, and direct assessment methods with consideration of the objectives and policies of Limerick County Development Plan. A Landscape Visual Impact Assessment will form part of the EIAR.

The assessment of the potential landscape and visual effects of the proposed development will be carried out in accordance with the following documentation:

- Outstanding Landscapes (An Foras Forbartha, 1976).
- Landscape and Landscape Assessment: Consultation Draft of Guidelines for Planning Authorities (Department of the Environment and Local Government, 2000).
- Guidelines for Landscape and Visual Impact Assessment (The Landscape Institute/Institute of Environmental Management and Assessment, UK, 2013).
- Photography and photomontage in landscape and visual impact assessment Landscape Institute Advice Note 01/11, 2011).
- EPA Guidelines on the information to be contained on Environmental Impact Statements (EPA 2002).
- EPA Advice Notes on Current Practice in the preparation of Environmental Impact Statements (EPA, 2003).
- EPA Draft Guidelines on the information to be contained on Environmental Impact Statements (EPA 2017).
- National Landscape Strategy 2015-2025.

6.8.4 Conclusion

There is potential for impacts on landscape, including visual impacts, during both the construction and operational phases of the scheme. These aspects will be considered further in the EIAR.

6.9 Cultural Heritage

This section of the EIAR will evaluate the cultural heritage of the proposed project in the study area. The term 'cultural heritage' is used here to encompass archaeological and built heritage together with historical and folklore resources.

6.9.1 Description of Existing Environment

There are 6 recorded archaeological sites or monuments as listed on the statutory Record of Monuments & Places (RMP) within the study area. These include the medieval castle complex from which Castletroy derives its name, incorporating a tower house with associated enclosure or 'bawn'. Additionally, a prehistoric burial mound or 'barrow' in the same townland may date from the Late Neolithic to the Iron Age periods (c.3000 BC to 400AD). There is an early medieval farmstead enclosure or 'ringfort' located in the townland of Rivers in the south—east part of the study area.

There are 5 protected structures within the study area as listed in the Record of Protected Structures of the LCCC Development Plan.

Protected Built Heritage includes Plassey Mill Complex, Plassey House (now part of the UL campus) and the decommissioned lattice iron footbridge over the Mulkear River.

6.9.2 Potential Impacts

During the construction phase there is potential for impact to protected structures and sites within the scheme area. Given the provisions of the National Monuments Acts, no disturbance to or interference with any

archaeological sites/monuments listed in the RMP can take place without prior notification, assessment and consultation with the National Monuments Service of the Department of Housing, Local Government & Heritage (DoHLGH). Potential for discovery of previously unrecorded archaeological material during construction of the development can lead to a loss of archaeological heritage where not appropriately mitigated.

6.9.3 Assessment Methodology

Archaeological and Built Heritage assessment though desktop and field studies will identify all known monuments and features within the study area. Assessment will include for establishing the extents of archaeological potential in greenfield areas and make recommendations to mitigate the impacts of the proposed development on the archaeological resource. This may include for testing, monitoring and excavation as appropriate.

6.9.4 Conclusion

There is the potential for impacts on the archaeological & built heritage resources during the construction phase of the scheme. Therefore, this topic will be considered further in the EIAR.

6.10 Material Assets

This section of the EIAR will evaluate the physical resources in the environment; namely transport infrastructure, utilities, services, traffic flow, private property, farmland, and commercial buildings as well as historic buildings and the management of waste, that are valued and intrinsic to the study area.

6.10.1 Description of Existing Environment

The study area is serviced by an extensive sewer network and the Castletroy Wastewater Treatment Plant (WWTP) which is located on the bank of the River Shannon on the western extent of the proposed cycle path and directly adjacent to the University of Limerick Boat House.

The nearest licenced landfill to the study area is Longpavement Landfill Site, located along the R464, approximately 7.5kms from the study area. The Parkway recycling centre is located approximately 4kms from the study area.

Utilities in the study area include water supply networks, telecommunications, electricity supply, and gas pipelines. It is highly likely that these services traverse the study area at various locations. These locations will need to be identified during options assessment.

The primary road access to the study area is via the R445, R464 and Plassey Park Road. It is an objective of Limerick City & County Council and Ryan Hanley to ensure that issues arising from the interaction between the proposed cycle path and existing roads and cycle lanes will be an important factor in the routing and design of the development, thereby ensuring consideration for those using the proposed cycle path and other road users with whom they will interact with.

6.10.2 Potential Impacts

During the construction phase of the cycle path there will be an increase in traffic volumes on the roads in the area, from both employee and construction traffic (large trucks, etc). There will be a small increase in the number of electricity and CCTV cable ducts and kiosks needed in the area.

During the construction phase, there is potential to disrupt existing services (overhead lines, underground services) through excavation, machinery movements and tree feeling.

6.10.3 Assessment Methodology

As part of this section, utility plans will be reviewed and the presence of water & wastewater services, electricity lines, gas services, telecommunications and fibre-optic infrastructure will be confirmed. The capacity of local amenities and services such as the local school, etc. will be examined. This assessment will adopt the guidance set out by Transport Infrastructure Ireland, or TII, (formerly the National Roads Authority or the NRA) in the document 'Guidelines for Traffic and Transport Assessments', May 2014.

6.10.4 Conclusion

There is potential for impacts on material assets during both the construction and operational phases of the scheme. Therefore, these topics will be considered further in the EIAR.

6.11 Interaction of the Foregoing

This section of the Environmental Impact Assessment Report (EIAR) will evaluate the interaction between the potential impacts identified in the preceding chapters of the EIAR because of the proposed scheme. All potential impacts and the measures proposed to mitigate these will be outlined in this chapter and any potential interactions between these various elements will be identified.

6.12 Indirect & Cumulative Impacts and the Interaction of Effects

To fully assess the potential impact of the proposed development on sensitive receptors, in particular those related to European Sites in proximity of the works, the project will be assessed in combination with existing activities and proposed plans for the region.

Indirect and cumulative impact assessment will take guidance from documents published by the EPA and the European Commission.

The proposed projects that will be considered are those with a sufficient level of detailed information in the public domain, e.g., those which have received planning permission. This will allow for an accurate assessment of potential cumulative impacts, including projects which are considered 'committed development'.

Myplan.ie, Limerick County Council Planning Register, Local Area Plans and County Council Development Plans and projects within the area will be consulted to determine the extent to which any other plans or projects may interact with this development and result in cumulative impacts on the area.

7 Conclusion

This report outlines the key themes which will be considered and assessed in the EIAR, along with the assessment methodologies that will be utilised. Consultation with the public, statutory bodies and non-statutory organisations, based on this document, is now open, to ensure inputs from all relevant interested parties from the earliest stages of the EIAR preparation.

- Comments and observations are invited in relation to this EIAR Scoping Report at your earliest convenience.
- All comments and observations received will be recorded, acknowledged and considered in the relevant chapters during the preparation of the Environmental Impact Assessment Report.

The completed EIAR will consider and assess all aspects of the environment and at the relevant phases, as have been described above. The completed EIAR will be submitted to An Bord Pleanála as part of a formal planning application process for the project.

Appendix A
Detailed Drawings

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& Contae **Luimnigh**

Limerick City
& County Council

University of Limerick to National Technology Park Cycle Path Co. Limerick

DETAIL DESIGN DRAWINGS

MAY 2021

RYAN HANLEY
CONSULTING ENGINEERS
1 Galway Business Park,
Dangan,
Galway.

Drawing Index

Drawing No.	Drawing Title
KP-001	Layout Key Plan
DD-001	Detail Design Plan Layout - Plate No. 01 & 02
DD-002	Detail Design Plan Layout - Plate No. 03 & 04
DD-003	Detail Design Plan Layout - Plate No. 05 & 06
DD-004	Detail Design Plan Layout - Plate No. 07 & 08
DD-005	Detail Design Plan Layout - Plate No. 09 & 10
DD-006	Detail Design Proposed Details - No. 01 & 02
DD-007	Detail Design Proposed Details - No. 03 & 04
DD-008	Detail Design Proposed Details - No. 05 & 06
DD-009	Detail Design Proposed Details - No. 07 & 08
DD-010	Detail Design Proposed Details - No. 09 & 10
DD-011	Detail Design Proposed Details - No. 11 & 12
DD-012	Detail Design Proposed Details - No. 13 & 14
DD-013	Detail Design Proposed Details - No. 15 & 16
DD-014	Detail Design Proposed Details - No. 17 & 18
DD-015	Detail Design Proposed Details - No. 19 & 20

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Limerick City
& County Council

RYAN HANLEY

CONSULTING ENGINEERS

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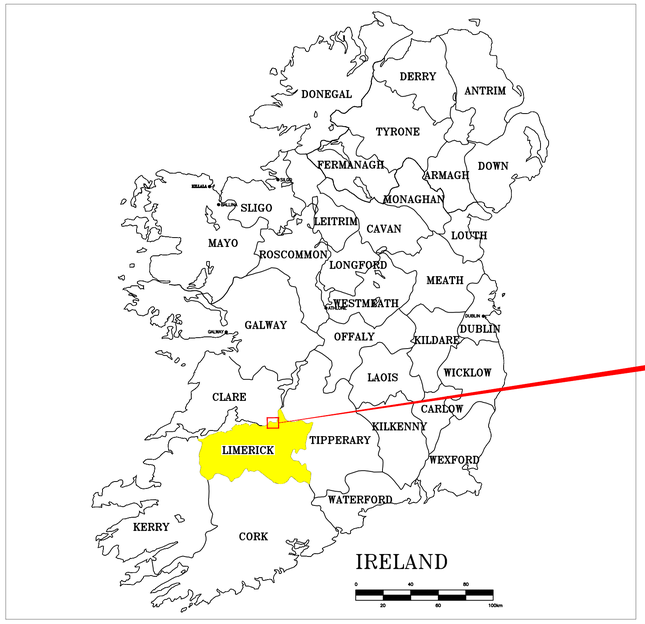

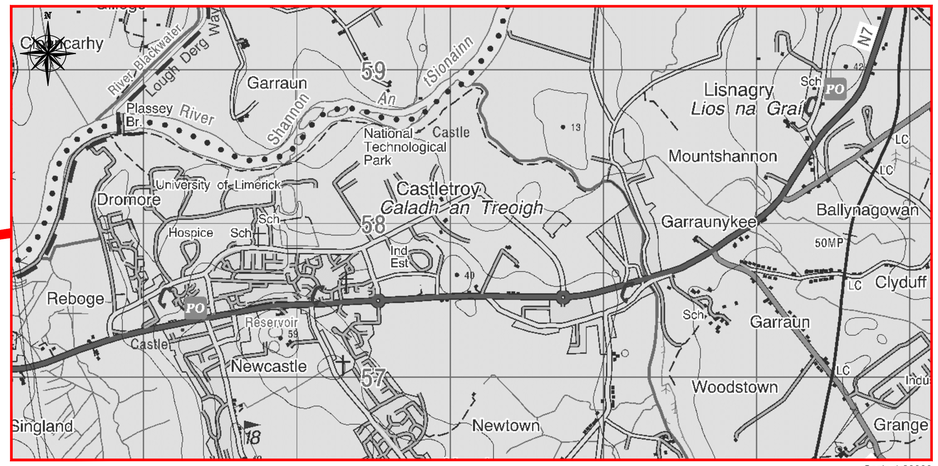

Location Plan

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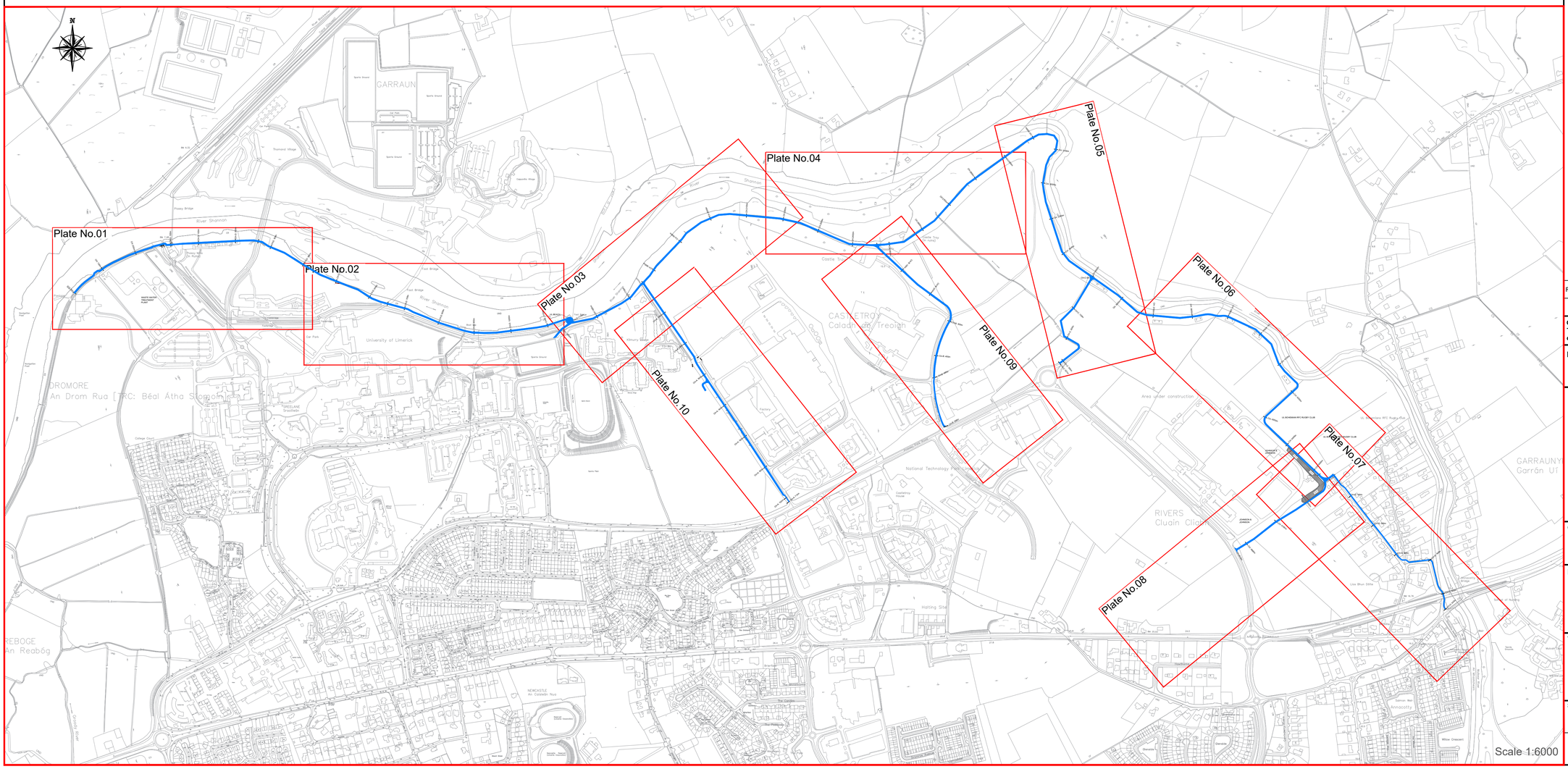

Notes

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Legend

Drawing Layout Reference

Proposed Route - Option A

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DETAILED DESIGN REPORT

University of Limerick to National Technology Park Cycle Path

TITLE

Preliminary Route Options Layout Key Plan

Sheet 1 of 16

SCALE @ A1	DATE	DRAWN	CHECKED	APPROVED
As Shown	MAY 2021	KB	BL	PS

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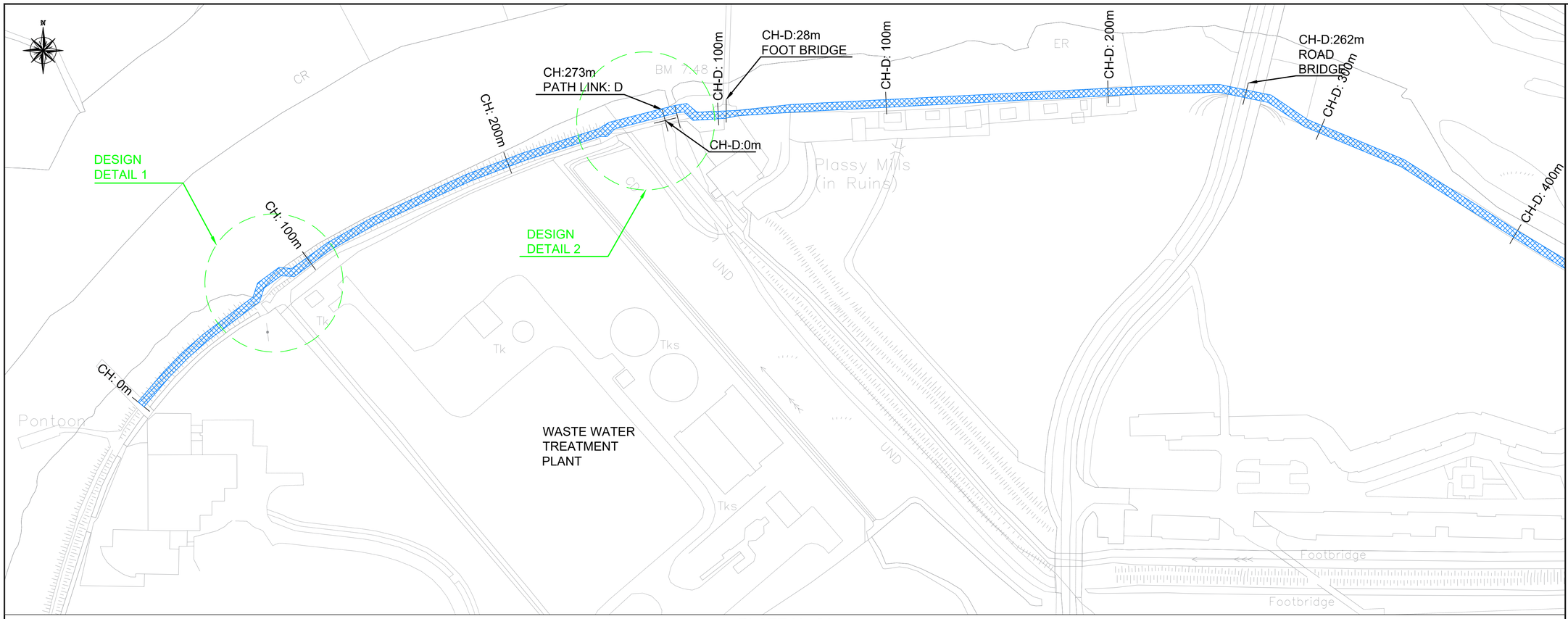

PLATE No.01

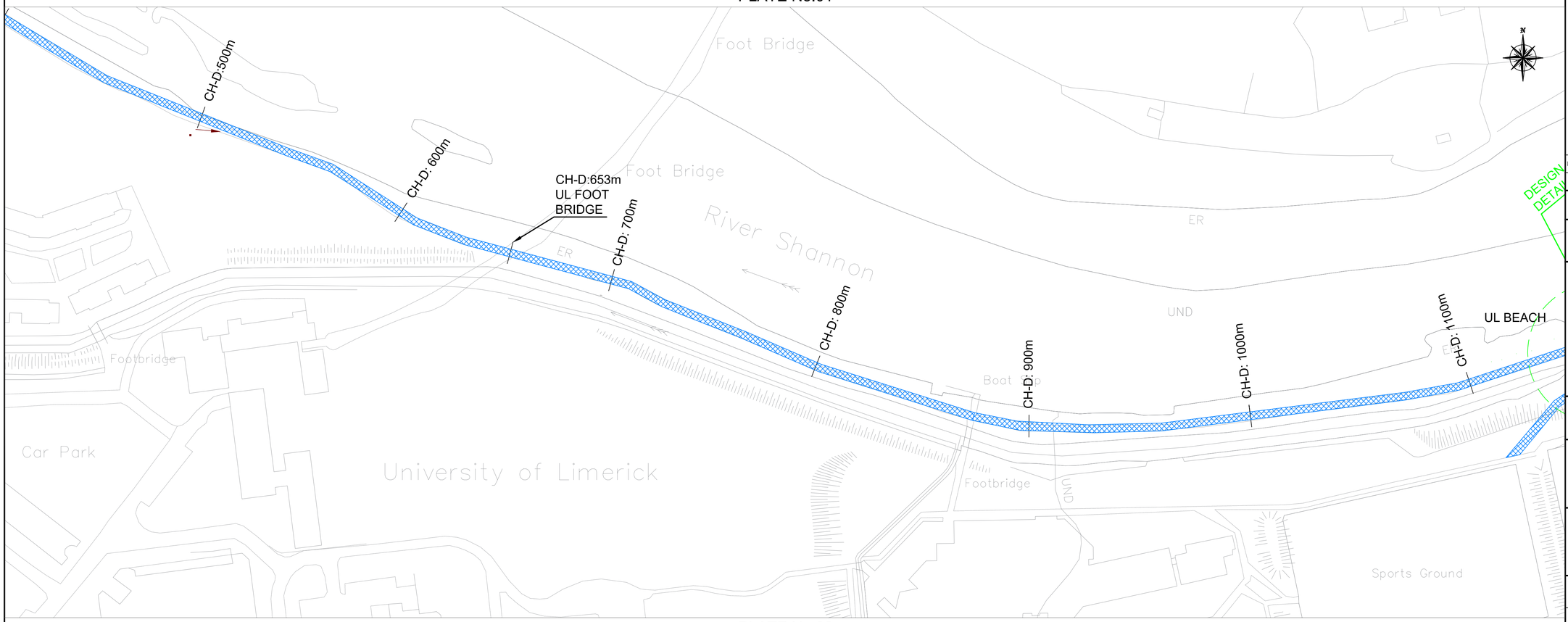

PLATE No.02

Notes

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Legend

Proposed Route

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DETAILED DESIGN REPORT
University of Limerick to National Technology Park Cycle Path

TITLE

Detailed Design Plan Layout
Plate No.01 & 02

Sheet 2 of 16

SCALE @ A1	DATE	DRAWN	CHECKED	APPROVED
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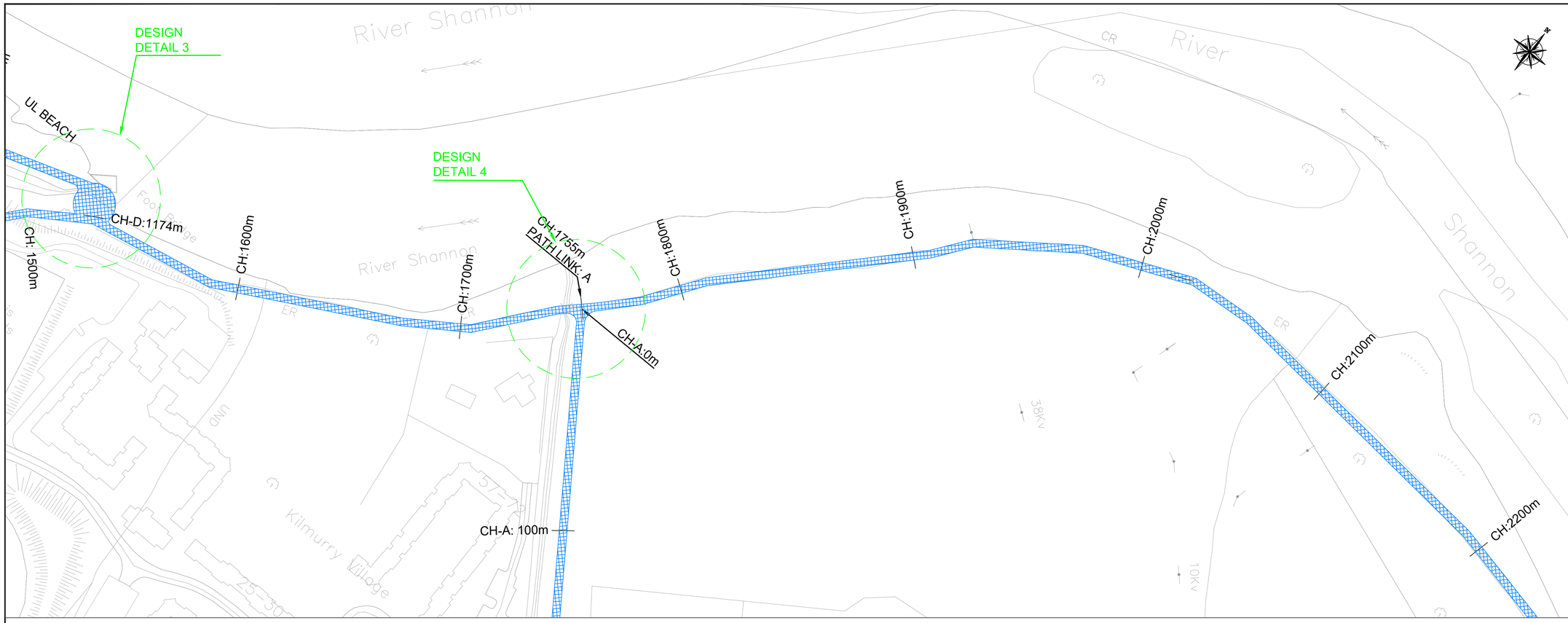

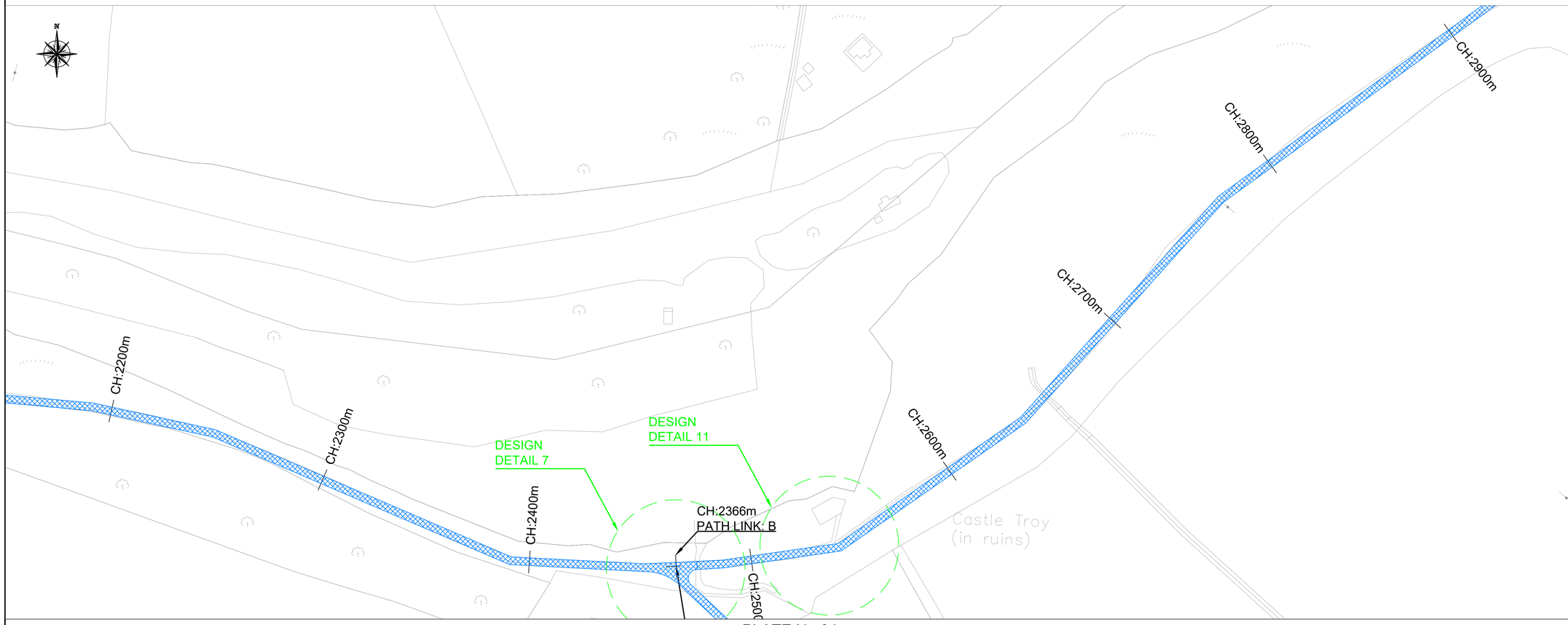

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Legend

Proposed Route

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DETAILED DESIGN REPORT
University of Limerick to National Technology Park Cycle Path

TITLE

Detailed Design Plan Layout
Plate No. 03 & 04

Sheet 3 of 16

SCALE @ A1	DATE	DRAWN	CHECKED	APPROVED
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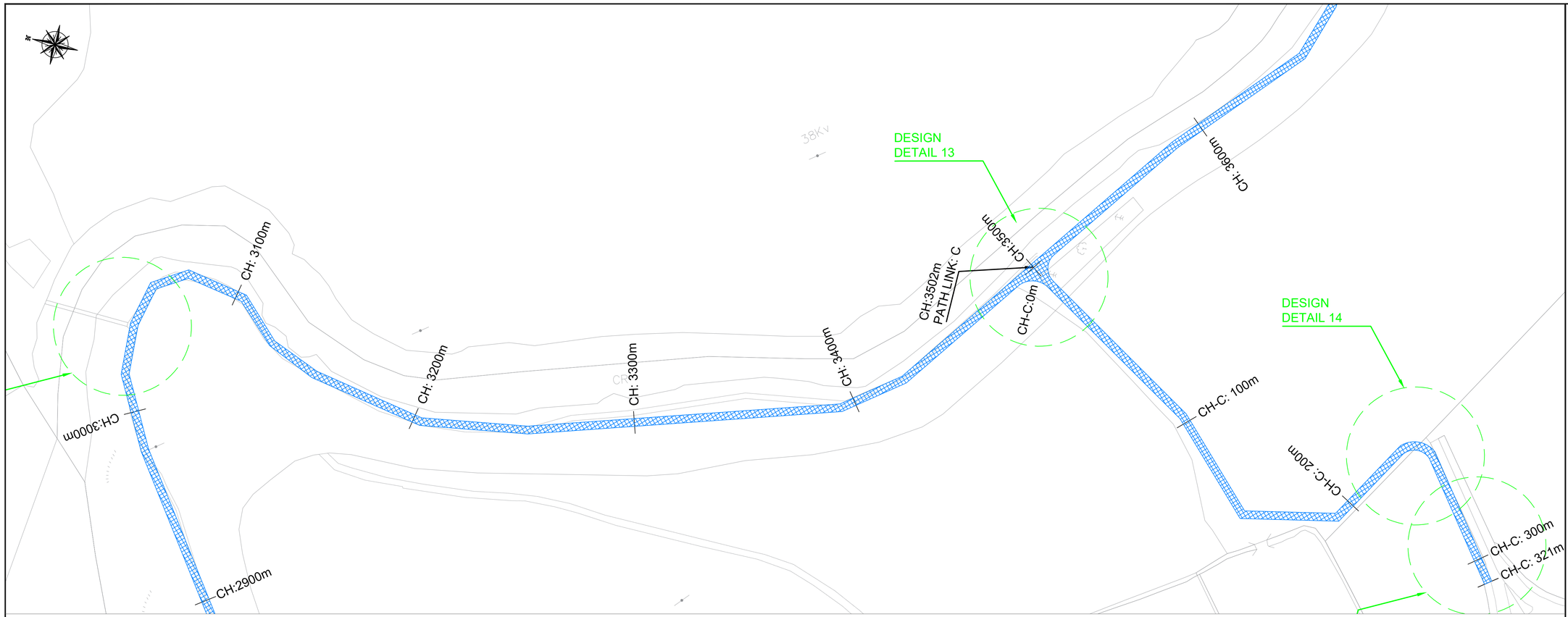

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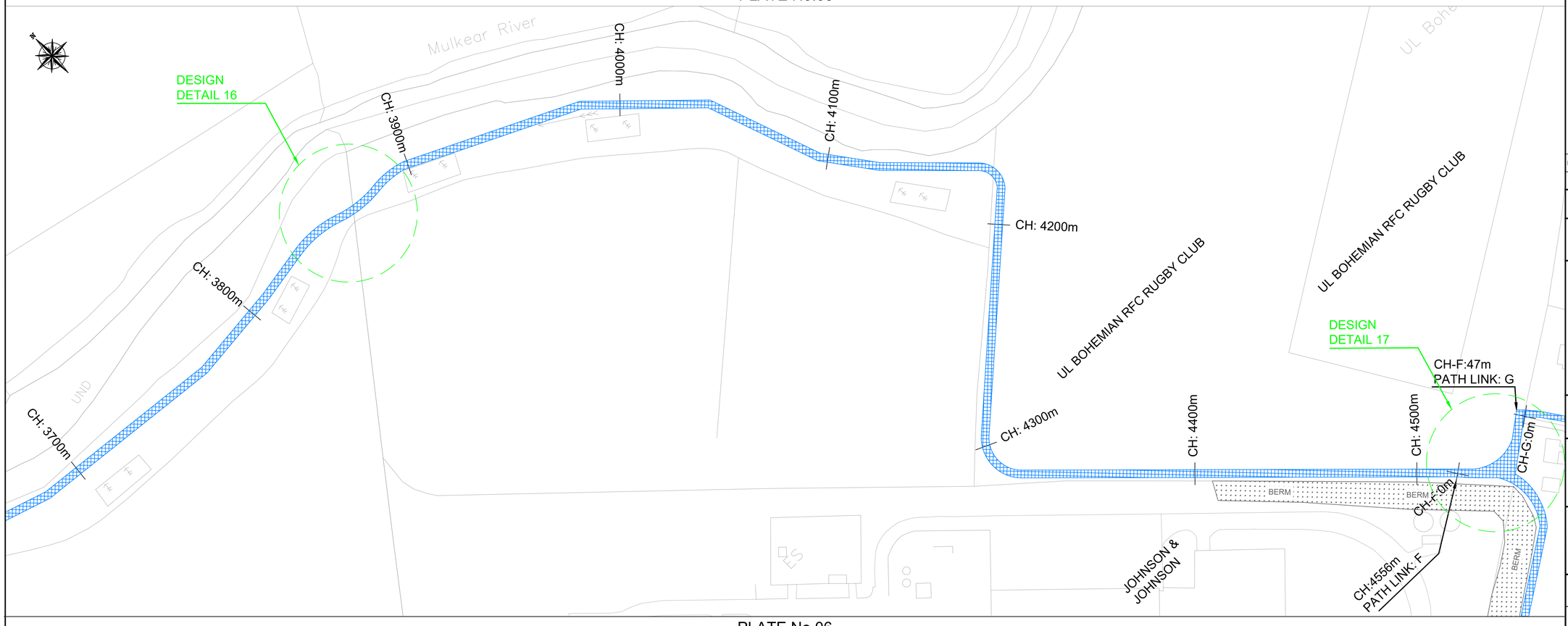

PLATE No.06

Notes

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Legend

Proposed Route

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University of Limerick to National Technology Park Cycle Path

TITLE

Detailed Design Plan Layout
Plate No. 05 & 06

Sheet 4 of 16

SCALE @ A1	DATE	DRAWN	CHECKED	APPROVED
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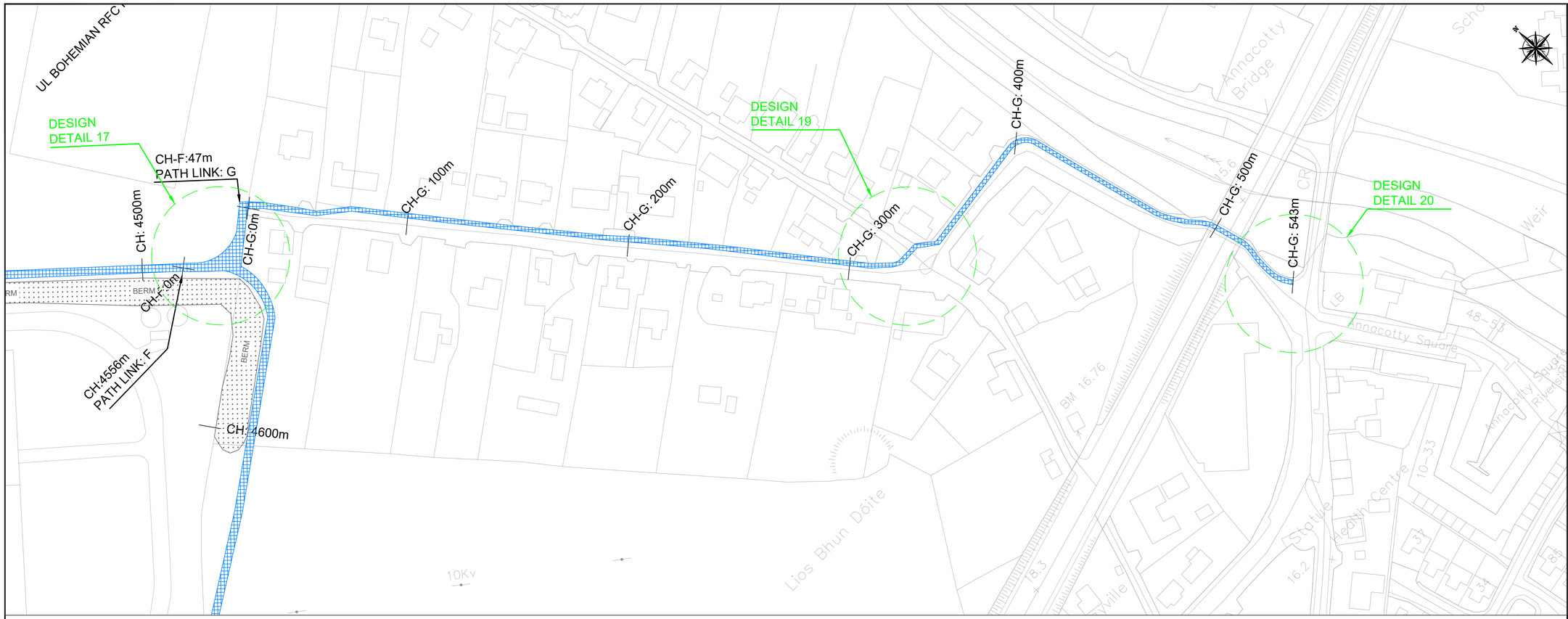

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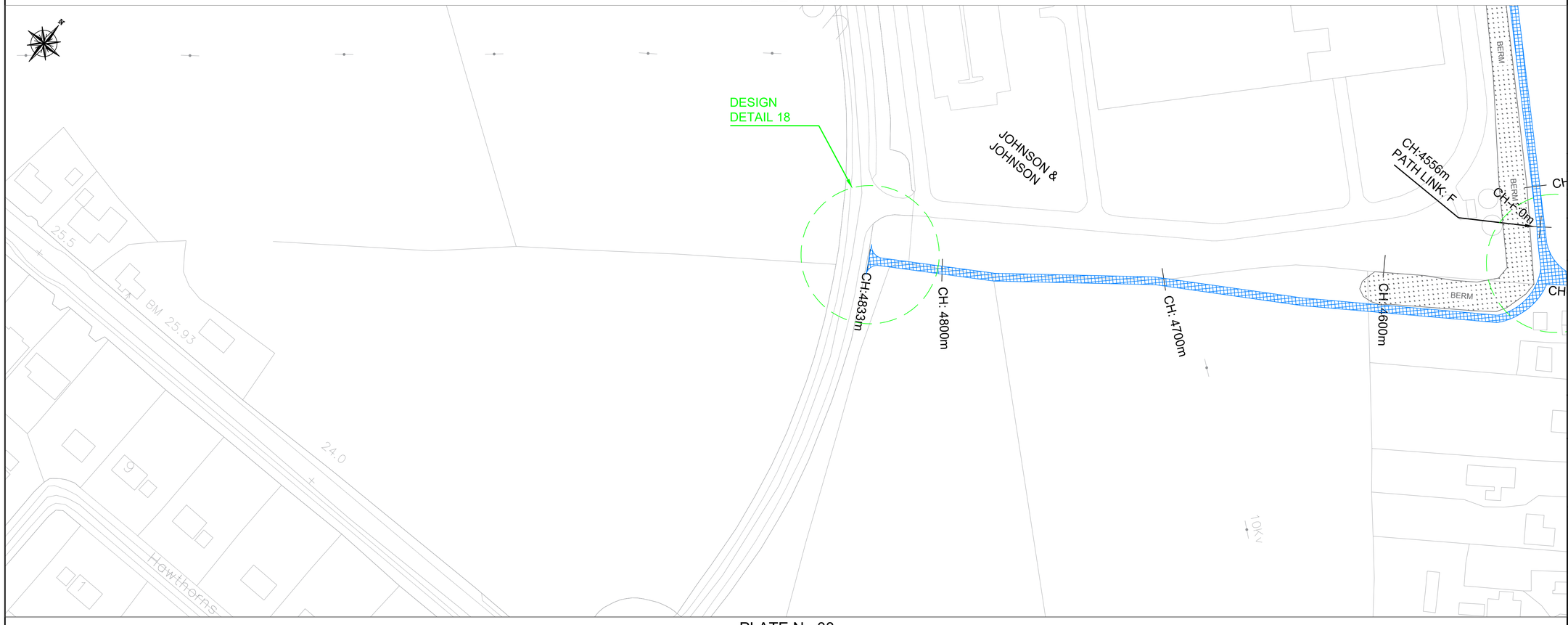

PLATE No.08

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Legend

Proposed Route

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University of Limerick to National Technology Park Cycle Path

TITLE

Detailed Design Plan Layout
Plate No. 07 & 08

Sheet 5 of 16

SCALE @ A1	DATE	DRAWN	CHECKED	APPROVED
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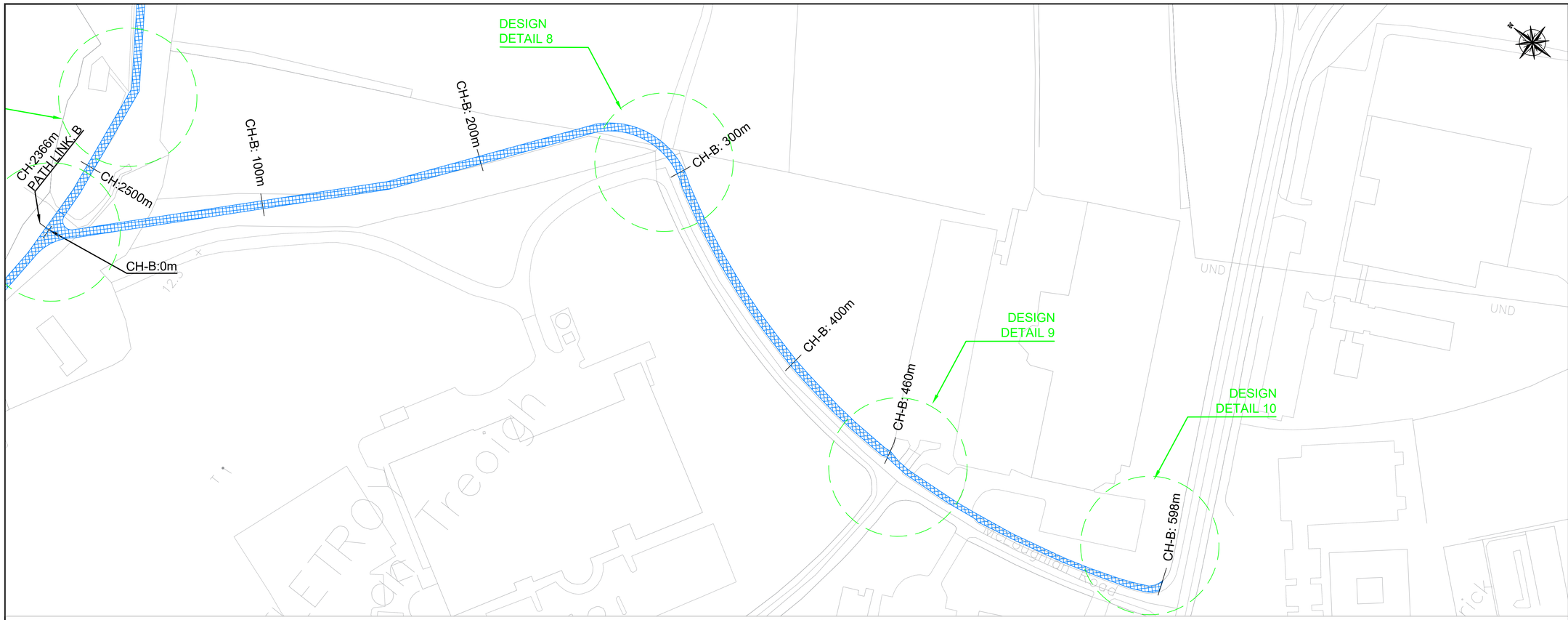

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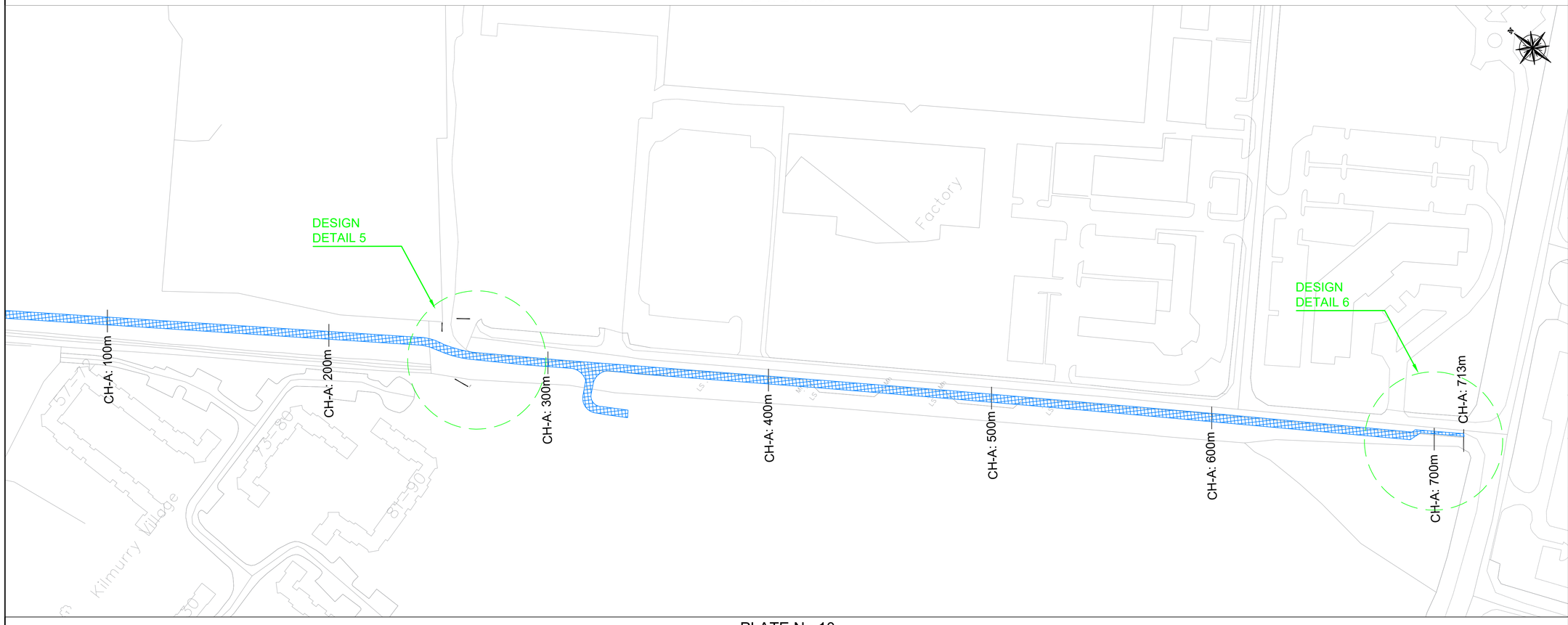

PLATE No.10

Notes

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Legend

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DETAILED DESIGN REPORT
University of Limerick to National Technology Park Cycle Path

TITLE

Detailed Design Plan Layout
Plate No. 09 & 10

Sheet 6 of 16

SCALE @ A1	DATE	DRAWN	CHECKED	APPROVED
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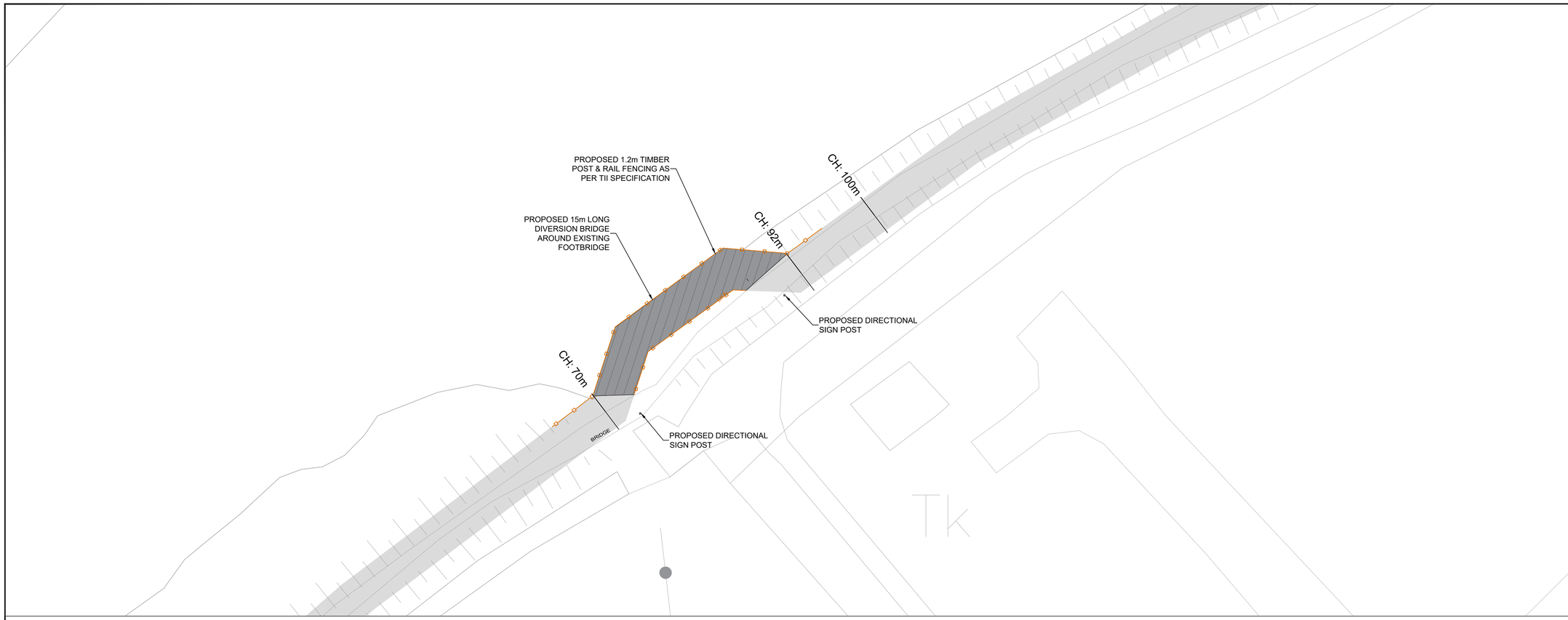

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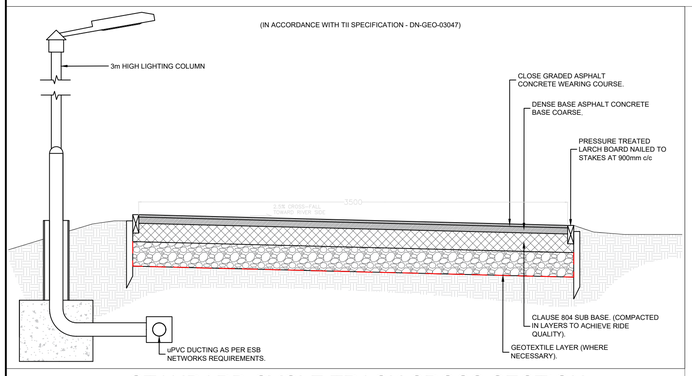
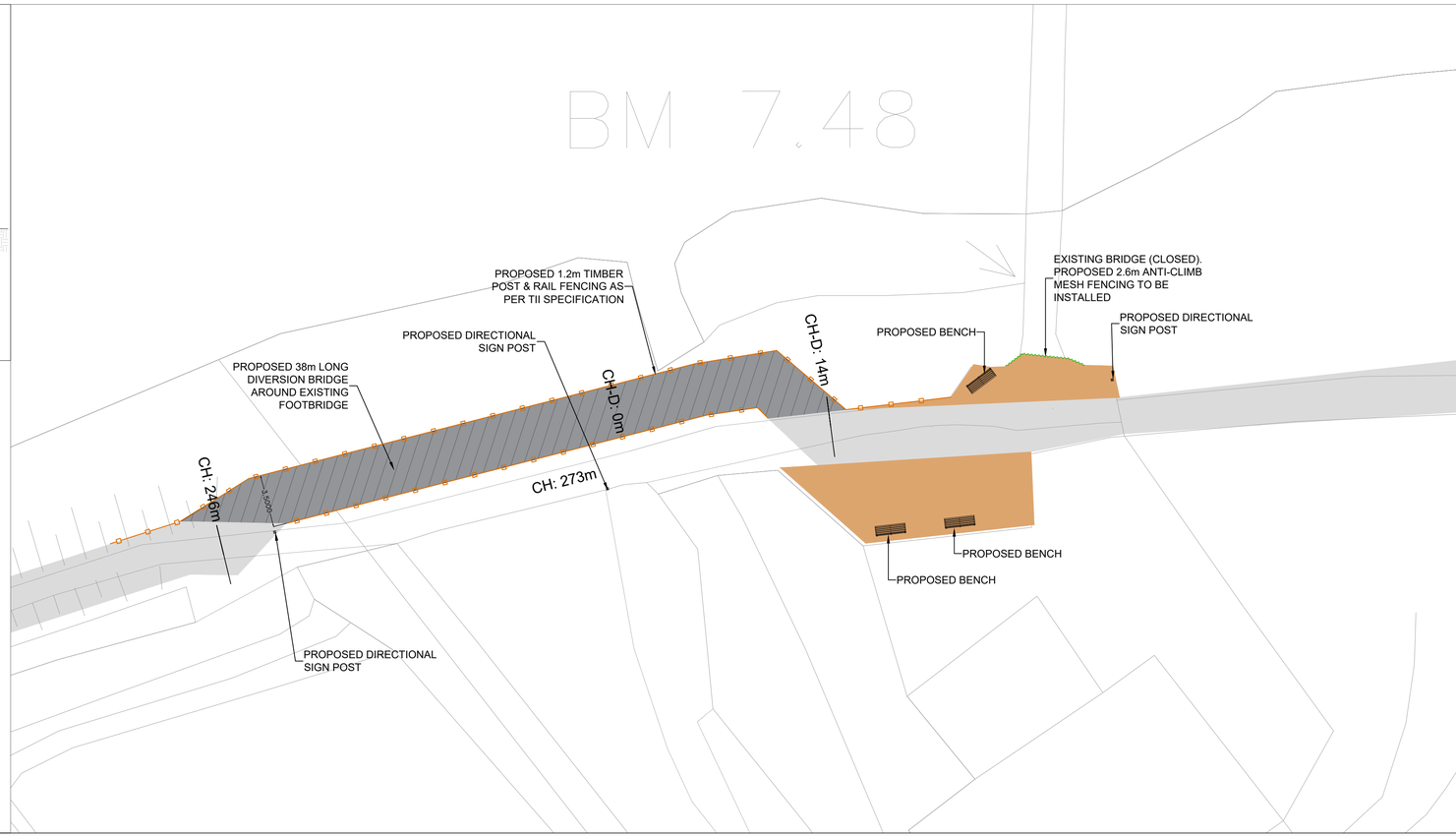


STANDARD CYCLE TRACK CROSS SECTION



DETAIL No. 02

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Legend

- Proposed Route
- Lay-By Area
- Cycle Track
- On-Road Cycle Track
- Proposed Bridge
- 1.2m High Timber Post & Rail Fencing
- 2.4m High Anti-Climb Mesh Fencing
- Directional Sign Post
- Wood/Timber Bollard

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PROJECT
DETAILED DESIGN REPORT
University of Limerick to National Technology Park Cycle Path

TITLE
Detail Design
Proposed Details 01 & 02

Sheet 7 of 16

SCALE @ A1	DATE	DRAWN	CHECKED	APPROVED
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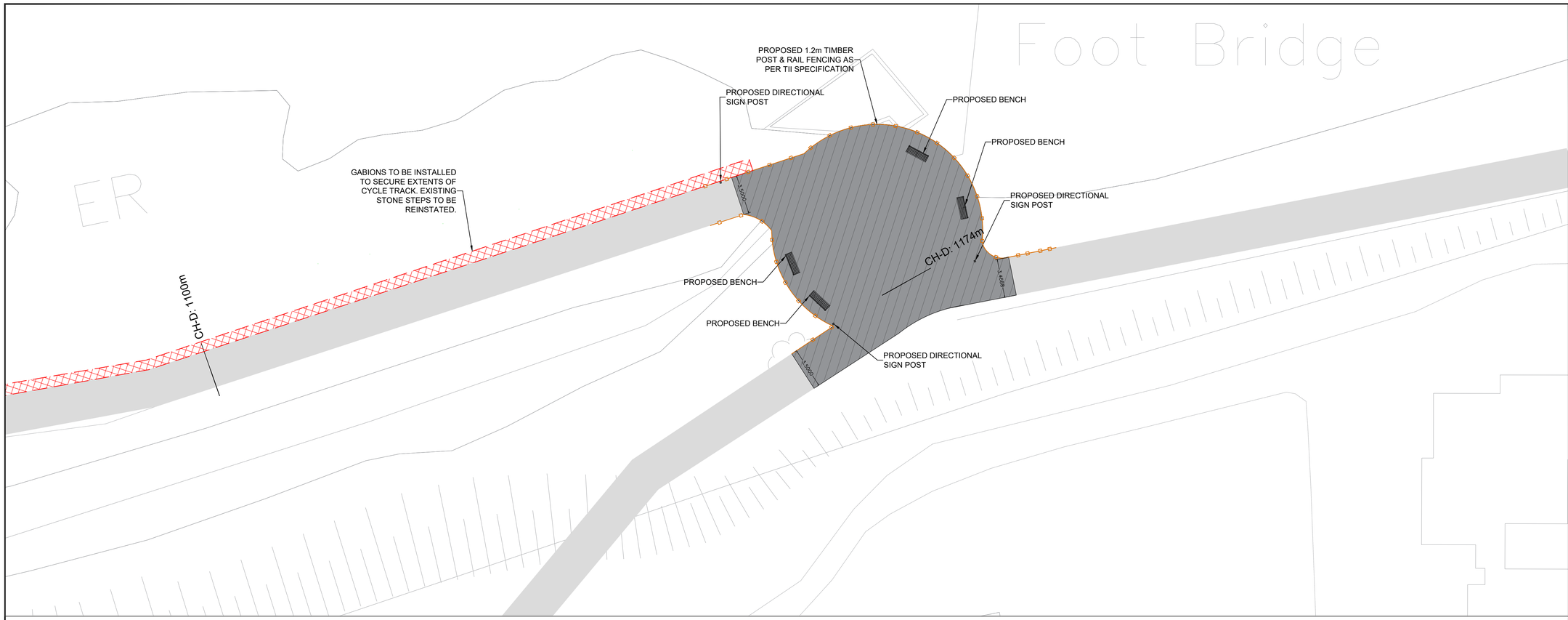

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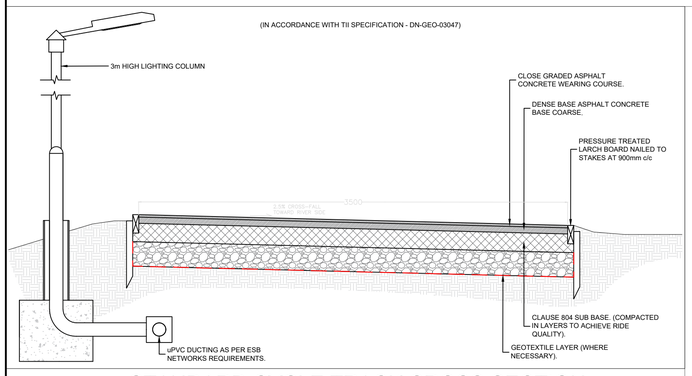
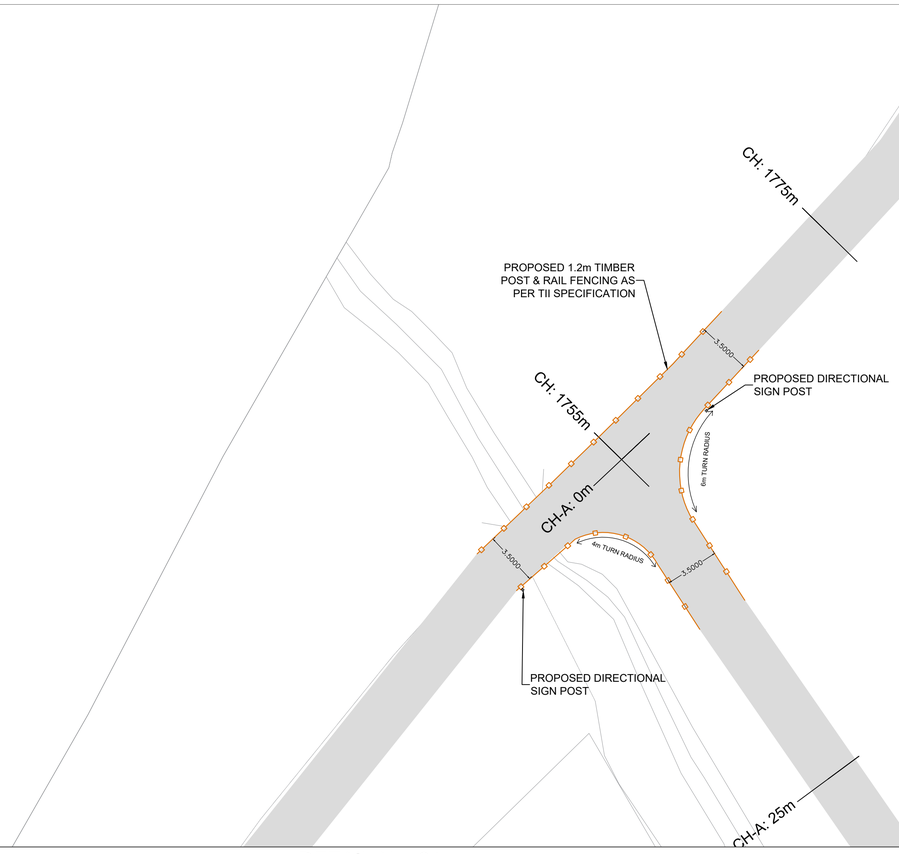


STANDARD CYCLE TRACK CROSS SECTION



DETAIL No. 04

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- Wood/Timber Bollard

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REV	DATE	DRN	DESCRIPTION	CHK	APD

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PROJECT

DETAILED DESIGN REPORT
University of Limerick to National Technology Park Cycle Path

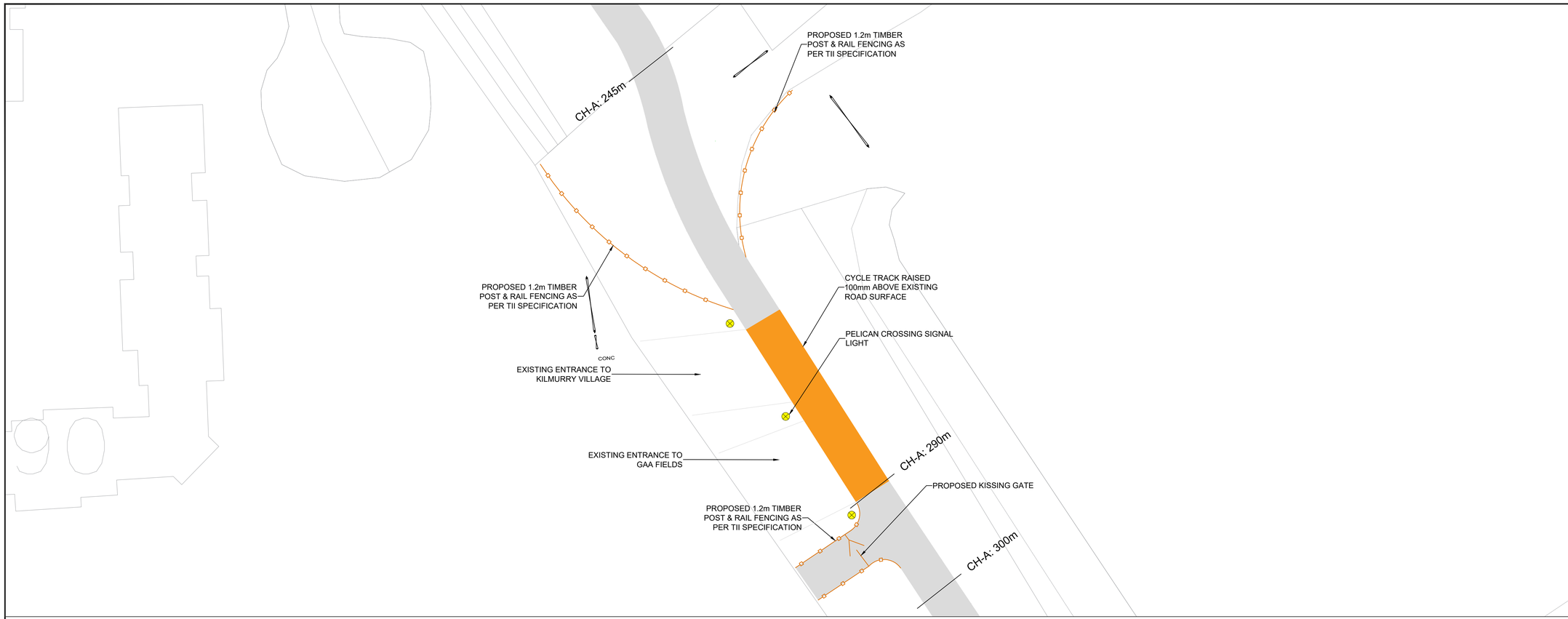
TITLE

Detail Design
Proposed Details 03 & 04

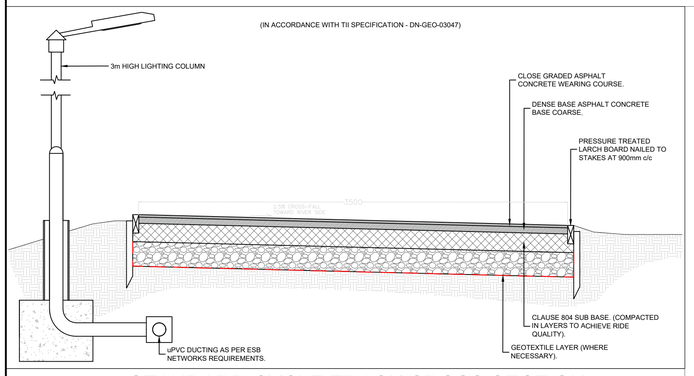
Sheet 8 of 16

SCALE @ A1	DATE	DRAWN	CHECKED	APPROVED
1:200	MAY 2021	KB	BL	PS

JOB No.	CAD FILE PATH	DRAWING No.	REV.
2535	UL to NTP cycle lanes / 18	DD-007	-



DETAIL No. 05



STANDARD CYCLE TRACK CROSS SECTION

DETAIL No. 06

Notes

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Legend

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- Proposed Bridge
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- Directional Sign Post
- Wood/Timber Bollard

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PROJECT

DETAILED DESIGN REPORT
University of Limerick to National Technology Park Cycle Path

TITLE

Detail Design
Proposed Details 05 & 06

SCALE @ A1	DATE	DRAWN	CHECKED	APPROVED
1:200	MAY 2021	KB	BL	PS

JOB No.	CAD FILE PATH	DRAWING No.	REV.
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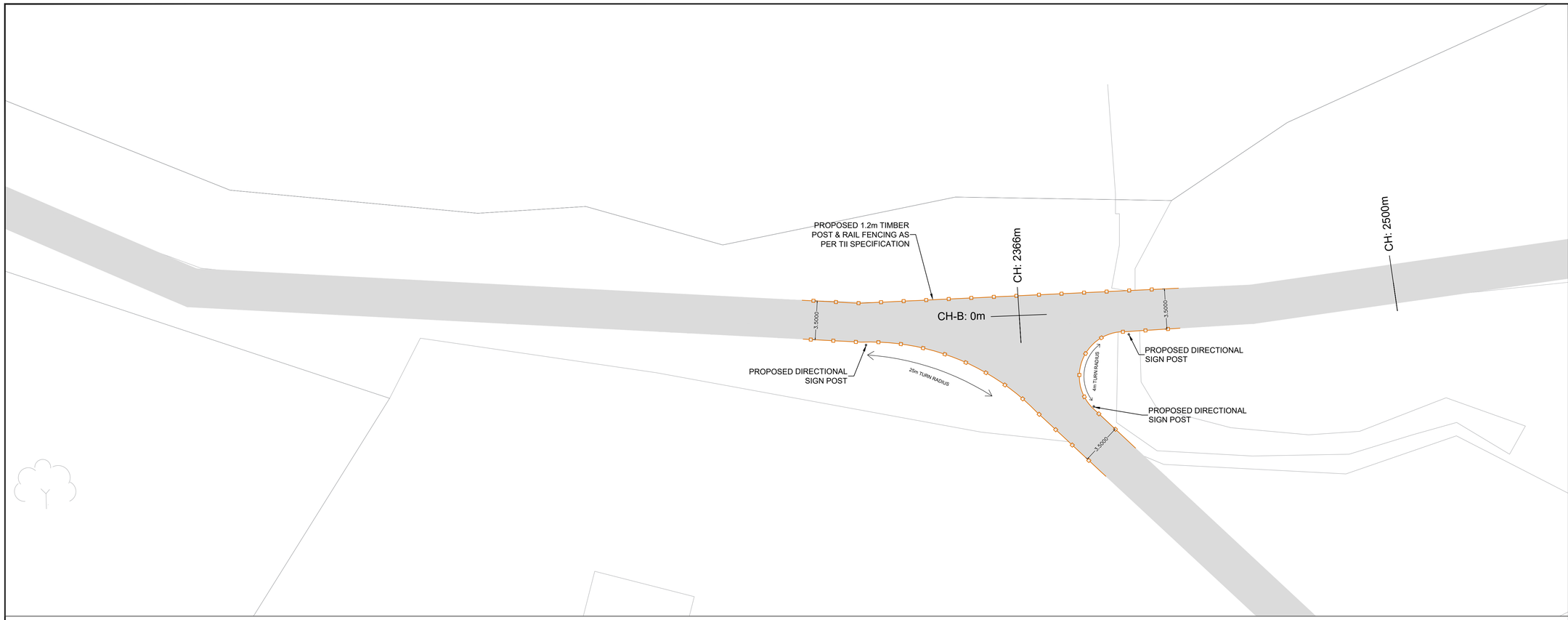

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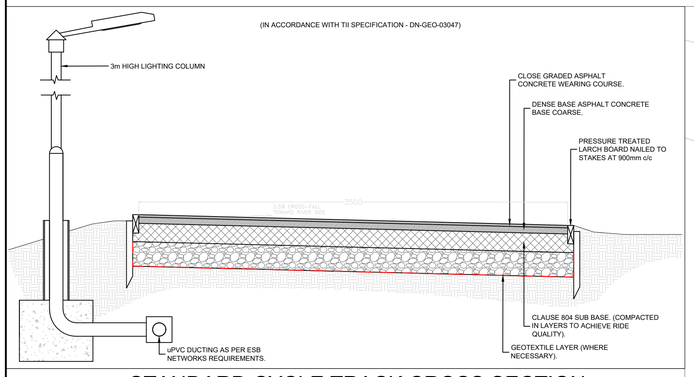
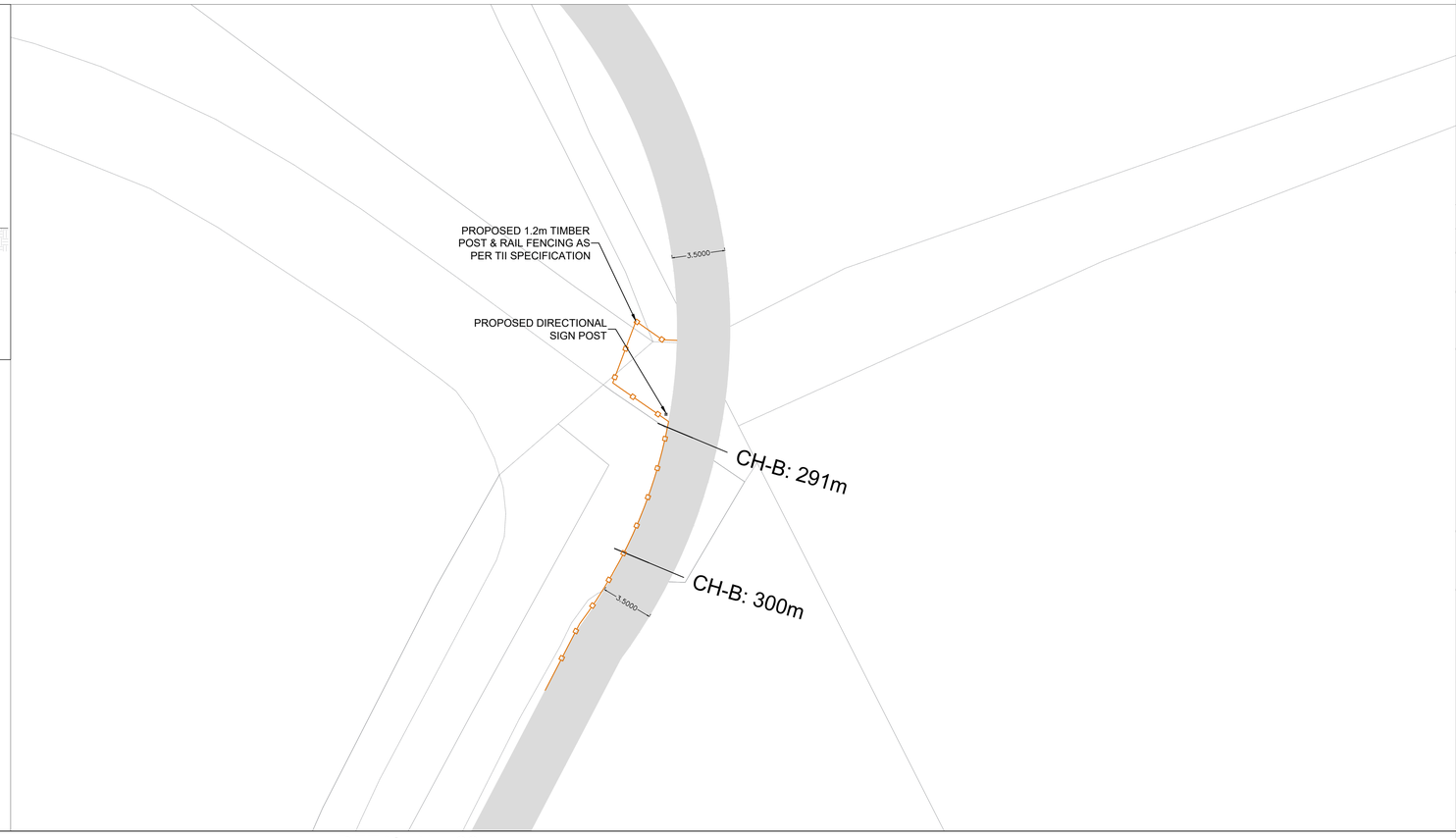


STANDARD CYCLE TRACK CROSS SECTION



DETAIL No. 08

Notes

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PROJECT
DETAILED DESIGN REPORT
University of Limerick to National Technology Park Cycle Path

TITLE
Detail Design
Proposed Details 07 & 08

Sheet 10 of 16

SCALE @ A1	DATE	DRAWN	CHECKED	APPROVED
1:200	MAY 2021	KB	BL	PS

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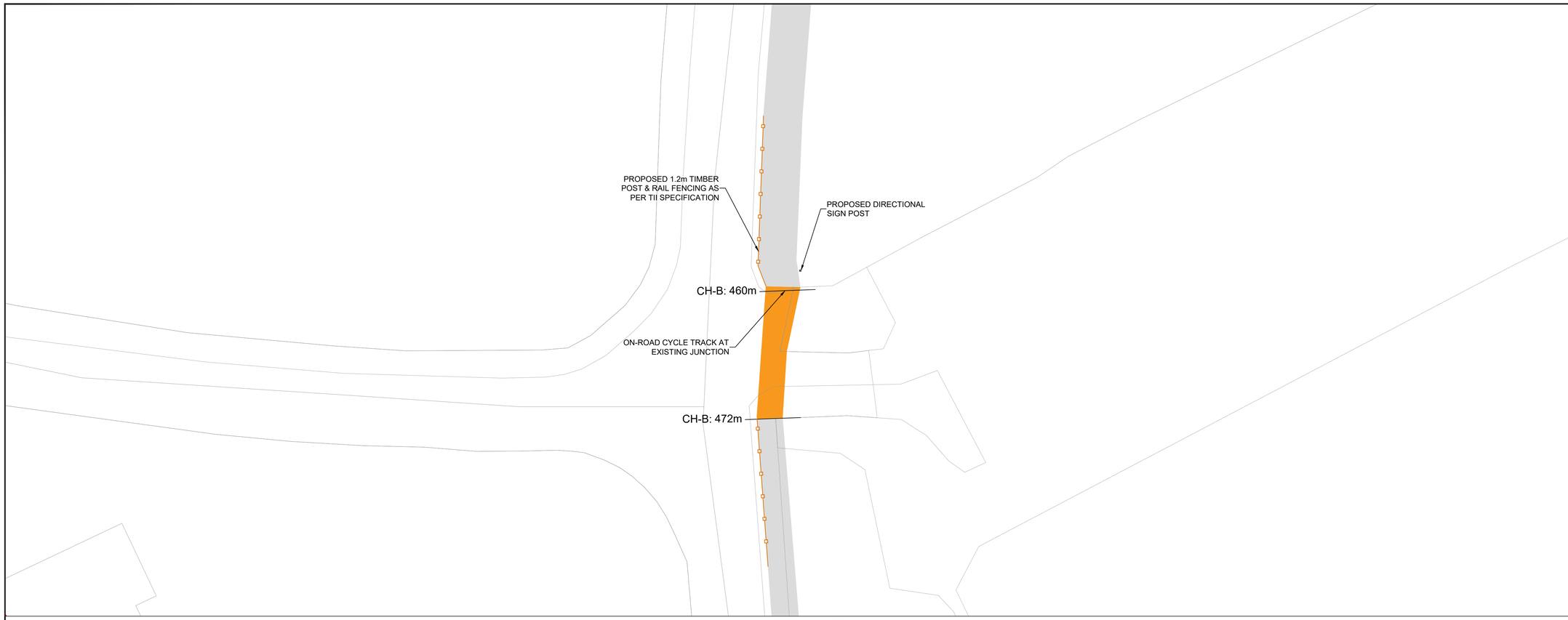

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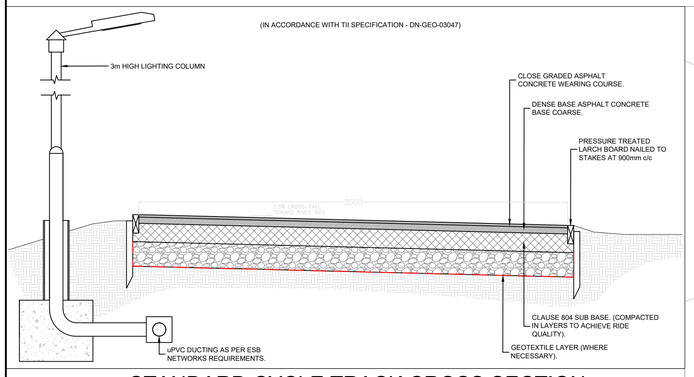
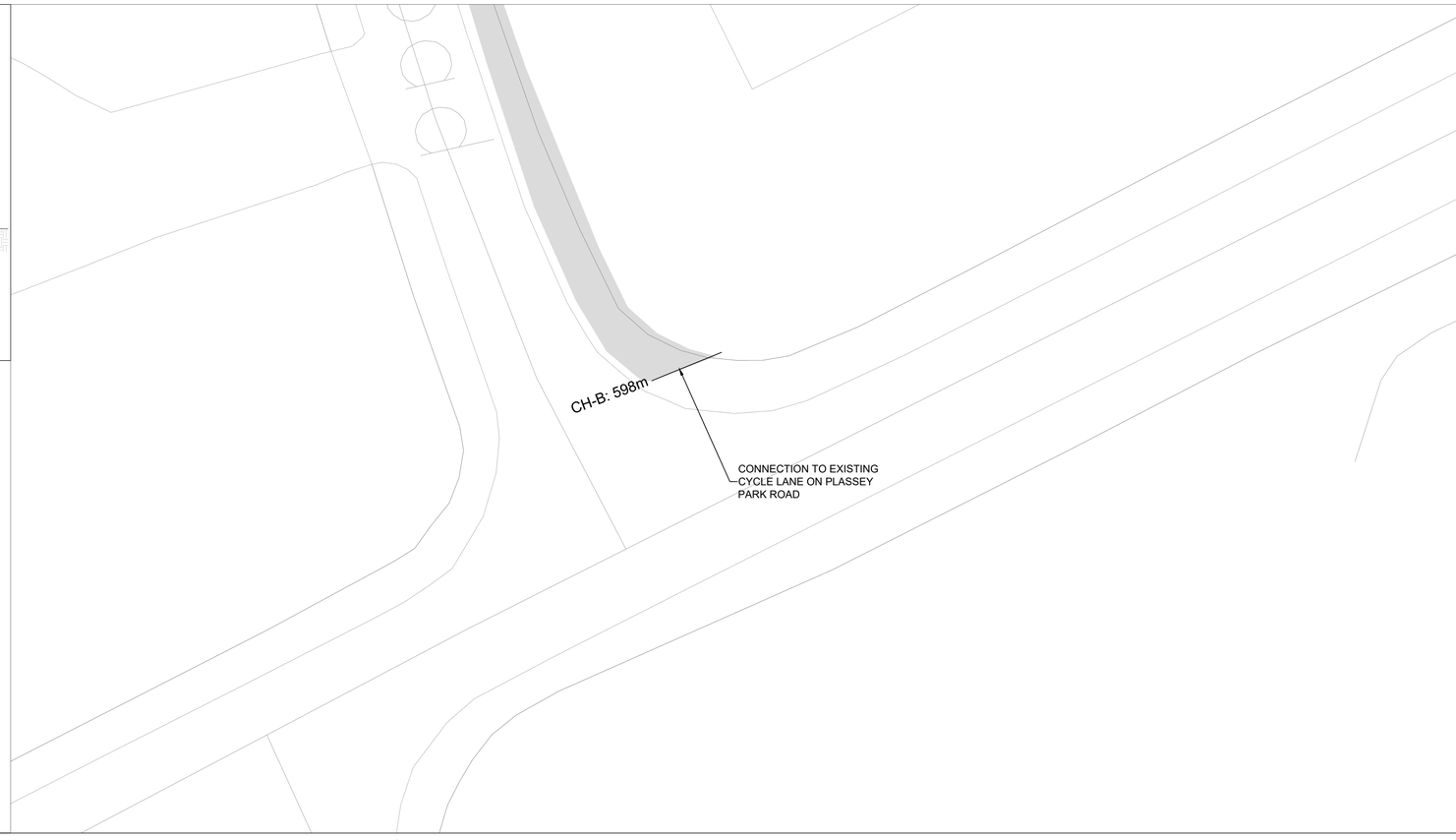


STANDARD CYCLE TRACK CROSS SECTION



DETAIL No. 10

Notes

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DETAILED DESIGN REPORT
University of Limerick to National Technology Park Cycle Path

TITLE

Detail Design
Proposed Details 09 & 10

Sheet 11 of 16

SCALE @ A1	DATE	DRAWN	CHECKED	APPROVED
1:200	MAY 2021	KB	BL	PS

JOB No.	CAD FILE PATH	DRAWING No.	REV.
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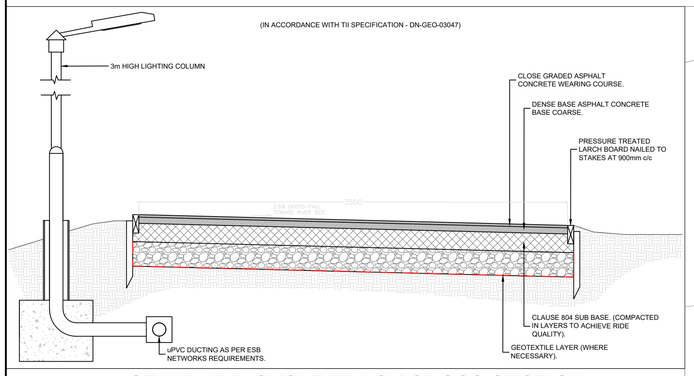
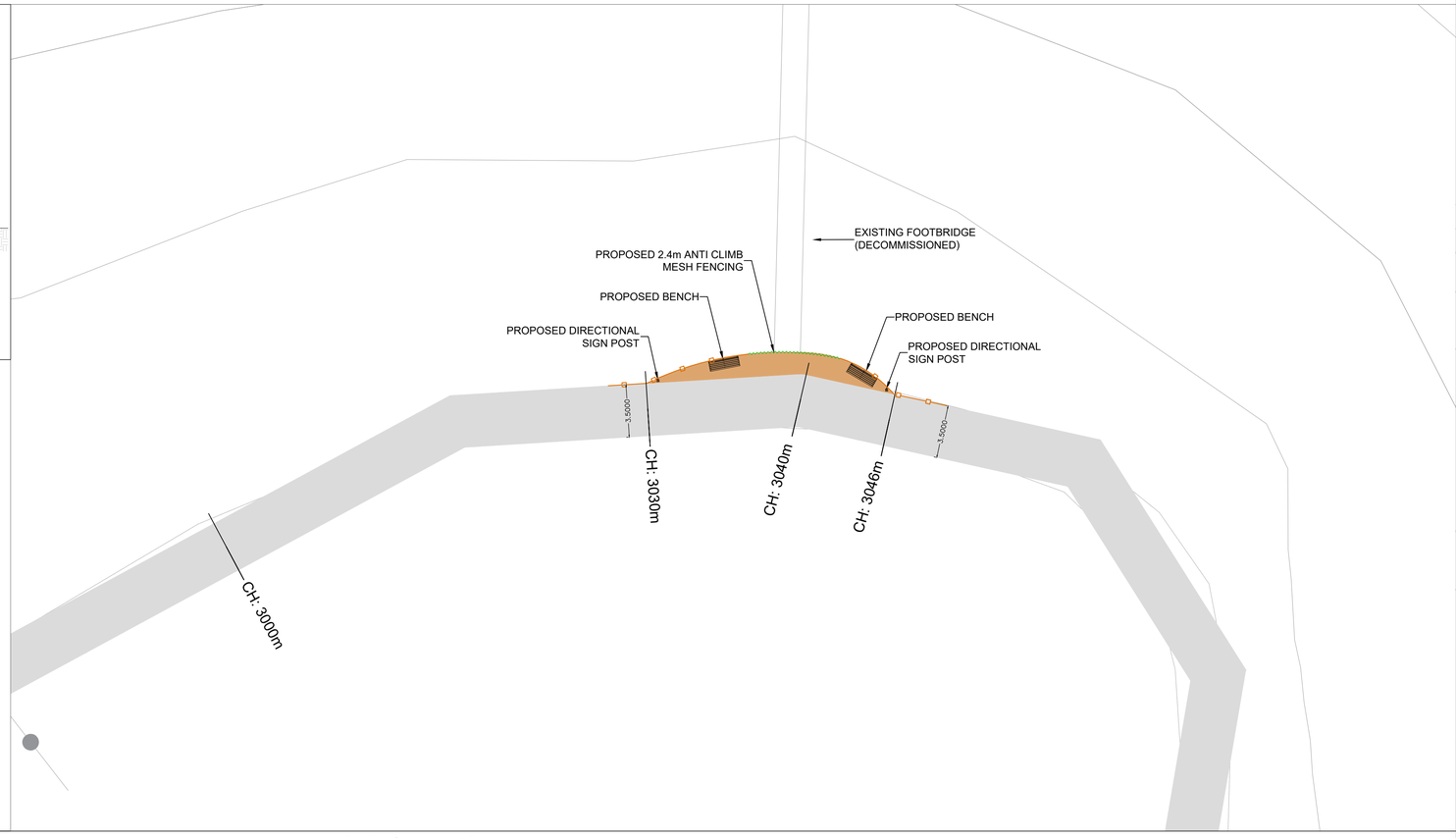
DETAIL No. 11



STANDARD CYCLE TRACK CROSS SECTION



DETAIL No. 12

Notes

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PROJECT
DETAILED DESIGN REPORT
University of Limerick to National Technology Park Cycle Path

TITLE
Detail Design
Proposed Details 11 & 12

Sheet 12 of 16

SCALE @ A1	DATE	DRAWN	CHECKED	APPROVED
1:200	MAY 2021	KB	BL	PS

JOB No.	CAD FILE PATH	DRAWING No.	REV.
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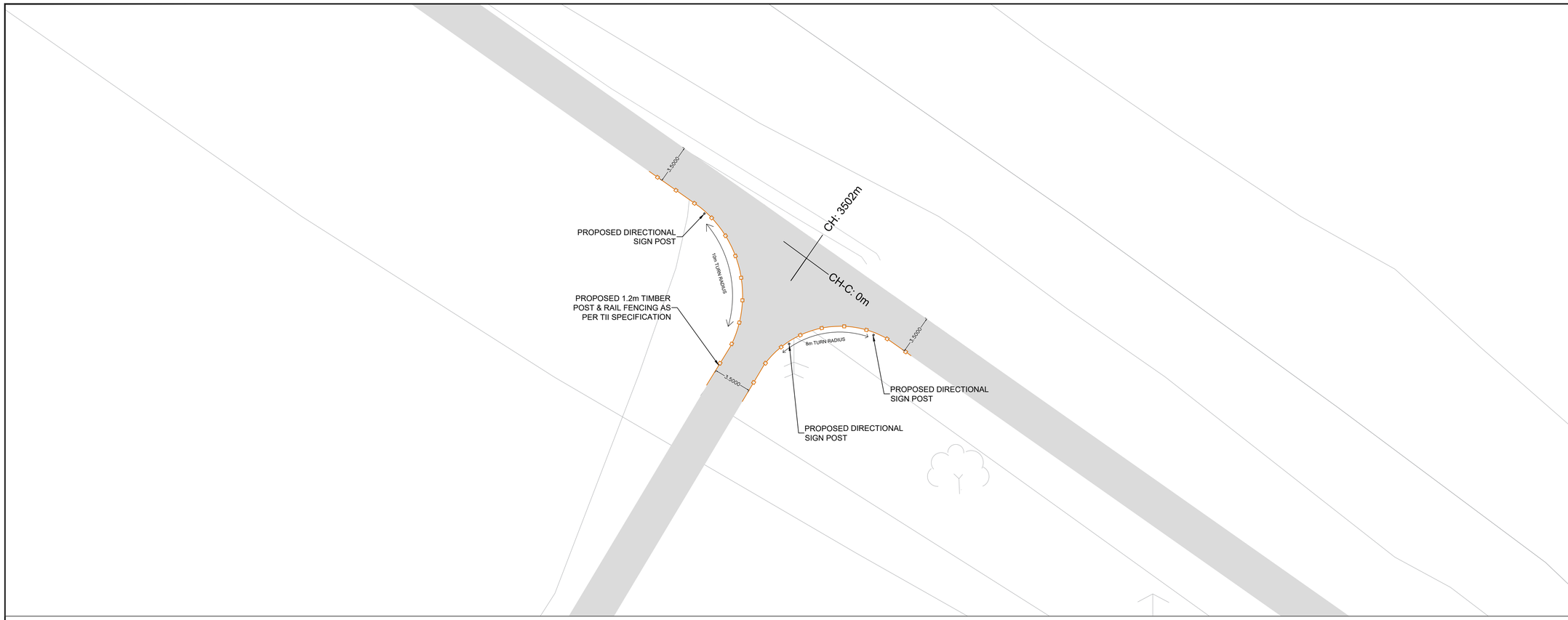

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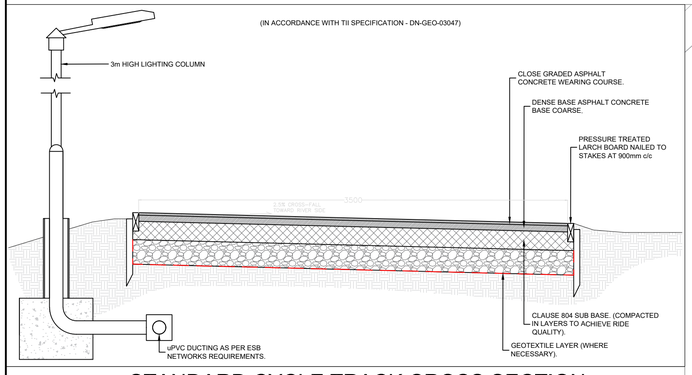
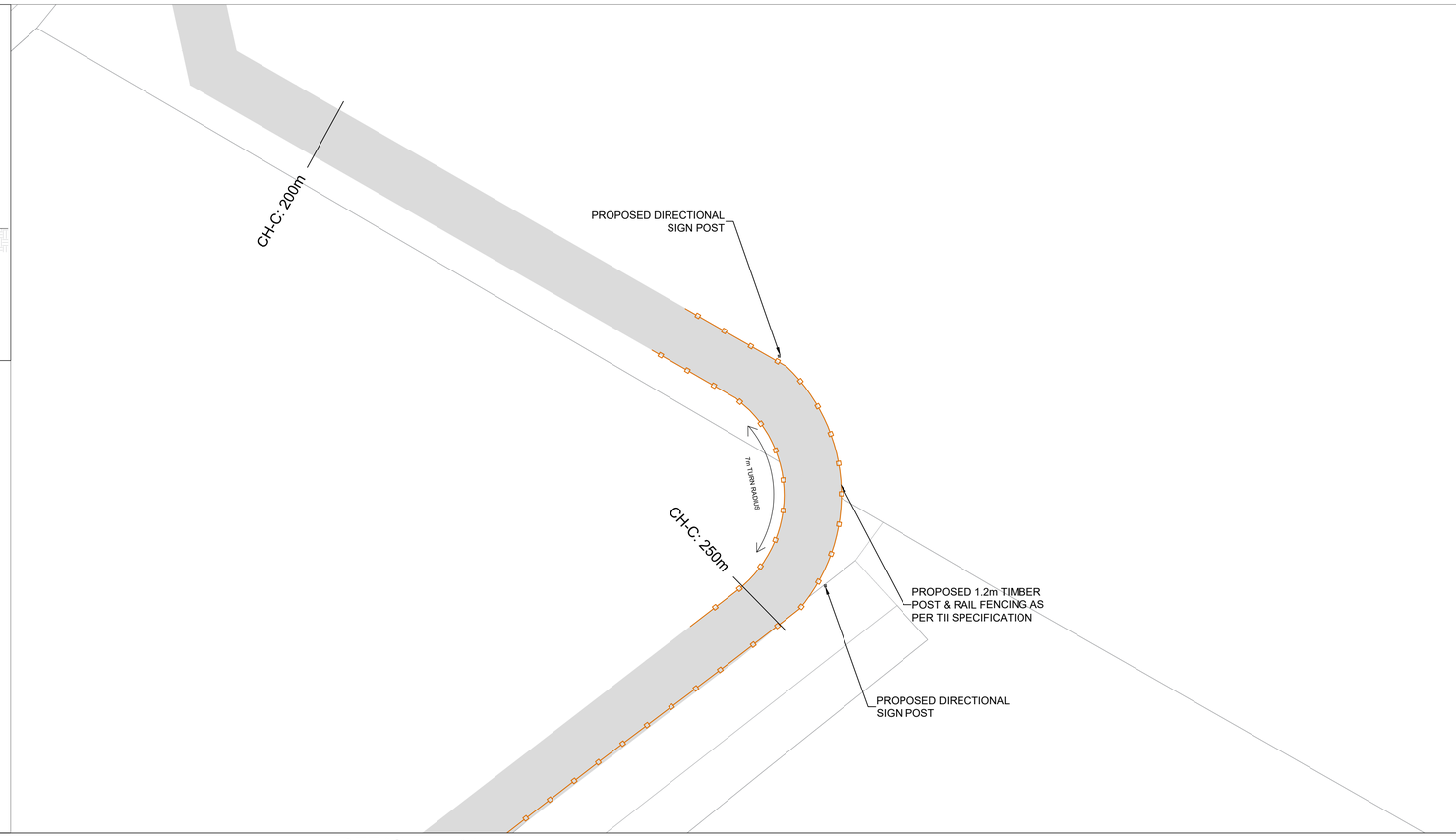


STANDARD CYCLE TRACK CROSS SECTION



DETAIL No. 14

Notes

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PROJECT
DETAILED DESIGN REPORT
University of Limerick to National Technology Park Cycle Path

TITLE
Detail Design
Proposed Details 13 & 14

Sheet 13 of 16

SCALE @ A1	DATE	DRAWN	CHECKED	APPROVED
1:200	MAY 2021	KB	BL	PS

JOB No.	CAD FILE PATH	DRAWING No.	REV.
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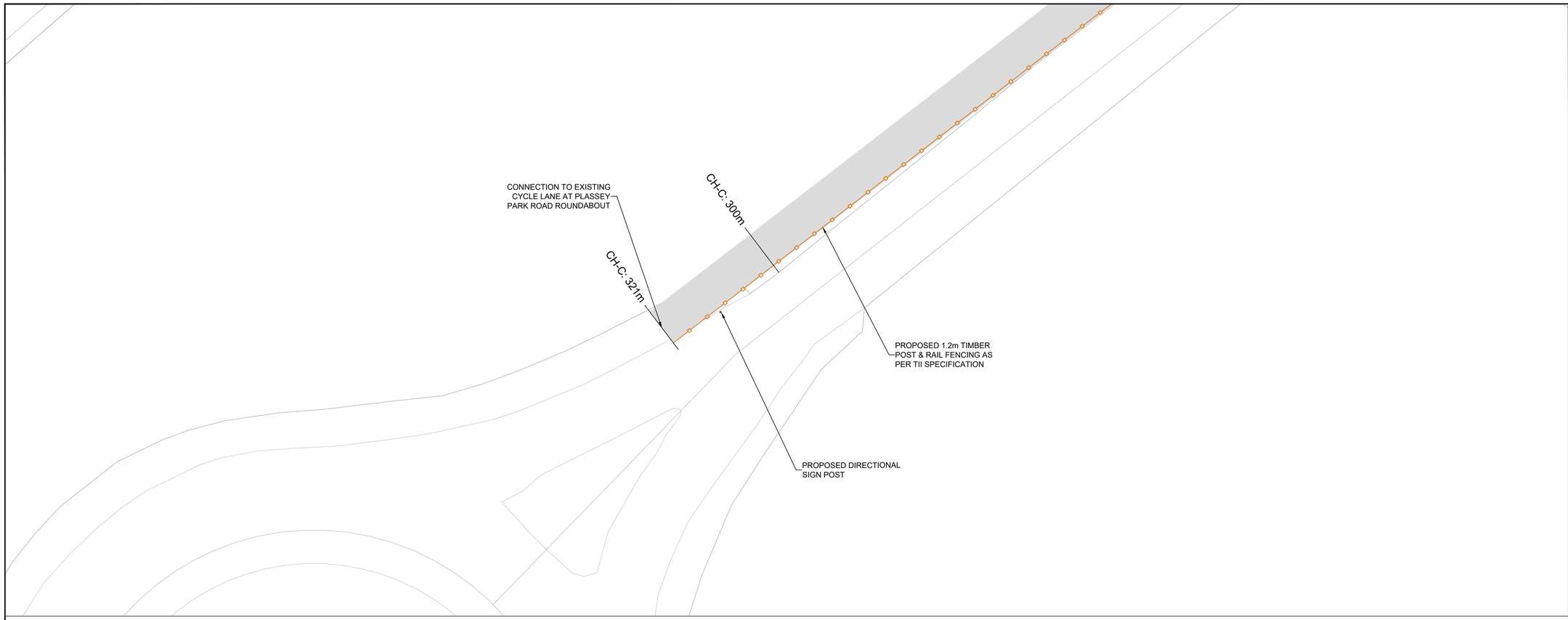

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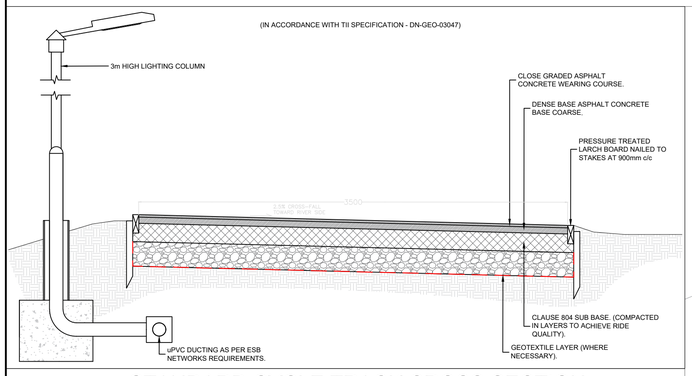
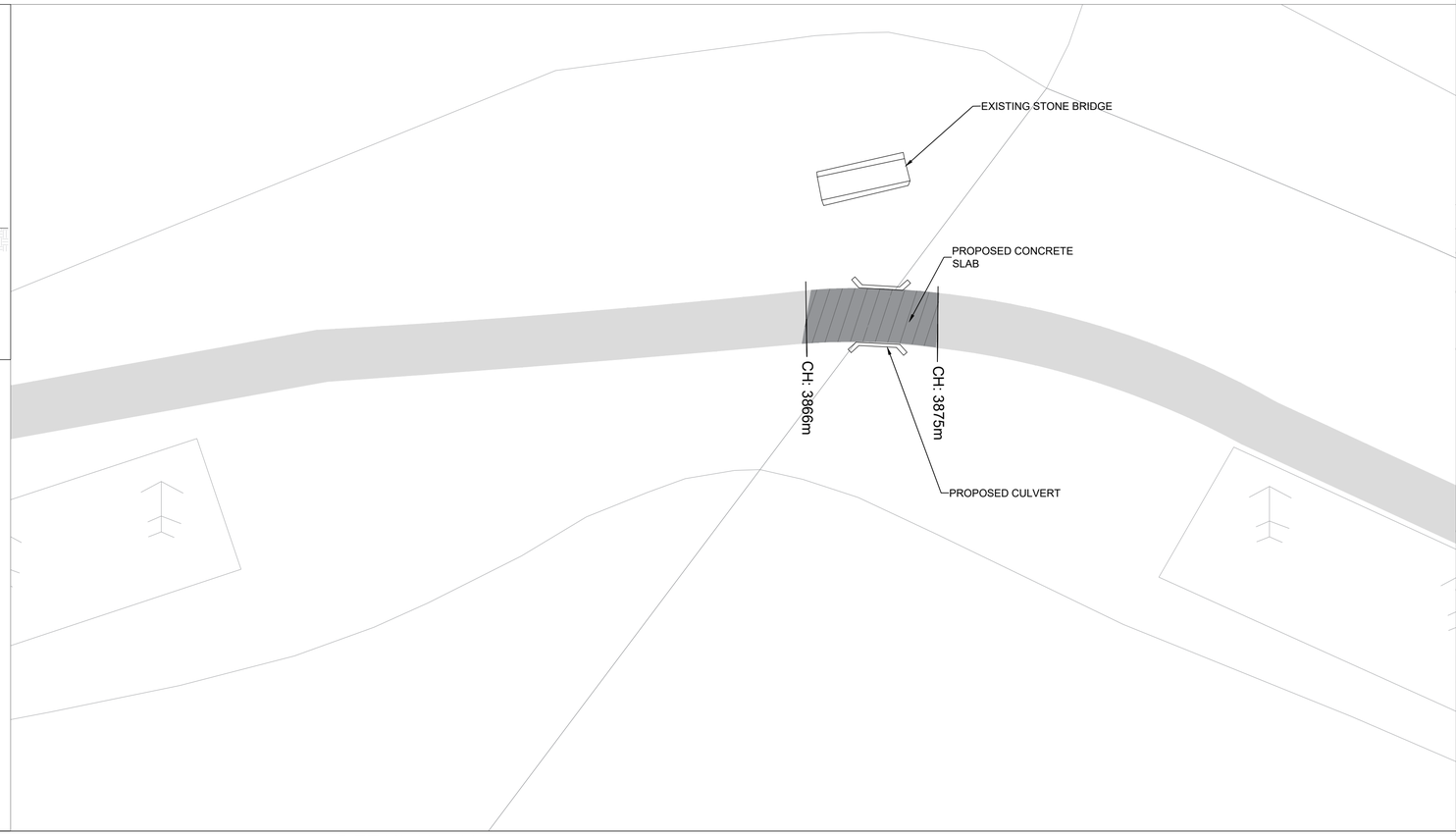


STANDARD CYCLE TRACK CROSS SECTION



DETAIL No. 16

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PROJECT

DETAILED DESIGN REPORT
University of Limerick to National Technology Park Cycle Path

TITLE

Detail Design
Proposed Details 15 & 16

Sheet 14 of 16

SCALE @ A1	DATE	DRAWN	CHECKED	APPROVED
1:200	MAY 2021	KB	BL	PS

JOB No.	CAD FILE PATH	DRAWING No.	REV.
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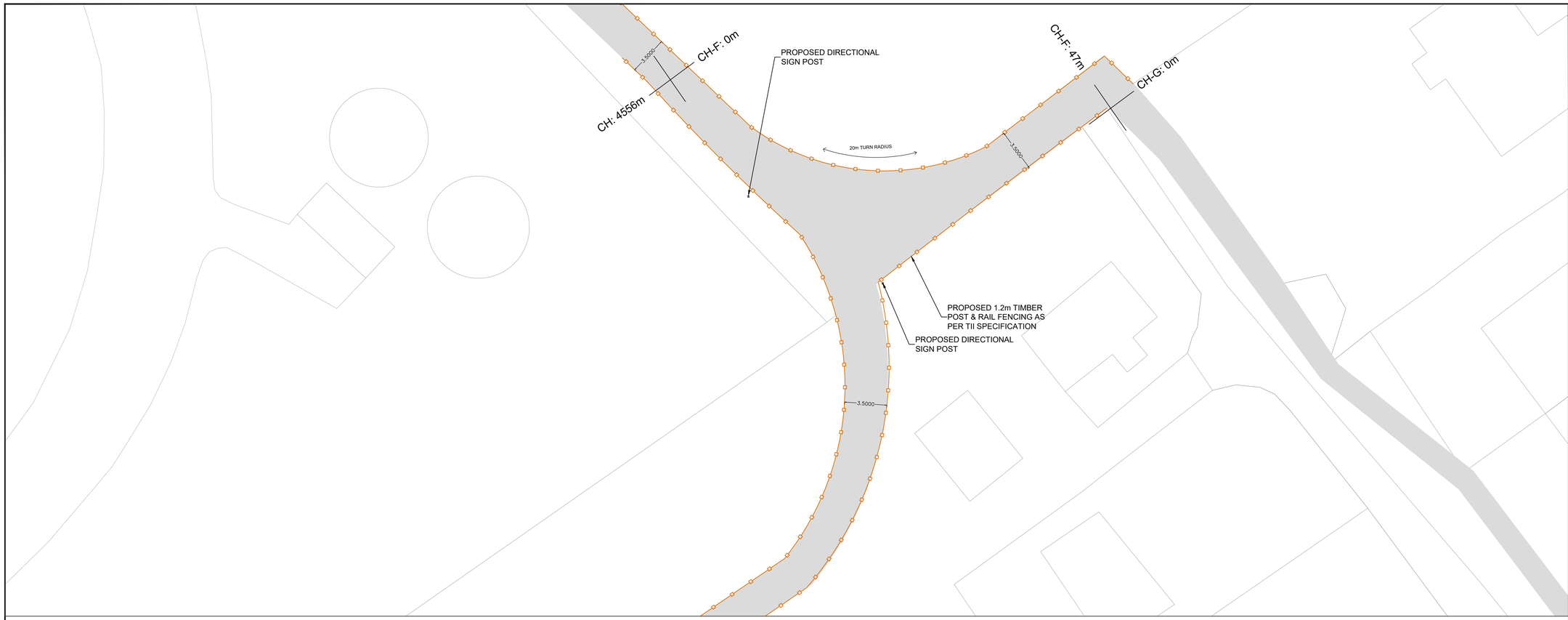

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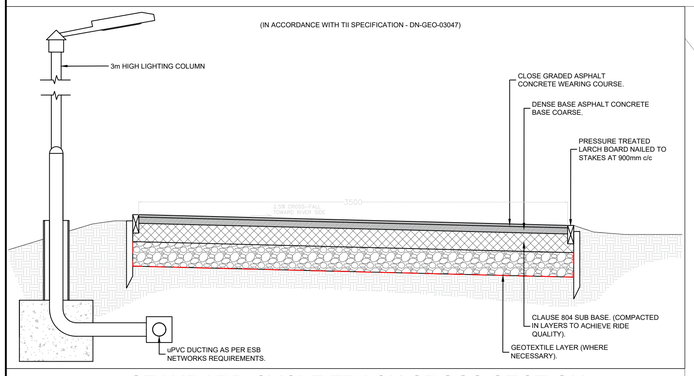
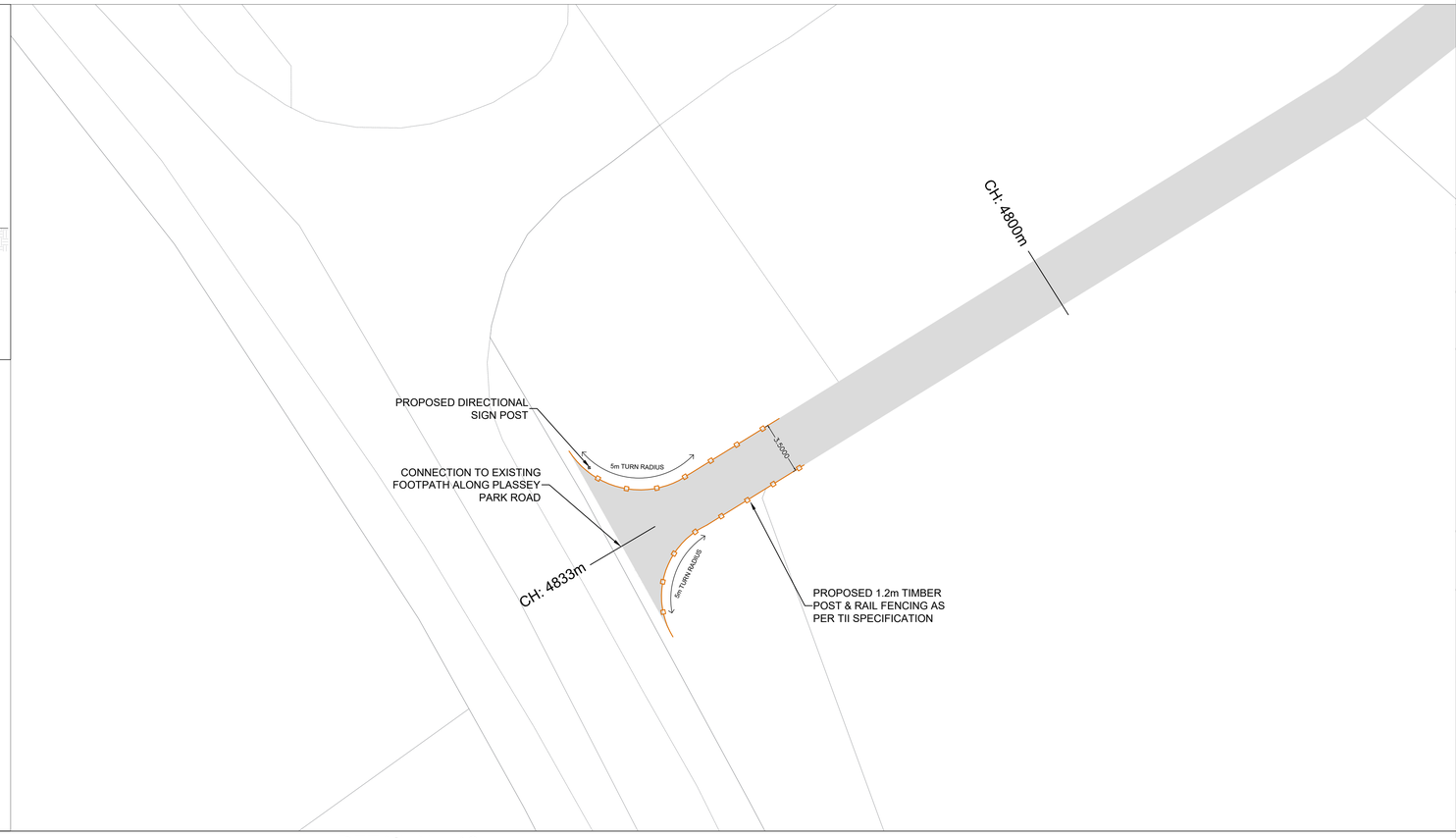


STANDARD CYCLE TRACK CROSS SECTION



DETAIL No. 18

Notes

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DETAILED DESIGN REPORT
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Detail Design
Proposed Details 17 & 18

Sheet 15 of 16

SCALE @ A1	DATE	DRAWN	CHECKED	APPROVED
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JOB No.	CAD FILE PATH	DRAWING No.	REV.
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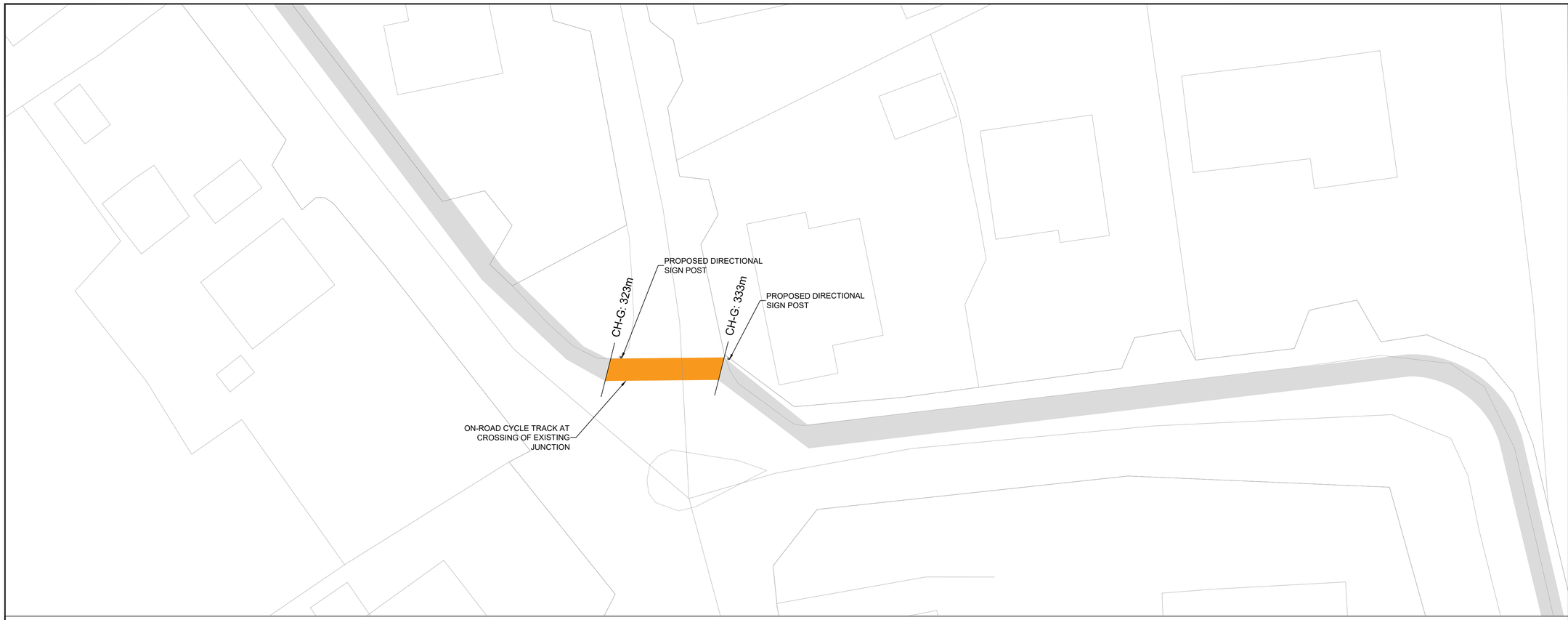

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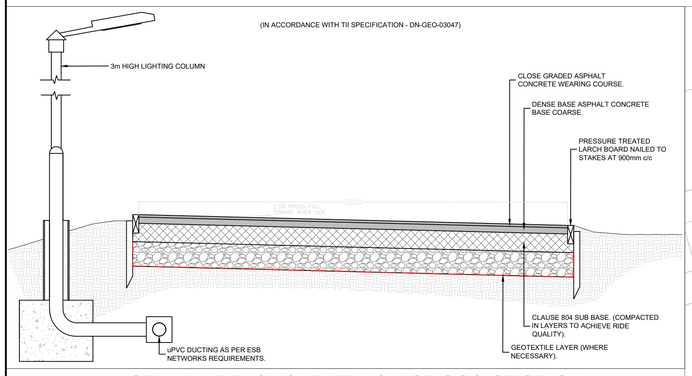
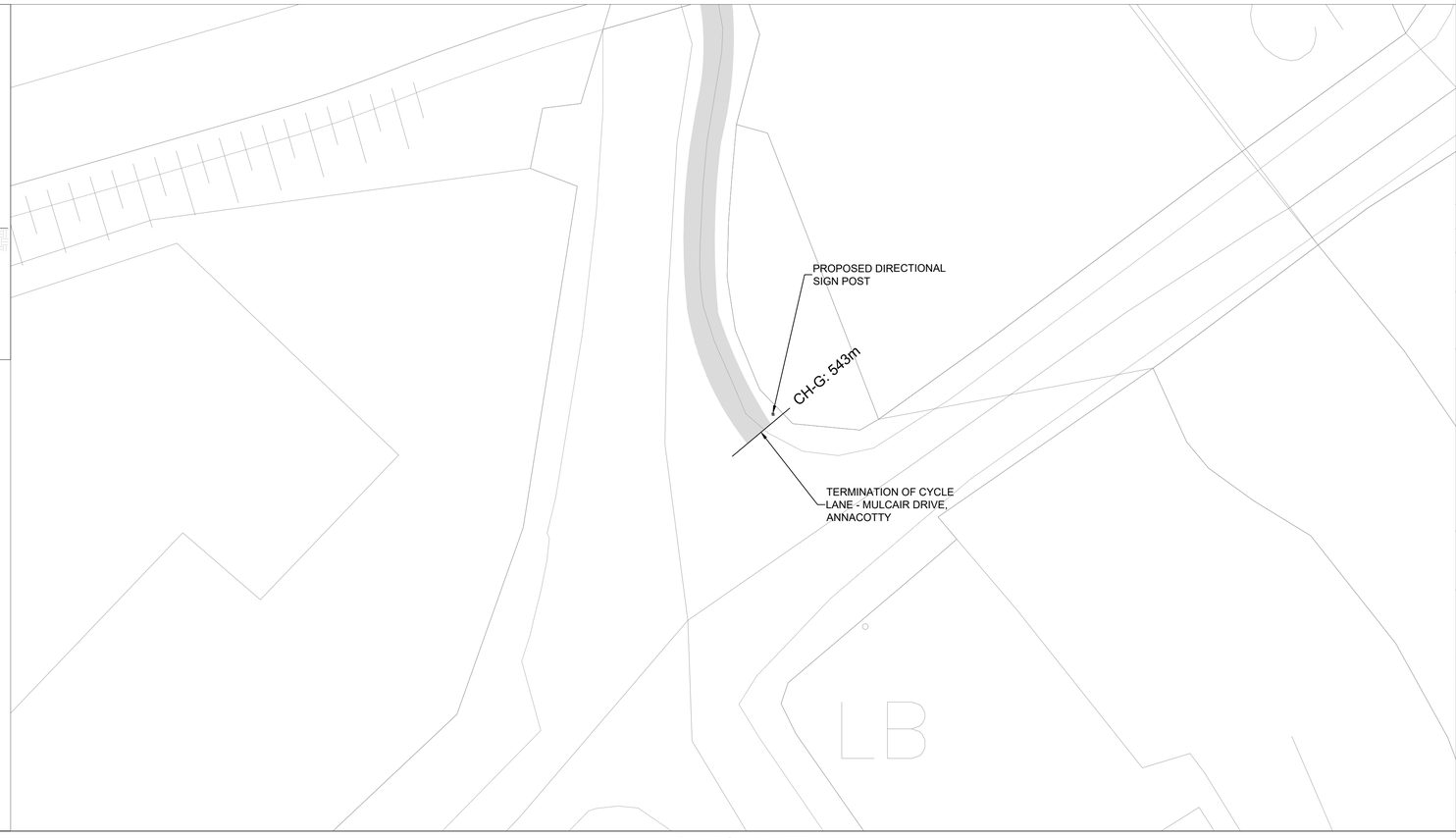


STANDARD CYCLE TRACK CROSS SECTION



DETAIL No. 20

Notes

1. **Levels are in metres O.D. and refer to Malin Head Datum.**
2. **Dimensions are in millimetres unless otherwise stated.**
3. **Figured dimensions only to be used. If in doubt check with the Engineer in advance of construction.**
4. **For Existing Electrical and Telecom Services contact the relevant utility provider.**
5. **Existing Services are based on record drawings and should not be deemed to be inclusive of all.**
6. **Services should be located on site by the Contractor prior to commencement of excavation.**
7. **The Contractor shall consult with utility companies and carry out investigative works to locate all services prior to all excavations.**

Legend

- Proposed Route
- Lay-By Area
- Cycle Track
- On-Road Cycle Track
- Proposed Bridge
- 1.2m High Timber Post & Rail Fencing
- 2.4m High Anti-Climb Mesh Fencing
- Directional Sign Post
- Wood/Timber Bollard

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REV	DATE	DRN	DESCRIPTION	CHK	APD

REVISIONS

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DRAWING STATUS

☐ PRELIMINARY ☒ CONTRACT ☐ TENDER ☐ CONSTRUCTION
☐ FOR APPROVAL ☐ FOR YOUR INFORMATION ☐ AS CONSTRUCTED ☐ DRAFT

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Limerick City & County Council

PROJECT

DETAILED DESIGN REPORT
University of Limerick to National Technology Park Cycle Path

TITLE

Detail Design
Proposed Details 19 & 20

Sheet 16 of 16

SCALE @ A1	DATE	DRAWN	CHECKED	APPROVED
1:200	MAY 2021	KB	BL	PS

JOB No.	CAD FILE PATH	DRAWING No.	REV.
2535	UL to NTP cycle lanes / 18	DD-015	-

Comhairle Cathrach & Contae Luimnigh

Limerick City & County Council

Limerick City Greenway (UL to NTP) Project

Invasive Species Management Plan

December 2024

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CLIENT	Limerick City and County Council
PROJECT NO.	2535
PROJECT TITLE	Limerick City Greenway (UL to NTP)
REPORT TITLE	Invasive Species Management Plan

REV.	STATUS	AUTHOR	REVIEWED BY	APPROVED BY	ISSUE DATE
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1	Updated following LCCC review	G. Kilbane	J. O'Connor	B. Larkin	8/11/2021
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3	Updated for new route	B. Quinn	T. Stafford	B. Larkin	17/07/2024
4	Updated for revised route	B. Quinn	T. Stafford	B. Larkin	16/12/2024

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1. INTRODUCTION

1.1 Introduction and Objectives

Ryan Hanley was commissioned by the Limerick City and County Council (LCCC) to carry out an invasive species survey and prepare an Invasive Species Management Plan (ISMP) for the prevention of spread, and the management of invasive species within the footprint of the proposed Limerick City Greenway (University Limerick (UL) to National Technology Park (NTP)), County Limerick herein referred to as the Greenway project.

The purpose of this ISMP is to set out options for control and initiate a plan to manage and prevent the spread of invasive species recorded within the Study Area of the Greenway project.

Walkover surveys were conducted on 5th November 2020, 14th May 2021, 28th April 2022, 3rd May 2023 and the 26th of June 2024. A number of invasive alien species (IAS) including Himalayan balsam (*Impatiens glandulifera*) and Giant hogweed (*Heracleum mategzzianum*) were recorded during these walkovers and documented growing within the Study Area of the proposed Greenway project. The main objectives of the ISMP are as follows:

1. To identify the extent of these invasive species infestations within the Study Area of the Limerick City Greenway project;
2. To identify appropriate eradication and/or control measures to prevent the spread of invasive species within the Study Area; and
3. To identify and recommend the most favoured method for avoiding the spread of invasive species as per the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. No. 477/2011).

This ISMP outlines the biosecurity strategies that will be adopted before and during the construction of the Limerick City Greenway to prevent the spread of invasive species. **The ISMP is intended to be a working document and will be updated annually during the pre-construction, construction and operational phases of the Project.** The ISMP will inform and be instructive to the Construction Environmental Management Plan (CEMP). Following construction, the plan will be updated for the operational phase of the project, taking into account any operational maintenance requirements.

Construction and any scheduled maintenance work undertaken during the project could potentially disturb stands of invasive plants and/or soils contaminated with invasive plant material. In addition to lands within the proposed works areas, there is a potential risk of invasive plant species being spread to neighbouring lands, public roads, and other locations.

1.2 Legislative Framework

Action 28 of the first National Biodiversity Plan (2002) required Ireland to prepare strategies, in consultation with Northern Ireland, to control introduced species and to prevent, or minimise future (accidental or deliberate) introduction of alien species, which might threaten biodiversity both within and outside protected areas. The National Biodiversity Action Plan 2017-2021, Irelands 3rd National Biodiversity Plan builds on this and Target 4.4 of Objective 4- Conserve and restore biodiversity and ecosystem services in the wider countryside aims to ensure '*Harmful invasive alien species are controlled and there is reduced risk of spread of new species*'.

1.2.1 European Communities (Birds and Natural Habitats) Regulations 477/2011

The European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. No. 477/2011) contains specific provisions that govern control of invasive species listed on its Third Schedule. Article 49 of the Regulation prohibits the introduction, breeding, release or dispersal of certain species and Article 50 prohibits dealing in and keeping certain species.

Article 49 (2) states; '*Save in accordance with a licence granted under paragraph (7), any person who plants, disperses, allows or causes to disperse, spreads or otherwise causes to grow in any place specified in relation to such plant in the third column of Part 1 of the Third Schedule, any plant which is included in Part 1 of the Third Schedule, shall be guilty of an offence*'.

Article 50 (2) states; '*Save in accordance with a licence granted under paragraph (70, a person shall be guilty of an offence if he or she imports or transports:*

(a) An animal or plant listed in Part 1 or Part 2 of the Third Schedule;
(b) Anything from which an animal or plant referred to in Part 2 of the Third Schedule can be reproduced or propagated; or
(c) A vector material listed in Part 3 of the Third Schedule.

Into or in or to any place in the State specified in relation to such an animal or plant or vector material in relation to that animal or plant or vector material in the third column of the Third Schedule.'

The implications of Article 50 result in the requirement of a license for the disposal of non-native alien species at an offsite licenced facility where onsite management is not feasible. Part 50 of the 2011 Regulation has not yet come into effect.

Species listed on the Third Schedule were derived from the Invasive Species in Ireland prioritisation risk assessment undertaken in 2013. From this, 48 non-native species were ranked as at risk of having a High Impact and 78 species at risk of having a Medium Impact.

1.2.2 EU Regulation 1143/2014

EU Regulation 1143/2014 on invasive alien species was entered into force on the 1st January 2015. It provides for a set of measures to prevent, minimise and mitigate adverse impacts in relation to invasive alien species to be taken across the EU that are included on the list of Invasive Alien Species of Union concern. Three distinct types of measures are envisaged, which follow an internationally agreed hierarchical approach to combatting IAS:

- Prevention: a number of robust measures aimed at preventing IAS of Union concern from entering the EU, either intentionally or unintentionally;
- Early detection and rapid eradication: Member States must put in place a surveillance system to detect the presence of IAS of Union concern as early as possible and take rapid eradication measures to prevent them from establishing; and
- Management: some IAS of Union concern are already well-established in certain Member States and concerted management action is needed so that they do not spread any further and to minimize the harm they cause.

Chapter II Preventions - Article 7 Restrictions

1. Invasive alien species of Union concern shall not be intentional:

a) brought into the territory of the Union, including transit under customs supervision;

b) kept, including in contained holding;
c) bred, including in contained holding;
d) transported to, from or within the Union, except for the transportation of species to facilities in the context of eradication;
e) placed on the market;
f) used or exchanged;
g) permitted to reproduce, grow or cultivate, including in contained holding; or
h) released into the environment.

2. Member States shall take all necessary steps to prevent the unintentional introduction or spread, including where applicable, by gross negligence, of invasive alien species of Union concern.

1.3 Guidance Documents

The eradication/control measures identified in this ISMP for the proposed Scheme apply the most relevant and current guidance in relation to the treatment and management of invasive alien plant species in construction projects. These measures were derived from best practice guidance manuals from both the UK and Ireland, in particular:

- The Management of Invasive Alain Plant Species on National Roads- Technical Guidance (TII, 2020);
- NRA Guidelines on the Management of Noxious Weeds and Non-Native Invasive Plant Species on National Road Schemes (NRA, 2010);
- Managing Invasive Non-native Plants in or near Freshwater, Environment Agency (2010);
- Best Practice Management Guidelines Himalayan balsam *Impatiens glandulifera*, Invasive Species Ireland (2008); and
- Best Practice Management Guidelines Giant hogweed *Heracleum mantegazzianum*, Invasive Species Ireland (2008).

1.4 What are Invasive Species?

In an Irish context, invasive species relates to any animal or plant which have been introduced into Ireland by humans and their activities, either purposefully or accidentally. Invasive species are also referred to as 'invasive non-native species', or 'invasive alien species', are those non-native species that have the ability to spread rapidly and become dominant in an area or ecosystem.

Invasive non-native species are so-called as they typically display one or more of the following characteristics or features:

a) prolific reproduction through seed dispersal and/or re-growth from plant fragments;
b) rapid growth patterns; and
c) resistance to standard weed control methods.

Where a non-native species displays invasive qualities, and is not managed, it can potentially:

a) outcompete native vegetation, affecting plant community structure and habitat for wildlife;

b) cause damage to infrastructure including road carriageways, footpaths, walls and foundations; and

c) have an adverse effect on landscape quality through a loss of naturalness, aesthetics and regional identity.

Himalayan balsam (*I. glandulifera*) and Giant hogweed (*H. mategzzianum*) were among the invasive species identified during the Study Area walkover surveys.

The Invasive Species Ireland project identified Himalayan balsam and Giant hogweed as some of the highest risk (most un-wanted) non-native invasive species in Ireland, while Himalayan balsam and Giant hogweed have been listed as Invasive Species of European Concern. There is strict legislation surrounding these species in both Ireland and the EU as described in Section 1.2 above. These species are described in detail below.

1.4.1 Giant hogweed (*H. mantegazzianum*)

Source: https://www.biodiversityireland.ie/wordpress/wp-content/uploads/Giant-Hogweed.pdf

Giant hogweed is a perennial plant that is native to Asia that reaches heights of up to 5 meters. Initially introduced into Ireland as an ornamental plant of parks and gardens, this species has a high competitive advantage over native plants and can outcompete native flora for space and resources through shading that occurs due to dense stand formation. It is found across many habitat types including bog and fen habitats, grasslands, woodlands, urban areas and riparian zones. It is predominantly found along watercourses as it thrives in rich, moist soils. Giant hogweed leaves can grow up to 3m in length and 1.5m wide, with a stem diameter between 5-10cm. It produces large umbels of white flowers up to 80cm across. The stem is green with purple blotches and is covered in fine hairs that are particularly dense at the leaf joints.

It reproduces through seed dispersal and can produce up to 50,000 seeds after 3 to 4 years of growth. Seeds can remain viable in the poor soil for up to 5 years and in favourable soil for up to 15 years if conditions are unsuitable for germination. This is particularly problematic along riparian zones of rivers and streams as large numbers of seeds are dispersed into the flowing water which are carried downstream invading new areas. In addition, severe erosion of riverbanks can occur in winter when the species dies back as native vegetation cannot establish during the growing season.

Giant hogweed is considered a significant health hazard. Giant hogweed is a phototoxic plant its sap contains a chemical (furanocoumarins) that can cause severe reactions when it comes into contact with skin and is then exposed to sunlight. The furanocoumarins alter the genetic structure of skin they come into prolonged contact with, eliminating the skins ability to protect itself from sunlight. The first symptom to occur is itching, followed by blistering of the skin which may recur for several years after the initial exposure that can result in permanent scaring of skin tissue. Extreme caution must be taken around this plant as just brushing into it can cause sap to be released. The intensity of the reaction varies with individual sensitivity.

1.4.2 Himalayan balsam (*I. glandulifera*)

Source: https://www.biodiversityireland.ie/wordpress/wp-content/uploads/Himalayan-Balsam_PRINT.pdf

Himalayan balsam is native to the western Himalayas that was first introduced into Ireland as an ornamental garden plant. It is a tall (up to 2m), shallow-rooted, annual plant that is particularly prevalent in damp areas, mainly colonising riverbanks, waste ground and wet woodlands. The plant has lance-shaped leaves with heavily serrated edges, arranged opposite each other. The stem is jointed, hollow and easily broken. It flowers from June onward, producing pink to white, bonnet shaped flowers. These flowers are very distinctive, making identification easy once they are evident.

It reproduces through seed dispersal from seed pods that explode when mature, scattering the small seeds up to 7 meters from the parent plant. Each plant can produce up to 4,000 seeds that float in water and remain viable in soil for up to 18 months.

Himalayan balsam outcompetes native plants for space, light and nutrients through rapid growth and shading, thereby replacing existing flora resulting in reduced local biodiversity. It is also known as a 'pollinator robber' since Himalayan balsam produces copious quantities of nectar, attracting bees and other pollinators away from native species that require their services to reproduce. It is particularly prevalent along riverbanks and disturbed soils; it has shallow roots making riverbanks bare and vulnerable to erosion when the plant dies back, which in turn leads to soil loss and increased siltation in the water.

1.5 Limitations to Construction and Need for a Management Plan

The negative economic, social and environmental impacts of invasive species have been increasing in recent years. There are significant risks associated with the presence of invasive species during the construction of proposed developments. If left untreated Japanese knotweed has been documented to cause structural damage to infrastructure, concrete, tarmac and the stability of riverbanks. Similarly Himalayan balsam can impede flow in rivers and drainage ditches causing a rise in flow levels, leading to flooding. The invasive species present within the study area represent areas of immediate concern owing to the potential delays and associated costs with their management.

A study on the economic impacts of invasive species in Ireland and Northern Ireland was published in 2013 (Kelly *et al.,* 2013) and estimated the total damage and treatment costs of invasive species on construction, development, and infrastructure projects to be upwards of €26,672,863.

The unintentional spread of invasive species during construction works is a significant issue and if not managed correctly, species could be spread to uninfested areas which would increase the future cost and effort required to control the species and could pose further biosecurity and public health and safety risks. The most common ways in which invasive species can spread during construction of a project are:

- Site and vegetation clearance, mowing, hedge-cutting or other landscaping activities;
- Spread of seed or plant fragments during the movement or transport of soils;
- Spread of seeds or plant fragments through the local surface water and drainage network;
- Contamination of vehicles or equipment with seeds or plant fragments which are then transported to other areas, especially on machinery with tracks; and

- Importation of soil from off-site sources contaminated with invasive species plant material.

Early intervention in the spread of invasive species can prevent invasions and subsequent impacts on infrastructure and habitats, thus reducing long-term management requirements with associated financial costs.

Giant hogweed and Himalayan balsam are listed under the Third Schedule for the purpose of the restriction imposed by Section 49 and 50 of the Regulations. It is therefore an offence to cause the spread of these species.

2. METHODS

2.1 Study Area

The Study Area for the ISMP is centred on the route of the proposed greenway along the banks of the River Shannon, from the west side of the bridge on the River Groody, past Plassey Beach, diverting south along McLoughlan Road and along University Road to Plassey Park Road, as shown in **Figure 2.1**. The Study Area is the area within which physical works are proposed to be constructed, accessed, and maintained.

For the project, the ISMP will only be put in place within the footprint of the proposed Greenway.

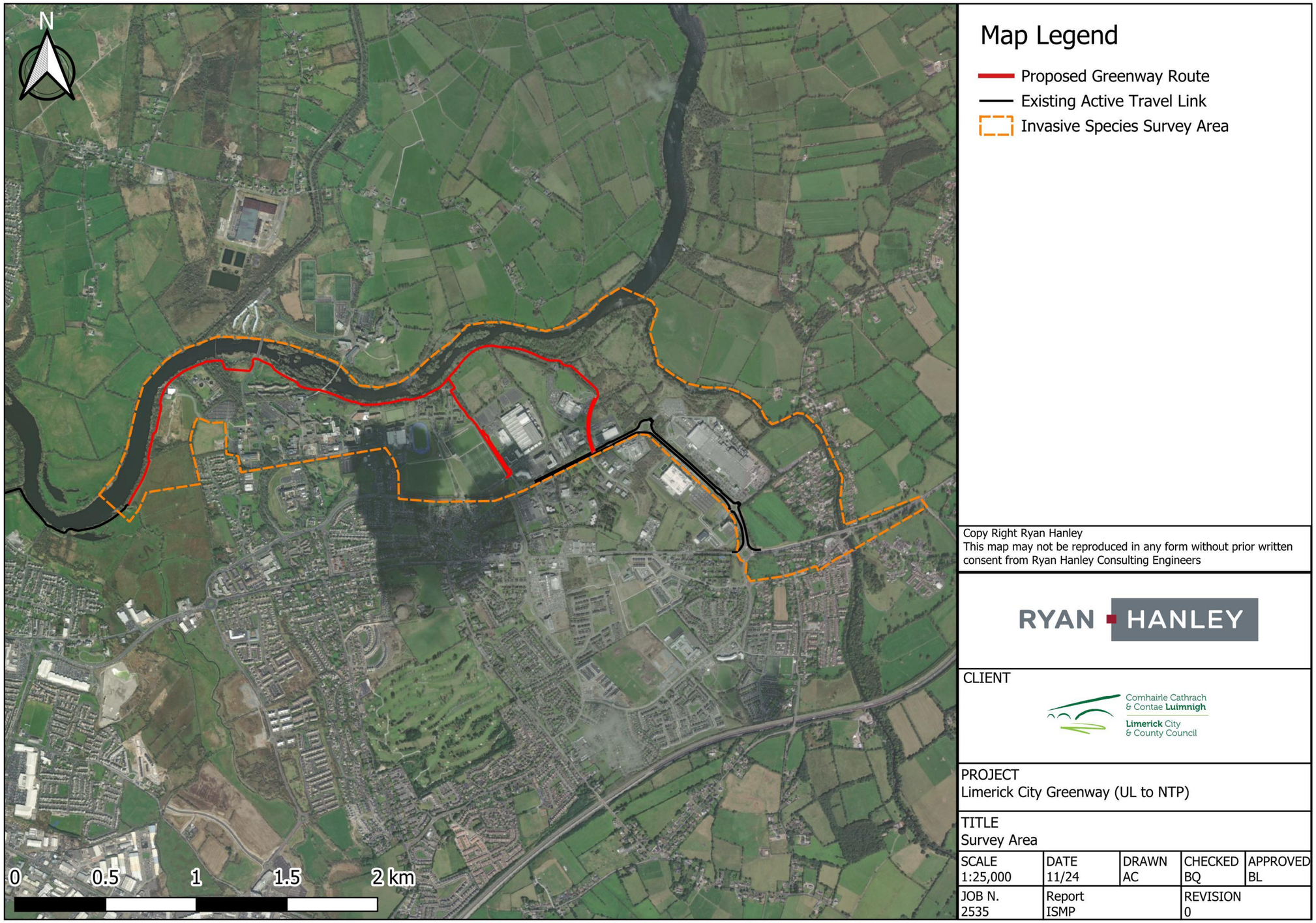


Figure 2.1- Invasive Species Study Area Limerick City Greenway

2.2 Desktop Study

Prior to the commencement of the walkover surveys, a desktop review of the relevant literature and databases (e.g. Biodiversity Ireland Database, NPWS Database, LCCC Invasive Species App) was undertaken for the Study Area in order to identify the presence of any invasive species which are listed on the Third Schedule of the Birds and Natural Habitats Regulations within the 10km grid squares/hectads R65 within which the proposed greenway is located. See **Section 3.1** below for results of this study.

2.3 Field Surveys

Walkover surveys of the proposed greenway Study Area were undertaken on 5th November 2020, 14th May 2021, 28th April 2022, 3rd May 2023 and 26th of June 2024 in order to identify the location and map the extent of any stands or individuals of invasive species recorded within the footprint of the preferred greenway route from the Groody River bridge to NTP. Where invasive species were identified, their location and extent were recorded. The area was also searched for new and or emerging shoots of any invasive species. See **Section 3.2** for results of these surveys.

2.4 Identification of Constraints

Constraints relative to the implementation of eradication/control measures were identified on the basis of the walkover surveys, best practice guidance and knowledge of the Study Area. This included a review of designated areas and health and safety constraints and flooding.

3. RESULTS

The presence of invasive species at locations within the Study Area has the potential to increase the financial burden on this project both in terms of treatment costs and delays in commencing construction works. Their presence within the Study Area requires the development of an ISMP prior to construction of the greenway in order to provide biosecurity protocols to eradicate/ avoid disturbing and spreading existing invasive species within the site, at new adjacent locations or off site.

3.1 Desktop Study

Invasive species listed on the Third Schedule identified during the desktop review of the Biodiversity Ireland Database, NPWS Database and LCCC Invasive Species APP are presented in **Table 3.1** below. Appendix A provides an illustration for the location of the invasive species on the LCCC APP.

Table 3.1- Invasive Species Identified within the Study Area during the Desktop Study

Common Name	Latin Name	Records
Brown Rat	*Rattus norvegicus*	Biodiversity Ireland Database
Canadian Waterweed	*Elodea canadensis*	Biodiversity Ireland Database
Dace	*Leuciscus leuciscus*	Biodiversity Ireland Database
Eastern Grey Squirrel	*Sciurus carolinensis*	Biodiversity Ireland Database
Fallow Deer	*Dama dama*	Biodiversity Ireland Database
Giant Hogweed	*Heracleum mantegazzianum*	Biodiversity Ireland Database, LCCC App
Giant Knotweed	*Fallopia sachalinensis*	Biodiversity Ireland Database
Greylag Goose	*Anser anser*	Biodiversity Ireland Database
Himalayan Balsam	*Impatiens glandulifera*	Biodiversity Ireland Database, LCCC App
Japanese Knotweed	*Fallopia japonica*	Biodiversity Ireland Database, LCCC App
Nuttall's Waterweed	*Elodea nuttallii*	Biodiversity Ireland Database
Three-cornered Garlic	*Allium triquetrum*	Biodiversity Ireland Database
Water Fern	*Azolla filiculoides*	Biodiversity Ireland Database

3.2 Field Surveys

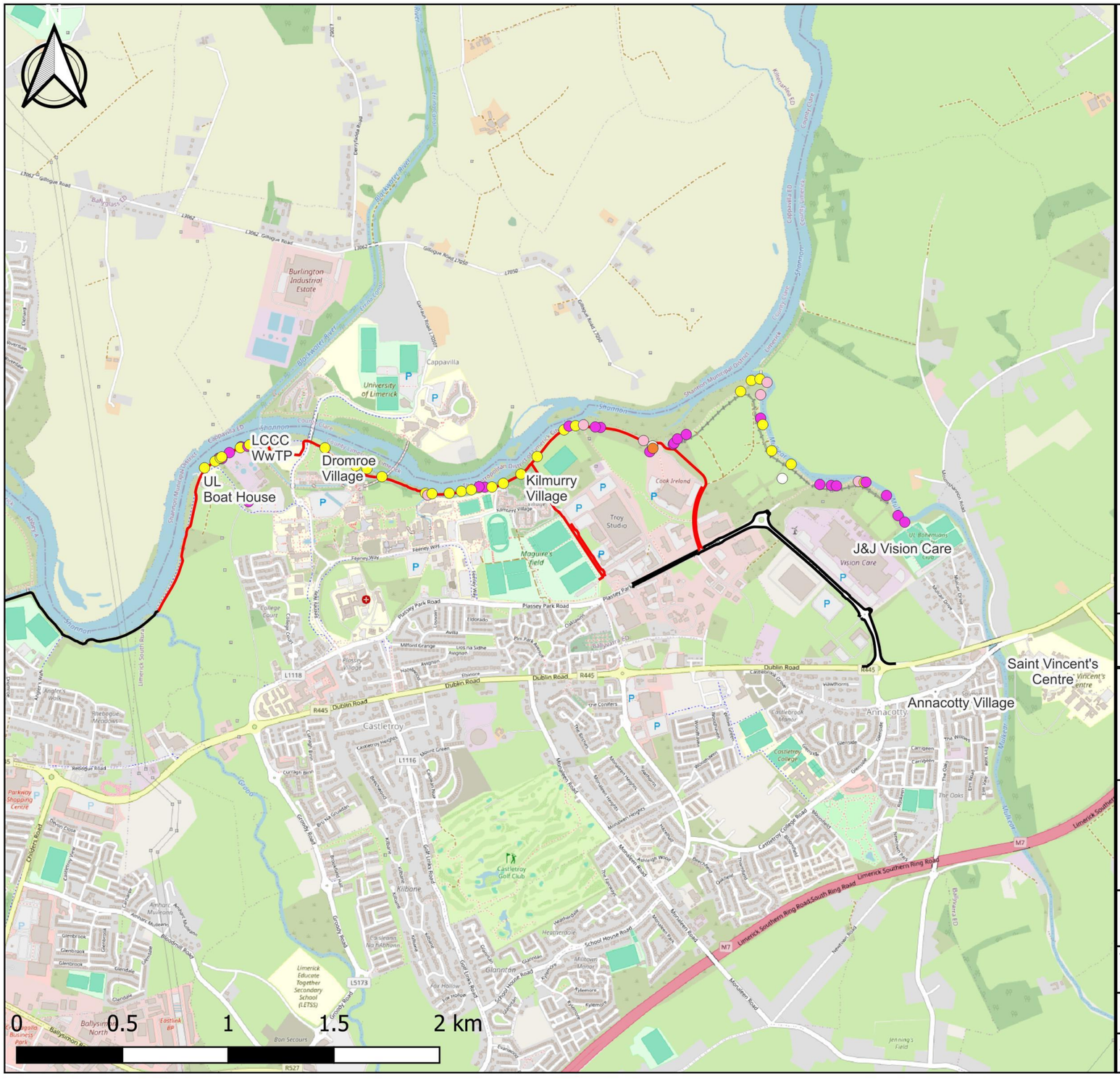
Stands of Giant Hogweed and Himalayan Balsam were identified along the length of the proposed greenway route interspersed with one another within the Study Area (**Plates 3.1- 3.6**). No other species listed in Table 3.1 on the Third Schedule were identified within the Study Area during any of the field surveys. Additionally, the non-native species Winter Heliotrope (*Petasites fragrans*) and Cherry laurel (*Prunus laurocerasus*) were recorded, however, these species are not listed on the Third Schedule and as such do not require specific measures for their control or disposal, therefore no further assessment for these species are required. However, best practice measures will ensure that avoidance of disturbance and spread of these non-native species as part of the works. The invasive species infestation was found to be extensive throughout the length of the greenway as shown in **Figure 3.1 to Figure 3.4** and **Table 3.2 to Table 3.3.**

Table 3.2- Invasive Species Identified during Walkover Surveys 2020-2021

ID Ref	Species	Grid ref (Easting, Northing)	Details
GH19	Giant hogweed (*H. mantegazzianum*)	160760, 158304	GH stands identified have been sprayed with herbicide in this area
HB14	Himalayan balsam (*I. glanduifera*)	160556, 158464	HB stands approximately 5m X30m in size identified on the riverbank.
HB8	Himalayan balsam (*I. glanduifera*)	160606, 158499	HB stands identified under dry culvert
GH18	Giant hogweed (*H. mantegazzianum*)	160622, 158512	10 stands of GH were identified
HB9	Himalayan balsam (*I. glanduifera*)	160630, 158514	HB stands were identified covering the base of a ditch
GH23	Giant hogweed (*H. mantegazzianum*)	160638, 158511	Extensive area of GH was identified within the boundary of the WWTP
HB10	Himalayan balsam (*I. glanduifera*)	160636, 158519	HB stands identified on both the right and left side of the path for 30m. Evidence of herbicide spraying
GH22	Giant hogweed (*H. mantegazzianum*)	160673, 158529	Stands of GH identified along the boundary fence of the WWTP
HB11	Himalayan balsam (*I. glanduifera*)	160725, 158562	HB stands identified on the left side of the existing track and covering the river bank in this area and additionally within a ditch on the right side of the track
GH21	Giant hogweed (*H. mantegazzianum*)	160728, 158566	An extensive area of GH was identified within the boundary of the WWTP
GH5	Giant hogweed (*H. mantegazzianum*)	160761, 158570	Several stands of GH were identified on the right side of the bridge and plants were approx. 1.5m high
HB16	Himalayan balsam (*I. glanduifera*)	160767, 158576	An extensive area of HB was identified
GH&HB4	Giant hogweed (*H. mantegazzianum*) and Himalayan balsam (*I. glanduifera*)	160830, 158583	Treatment signage present in this area and several GH and HB plants were identified at an early stage of growth
GH&HB3	Giant hogweed (*H. mantegazzianum*) and Himalayan balsam (*I. glanduifera*)	160861, 158600	Several GH and HB plants were identified at an early stage of growth
HB15	Himalayan balsam (*I. glanduifera*)	161126, 158561	HB plants were identified at an early stage of growth
HB26	Himalayan balsam (*I. glanduifera*)	161271, 158475	HB stands identified on the right side of the existing track
HB27	Himalayan balsam (*I. glanduifera*)	161323, 158463	Stands of HB identified on both the right and left sides of the riverbank
HB23	Himalayan balsam (*I. glanduifera*)	161396, 158426	HB interspersed with Mares tail
HB24	Himalayan balsam (*I. glanduifera*)	161602, 158348	HB stands identified on the left side of the existing track and covering the river bank for approx. 100m.
GH&HB7	Giant hogweed (*H. mantegazzianum*) and Himalayan balsam (*I. glanduifera*)	161610, 158336	An extensive area of HB identified with several stands of GH interspersed
HB25	Himalayan balsam (*I. glanduifera*)	161633, 158344	HB stands identified either side of the path in this area
HB3	Himalayan balsam (*I. glanduifera*)	161712, 158347	HB stands identified either side of the path for approximately 100m
HB4	Himalayan balsam (*I. glanduifera*)	161772, 158358	HB stands identified either side of the path for approximately 100m
HB6	Himalayan balsam (*I. glanduifera*)	161820, 158361	HB stands identified either side of the path for approximately 100m

ID Ref	Species	Grid ref (Easting, Northing)	Details
HB5	Himalayan balsam (*I. glanduifera*)	161853, 158373	HB stands identified within the river bank
GH1	Giant hogweed (*H. mantegazzianum*)	161855, 158377	GH immature plants x 4
GH24	Giant hogweed (*H. mantegazzianum*)	161882, 158375	GH immature plants large area adjacent to river bank
HB28	Himalayan balsam (*I. glanduifera*)	161917, 158377	HB stands identified on the left side of the path for approximately 100m
HB1	Himalayan balsam (*I. glanduifera*)	161968, 158394	HB stands identified either side of the path for approximately 100m
HB12	Himalayan balsam (*I. glanduifera*)	162052, 158439	HB stands identified either side of the path for approximately 100m
HB13	Himalayan balsam (*I. glanduifera*)	162130, 158519	HB stands identified either side of the path for approximately 20m
HB2	Himalayan balsam (*I. glanduifera*)	162253, 158643	HB stands identified either side of the path for approximately 25m
GH3	Giant hogweed (*H. mantegazzianum*)	162280, 158663	Stands of GH identified in the area with evidence of spraying being undertaken. Evidence of spray drift on adjacent vegetation.
HB7	Himalayan balsam (*I. glanduifera*)	162311, 158665	HB large area of infestation either side of trail path
GH&HB2	Giant hogweed (*H. mantegazzianum*) and Himalayan balsam (*I. glanduifera*)	162351, 158669	Large area of HB and GH infestation identified in this area
GH2	Giant hogweed (*H. mantegazzianum*)	162406, 158659	Large area of GH identified along the path for approximately 100m
GH4	Giant hogweed (*H. mantegazzianum*)	162429, 158657	Large area of GH identified along the path
GH&HB1	Giant hogweed (*H. mantegazzianum*) and Himalayan balsam (*I. glanduifera*)	162634, 158599	Large area of GH identified along the right side of the path
GH20	Giant hogweed (*H. mantegazzianum*)	162664, 158540	Large area of GH identified by the left corner of the path
GH6	Giant hogweed (*H. mantegazzianum*)	162772, 158577	Large area of GH infestation identified
GH7	Giant hogweed (*H. mantegazzianum*)	162781, 158586	GH stands identified in castle ruins
GH8	Giant hogweed (*H. mantegazzianum*)	162792, 158604	Stands of GH identified in and around the castle ruins
GH9	Giant hogweed (*H. mantegazzianum*)	162836, 158625	GH stands identified either side of path in this area
HB17	Himalayan balsam (*I. glanduifera*)	163094, 158827	HB - Extensive infestation of HB identified in this area
HB18	Himalayan balsam (*I. glanduifera*)	163141, 158880	HB large area of infestation on left side of trail path
HB19	Himalayan balsam (*I. glanduifera*)	163184, 158887	Extensive infestation of HB identified in this area
GH&HB5	Giant hogweed (*H. mantegazzianum*) and Himalayan balsam (*I. glanduifera*)	163219, 158872	HB and GH infestation identified to the left side of the trail path
GH&HB6	Giant hogweed (*H. mantegazzianum*) and Himalayan balsam (*I. glanduifera*)	163187, 158813	Large area of HB and GH infestation identified either side of path for approximately 40m
GH12	Giant hogweed (*H. mantegazzianum*)	163185,158703	Approximately 20 stands of GH identified either side of the path
HB22	Himalayan balsam (*I. glanduifera*)	163196, 158670	Large areas of HB identified either side of the track
HB29	Himalayan balsam (*I. glanduifera*)	163237, 158547	HB small stands identified on right side of trail path

ID Ref	Species	Grid ref (Easting, Northing)	Details
HB21	Himalayan balsam (*I. glanduifera*)	163333, 158484	HB immature stands identified on left side of trail path
GH10	Giant hogweed (*H. mantegazzianum*)	163462, 158389	GH stands identified on right side of path
GH13	Giant hogweed (*H. mantegazzianum*)	163520, 158384	GH stands identified on left side of the trail path
GH11	Giant hogweed (*H. mantegazzianum*)	163543, 158381	GH stands identified on left side of the trail path
GH&HB5	Giant hogweed (*H. mantegazzianum*) and Himalayan balsam (*I. glanduifera*)	163647, 158400	Several GH and HB plants were identified at an early stage of growth by the stone foot bridge
HB20	Himalayan balsam (*I. glanduifera*)	163677, 158400	HB immature stands identified on left side of trail path by the overwater pipe
GH16	Giant hogweed (*H. mantegazzianum*)	163685, 158399	GH large stands identified on left side of the trail path
GH17	Giant hogweed (*H. mantegazzianum*)	163783, 158338	GH stands identified on left side of the trail path
GH14	Giant hogweed (*H. mantegazzianum*)	163836, 158244	GH large stands identified on right side of the trail path
GH15	Giant hogweed (*H. mantegazzianum*)	163868, 158208	GH large stands identified on right side of the trail path by entrance to Bohs rugby club



Map Legend

- Proposed Greenway Route
- Existing Active Travel Link

IAPS Records 2020-2021

- Himalayan Balsam
- Giant Hogweed
- Cherry Laurel
- Giant Hogweed & Himalayan Balsam
- Snowberry

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Limerick City & County Council

PROJECT
Limerick City Greenway (UL to NTP)

TITLE
Invasive Species Locations

SCALE	DATE	DRAWN	CHECKED	APPROVED
1:25,000	07/24	AC	BQ	BL

JOB N.	Report	REVISION
2535	ISMP	0

Figure 3.1- Invasive Species Locations Identified during the Walkover Survey 2020-2021

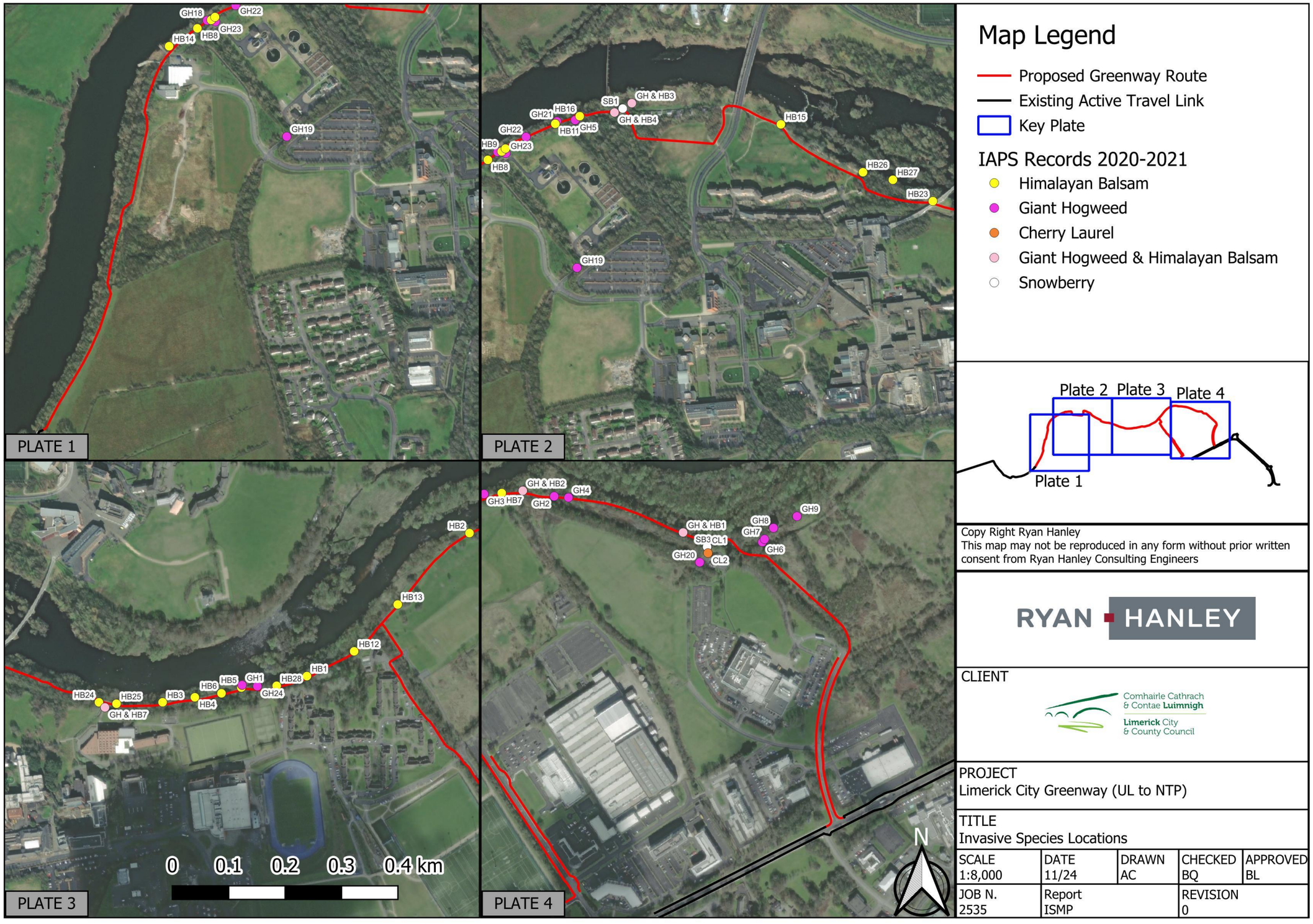


Figure 3.2- Invasive Species Locations Recorded during the Walkover Survey 2020-2021

Plate 3.1 Young Giant Hogweed adjacent to existing track at 163677, 158420 (May, 2021)

Plate 3.2 Young Giant Hogweed adjacent to existing track at 162774, 158592 (May, 2021)

Plate 3.3 Young Giant Hogweed adjacent to existing track at 162466, 158670 (May, 2021)

Plate 3. 4 Young Himalayan Balsam adjacent to existing track at 161221, 158516 (May, 2021)

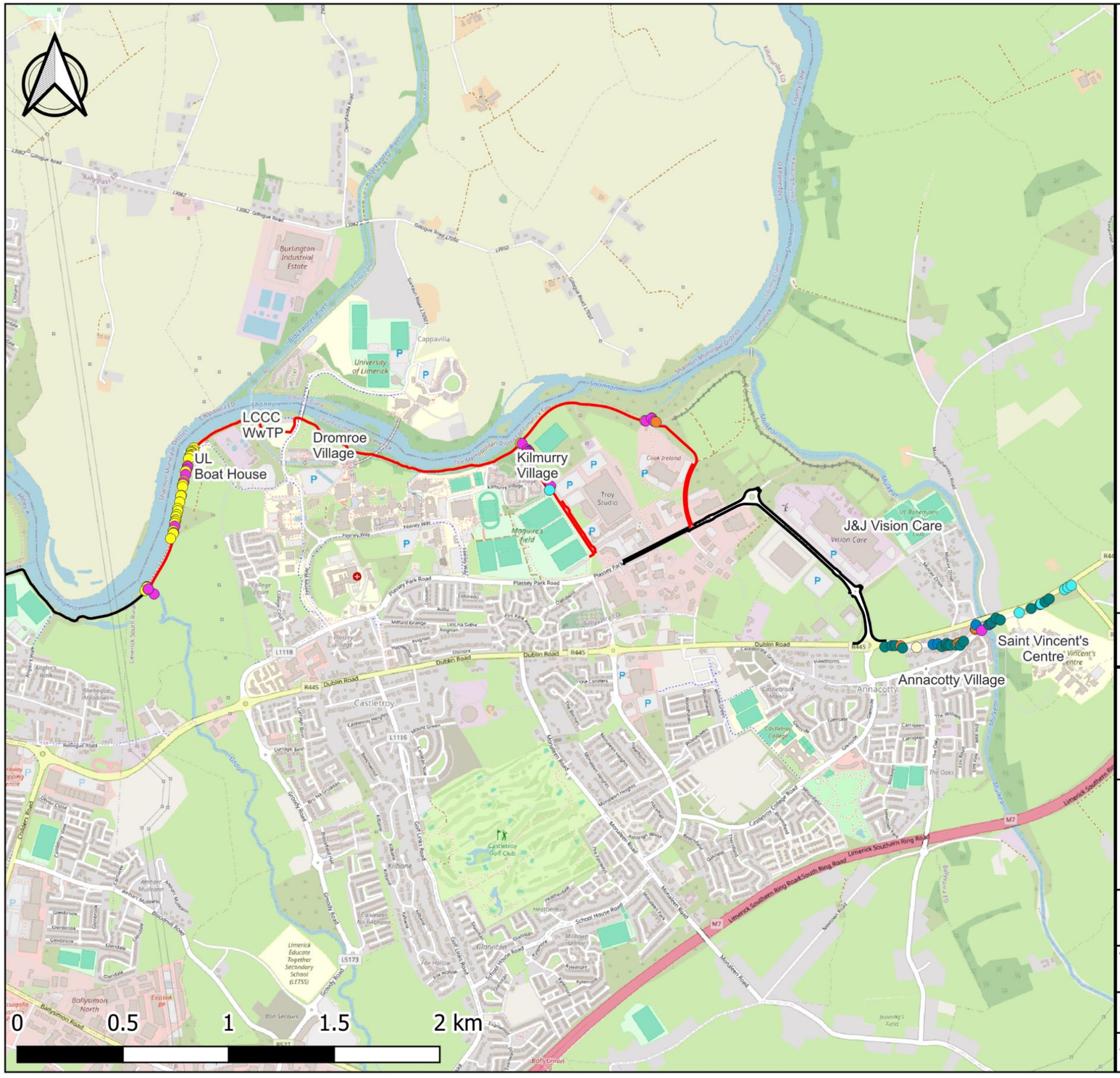
Plate 3.5 Mature Himalayan Balsam on both sides of existing track at 161671, 158354 (Nov, 2020)

Plate 3.6 Young Himalayan Balsam in drainage ditch near existing track at 160756,158580 (May,2021)

Table 3.3- Invasive Species Identified during Walkover Surveys 2024

TN	Invasive species	ITM X	ITM Y	Notes
TN1	Himalayan balsam	560506.54	658496.972	Within riverbank, west of the existing pathway
TN2	Himalayan balsam	560505.259	658484.763	Within ditch, east of the existing pathway
TN3	Himalayan balsam	560494.103	658481.288	Large carpet of HB underneath and adjacent to the pontoon
TN4	Himalayan balsam	560495.932	658474.476	Within grassy verge
TN5	Himalayan balsam	560494.423	658474.796	Large carpet of HB within bankside
TN6	Himalayan balsam	560496.16	658465.422	Within ditch
TN7	Himalayan balsam	560488.204	658462.496	HB carpeting riverbank
TN8	Himalayan balsam	560488.845	658457.329	Within ditch
TN9	Himalayan balsam	560481.392	658445.807	HB carpeting riverbank as well as grassy verges on both sides of the path
TN10	Himalayan balsam	560476.179	658412.543	HB still dominating both sides of the path
TN11	Himalayan balsam	560476.842	658408.199	Within field
TN12	Giant hogweed	560476.842	658408.199	Within field
TN13	Giant hogweed	560472.27	658395.328	Within field
TN14	Himalayan balsam	560467.263	658386.64	HB in grassy verges beside path and riverbank
TN15	Giant hogweed	560467.08	658371.231	GH in ditch
TN16	Himalayan balsam	560458.964	658340.23	HB within grassy verges
TN17	Giant hogweed	560457.272	658334.149	Within riverbank
TN18	Himalayan balsam	560454.072	658324.136	HB continues to carpet riverbank and grassy verges
TN19	Himalayan balsam	560452.746	658313.39	Within ditch
TN20	Himalayan balsam	560447.442	658272.651	Within ditch
TN21	Himalayan balsam	560445.018	658270.41	Within riverbank
TN22	Himalayan balsam	560438.96	658241.375	On both sides of the pathway
TN23	Himalayan balsam	560429.769	658210.169	Within riverbank
TN24	Himalayan balsam	560430.04	658199.88	Large carpet of HB around bridge
TN25	Himalayan balsam	560424.97	658181.64	Within grassy verges
TN26	Himalayan balsam	560421.54	658171.76	Carpeting riverbank
TN27	Himalayan balsam	560420.72	658156.53	Within ditch
TN28	Himalayan balsam	560417.42	658149.13	Within riverbank
TN29	Himalayan balsam	560415.23	658140.35	Dominating grassy verges
TN30	Giant hogweed	560415.23	658127.18	Within ditch
TN31	Himalayan balsam	560408.78	658105.64	Within riverbank and grassy verge
TN32	Giant hogweed	560410.7	658096.87	Within ditch/stream bank
TN33	Himalayan balsam	560408.65	658092.75	Within riverbank and both grassy verges
TN34	Himalayan balsam	560396.06	658068.574	Large carpet of HB in riverbank and within grassy verges
TN35	Giant hogweed	560285.054	657841.932	Within riverbank
TN36	Himalayan balsam	560283.133	657837.68	Within riverbank
TN37	Himalayan balsam	560275.52	657823.551	Within riverbank
TN38	Giant hogweed	560317.7	657806.679	Large stand of GH in field
TN39	Himalayan balsam	560289.94	657829.038	Coming through wooden fence
TN40	Giant hogweed	560290.558	657829.415	Near pathway, behind wooden fence
TN41	Giant hogweed	560290.489	657830.067	Within ditch
TN42	Sycamore	563776	657556.58	10x sycamore trees within treeline
TN43	Sycamore	563809.74	657562.07	Within treeline
TN44	Sycamore	563826.48	657562.62	Within treeline
TN45	Cherry laurel	563851.44	657560.97	Within planted area

TN46	Sycamore	563859.67	657551.37	Within treeline
TN47	New Zealand Flax	563926.61	657554.66	Within garden
TN48	Butterfly-bush	564004.66	657567.83	Within garden
TN49	Butterfly-bush	564026.61	657569.75	Within garden
TN50	Sycamore	564046.09	657558.37	Within treeline
TN51	Sycamore	564067.08	657563.58	Within treeline
TN52	Sycamore	564068.31	657572.22	Within garden
TN53	Sycamore	564078.05	657564.4	Within treeline
TN54	Sycamore	564087.24	657565.36	Within treeline
TN55	Sycamore	564111.66	657565.91	Within treeline
TN56	Cherry laurel	564122.49	657574	Hedging for boundary of a house
TN57	Cherry laurel	564130.17	657576.47	Behind wall
TN58	Sycamore	564133.47	657563.85	Within treeline
TN59	Sycamore	564148.56	657582.78	Saplings behind wall
TN60	Cherry laurel	564204.66	657638.2	Within hedgerow
TN61	Cherry laurel	564206.72	657644.79	Within hedgerow
TN62	Butterfly-bush	564207.54	657660.7	Within hedgerow
TN63	Giant hogweed	564234.43	657633.81	Growing out from wall edge of the Mulkear river
TN64	Sycamore	564268.615	657661.451	Within riparian treeline
TN65	Giant hogweed	564278.8	657667.521	On top of wall
TN66	Sycamore	564281.544	657670.848	Within treeline
TN67	Sycamore	564301.81	657692.35	Multiple planted sycamores within treeline
TN68	Sycamore	564322.39	657683.84	Within treeline
TN69	Winter heliotrope	564412.028	657718.275	Within grassy verge
TN70	Sycamore	564468.47	657738.03	Planted tree
TN71	Butterfly-bush	564510.86	657756.82	Sapling within grassy verge
TN72	Winter heliotrope	564516.21	657760.11	Within grassy verge
TN73	Sycamore	564534.18	657768.89	Planted tree
TN74	Sycamore	564553.726	657782.865	Planted tree
TN75	Winter heliotrope	564626.79	657827.67	Within grassy verge
TN76	Winter heliotrope	564642.7	657837.68	Within grassy verge
TN77	Winter heliotrope	564659.02	657847.01	Surrounding signpost in grassy verge
TN78	Himalayan balsam	562052.4	658519.6	Large carpet before treeline
TN79	Giant hogweed	562059.07	658517.92	Stand in front of treeline
TN80	Giant hogweed	562084.73	658490.21	Small stand in front of treeline
TN81	Giant hogweed	562092	658482.25	In front of treeline
TN82	Giant hogweed	562089.25	658479.51	Multiple stands within and around treeline
TN83	Giant hogweed	562084.73	658477.45	Large stands behind fence
TN84	Giant hogweed	562088.7	658470.45	Multiple stands within and around treeline
TN85	Giant hogweed	562194.46	658316.41	Large GH stands within treeline
TN86	Winter heliotrope	562189.52	658298.17	Carpeting field boundary line
TN87	Himalayan balsam	562640.48	658626.29	Carpeting south side of pathway
TN88	Giant hogweed	562644.73	658625.15	Large stands within the HB
TN89	Himalayan balsam	562673.69	658638.49	Carpeting the north side of the pathway
TN90	Giant hogweed	562671.7	658636.79	Large stands within the HB
TN91	Giant hogweed	562683.62	658623.73	Large stands
TN92	Cherry laurel	562693.56	658620.04	Large tree where pathway is proposed



Map Legend

- Proposed Greenway Route
- Existing Active Travel Link

IAPS Records 2024

- Himalayan Balsam
- Giant Hogweed
- Sycamore
- Cherry Laurel
- New Zealand Flax
- Butterfly-bush
- Winter heliotrope

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PROJECT
Limerick City Greenway (UL to NTP)

TITLE
Invasive Species Locations

SCALE	DATE	DRAWN	CHECKED	APPROVED
1:25,000	11/24	AC	BQ	BL

JOB N.	Report	REVISION
2535	ISMP	0

Figure 3.3- Invasive Species Locations Recorded during the Walkover Survey 2024

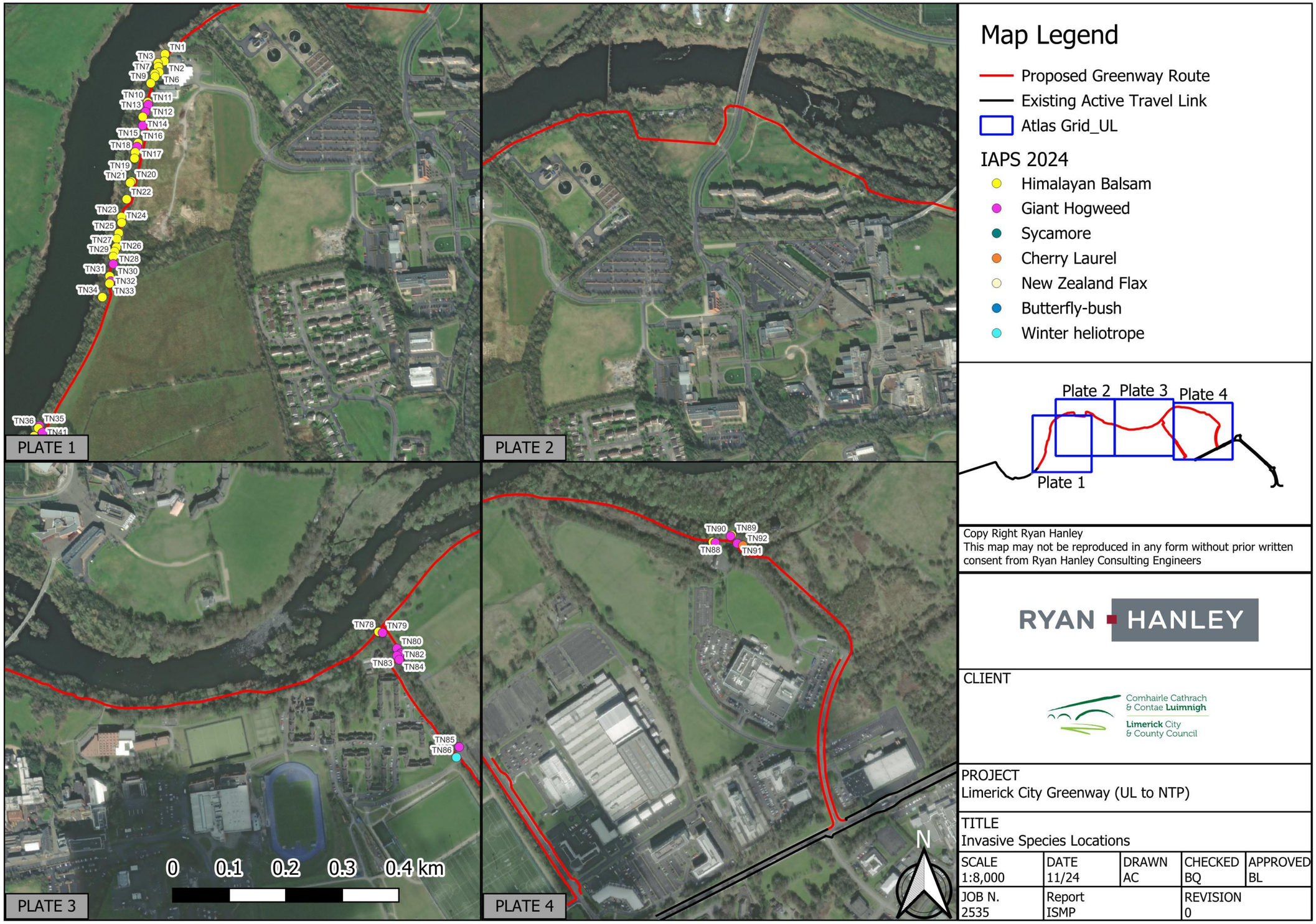


Figure 3.4- Invasive Species Locations Recorded during the Walkover Survey 2024

4. BEST PRACTICE CONTROL MEASURES FOR INVASIVE SPECIES

Invasive species have been identified at a number of locations adjacent to the proposed Greenway route within the Study Area. Himalayan balsam and Giant hogweed are invasive species listed on the Third Schedule whereby interference is legally controlled. They are highly invasive and can easily spread to new areas and are effective colonisers of disturbed ground (e.g. construction sites).

4.1 Advanced Treatment

Depending on the timescale of the construction of a project it may be possible to eradicate some species prior to the onset of construction on site via advanced treatment and in most cases, this is considered preferable. It is the aim of this ISMP to accomplish effective control or eradication of invasive plants within the managed area. By treating in advance of construction there will be control over the spread of infestations. However, if advanced control is not entirely achieved before construction, then biosecurity measures which includes site hygiene protocols, will be needed to avoid spread of invasive species.

Given the high level of invasive species infestation along the Greenway route, it is expected that the advanced treatment for invasives will likely be chemical treatment rather than excavation. Giant hogweed and Himalayan balsam all respond well to chemical treatment.

The specific treatment method will be decided on a site-by-site basis and in consideration of the time of year.

Use of an aquatic approved herbicide for any infestation close to water will be required. Biosecurity measures, as per Section 4.3, will be required even if the control of spread of invasive species is achieved prior to construction.

4.2 Monitoring

This ISMP must be revised by the specialist contractor on the basis of annual monitoring in early summer to assess the effectiveness of controls, treatment of plants/areas in the previous year or any newly discovered infestation including young plants. This will be undertaken by a suitably qualified person, with competence in identifying invasive species, within the proposed boundary of the greenway and any additional areas where construction works are required (e.g. temporary construction compounds, haul routes etc). Further treatment targets and operations will be undertaken thereafter. In advance of works commencing on Greenway:

- Pre-construction surveys will be completed 3-4 weeks before construction begins;
- Data collected as part of this survey will include a detailed description of any infestations identified including the approximate area of the respective stands where feasible;
- Ongoing monitoring throughout the growing season in all areas adjacent to the biosecurity zones; and
- Mapping of the most up to date invasive species distribution and extent of infestations will be produced.

4.3 Biosecurity Measures

All personnel that will be working on the proposed greenway route shall be educated through tailored tool-box talks to recognise each of the invasive species present within the footprint of the works.

Biosecurity zones must be established on-site prior to site works commencing and will specify the area of the zones, the required actions that must be taken in each zone and who must carry out the actions. All staff will be educated on the health and safety and biosecurity measures that should be followed around each species. Personnel must be familiar with the location of all biosecurity zones, and emergency procedures should they come into contact with Giant Hogweed material. Only those who have been inducted into biosecurity measures on-site should enter the biosecurity zones within the works area. Should any risk of contaminated material escaping be observed by the site supervisor, additional tool box talks and any additional necessary training that is needed shall be given.

Maintaining biosecurity measures at all times in an area where invasive species are present is essential to prevent further spread. Biosecurity measures are also necessary on sites where invasive species are not present, but where there is risk of contaminated material being brought to site, i.e., site machinery being used on multiple sites, construction staff travelling between infested and not infested sites. Careful preparation of the site and planning of the works is crucial to successful treatment of invasive species.

At all site locations during the construction stage, the contractor will adhere to the following best practice biosecurity measures in order to avoid the spread and introduction of invasive species where applicable:

- Fence off (biosecurity zones) 8m from the furthermost stand of invasive species in infested areas prior to and during construction where possible in order to avoid spreading seeds or plant fragments around or off the construction site. If this is not possible the biosecurity zones will be determined by a suitably qualified person in agreement with the site manager;
- Clearly identify and mark out infested areas. Erect signs at the construction site entrances and by the biosecurity zones to inform site users of the risk;
- Dedicated biosecurity zone entry and exit points should be created for operators on foot and for mobile plant equipment;
- Personnel working on or between biosecurity zones should ensure their clothing and footwear are cleaned to prevent spread;
- Don't use machinery with caterpillar tracks in infested areas. Machinery tyres must be cleaned prior to exiting the biosecurity zones;
- Clearly identify and mark out areas where contaminated soil is to be stockpiled on site, which cannot be within 50m of any watercourse or within the flood zone. Biosecurity zones need to be fenced and surround all stockpiles of contaminated soils containing invasive species;
- Infested areas which will not be excavated will be protected by a root barrier membrane if they are likely to be disturbed by machinery;
- Appropriate silt barriers will be installed in drains that may occur within infested areas;
- Biosecurity facilities must be installed on-site prior to site works commencing. Installation of a dedicated footwear and vehicular wheel wash down facility, into a contained area by the entrance and exit points of the construction site and in the biosecurity zones, away from drains and watercourses. All run-off will be isolated and treated as contaminated material;
- Vehicles entering and leaving the construction site and biosecurity zones will be cleaned using stiff-haired brush and pressure washers, paying special attention to any areas that might retain seed and plant material;

- Where there is potential for cross-contamination on site (machinery or personnel moving from one biosecurity zone to another or from the biosecurity zone to other areas on site), consideration should be given to designating vehicles or machinery to specific sites to prevent spread;
- Vehicles leaving the site to be inspected for any plant material and will be washed down into a dedicated wastewater contained storage area then tinkered off site to a licenced waste facility;
- If soil is imported to the site for landscaping, infilling or embankments, the contractor shall gain documentation from suppliers that it is free from invasive species;
- Ensure all site users are aware of measures to be taken and alert them to the presence of the ISMP; and
- An Environmental/Ecological Clerk of Works shall be on site to monitor and oversee the implementation of this ISMP and installation of the biosecurity zones.

4.4 Treatment Methods

There are a number of management options that may be implemented to control and prevent the spread of invasive species. These are presented in the sections below. It must also be noted that it may not be possible to completely eradicate invasive species before or during the construction phase.

4.4.1 Chemical Treatment

The use of suitable herbicides/pesticides should only be recommended and applied by a suitably qualified person. Appropriate training must include achieving competency certification in the safe use of herbicides/pesticides through a National Proficiency Test Council registered assessment centre or achieving an appropriate FETAC award in this area.

Chemical treatment involves the application of a herbicide to invasive species which will be absorbed into the plant's root/rhizome system and kill the plant without any excavation or removal of the plant material. In order for herbicide treatment programmes to be successful, it is important that the initial infestation remains as healthy as possible until the herbicide is applied. The preferred types of herbicides to be used in treatment are Glyphosate or similar. Generally, if herbicide is applied as the treatment option, it will need to be reapplied for up to four years (depending on the targeted invasive species) after the first application to ensure the plant control measures have been effective, or monitored for a minimum of two years during which no regrowth is recorded.

The selection of the most appropriate chemical treatment eradication/control measure for invasive species is dependent on a number of factors including lead in time available before construction activities, the extent of funding available to the management of invasive species within a site and land ownership. Where land is privately owned, chemical treatment and eradication of invasive species on the site may not be an option.

Table 4.1- Type of Herbicide used in Invasive Species Treatment

Herbicide	Licenced Product	PCS No.	Selectivity	Persistence	Timing of 1st Application	Aquatic Approved Product
Glyphosate	Roundup Biactive	04660	Non-selective	Non-persistent	Mar-Oct	Yes

Glyphosate is non-persistent and can be used near water but is not selective (will impact all plant species). The most effective time to apply Glyphosate is dependent on the species being treated but, in general, application should be undertaken before October (or before cold weather causes leaves to discolour and fall). The application of Glyphosate should not be undertaken on foggy days, in windy weather or if rain is forecast within twelve hours of application where there is a risk of spray drift occurring. Consultation should be undertaken with the National Parks and Wildlife Service (NPWS) when herbicide treatment is undertaken adjacent to or within a European Site. Foliar treatment (spraying) is usually applied with a sprayer such as a knapsack sprayer or a larger spray system. Treatment dyes and sticking agents can be used to clearly identify all areas treated and reduce foliar run-off and increase absorption of the herbicide respectively. It is an effective way to treat large monocultures of invasive species, or to spot-treat individual plants. Reapplication rates will depend on site specific considerations including the extent of the infestation, its location and the time of year treatment commences.

4.4.1.1 Himalayan balsam

Chemical control of Himalayan balsam is readily achieved with the use of Glyphosate as a foliar spray where infestations occur. It should be applied during active growth in late spring (May-June) to ensure that germinating seedlings have grown sufficiently to be covered by the spray. Herbicide can be applied as a spot treatment to individual plants or as an overall spray. Where accessibility is problematic e.g. riverbanks, a long lance sprayer may be used. Herbicide application will not kill Himalayan balsam seeds in the seed bank. Monitoring with follow-up treatments to control seedling germination will be required over a period of two or more years to ensure complete removal from the seed bank. It is essential to establish native riparian vegetation quickly after herbicide treatment to prevent erosion of the riverbank. Monitoring of the site will be required in mid-summer (July-August) to assess the occurrence of seedlings and determine appropriate control.

Spraying is considered the most suitable treatment method for large dense infestations of Himalayan balsam and is considered suitable for projects that have a limited timescale, as disposal of treated plants is not required.

4.4.1.2 Giant hogweed

Giant hogweed sap poses a major hazard to human health and appropriate PPE must be worn by personnel at all times when undertaking herbicide treatment in areas contaminated with this species. This includes at a minimum: coveralls with hood made of synthetic, water-resistant fibres, rubber gloves with long sleeves, goggles or face visor with face mask and rubber boots/wellingtons.

Appropriate PPE should be agreed with the contractor's Health & Safety manager prior to any application of herbicide.

Following any incident with Giant Hogweed sap, the site supervisor and qualified first aider should be notified immediately, and appropriate medical advice should be sought. A record must be kept of all incidents involving Giant hogweed.

Giant hogweed plants can be sprayed or injected with Glyphosate when actively growing, usually in April and May when the plants have grown to about 50cm in height with full leaves, potentially killing the plant with one application.

In order to be effective, spraying must be carried out before the plant flowers and sets seed, otherwise there will be additional seeds within the seedbank that will require future treatment in subsequent years.

Long-lance spraying may assist in accurate application of herbicide to plants growing in inaccessible sites and taller plants being treated later in the season. Use of long-lance sprayers have the added benefit of ensuring a safe distance is maintained between the operator and the plants. Re-application in the same season (late August and early September) should be planned in order to treat new plants that typically grow from the seedbank to replace the dead plants or any plants that may have been missed. Herbicide treatment will not kill seeds in the seed bank and monitoring and herbicide application must be repeated annually over 3-5 years to eradicate new plants growing in subsequent years. Numbers of plants will decrease significantly from one year to the next and treatment should be sustained until there is at least one clear year with no new Giant hogweed plants.

Spraying is the most suitable method for treating large dense infestations of Giant hogweed and is considered an efficient method of control.

Stem injections are an option for Giant hogweed with Glyphosate, but since Giant Hogweed is easily and safely treated using conventional spraying methods and stem injections run a higher risk of sap coming into contact with personnel involved in the treatment programme, this should only be conducted where a specific risk assessment has been carried out.

4.4.2 Excavation and Disposal of Material

Even if stands of invasive species are treated using herbicide, care should still be taken regarding the disposal of invasive species plant material and the future use of excavated soil in the Study Area that may be contaminated with invasive species. It is not possible at this stage to accurately estimate the volume of material that will have to be excavated as part of the construction of Limerick City Greenway. Invasive species (particularly roots, flower heads or seeds) must be disposed of at licenced waste facilities or composting sites, appropriately buried on site, or incinerated (under licence) having regard to relevant legislation. It should be noted that some invasive species plant material (such as Giant hogweed) or soil containing residual herbicides may be classified as either 'hazardous waste' or 'non-hazardous waste' under the terms of the Waste Management Acts, and both categories may require special disposal procedures or permissions.

4.4.2.1 Himalayan balsam

Cutting (Mowing or Strimming)

Himalayan balsam can be successfully controlled by cutting back the plants via mowing or strimming before the plants flower in June. If cutting is done earlier in the season this may promote the plants to resprout with greater seed production. In order to prevent vigorous regrowth, plant stems must be cut at ground level, below the first node. Cutting should be undertaken frequently during the growing season to prevent sprouting and flower formation. This process should be repeated annually until Himalayan balsam stops growing in the infested area.

Hand Pulling

As Himalayan balsam have very shallow roots, hand pulling is also an effective treatment option. A gentle tug is usually enough to remove the entire root system and normally best done if pulled from the base of the plant. Hand pulling should ideally commence in May-June when plants can be easily identified and will not have set seed. Hand pulling will require a follow up pull in August due to new seeds sprouting from the seed bank. Plants that are hand pulled should not be placed on soil or in damp areas as they will readily re-root. Waste material should be left to dry out or incinerated. These methods

are particularly useful for smaller infestations to avoid damage to non-target species. Herbicide application can be used as a follow up to hand pulling later in the year to deal with missed plants or regrowth from the seed bank.

While hand pulling is labour intensive and can be time consuming depending on the size of infestation it is considered to be an effective method of treating Himalayan balsam where infestations are relatively low.

Excavated Material

Himalayan balsam can eject its seeds up to 7m from the parent plant and any excavation works from within this area should be considered to be contaminated with Himalayan balsam seeds. The vast majority of these seeds remain in the top 5cm of soil, however, the recommended excavation depth to ensure complete removal of Himalayan balsam from the seed bank is 0.5m (Property Care Association, 2015).

This excavated material should be retained onsite, if possible, either stockpiled/bunded and treated or buried under other substrate. If contaminated soil is stockpiled on site, the stockpile biosecurity area should be cordoned off and fenced from the rest of the site with appropriate signage put in place. Stockpiled material will be monitored and regrowth will be treated with herbicide. If contaminated soil is to be buried a minimum depth of 2m is required. Burial at this depth is sufficient to prevent regrowth. Himalayan balsam seeds do not contain sufficient energy reserves to allow them to germinate and grow up through hard substrate.

It is recommended that work is avoided within areas contaminated with Himalayan balsam during the time when the plant is seeding (late July – Oct). If work is planned during this period, then these areas must be cleared of Himalayan balsam by herbicide application, strimming or hand-pulling plants in May/June in advance of works taking place.

4.4.2.2 Giant Hogweed

Hand cutting of Giant hogweed should never be undertaken unless the operator is wearing full PPE as described above and approval has been agreed with the Site Project Manager and the contractor's Health & Safety representative. A Risk Assessment and Method Statement should be signed off before works commence. Machine operators should take similar precautions as the sap can be spread onto machinery and subsequently come into contact with skin. Cutting must be undertaken before flowering using long-handled loppers in order to maintain a safe distance from the leaves and other parts of the plant. Power equipment, such as trimmers, strimmers or weed whackers, should not be used on Giant hogweed as they can result in the airborne spray of sap and plant material.

If the use of such equipment is unavoidable, a full Risk Assessment and Method statement will be required and approval agreed with the Health & Safety representative and the employer's representative.

Cutting is a treatment method used when a site is unsuitable for herbicide application due to water quality or sensitive area constraints. This technique is considered moderately effective as it is time consuming therefore making it suitable for sites with small infestations or low density and widely dispersed plants.

Cut material must be collected and disposed of as material left in situ is considered a health risk. Seed heads should be bagged before cutting to reduce dispersal. Care should be taken when deciding the most appropriate means of disposing of Giant hogweed plant material in order to avoid the spread of seeds and minimise health hazards to the public.

Small infestations can be controlled by digging out the whole plant. This should be done in April or May, cutting the plant at a 45 degree angle below ground to ensure damage to the rootstock and to prevent regrowth from the base. It is possible that large infestations may be controlled by deep cultivation (ploughing) although this is generally impractical on river banks. This method is very effective but time consuming and labour intensive therefore increasing the costs associated with treatment and therefore is only considered suitable for individual plants or small stands and not areas of significant infestation. This treatment method requires staff to work in close proximity to Giant hogweed and may thereby increase health and safety risks which can be mitigated with PPE and good work practices.

Ensure that soils from within 8m of the plant is not transferred to other areas as it is likely to contain vast numbers of seeds from previous years flowering. The majority of seeds are contained within the top 5cm of the soil and are viable for up to 15 years. Excavated soil and cut vegetative material should not be stock piled within 10m of any watercourse due to the risk of material being transferred by water. Giant hogweed material and infected soil should be stored on top of an invasive species membrane/ fabric in a designated biosecurity area for appropriate disposal.

4.4.2.3 Off-site Disposal

The waste mitigation hierarchy dictates that the licencing, transportation and off-site disposal of invasive species material is only considered as a last resort when none of the other treatment methods described above can be carried out (site is too small to contain excavated material, too shallow for burial, where there is a lack of space or where the infestation simply cannot be avoided by the construction works). For disposal off site to a licenced facility, consultation must be undertaken with the National Parks and Wildlife Service (NPWS), the Environmental Protection Agency (EPA) and the Local Authority prior to the disposal of invasive species. The movement of invasive species plant material including contaminated soil off-site **requires a licence** from the Licensing Unit of the NPWS **and must be transported by a licenced haulier to a licenced facility**. All off site disposals must be carried out in accordance with the relevant Duty of Care and Waste Management legislation (as per guidance from NRA, 2008). The licenced waste facility must:

- Be informed in advance of the nature of the waste material;
- Be licenced to accept this material; and
- Be prepared to accept the material.

Great care is required to ensure that no material is lost when the excavated material is being transported off site.

4.4.4 Post-construction Monitoring

Following the construction of the Greenway, it is important that the site is systematically re-surveyed to determine the success of control measures and to identify areas where invasive plants are reinvading. It is important to note that untreated Giant Hogweed and Himalayan balsam in the wider environment of Limerick, adjacent to or on the riverbanks of the Shannon and Mulkear upstream of the proposed greenway route are a risk to recolonise the study area after treatment. Work in partnership with neighbouring landowners to treat Giant hogweed and Himalayan balsam is encouraged. Establishing a good sward of grasses/ native riparian vegetation soon after treatment of these invasive species will help to reduce the rate of re-colonisation of the area by these species and help to prevent the slippage of banks. If invasive species are found, then they shall be treated as per the measures outlined in this plan and the species- specific guidelines above.

5. PROJECT SPECIFIC TREATMENT PLAN

The proposed Limerick City Greenway (UL to NTP) is a linear project, and construction is proposed to be carried out in five separate sections. The proposed construction works will typically take 6-12 months to construct so the specific treatment method for each section will be decided on a site-by-site basis and in consideration of the time of year.

Before the specialist treatment and invasive species management period begins in each section of the proposed greenway works area, an invasive species specialist should carry out a pre-construction re-survey to confirm the extent of invasive species and adopt/amend this plan accordingly.

Chemical treatment is the preferred treatment for Himalayan balsam and Giant hogweed for this project.

The site must be monitored through the treatment period and in the subsequent years. Any re-growth of Himalayan balsam and Giant hogweed must be subsequently treated as detailed in section 4.

The biosecurity control measures listed in section 4.3 should be implemented. Control measures and treatment shall be implemented by a suitably qualified licenced specialist.

An outline ISMP programme of works is provided in the table below. There is no preference or sequence provided for the completion of particular sections. The periods provided assume the specialist treatment and monitoring works will be carried out by an LCCC appointed specialist over a 24-month period.

Additional monitoring in each section will be required by the Works Contractor's specialist (ideally the appointed Environmental/Ecological Clerk of Works) who is likely to require additional treatment ahead of the site clearance and construction of the proposed greenway given the extensive spread of invasive species currently proliferating in the area.

Table 5-1: Outline ISMP programme for Limerick City Greenway (UL to NTP)

Task	Period	Timing of Treatment	Responsibility
Appoint Specialist	0		LCCC
Specialist re-survey of proposed works area	Month 0-1		Specialist
Specialist works in 1st Section	Month 1-2	Mar/Apr/May/Jun	Specialist
Monitoring in 1st Section	Month 4-24		Specialist
Specialist works in 2nd Section	Month 1-3	Mar/Apr/May/Jun	Specialist
Monitoring in 2nd Section	Month 4-24		Specialist
Specialist works in 3rd Section	Month 1-3	Mar/Apr/May/Jun	Specialist
Monitoring in 3rd Section	Month 4-24		Specialist
Specialist works in 4th Section	Month 2-3	Mar/Apr/May/Jun	Specialist

Monitoring in 4th Section	Month 4-24		Specialist
Specialist works in 5th Section	Month 2-3	Mar/Apr/May/Jun	Specialist
Monitoring in 5th Section	Month 4-24		Specialist

6. CONCLUSION

This Invasive Species Management Plan inclusive of biosecurity measures has been prepared for the proposed Limerick City Greenway (UL to NTP) project.

Advanced chemical treatment has been identified as the preferred treatment option for this project. However, given the extent of the invasive species infestation within the Study Area eradication of these species within the construction site is considered unlikely and further biosecurity control measures during the construction of the greenway will be required. A pre-construction re-survey shall be undertaken by the Works Contractor's specialist to confirm the extent of invasive species within the proposed greenway works area at the time. This plan provides measures to prevent the spread of invasive species listed on the Third Schedule of the Birds and Habitats Regulations (S.I. 477 of 2011) within the proposed greenway works area and adjacent lands.

Invasive species control measures have been described in section 4, and section 5 states the project specific proposals for this project. Control measures and treatment shall be implemented by a suitably qualified licenced specialist. The site will be monitored through the treatment period of this plan and in the subsequent years. Any re-growth of Himalayan balsam and Giant hogweed will be subsequently treated as detailed in section 4.

LCCC engaged a spraying contractor to carry out herbicide treatment during the summer and autumn of 2021. This spraying did not go ahead because the contractor withdrew from the contract.

It is recommended that LCCC engages a specialist to carry out IAPS treatment over two calendar years which should be completed before the works contractor starts on site, following the recommended treatment methods detailed in section 4 and section 5 of this invasive species management plan.

7. REFERENCES

DCHG, (2017). National Biodiversity Action Plan 2017-2021. Department of Culture, Heritage and the Gaeltacht.

Delbart, E., Mahy, G., Weickmans, B., Henriet, F., Cremer, S., Pieret, N., Vanderhoeven, S. and Monty, A. (2012). Can land management control Japanese knotweed? Lessons from control tests in Belgium. Environmental Management, 50(6), pp. 1089-1097.

Kelly, J., Maguire, C.M. and Cosgrove, P.J., Muir, R.A. (2015). Best Practice Management Guidelines Japanese knotweed Fallopia japonica. Prepared for NIEA and NPWS as part of Invasive Species Ireland.

National Roads Authority (2010). Guidelines on The Management of Noxious Weeds and Non-native Invasive Plant Species on National Roads. Prodiced by EirEco Consultants.

European Commission (2017) Invasive Alien Species of Union Concern.

A Guide to Habitats in Ireland The Heritage Council by Julie A. Fossitt (October 2000).

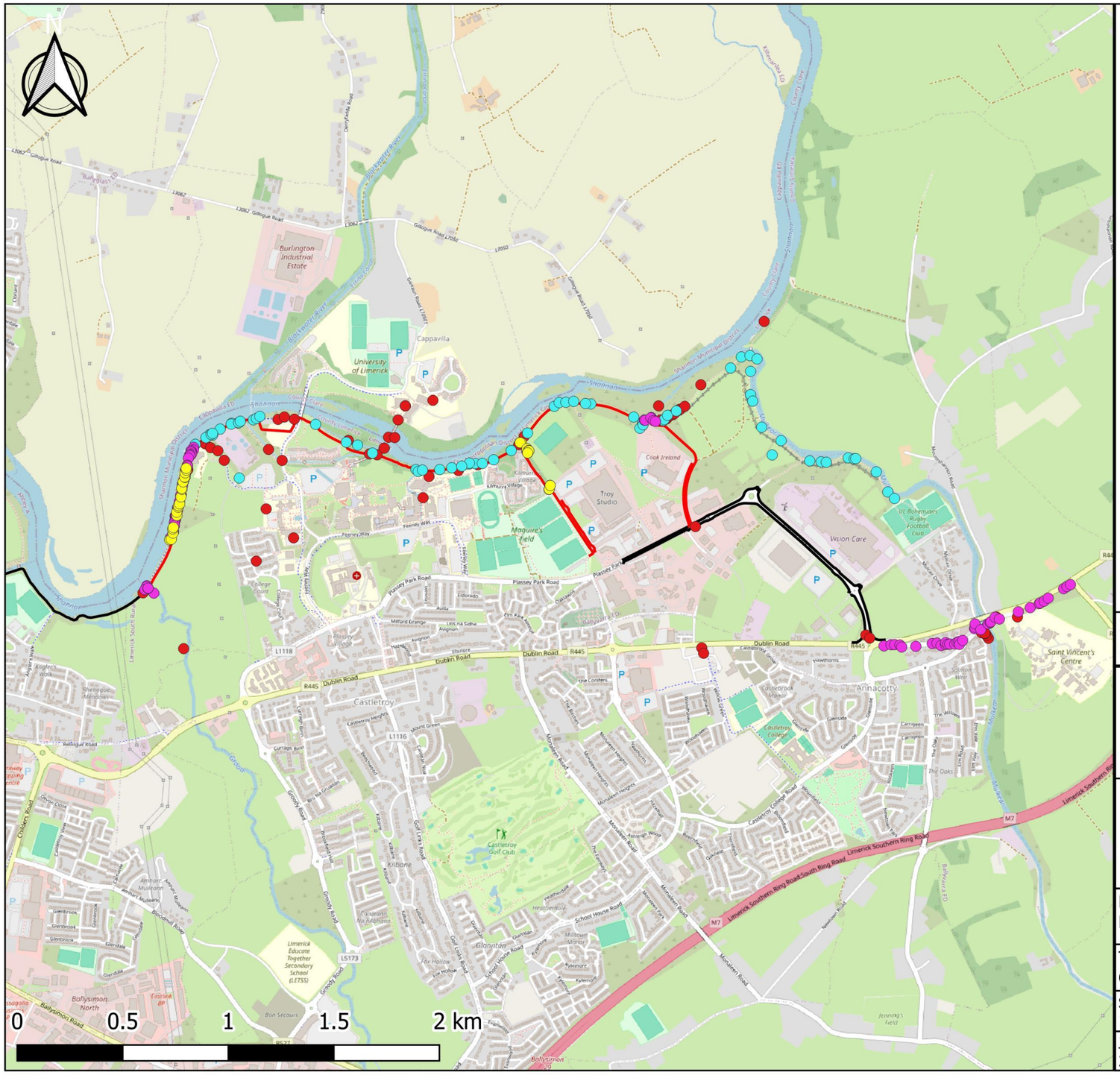
Appendix A

Desktop Study and Field Survey Results

A1: All Invasive Species Records for the Limerick City Greenway Study Area

A2: Limerick City & County Council App Invasive Species Records

A3: National Biodiversity Data Centre Invasive Species Records



Map Legend

- Proposed Greenway Route
- Existing Active Travel Link
- IS from LCCC App
- IS from NBDC
- IAPS Records 2020-2021
- IAPS Records 2022_2023
- IAPS Records 2024

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CLIENT

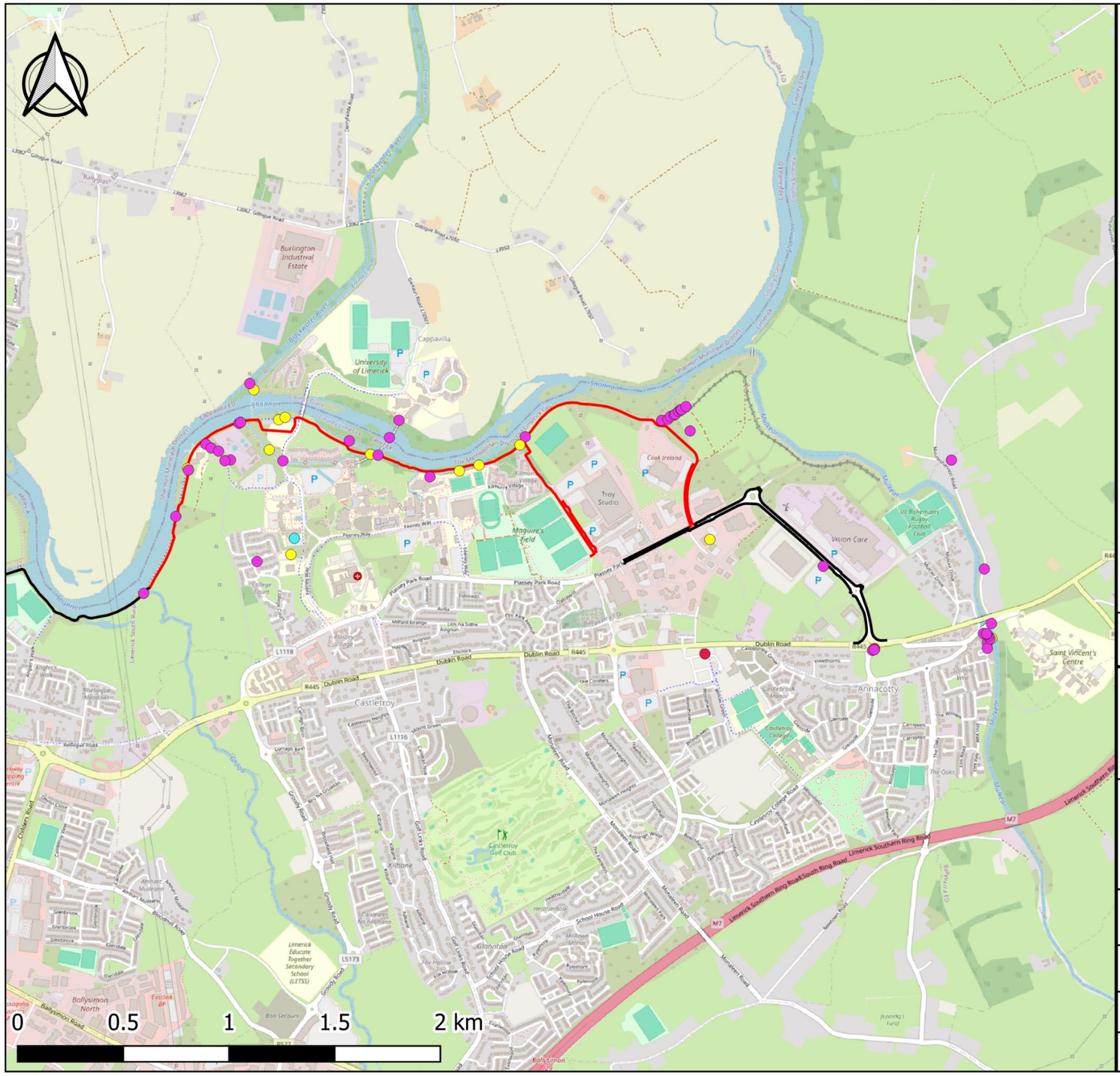
Comhairle Cathrach & Contae Luimnigh
Limerick City & County Council

PROJECT
Limerick City Greenway (UL to NTP)

TITLE
Combined IAPS Records

SCALE	DATE	DRAWN	CHECKED	APPROVED
1:25,000	11/24	AC	BQ	BL
JOB N. 2535	Report ISMP		REVISION 0	

Appendix A1- All Invasive Species Records for the Limerick City Greenway



Map Legend

- Proposed Greenway Route
- Existing Active Travel Link

IS from LCCC App

- Himalayan Balsam
- Giant Hogweed
- Winter heliotrope
- Japanese Knotweed

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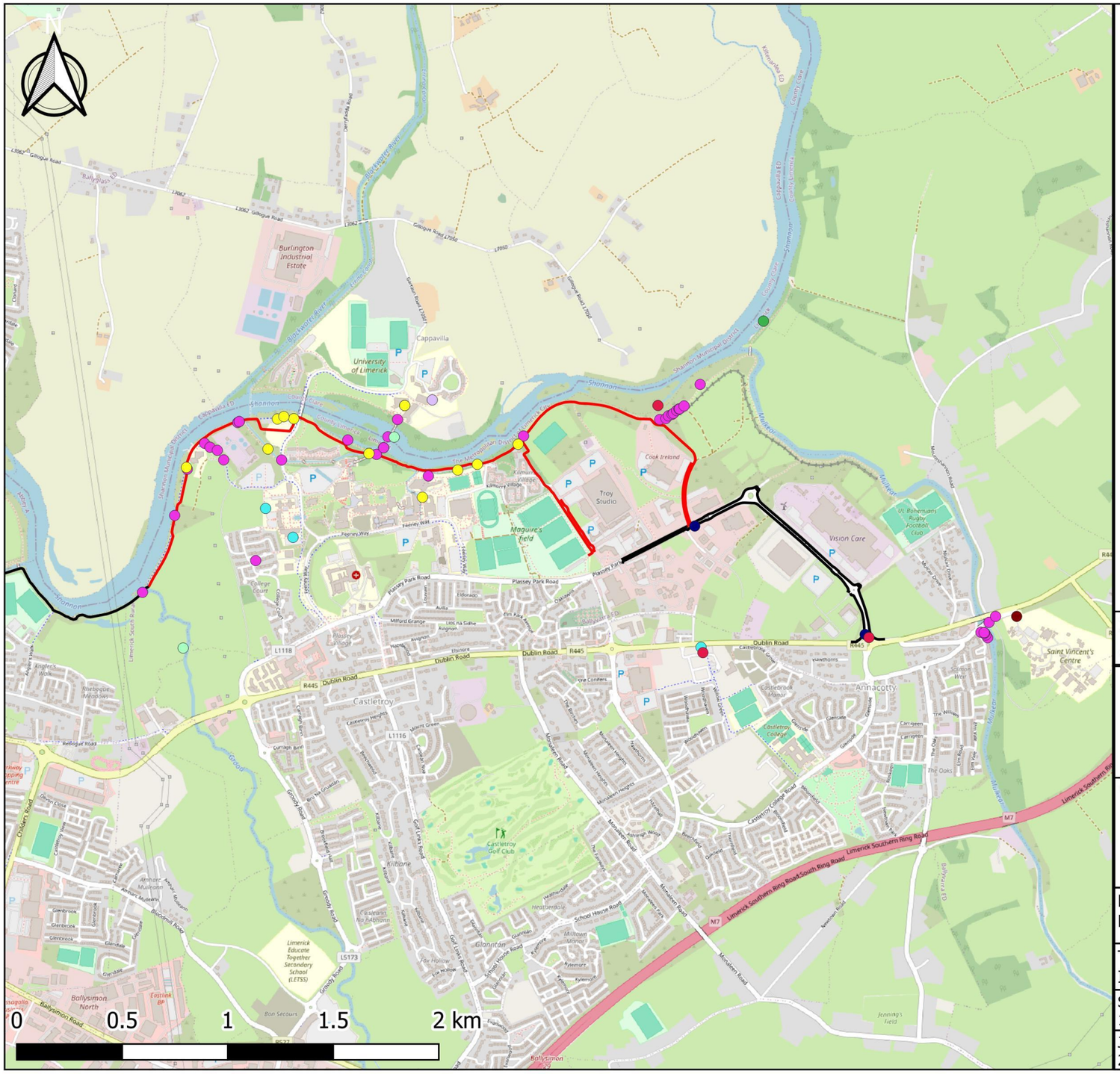
Limerick City & County Council

PROJECT
Limerick City Greenway (UL to NTP)

TITLE
LCCC App - Invasive Species Locations

SCALE	DATE	DRAWN	CHECKED	APPROVED
1:25,000	11/24	AC	BQ	BL
JOB N. 2535	Report ISMP		REVISION 0	

Appendix A2- Limerick City and County Council App Invasive Species Records



Map Legend

- Proposed Greenway Route
- Existing Active Travel Link

NBDC Records

- Himalayan Balsam
- Giant Hogweed
- Butterfly-bush
- Water Fern
- Nutall's Waterweed
- Common Dace
- European Rabbit
- Winter heliotrope
- Japanese Knotweed

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PROJECT
Limerick City Greenway (UL to NTP)

TITLE
IAPS Records from National Biodiversity Centre

SCALE	DATE	DRAWN	CHECKED	APPROVED
1:25,000	11/24	AC	BQ	BL

JOB N.	Report	REVISION
2535	ISMP	0

Appendix A3- National Biodiversity Data Centre Invasive Species Records

Comhairle Cathrach & Contae Luimnigh

Limerick City & County Council

Limerick City Greenway (UL to NTP)

Biodiversity Management Plan

July 2025

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Client	Limerick City & County Council
Project No.	2535
Project Title	Limerick City Greenway (UL to NTP)
Report Title	Biodiversity Management Plan

Rev.	Status	Authors	Reviewed By	Approved By	Issue Date
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1	Issued following Client Review	C. Murphy	P. Rodolfi T. Stafford	B. Larkin	June 2025
2	Issued	C. Murphy	P. Rodolfi T. Stafford	B. Larkin	July 2025

Executive Summary

This document is a Biodiversity Management Plan for a proposed Limerick City Greenway (UL to NTP).

Biodiversity Management Plan Summary

The development consists of the upgrading of an existing pathway and desire line, along the southern bank of the River Shannon which will connect UL and the National Technology Park (NTP) directly to Limerick city. This proposed development is in accordance with the Limerick Development Plan 2022-2028 (LDP) and the Limerick Shannon Metropolitan Area Transport Strategy (LSMATS). Both documents aim to promote the use of sustainable and/or zero-emission modes of transport in Limerick. Developing this project in Limerick will allow for safe and efficient modes of carbon neutral transport such as cycling as well as promoting cycling as a realistic choice of travel in the Limerick Metropolitan Area. The project also accords with European Strategies such as the Sustainable and Smart Mobility Strategy and the EU Cycling Strategy.

The proposed site is located within and adjacent to the Lower River Shannon Special Area of Conservations (SAC), and it is located close to the River Shannon and River Fergus Estuaries Special Protected Area (SPA). A number of Natural Heritage Areas (NHA's) and Proposed Natural Heritage Areas (pNHA's) are also relatively close to the proposed site development. Appropriate planning and mitigation strategies must be implemented and followed.

Field surveys undertaken in the study area of the proposed development recorded a number of non-volant mammals and birds using this area. Three faunal species of International Importance are known to populate the area of the proposed site, these species being Otter *(Lutra lutra),* Atlantic salmon (*Salmo salar),* and Sea Lamprey (*Petromyzon marinus*), these species are Qualifying Interests (QIs) of the Lower River Shannon SAC. No instream works are proposed as part of the works so it is not considered that these species will be significantly affected by the proposed site. However, the mobilisation of contaminants during the construction phase of development can impact local aquatic habitats and can cause reductions in water quality, thus affecting aquatic life. Depending on the time of year of the construction phases, the life cycle of migratory fish species may be impacted by a reduction in water quality. Therefore, substances and surface water runoff during the construction phase must be properly managed. The timing of construction phases should also consider breeding and migratory seasons of protected species within the area.

Badgers, bats and birds use the treelines and scrub areas for commuting, foraging and protection purposes. There is the potential of medium-term effects on these species during the construction phases due to loss of hedgerows, trees and scrub. The removal of shrub and trees can reduce feeding opportunities for mammals and increase species competition. However, due to the relatively small amount of habitat losses involved compared to the overall landscape area, faunal species will not be significantly affected.

The dominant habitats present in the study area consist mainly of modified habitats such as amenity grasslands, buildings, and artificial surfaces. No protected floral species were identified during multiple field surveys undertaken between 2020-2024. However, Himalayan balsam (Impatiens glandulifera) and Giant hogweed (Heracleum mantegazzianum) which are classified as invasive alien species were identified in abundance along the length of the proposed greenway route. Alluvial forests, which is recognised as a habitat of international importance (Annex I woodland habitat), occurs on the banks of the Shannon and on islands in the vicinity of the University of Limerick.

As part of the project design and in accordance with best practice guidance notes it is proposed to install energy efficient public lighting that will provide a suitable level of light for use by cyclists and pedestrians whilst creating minimal light spillage onto adjacent environmentally sensitive locations. Ancillary and amenity elements are included as part of the proposed development which include fencing, signage, cycle track markings, information boards, and park benches.

Mitigation measures have been provided in order to reduce long term negative impacts on habitats, flora and fauna in the site area, as well as enhance biodiversity after the construction phase of the development. Invasive alien species must be dealt with according to Ireland's 4th National Biodiversity Action Plan 2023–2030.

Project Summary

This report has been prepared to support a planning application to An Bord Pleanála made under Section 51(A) of the Roads Act (1993) (As amended). This report has been prepared by Ryan Hanley on behalf of Limerick City & County Council (LCCC).

The proposed Limerick City Greenway (University of Limerick (UL) to National Technology Park (NTP)) will be 4.25km long and will consist of a 3.3km long and 3.0-4.0m wide shared path on existing paths or in green fields, and 0.9km of separated 1.8m wide footpaths and 1.8-2.0m wide cycle lanes alongside the eastern and western sides of University Road and McLaughlan Road. The proposed Greenway will extend between the River Goody bridge and Plassey Park Road.

All elements of this project will be constructed for permanent local and visitor recreational use.

There will be no buildings constructed along the route.

Two concrete bridge decks will be replaced with wider steel decks, but the existing bridge supports will remain. One new steel and concrete bridge will replace a narrow reinforced concrete bridge. One new steel and concrete bridge will provide access to all and replace the function of a narrow reinforced concrete bridge with steps, but the exiting bridge will remain in place. One new steel and concrete bridge will be constructed alongside a narrow stone bridge. A new concrete ramp to Plassey Beach will replace stone steps, and a new concrete retaining wall will enable the existing gravel path at Plassey Beach to be widened to 3.5m.

The proposed Greenway will be constructed in Castletroy, Co. Limerick. It will extend eastwards from the existing Limerick Smarter Travel Cycle Route 2 to run along the southern bank of the River Shannon and provide a new connection between the existing Shannon Fields Greenway to UL path at Groody Bridge, and existing cycle lanes and footpaths on Plassey Park Road. It will also provide new connections to the IDA's National Technology Park (NTP) at Plassey, and the University of Limerick. This proposed Greenway east of Limerick city will extend existing cycle routes from the city further east and provide future links to Castleconnell and to Co. Clare.

The proposed Limerick City Greenway (UL to NTP) is included in Section 9.1.7 Greenway Cycle Network in the Limerick Shannon Metropolitan Area Transport Study (LSMATS) and is described as an 'Extension of the Shannon Fields Greenway to UL along the banks of River Shannon to the NTP and Annacotty'. The Limerick Development Plan 2022-2028 (LDP) includes policies to deliver modal split (Objective TR 06), to promote 'walking, cycling or other non-motorised wheel-based transport modes for purposeful travel' (Section 7.5.2), to encourage behavioural change (Objective TR 07), to provide walking and cycling infrastructure (Objective TR O8), and to promote sustainable patterns of transport use (Objective TR P4). This project will provide an accessible cycling and walking route for users of all abilities in accordance with the objectives in the LDP and LSMATS.

The project is not a class of development for which mandatory Environmental Impact Assessment (EIA) is required as specified in either Part 1 of Schedule 5 of the Planning and Development Regulations, 2001 (as amended) or in Part 2 of Schedule 5 of the Planning and Development Regulations, 2001 (as amended). The Formal EIA screening process was completed having regard to the Roads Act as amended by the EIA Directive 2014/52/EU. An EIA report has been prepared for this project. An AA Screening Report was prepared for this project. It concluded that a Natura Impact Statement (NIS) was required so an NIS has been prepared for this project.

The proposed Greenway will provide strategic, sustainable, and safe connectivity between Limerick city the University of Limerick, the National Technology Park, and connect community facilities, tourist attractions, and transport nodes (i.e., bus stations). This connectivity will benefit communities, businesses, and visitors.

The proposed works for the construction of the Limerick City Greenway (UL to NTP) will be on land for which specific planning objectives are in place. All applicable planning objectives have been examined and any risks to the meeting of same have been mitigated. As a result, the development of the proposed Greenway will not significantly impede development potential or zoning objectives of the land. The proposed development is consistent with planning policy at National, Regional and Local level and is in accordance with proper planning and sustainable development.

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1 Introduction

This Biodiversity Management Plan aims to enhance biodiversity and reduce direct and indirect impacts of the proposed development of the Limerick City Greenway (UL to NTP) on the development site and nearby habitats. The Limerick City Biodiversity Management Plan highlights the importance of local habitat enhancement, wildlife corridors, the management of invasive species and community appreciation in regard to promoting local natural heritage. The Limerick City Greenway (UL to NTP) Project will form an extension to the already constructed Limerick Smarter Travel, Route 2, which connects directly into the city centre. That project involved the upgrading of an existing pathway, 1.5km in length between the Guinness Bridge and the Groody Bridge, along the southern bank of the River Shannon.

The proposed Limerick City Greenway (University of Limerick (UL) to National Technology Park (NTP)) will be 4.25km long and will consist of a 3.3km long and 3.0-4.0m wide shared path on existing paths or in green fields, and 0.9km of separated 1.8m wide footpaths and 1.8-2.0m wide cycle lanes alongside the eastern and western sides of University Road and McLaughlan Road. The proposed Greenway will extend between the River Goody bridge and Plassey Park Road.

Site visits were carried out between 2020-2024, and these visits allowed for screening of the dominant and the non-dominant habitats present which may be affected by the various phases of the project and enabled the assessment of potential impacts on key ecological receptors. Habitats, flora and fauna within and surrounding the proposed site boundary were also included in the screening visits.

2 Methodology

2.1 Desk Study

A desk study of the proposed development site was undertaken in order to gather information regarding the existing ecological and hydrological environment. This assessment included the identification of any potential impacts on designated sites (European Sites, Natural Heritage Areas and Proposed Natural Heritage Areas), water quality and protected, habitats, rare and other notable species by the proposed Greenway during all phases of development and succeeding development. Tables 6.2-6.12 in Chapter 6 – Biodiversity of the EIAR provides detailed information found during the desk study regarding flora, fauna, designated sites and water quality of hectad R65. The following sources of information were reviewed as part of this report:

- Ordnance Survey maps of the study area (www.osi.ie);
- Aerial photography of the Study Area;
- The National Parks and Wildlife Service (NPWS) site synopses and online database (www.npws.ie) of information on designated sites;
- A Guide to Habitats in Ireland (Fossitt, 2000);
- New Atlas of the British & Irish Flora (Preston *et al.*, 2002);
- Flora (Protection) Order 2022 Map Viewer: https://heritagedata.maps.arcgis.com/apps/webappviewer/index.html?id=a41ef4e10227499d8de17a8abe42bd1e
- Bat records from the Bat Conservation Ireland (BCI) databases (All-Ireland Daubenton's Bat Survey, Bat Monitoring Scheme BATLAS);
- The Bird Atlas 2007-2011, the British Ornithology Trust website www.bto.org/volunteer-surveys/birdatlas;
- The National Biodiversity Data Centre (NBDC) database www.biodiveristyireland.ie for records of rare, protected, threatened and invasive species;
- NPWS Rare and Protected Species Records;
- Environmental information/data from the Environmental Protection Agency (EPA) website http://www.epa.ie/rivermap/data;
- The Water Framework Directive website www.wfdireland.ie; and
- GeoHive online mapping http://map.geohive.ie/mapviewer.html.

A section of the proposed greenway lies in close proximity to the Lower River Shannon SAC, site code 002165, so an Natura Impact Statement (NIS) was produced because an Appropriate Assessment Screening report concluded that there are likely significant effects to some of the qualifying interests of the SAC.

There are four Natural Heritage Areas (NHA's) and sixteen Proposed Natural Heritage Areas (pNHA's) within the zone of influence of the scheme.

Records of rare or protected flora and fauna within a 10km grid square of the proposed project were obtained from the National Parks and Wildlife Service (NPWS), National Biodiversity Data Centre (NBDC), Botanical Society for Britain and Ireland (BSBI) and Bat Conservation Ireland (BCI). There are nineteen records of plant species (vascular and bryophytes) of conservation concern, that are listed under either the Flora Protection Order, Annex II or the Irish Red List, within the 10 km grid square. Information

gathered from the National Biodiversity Data Centre for grid R65, indicate there are a total of 62 no. records for protected species.

3 Description of the Proposed Development

3.1 Existing gravel path, green field, and roads

The proposed Limerick City Greenway (UL to NTP) will be constructed alongside the southern bank of the River Shannon between the River Groody bridge and east of Cook Medical in the IDA park. There will be links perpendicular to the river between Kilmurray Student Village and University Road, and between Cook Medical/McLaughlan Road and Plassey Park Road.

Refer to the Preliminary Design drawings in Appendix A for Chainages.

CH000 – CH300

The proposed route commences west from the existing River Groody bridge (Figure 3-1) at the confluence of the River Groody with the River Shannon.

Figure 3-1: Existing Bridge at River Groody

The proposed Greenway route will divert from and run adjacent to an existing narrow walking track along the southern bank of the River Shannon. The existing narrow path has a wooden fence along its sides and there have been complaints to LCCC from the public regarding the width of the path, especially in relation to the speed of cyclists and scooter users. For this reason a new 3.5m wide path is proposed to be constructed between CH0-300.

Figure 3-2: Start of proposed greenway in green field with existing path alongside

CH300-CH430

The proposed greenway will cross the land drain and rejoin the existing path which will be resurfaced but the existing path will remain the same. The path will avoid a small forest of trees that were planted to compensate for habitat loss when the Living Bridge that connects the UL Campus that is located in Co. Limerick and in Co. Clare was constructed. The path will cross the existing bridge at CH400.

Figure 3-3: Existing bridge at CH400

CH430-CH615

The proposed greenway will divert away from the existing path and run through a green field. It will cross a land drain.

CH615-CH795

The proposed greenway will rejoin the existing path and run in front of the UL Boat Club building, and the UL slipway. The existing ESB covered will be raised to match the level of the proposed greenway (approx. 150mm higher than existing).

Figure 3-4: Existing path to be resurfaced

The proposed greenway will continue along the existing paved path until the surface changes from paved to gravel surface. It will connect to an existing shared surface leading to the UL campus.

Figure 3-5: Paved path connects to shared path leading to UL

Figure 3-6: Existing Project information sign for Limerick Smarter Travel Cycle Route 2

Figure 3-7: Existing direction sign outside the UL Boat Club and slipway in background

There is existing public lighting along the existing path between the River Groody bridge and the UL Boat House. Refer to the black column and lantern in Figure 3-8.

Figure 3-8: Examples of existing Public Lighting Column and Lantern along Limerick Smarter Travel Cycle Route 2

East of the paved path towards the UL campus, the existing path surface changes from tarmac to gravel.

Figure 3-9: Path surface changes from paved to gravel and narrows to approximately 1.5m width

CH795

The path will cross a bridge over a land drain (Named as Bridge 1 for the purposes of this project). There is a stone parapet on the River Shannon side of the bridge and a metal railing on the opposite side. There are wooden fences leading to the bridge on the eastern and western approaches.

Figure 3-10: Existing Bridge No 1

Figure 3-11: Existing bridge over land drain (Bridge 1)

Figure 3-12: Existing abutment wall (proposed to be decommissioned)

CH795-CH950

The proposed greenway will continue eastwards and pass along the existing gravel path north of the Castletroy wastewater treatment plant. There is a northern access into the plant with an existing route over a culverted land drain that will be included in the proposed greenway path.

Figure 3-13: View south to the northern access gate of Castletroy Wastewater Treatment Plant

Figure 3-14: View facing east outside the Castletroy wastewater treatment plant

There are existing concrete railings alongside the narrow gravel path. The proposed path will avoid two trees with a potential for a bat roost at CH850. No bat roosts have been identified in these trees, but the trees will remain.

CH950-CH980

The existing path continues to an existing narrow stone bridge (named as Bridge 2 in this project). The surface changes from gravel to paved.

There are existing stone abutments and a high stone wall at Bridge 2.

Figure 3-15: Existing path and stone bridge along Shannon River leading to Bridge 2

Figure 3-16: View of Bridge 2 from the exiting paved path

The existing stone parapet that is missing in Figure 3-17 has been reset into position by LCCC since the photo was taken.

Figure 3-17: View of Bridge 2 from bank of drain

Figure 3-18: View under Bridge 2 facing north to the River Shannon

Figure 3-19: : Existing railing between Bridge 2 and Bridge 3

CH1000

The existing path continues to a temporary steel truss bridge that has replaced a concrete deck over an existing stone bridge (named as Bridge 3 in this project). This bridge crosses the Plassey Mill Race where it flows into the River Shannon.

Figure 3-20: Existing temporary bridge across the Plassey mill race where it rejoins the River Shannon

Figure 3-21: Shallow water level in Plassey Mill Race and existing abutments of Bridge 3

CH1000-1040

The existing path continues past a rest area north of Plassey Mills (Figure 3-22).

Figure 3-22: Existing bench in front of Plassey Mill

The existing bridge between Co. Limerick and Co. Clare is to the north of this area (Figure 3-23). This bridge is known locally as the 'Black bridge'.

Figure 3-23: Black bridge

Figure 3-24: Blocked access to the Black bridge that links County Limerick and County Clare

There is an existing kissing gate on the path east of the rest area in front of Plassey Mills.

Figure 3-25: Existing gate on path at Plassey Mills (1 of 2)

Figure 3-26: Existing gate on path at Plassey Mills (2 of 2

CH1040

The existing path continues eastwards towards an existing bridge (named as Bridge 4 in this project) across the decommissioned overspill for the Plassey Mill Race.

Figure 3-27: Existing bridge (Bridge 4) over the decommissioned and dry Plassey Mill race overspill

Figure 3-28: Dry bed of overspill from Plassey Mill Race

CH1040-CH1330

The existing path continues north of the existing Fisherman cottages, but the proposed path will turn south-east and run behind the Fisherman Cottages as requested by the residents. This area is characterised by uneven poorly drained ground with thick undergrowth. The residents in the cottages have reported regular flooding in their properties so this project will construct a new flood defence system for the residents.

Figure 3-29: Thick vegetation with immature trees with Plassey Mills in the background

Figure 3-30: Heavy undergrowth to rear/south of Fisherman Cottages

Figure 3-31: Trees to south/rear of Fisherman Cottages (cottage partially visible)

Figure 3-32: Existing Bee Hives east of the Fisherman Cottages

Figure 3-33: Existing kissing gate at the Garrisson Wall to be retained on the gravel path that runs in front of the Fisherman cottages

There is an existing gravel path to the east of the Fisherman Cottages that connects to existing shared paths in the UL Campus.

Figure 3-34: Existing gravel path east of Fisherman Cottages

CH1330-CH1340

The proposed path will rejoin the existing path and will pass under an existing bridge between Co. Limerick and Co. Clare.

Figure 3-35:: Existing road bridge between the UL campus in Co. Limerick and Co. Clare

Figure 3-36: View of existing gravel path under road bridge that links UL campus between Co. Limerick and Co. Clare

CH1340-CH1410

East of the road bridge the existing path continues eastwards along the southern bank of the River Shannon and towards the existing Dromroe Student village in the UL Campus. The existing path runs through a designated Annex 1 habitat Alluvial woodland forest. UL Facilities has planted Oak trees between Dromroe Student village and the existing path at this location.

Figure 3-37: Existing gravel path along southern bank of the River Shannon

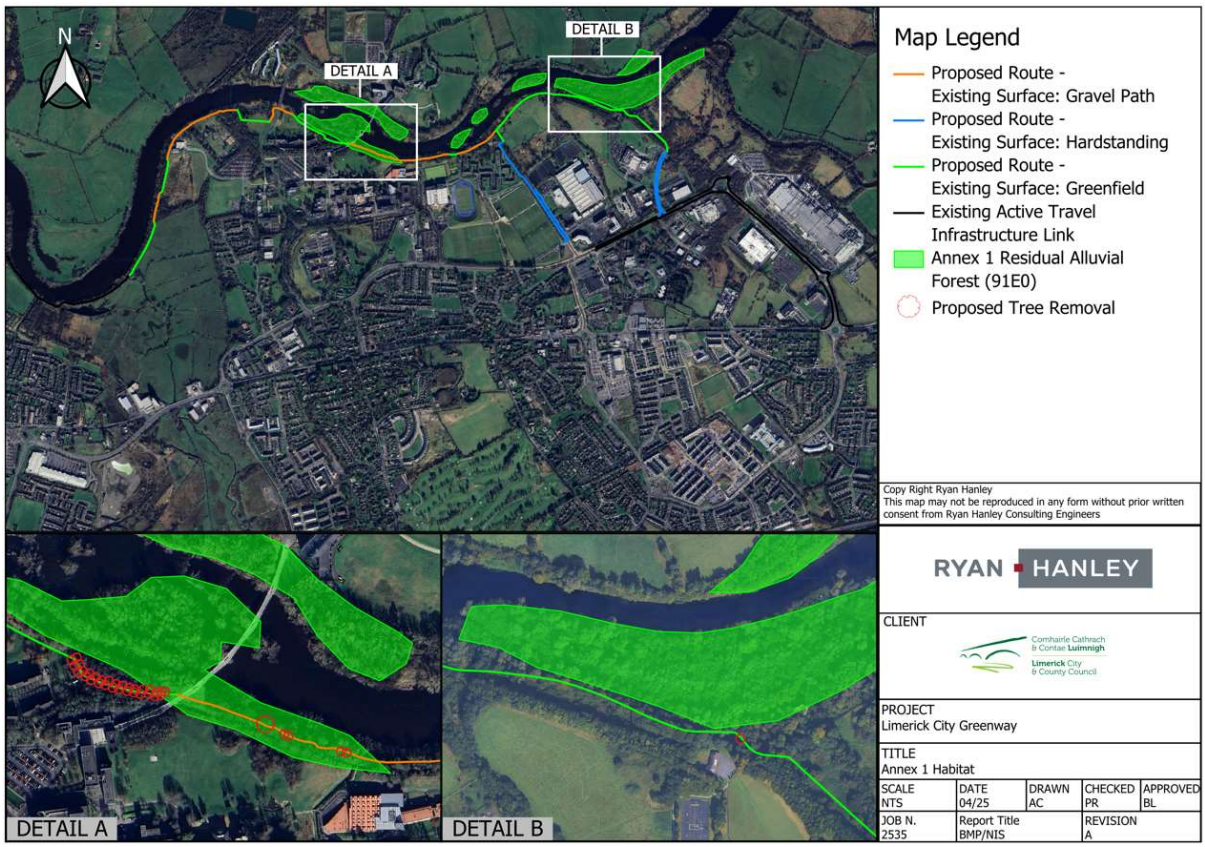

Figure 3-38: Extent of Annex 1 Alluvial Forest interactions with existing path and proposed Greenway route

CH1410-1730

To avoid the existing avenue of beech trees in the Annex 1 Alluvial Woodland forest alongside the riverside path, the proposed greenway route will divert to the south of the beech trees and north of the Oak trees towards a newly planted stand of birch trees. The existing gravel path will remain unaltered.

Figure 3-39: Existing Beach and newly planted Oak trees between the River Shannon and Dromroe Student village

Figure 3-40: Existing gravel path alongside river through an avenue of mature trees in the Annex 1 Alluvial forest

A 6.5m wide strip of immature Birch trees will be removed to provide space for the proposed greenway.

Figure 3-41: Existing immature trees to be removed

The existing path continues under the Living Bridge.

Figure 3-42: Living Bridge in UL campus

Figure 3-43: Existing gravel path under the Living Bridge

CH1730-CH1965

The existing earthen path enters an existing Annex 1 Alluvial woodland and continues eastwards on a raised earth path north of the Plassey Mill Race and approximately 10-20m to the south of the River Shannon.

Figure 3-44: Existing raised earthen path in the Annex 1 habitat Alluvial residual forest

CH1965-CH2150

An existing footbridge from the UL campus joins the earth path at CH1915.

Figure 3-45: Existing footbridge to University of Limerick and flowering Himalayan Balsam (looking west)

The existing earthen path continues eastward on an elevated earth mound with the Plassey Mill Race to the south and the River Shannon to the north.

Figure 3-46: Existing stone steps from earthen path to Plassey Beach

CH2150-CH2250

The existing earthen path continues alongside Plassey Beach.

Figure 3-47: Unpaved path at Plassey Beach

CH2250

There is an existing reinforced concrete bridge that crosses the start of the existing Plassey Mill race.

Figure 3-48: Existing concrete bridge at mouth of Plassey mill race (to be retained)

Figure 3-49: Existing concrete bridge at mouth of Plassey mill race with Plassey Beach in the background

Figure 3-50: Existing concrete bridge at mouth of Plassey mill race looking northeast

CH2250-CH2500

The existing route passes north of Kilmurray Student Village and reaches a junction.

Figure 3-51: Existing gravel path north of Kilmurray Student Village

The route south provides access to University Road and to Plassey Park Road. The route east provides access to Cook Medical in the IDA's National Technology Park and McLaughlan Road.

Figure 3-52: Existing earthbound path south of the River Shannon

Figure 3-53: Existing path east of Kilmurray Student village approaching the land boundary between UL and the IDA

Figure 3-54: Existing gate and culvert at the land boundary between UL and the IDA

CH2500-CH3180

The path changes from an earthen path to a desire line and continues eastwards running generally 20-50m south of the southern bank of the River Shannon. It crosses under overhead electric wires.

Figure 3-55: Desire line through green field

Figure 3-56: Desire line through green field approaching a small stand of trees

Figure 3-57: Desire line through green field weaving between small stands of trees

Figure 3-58: Proximity of desire line to River Shannon

Figure 3-59: Desire line along proposed Greenway route

CH3180-CH3490

The existing desire line continues along the southern bank of the River Shannon at the boundary between UL registered land and IDA registered land (approx. CH3180), but the proposed Greenway route turns south to McLaughlan Road.

Figure 3-60: Warning signs at the IDA boundary (at Cook Medical)

Figure 3-61: Overhead ESB utilities

Figure 3-62: Existing earth berm with Johnson & Johnson factory in background

Figure 3-63: Example of scrubland between the River Shannon and McLaughlan Road

CH3490-CH3805

There are existing concrete footpaths and grass verges alongside McLaughlan Road between the original entrance road into Cook Medical and Plassey Park Road. There is street lighting and other utilities including drainage, telecommunications, and underground electricity cables in this private road.

Figure 3-64: McLaughlan Road in the IDA park

Figure 3-65: McLaughlan Road in the IDA park with street lighting and junctions to other roads/entrances

Figure 3-66: McLaughlan Road where it joins Plassey Park Road (in background)

There is an existing zebra crossing on Plassey Park Road to the north-east of the junction between Plassey Park Road and McLaughlan Road.

Figure 3-67: Existing Zebra crossing on Plassey Park Road

CH000_C-CH300_C

There is a junction in the existing path east of Kilmurray Student Village and the southern route follows a desire line to an existing bridge east of the UL Agricultural Laboratory. The bridge crosses an existing drainage channel at the north of University Road.

Figure 3-68: Existing desire line connecting the riverside path to an existing bridge to the UL Agricultural Laboratory

There is a secure car parking area immediately south of the laboratory.

Figure 3-69: Secure car parking area immediately south of the laboratory

The entrance road to the UL Agricultural Laboratory runs west of the large drainage channel (bounded by an anti-climb fence) and there are rubbish bins and a car parking area between Kilmurray Student Village and the anti-climb fence. There is an entrance road and gate into Kilmurray Student Village that is generally locked. The gate opens onto University Road.

Figure 3-70: Existing gate access from Kilmurray Student Village to University Road

CH300_C-CH677_C

There are no footpaths along University Road but there are large parking bays and public lighting along the western side of the road. There are commercial/industrial buildings along the eastern side.

Figure 3-71: University Road (looking south)

Figure 3-72: Entrance to industrial buildings off University Road

The proposed Greenway will join into newly constructed Active Travel infrastructure at the southern part of University Road where it joins Plassey Park Road.

Figure 3-73: Junction of University Road and Plassey Park Road

3.2 Proposed Greenway and Bridges

CH000 to CH795: Groody Bridge to Proposed Bridge 1

The proposed Greenway will divert to the southeast of the existing tarmac path because the existing path narrows to 2.2m width (between the existing wooden fences) and LCCC has received complaints from members of the public about near passes from cyclists and scooters. It is intended that walkers would continue to use the existing path and cyclists and other users travelling at speeds in excess of walking pace would utilise the proposed Greenway.

Figure 3-74: Proposed Greenway and existing path, and proposed rest area at CH 000

A new rest area with new benches will be provided (refer to Figure 3-95 for an example of the proposed bench). Proposed wooden bollards will redirect cyclists off the existing path and towards the proposed Greenway.

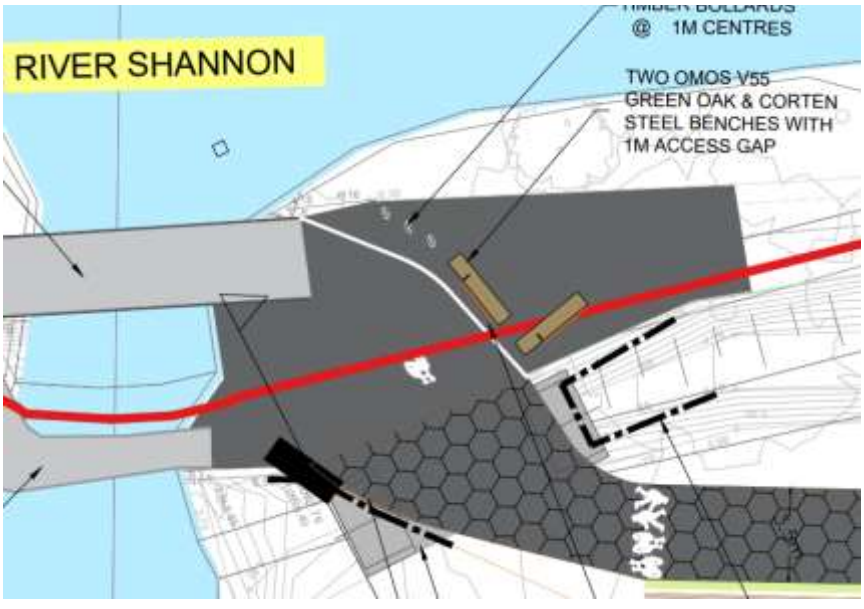

Figure 3-75: Proposed rest area at Groody Bridge

Figure 3-76: Example of wooden bollard that would be installed along the proposed Greenway

In the green field the proposed Greenway will run parallel to a land drain which runs parallel to the River Shannon. A proposed shallow land drain will run along the south side of the Greenway and drainage culverts will enable surface water to drain to the River Shannon. New public lighting will be provided.

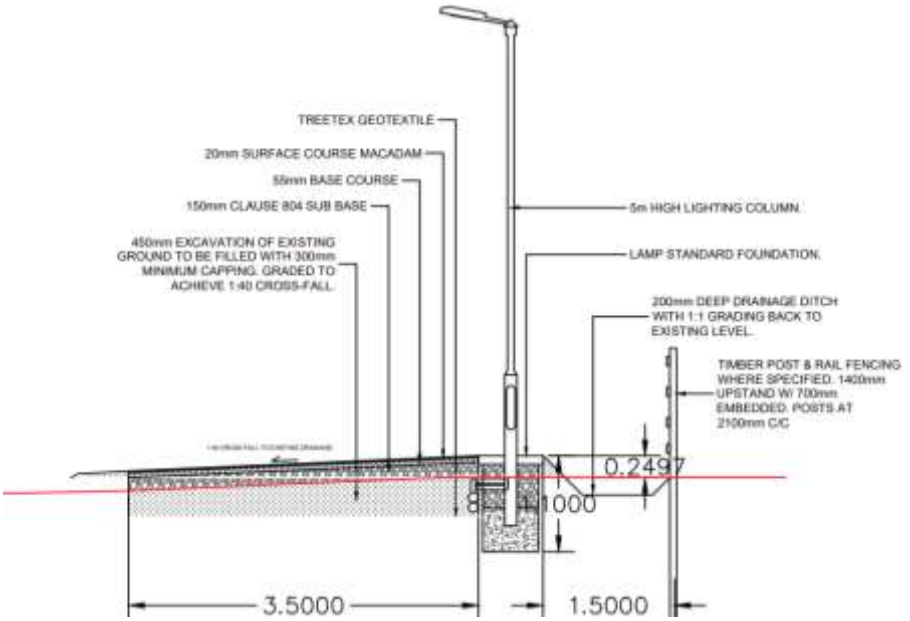

Figure 3-77: Proposed cross section of 3.5m greenway, public lighting column, and land drain

The proposed Greenway will divert north to join the existing 3.5m wide Smarter Travel path and avoid passing through a compensatory habitat area that was planted by the developers of the Living Bridge that connects the UL campus between Co. Limerick and Co. Clare. The proposed Greenway will cross an existing bridge (CH 400). A new steel parapet will be installed above the low stone parapet on this existing bridge to replace the existing parapet which currently narrows the bridge.

Figure 3-78: Existing bridge at CH400

The existing path will be resurfaced.

In accordance with LCCC's tree replacement guide, there will be five trees planted for every tree that will be removed to facilitate construction of the proposed Greenway.

The proposed Greenway will divert south (@ CH430) east of the compensatory habitat area and continue in a green field until it will rejoin the existing 3.5m wide path immediately west of the UL Boat Club. The existing tarmac path will be resurfaced where it passes the existing slipway for the Boat club until CH725 where the existing 2.0m (approx.) wide gravel path will be replaced with a 3.5m wide tarmac path. The surface of the existing path will not be excavated except to install twin ducts for the public lighting and a cellular membrane will be paid onto the gravel path and appropriate building layers will form the base for the tarmacadam surface finish. This will ensure tree roots will not be disturbed.

Figure 3-79: Tree root protection system under new tarmac path in Fairview Park, Dublin 3

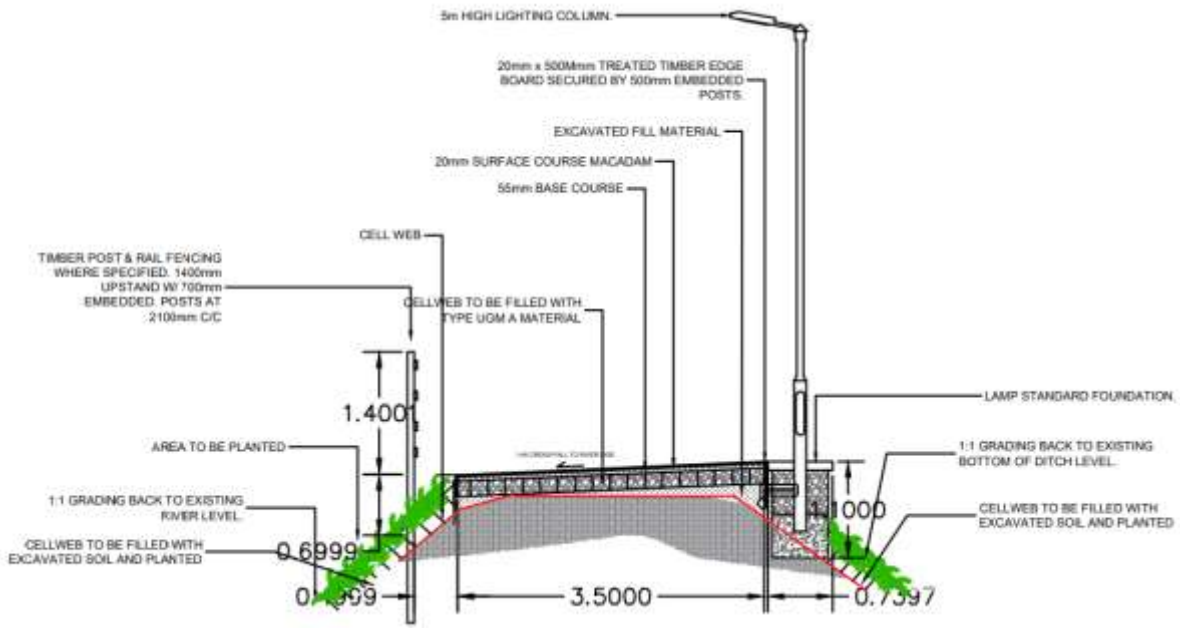

Figure 3-80: Replacement of gravel path with proposed 3.5m wide Greenway

At CH775 there is a proposed tarmac path to join to the existing UL campus shared surface. There are proposed replacement planting trees alongside this proposed path and a proposed bug hotel will be constructed from leftover construction wood and small bore tree branches that may be removed.

Figure 3-81: Example of a bug hotel that will recycle construction materials and reuse tree branches

CH795: Proposed Bridge 1

The proposed Greenway route will extend eastwards to an existing concrete bridge which will be replaced by a proposed 4.8m long and 4.5m wide steel bridge on new concrete abutment walls (Bridge No. 1 @ CH 795). Refer to drawing RHA-XX-DR-C-PD0007.

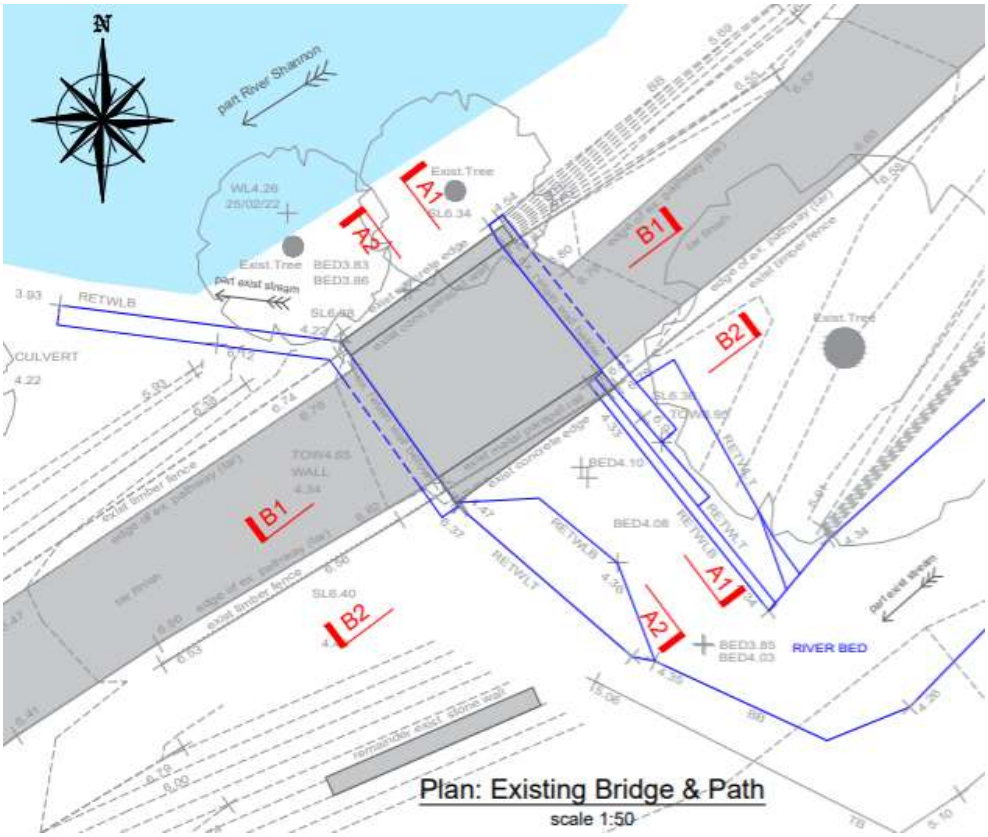

Figure 3-82: Plan of existing Bridge 1 (refer to drawing RHA-XX-DR-S-SP0010)

The existing bridge parapets, one is reinforced concrete, and the other is metal railing (refer to Figure 3-10, Figure 3-11, and Figure 3-12), will be taken down. The existing reinforced concrete bridge deck will be deconstructed by lifting it off the abutments and transporting it to the construction compound where it will be crushed. The crushed material will be recycled by using it to construct haul roads/temporary compounds/ and as a base for the proposed greenway path. Metal arisings, the parapet and the railing will be transported offsite to a licenced waste facility. The existing abutments will be deconstructed by breaking out the walls which will be removed to the construction compound for crushing and recycling, and the foundations will be exposed. Any concrete in the foundations will be broken out and mixed with stone rubble to form the base of the foundations for the proposed bridge abutments.

Dust will be suppressed during the wall and foundation breaking works. To avoid water runoff carrying fines, a shade cloth will be erected immediately adjacent to the concrete that will be broken out to trap dust arisings.

To carry out this deconstruction work and minimise the impact on the environment and local ecology there will be a water filled flood barrier to protect the work site from the River Shannon. To protect the River Shannon from contaminated liquids associated with construction activities including silt, a temporary sheet piled wall will be inserted into the riverbank between the water filled barrier and the worksite, and a silt curtain will be suspended in the River Shannon.

The breaking up and removal of the bridge abutment walls and foundation will be carried out on a dry day within a 6–8-hour period so those works will have a very short duration. The construction period of the bridge is expected to take 2-3 weeks. The existing drain under Bridge 1 is dry so there won't be a risk of drainage water running through the work site. The proposed sheet pile will prevent any material contaminated with dissolved chemicals (from broken concrete) from running into the river. The proposed shade cloth will prevent airborne dust from floating to the river. The proposed water filled flood barrier will prevent water from entering the worksite.

The proposed construction sequence for Bridge 1 is illustrated in Figure 3-83.

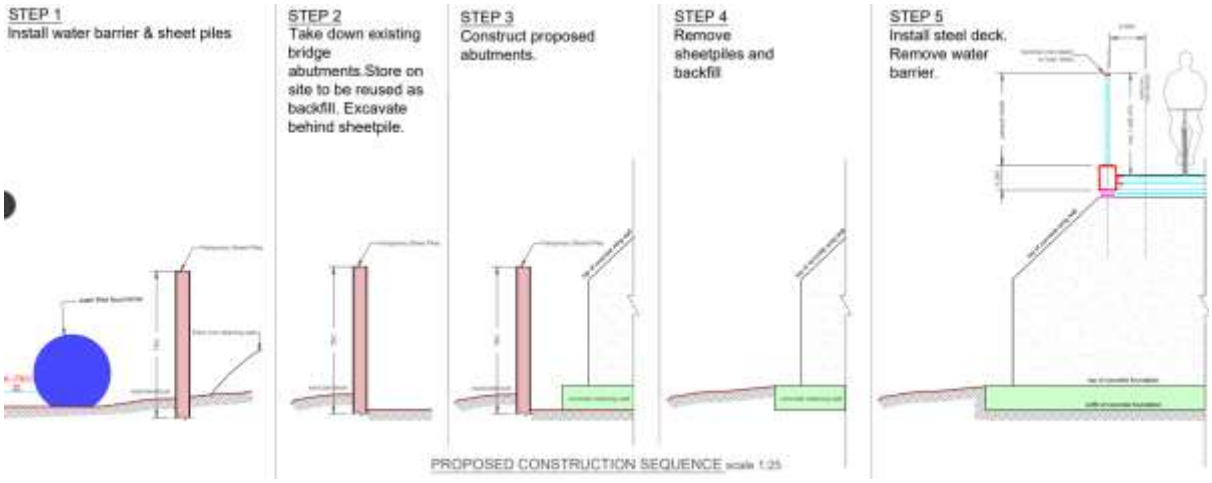

Figure 3-83: Proposed construction sequence for Bridge 1 (refer to drawing RHA-XX-DR-S-SP0012)

New bridge abutments are proposed to be constructed on new concrete foundations and a new steel deck with parapets will be installed by lifting a prefabricated structure into place. Refer to drawing RHA-XX-DR-S-SP0011.

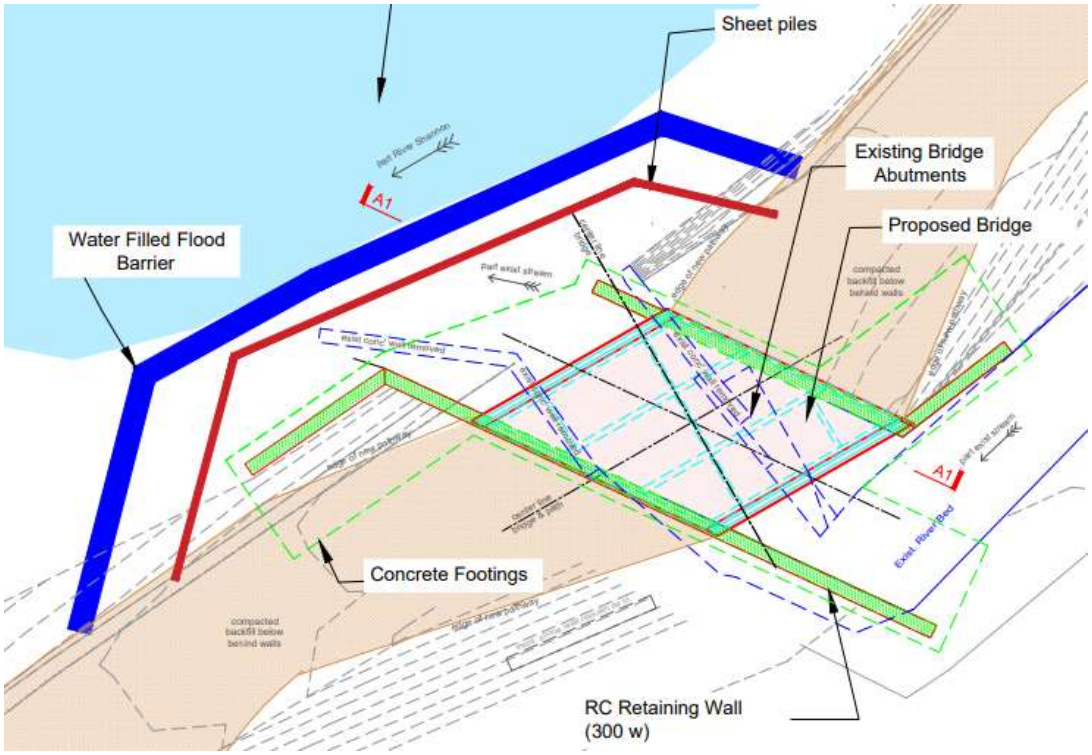

Figure 3-84: Proposed plan of Bridge 1, with ecology protection measures (refer to drawing RHA-XX-DR-S-SP0012)

Due to its proximity to the River Shannon which supports lamprey, the proposed works (including preparatory work) beside the River Shannon which supports salmonids shall be undertaken from May to October (inclusive) and in consultation with Inland Fisheries Ireland (IFI) to avoid accidental damage or siltation of spawning beds, subject to the water level in the river.

Bat surveys have been carried out along the riverbank and in the location of Bridge 1. No trees with a potential for bat roots were identified at Bridge 1 and the closest tree with a potential for a Bar roost is 60m to the east.

The existing bridge and vegetation growing on it were surveyed by an experienced Ecologist to look for species such as dipper, grey wagtail, wren and other bird species that will use bridge structures as nesting sites, and there was no evidence of birds nests or bat roosts at the structure or vegetation. A survey by an experienced Ecologist shall be undertaken at Bridge 1 no more than 24 hours ahead of vegetation clearance or structure removal works to confirm there are no bats roosting or birds nesting in the vegetation or in the structure that will be taken down and removed.

The SAC boundary line runs through the existing and proposed bridge.

The existing area under Bridge 1 is dry so a flume is not proposed.

No refuelling will be permitted outside of construction compounds and all machinery will be periodically serviced and regularly maintained to ensure diesel and oils spills do not occur.

There will be a 40m long silt curtain installed in the River Shannon to catch any discharges from the worksite into the river. Silt curtains will catch materials that float or are suspended in the water. Silt curtains are typically made from PVC and closed-cell foam. They are a flexible, water permeable barrier that extends downwards in the body of water, where it is typically anchored or weighted to prevent the silt from moving. The foam provides buoyancy, while the PVC curtain controls sediment in the

water. Example photos of a silt curtain in the River Corrib in Galway are provided in Figure 3-85 and Figure 3-86.

Figure 3-85: Installation of a silt curtain in the River Corrib, Co. Galway

Figure 3-86: Silt curtain retaining contaminated water during advanced works for sheet piling

Figure 3-87: Example of sheet piling along the bank of the River Corrib

CH795 to CH970: Proposed 3-4m wide greenway

The proposed 3.5m wide greenway will be installed on top of the existing 1.5-2.0m wide gravel path and grass verges (refer to the cross section in Figure 3-77). The proposed Greenway will pass two trees with bat roost potential (although no roosts have been identified) at CH850. The public lighting columns have been designed at maximum distances from these trees to minimise light impact on bats if bats were to create roosts there in the future.

CH970: Proposed Bridge 2

The proposed Bridge No. 2 @ CH 970 will be a new 9.6m long and 4.5m wide steel and reinforced concrete bridge, and it will be constructed alongside the existing stone bridge. No demolition works are required for Bridge 2.

A photomontage which illustrates the proposed Bridge 2, the proposed Bridge 3, and the proposed amenity area can be seen in Figure 3-88.

Figure 3-88: Proposed bridges No 2 & 3 and rest area east of Plassey Mills

Due to its proximity to the River Shannon which supports lamprey, the proposed foreshore works (including preparatory work) beside all watercourses supporting salmonids shall be undertaken from May to October (inclusive) and in consultation with Inland Fisheries Ireland (IFI) to avoid accidental damage or siltation of spawning beds, subject to the water level in the river.

The SAC boundary line runs through the proposed bridge.

The existing Bridge 2 plan and section are provided in Figure 3-89.

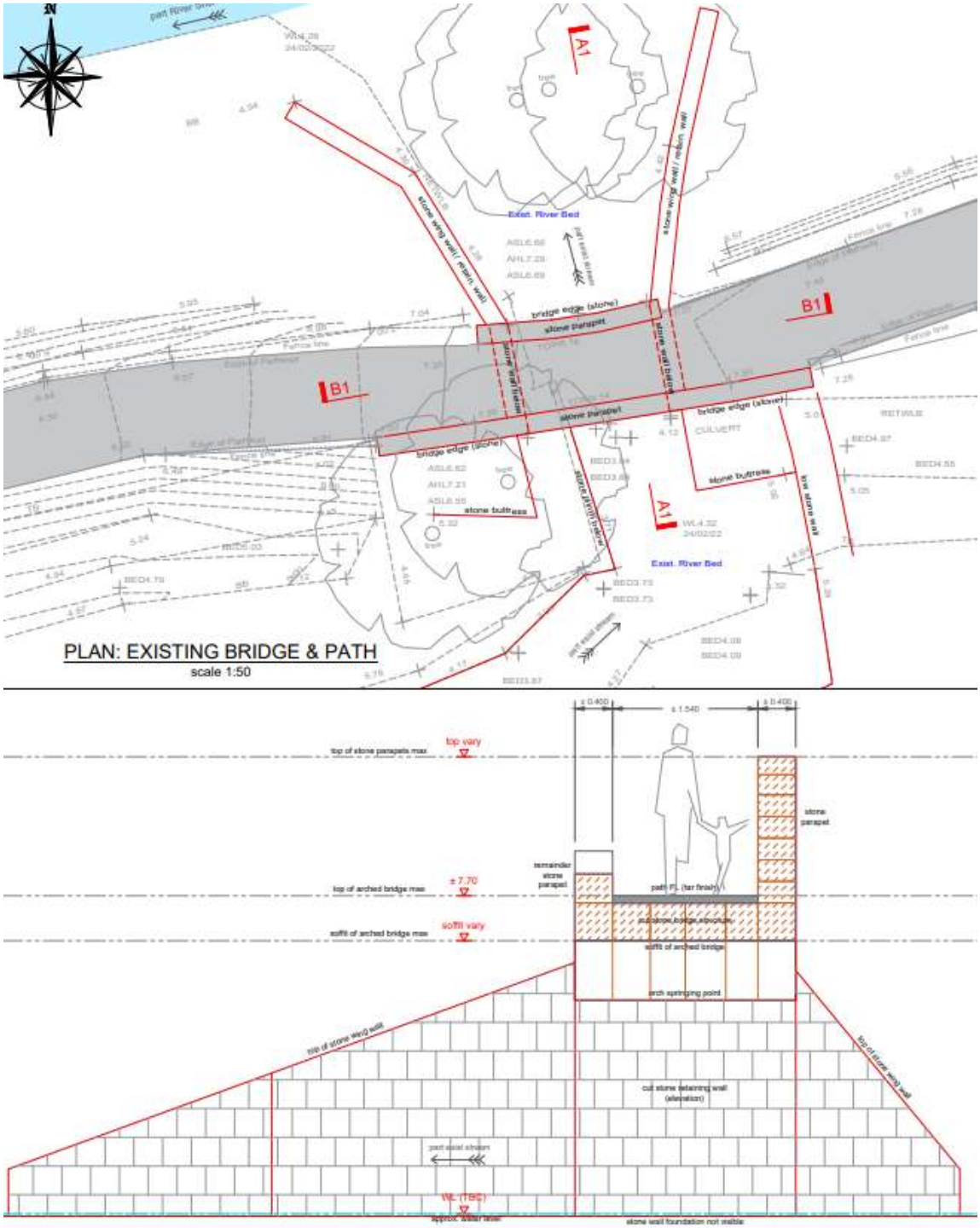

Figure 3-89: Existing plan and section for Bridge 2 (refer to drawing RHA-XX-DR-S-SP0020)

The plan for the proposed new bridge 2 alongside the existing stone bridge is illustrated in Figure 3-90 and the section drawing that illustrates the same is in Figure 3-91. The abutment for the existing stone bridge will remain untouched. The stonework for the existing bridge will be repointed, the low parapet wall will be restored by a stonemason, and a new metal railing will be installed onto it to ensure the existing stone bridge complies with current design standards for bridge parapets, i.e., 1.45m high. The bottom of the new metal parapet railing on the existing low stone parapet will follow the arc of the stone wall to preserve its historical function which was to allow a tow rope to slide over the parapet while a horse was towing a barge down the River Shannon.

Figure 3-90: Plan for the proposed new bridge 2 alongside the existing stone bridge (refer to drawing RHA-XX-DR-S-SP0021)

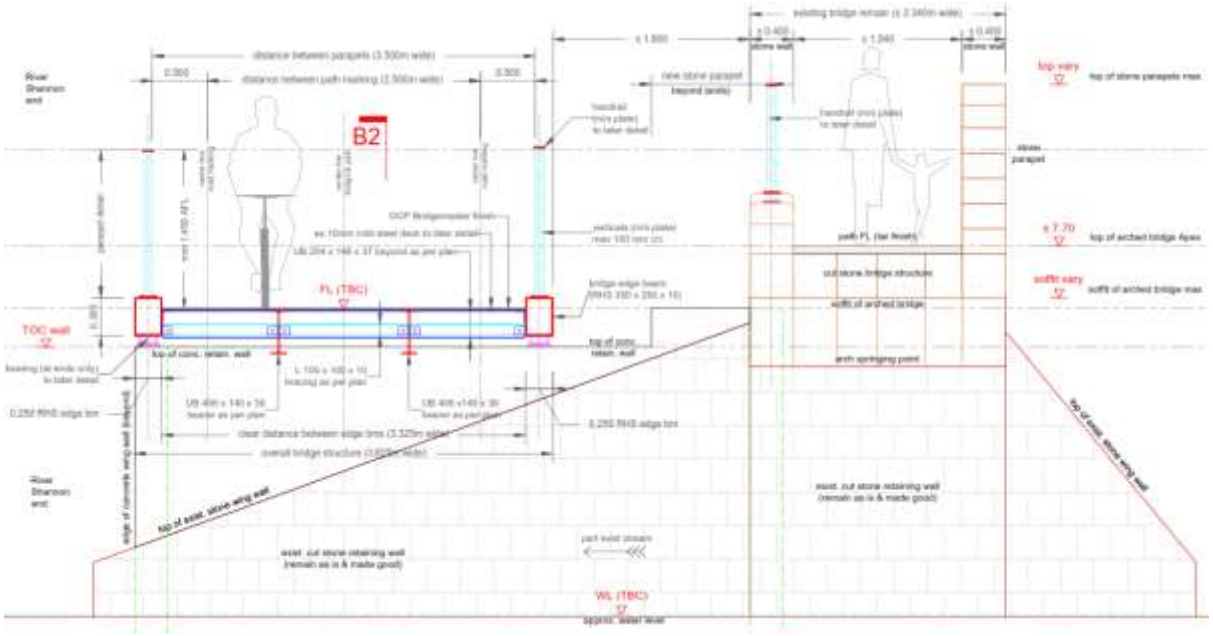

Figure 3-91: Section for the proposed new bridge 2 alongside the existing stone bridge (refer to drawing RHA-XX-DR-S-SP0021)

To carry out this construction work and minimise the impact on the environment and local ecology there will be a water filled flood barrier to protect the work site from the River Shannon. To protect the River Shannon from contaminated liquids associated with construction activities including silt, a temporary sheet

piled wall will be inserted into the riverbank between the water filled barrier and the worksite, and a silt curtain will be suspended in the River Shannon. Refer to drawing RHA-XX-DR-S-SP0022.

The construction period of Bridge 2 is expected to take 2-3 weeks. The existing stream under Bridge 2 will be flumed during the works to keep the work site dry. The proposed sheet pile will prevent any material contaminated from running into the river. A proposed shade cloth will prevent airborne dust from floating to the river. The proposed water filled flood barrier will prevent river water from entering the worksite.

There will be a 60m long silt curtain installed in the River Shannon to catch any discharges from the worksite into the river. Silt curtains will catch materials that float or are suspended in the water. Silt curtains are typically made from PVC and closed-cell foam. They are a flexible, water permeable barrier that extends downwards in the body of water, where it is typically anchored or weighted to prevent the silt from moving. The foam provides buoyancy, while the PVC curtain controls sediment in the water. Example photos of a silt curtain in the River Corrib in Galway are provided in Figure 3-85 and Figure 3-86.

Tree felling of immature trees and saplings will be required in the September to February period before the construction work for Bridge 2. All trees to be cut down shall be inspected by an experienced and qualified Ecologist to check for nests and roosts (despite their very limited habitat potential) and shall be laid on the ground for at least 24 hours before they will be recycled or mulched.

There will be aquatic wall plates bolted to the new abutments where they will be in contact with river/surface water drainage water. The purpose of the aquatic plates is to provide a habitat for fish and other aquatic life.

Figure 3-92: Example of aquatic plates to be installed on bridge abutments

CH1000: Proposed Deck replacement for Bridge 3

The existing temporary bridge across the Plassey Mill race @ CH1000 will be replaced with a new 5.4m long and 4.5m wide steel bridge deck. The new steel deck and parapets will be lifted onto new concrete plinths which will be cast directly onto the stone abutment walls. Refer to drawing RHA-XX-DR-S-SP0031.

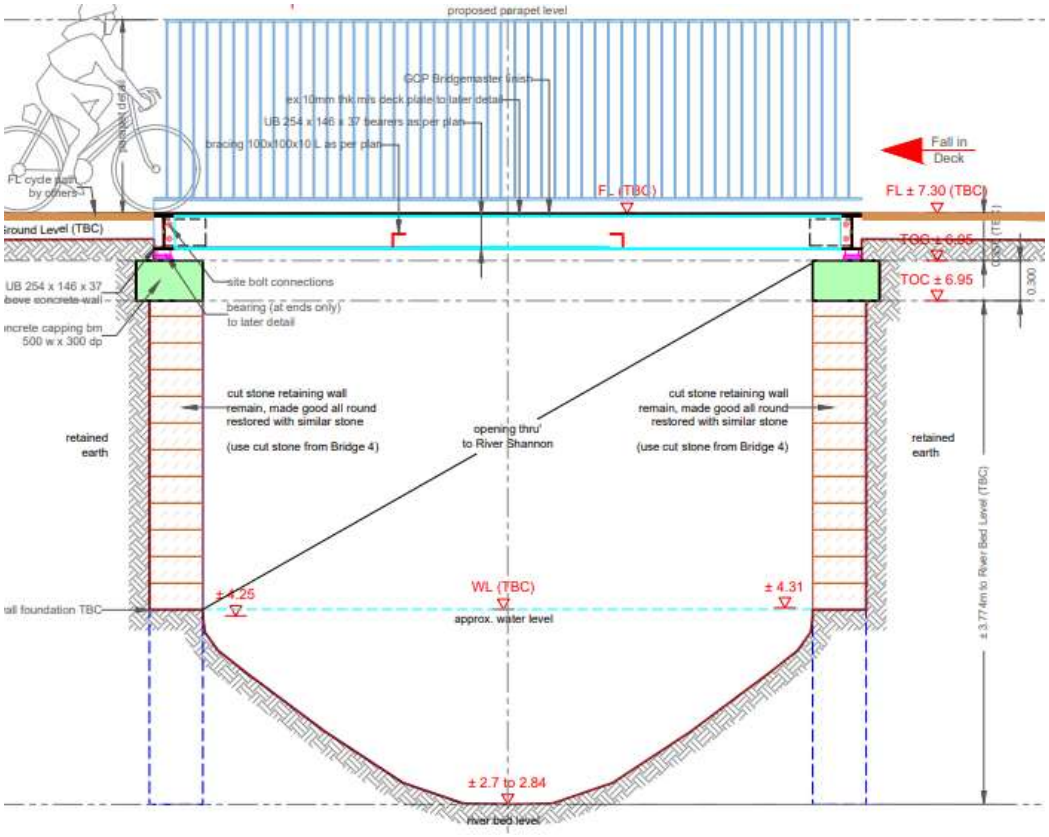

Figure 3-93: Proposed deck replacement for Bridge 3 with new concrete plinths on existing stone abutments

Due to its proximity to the River Shannon which supports lamprey, the proposed foreshore works (including preparatory work) beside all watercourses supporting salmonids shall be undertaken from May to October (inclusive) and in consultation with Inland Fisheries Ireland (IFI) to avoid accidental damage or siltation of spawning beds, subject to the water level in the river.

There will be two 6m long silt curtains installed in the Mill Race stream to catch any discharges from the worksite into the stream. Silt curtains will catch materials that float or are suspended in the stream water. They are a flexible, water permeable barrier that extends downwards in the body of water, where it is typically anchored or weighted to prevent the silt from moving. Silt curtains are typically made from PVC and closed-cell foam. The foam provides buoyancy, while the PVC curtain controls sediment in the water.

The SAC boundary line runs through the existing and proposed bridge. Refer to the red line in Figure 3-94.

CH1010 to CH1030: Proposed rest area at Plassey Mills

The plan for the proposed rest area at Plassey Mills is illustrated in Figure 3-94.

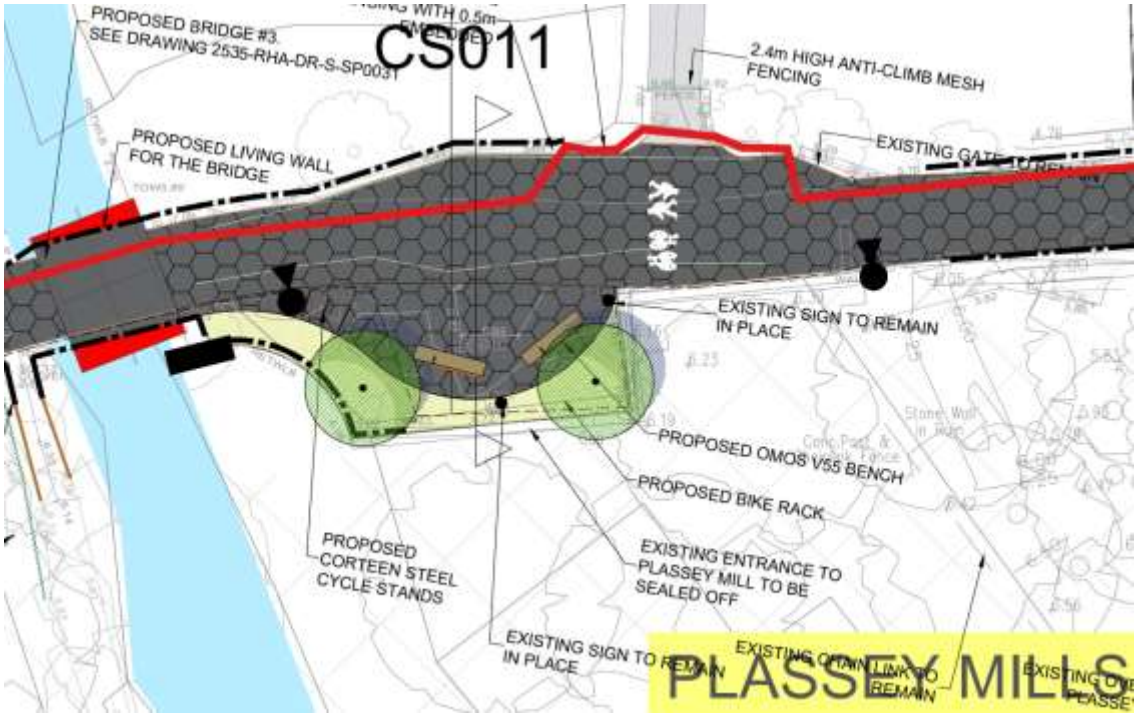

Figure 3-94: Proposed rest area at Plassey Mill

Two new benches similar to an OMOS green oak and Corten steel bench will be provided. A rack of new Corten steel cycle stands will also be provided and two new native Irish trees with understory will soften the interface between the existing stone/block walls and the proposed tarmac path surface.

Figure 3-95: Green Oak and Corten steel seat and cycle stand

A future connection to the Black bridge across the River Shannon to Co. Clare could join the proposed Greenway at this rest area.

CH1045: Proposed deck replacement for Bridge 4

A proposed 5.1m long and 4.5m wide steel bridge deck for Bridge 4 @ CH 1045 will replace the existing 3m wide concrete bridge deck across the overspill for the Plassey Mill race. The existing reinforced concrete bridge deck will be deconstructed by lifting it off the cut stone abutment walls and transporting it to the construction compound where it will be crushed. The crushed material will be recycled by using it to construct haul roads/temporary compounds/ and as a base for the proposed greenway path. Metal arisings and the existing steel parapets will be transported offsite to a licenced

waste facility. The existing cut stone abutment walls and foundations will remain in-situ. The proposed steel deck will sit on top of a concrete plinth that will be set into place on the existing stone abutments. The existing width of the Plassey Mill Race overspill will not be impacted.

New parapets will replace the existing stainless-steel parapets. Refer to drawing RHA-XX-DR-S-SP0042.

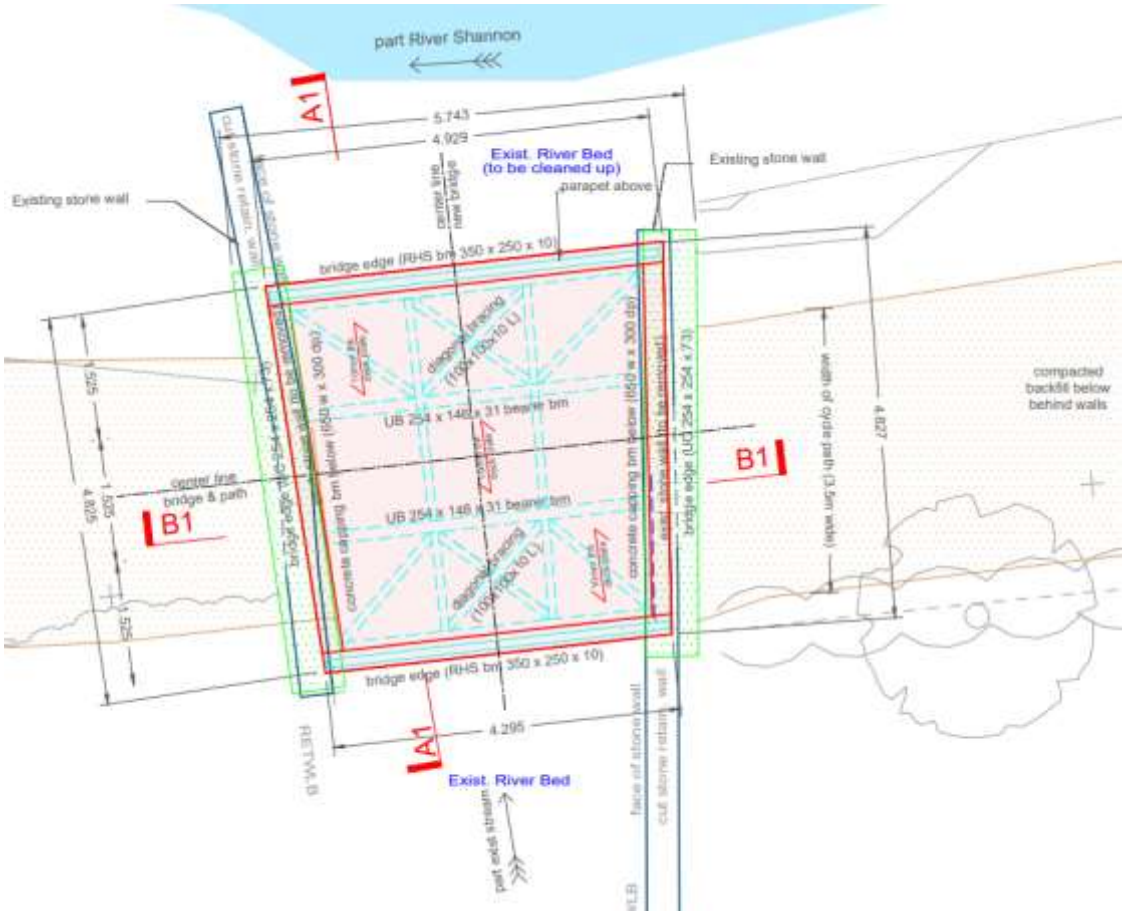

Figure 3-96: Proposed plan of Bridge 4 deck replacement

Due to its proximity to the River Shannon which supports lamprey, the proposed foreshore works (including preparatory work) beside all watercourses supporting salmonids shall be undertaken from May to October (inclusive) and in consultation with Inland Fisheries Ireland (IFI) to avoid accidental damage or siltation of spawning beds, subject to the water level in the river.

The SAC boundary line runs through the existing and proposed bridge.

There are no trees proposed for removal to construct Bridge 4.

CH1050 to CH1320: Proposed route south of Fisherman Cottages

The proposed Greenway will turn southeast and will continue south of a collection of fishing huts and cross a section of mixed broadleaved woodland and amenity grassland (approx. CH 1050 – CH 1250).

The plan for the proposed Greenway route south of the Fisherman cottages is illustrated Figure 3-97.

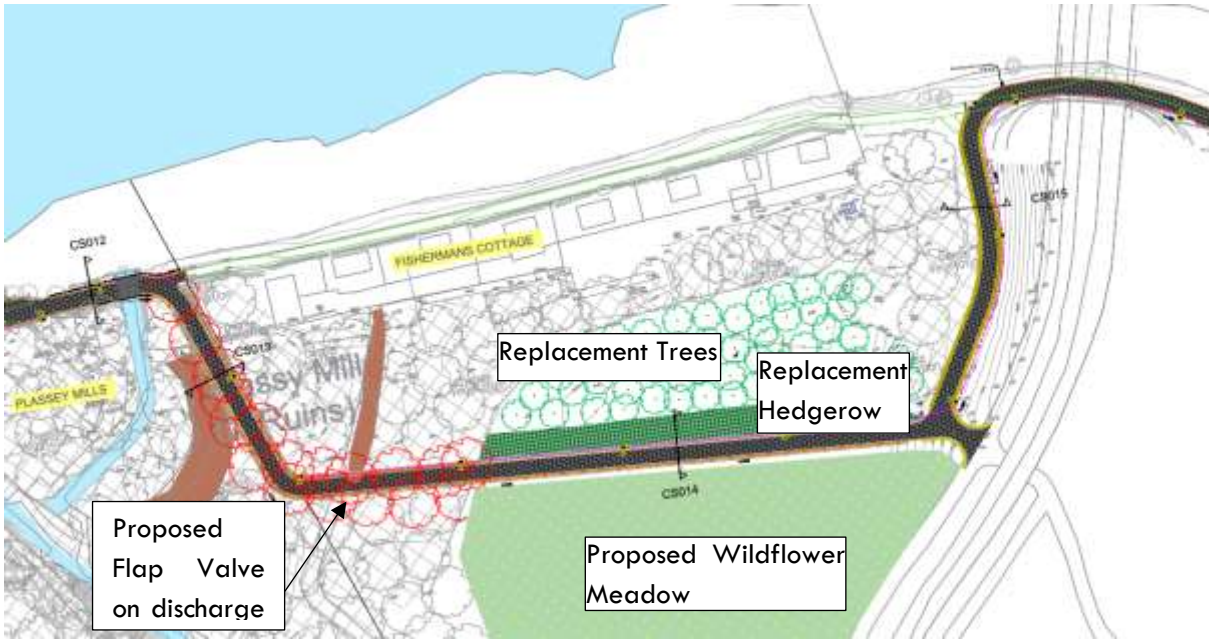

Figure 3-97: Proposed route south of Fisherman cottages

The trees and hedgerows that will be cut down to clear a path for the proposed Greenway will be replanted to act as a screen between the proposed path and the rear of the Fisherman cottages. All trees and hedgerows shall be cut down between September and February and shall be inspected by an experienced and qualified Ecologist to check for nests and roosts. They shall be laid on the ground for at least 24 hours before they will be recycled or mulched. Refer to the Landscape drawing 2525-RHA-XX-DR-C-LA0003 for proposed planting details for the Trees, Hedgerows, and wildflower meadow in this area.

The residents in the Fisherman cottages requested LCCC to resolve flooding at the rear of their properties. The proposed earth bund along the east (partially), south, and west (partially) of the properties will prevent flood water from the Plassey Mill Race from entering the rear of the properties. There will be proposed drainage channels on the north and south sides of the elevated Greenway path (refer to Figure 3-98) and surface water will drain towards the existing land drain that discharges to the Plassey Mill Race (refer to drawing RHA-XX-DR-C-PD0011). A proposed flap valve will prevent water from back entering the rear of the Fisherman Cottage properties from the Plassey Mill Race.

There is no direct drainage route to the river at the rear of the cottages. The area drains overland south to the Plassey Mill Race and the Plassey Mill Race overspill drain adjacent to the worksite is dry. Sediment mats will be placed between the bund and the Plassey Mill Race on the overland drainage route to trap material. If the area at the rear of the cottages needs to be drained dry ahead of the works, a silt buster tank to remove sediment from water will be utilised, before the water will be returned to the Plassey Mill race.

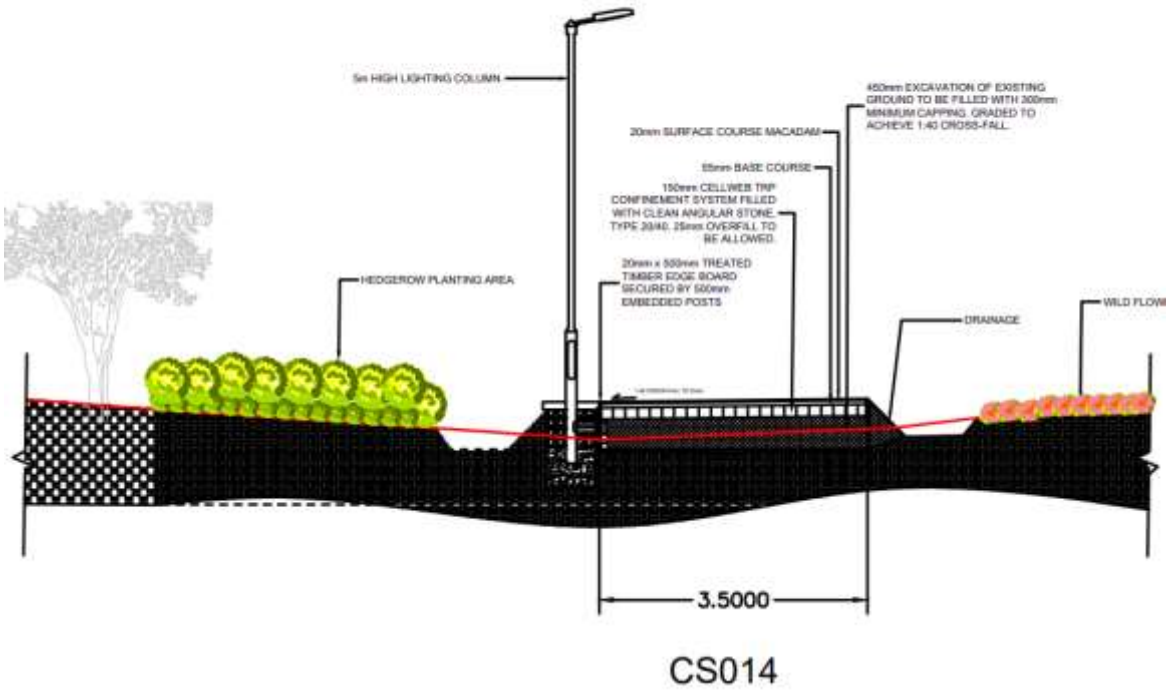

Figure 3-98: Cross Section 014 along proposed Greenway south of the Fisherman Cottages

Figure 3-99: Proposed Greenway south of the Fisherman cottages with proposed hedgerows and trees (looking west)

The proposed route will replace an existing gravel path going north towards Drumroe Village University Bridge, pass under the existing road bridge between Limerick and Clare, and turn east to continue along the River Shannon north of the Drumroe Student Village.

CH1320 to CH2180: Proposed Greenway through Annex 1 Alluvial Woodland forest area

East of the road bridge and east and west of the Living bridge between Co. Limerick and Co. Clare there is an Annex 1 Alluvial Woodland forested area outlined in green in Figure 3-100. The existing path is illustrated by the orange line, and the proposed path in a green field is illustrated by the green

line. The trees that are proposed to be cut down are illustrated in red outline. There is also an avenue of mature Beach trees along the riverbank within this wooded area and the proposed greenway avoids those trees.

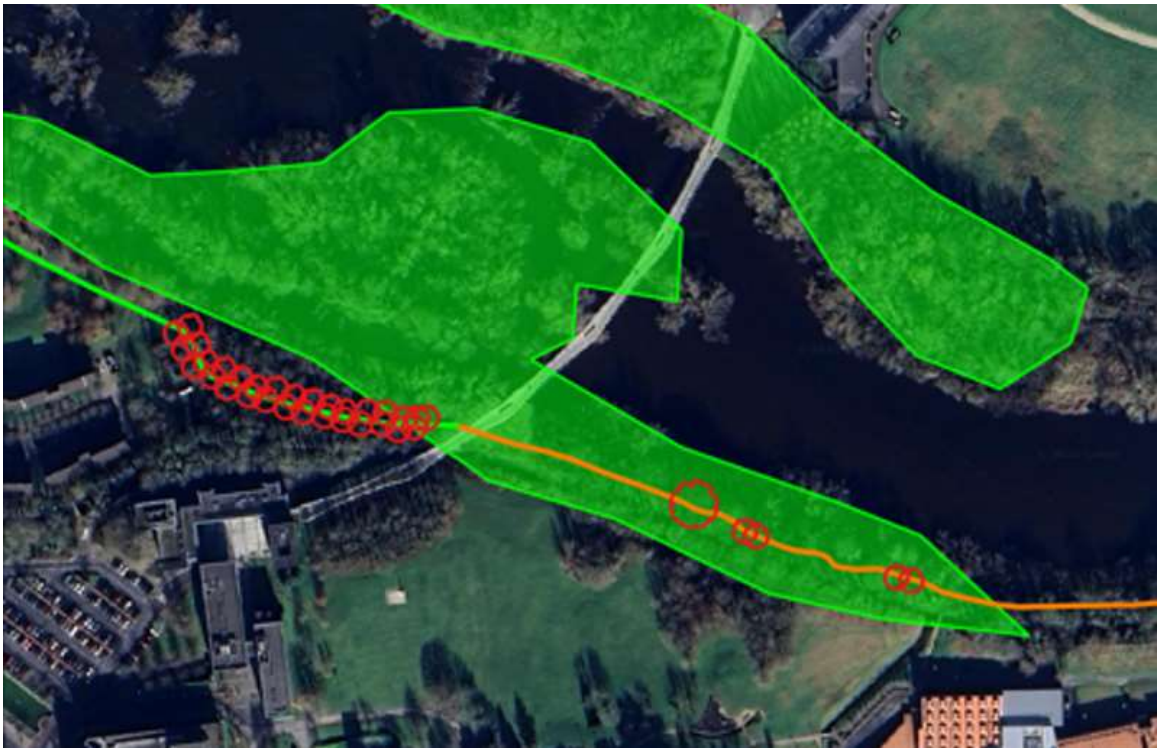

Figure 3-100: Existing Annex 1 Alluvial woodland

Figure 3-101: Proposed Greenway diverts from existing path to avoid the Annex 1 Alluvial Woodland north of Dromroe Student Village

The proposed Greenway avoids the mature Beach trees by diverting south of the existing gravel path (@ CH1420) to immature Birch trees where a 6m wide avenue of tree clearance will be required to construct the proposed Greenway. The trees that will be cut down are saplings and immature Birch with no habitat potential. Refer to Figure 3-132 later in this report. All trees shall be cut down between September and February and shall be inspected by an experienced and qualified Ecologist to check for nests and roosts. They shall be laid on the ground for at least 24 hours before they will be recycled or mulched.

These trees have been characterised as moderate quality by the project Arborist, namely '*Trees present in numbers, usually growing as groups or woodlands, such that they attract a higher collective rating than they might as individuals; or trees occurring as collectives but situated so as to make little visual contribution to the wider locality*'. Further information is available in the LCG Tree Survey Report_Rev0 in the EIA Part 3 Appendices.

Figure 3-102: Arborist map of moderate-quality trees east of the Living Bridge that will be removed for the proposed Greenway

The proposed Greenway will rejoin the existing gravel path and pass under the Living bridge (@ CH 1650).

Between the Living Bridge and Plassey Beach the proposed path will narrow to 3m at locations to avoid trees and will meander around existing trees. The new tarmac surface will be laid on top of the existing earth bank and no excavations will be carried out. Refer to Figure 3-104 for a photomontage where the proposed path will pass through the Annex 1 Alluvial Woodland forest with the River Shannon to the north and the Plassey Mill Race to the south.

Figure 3-103: Proposed Greenway under the Living Bridge (looking west)

Figure 3-104:Proposed Greenway in the Annex 1 Alluvial Woodland

CH2180 to CH2250: Proposed Bridge 5, Ramp to Plassey Beach, Rest area

The proposed infrastructure at Plassey Beach includes a new bridge, an access ramp to provide access from the path to the beach for all users, new seating for a rest area or for swimmers to change, new cycle stands, and new landscape planting areas as illustrated in Figure 3-105. The existing earthen embankment at the start of the Plassey Mill Race will be preserved.

The new bridge (Bridge 5) will facilitate pedestrians with limited mobility, wheelchair users, and cyclists to cross the Plassey Mill Race in this area whereas the existing bridge is narrow and has steps to access it which currently makes it inaccessible to users with limited mobility, buggies/prams, and wheelchair

users (refer to Figure 3-48, Figure 3-49, and Figure 3-50). This existing narrow concrete bridge at the mouth of the Plassey Mill Race will remain in place.

There will be a new ramp for people to walk down, wheelchair users to roll down, and children's prams/buggies to be pushed down from the proposed Greenway to Plassey Beach providing an amenity that provides access for all.

New public lighting will be provided using both 5m high and 1.6m high columns depending on existing tree cover.

The SAC boundary line runs south of the Plassey Mill Race stream (refer to the red line in Figure 3-105) and the existing and proposed bridge, retaining wall, and ramp are within the SAC.

The trees that have to be removed are illustrated in red in Figure 3-105. They will be cut down between September and February. All trees to be cut down shall be inspected by an experienced and qualified Ecologist to check for nests and roosts and shall be laid on the ground for at least 24 hours before they will be recycled or mulched.

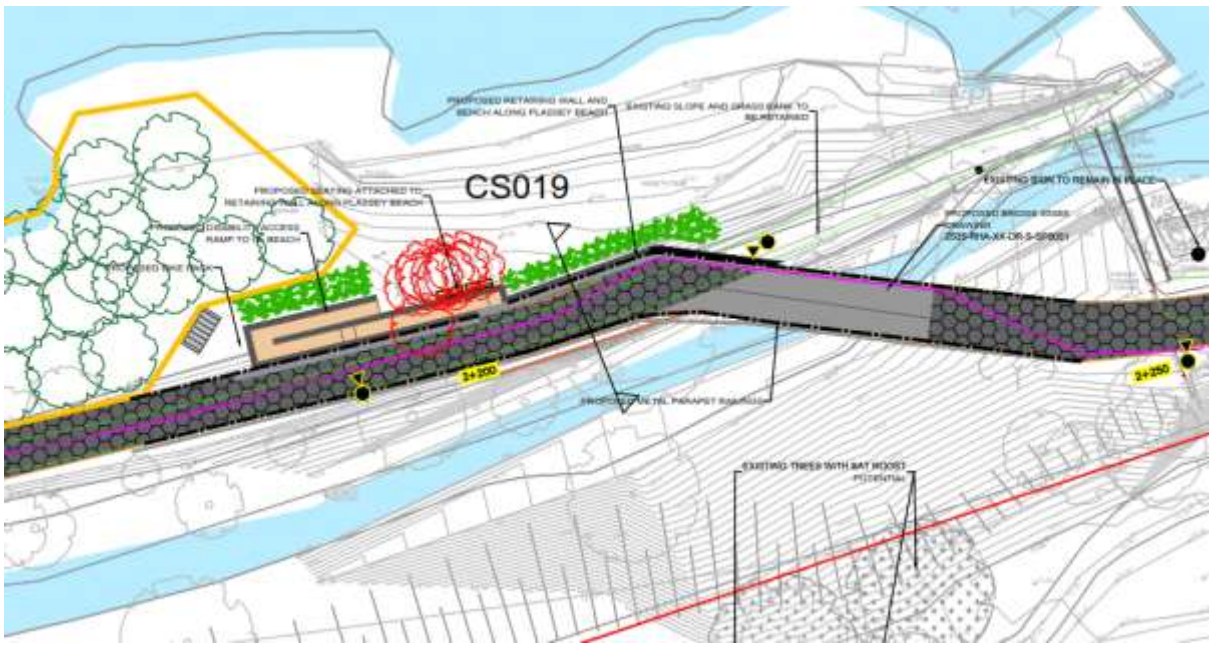

Figure 3-105: Proposed plan of ramp and Bridge 5 at Plassey Beach

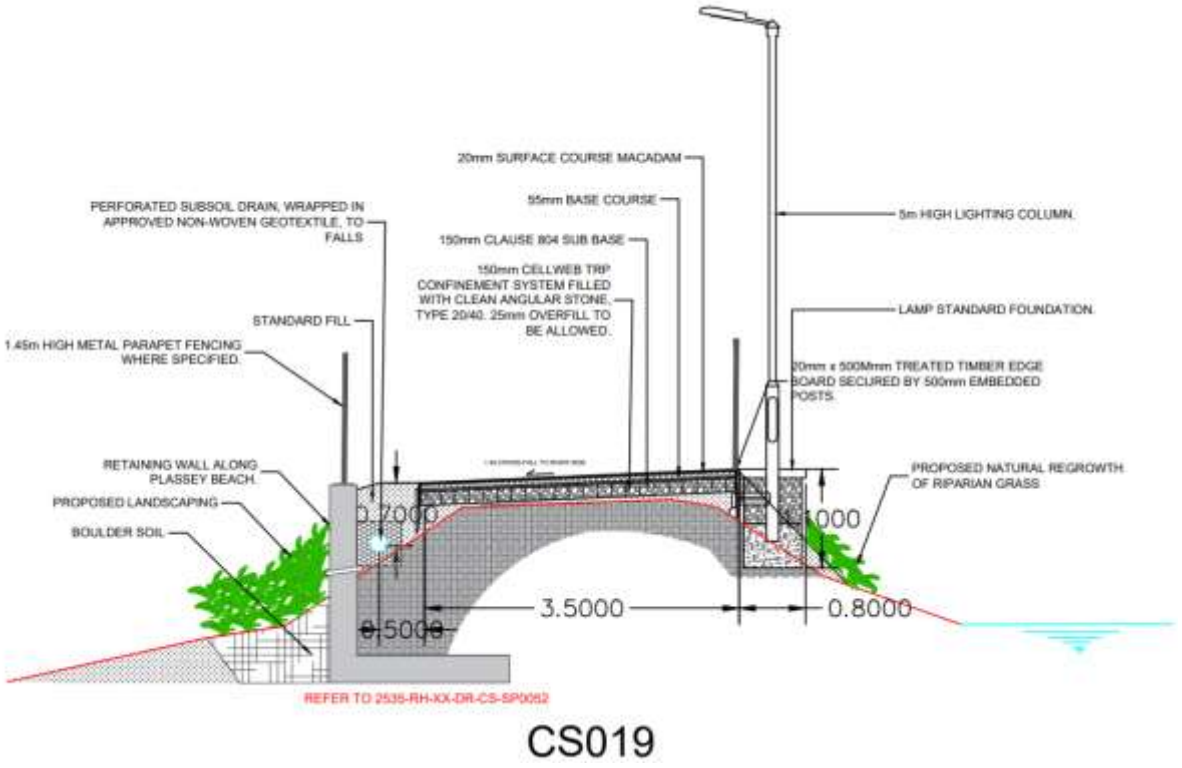

Figure 3-106: Proposed section of retaining wall for ramp at Plassey Beach

Figure 3-107: Proposed Bridge No. 5, existing embankment at Plassey Beach, and existing bridge in background

Figure 3-108: View of proposed Bridge 5 and ramp to Plassey Beach with landscaping, seating, and cycle stands

No instream works will take place at Plassey Beach or in the Plassey Mill Race. As per Bridge 1 and Bridge 2, the worksite will be protected from river water flooding by installing a water filled flood barrier on Plassey Beach, and the River Shannon and Plassey Mill Race will be protected from accidental spillages of contaminated water by proposed sheet piles and a silt curtain.

There will be a 100m long silt curtain installed in the River Shannon to catch any discharges from the worksite into the river. Silt curtains will catch materials that float or are suspended in the water. Silt curtains are typically made from PVC and closed-cell foam. They are a flexible, water permeable barrier that extends downwards in the body of water, where it is typically anchored or weighted to prevent the silt from moving. The foam provides buoyancy, while the PVC curtain controls sediment in the water. Example photos of a silt curtain in the River Corrib in Galway are provided in Figure 3-85 and Figure 3-86.

Dust will be suppressed during the construction works. To avoid water runoff carrying fines, a shade cloth will be erected immediately adjacent to the proposed concrete foundations and walls to trap dust arisings.

Dewatering of the area where the proposed foundations for the Bridge 5 abutment walls will be constructed will utilise a silt buster tank to remove silt from water before the water will be returned to the River Shannon.

The construction period of the bridge, the retaining wall, and the ramp is expected to take 4-5 weeks and the work will be carried out during the summer when it is expected to be dry and the river is at the lowest level during the year. The existing Mill Race stream under the proposed Bridge 5 will continue to run during the works and during the summer months the depth of this stream has been measured during the summer of 2022 as being 100mm deep. The proposed sheet pile will prevent any loose soil or suspended material from running into the Mill Race stream. The proposed shade cloth will prevent airborne dust from floating onto the stream or River Shannon. The proposed water filled flood barrier will prevent river water from entering the worksite.

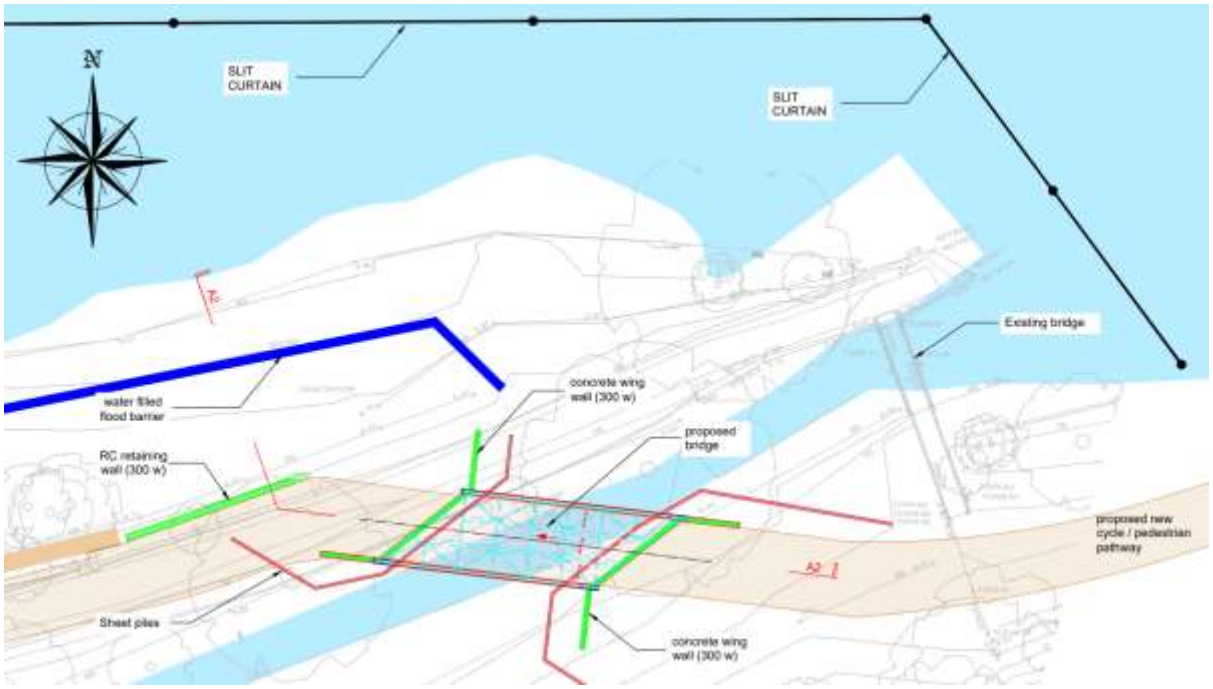

Figure 3-109: Plan of proposed Bridge 5 and proposed Ramp, showing proposed Silt Curtain, Sheet piles and water filled flood barrier (refer to drawing RHA-XX-DR-S-SP0052)

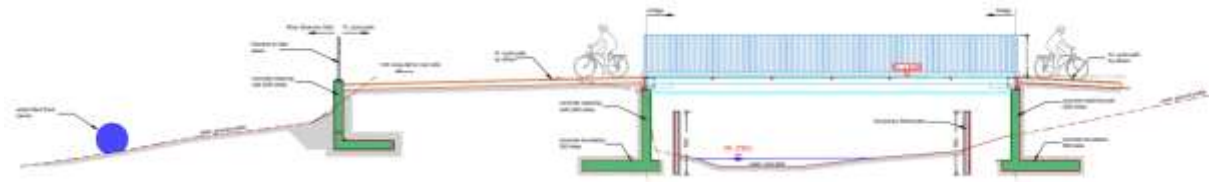

Figure 3-110: Section of retaining wall for proposed Ramp and Abutment walls for proposed Bridge 5 (refer to drawing RHA-XX-DR-S-SP0052)

The construction sequence for the bridge abutments is illustrated in the figure below.

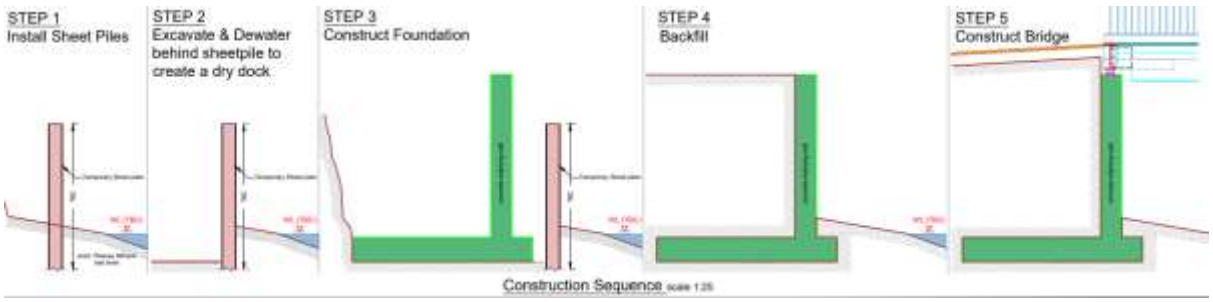

Figure 3-111: Construction sequence for abutment structures to support the steel deck of Bridge 5 (refer to drawing RHA-XX-DR-S-SP0052)

CH2250 to CH2500: Proposed Greenway on raised gravel path

East of Plassey Beach and north of Kilmurray Student village is an existing raised gravel path that will be covered with a tarmac surface. The proposed Greenway will cross an existing watercourse and the existing drainage pipe will be replaced with a proposed 900mm diameter culvert pipe.

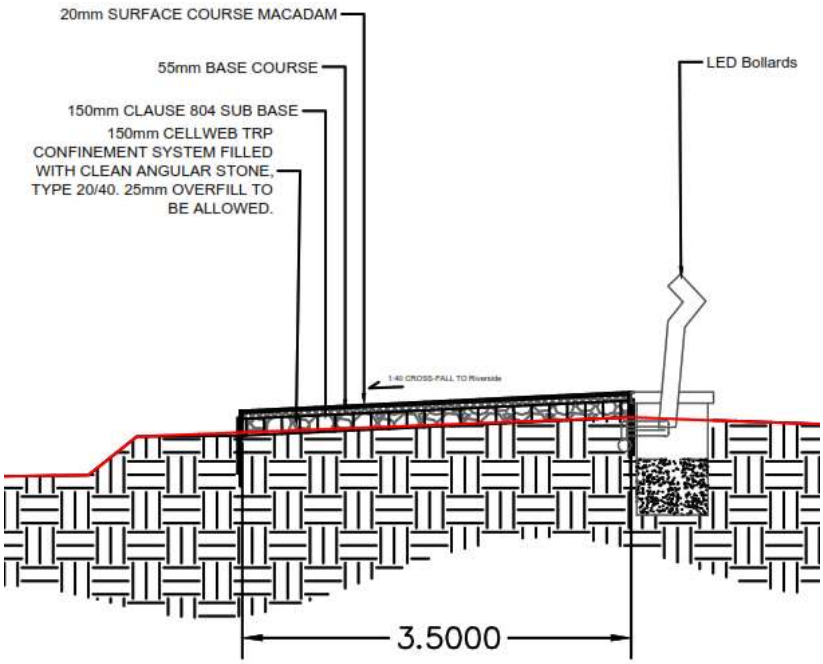

Figure 3-112: Proposed tarmac path and public lighting north of Kilmurray Student Village

At CH2500 the proposed Greenway will split into two paths. One will continue eastwards along an existing desire line to Cook Medical and onwards to McLaughlan Road. There will be a new swing gate installed at this junction so the section of proposed Greenway in the green field can be temporarily closed during and after significant flood events. The other path at the junction will turn south towards University Road and this is described in CH000_C to CH300_C.

Figure 3-113: Proposed junction on Greenway at CH2500 (refer to drawing RHA-XX-DR-C-PD0019)

CH2500 to CH3180: Proposed Greenway along desire line

The proposed Greenway route continues east and traversers amenity grassland and scrub areas where there is an unpaved desire line.

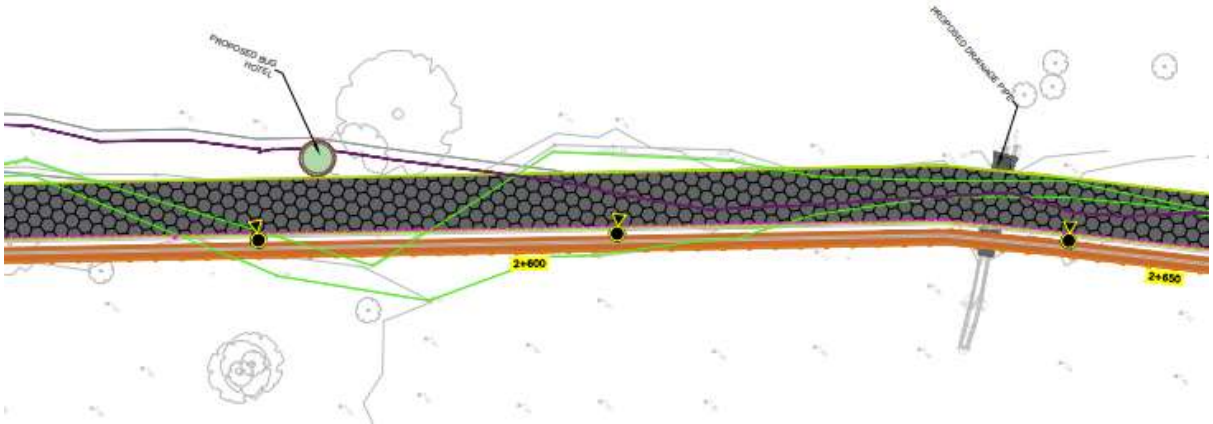

Figure 3-114: Proposed Greenway to replace existing grass desire line

There will be a new shallow land drain on the field side of the proposed Greenway and proposed drainage culverts will be constructed under the proposed path to drain surface water to the River Shannon, and to ensure the tarmac path can be utilised as soon as possible after flooding events (after LCCC maintenance personnel have inspected and cleared the path of flood debris).

The Flood Risk Assessment undertaken for this project, CFRAM flood mapping, confirms this part of the proposed Greenway will be subject to low probability (1 in 1000 year) and medium probability (1 in 100 year) flooding events. Anecdotal evidence collected during site visits and the public consultation event in August 2022 confirmed there will also be a high probability (1 in 10 year) of flooding events.

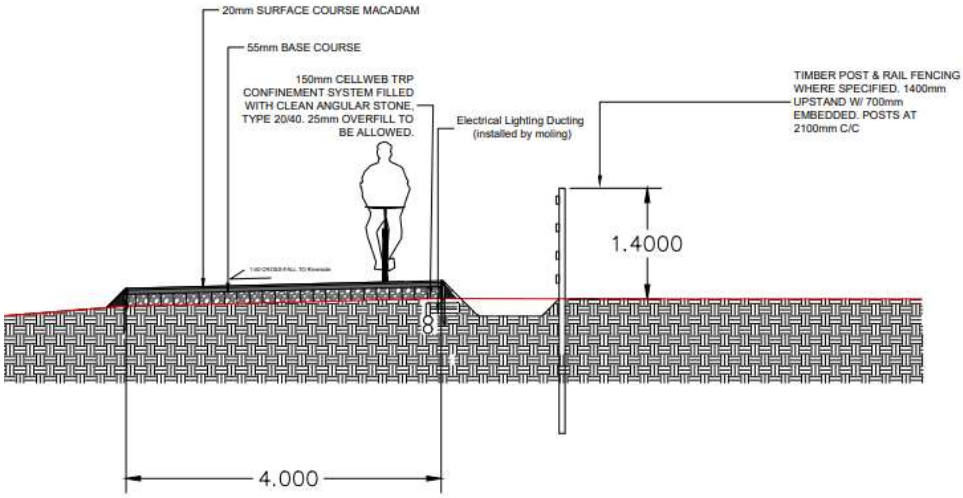

Figure 3-115: Proposed Greenway cross section in green field

CH3180 to CH3490: Proposed Greenway in green field

The proposed Greenway route turns south-east (CH 3180) to traverse the edge of trees, and through grassland and scrub areas. It will avoid the IDA's proposed surface water management system (shown in greyscale). There will be drainage channels along the east and west sides of the proposed Greenway to manage surface water and drain water towards the River Shannon.

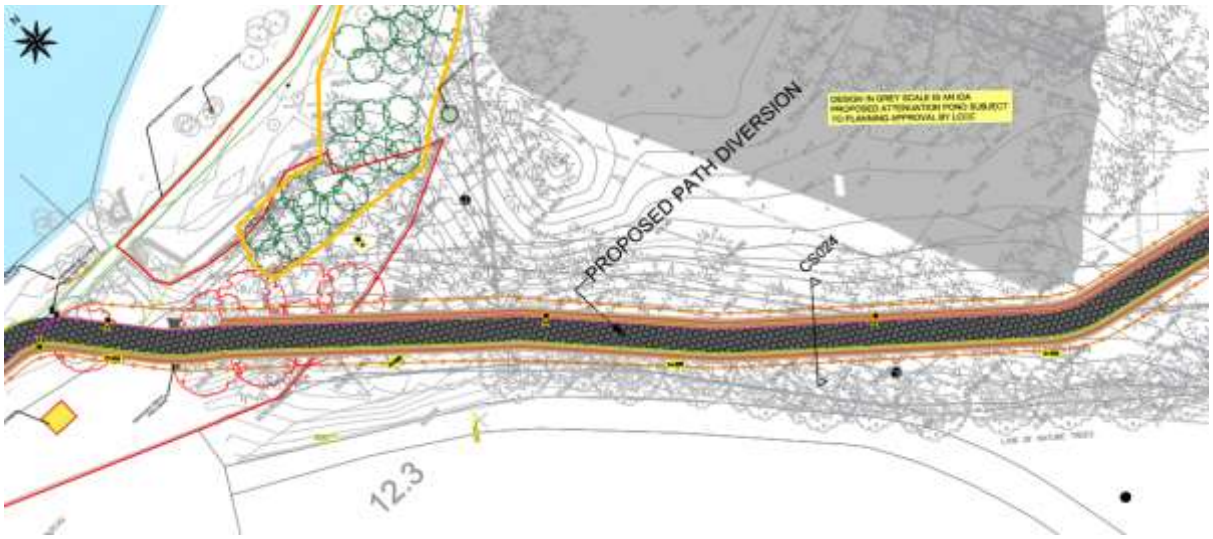

Figure 3-116: Proposed drainage alongside proposed path to manage surface water

The proposed Greenway will turn south-west to join to McLaughlan Road in the National Technology Park (NTP) at CH 3490.

CH3490 to CH3805: Proposed Cycle lane and Footpaths alongside McLaughlan Road

The proposed Greenway changes from a shared 3.5m wide greenway to Active Travel infrastructure with separate 1.8m wide footpaths and 1.8m wide cycle lanes along the eastern and western side of McLaughlan Road.

Figure 3-117: Proposed cycle lanes and footpath on McLaughlan Road where it joins the shared path

The proposed footpaths and cycle lanes will tie into existing footpaths and cycle lanes on Plassey Park Road at its junction with McLaughlan Road.

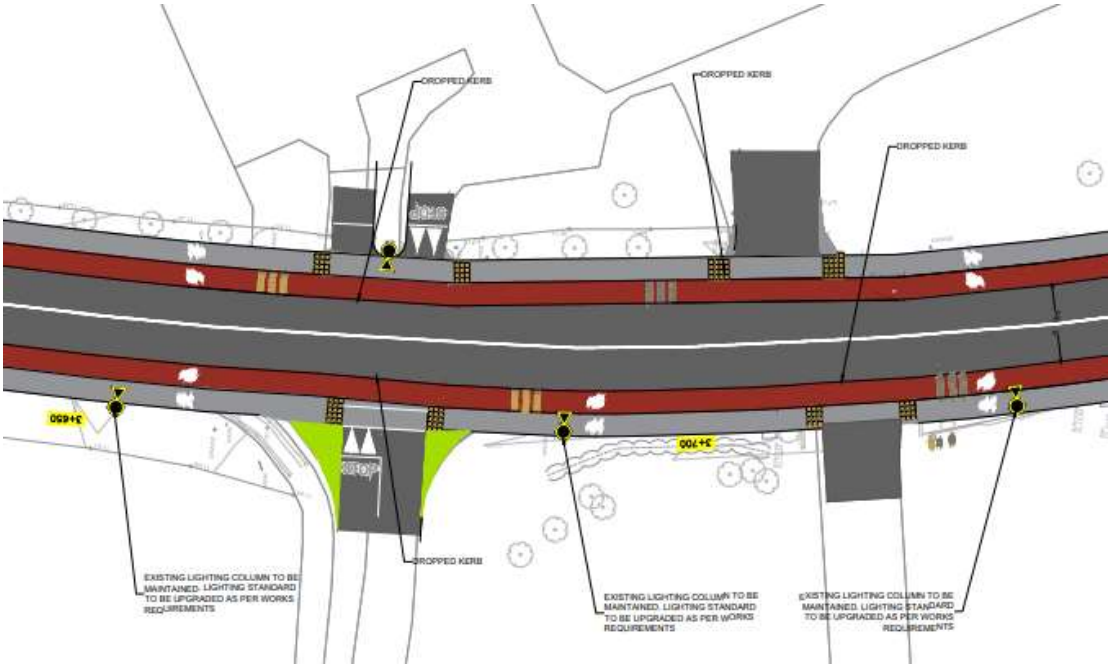

Figure 3-118: Proposed plan for footpaths and cycle lanes alongside McLaughlan Road

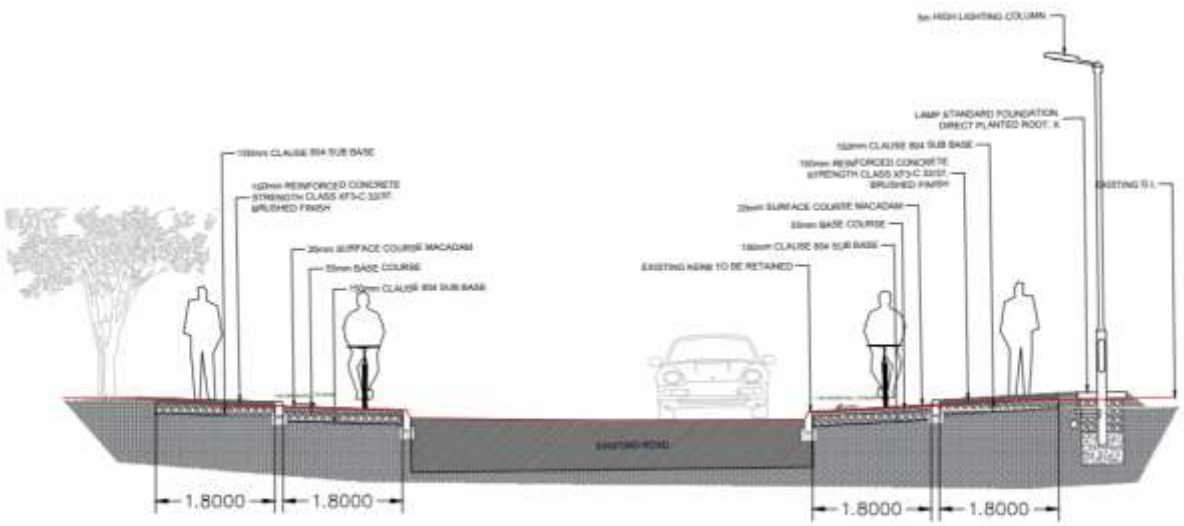

Figure 3-119: Proposed cross section for footpaths and cycle lanes alongside McLaughlan Road

An existing 2m wide raised table Zebra crossing on Plassey Park Road will be converted to a 6m wide Toucan crossing to prioritise crossings for pedestrians and cyclists and in accordance with design guidance for Toucan crossings on bus routes.

Figure 3-120: The existing Zebra crossing on Plassey Park Road proposed to be converted to a Toucan crossing

CH000_C to CH300_C:P Proposed Greenway east of Kilmurray Student Village

The proposed Greenway will run in a southerly direction past the eastern boundary of the UL Agricultural Laboratory building and Kilmurray Student Village. This short section of the Greenway will be a shared space between Greenway users and vehicles associated with the UL Agricultural laboratory, but removable bollards will be installed on the Greenway that will be operated by UL Facilities to manage vehicle movements. Typically the bollards would be locked in place to prevent unauthorized access for vehicles to this section of the Grenway. Refer to drawing RHA-XX-DR-C-PD0029. The existing parking spaces to the east of Kilmurray Student Village will be reconstructed to accommodate the proposed Greenway. The existing rubbish bin area will be realigned for the same reason.

Figure 3-121: Proposed Greenway at UL Agricultural Laboratory building east of Kilmurray Student Village

Figure 3-122: Proposed Greenway approaching the eastern/rear entrance to Kilmurray Student Village

The proposed Greenway will leave the Kilmurray Student Village and join University Road.

Figure 3-123: Proposed Greenway at eastern entrance to Kilmurray Student Village

CH300_C to CH677_C: Proposed footpaths and cycle lanes on University Avenue

The proposed Greenway crosses the entrances to Kilmurry Student Village and the UL Gaelic grounds where it changes from a shared 3.5m wide greenway to Active Travel infrastructure with separate 1.8m wide footpaths and 2.0m wide cycle lanes along the eastern and western side of University Road.

Figure 3-124: Proposed Greenway on University Road

The proposed cycle lanes and footpaths on University Road will tie into Active Travel infrastructure which was constructed along Plassey Park Road as part of the Limerick Shannon Metropolitan Area Transport Strategy (refer to Figure 3-73).

3.3 Proposed Amenity/Rest areas, Landscaping and Tree Planting

In accordance with LCCC's replacement tree planting policy, there will be five native Irish trees (e.g.: Oak, Willow, Alder, Birch) are proposed to be planted for every tree that is cut down to enable construction of the proposed Greenway path.

There will be three new amenity/rest areas provided along the proposed Greenway with new seating and cycle stands.

There will be a new wildflower meadow (in accordance with the All-Ireland pollinator plan), a hedgerow, and tree planting south of the Fisherman cottages, and new understory planting at the Plassey Mills rest area. There will be new landscaping along the retaining wall and ramp at Plassey Beach.

CH000: Proposed Amenity/Rest area at Groody Bridge

There will be a proposed amenity/rest area east of Groody Bridge. The red line in Figure 3-125 is the SAC boundary line which passes through the existing path. Refer to drawings 2525-RHA-XX-DR-C-PD0001 and 2525-RHA-XX-DR-C-LA0002.

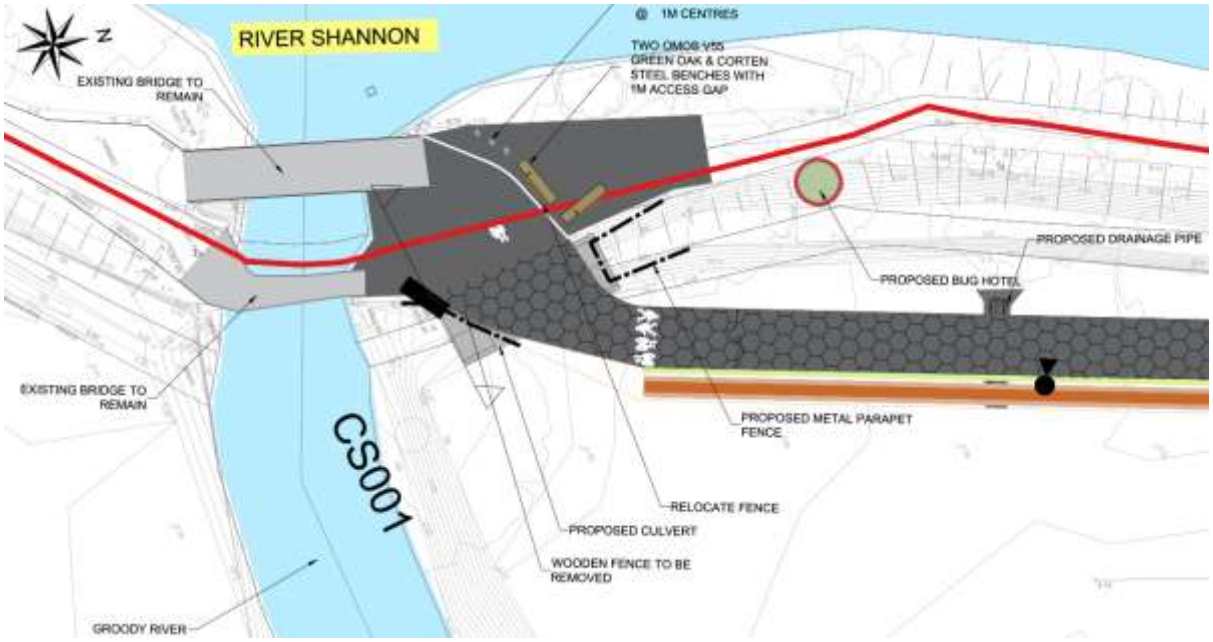

Figure 3-125: proposed amenity/rest area east of Groody Bridge

CH 770: Proposed Tree planting east of UL Boat Club

There will be native Irish trees planted along a proposed path between the proposed Greenway and an existing UL campus shared path. Refer to drawing 2525-RHA-XX-DR-C-PD0007. The replacement tree planting will support the propagation of and avoid gaps in the broad leaf woodland along the riverbank to the benefit of bats, especially the Lesser Horseshoe bat.

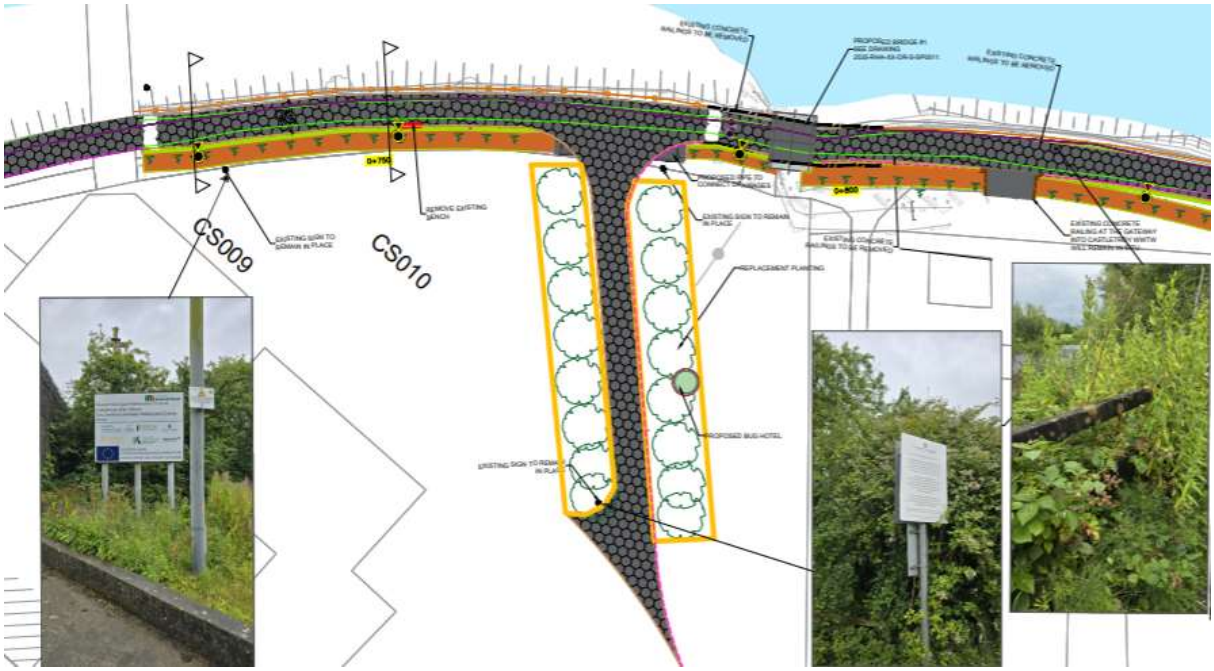

Figure 3-126: Proposed tree planting area west of proposed Bridge 1

CH1020: Proposed Amenity/Rest area at Plassey Mills

The proposed amenity/rest area at Plassey Mills will provide new seating and cycle stands. It could also function as a junction for any future usage of the currently sealed off Black bridge that crosses the River Shannon in this location.

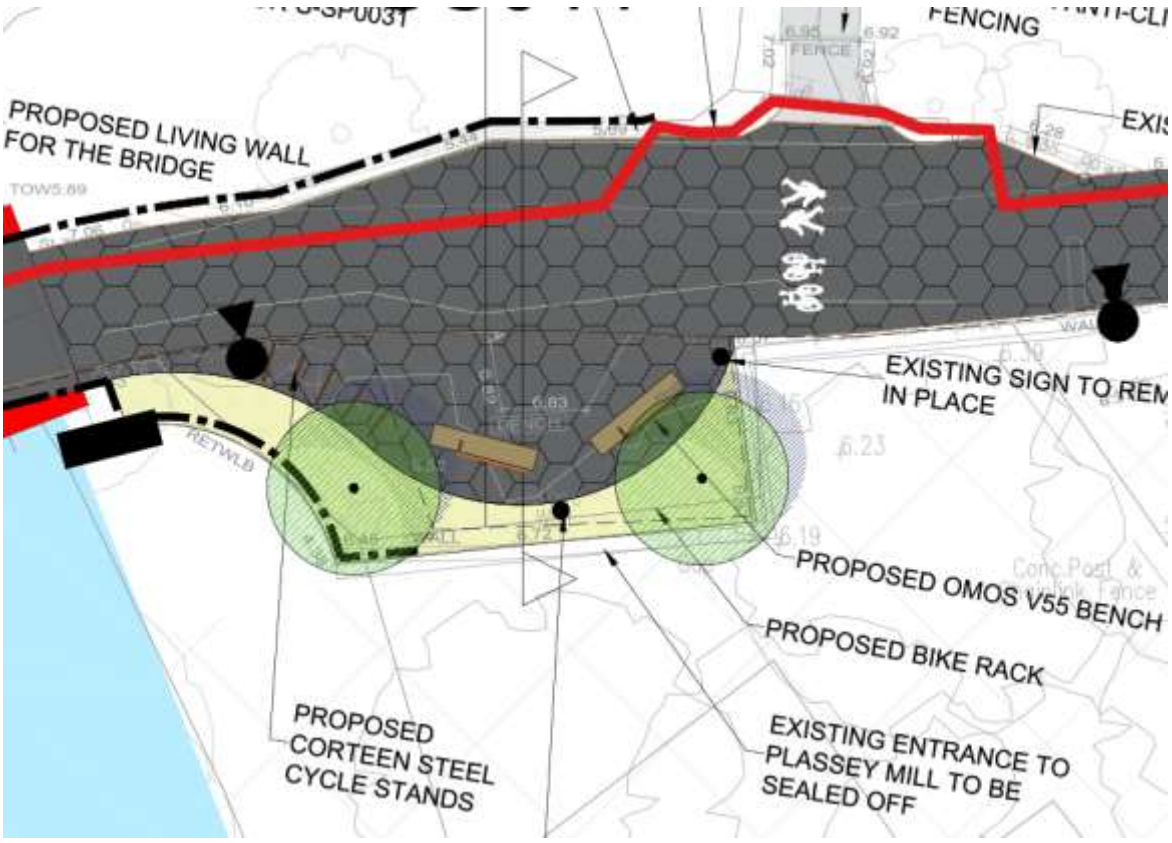

Figure 3-127: Proposed amenity/rest area at Plassey Mills

CH 1200; Proposed Landscaping south of the Fisherman cottages

There will be a new wildflower meadow (in accordance with the All-Ireland pollinator plan), a hedgerow, and tree planting south of the Fisherman cottages. Refer to drawings 2525-RHA-XX-DR-C-PD0001 and 2525-RHA-XX-DR-C-LA0003. The replacement tree planting will support the propagation of and avoid gaps in the broad leaf woodland along the riverbank to the benefit of bats, especially the Lesser Horseshoe bat.

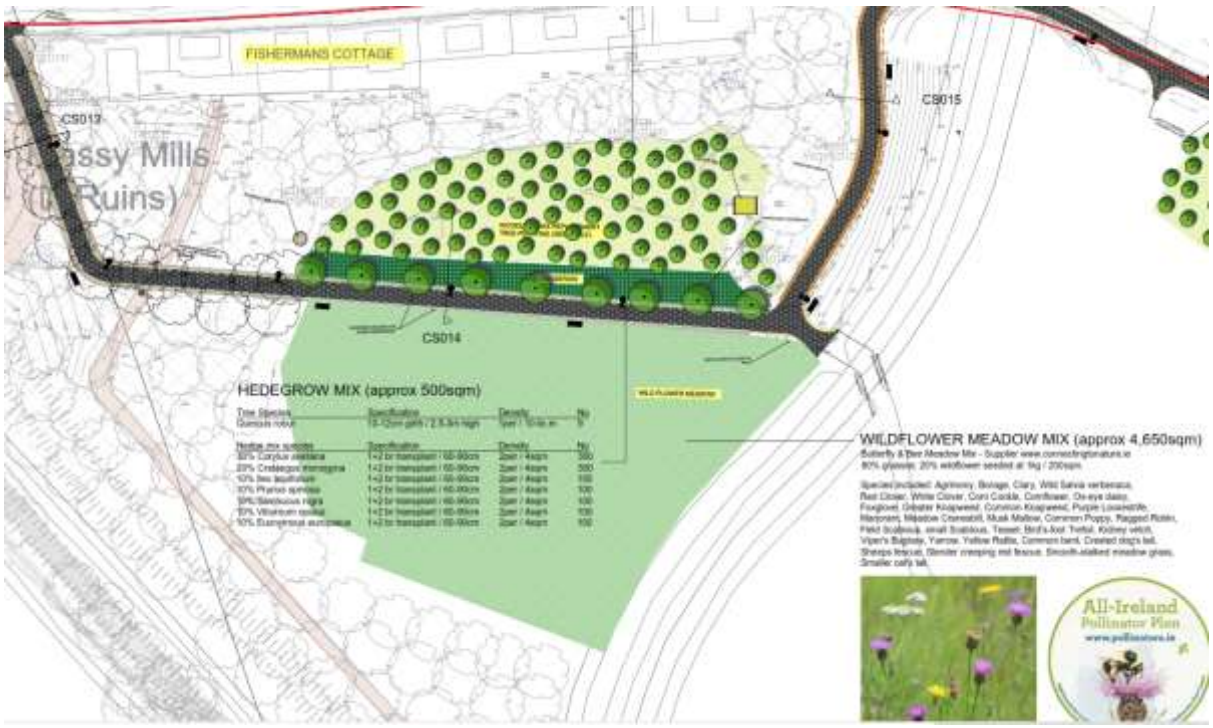

Figure 3-128: Proposed landscaping south of the Fisherman cottages

CH 1400-1520: Proposed Tree planting north of Dromroe Student Village

There will be replacement trees planted in a green field area to the north of Dromroe Student Village. Refer to drawings 2525-RHA-XX-DR-C-PD0011, 2525-RHA-XX-DR-C-PD0012, and 2525-RHA-XX-DR-C-LA0003. The replacement tree planting will support the propagation of and avoid gaps in the broad leaf woodland along the riverbank to the benefit of bats, especially the Lesser Horseshoe bat.

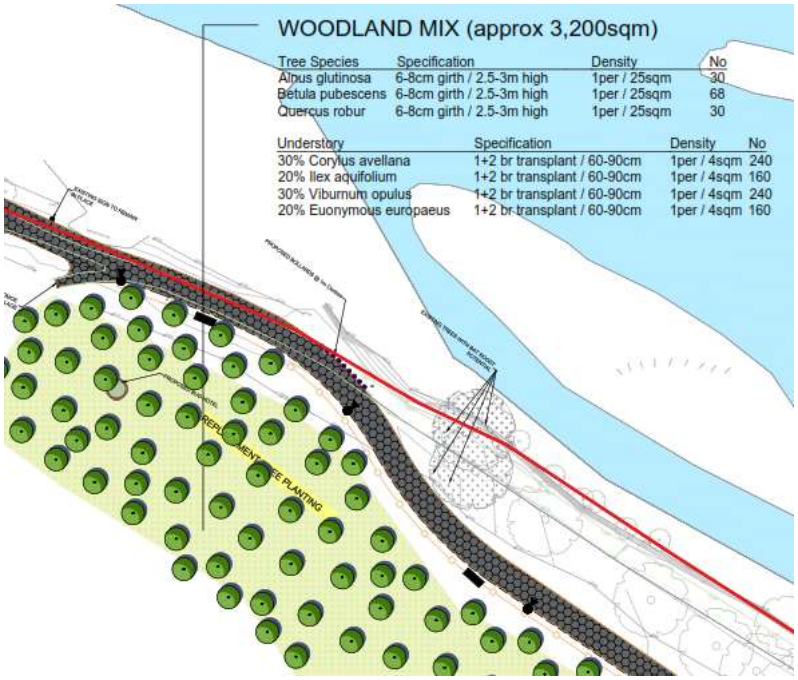

Figure 3-129: Proposed tree planting area north of Dromroe Student Village

CH 2105-2175: Proposed Landscaping and Amenity/Rest area at Plassey Beach

There will be new native Irish trees and new riverside shrubs planted at Plassey Beach. Refer to drawings 2525-RHA-XX-DR-C-PD0017 and 2525-RHA-XX-DR-C-LA0004. The replacement tree planting will support the propagation of and avoid gaps in the broad leaf woodland along the riverbank to the benefit of bats, especially the Lesser Horseshoe bat.

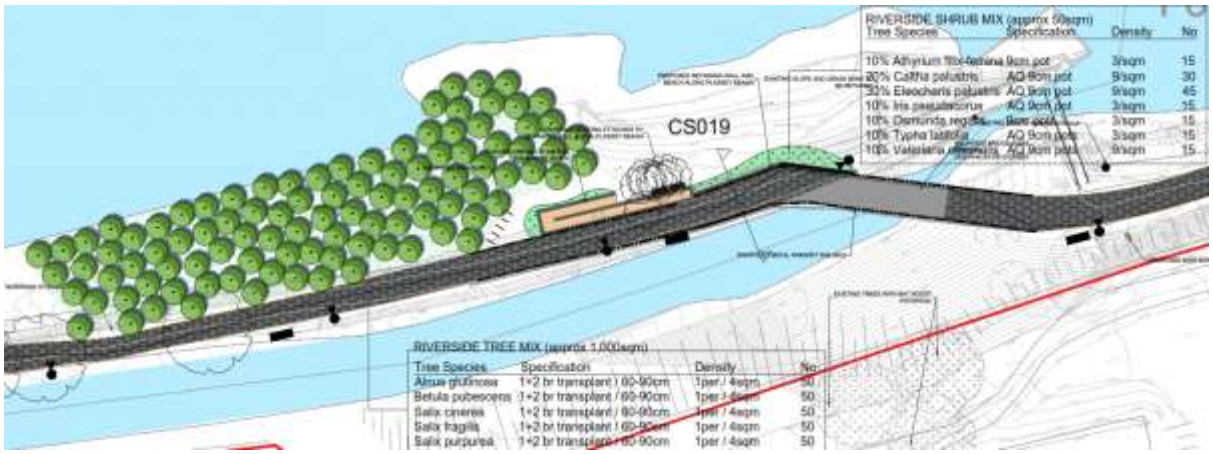

Figure 3-130: Proposed native Irish trees and new riverside shrubs at Plassey Beach

CH 3190-3450: Proposed Tree planting east of Cook Medical campus

There will be native Irish trees and an understory planted adjacent to the proposed path east of the Cook Medical campus and southwest of Troy Castle. Refer to drawing 2525-RHA-XX-DR-C-PD0023 and 2525-RHA-XX-DR-C-LA0005. The replacement tree planting will support the propagation of and avoid gaps in the broad leaf woodland along the riverbank to the benefit of bats, especially the Lesser Horseshoe bat.

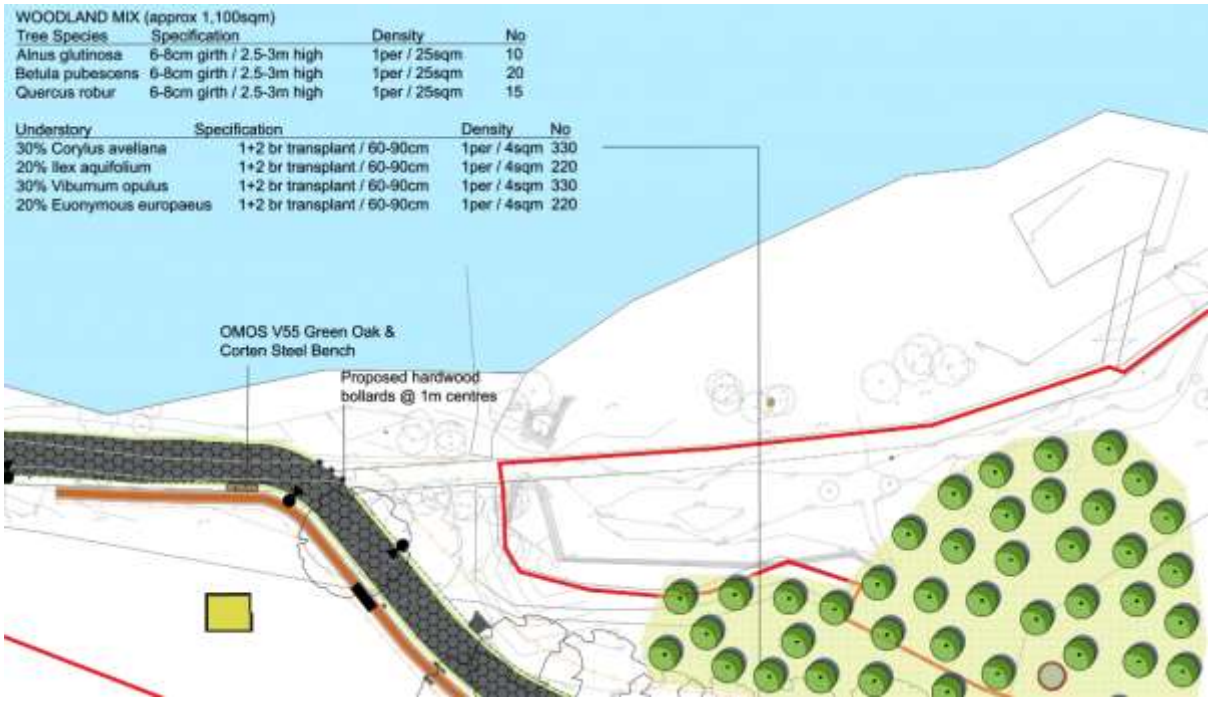

Figure 3-131: Proposed replacement tree planting east of Cook Medical

3.4 Description of Proposed Construction Works

3.4.1 Tree removal

The proposed works have been designed to minimise disturbance to the habitat and limit tree removal within the site, but there are trees that will be cut down to construct the proposed Greenway. In accordance Section 40 of the Wildlife Act 1976 as amended by Section 46 of the Wildlife Amendment Act 2000 the proposed trees can only be removed between and 1st September and the last day of February in the following year. The trees that have to be removed will be cut down during this period.

The proposed path has been designed to avoid existing mature trees except for one dead mature tree and one dead semi-mature tree that will be felled ahead of the construction works. Tree overhang from approximately 30 No. semi-mature and mature trees will be cut down along the proposed path. These trees have been assessed by an experienced and qualified Arborist and an experienced and qualified Ecologist, and they have very limited habitat potential. There is one dead mature tree and four immature trees that will be removed in the Annex 1 habitat Alluvial woodland forest (Refer to Figure 4.2). The remainder of the trees to be cut down are outside the Annex 1 habitat Alluvial woodland and they are saplings and immature trees with no habitat potential. Refer to Figure 3-132.

Figure 3-132: Saplings and immature trees that will be removed along the route of the Greenway

All trees to be cut down between September and February shall be inspected by an experienced and qualified Ecologist to check for nests and roosts and shall be laid on the ground for at least 24 hours before they will be recycled or mulched.

LCCC requires trees that are cut down to be replanted at a rate of 5:1 so over 300 native trees are proposed to be planted along the proposed Greenway. This will help to deliver the LDP Objective EH

O10 to plant 'native trees, hedgerows and vegetation and the creation of new habitats in all new developments and public realm projects'.

Tree branches and immature trunks which are felled will be reused in the production of bug hotels. Any leftover trunks and branches will be chipped and mulched at the closest construction compound for reuse on site.

Figure 3-133: Scrubland that will be cleared ahead of the Greenway construction works

3.4.2 Site Clearance

Surface stripping will be required in greenfield areas where topsoil and subsoil will be stripped along the route of the path to an average depth of 300mm. The topsoil and subsoil will be mounded and seeded on the river side of the path and will be left in place as a permanent installation. To prevent soil washing into the river, a sediment barrier will be erected at the base of the mounds on the river side.

In advance of construction works existing infrastructure items will be removed and disposed off-site, these include:

- One steel kissing gates along the existing gravel track at Plassey Mills and disposal off site;
- Approximately 500m of existing wooden, concrete, and steel fencing and disposal off site;

Advance work in Section 2 will require the removal of a temporary steel bridge at the location of Bridge No. 3.

Advance works will also include cutting out of four existing concrete footbridges and one set of bridge abutments and crushing of concrete within the construction compounds so the aggregate can be reused during the construction works.

Extensive areas of vegetation will need to be cleared in advance of construction works. Trees which are felled will be chipped on site for mulch for use on site. Mulch will be added to slopes to prevent soil erosion, retain water, and manage weeds.

Vegetation clearance includes:

- Felling of trees and mulching for onsite use;
- Clearance of overhanging branches and mulching for onsite use;
- Clearance of native scrub from drainage channels, bagging, and disposal;
- Clearance of native scrub in heavy dense areas, bagging, and burial under soul mounds to prevent spread of invasive species.

A planting scheme is proposed to replace vegetation which has been removed as part of the works. Refer to the landscape drawings 2525-RHA-XX-DR-C-LA0001 to 2525-RHA-XX-DR-C-LA0005 for details of the proposed planting areas and species.

Advanced treatment and removal of invasive species including Giant Hogweed and Himalayan Balsam that have been surveyed in the work site shall be carried out ahead of construction works. Refer to the Invasive Species Management Plan in Appendix E for details.

If invasive species plants that spread by rhizomes (e.g. Japanese Knotweed) are encountered by site clearance crews, the plant will be removed in accordance with guidelines for managing invasive species, wrapped in plastic, and buried under topsoil and subsoil mounds so those invasive species plants cannot propagate. No invasive species will be moved to a different location within the works site or off site.

Site clearance will be required in advance of the Greenway's construction, as follows:

- At a minimum this will include excavation of topsoil and subsoil and establishment of permanent mounds (including reseeding) immediately alongside the stripped soil in green fields along the proposed route between Kilmurray Student village and Cook Medical;
- Existing infrastructure items obstructing the proposed path, such as metal gates, metal parapets, metal arisings from crushed concrete, and metal fences will be removed and disposed offsite to a licenced waste facility;
- Existing concrete footbridges will be or crushed in temporary construction compounds and the material will be reused as aggregate for haul roads during the works (metal arisings will be transported to a licenced waste facility);
- Vegetation clearance involves removing scrub and will be carried out in consideration of ecological restrictions between September and February.
- Trees which are felled will be mulched in a temporary construction compound for reuse on site to minimise soil erosion, keep soil wet, and prevent weed growth.
- Where excavation is required to remove roots from trees that have been cut down, any unconsolidated ground will be sown with grass seed following reinstatement to prevent erosion;

Temporary works will be put in place in advance of construction, including the provision of silt fences at all interfaces of the works area and the existing watercourse to prevent run off from the works area.

3.4.3 Temporary Construction Compounds

The temporary construction compounds will be temporarily surfaced with hard standing on a geomembrane to prevent generation and spreading of mud. Temporary perimeter fencing with silt curtains at the base and shade cloths to act as dust curtains will be erected around compounds. Delivery trucks will not cross through the compounds, and they will drop their loads within the compounds. The construction works vehicles will be permitted to work on the Greenway side of the compounds only and will not pass through the compound to exit onto public roads. This will control mud spreading onto public roads and will help to prevent the spread of invasive species that are evident along the proposed path.

The compounds will be adequately buffered to prevent any surface water runoff. The construction compounds will be constructed in Flood Zone C areas only.

The compounds will comprise the following elements:

- temporary site office, portaloo toilets, facilities for staff, and car-parking areas;
- crushing and storage areas for construction materials;
- bunded containment areas for plant refuelling which will only be permitted within the compounds,
- maintenance area for construction vehicles and plant;
- wheel wash area for construction vehicles and plant with water capture and settlement to prevent the spread of invasive species;
- storage of fuels, oils, lubricants, solvents, and site generators;
- a dedicated waste storage area for any construction waste generated. Skips or bays will be provided for recyclable material;
- wheel wash area for delivery vehicles (or road cleaning to be carried out as an alternative subject to UL, IDA and LCCC requirements).

Temporary compounds and a working area will be required during the construction period to accommodate workforce and vehicle movements, stockpiling of excavated material, and the construction (and removal where required) of haul roads. For each compound the top-soil and sub soil will be removed and mounded on the compound footprint, a geotextile layer will be laid across the entre area, imported fill (40mm crushed rock) will be spread across the area, and the compounds will have a temporary fence set up on their boundary.

Provision has been made for four temporary compounds with areas typically measuring 40m x 40m but these dimensions will be adjusted to suit site conditions and avoid tree felling. There is one temporary working area proposed in Castletroy wastewater treatment plant (WwTP) to set up a crane to lift in prefabricated concrete and steel sections associated with Bridges 2 and 3. Each of the compounds facilitate access to the five different sections of the proposed Greenway. Sectioning of the route in this way will allow part of the existing path to remain open for the public while works are being carried out in other sections. Refer to Figure 3-134.

Each temporary compound and working area will be removed after works in each section are completed and the area will be reinstated back to its original state.

Upon completion of sections of the Greenway, the temporary construction compounds and haul roads will be decommissioned, and the grounds will be reinstated to their original condition. Where possible, hardstanding materials removed will be reused in the construction of other temporary compounds and used in the construction of the base layers of the proposed Greenway project.

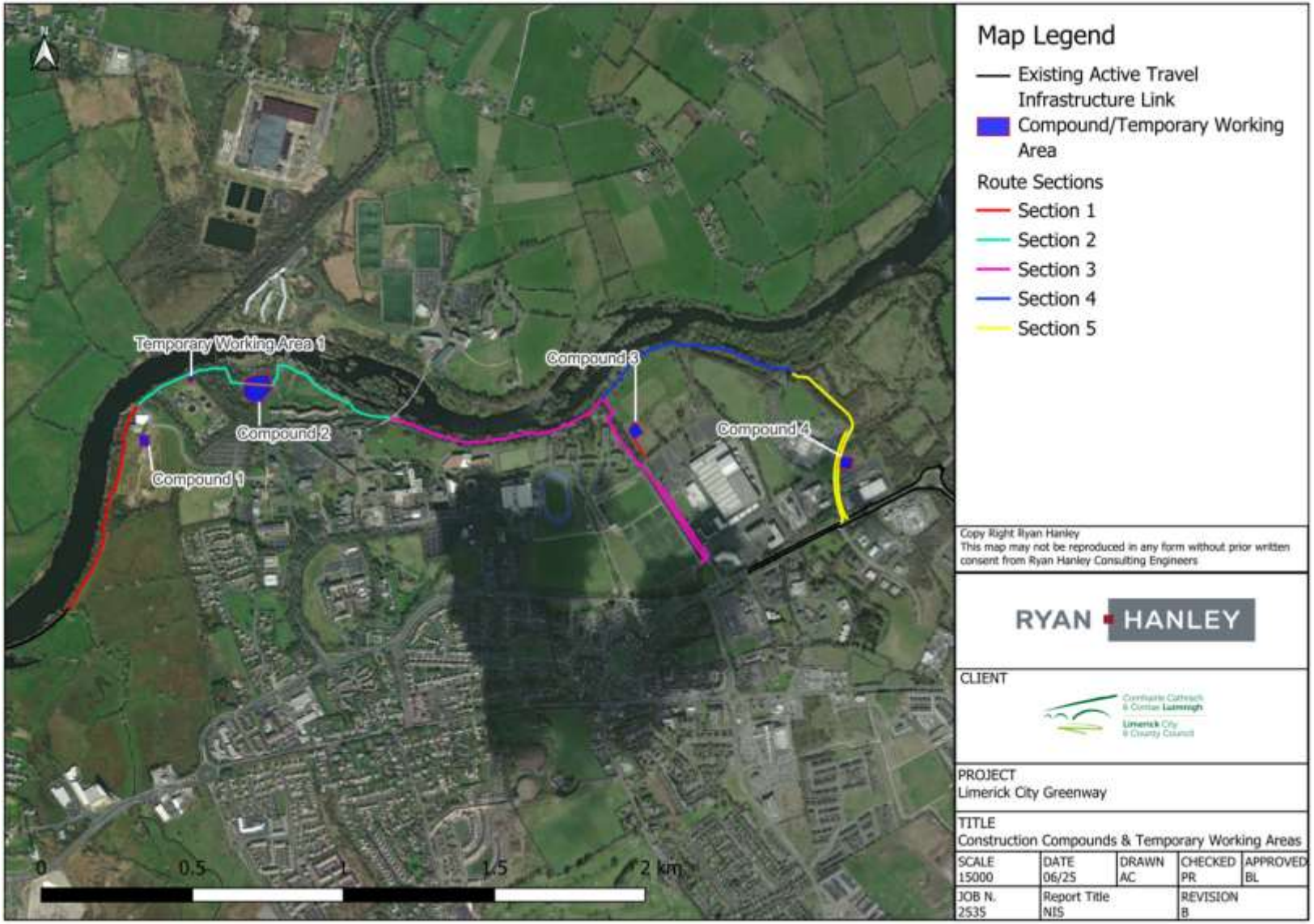

Figure 3-134: Proposed Sections, Compounds and Temporary Working area

3.4.4 Haul roads

Haul roads are required to facilitate the construction of the proposed Greenway. Haul road will be developed in green fields, scrublands, tree felling areas, and along existing gravel paths to enable construction vehicle movements. The haul roads will form the sub-base layer of the proposed path. Approximately 3.6km of haul roads will be developed along the proposed route as per Table 3-1.

Table 3-1: Lengths of Haul Roads per Section

Section Ref.	Haul Roads (m)
Section 1	736
Section 2	1005
Section 3	845
Section 4	725
Section 5	284
Total Length	3,595

The haul roads for construction vehicles will be developed along the route of the proposed path so the tarmac finished layer can be laid onto the haul road. The haul road will be approximately 3.5-4.0m wide and will comprise of the subbase layers of the proposed path: a geotextile layer, and crushed rock (UGM A). The depth of the subbase layer will generally be 300mm – 450mm depending on the ground conditions of the area and the haul roads will be laid in sections as the construction of the Greenway progresses.

Approximately 313m of temporary haul roads which do not lie along the proposed path will be constructed to facilitate access between the compounds and the works areas in each section. These haul roads will be removed after works in each section are completed and the area will be reinstated back to its original state.

Temporary haul roads will be constructed by excavating topsoil and subsoil and laying geotextile and aggregate/blinding (UGM A). The soil will be stored temporarily if it is required for reinstatement or will be permanently mounded and reseeded if it is not required for reinstatement. The haul roads will be laid in sections as construction of the path progresses.

On completion of sections of the proposed Greenway, the temporary haul roads will be removed, and materials will be reused in subsequent sections as the works advance, or the UGM A material, 55mm binder course and 20mm surface macadam course will be laid above the haul roads in greenfield areas. Lath edging (50 x 75mm) will be laid at both side of path attached to stakes located at 900mm c/c.

3.4.5 Earthworks

There will be no excavation required for the proposed Greenway along existing tarmac or gravel paths. To protect trees alongside the path a 'Cellweb®TRP' tree root protection system (or equivalent) will be laid onto the existing path and imported material (i.e., crushed rock and gravel to UGM A, overlaid with tarmacadam) will build up the level of the path. The sloping banks on the river side and the Plassey Mill

Race will also have a 'Cellweb®TRP' system (or equivalent) to enable widening of the existing gravel track. Refer to Figure 3-135 for an example.

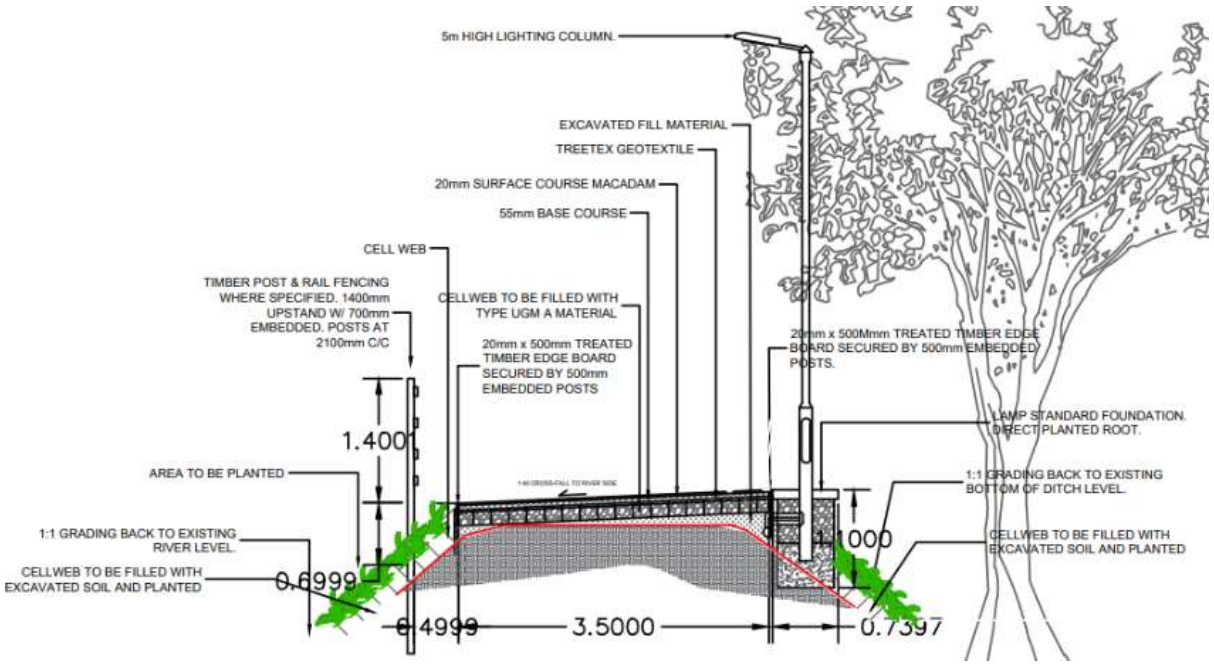

Figure 3-135: Tree root protection along proposed Greenway (Red line is existing ground level)

Excavation of topsoil and subsoil will be required where the proposed path passes through green field areas. Approx. 300mm depth of soil will be excavated and permanently left as a mound to be reseeded approximately 0.75m high and 2m wide on the river side of the path. Soil from areas that were contaminated with invasive species will be wrapped in plastic and buried under excavated soil. This accords with the project objective to ensure at least 95% of all waste is kept on site and not sent to a landfill.

Excavation of the carriageway, green verge, and footpaths will be required along University Road and McLaughlan Road to build up the concrete footpath and tarmac cycle lanes. A raised kerb will separate the existing roads from the proposed cycle lanes.

3.4.6 Testing of Imported Material

Clean Type UGM A fill material is required to be imported into the work site. To prevent cross contamination or pollution, a suite of testing from the source quarry will be required because the proposed Greenway is adjacent to water.

3.4.7 Traffic Management

A *Draft* Traffic Management Plan has been prepared for the proposed works and consultation has been carried out with UL Facilities and Uisce Éireann. The traffic management proposals have been presented to elected representatives. Construction and works delivery traffic will use the following existing roads/routes:

- The entrance road to the Castletroy WwTP;
- The road across the bridge to Co. Clare;
- University Road;
- McLaughlan Road;

- Plassey Park Road.

3.4.8 Construction of Greenway

Construction works should take place during daylight hours only with no temporary lighting on the site during the hours of darkness. Works shall only be carried between 08:00-18:00 during daytime hours or between dawn and dusk to minimize disturbance to nocturnal Qualifying Interests species. Motion detection sensors to turn on lights were considered but have not been proposed because the existing path is well used by the public so the use of always on lights from dusk until 23:00 hours is preferred over lights turning on and off, and risking the creation of a strobe light effect for nocturnal Qualifying Interests species.

During construction, noise limits, noise control measures, hours of operation and selection of plant items will be considered in relation to disturbance of birds. Plant machinery will be turned off when not in use.

The design and construction of the 4.25km long and 3.5-4.0m wide shared path, 1.5-2.0m wide footpath, and 1.8-2.0m wide cycle lanes has been carried out in accordance with the following:

- Transport Infrastructure Ireland (TII) Rural Cycleway Design DN-GEO-03047 (2022);
- Department of the Transport and Department of Housing, Local Government and Heritage, Design Manual for Urban Roads and Streets (DMURS, 2023);
- National Transport Authority's Cycle Design Manual (2023); and,
- Department of Transport, Tourism & Sport document Traffic Signs Manual (TSM) (2019).

Construction of the path will be carried out in sections. The sequencing of works per section is flexible. Each section will be reinstated before works commence in the next section. Existing users of the gravel track along the River Shannon will be directed around each section and there are existing footpaths and cycle lanes in the UL campus and along Plassey Park Road to accommodate diversions.

Isolation of the works area, including erection of fencing around the temporary works area and traffic management will be set up as required. The fenced area will include the full area required to facilitate the works including the temporary site compounds and the temporary haul roads.

Construction of the Greenway along the existing gravel path in wooded areas will involve the installation of lath edging (50 x 75mm) at both sides of the proposed path attached to stakes located at 900mm c/c, laying a 150mm thick root protection material onto the gravel track, filling this with UGM A material, laying a 55mm binder course onto it and finishing with 20mm surface macadam course;

Construction of the path along the existing gravel path in non-wooded areas will involve the installation of lath edging (50 x 75mm) at both sides of the proposed path attached to stakes located at 900mm c/c, laying 150mm of UGM A material directly onto the existing gravel path, laying a 55mm binder course onto that, and finishing with 20mm surface macadam course;

Where the path is being laid in an area with an existing tar pavement (i.e., along University Road and McLaughlan Road, the top 250mm of the existing surface will be removed and subsequently the depth of the subbase layer in these areas will be reduced to approximately 180mm.

Storage of other excavated material will be on a temporary basis, on site within the temporary works area and separate from the topsoil storage. Excavated material will be reused on-site, primarily for backfilling against new bridge abutments and the proposed retaining wall at Plassey Beach. This material will be classified as a construction by-product in the context of Article 27 of the European Communities (Waste Directive) Regulations. If there is any surplus excavated material, it will be

transported off site to an authorised waste or recovery facility. Large volumes of excavated material will not be allowed to accumulate within the temporary working areas.

The construction works for reinforced abutment walls, retaining walls, concrete culverts, open drains will be carried out in parallel with the path construction.

The construction works for lighting column foundations and trenches for ducting will be carried out in parallel with the path construction. To protect the tree roots, ducts will be moled to a minimum crown depth of 600mm wherever the ducts pass mature trees.

Additional works including the installation of; signage, safety barriers, fencing, park benches and tree planting will be completed along the path prior to reinstatement of works area and the works area being reopened.

The works area will be reinstated to its original condition. This will involve levelling, raking, and seeding with grass.

3.4.9 Construction of Bridges, Retaining wall, Ramp

The five bridges on which the proposed path will cross existing drains, a stream, and the Plassey Mill Race (at two locations). These are as follows:

- A 4.9m long single span, steel frame bridge and new concrete abutments will be constructed for both pedestrians and cyclists at CH795;
- A 9.6m long single span steel bridge and 41m of concrete retaining wall and abutments will run adjacent to an existing stone footbridge at CH970;
- A 5.4m long single span, steel frame bridge for both pedestrians and cyclists will be constructed on existing cut stone abutments at CH1000;
- A 5.1m long single span, steel frame bridge for both pedestrians and cyclists will be constructed on existing cut stone abutments at CH1045;
- A 12.9m long single span, steel frame bridge for both pedestrians and cyclists will be constructed on new concrete abutments and obliquely cross the Plassey Mill Race at CH2220-2235. 28m of concrete abutments will support the 12.9m long steel deck;
- A new 12m long concrete retaining wall will be constructed at Plassey Beach;
- A new fully accessible 20m long ramp at a 3% slope will be constructed at Plassey Beach to provide access from the proposed Greenway to the beach for all users.

Construction of the new bridges will take place as follows:

- Temporary works will be put in place including silt barrages, and temporary flumes will be installed to manage overland drainage water.
- To prevent pollution to the adjacent stream and river bio-degradable hydraulic oils are to be used in machinery, and spill kits shall be ready on site for immediate use.
- Works beside streams will be restricted as a result of the spawning season for salmonids so work will not be carried out during Nov-March.
- Biosecurity management for in-stream works will be strictly monitored. With the presence of Giant hogweed (*Heracleum mantegazzianum*) and Himalayan balsam (*Impatiens glandulifera*) along the path route, regular cleaning of machinery to prevent spread of non-native species is very important.
- The foundations and abutment walls will be excavated down to formation level. Excavated material will be stored on site for reuse as backfilling. Formwork will be erected, and aggregate and blinding will be tamped into place. Reinforcement bars will be placed into the formwork

and concrete will be poured in using a concrete pump crane. After the required curing time has passed the formwork will be removed.

- The new bridges will be constructed using prefabricated steel frames that will be placed and fixed *in situ* onto the concrete abutments or onto the existing cut stone abutments. Steel frames will be delivered to the construction compound by truck, and then transported to the proposed crossing location by digger. The steel frames will be swung into place using a crane or digger and placed and fixed by hand.
- The annulus between the new structures and the excavated areas will be backfilled with excavated material (and topped up with imported material if required), the area will be reinstated, and the section will be reopened.

3.4.10 *Drainage infrastructure*

A Flood Risk Assessment for the proposed greenway has been completed. The following figures illustrate the potential temporary impact that 1 in 100 year and 1 in 1000 year floods will have on the proposed Greenway, and demonstrates why a new drainage network of land drains and culverts will be required to convey surface water to the River Shannon after flood events. Maintenance of this drainage infrastructure by LCCC will be required.

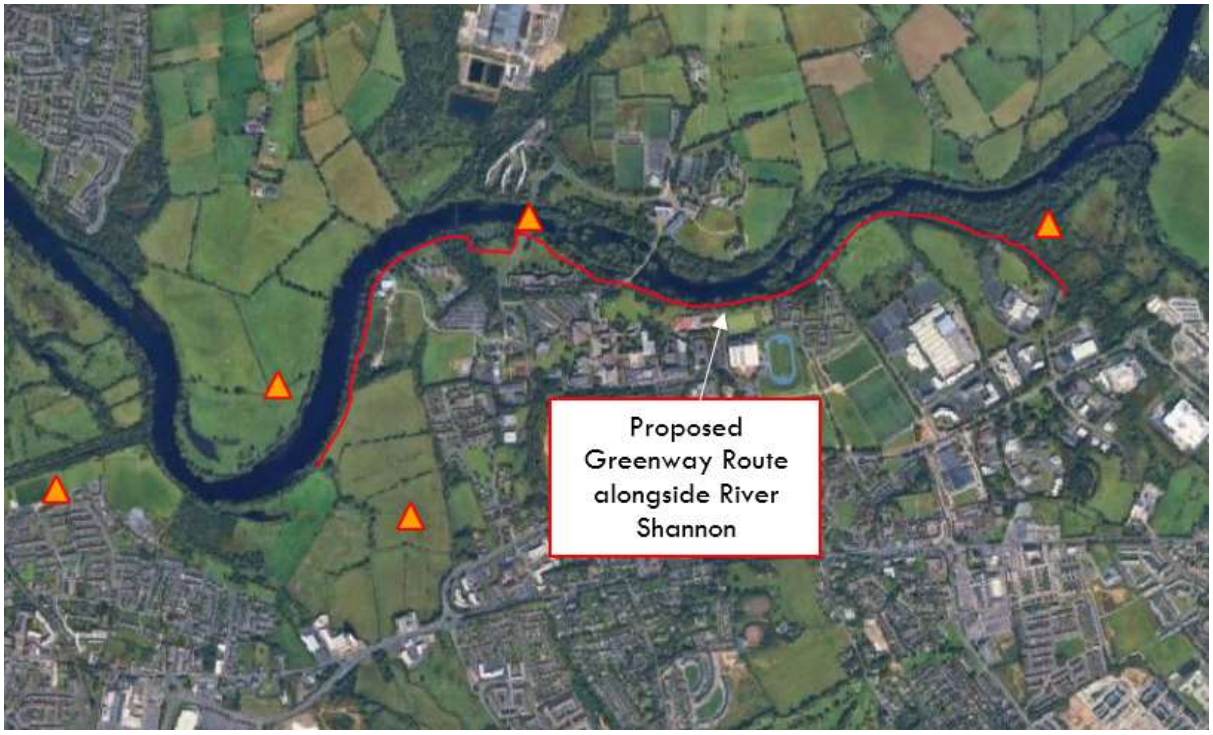

Figure 3-136: Past Flood Events OPW database (www.floodinfo.ie)

Flood Mapping developed by the OPW CFRAM programme confirms that appreciable lengths of the proposed Greenway are in Flood Zone A (2.36km) and Flood Zone B (2.77km) associated with the River Shannon and its tributaries scheme floodplains.

Portions of the existing paths and the proposed greenway are below the 10% AEP flood level.

The proposed scheme, being an "Amenity open space, outdoor sports and recreation" facility, is classed as a Water Compatible development in the OPW Planning System and Flood Risk management Guidelines, and therefore is an appropriate development for both Flood Zone A and B.

A justification test for the development in accordance with the Flood Risk Management Guidelines, further confirmed that the proposed development is appropriate albeit with mitigations. The Greenway track should be constructed to be water compatible, i.e. one which is resistant to damage caused by flooding and prolonged inundation, e.g. sealed surface, appropriate drainage etc.

Figure 3-137: November 2009 River Shannon Flood Event at UL campus in Co. Limerick on left hand side, with UL campus in Co. Clare on right hand side of figure, OPW database (www.floodinfo.ie)

Figure 3-138: Sections of Greenway at Flood Risk (1 in 100 or 1% AEP)

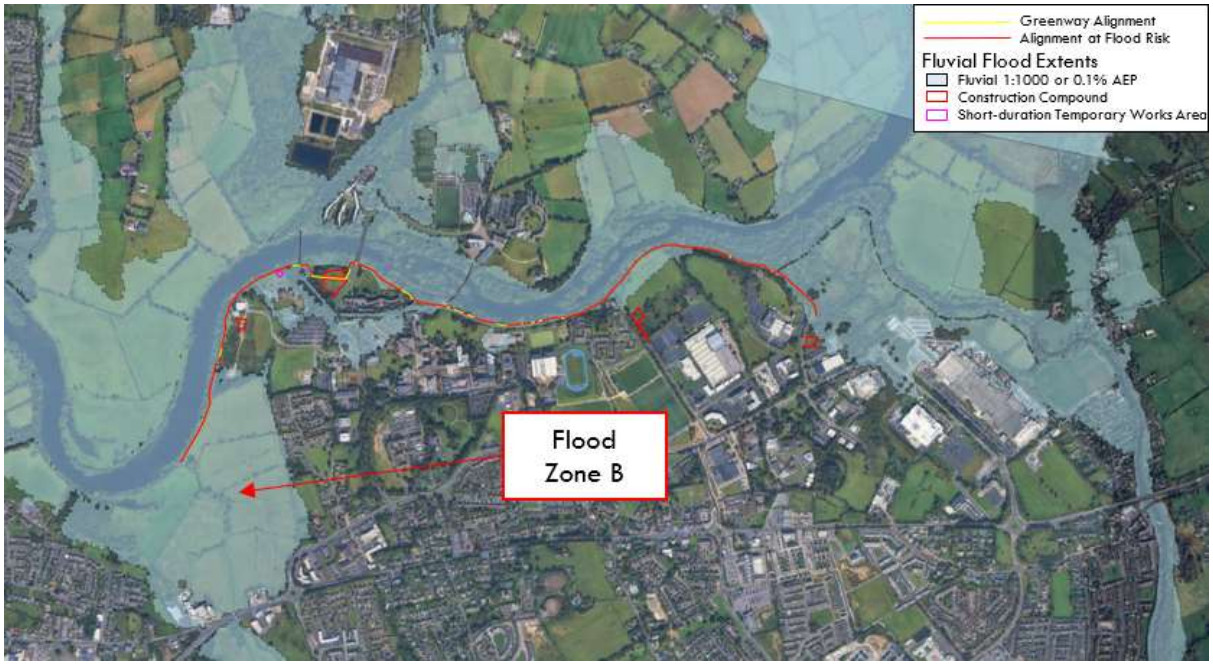

Figure 3-139: Sections of Greenway at Flood Risk (1 in 1000 or 0.1% AEP)

Surface water will be managed through a series of existing open drains alongside the proposed Greenway and existing culverts under existing paths, proposed open drains alongside the proposed Greenway, and new culvert pipes under the proposed path.

There will be 5 No. box culverts constructed in existing drainage channels where the proposed Greenway will cross it. Four are new culverts and one is a replacement culvert. They will have a minimum diameter of 0.9m and range up to 2.0m cross sectional diameter (exact diameters to be confirmed after completion of the Section 50 assessment).

22 No. precast concrete culvert pipes of 0.5m diameter and 6-8m in length and associated headwalls will cross under the proposed Greenway path at 100m intervals where there are no existing culverts. The purpose of these culverts is to enable groundwater which collects in the open drains alongside the path to be discharged to the rivers. The open drains will be shallow, approximately 1.0m wide and 200mm deep. The drains will collect storm water flows from the proposed path and runoff from the hilly green field in the IDA's National Technology Park. Water will flow in the drains to the 22 No. culverts and pass under the proposed path.

Following flood events there is a risk of debris in the minor watercourses culverts and drains pipes. Post flooding maintenance to clear the culverts of debris will be required by LCCC.

3.4.11 Public Lighting

The Public Lighting design for the proposed project will use best practice guidance notes "*Bats and artificial lighting in the UK*" as published by the Bat Conservation Trust, in respect of mitigation strategies, to minimise the impact of outdoor lighting upon bat populations. The LCCC Public Lighting standard has also been followed.

There will be new public lighting along the shared path which follows the south bank of the River Shannon for approximately 3km.

Public lighting will be controlled by light sensors so their turn on time will vary during the calendar year and turn on after dusk, but lights will turn off at 23:00 hours.

Light emitting diodes (LEDs) type lanterns of the cool white type in accordance with the LCCC Public Lighting standard will be installed. They will have a Colour Temperature of 2,700°Kelvin, because it is considered less disruptive to the emergence of bats from roosts at dusk, and subsequent movement from habitats to foraging locations.

LED lanterns do not emit any ultraviolet or infra-red radiation, this again being a desirable feature in relation to impact upon bats, in terms of causing spatial exclusion from artificially lit areas.

Light levels have been kept as low as possible (P4 Class) by reference to levels specified in "Design of road lighting' - BS EN 5489-1: 2020, and these will be in accordance with the LCCC Public Lighting standard.

There will be two lighting columns; 1.6m high and 5m high. The 1.6m high lighting column will have an integrated lantern that will point directly onto the path, and they will be spaced 5m apart (Refer to the Preliminary design drawing 2535-RHA-XX-DR-C-PD-0016 for a photo of an equivalent lighting column). The Lanterns on 5m high columns will be mounted at 0° degree tilt and will be the fully cut off type with no light output above the horizontal plane. The 5m high lighting columns will be spaced approximately 35m apart to avoid siting lighting columns near mature trees with roost potential and the 1.6m high columns shall be used if there are any signs of bats in an area. The 1.6m high columns will be used in the Annex 1 Alluvial forest area.

Cable ducts for the public lighting will be installed by open trench to minimum 300mm cover in areas where no trees or tree roots are present, and by Moling technique in areas with trees. The moling will allow cable ducts to be installed to a minimum depth of 600mm so the cable ducts will pass under tree roots and protect them from damage.

Any temporary lighting required for health or safety reasons during the construction period shall be installed at a minimum of 10 metres from existing treelines and woodland habitats and directed away from such sensitive habitats.

3.4.12 *Interface with roads*

The proposed Greenway will interface with existing roads at several locations along the route. The features which define interfaces with roads relate to improving the safety of pedestrians, cyclists, and motorists where they interact. In addition to sign posting and path markings/decals, the following features have been included as safety measures at the interfaces with roads.

i) Tactile paving

Tactile paving will be installed on a footpath wherever a footpath crosses a road at road level and at raised tables to provide warning of approaching traffic for the visually impaired.

ii) Toucan Crossing

There will be 1 No. new Toucan crossing on Plassey Park Road to replace the existing raised table.

iii) Kerbs

Raised kerbs will run parallel to the proposed cycle lanes to provide a physical separation between the road and the proposed Greenway. At junctions, the proposed raised kerbs will transition to dipped

kerbing to facilitate smooth for vehicles from the carriageway across the proposed cycle lanes and footpaths.

iv) Raised Tables

Alongside University Road, there will be raised tables crossing the road entrance into Kilmurry Village and the northern entrance to the UL Gaelic pitches. There will be raised tables at the southern part of McLaughlan Road. These raised tables will maintain a consistent level of the footpath and the cycle lanes where they cross a road, or a junction, and will signal traffic to slow down and check oncoming walkers and cyclists.

3.4.13 Road Markings

Cycle track markings will be carried out in line with Traffic Signs Manual, Chapter 7 – Road Markings – Department of Transport, Tourism & Sport (2019).

There will be decals on shared surfaces illustrating the side of the path that cyclists and walkers should adopt at transitions from shared surface paths to separated cycle lanes and footpaths.

3.4.14 Signage

There will be directional signs along the 4.25km of the proposed route. Existing signs along the proposed route will be retained. Refer to Figure 3-7 for a photo of an existing directional sign on the existing path.

Directional signage for the Greenway will be erected at the approach to junctions and interfaces with roads, and where the path splits into separate cycle lanes and footpaths. There will be signs to University Road, McLaughlan Road, Plassey Park Road, and at all the interface locations in the UL campus where the proposed path leads to other existing cycle lanes or interfaces with roads.

Speed control signs will be erected to remind cyclists to manage their speed and be mindful of other path users.

All signage will be clear and consistent and will be designed in accordance with the Department of Transport's 'Traffic Signs Manual'.

3.4.15 Information boards

Information boards will be erected at areas of interest including Plassey Beach and Plassey Mills. The information boards will include information about ecology (i.e., flora and fauna and biodiversity) and built heritage (architecture and/or structures of architectural or heritage importance).

3.4.16 Fencing

There will be 1.4m high timber post and rail fencing to Transport Infrastructure Ireland (TII) standard detail CC-SCD-00301 which will be erected at locations along the path including:

- Where the proposed Greenway runs adjacent to or crosses water
- Where the proposed Greenway approaches bridges or retaining walls;
- Where there is a ditch or steep slope adjacent to the path;
- At junctions;
- At sections of the boundary with UL;
- Along the boundary with private landowners; and,

- Along the boundary with the National Technology Park.

There will be 1.45m high corten steel fencing along the parapets of the proposed steel bridges and along the approaches to the existing stone bridges and cut stone abutments.

There will be 2.4m high anti-climb palisade fencing erected along the south-eastern boundary of Kilmurray Student Village and outside the commercial property BD-RCI Limerick on University Road to match the existing fence.

3.4.17 Amenity/Rest area Benches

Green Oak and corten steel benches will be installed in the amenity areas at Groody Bridge, Plassey Mills and Plassey Beach.

3.4.18 Construction Programme and sequencing

The construction duration for 4.25km of the proposed Greenway is approximately 30-60 months with works being carried out in one section at any one time. Sequencing of work in any of the five sections is flexible.

The works will be subject to ecological programme constraints as follows:

- Foreshore works (include preparatory work) beside all watercourses supporting salmonids shall be undertaken from May to October (inclusive) and in consultation with Inland Fisheries Ireland (IFI) to avoid accidental damage or siltation of spawning beds.
- To avoid impacting on bird nesting sites, the vegetation removal within the defined working area will not be carried out during the peak bird nesting season of March to August (inclusive) prior to the onset of works.
- Invasive species along the proposed greenway should be treated and removed prior to construction works.

3.4.19 Reinstatement works

The temporary working areas and compounds will be reinstated to their original condition following completion of the construction phase in each section.

Tree planning is proposed alongside the Greenway to compensate for tree felling along the route. For every tree that is felled, there will be five trees planted to compensate, so approximately 305 trees are proposed to be planted along the proposed Greenway.

3.4.20 Post construction Maintenance

Adherence to best practice codes such as the "Code of Best Practice for National and Regional Greenways" ensures that a continuously high standard of the proposed Greenway is provided for all users. LCCC be responsible for the upkeep and maintenance including litter control and invasive species management through ongoing maintenance plans.

4 Receiving Environment

Given the location, nature and size of this proposed development and the proposed construction methodology (refer to section 4.18 of the EIAR) it is considered for the purpose of this Biodiversity Management Plan that the likely receiving environment is the zone immediately around the construction site, and downstream catchment.

4.1 Designated Areas

The proposed development is located within and directly adjacent to the Lower River Shannon SAC (see Figure 5.1). It has been determined that there is a potential interaction between the works and this SAC, therefore its conservation objectives and the potential adverse effects to the site and its Qualifying Interest have been outlined in the NIS. The Lower River Shannon SAC Qualifying Interests (QIs) are as follows:

- Sandbanks which are slightly covered by sea water all the time [1110]
- Estuaries [1130]
- Mudflats and sandflats not covered by seawater at low tide [1140]
- Coastal lagoons [1150]
- Large shallow inlets and bays [1160]
- Reefs [1170]
- Perennial vegetation of stony banks [1220]
- Vegetated sea cliffs of the Atlantic and Baltic coasts [1230]
- Salicornia and other annuals colonising mud and sand [1310]
- Atlantic salt meadows (Glauco-Puccinellietalia maritimae) [1330]
- Mediterranean salt meadows *(Juncetalia maritimi)* [1410]
- Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation [3260]
- Molinia meadows on calcareous, peaty or clayey-silt-laden soils *(Molinion caeruleae)* [6410]
- Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae) [91E0]
- *Margaritifera margaritifera* (Freshwater Pearl Mussel) [1029]
- *Petromyzon marinus* (Sea Lamprey) [1095]
- *Lampetra planeri* (Brook Lamprey) [1096]
- *Lampetra fluviatilis* (River Lamprey) [1099]
- *Salmo salar* (Salmon) [1106]
- *Tursiops truncatus* (Common Bottlenose Dolphin) [1349]
- *Lutra lutra* (Otter) [1355]

The River Shannon and River Fergus Estuaries SPA is located 3.7km southwest and 8km downstream of the proposed works. Due to distance, scale and dilution factors it is considered that the proposed works will not result in any likely significant effects with the qualifying interests of the SPA.

The following protected Natural Heritage Areas were assessed through the Source Pathway Receptor model; Woodcock Hill Bog, Gortacullin Bog, Grageen Fen and Bog, Doon Lough and Bleanbeg Bog. Sixteen Proposed Natural Heritage Areas are also located in close proximity to the site. Extensive site synopsises for these areas and pathway for effects can be found in Table 6.3 of Chapter 6 of the EIAR for the development.

The habitats within the Study Area were surveyed by Ryan Hanley Ecologists and contracted ecologists between 2020-2024. A large proportion of the habitats are within the Lower River Shannon SAC, a site of international conservation importance. It was noted that three dominant habitats of high importance were present within and adjacent to the proposed Greenway, these habitats are depositing/lowland rivers (FW2) of International Importance, riparian woodland (WN5) of Local Importance (higher value) and Annex I habitat - Alluvial forest (91E0). The River Shannon forms the northern boundary of the study area and greatly influences the adjacent low-lying habitats.

4.2 Site Surveys

The following points summarise the information gathered and analysed by field surveys of the Study Area regarding flora and fauna;

- Otter as an ecological receptor have been assigned as Local Importance (High value) on the basis of suitable riparian habitats along the study area.
- Badger as an ecological receptor has been assigned Local Importance (Lower value) on the basis that the habitats within the Study area are unlikely to support a badger population of Local Importance.
- Bats as an ecological receptor have been assigned as Local Importance (Higher value) on the basis of the potential for a population within the study area.
- Reptiles and Amphibians as ecological receptors have been assigned as Local Importance (Lower value) on the basis of the potential for a population within the study area.
- Invertebrates as ecological receptors have been assigned as Local Importance (Lower value) on the basis of the potential for a population within the study area.
- Macroinvertebrates as ecological receptors have been assigned as Local Importance (Lower value) on the basis of the potential for a population within the study area.
- No protected flora was identified, and no species listed on Annex II of the EU Habitats Directive or additional flora listed in the Flora (Protection) Order (2022) or the Irish Red Data Book were recorded.
- Himalayan balsam (*Impatiens glandulifera*) and Giant hogweed (*Heracleum mategzzianum*) were found in considerable volume along the length of the proposed greenway route, their specific locations are shown in Figure 6.6, 6.7 and 6.8 of the EIAR.
- Bird species were recorded during walkover surveys in 2021/22 and 2023/24, the following species were recorded within the vicinity of the development site and are considered Red Listed species; Swift (Apus apus), Grey Wagtail (Motacilla cinerea), Lapwing (Vanellus vanellus), Kestrel (Falco tinnunculus), Redwing (Turdus iliacus), Curlew (Numenius arquata).
- Wintering Birds as an ecological receptor have been assigned as Local Importance (Lower value) on the basis of the potential for a population within the study area.

- Breeding Birds as an ecological receptor have been assigned as Local Importance (Higher value) on the basis of the potential for a population within the study area.

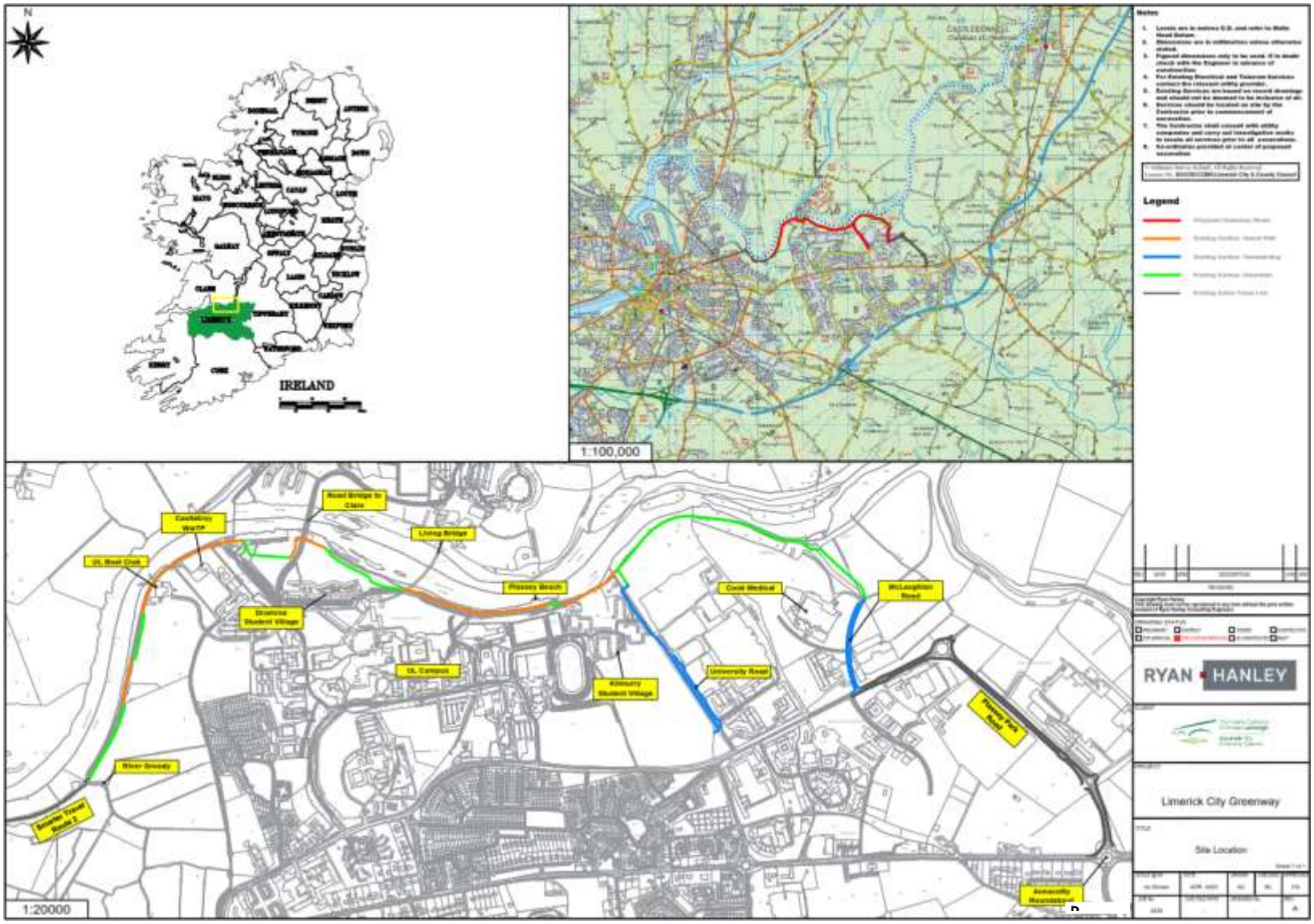

Figure 4-1: Location of the proposed Limerick City Greenway (UL to NTP)

The full list of habitats identified during the site visits are listed in Table 6.13 of the EIAR. An extensive overview and evaluation of each habitat listed can be found in 6.4.1.1. Table 6.14 of the EIAR provides a summary of the habitat importance/ecological value and identifies the habitats classified as Key Ecological Receptors (KERs).

4.3 Habitats and Flora

The proposed greenway will be used by pedestrians and cyclists for recreational and transport/commuting uses. The proposed greenway will be surfaced with porous tarmac which will correspond to Fossitt's classification of habitats as Buildings & Artificial Surfaces (BL3). Roads, car parks, pavements, yards, paths and driveways elsewhere in the study area are also categorised as BL3. The amenity grassland found along the proposed Greenway is associated with lawns of various buildings and institutions, as well as sports fields.

Given that the study area is dominated by highly modified habitats including amenity grassland and buildings and artificial surfaces, no protected flora was recorded during the survey. No species listed on Annex II of the EU Habitats Directive or additional flora listed in the Flora (Protection) Order (2022) or the Irish Red Data Book were recorded during the survey. However, there is a record of one FPO species, Opposite-leaved pondweed (*Groenlandia densa)* occurring in the area during the year 1833.

Three habitats regarded as International Importance are located within the study area of the proposed development as well as nine habitats regarded as Local Importance (Higher Value). All nine Local Importance (Higher Value) habitats are KERs, however only one habitat of International Importance (FW2) is regarded as a KER. The remaining two habitats are considered to be of International Importance (ED2 and GS2) because of their occurrence within the SAC designation, however, upon further investigation they can be ruled out as KER.

Annex I habitat (EU Habitats Directive) Alluvial forests 91E0 with *Alnus glutinosa* and *Fraxinus excelsior* is present within the Zone of Influence of the proposed works, within the Islands within the River Shannon and along the banks, specifically from Drumroe Student Village until Thomond College, reappearing from Troy studios up until the merge with the River Mulkear. This habitat is located on the southern bank of the river although not in a continuous manner. This habitat is considered of International Importance.

Habitat type 3260 '*Floating River Vegetation*' is known to be present throughout most major rivers in the Lower Shannon River SAC and is therefore highly likely to be present in the vicinity of the proposed works.

The WFD status of the waterbodies within the Study Area includes good status for the Mulkear (Limerick) River_050, and moderate status for the Lower River Shannon_060 waterbody. With regards to each river body's ability to meet the WFD objectives by 2027, the Mulkear (Limerick) River_050 is "*Not at risk*", the Lower River Shannon_060 is "*Under Review*". Limerick Dock and the Upper Shannon Estuary are both classed as having "Poor" WFD status and are "*At Risk*". The study area runs along the boundary of two groundwater bodies. Limerick City East which begins below the southern banks of the Lower Shannon River and Limerick City North which begins on the Northern banks of the same river. Limerick City North has a "Good" WFD status and is "*Not at risk*". Limerick City East has a "Good" WFD status but is currently "*At Risk*".

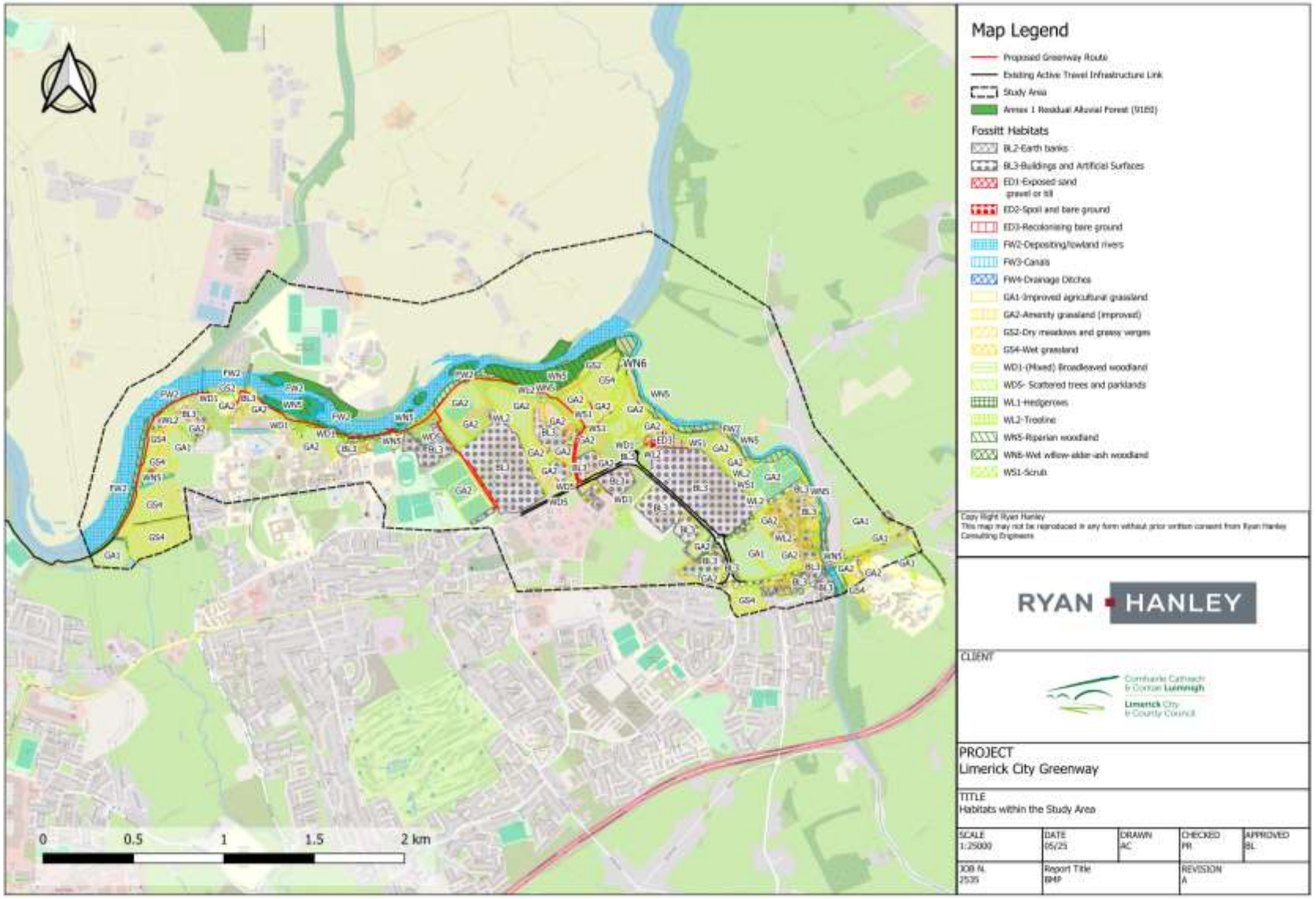

Figure 4-2: Overview of Fossitt Habitats recorded within the study area of the proposed greenway

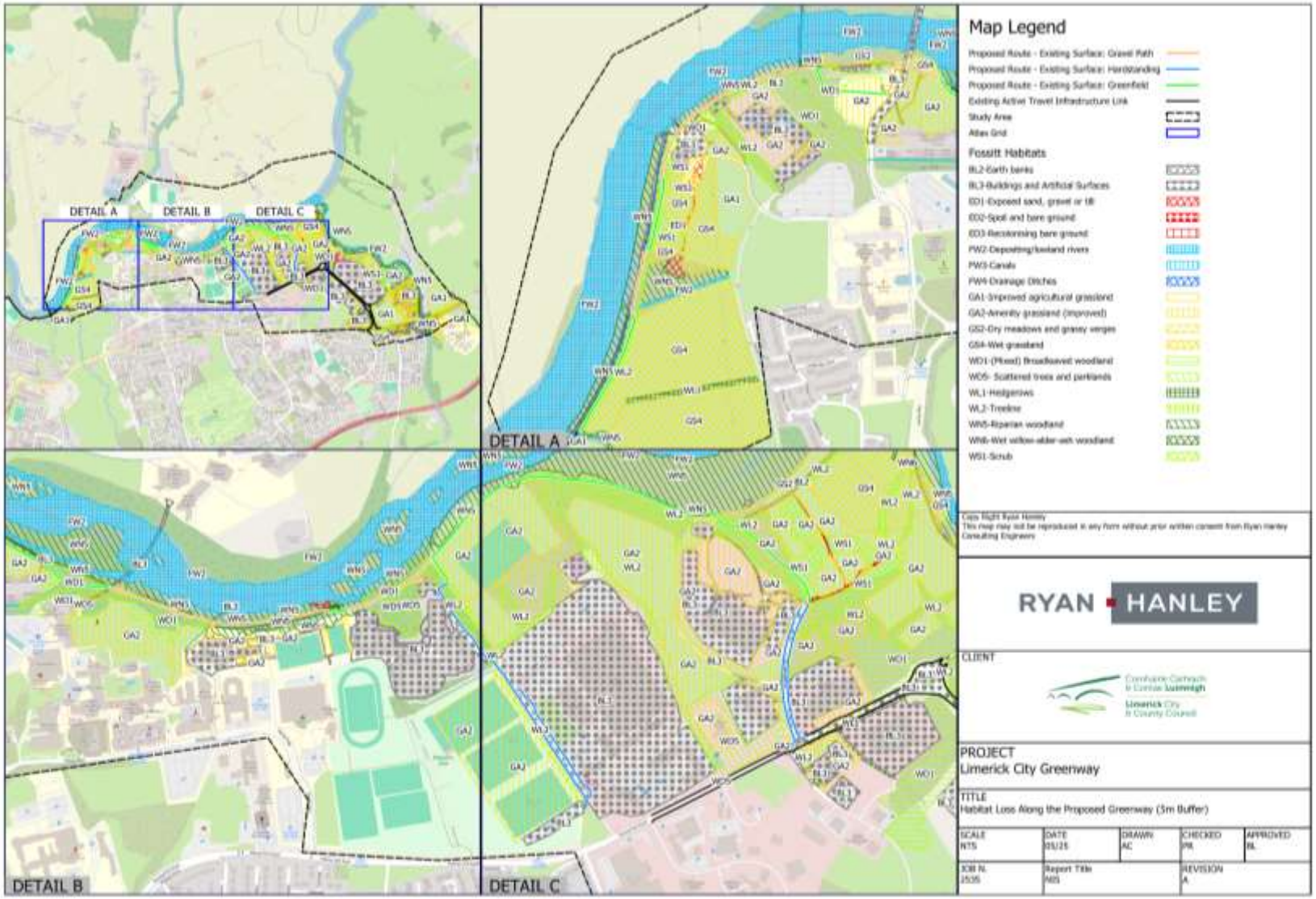

Figure 4-3: Detailed view of Fossitt habitats recorded within the study area of the proposed greenway

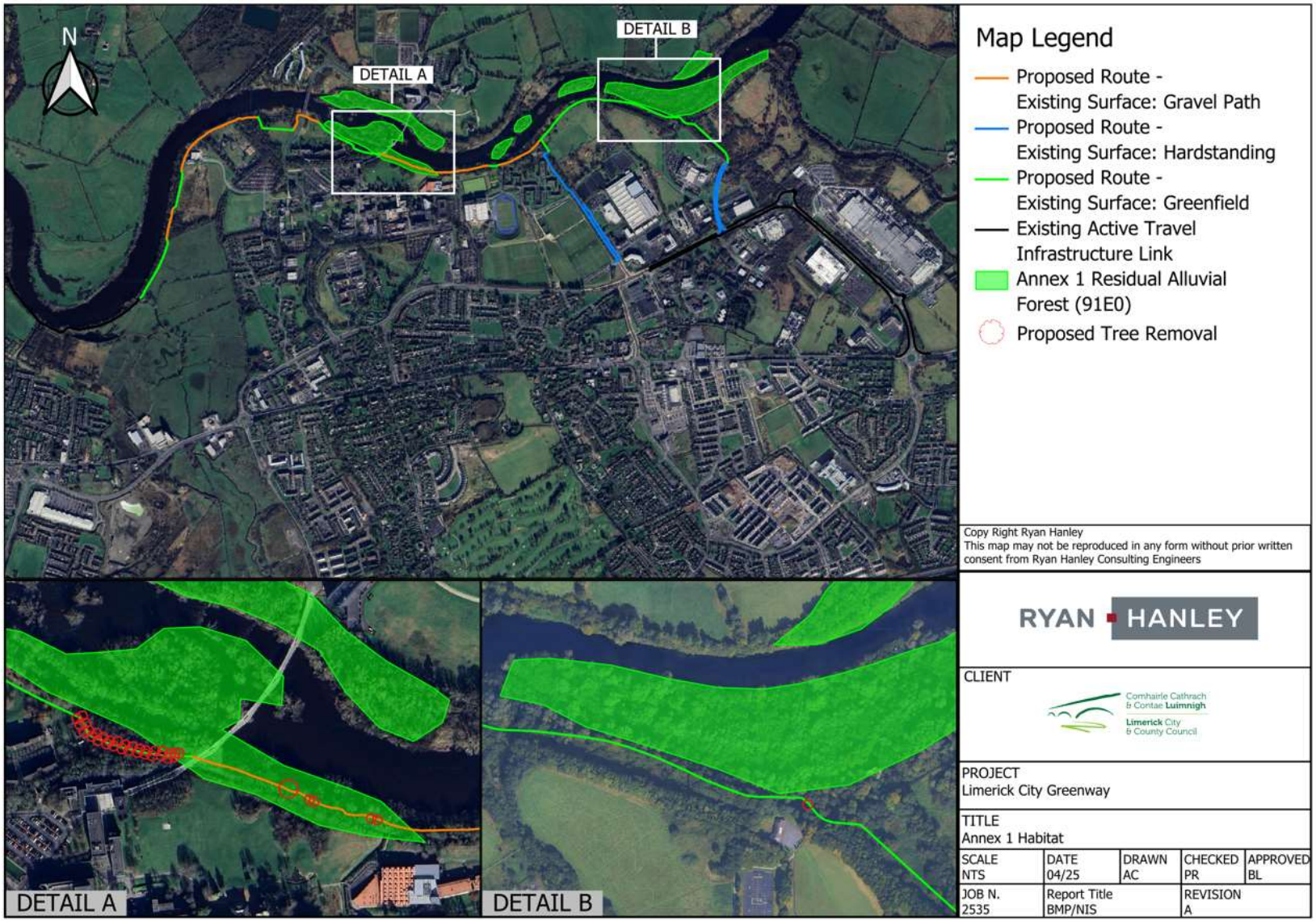

Figure 4-4: Annex I habitat presence in the proximity of the proposed Greenway

Table 4.1 Habitats recorded within the study date and habitats significance

	Habitat	Code	Receptor Importance/ Ecological Value	Key Ecological Recptor
1	Earth banks	BL2	Local importance (lower value)	No
2	Buildings & Artificial Surfaces	BL3	Local importance (lower value)	No
3	Exposed sand, gravel or till	ED1	Local importance (lower value)	No
4	Spoil and bare ground	ED2	Local importance (lower value)	No
5	Recolonising bare ground	ED3	Local importance (lower value)	No
6	Depositing/lowland Rivers	FW2	Local importance (higher value)	Yes
7	Canals	FW3	Local importance (higher value)	Yes
8	Drainage ditches	FW4	Local importance (higher value)	Yes
9	Improved Agricultural grassland	GA1	Local importance (lower value)	No
10	Amenity grassland (improved)	GA2	Local importance (lower value)	No
11	Dry meadows and grassy verges	GS2	Local importance (lower value)	No
12	Wet grassland	GS4	Local importance (higher value)	Yes
13	(Mixed) broadleaved woodland	WD1	Local importance (higher value)	Yes
14	Scattered trees and parklands	WD5	Local importance (lower value)	No
15	Hedgerows	WL1	Local importance (higher value)	Yes
16	Treelines	WL2	Local importance (higher value)	Yes
17	Riparian woodland	WN5	Local importance (higher value)	Yes
18	Wet willow-alder-ash woodland	WN6	Local importance (higher value)	Yes
19	Scrub	WS1	Local importance (higher value)	Yes

4.4 Fauna

Fauna evaluation in this section was assessed in accordance with the receptor importance classification methodology outlined in NRA (2009); "Guidelines for Assessment of Ecological Impacts of National Roads Schemes".

Of the faunal species recorded or known to be present in the area, there are three species of International Importance:

- Otter is listed under Annex II and Annex IV of the EU Habitats Directive and is also protected under the Wildlife Act (as amended);
- Salmon is listed on Annex II of the EU Habitats Directive. Otter and Salmon are two of the qualifying interests (QI) present in the Lower Shannon SAC. However, it is not considered that these species will be significantly affected by the proposed project; and
- Sea Lamprey (Petromyzon marinus) was recorded by the NBDC on site and it is a qualifying interest of the Lower Shannon SAC and listed as Annex II of the EU Habitats Directive. No instream works are proposed as part of the works so it is not considered that this species will be significantly affected by the proposed scheme.

A high level of bat activity and species diversity was recorded during the survey period. The study area provides a diversity of habitats including treelines, hedgerows, and many foraging opportunities for bats. Light pollution here is typically low and the area has good landscape connectivity with surrounding habitats. The suitability of the proposed project site for bats was considered and while the site is likely to be used by foraging and commuting bats the proposed scheme is unlikely to result in loss or damage to any significant roosting habitat as such bats are classified as Local Importance (Higher value).

The other species recorded such as bird species are classified as Local Importance (Higher value) in the context of the proposed project. These species are common and widespread in the local area and are not dependent on the site of the proposed works.

The low-medium quality of habitats within the study area overall, coupled with the limited records of fauna species protected under the Wildlife Act (as amended) from both the desktop study and field walkovers, would suggest that no additional fauna species populations utilise the study area in higher than local significance.

5 Habitat Management Action Plan

The proposed development area is considered to be of high ecological value at a local level. It is extremely important that all measures should be taken to preserve the current ecological receptors at the site and to increase biodiversity in the operational phase, and recommendations are proposed in Sections 5.1 to 5.3 of this report to achieve this.

Following completion of the construction of the Greenway, it is proposed to reinstate the construction and temporary works areas. Where opportunity exists, enhancement measures may be employed which will be carried out in liaison with the competent authority and the appointed Ecological Clerk of Works (ECoW). Upon completion of the site works, all plant and machinery will be removed. The grasslands adjacent to the site will be left to regenerate naturally and site fencing will be removed. Any reinstatement of breaches in hedgerows and tree lines will be carried out in consultation with a suitably qualified ecologist. Local strains of native species shall be planted, and hedge management shall reflect local traditional styles. As stated in Ch. 4 of the EIAR, thinning of branches and vegetation will be reused on site for the production of insect hotels, further promoting biodiversity during and after the construction phase.

The action plan measures will follow a suitable ecological calendar to ensure that habitat and species are not disturbed during the proposed works.

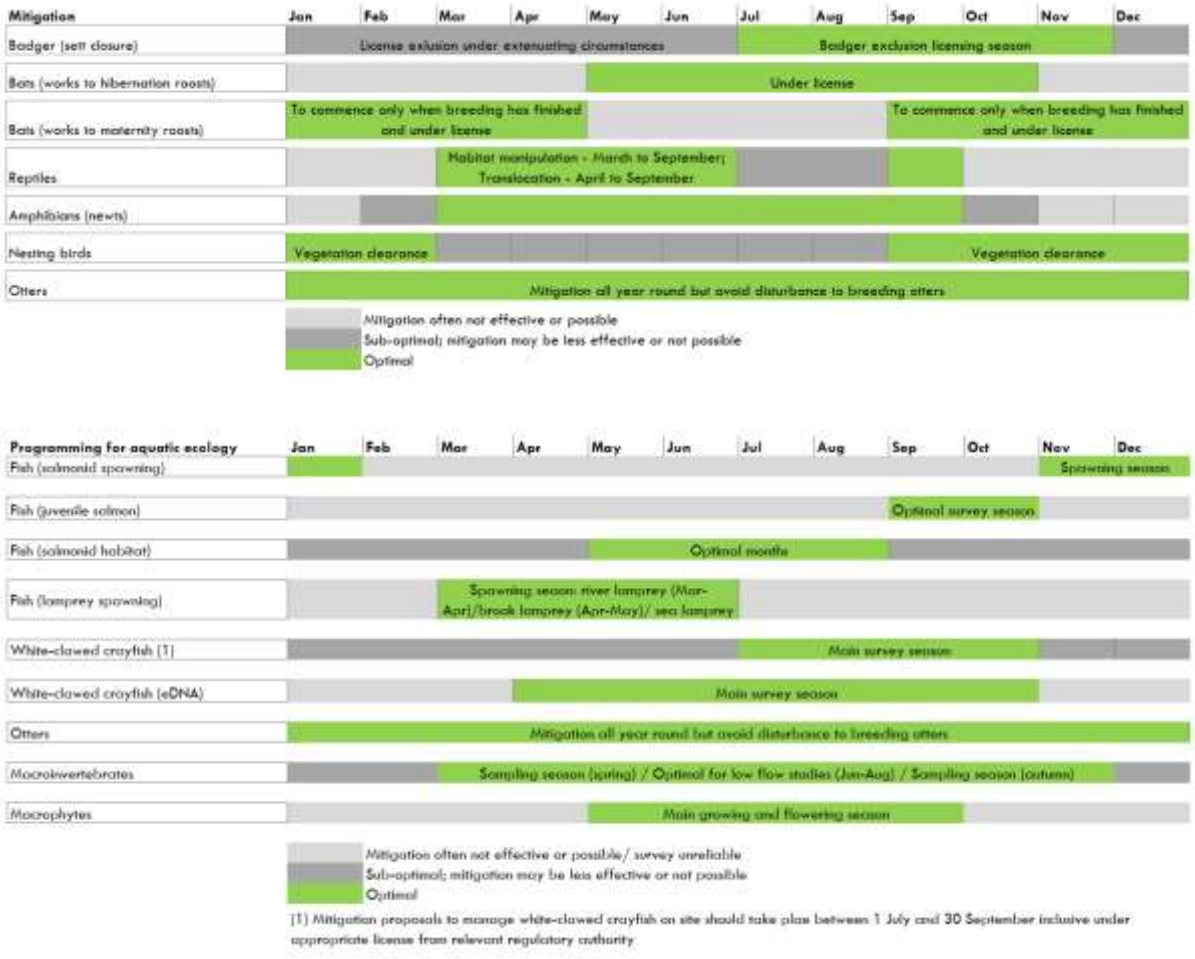

Figure 4.1 Ecological calendar for implementation of mitigation measures and action plan

5.1 Ecological Clerk of Works

A suitable qualified Ecological Clerk of Works (ECoW) shall be appointed for part time attendance for the full duration of the works and will supervise all aspects of the construction of the Greenway.

The ECoW will hold a minimum University degree in Environmental Science, (NFQ Level 8); Minimum of 5 years' post-graduate experience in ecological assessment, appraisal techniques and mitigation monitoring.

- The ECoW will be responsible for biodiversity monitoring elements and providing on-site toolbox talks. The conduction of regular site visits during construction by the ECoW, must occur to access qualifying interests and protected species.
- The ECoW shall be onsite part time until all works have finished, and all machinery has been demobilised and has left the site. All staff will be trained by the ECoW in the identification of qualifying interests and protected species within the SAC.
- All staff will be inducted by the ECoW through a toolbox talk in the identification of invasive species and noxious weeds and the associated biosecurity measures required when working on site.
- The ECoW will be responsible for monitoring water quality throughout the works duration. Alarmed sondes will be employed to measure turbidity in the main channel upstream and downstream of the works area during the construction phases.
- The ECoW will maintain a monitoring log and provide frequent reports to the project team and relevant statutory authorities. They will record, report and follow up on all ecological breaches, if they occur.

5.2 Invasive Species

The desktop study and site visits have identified significant amounts of invasive species within the Greenway clearance area, including stands of Himalayan balsam and Giant hogweed. Invasive species have the potential to spread to other locations via machinery used on site or via the river itself if plant material is disturbed.

An Invasive Species Management Plan (ISMP) has been established for the site and the following biosecurity measures will be put in place to ensure no spread of invasive species:

- A pre-construction survey for invasive species will be conducted at the earliest stage possible to update and inform on the status of invasive plant species in or near the works area. Particular attention should be given to identifying those invasive species identified on the Third Schedule of the Birds and Natural Habitats Regulations 2011 (as amended). This survey should be undertaken during the appropriate botanical season (April to September).
- Control measures such as the application of glyphosate to Japanese knotweed will be timed for early growth stages in April and May, with follow-up treatments in late summer. Himalayan balsam will be hand-pulled before mid-June to prevent seed set. Monitoring of treated areas will be carried out throughout the growing season and for at least three years post-treatment to assess efficacy and inform adaptive management. All works will be overseen by the Ecological Clerk of Works to ensure adherence to best practice and legal obligations.

- Biosecurity zones must be established on-site prior to site works commencing and will specify the area of the zones, the required actions that must be taken in each zone and who must carry out the actions. All staff will be educated on the health and safety and biosecurity measures that should be followed around each species.
- All machinery and construction related vehicles arriving and leaving the site will be checked and monitored for the presence of plant material e.g. leaves roots and rhizomes from non-native invasive species.
- Non-native invasive species will be managed or avoided where they occur throughout the works area, in line with the NRA Guidelines on the Management of Noxious Weeds and Non-Native Invasive Plant Species on National Road Schemes (NRA, 2010), and any other best practice guidance which may be available in the interim.
- Any Himalayan balsam identified during the site survey will be hand-pulled prior to the commencement of the works. Hand pulling must only take place before the plant goes to seed around mid-June depending on the growing season.
- Any Giant hogweed identified during the site survey will be sprayed or injected with Glyphosate when actively growing, usually in April and May when the plants have grown to about 50cm in height with full leaves, potentially killing the plant with one application.
- Contaminated material will be stockpiled off site. The area will be clearly marked, lined with a root barrier membrane and be of sufficient size to hold all the material to be excavated.
- Regular investigative monitoring surveys on the effectiveness of invasive species treatment measures must be conducted.
- Seeds may survive in the excavated material for up to 18 months. A two-year monitoring programme of control, which will extend beyond the works period will be required.

5.3 Landscaping

All personnel involved with the project shall be informed of the requirement for protection of designated habitats including the aquatic environment, i.e. Lower River Shannon SAC, and best practice methodologies to be employed via toolbox talks or formal presentation from the ECoW.

- Tree roots will be protected by using non-invasive construction methods such as; avoidance of digging into the existing gravel track so as not to encounter tree roots and installing Cellweb®TRP (or equivalent) tree root protection directly onto the existing gravel path and build-up of subsequent layers on it. The system allows continued water permeation and gas exchange. It is also extremely effective at spreading point loads and reducing the load that is applied to the soils beneath. This in turn minimises soil compaction, maintaining an open soil structure which allows continued gas exchange, water permeation and migration.
- Where dense tree coverage exists along the Greenway, service ducts for the public lighting will be installed by moling or non-dig techniques which allows for trench-less installations of services without having to excavate trenches and protecting tree roots from damage.
- Excavated material shall not be stored beyond the working day, however in the event that this is not practical, appropriate precautions in relation to the material will be taken. These precautions will include appropriate storage and covering.

- The access location to the proposed works shall be clearly marked out prior to the commencement of works. No works will be permitted outside of this works area.
- Appropriate fencing shall be installed and maintained for the duration of the works to prevent the public from entering the works site.
- Clearance of vegetation shall be undertaken as early as possible prior to the commencement of works and maintained until work commences to prevent bird nesting. In the event that vegetation clearance is not possible before the commencement of works, upon agreement by the NPWS, a check to confirm the absence of nesting birds should be carried out by a suitably experienced ecologist no more than 48 hours prior to works.
- Tree removal will be avoided where possible, however, if it must take place, tree removal will be confined to mainly younger trees and trees of less value, Category A and B trees will be avoided. A qualified Arborist is to be on site to assist in the setting out of certain parts of the path where the proposed route is close to existing trees to avoid as many trees as possible.
- There are 61 No. trees proposed for removal and there are 305 No. new native Irish trees to be planted. New trees will be selected from 26 No. native Irish trees listed on the Preliminary Design (Landscaping Visuals) drawings including but not exclusively Native Oak (Q. *robur)*, Birch (*B. pubescens)*, Willow (*salix sp)*, and Alder (*Alnus)*.
- The 305 No. new native Irish trees should be planted in the optimal planting season (November to April). Planting tree species should be avoided during the dormant season (late October to mid-March), planting during the dormant season allows for the establishment of tree roots before optimal conditions.
- Works shall only be carried out in dry, low flow conditions. Met Eireann five-day forecasts will be monitored on a daily basis prior to works commencing and no gravel removal will be carried out during prolonged wet weather.
- The Preliminary Design (Landscaping Visuals) drawings are included in Appendix II with details on the proposed biodiversity and landscape enhancement measures.
- The monitoring of survival and establishment/successful rates of the proposed 305 No. new native Irish trees must be conducted during the first two years of seeding.
- The ongoing monitoring of invasive species colonisation, maintenance scheduling and habitat structure must be conducted regularly.

5.4 Fauna

5.4.1 Disturbance/ Avoidance

No badger activity was established within the study area, however, the activity status of this species could change in the intervening period between the site surveys and the commencement of construction of the scheme.

The habitat is unlikely to support badgers but the Precautionary Approach will be implemented along with Best Practice to avoid badgers entering the site or spoil heaps. An additional badger survey should be undertaken prior to construction works commencing to identify any potential badger activity.

As no bat roosts were identified within the study area no specific mitigation in relation to roost loss is recommended. General protective measures are outlined as follows:

- Where possible, treelines and hedgerows shall be retained. Any trees requiring removal to facilitate construction works must be subject to a visual inspection to identify potential for bat roosts. The removal of liner features can result in the disconnection of commuting corridors such as hedgerows and treelines.
- Where possible, these linear features should be reconnected using native hedgerow or tree species to compensate for the loss of these features.
- Where possible, conduct monitoring for protected habitats and species using appropriate methodologies.
- Post construction monitoring surveys are to be conducted in order to assess if fauna is traversing through the proposed Greenway.
- Records of any fauna mortality due to the proposed works or infrastructure must be documented. Monitoring of faunal mortality and causes of mortality is necessary.

Breeding birds have been identified as KERs of the proposed works as there were significant populations recorded as likely to be impacted by the proposed works. The proposed works will result in the loss of some habitat for breeding birds in the form of some scrub, vegetation and some individual trees.

- To limit potential impacts of construction on breeding birds, woody vegetation removal, including treelines and any hedgerows, will not be permitted during the breeding bird season (1st of March to the 31st of August inclusive).
- During construction, noise limits, noise control measures, hours of operation and selection of plant items will be considered in relation to disturbance of birds.
- Plant machinery will be turned off when not in use. All plant and equipment for use will comply with BS 5228-1: 2009: Code of Practice for Noise and Vibration Control on Construction and Open Sites Part 1: Noise, as specified in Chapter 9- Air & Climate, Noise & Vibration.

Approximately 3km of the proposed Greenway route will be constructed adjacent to the River Shannon encompassing some of its riverbanks and sections of land that lie within or in close proximity to the Lower River Shannon SAC, this is shown in Figure 5.1. Along these stretches, bank slopes and riparian zones will be retained and protected wherever feasible, to preserve important habitat for otters (*Lutra lutra*), a qualifying interest of the SAC. These riparian areas are essential for breeding, foraging, and sheltering. While some temporary disturbance or loss of riparian vegetation may occur during construction, particularly where works are immediately adjacent to the riverbank, such areas will be allowed to naturally regenerate post-construction. During construction, measures including sediment control, fencing, and buffer zones will be implemented to minimise habitat degradation and avoid direct impacts on otter resting places or foraging areas.

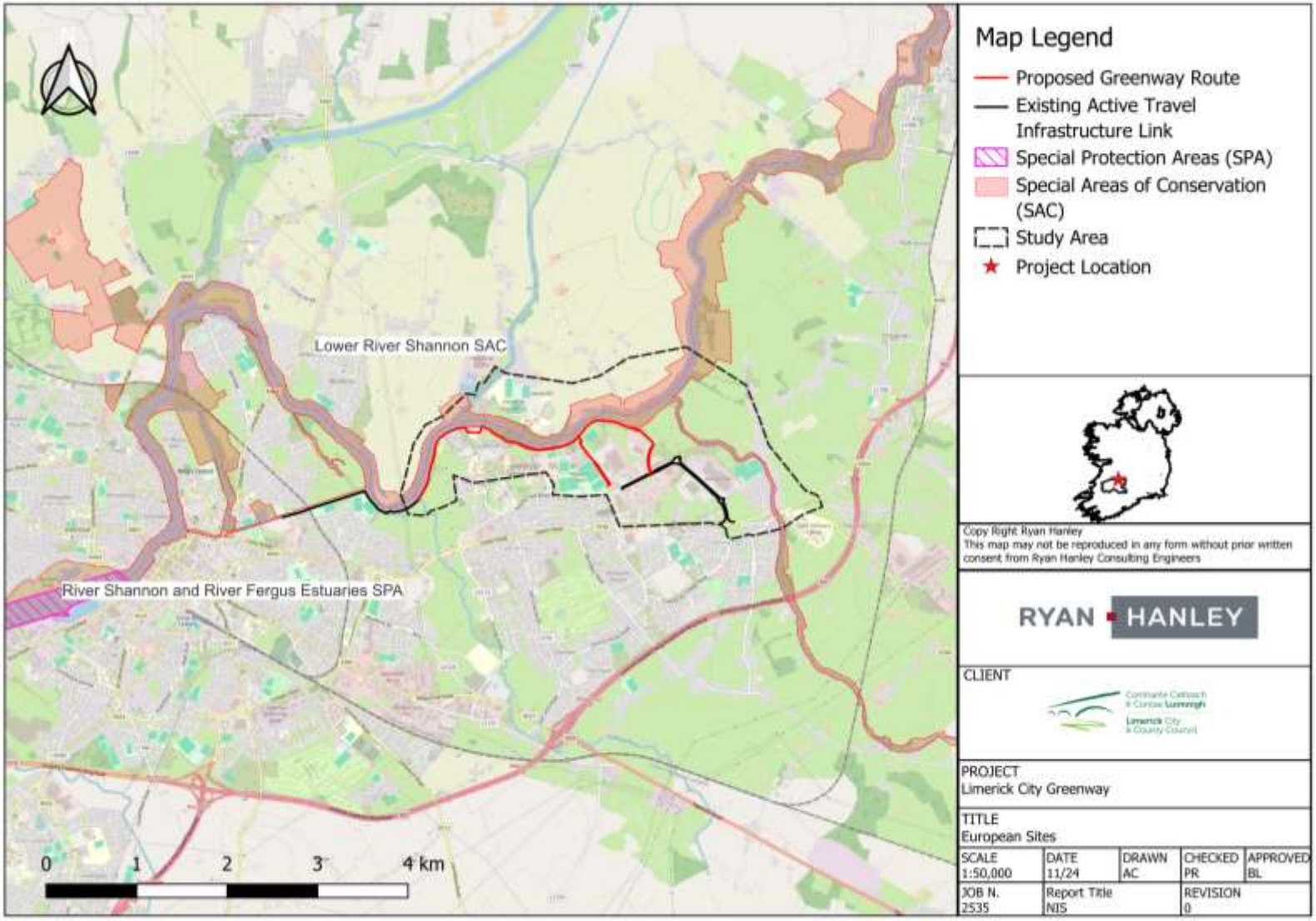

Figure 5.1 European sites within the Zone of Influence of the proposed greenway

5.4.2 Lighting

The Public Lighting design for the proposed project will use best practice guidance notes "Bats and artificial lighting in the UK" as published by the Bat Conservation Trust, in respect of mitigation strategies, to minimise the impact of outdoor lighting upon bat populations. The LCCC Public Lighting standard has also been followed.

There will be new public lighting along the shared path which follows the south bank of the River Shannon for approximately 3km.

Public lighting will be controlled by light sensors so their turn on time will vary during the calendar year, but lights will turn off at 23:00 hours.

Light emitting diodes (LEDs) type lanterns of the cool white type in accordance with the LCCC Public Lighting standard will be installed. They will have a Colour Temperature of 3,000oKelvin, because it is considered least disruptive to the emergence of bats from roosts at dusk, and subsequent movement from habitats to foraging locations.

LED lanterns do not emit any ultraviolet or infra-red radiation, this again being a desirable feature in relation to impact upon bats, in terms of causing spatial exclusion from artificially lit areas.

Light levels have been kept as low as possible (P4 Class) by reference to levels specified in "Design of road lighting' - BS EN 5489-1: 2020, and these will be in accordance with the LCCC Public Lighting standard.

Lanterns are mounted at 0o degree tilt and are fully cut off type with no light output above the horizontal plane.

At 5m mounting height ~35m distance spacings between lighting columns is achieved and this enables the works to avoid siting columns near mature trees favoured by bat population. The height of the columns also mitigates against vandalism which can be an issue when placing luminaires in isolated locations.

Cable ducts for the public lighting will be installed by open trench to minimum 300mm cover in areas where no trees are present, and by Moling technique in areas of dense tree coverage. The moling will allow cable ducts to be installed to a minimum depth of 600mm where the cable ducts will pass under tree roots and protect them from damage.

5.4.3 Water Quality

The proposed scheme has been identified as potentially giving rise to adverse effects on watercourses within the study area. The following measures should be adopted during construction works:

- Pre-construction monitoring of water quality, such as pH, turbidity, conductivity, nutrients and hydrocarbons, must be undertaken.
- The regular monitoring of water quality in the surrounding waterbodies must be undertaken during the construction of the proposed works. Monitoring such as sampling should occur upstream and downstream of the proposed works to detect pollution incidents, especially after rainfall events.
- Visual inspections should be performed regularly for signs of sediment runoff or algal blooms.

- No abstraction from any watercourses will be permitted to facilitate the works. Consumables or waste will be removed from all sampling locations and returned to the site compound for disposal.
- Alarm sondes will be triggered when there is a 20% difference between NTU value recorded in the upstream and downstream sondes. There will be no storage of machinery (including drill rigs) fuel, samples, or chemicals (e.g. bentonite, drilling fluid) in areas prone to flooding (all construction compounds will be located in Flood Zone C areas) or within 20m of any drain or watercourse.
- Storage tanks shall have secondary containment provided by means of an above ground bund to capture any oil leakage irrespective of whether it arises from leakage of the tank itself or from associated equipment such as filling and off-take points, sighting gauges, etc., all of which should be located within the bund. Bund specification should conform to the current best practice for oil storage (Enterprise Ireland, BPGCS005).
- Oil booms and oil soakage pads should be maintained on-site to enable a rapid and effective response to any accidental spillage or discharge. Waste oils and hydraulic fluids shall be collected in suitable leak-proof containers and transported from the Site and Off-Site Areas for disposal or recycling.
- Machinery used on Site shall be regularly inspected to ensure there is no leakage from them and to ensure the machinery shall not cause contamination of watercourses. Protection measures shall be put in place by the Contractor to ensure that all hydrocarbons used during the works are appropriately handled, stored and disposed of in accordance with recognised standards as detailed by the Environmental Protection Agency.
- Guidelines for minimising impacts on water quality and fisheries in relation to Construction shall be implemented including, but not limited to, CIRIA C532 "Control of water pollution from construction sites - Guidance for consultants and contractors", Inland Fisheries Ireland guidelines and TII guidelines.

Post-construction monitoring of water quality should be undertaken for at least six months in the vicinity of the proposed works to verify no change in water quality.

6 Conclusion

The site is considered to be of significant ecological importance due to the proximity of the Lower River Shannon SAC. There will be locally significant losses of amenity grassland and wooded habitat and in respect of KERs associated with these and other habitats within the proposed development study area. Environmental management and design measures are proposed, chiefly to limit tree and hedge clearance along the route and to control and limit sediment and potential contaminant runoff, to protect watercourses against water quality and structural effects and to provide mitigation though an equivalent level of hedge and tree species planting and reinstatement along the route.

The potential for effects on European sites downstream of the proposed project was considered. The development of the proposed Limerick City Greenway (UL to NTP) works will not adversely affect the integrity of the European site, either alone or in combination with other plans or projects.

Once mitigation measures which are mentioned above are implemented and followed in regard to the proposed development, the works will not adversely affect biodiversity, KERs nor the European sites.

7 References

Balmer, D.E., Gillings, S., Caffrey, B.J., Swann, R.L., Downie, I.S. and Fuller, R.J. (2013 Bird Atlas 2007-11:
The breeding and wintering birds of Britan and Ireland. BTO Books, Thetford, UK.

British Biological Society (2010) Mosses and Liverworts of Britain and Ireland a field guide. British Biological Society.

Chartered Institute of Ecology and Environmental Management (CIEEM) (2018) Guidance for Ecological Impact Assessment in the UK and Ireland- Terrestrial, Freshwater, Coastal and Marine.

Colhoun, K. and Cummins, S. (2013). Birds of Conservation Concern in Ireland 2014-2019. Irish Birds 9(4):
523-544.

Crowe, O., Coombes, R.H., O'Sullivan, O., Tierney, T.D., Walsh, A.J. & O'Halloran, J. (2014) Countryside Bird Survey Report 1998-2013. Birdwatch Ireland Wicklow.

Edgar, P., Foster, J. and Baker, j. (2010). Reptile Habitat Management Handbook. Amphibian and Reptile
Conservation, Bournemouth.

Environmental Protection Agency (May, 2022): Guidelines on the Information to be Contained in Environmental Impact Assessment Reports. EPA, Wexford.

Environmental Protection Agency (September 2015): Draft – Advice Notes on Current Practice (in the preparation on Environmental Impact Statements). EPA, Wexford.

European Commission (2000) Managing Natura 2000 Sites - The provisions of Article 6 of the 'Habitats' Directive 92/43/EEC. European Commission.

European Union (Birds and Natural Habitats) Regulations 2011 to 2015.

Fossitt JA (2000) A Guide to Habitats in Ireland. The Heritage Council.

Habitats Directive (92/43/EEC)

Kelly, et.al. (2015) Sampling Fish for the Water Framework Directive - Summary Report 2014. Inland Fisheries Ireland, Citywest Business Campus, Dublin 24, Ireland.

Lundy MG, Aughney T, Montgomery WI, Roche N (2011) Landscape conservation for Irish bats & species specific roosting characteristics. Bat Conservation Ireland.

NRA (2006) Guidelines for the Treatment of Badger Prior to the Construction of National Roads Schemes. National Roads Authority.

NRA (2009) Guidelines for Assessment of Ecological Impacts of National Road Schemes (Revision 2). National Roads Authority.

NRA (2009) Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes. National Roads Authority.

Preston et al. (2002) New Atlas of the British and Irish Flora: An Atlas of the Vascular Plants of Britain, Ireland, The Isle of Man and the Channel Islands.

Reid, N., Hayden, B., Lundy, M.G., Pietravalle, S., McDonald, R.A. & Montgomery, W.I. (2013) National Otter Survey of Ireland 2010/12. Irish Wildlife Manuals No. 76. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht, Dublin, Ireland.

SI 356/2015- Flora (Protection) Order, (2015).

SI 477/2011- European Communities (Birds and Natural Habitats) Regulations 2011.

Smith et. al. (2011) Best Practice Guidance for Habitat Survey and Mapping. The Heritage Council.

Stace (2010) New Flora of the British Isles. Cambridge University Press.

Tree Council of Ireland (2025), *How to plant a tree: Bareroot Trees*. Tree Council of Ireland. Available at: How to Plant a Tree | Tree Council

Appendix A Preliminary Design Drawings

Appendix B Landscape Architecture Drawings

Appendix C Structural Design Drawings

Appendix D Site Visuals

Plate D - 1: Amenity grassland (improved) GA2

Plate D - 2: Living Bridge

Plate D - 3: View of the proposed path with WN5 and view of the path with riparian woodland habitat along its edges

Plate D - 4: Exiting path between the Groody River and UL Boat House

Plate D - 5: Amenity grassland (GA2) east of Kilmurry Student Village

Plate D - 6: R445 bridge at Annacotty village crossing the River Mulkear

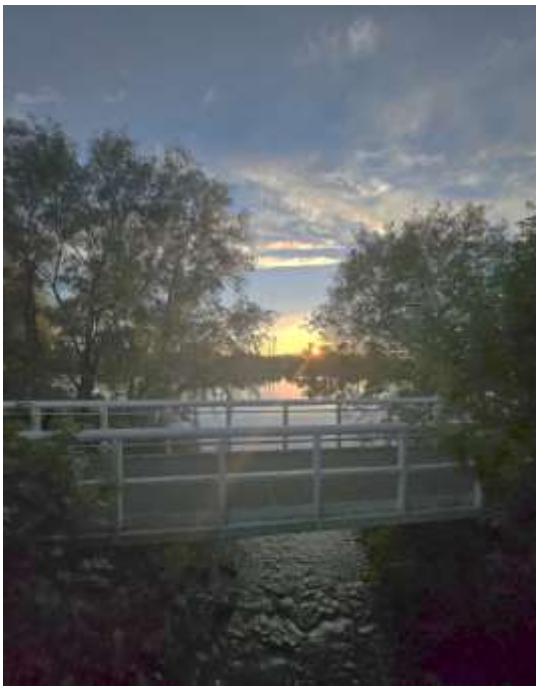

Plate D - 7: Bridge over the Groody River, west end of the proposed greenway

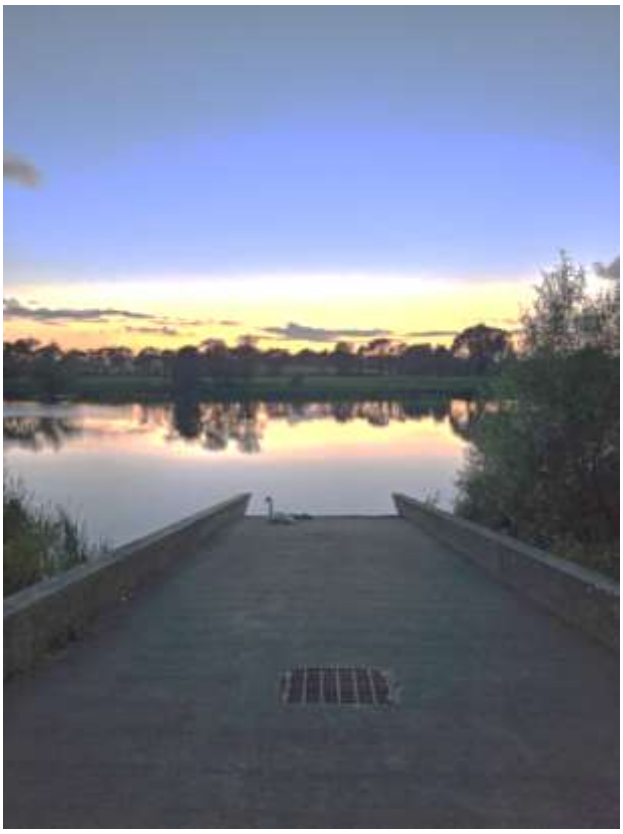

Plate D - 8; UL Pontoon into the River Shannon

Comhairle Cathrach & Contae Luimnigh

Limerick City & County Council

Limerick City Greenway

(UL to NTP)

Construction Environmental Management Plan

JULY 2025

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APPENDIX C STRUCTURAL DESIGN DRAWINGS

Abbreviations

AASR	Appropriate Assessment Screening Report
BPM	Best Means Practicable
CEMP	Construction Environmental Management Plan
CMS	Construction Management System
ECoW	Ecological Clerk of Works
EMS	Environmental Management System
EPA	Environmental Protection Agency
EWC	European Waste Code
IAPS	Invasive Alien Plant Species
ISMP	Invasive Species Management Plan
IRP	Incident Response Plan
KPI	Key Performance Indicator
LCCC	Limerick City and County Council
LoW	List of Waste
MRF	Materials Recovery Facility
NPWS	National Parks and Wildlife Services
NIS	Natura Impact Statement
NTP	Notice to Proceed
NTU	Nephelometric Turbidity Unit
RA	Risk Assessment
SAC	Special Areas of Conservation
SDS	Safety Data Sheet
SPA	Special Protection Areas
TTMP	Temporary Traffic Management Plan
UL	University of Limerick
WEEE	Waste Electrical and Electronic Equipment
WFD	Water Framework Directive
WMP	Waste Management Plan
WSA	Waste Storage Area

Executive Summary

This report has been prepared to support a planning application to An Bord Pleanála made under Section 51(A) of the Roads Act (1993) (As amended). This report has been prepared by Ryan Hanley on behalf of Limerick City & County Council (LCCC).

The proposed Limerick City Greenway (University of Limerick (UL) to National Technology Park (NTP)) will be 4.25km long and will consist of a 3.3km long and 3.0-4.0m wide shared path on existing paths or in green fields, and 0.9km of separated 1.8m wide footpaths and 1.8-2.0m wide cycle lanes alongside the eastern and western sides of University Road and McLaughlan Road. The proposed Greenway will extend between the River Goody bridge and Plassey Park Road.

All elements of this project will be constructed for permanent local and visitor recreational use.

There will be no buildings constructed along the route.

Two concrete bridge decks will be replaced with wider steel decks, but the existing bridge supports will remain. One new steel and concrete bridge will replace a narrow reinforced concrete bridge. One new steel and concrete bridge will provide access to all and replace the function of a narrow reinforced concrete bridge with steps, but the exiting bridge will remain in place. One new steel and concrete bridge will be constructed alongside a narrow stone bridge. A new concrete ramp to Plassey Beach will replace stone steps, and a new concrete retaining wall will enable the existing gravel path at Plassey Beach to be widened to 3.5m.

The proposed Greenway will be constructed in Castletroy, Co. Limerick. It will extend eastwards from the existing Limerick Smarter Travel Cycle Route 2 to run along the southern bank of the River Shannon and provide a new connection between the existing Shannon Fields Greenway to UL path at Groody Bridge, and existing cycle lanes and footpaths on Plassey Park Road. It will also provide new connections to the IDA's National Technology Park (NTP) at Plassey, and the University of Limerick. This proposed Greenway east of Limerick city will extend existing cycle routes from the city further east and provide future links to Castleconnell and to Co. Clare.

The proposed Limerick City Greenway (UL to NTP) is included in Section 9.1.7 Greenway Cycle Network in the Limerick Shannon Metropolitan Area Transport Study (LSMATS) and is described as an '*Extension of the Shannon Fields Greenway to UL along the banks of River Shannon to the NTP and Annacotty*'. The Limerick Development Plan 2022-2028 (LDP) includes policies to deliver modal split (Objective TR 06), to promote '*walking, cycling or other non-motorised wheel-based transport modes for purposeful travel*' (Section 7.5.2), to encourage behavioural change (Objective TR 07), to provide walking and cycling infrastructure (Objective TR O8), and to promote sustainable patterns of transport use (Objective TR P4). This project will provide an accessible cycling and walking route for users of all abilities in accordance with the objectives in the LDP and LSMATS.

The project is not a class of development for which mandatory Environmental Impact Assessment (EIA) is required as specified in either Part 1 of Schedule 5 of the Planning and Development Regulations, 2001 (as amended) or in Part 2 of Schedule 5 of the Planning and Development Regulations, 2001 (as amended). The Formal EIA screening process was completed having regard to the Roads Act as amended by the EIA Directive 2014/52/EU. An EIA report has been prepared for this project. An AA Screening Report was prepared for this project. It concluded that a Natura Impact Statement (NIS) was required so an NIS has been prepared for this project.

The proposed Greenway will provide strategic, sustainable, and safe connectivity between Limerick city the University of Limerick, the National Technology Park, and connect community facilities, tourist

attractions, and transport nodes (i.e., bus stations). This connectivity will benefit communities, businesses, and visitors.

The proposed works for the construction of the Limerick City Greenway (UL to NTP) will be on land for which specific planning objectives are in place. All applicable planning objectives have been examined and any risks to the meeting of same have been mitigated. As a result, the development of the proposed Greenway will not significantly impede development potential or zoning objectives of the land. The proposed development is consistent with planning policy at National, Regional and Local level and is in accordance with proper planning and sustainable development.

1. Introduction

1.1 General

The Construction Environmental Management Plan (CEMP) has been prepared by Ryan Hanley on behalf of Limerick City and County Council (LCCC) for the proposed Limerick City Greenway (UL to NTP) project in Co. Limerick.

This CEMP defines the project specific environmental mitigation measures, which are detailed in the Environmental Impact Assessment Report (EIAR) and Natura Impact Statement (NIS) as well as other documents that are to be put in place and procedures to be followed for the scope of construction works, both permanent and temporary, for the Limerick City Greenway (UL to NTP).

The CEMP is considered a '*live*' document and prior to commencing construction on site, the appointed Construction Management Team will prepare a detailed CEMP. The detailed CEMP will be based on the contents of this CEMP and will define environmental measures and procedures to manage construction works regarding risk to the environment in more detail.

The CEMP is an integral part of the site health, safety, environmental and quality management system and constitutes a component of the Construction Health and Safety Plan documentation. The CEMP is also subject to the requirements of the project quality management system with respect to documentation control, records control, and other relevant measures.

1.2 Site Location

The proposed Limerick City Greenway (UL to NTP) will be 4.25km long and will consist of a 3.3km long and 3.0-4.0m wide shared path on existing paths or in green fields (refer to the orange and green lines on Figure 1 1), and 0.9km of separated 1.8m wide footpaths and 1.8-2.0m wide cycle lanes alongside the eastern and western sides of University Road and McLaughlan Road (refer to the blue lines on Figure 1-1). The proposed Greenway will extend between the River Goody bridge and Plassey Park Road.

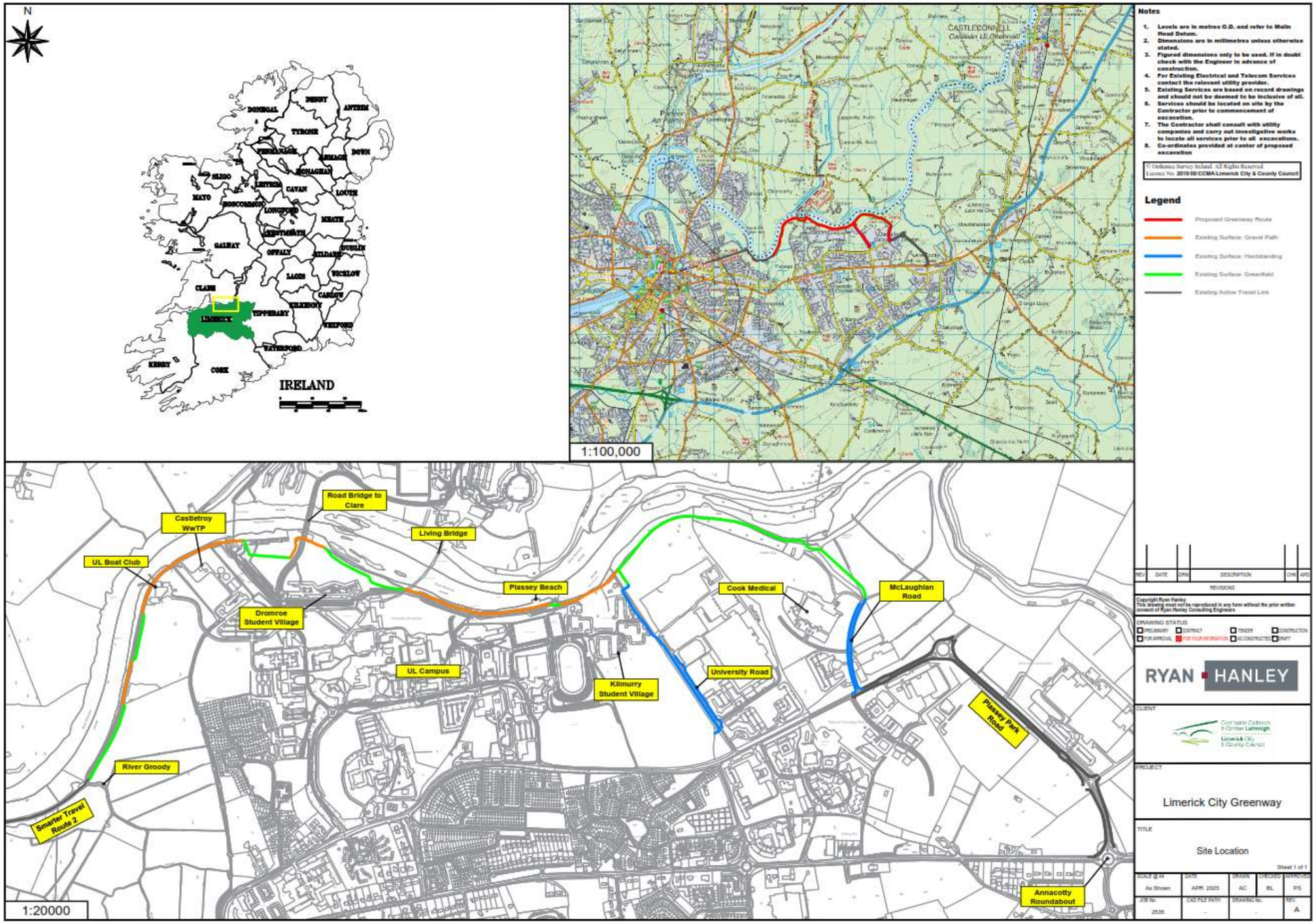

Figure 1-1: Location Map

1.3 Purpose of this Document

The purpose of this document is to communicate applicable environmental guidance and instruction to all contractors, sub-contractors, and employees in order to address and prevent potential environmental effects that may arise while carrying out any construction activity for the proposed works.

This CEMP is to be read in conjunction with the EIAR and NIS. This CEMP will assist the appointed contractor in the development of the detailed CEMP as well as a suite of Construction Phase Management Plans including waste, surface water and traffic. The objectives of the detailed CEMP developed by the contractor appointed by LCCC to construct the works, prior to commencement of construction activities and will also include any planning conditions imposed by LCCC.

The detailed CEMP will be overseen by personnel such as the Site Manager and Environmental Manager, as outlined in Section 5.1 of this report.

1.4 Description of Ecological Site Surveys Undertaken

Site survey visits were made by the Ryan Hanley team and contracted Ecologists between 2020 and 2024 with a focus on the variety of habitats, mammals, bats, birds, and freshwater aquatic ecology occurring within the environs of the proposed scheme. The ecology of the area surrounding the proposed development was first assessed in terms of habitats, flora, fauna and invasive species.

The area over which the proposed development has the potential to result in effects to the Zone of Influence was determined by on-site observation and scientific analysis. The surveys undertaken for the Limerick City Greenway (UL to NTP) Project included:

Survey Type	Dates
Preliminary Multi-Disciplinary walkover survey	Nov 2020 and April 2022
Ecology habitat survey	May 2021 and April 2022
Aquatic Ecology Appraisal	Oct 2023
Water Framework Directive (WFD) Assessment – RHAT survey	July 2024
Badger Surveys	May 2021 and July 2024
Bat Surveys	July 21, Sept 2021, June & July 2024
Breeding Bird Survey	June 2021, April and June 2022, and May and June 2023
Winter bird Surveys	Nov 2021 to March 2022 and October 2023 to March 2024
Invasive Alien Plant Species Surveys	Nov 2020 and May 2021 – June and July 2024
Otter Surveys	May 2021 and July 2024
Tree Surveys and arboriculture impact assessment	May and June 2021 and Feb 2024

All surveys were undertaken by professional ecologists with the professional experience and necessary qualifications required to carry them out. Habitats recorded within the study area of the greenway are illustrated in Figure 1-3.

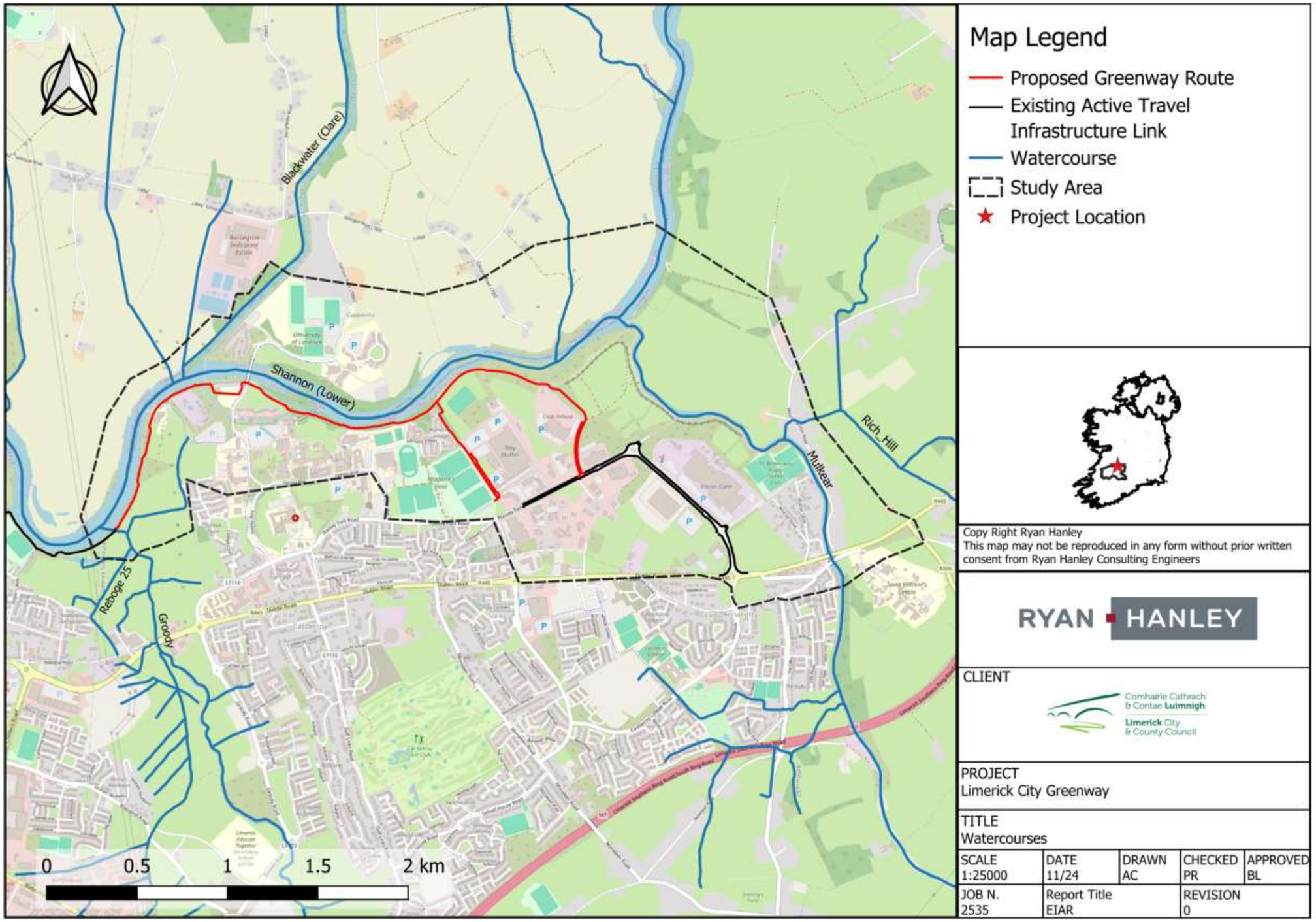

Figure 1-2: Study Area

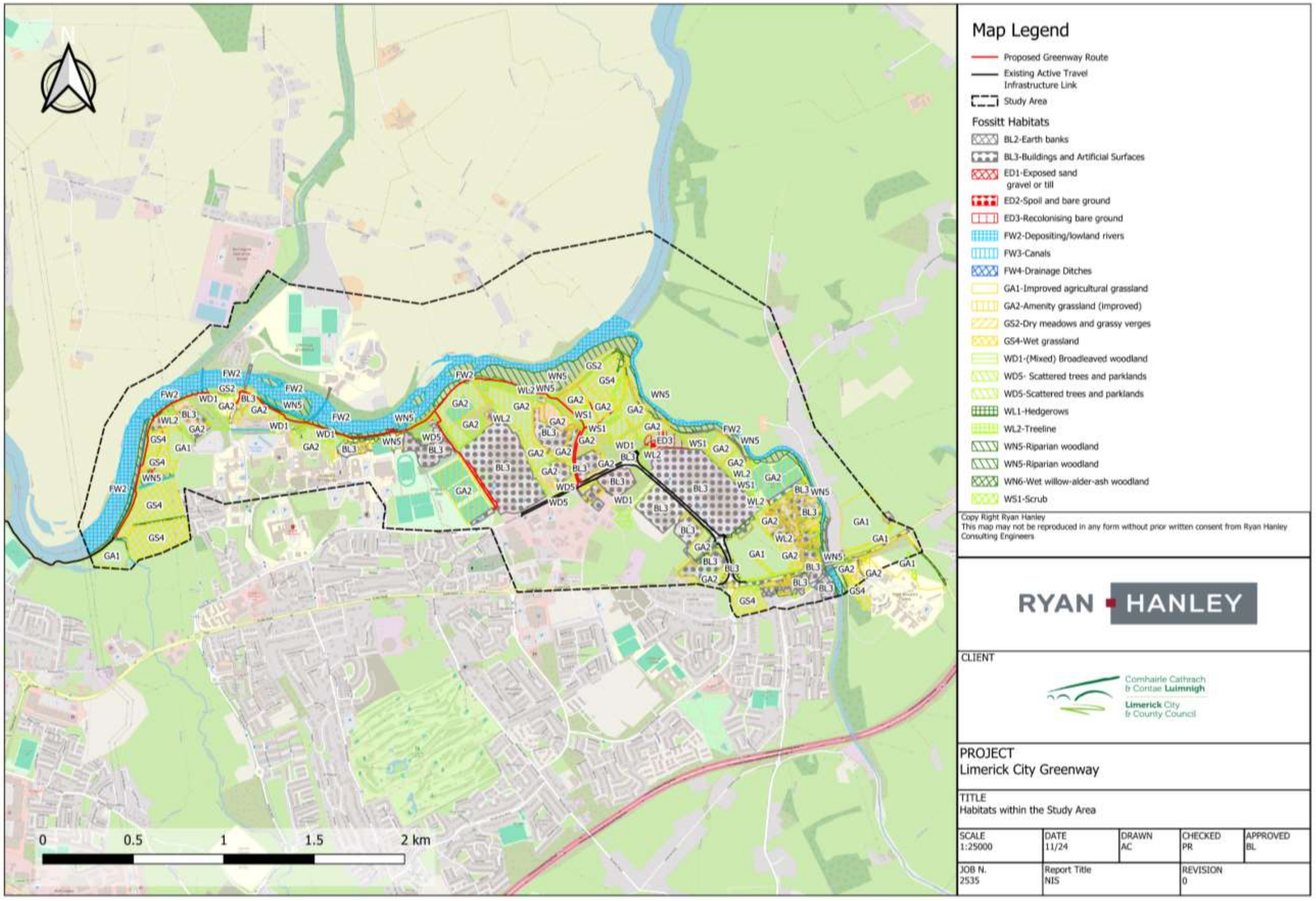

Figure 1-3: Fossitt Habitats Recorded within the Study Area

2. Targets and Objectives

Proposed construction phase works will be designed and carried out to approved standards, which will include specified materials, standards, specifications, and environmental codes of practice.

2.1 Key Site Targets

The key site targets are as follows:

- Ensure construction works and activities are completed in accordance with mitigation and approaches presented in this CEMP, EIAR, NIS and associated documentation;
- Ensure construction works and activities are completed in accordance with all documents prepared as part of the assessment of the proposed development;
- Ensure construction works and activities have minimal impact/disturbance to the local landowners, academic facilities, accommodation and the local community;
- Ensure construction works and activities have minimal impact on the natural environment;
- Adopt a sustainable approach to construction; and
- Provide adequate environmental training and awareness for all project personnel.

2.2 Key Site Objectives

The key site objectives from an environmental perspective are as follows:

- Using recycled materials, if possible, e.g., timber, excavated stone and overburden material;
- Ensure sustainable sources for materials supply where possible;
- Avoidance of any pollution incident or near miss as a result of working around or close to existing watercourses and having emergency measures in place;
- Keeping all watercourses free from obstruction and debris;
- Keep impact of construction to a minimum on the local environments, watercourses, and wildlife;
- Correct fuel storage and refuelling procedures to be followed;
- Good waste management and housekeeping to be implemented;
- Air, dust, and noise pollution prevention to be implemented;
- Implementation of monitoring of the works and any adverse effects that it may have on the environment. Construction methods and designs will be altered where it is found there is an adverse effect on the environment;
- Follow the principles of Waste Hierarchy to minimise waste and disposal to landfill;
- Comply with all relevant water quality legislation listed throughout this document; and
- Ensure a properly designed, constructed, and maintained drainage system appropriate to the requirements of the site is always kept in place.

2.3 Construction Phase Live Document

As outlined in the Introduction above, the CEMP is to be considered a '*live*' document and as such will be reviewed on a regular basis. Updates to the CEMP may be necessary due to any changes in environmental management practices, design, and/or contractors. As detailed in more detail in the later sections, the procedures agreed in this CEMP and developed further in the detailed CEMP will be audited by the environmental manager regularly throughout the construction phase to ensure compliance.

Triggers for amendments to the CEMP will include:

- When there is a perceived need to improve performance in an area of environmental impact;
- As a result of changes in environmental legislation applicable and relevant to the project;

- Where landowner accommodation works are agreed which necessitate a change;
- As a result of changes to the project design;
- Where the outcomes from auditing establish a need for change;
- Outcomes of third-party consultations;
- Where work method statements identify changes to a construction methodology to address high environmental risk; and
- As a result of an incident or complaint occurring that necessitates an amendment.

The contractor will ensure that the CEMP remains up to date for the duration of the construction period.

2.4 Conditions on planning as specified by An Bord Pleanála

This section will be populated with any and all additional requirements under conditions imposed by An Board Pleanála (ABP) should the Board decide to grant development consent for the Limerick City Greenway (UL to NTP) project.

3. Description of the Proposed Development

3.1 Existing gravel path, green field, and roads

The proposed Limerick City Greenway (UL to NTP) will be constructed alongside the southern bank of the River Shannon between the River Groody bridge and east of Cook Medical in the IDA park. There will be links perpendicular to the river between Kilmurray Student Village and University Road, and between Cook Medical/McLaughlan Road and Plassey Park Road.

Refer to the Preliminary Design drawings in Appendix A for Chainages.

CH000 – CH300

The proposed route commences west from the existing River Groody bridge (Figure 3-1) at the confluence of the River Groody with the River Shannon.

Figure 3-1: Existing Bridge at River Groody

The proposed Greenway route will divert from and run adjacent to an existing narrow walking track along the southern bank of the River Shannon. The existing narrow path has a wooden fence along its sides and there have been complaints to LCCC from the public regarding the width of the path, especially in relation to the speed of cyclists and scooter users. For this reason a new 3.5m wide path is proposed to be constructed between CH0-300.

Figure 3-2: Start of proposed greenway in green field with existing path alongside

CH300-CH430

The proposed greenway will cross the land drain and rejoin the existing path which will be resurfaced but the existing path will remain the same. The path will avoid a small forest of trees that were planted to compensate for habitat loss when the Living Bridge that connects the UL Campus that is located in Co. Limerick and in Co. Clare was constructed. The path will cross the existing bridge at CH400.

Figure 3-3: Existing bridge at CH400

CH430-CH615

The proposed greenway will divert away from the existing path and run through a green field. It will cross a land drain.

CH615-CH795

The proposed greenway will rejoin the existing path and run in front of the UL Boat Club building, and the UL slipway. The existing ESB covered will be raised to match the level of the proposed greenway (approx. 150mm higher than existing).

Figure 3-4: Existing path to be resurfaced

The proposed greenway will continue along the existing paved path until the surface changes from paved to gravel surface. It will connect to an existing shared surface leading to the UL campus.

Figure 3-5: Paved path connects to shared path leading to UL

Figure 3-6: Existing Project information sign for Limerick Smarter Travel Cycle Route 2

Figure 3-7: Existing direction sign outside the UL Boat Club and slipway in background

There is existing public lighting along the existing path between the River Groody bridge and the UL Boat House. Refer to the black column and lantern in Figure 3-8.

Figure 3-8: Examples of existing Public Lighting Column and Lantern along Limerick Smarter Travel Cycle Route 2

East of the paved path towards the UL campus, the existing path surface changes from tarmac to gravel.

Figure 3-9: Path surface changes from paved to gravel and narrows to approximately 1.5m width

CH795

The path will cross a bridge over a land drain (Named as Bridge 1 for the purposes of this project). There is a stone parapet on the River Shannon side of the bridge and a metal railing on the opposite side. There are wooden fences leading to the bridge on the eastern and western approaches.

Figure 3-10: Existing Bridge No 1

Figure 3-11: Existing bridge over land drain (Bridge 1)

Figure 3-12: Existing abutment wall (proposed to be decommissioned)

CH795-CH950

The proposed greenway will continue eastwards and pass along the existing gravel path north of the Castletroy wastewater treatment plant. There is a northern access into the plant with an existing route over a culverted land drain that will be included in the proposed greenway path.

Figure 3-13: View south to the northern access gate of Castletroy Wastewater Treatment Plant

Figure 3-14: View facing east outside the Castletroy wastewater treatment plant

There are existing concrete railings alongside the narrow gravel path. The proposed path will avoid two trees with a potential for a bat roost at CH850. No bat roosts have been identified in these trees, but the trees will remain.

CH950-CH980

The existing path continues to an existing narrow stone bridge (named as Bridge 2 in this project). The surface changes from gravel to paved.

There are existing stone abutments and a high stone wall at Bridge 2.

Figure 3-15: Existing path and stone bridge along Shannon River leading to Bridge 2

Figure 3-16: View of Bridge 2 from the exiting paved path

The existing stone parapet that is missing in Figure 3-17 has been reset into position by LCCC since the photo was taken.

Figure 3-17: View of Bridge 2 from bank of drain

Figure 3-18: View under Bridge 2 facing north to the River Shannon

Figure 3-19: : Existing railing between Bridge 2 and Bridge 3

CH1000

The existing path continues to a temporary steel truss bridge that has replaced a concrete deck over an existing stone bridge (named as Bridge 3 in this project). This bridge crosses the Plassey Mill Race where it flows into the River Shannon.

Figure 3-20: Existing temporary bridge across the Plassey mill race where it rejoins the River Shannon

Figure 3-21: Shallow water level in Plassey Mill Race and existing abutments of Bridge 3

CH1000-1040

The existing path continues past a rest area north of Plassey Mills (Figure 3-22).

Figure 3-22: Existing bench in front of Plassey Mill

The existing bridge between Co. Limerick and Co. Clare is to the north of this area (Figure 3-23). This bridge is known locally as the 'Black bridge'.

Figure 3-23: Black bridge

Figure 3-24: Blocked access to the Black bridge that links County Limerick and County Clare

There is an existing kissing gate on the path east of the rest area in front of Plassey Mills.

Figure 3-25: Existing gate on path at Plassey Mills (1 of 2)

Figure 3-26: Existing gate on path at Plassey Mills (2 of 2

CH1040

The existing path continues eastwards towards an existing bridge (named as Bridge 4 in this project) across the decommissioned overspill for the Plassey Mill Race.

Figure 3-27: Existing bridge (Bridge 4) over the decommissioned and dry Plassey Mill race overspill

Figure 3-28: Dry bed of overspill from Plassey Mill Race

CH1040-CH1330

The existing path continues north of the existing Fisherman cottages, but the proposed path will turn south-east and run behind the Fisherman Cottages as requested by the residents. This area is characterised by uneven poorly drained ground with thick undergrowth. The residents in the cottages have reported regular flooding in their properties so this project will construct a new flood defence system for the residents.

Figure 3-29: Thick vegetation with immature trees with Plassey Mills in the background

Figure 3-30: Heavy undergrowth to rear/south of Fisherman Cottages

Figure 3-31: Trees to south/rear of Fisherman Cottages (cottage partially visible)

Figure 3-32: Existing Bee Hives east of the Fisherman Cottages

Figure 3-33: Existing kissing gate at the Garrisson Wall to be retained on the gravel path that runs in front of the Fisherman cottages

There is an existing gravel path to the east of the Fisherman Cottages that connects to existing shared paths in the UL Campus.

Figure 3-34: Existing gravel path east of Fisherman Cottages

CH1330-CH1340

The proposed path will rejoin the existing path and will pass under an existing bridge between Co. Limerick and Co. Clare.

Figure 3-35:: Existing road bridge between the UL campus in Co. Limerick and Co. Clare

Figure 3-36: View of existing gravel path under road bridge that links UL campus between Co. Limerick and Co. Clare

CH1340-CH1410

East of the road bridge the existing path continues eastwards along the southern bank of the River Shannon and towards the existing Dromroe Student village in the UL Campus. The existing path runs through a designated Annex 1 habitat Alluvial woodland forest. UL Facilities has planted Oak trees between Dromroe Student village and the existing path at this location.

Figure 3-37: Existing gravel path along southern bank of the River Shannon

Figure 3-38: Extent of Annex 1 Alluvial Forest interactions with existing path and proposed Greenway route

CH1410-1730

To avoid the existing avenue of beech trees in the Annex 1 Alluvial Woodland forest alongside the riverside path, the proposed greenway route will divert to the south of the beech trees and north of the Oak trees towards a newly planted stand of birch trees. The existing gravel path will remain unaltered.

Figure 3-39: Existing Beach and newly planted Oak trees between the River Shannon and Dromroe Student village

Figure 3-40: Existing gravel path alongside river through an avenue of mature trees in the Annex 1 Alluvial forest

A 6.5m wide strip of immature Birch trees will be removed to provide space for the proposed greenway.

Figure 3-41: Existing immature trees to be removed

The existing path continues under the Living Bridge.

Figure 3-42: Living Bridge in UL campus

Figure 3-43: Existing gravel path under the Living Bridge

CH1730-CH1965

The existing earthen path enters an existing Annex 1 Alluvial woodland and continues eastwards on a raised earth path north of the Plassey Mill Race and approximately 10-20m to the south of the River Shannon.

Figure 3-44: Existing raised earthen path in the Annex 1 habitat Alluvial residual forest

CH1965-CH2150

An existing footbridge from the UL campus joins the earth path at CH1915.

Figure 3-45: Existing footbridge to University of Limerick and flowering Himalayan Balsam (looking west)

The existing earthen path continues eastward on an elevated earth mound with the Plassey Mill Race to the south and the River Shannon to the north.

Figure 3-46: Existing stone steps from earthen path to Plassey Beach

CH2150-CH2250

The existing earthen path continues alongside Plassey Beach.

Figure 3-47: Unpaved path at Plassey Beach

CH2250

There is an existing reinforced concrete bridge that crosses the start of the existing Plassey Mill race.

Figure 3-48: Existing concrete bridge at mouth of Plassey mill race (to be retained)

Figure 3-49: Existing concrete bridge at mouth of Plassey mill race with Plassey Beach in the background

Figure 3-50: Existing concrete bridge at mouth of Plassey mill race looking northeast

CH2250-CH2500

The existing route passes north of Kilmurray Student Village and reaches a junction.

Figure 3-51: Existing gravel path north of Kilmurray Student Village

The route south provides access to University Road and to Plassey Park Road. The route east provides access to Cook Medical in the IDA's National Technology Park and McLaughlan Road.

Figure 3-52: Existing earthbound path south of the River Shannon

Figure 3-53: Existing path east of Kilmurray Student village approaching the land boundary between UL and the IDA

Figure 3-54: Existing gate and culvert at the land boundary between UL and the IDA

CH2500-CH3180

The path changes from an earthen path to a desire line and continues eastwards running generally 20-50m south of the southern bank of the River Shannon. It crosses under overhead electric wires.

Figure 3-55: Desire line through green field

Figure 3-56: Desire line through green field approaching a small stand of trees

Figure 3-57: Desire line through green field weaving between small stands of trees

Figure 3-58: Proximity of desire line to River Shannon

Figure 3-59: Desire line along proposed Greenway route

CH3180-CH3490

The existing desire line continues along the southern bank of the River Shannon at the boundary between UL registered land and IDA registered land (approx. CH3180), but the proposed Greenway route turns south to McLaughlan Road.

Figure 3-60: Warning signs at the IDA boundary (at Cook Medical)

Figure 3-61: Overhead ESB utilities

Figure 3-62: Existing earth berm with Johnson & Johnson factory in background

Figure 3-63: Example of scrubland between the River Shannon and McLaughlan Road

CH3490-CH3805

There are existing concrete footpaths and grass verges alongside McLaughlan Road between the original entrance road into Cook Medical and Plassey Park Road. There is street lighting and other utilities including drainage, telecommunications, and underground electricity cables in this private road.

Figure 3-64: McLaughlan Road in the IDA park

Figure 3-65: McLaughlan Road in the IDA park with street lighting and junctions to other roads/entrances

Figure 3-66: McLaughlan Road where it joins Plassey Park Road (in background)

There is an existing zebra crossing on Plassey Park Road to the north-east of the junction between Plassey Park Road and McLaughlan Road.

Figure 3-67: Existing Zebra crossing on Plassey Park Road

CH000_C-CH300_C

There is a junction in the existing path east of Kilmurray Student Village and the southern route follows a desire line to an existing bridge east of the UL Agricultural Laboratory. The bridge crosses an existing drainage channel at the north of University Road.

Figure 3-68: Existing desire line connecting the riverside path to an existing bridge to the UL Agricultural Laboratory

There is a secure car parking area immediately south of the laboratory.

Figure 3-69: Secure car parking area immediately south of the laboratory

The entrance road to the UL Agricultural Laboratory runs west of the large drainage channel (bounded by an anti-climb fence) and there are rubbish bins and a car parking area between Kilmurray Student Village and the anti-climb fence. There is an entrance road and gate into Kilmurray Student Village that is generally locked. The gate opens onto University Road.

Figure 3-70: Existing gate access from Kilmurray Student Village to University Road

CH300_C-CH677_C

There are no footpaths along University Road but there are large parking bays and public lighting along the western side of the road. There are commercial/industrial buildings along the eastern side.

Figure 3-71: University Road (looking south)

Figure 3-72: Entrance to industrial buildings off University Road

The proposed Greenway will join into newly constructed Active Travel infrastructure at the southern part of University Road where it joins Plassey Park Road.

Figure 3-73: Junction of University Road and Plassey Park Road

3.2 Proposed Greenway and Bridges

CH000 to CH795: Groody Bridge to Proposed Bridge 1

The proposed Greenway will divert to the southeast of the existing tarmac path because the existing path narrows to 2.2m width (between the existing wooden fences) and LCCC has received complaints from members of the public about near passes from cyclists and scooters. It is intended that walkers would continue to use the existing path and cyclists and other users travelling at speeds in excess of walking pace would utilise the proposed Greenway.

Figure 3-74: Proposed Greenway and existing path, and proposed rest area at CH 000

A new rest area with new benches will be provided (refer to Figure 3-95 for an example of the proposed bench). Proposed wooden bollards will redirect cyclists off the existing path and towards the proposed Greenway.

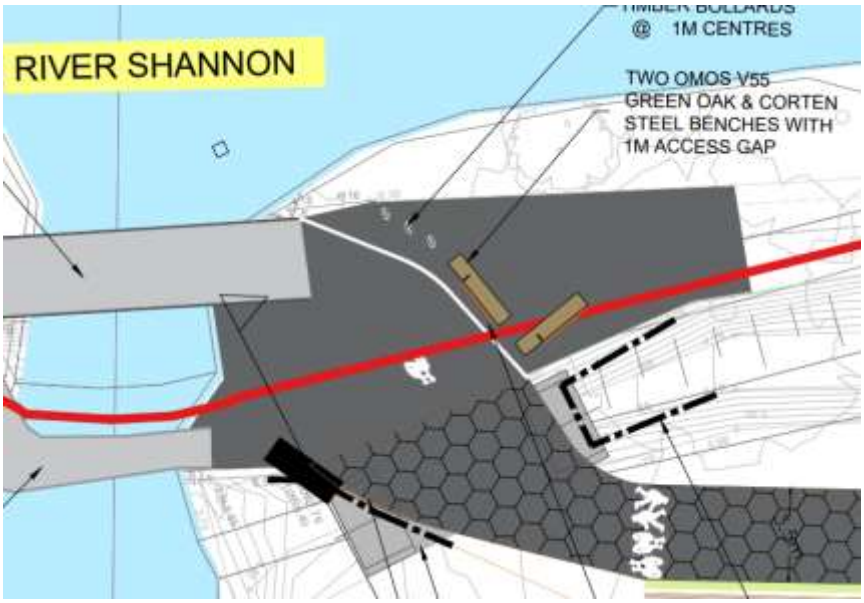

Figure 3-75: Proposed rest area at Groody Bridge

Figure 3-76: Example of wooden bollard that would be installed along the proposed Greenway

In the green field the proposed Greenway will run parallel to a land drain which runs parallel to the River Shannon. A proposed shallow land drain will run along the south side of the Greenway and drainage culverts will enable surface water to drain to the River Shannon. New public lighting will be provided.

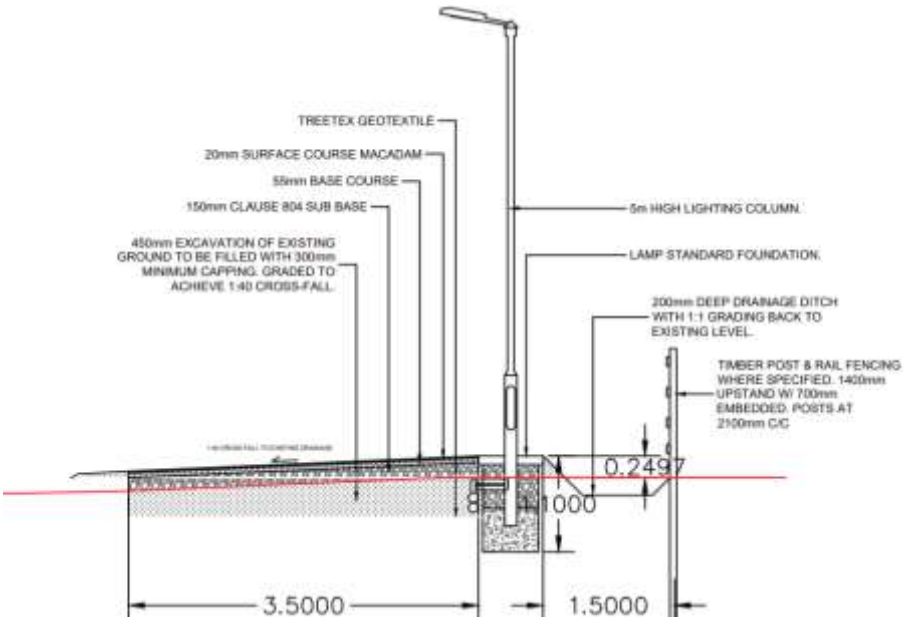

Figure 3-77: Proposed cross section of 3.5m greenway, public lighting column, and land drain

The proposed Greenway will divert north to join the existing 3.5m wide Smarter Travel path and avoid passing through a compensatory habitat area that was planted by the developers of the Living Bridge that connects the UL campus between Co. Limerick and Co. Clare. The proposed Greenway will cross an existing bridge (CH 400). A new steel parapet will be installed above the low stone parapet on this existing bridge to replace the existing parapet which currently narrows the bridge.

Figure 3-78: Existing bridge at CH400

The existing path will be resurfaced.

In accordance with LCCC's tree replacement guide, there will be five trees planted for every tree that will be removed to facilitate construction of the proposed Greenway.

The proposed Greenway will divert south (@ CH430) east of the compensatory habitat area and continue in a green field until it will rejoin the existing 3.5m wide path immediately west of the UL Boat Club. The existing tarmac path will be resurfaced where it passes the existing slipway for the Boat club until CH725 where the existing 2.0m (approx.) wide gravel path will be replaced with a 3.5m wide tarmac path. The surface of the existing path will not be excavated except to install twin ducts for the public lighting and a cellular membrane will be paid onto the gravel path and appropriate building layers will form the base for the tarmacadam surface finish. This will ensure tree roots will not be disturbed.

Figure 3-79: Tree root protection system under new tarmac path in Fairview Park, Dublin 3

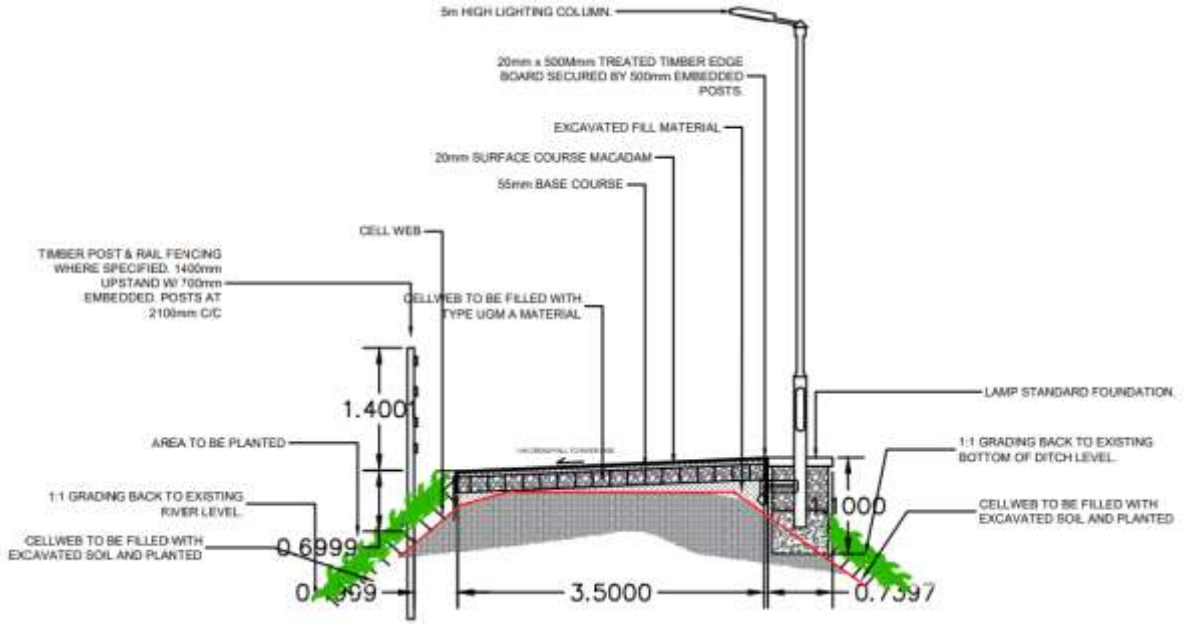

Figure 3-80: Replacement of gravel path with proposed 3.5m wide Greenway

At CH775 there is a proposed tarmac path to join to the existing UL campus shared surface. There are proposed replacement planting trees alongside this proposed path and a proposed bug hotel will be constructed from leftover construction wood and small bore tree branches that may be removed.

Figure 3-81: Example of a bug hotel that will recycle construction materials and reuse tree branches

CH795: Proposed Bridge 1

The proposed Greenway route will extend eastwards to an existing concrete bridge which will be replaced by a proposed 4.8m long and 4.5m wide steel bridge on new concrete abutment walls (Bridge No. 1 @ CH 795). Refer to drawing RHA-XX-DR-C-PD0007.

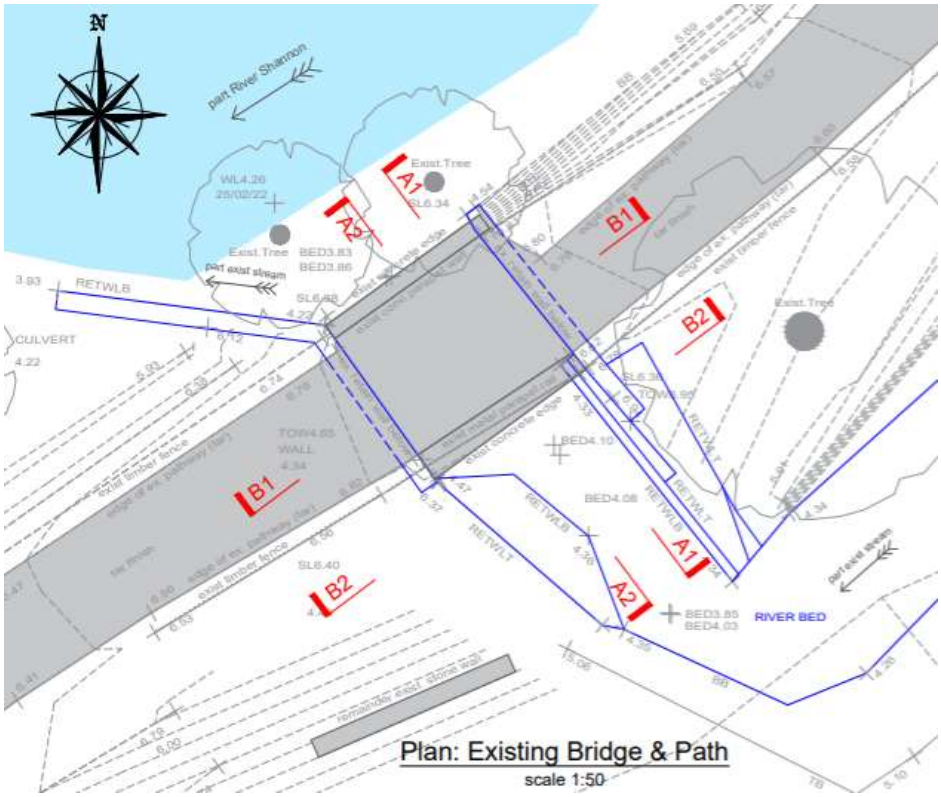

Figure 3-82: Plan of existing Bridge 1 (refer to drawing RHA-XX-DR-S-SP0010)

The existing bridge parapets, one is reinforced concrete, and the other is metal railing (refer to Figure 3-10, Figure 3-11, and Figure 3-12), will be taken down. The existing reinforced concrete bridge deck will be deconstructed by lifting it off the abutments and transporting it to the construction compound where it will be crushed. The crushed material will be recycled by using it to construct haul roads/temporary compounds/ and as a base for the proposed greenway path. Metal arisings, the parapet and the railing will be transported offsite to a licenced waste facility. The existing abutments will be deconstructed by breaking out the walls which will be removed to the construction compound for crushing and recycling, and the foundations will be exposed. Any concrete in the foundations will be broken out and mixed with stone rubble to form the base of the foundations for the proposed bridge abutments.

Dust will be suppressed during the wall and foundation breaking works. To avoid water runoff carrying fines, a shade cloth will be erected immediately adjacent to the concrete that will be broken out to trap dust arisings.

To carry out this deconstruction work and minimise the impact on the environment and local ecology there will be a water filled flood barrier to protect the work site from the River Shannon. To protect the River Shannon from contaminated liquids associated with construction activities including silt, a temporary sheet piled wall will be inserted into the riverbank between the water filled barrier and the worksite, and a silt curtain will be suspended in the River Shannon.

The breaking up and removal of the bridge abutment walls and foundation will be carried out on a dry day within a 6–8-hour period so those works will have a very short duration. The construction period of the bridge is expected to take 2-3 weeks. The existing drain under Bridge 1 is dry so there won't be a risk of drainage water running through the work site. The proposed sheet pile will prevent any material contaminated with dissolved chemicals (from broken concrete) from running into the river. The proposed shade cloth will prevent airborne dust from floating to the river. The proposed water filled flood barrier will prevent water from entering the worksite.

The proposed construction sequence for Bridge 1 is illustrated in Figure 3-83.

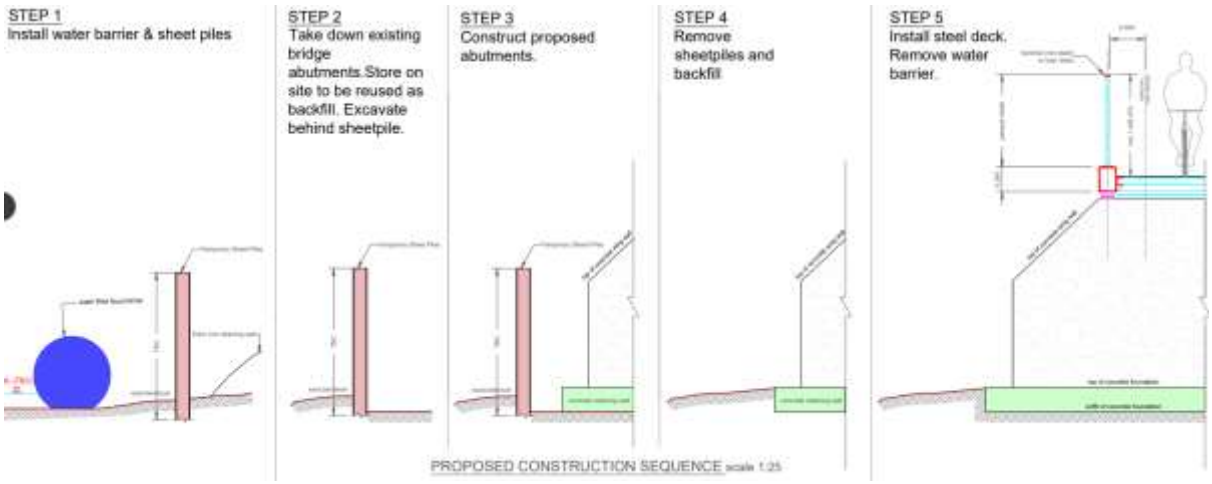

Figure 3-83: Proposed construction sequence for Bridge 1 (refer to drawing RHA-XX-DR-S-SP0012)

New bridge abutments are proposed to be constructed on new concrete foundations and a new steel deck with parapets will be installed by lifting a prefabricated structure into place. Refer to drawing RHA-XX-DR-S-SP0011.

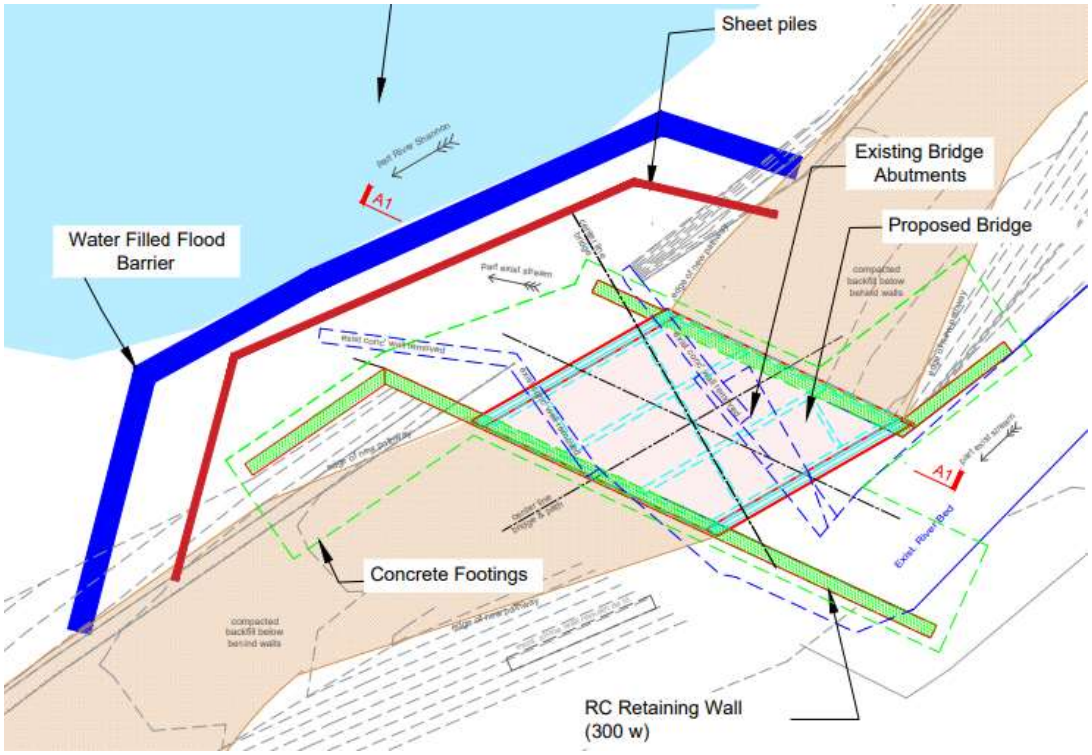

Figure 3-84: Proposed plan of Bridge 1, with ecology protection measures (refer to drawing RHA-XX-DR-S-SP0012)

Due to its proximity to the River Shannon which supports lamprey, the proposed works (including preparatory work) beside the River Shannon which supports salmonids shall be undertaken from May to October (inclusive) and in consultation with Inland Fisheries Ireland (IFI) to avoid accidental damage or siltation of spawning beds, subject to the water level in the river.

Bat surveys have been carried out along the riverbank and in the location of Bridge 1. No trees with a potential for bat roots were identified at Bridge 1 and the closest tree with a potential for a Bar roost is 60m to the east.

The existing bridge and vegetation growing on it were surveyed by an experienced Ecologist to look for species such as dipper, grey wagtail, wren and other bird species that will use bridge structures as nesting sites, and there was no evidence of birds nests or bat roosts at the structure or vegetation. A survey by an experienced Ecologist shall be undertaken at Bridge 1 no more than 24 hours ahead of vegetation clearance or structure removal works to confirm there are no bats roosting or birds nesting in the vegetation or in the structure that will be taken down and removed.

The SAC boundary line runs through the existing and proposed bridge.

The existing area under Bridge 1 is dry so a flume is not proposed.

No refuelling will be permitted outside of construction compounds and all machinery will be periodically serviced and regularly maintained to ensure diesel and oils spills do not occur.

There will be a 40m long silt curtain installed in the River Shannon to catch any discharges from the worksite into the river. Silt curtains will catch materials that float or are suspended in the water. Silt curtains are typically made from PVC and closed-cell foam. They are a flexible, water permeable barrier that extends downwards in the body of water, where it is typically anchored or weighted to prevent the silt from moving. The foam provides buoyancy, while the PVC curtain controls sediment in the water. Example photos of a silt curtain in the River Corrib in Galway are provided in Figure 3-85 and Figure 3-86.

Figure 3-85: Installation of a silt curtain in the River Corrib, Co. Galway

Figure 3-86: Silt curtain retaining contaminated water during advanced works for sheet piling

Figure 3-87: Example of sheet piling along the bank of the River Corrib

CH795 to CH970: Proposed 3-4m wide greenway

The proposed 3.5m wide greenway will be installed on top of the existing 1.5-2.0m wide gravel path and grass verges (refer to the cross section in Figure 3-77). The proposed Greenway will pass two trees with bat roost potential (although no roosts have been identified) at CH850. The public lighting columns have been designed at maximum distances from these trees to minimise light impact on bats if bats were to create roosts there in the future.

CH970: Proposed Bridge 2

The proposed Bridge No. 2 @ CH 970 will be a new 9.6m long and 4.5m wide steel and reinforced concrete bridge, and it will be constructed alongside the existing stone bridge. No demolition works are required for Bridge 2.

A photomontage which illustrates the proposed Bridge 2, the proposed Bridge 3, and the proposed amenity area can be seen in Figure 3-88.

Figure 3-88: Proposed bridges No 2 & 3 and rest area east of Plassey Mills

Due to its proximity to the River Shannon which supports lamprey, the proposed foreshore works (including preparatory work) beside all watercourses supporting salmonids shall be undertaken from May to October (inclusive) and in consultation with Inland Fisheries Ireland (IFI) to avoid accidental damage or siltation of spawning beds, subject to the water level in the river.

The SAC boundary line runs through the proposed bridge.

The existing Bridge 2 plan and section are provided in Figure 3-89.

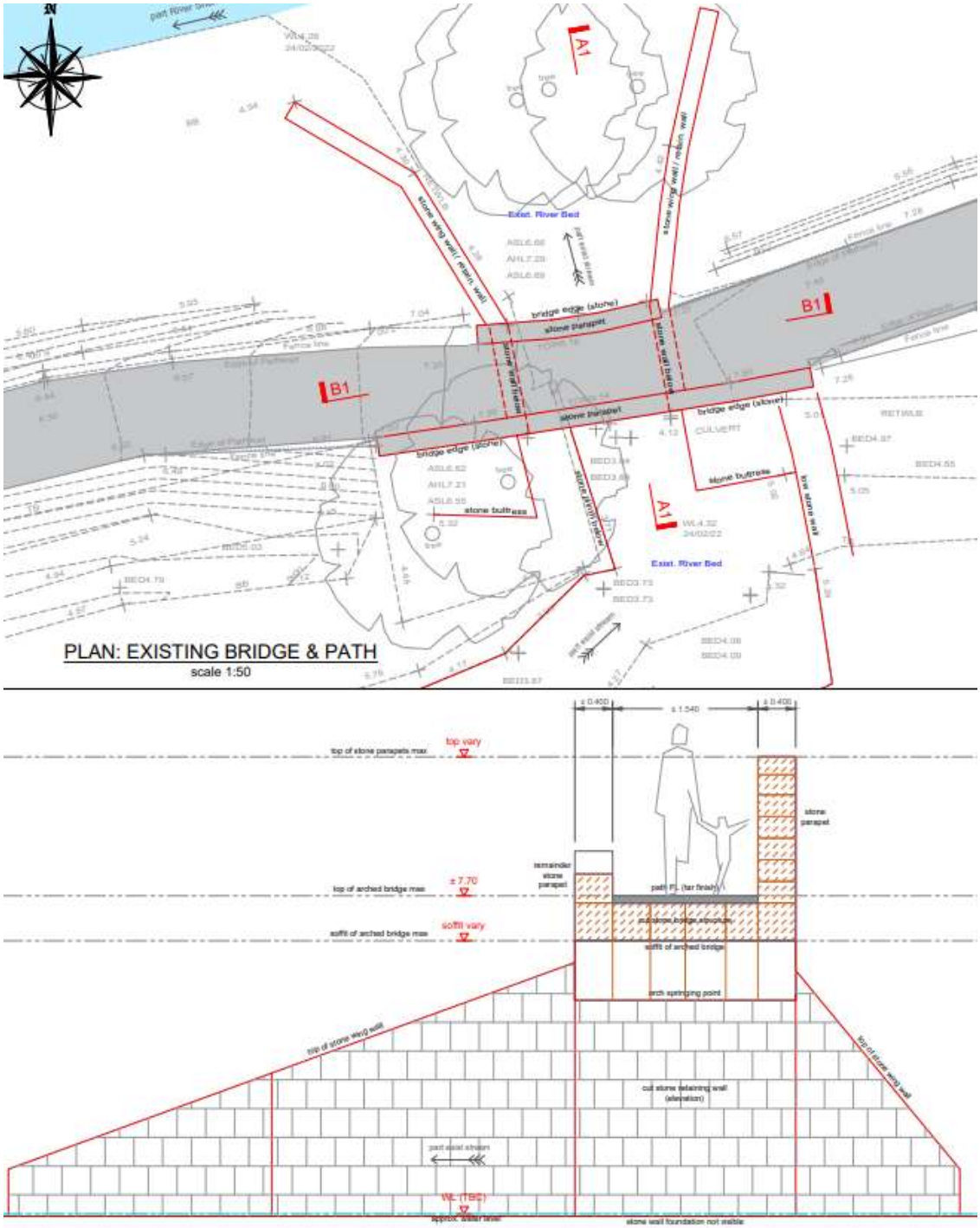

Figure 3-89: Existing plan and section for Bridge 2 (refer to drawing RHA-XX-DR-S-SP0020)

The plan for the proposed new bridge 2 alongside the existing stone bridge is illustrated in Figure 3-90 and the section drawing that illustrates the same is in Figure 3-91. The abutment for the existing stone bridge will remain untouched. The stonework for the existing bridge will be repointed, the low parapet wall will be restored by a stonemason, and a new metal railing will be installed onto it to ensure the existing stone bridge complies with current design standards for bridge parapets, i.e., 1.45m high. The bottom of the new metal parapet railing on the existing low stone parapet will follow the arc of the stone wall to preserve its historical function which was to allow a tow rope to slide over the parapet while a horse was towing a barge down the River Shannon.

Figure 3-90: Plan for the proposed new bridge 2 alongside the existing stone bridge (refer to drawing RHA-XX-DR-S-SP0021)

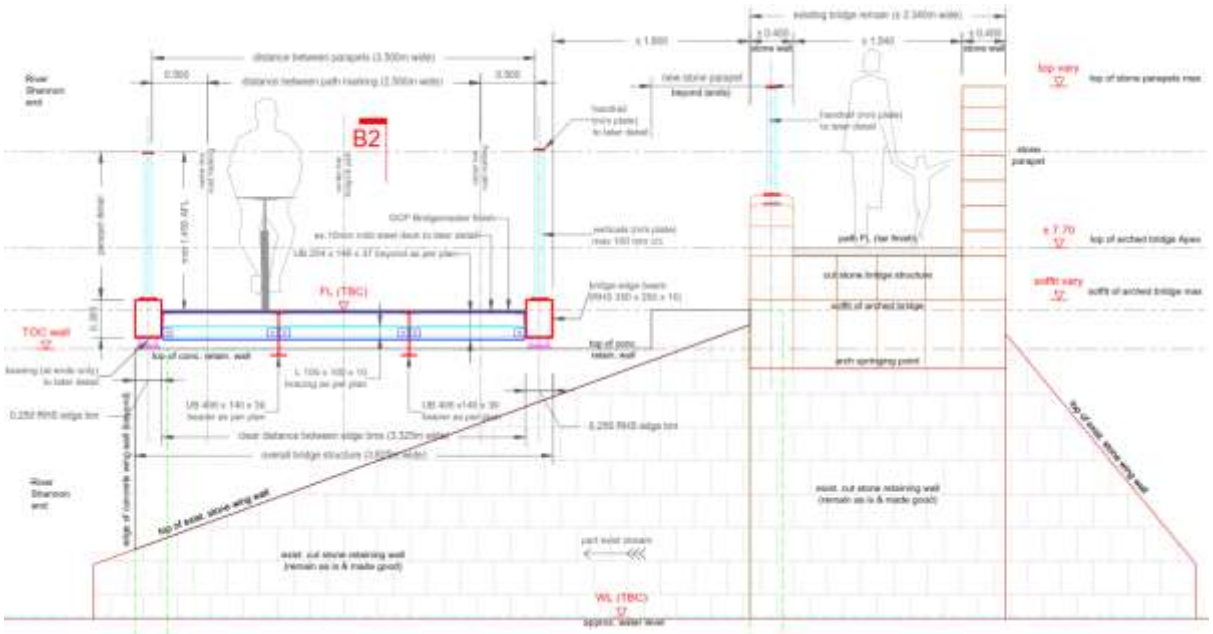

Figure 3-91: Section for the proposed new bridge 2 alongside the existing stone bridge (refer to drawing RHA-XX-DR-S-SP0021)

To carry out this construction work and minimise the impact on the environment and local ecology there will be a water filled flood barrier to protect the work site from the River Shannon. To protect the River Shannon from contaminated liquids associated with construction activities including silt, a temporary sheet piled wall will be inserted into the riverbank between the water filled barrier and the worksite, and a silt curtain will be suspended in the River Shannon. Refer to drawing RHA-XX-DR-S-SP0022.

The construction period of Bridge 2 is expected to take 2-3 weeks. The existing stream under Bridge 2 will be flumed during the works to keep the work site dry. The proposed sheet pile will prevent any material contaminated from running into the river. A proposed shade cloth will prevent airborne dust from floating to the river. The proposed water filled flood barrier will prevent river water from entering the worksite.

There will be a 60m long silt curtain installed in the River Shannon to catch any discharges from the worksite into the river. Silt curtains will catch materials that float or are suspended in the water. Silt curtains are typically made from PVC and closed-cell foam. They are a flexible, water permeable barrier that extends downwards in the body of water, where it is typically anchored or weighted to prevent the silt from moving. The foam provides buoyancy, while the PVC curtain controls sediment in the water. Example photos of a silt curtain in the River Corrib in Galway are provided in Figure 3-85 and Figure 3-86.

Tree felling of immature trees and saplings will be required in the September to February period before the construction work for Bridge 2. All trees to be cut down shall be inspected by an experienced and qualified Ecologist to check for nests and roosts (despite their very limited habitat potential) and shall be laid on the ground for at least 24 hours before they will be recycled or mulched.

There will be aquatic wall plates bolted to the new abutments where they will be in contact with river/surface water drainage water. The purpose of the aquatic plates is to provide a habitat for fish and other aquatic life.

Figure 3-92: Example of aquatic plates to be installed on bridge abutments

CH1000: Proposed Deck replacement for Bridge 3

The existing temporary bridge across the Plassey Mill race @ CH1000 will be replaced with a new 5.4m long and 4.5m wide steel bridge deck. The new steel deck and parapets will be lifted onto new concrete plinths which will be cast directly onto the stone abutment walls. Refer to drawing RHA-XX-DR-S-SP0031.

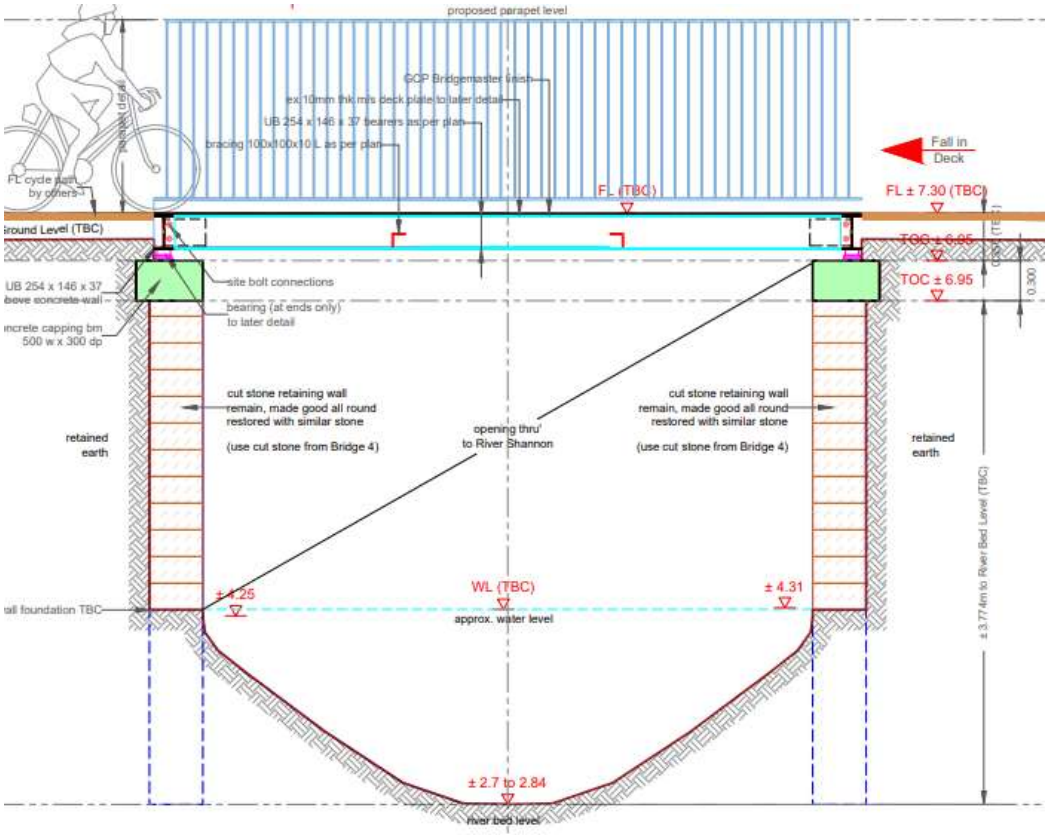

Figure 3-93: Proposed deck replacement for Bridge 3 with new concrete plinths on existing stone abutments

Due to its proximity to the River Shannon which supports lamprey, the proposed foreshore works (including preparatory work) beside all watercourses supporting salmonids shall be undertaken from May to October (inclusive) and in consultation with Inland Fisheries Ireland (IFI) to avoid accidental damage or siltation of spawning beds, subject to the water level in the river.

There will be two 6m long silt curtains installed in the Mill Race stream to catch any discharges from the worksite into the stream. Silt curtains will catch materials that float or are suspended in the stream water. They are a flexible, water permeable barrier that extends downwards in the body of water, where it is typically anchored or weighted to prevent the silt from moving. Silt curtains are typically made from PVC and closed-cell foam. The foam provides buoyancy, while the PVC curtain controls sediment in the water.

The SAC boundary line runs through the existing and proposed bridge. Refer to the red line in Figure 3-94.

CH1010 to CH1030: Proposed rest area at Plassey Mills

The plan for the proposed rest area at Plassey Mills is illustrated in Figure 3-94.

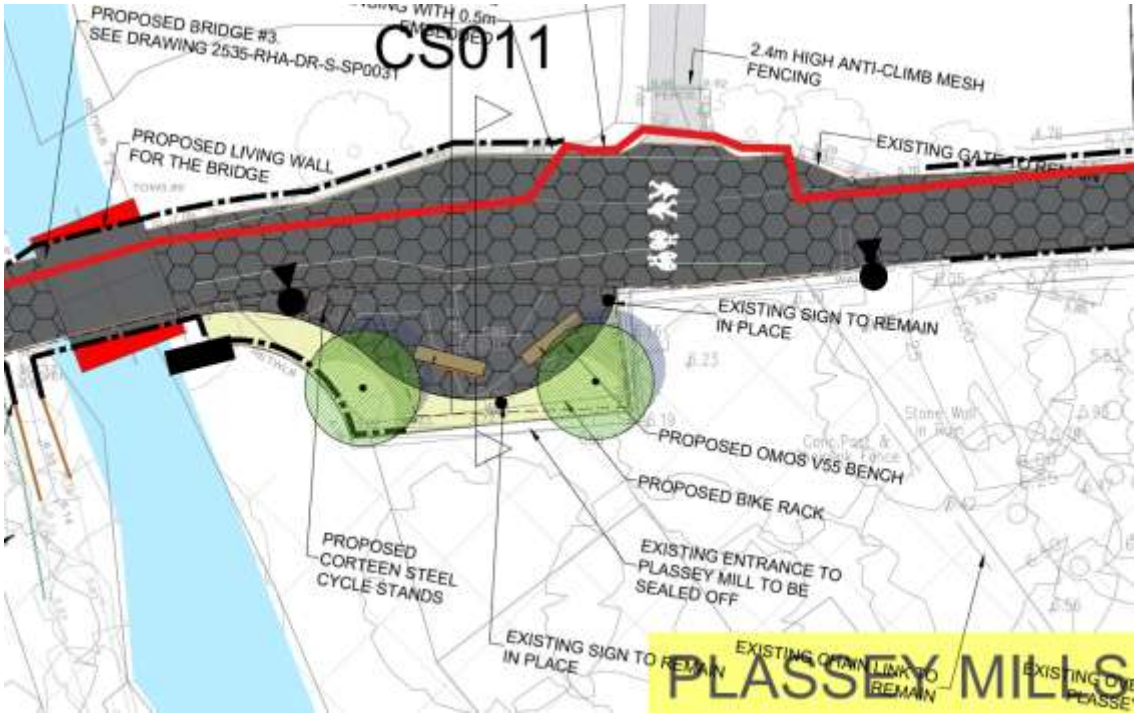

Figure 3-94: Proposed rest area at Plassey Mill

Two new benches similar to an OMOS green oak and Corten steel bench will be provided. A rack of new Corten steel cycle stands will also be provided and two new native Irish trees with understory will soften the interface between the existing stone/block walls and the proposed tarmac path surface.

Figure 3-95: Green Oak and Corten steel seat and cycle stand

A future connection to the Black bridge across the River Shannon to Co. Clare could join the proposed Greenway at this rest area.

CH1045: Proposed deck replacement for Bridge 4

A proposed 5.1m long and 4.5m wide steel bridge deck for Bridge 4 @ CH 1045 will replace the existing 3m wide concrete bridge deck across the overspill for the Plassey Mill race. The existing reinforced concrete bridge deck will be deconstructed by lifting it off the cut stone abutment walls and transporting it to the construction compound where it will be crushed. The crushed material will be recycled by using it to construct haul roads/temporary compounds/ and as a base for the proposed greenway path. Metal arisings and the existing steel parapets will be transported offsite to a licenced waste facility. The existing cut stone abutment walls and foundations will remain in-situ. The proposed

steel deck will sit on top of a concrete plinth that will be set into place on the existing stone abutments. The existing width of the Plassey Mill Race overspill will not be impacted.

New parapets will replace the existing stainless-steel parapets. Refer to drawing RHA-XX-DR-S-SP0042.

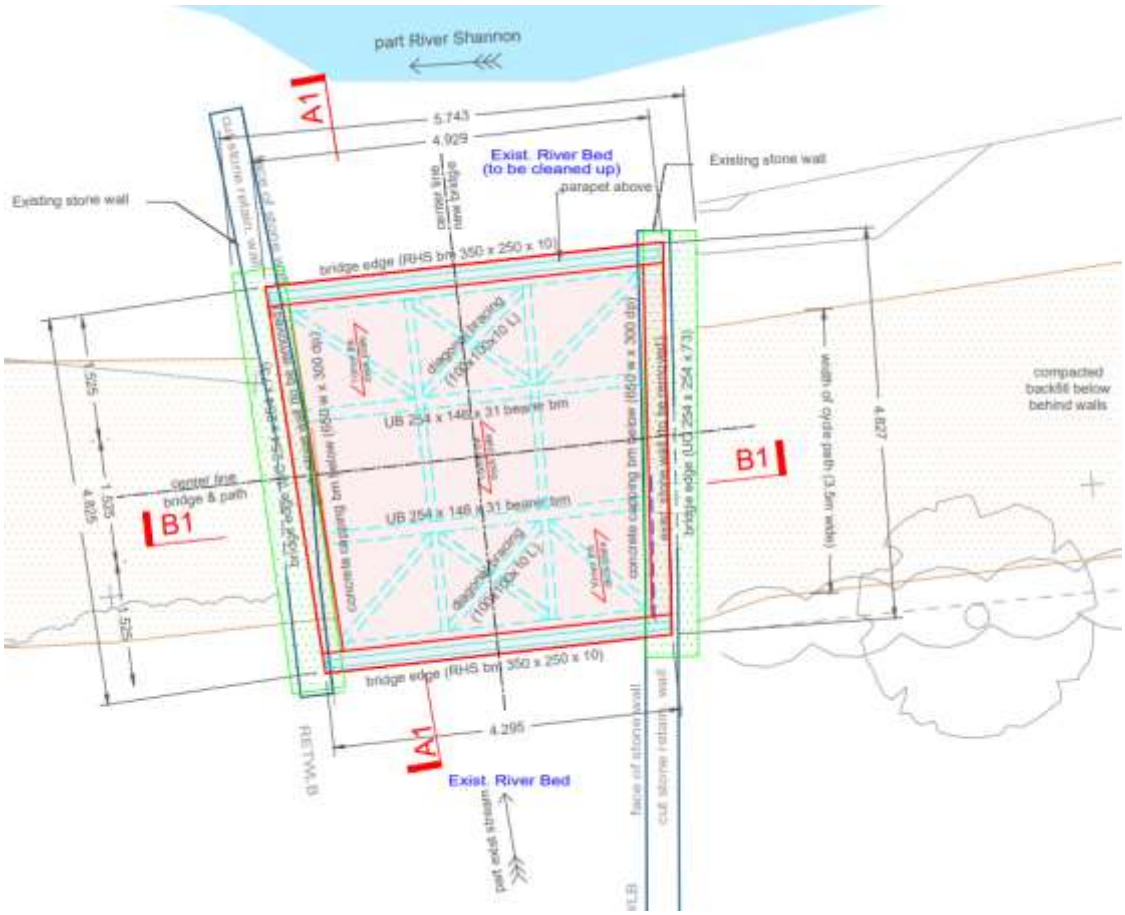

Figure 3-96: Proposed plan of Bridge 4 deck replacement

Due to its proximity to the River Shannon which supports lamprey, the proposed foreshore works (including preparatory work) beside all watercourses supporting salmonids shall be undertaken from May to October (inclusive) and in consultation with Inland Fisheries Ireland (IFI) to avoid accidental damage or siltation of spawning beds, subject to the water level in the river.

The SAC boundary line runs through the existing and proposed bridge.

There are no trees proposed for removal to construct Bridge 4.

CH1050 to CH1320: Proposed route south of Fisherman Cottages

The proposed Greenway will turn southeast and will continue south of a collection of fishing huts and cross a section of mixed broadleaved woodland and amenity grassland (approx. CH 1050 – CH 1250).

The plan for the proposed Greenway route south of the Fisherman cottages is illustrated Figure 3-97.

Figure 3-97: Proposed route south of Fisherman cottages

The trees and hedgerows that will be cut down to clear a path for the proposed Greenway will be replanted to act as a screen between the proposed path and the rear of the Fisherman cottages. All trees and hedgerows shall be cut down between September and February and shall be inspected by an experienced and qualified Ecologist to check for nests and roosts. They shall be laid on the ground for at least 24 hours before they will be recycled or mulched. Refer to the Landscape drawing 2525-RHA-XX-DR-C-LA0003 for proposed planting details for the Trees, Hedgerows, and wildflower meadow in this area.

The residents in the Fisherman cottages requested LCCC to resolve flooding at the rear of their properties. The proposed earth bund along the east (partially), south, and west (partially) of the properties will prevent flood water from the Plassey Mill Race from entering the rear of the properties. There will be proposed drainage channels on the north and south sides of the elevated Greenway path (refer to Figure 3-98) and surface water will drain towards the existing land drain that discharges to the Plassey Mill Race (refer to drawing RHA-XX-DR-C-PD0011). A proposed flap valve will prevent water from back entering the rear of the Fisherman Cottage properties from the Plassey Mill Race.

There is no direct drainage route to the river at the rear of the cottages. The area drains overland south to the Plassey Mill Race and the Plassey Mill Race overspill drain adjacent to the worksite is dry. Sediment mats will be placed between the bund and the Plassey Mill Race on the overland drainage route to trap material. If the area at the rear of the cottages needs to be drained dry ahead of the works, a silt buster tank to remove sediment from water will be utilised, before the water will be returned to the Plassey Mill race.

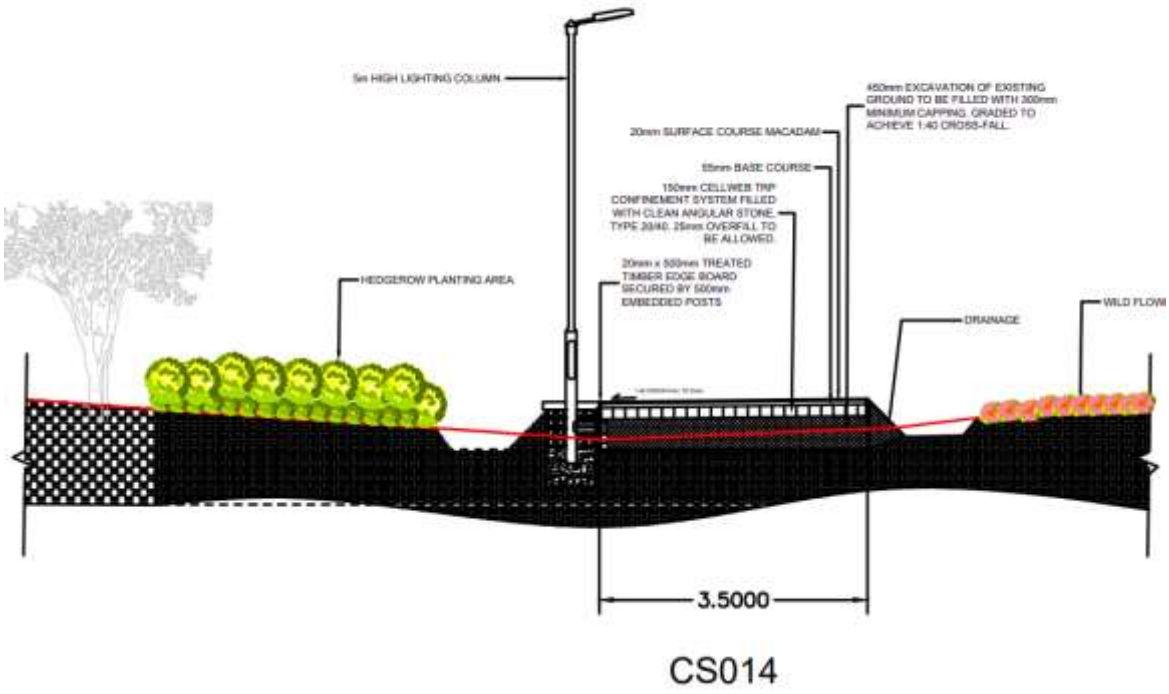

Figure 3-98: Cross Section 014 along proposed Greenway south of the Fisherman Cottages

Figure 3-99: Proposed Greenway south of the Fisherman cottages with proposed hedgerows and trees (looking west)

The proposed route will replace an existing gravel path going north towards Drumroe Village University Bridge, pass under the existing road bridge between Limerick and Clare, and turn east to continue along the River Shannon north of the Drumroe Student Village.

CH1320 to CH2180: Proposed Greenway through Annex 1 Alluvial Woodland forest area

East of the road bridge and east and west of the Living bridge between Co. Limerick and Co. Clare there is an Annex 1 Alluvial Woodland forested area outlined in green in Figure 3-100. The existing path is illustrated by the orange line, and the proposed path in a green field is illustrated by the green

line. The trees that are proposed to be cut down are illustrated in red outline. There is also an avenue of mature Beach trees along the riverbank within this wooded area and the proposed greenway avoids those trees.

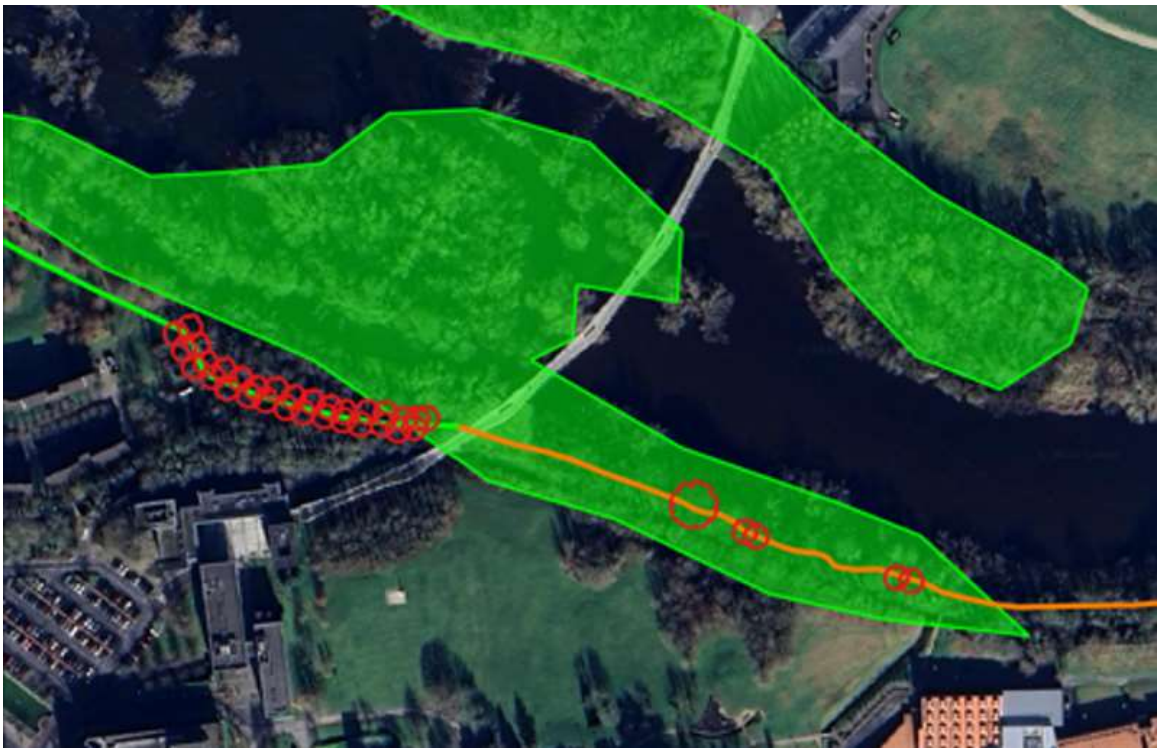

Figure 3-100: Existing Annex 1 Alluvial woodland

Figure 3-101: Proposed Greenway diverts from existing path to avoid the Annex 1 Alluvial Woodland north of Dromroe Student Village

The proposed Greenway avoids the mature Beach trees by diverting south of the existing gravel path (@ CH1420) to immature Birch trees where a 6m wide avenue of tree clearance will be required to construct the proposed Greenway. The trees that will be cut down are saplings and immature Birch with no habitat potential. Refer to Figure 3-132 later in this report. All trees shall be cut down between September and February and shall be inspected by an experienced and qualified Ecologist to check for nests and roosts. They shall be laid on the ground for at least 24 hours before they will be recycled or mulched.

These trees have been characterised as moderate quality by the project Arborist, namely '*Trees present in numbers, usually growing as groups or woodlands, such that they attract a higher collective rating than they might as individuals; or trees occurring as collectives but situated so as to make little visual contribution to the wider locality*'. Further information is available in the LCG Tree Survey Report_Rev0 in the EIA Part 3 Appendices.

Figure 3-102: Arborist map of moderate-quality trees east of the Living Bridge that will be removed for the proposed Greenway

The proposed Greenway will rejoin the existing gravel path and pass under the Living bridge (@ CH 1650).

Between the Living Bridge and Plassey Beach the proposed path will narrow to 3m at locations to avoid trees and will meander around existing trees. The new tarmac surface will be laid on top of the existing earth bank and no excavations will be carried out. Refer to Figure 3-104 for a photomontage where the proposed path will pass through the Annex 1 Alluvial Woodland forest with the River Shannon to the north and the Plassey Mill Race to the south.

Figure 3-103: Proposed Greenway under the Living Bridge (looking west)

Figure 3-104:Proposed Greenway in the Annex 1 Alluvial Woodland

CH2180 to CH2250: Proposed Bridge 5, Ramp to Plassey Beach, Rest area

The proposed infrastructure at Plassey Beach includes a new bridge, an access ramp to provide access from the path to the beach for all users, new seating for a rest area or for swimmers to change, new cycle stands, and new landscape planting areas as illustrated in Figure 3-105. The existing earthen embankment at the start of the Plassey Mill Race will be preserved.

The new bridge (Bridge 5) will facilitate pedestrians with limited mobility, wheelchair users, and cyclists to cross the Plassey Mill Race in this area whereas the existing bridge is narrow and has steps to access it which currently makes it inaccessible to users with limited mobility, buggies/prams, and wheelchair

users (refer to Figure 3-48, Figure 3-49, and Figure 3-50). This existing narrow concrete bridge at the mouth of the Plassey Mill Race will remain in place.

There will be a new ramp for people to walk down, wheelchair users to roll down, and children's prams/buggies to be pushed down from the proposed Greenway to Plassey Beach providing an amenity that provides access for all.

New public lighting will be provided using both 5m high and 1.6m high columns depending on existing tree cover.

The SAC boundary line runs south of the Plassey Mill Race stream (refer to the red line in Figure 3-105) and the existing and proposed bridge, retaining wall, and ramp are within the SAC.

The trees that have to be removed are illustrated in red in Figure 3-105. They will be cut down between September and February. All trees to be cut down shall be inspected by an experienced and qualified Ecologist to check for nests and roosts and shall be laid on the ground for at least 24 hours before they will be recycled or mulched.

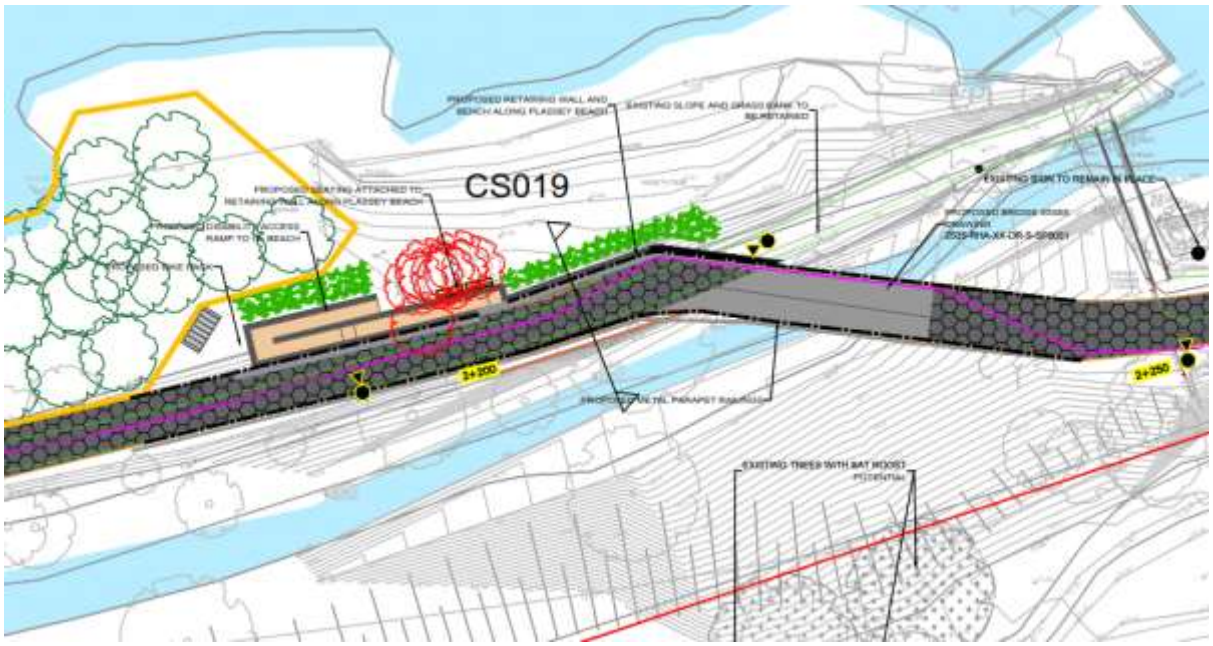

Figure 3-105: Proposed plan of ramp and Bridge 5 at Plassey Beach

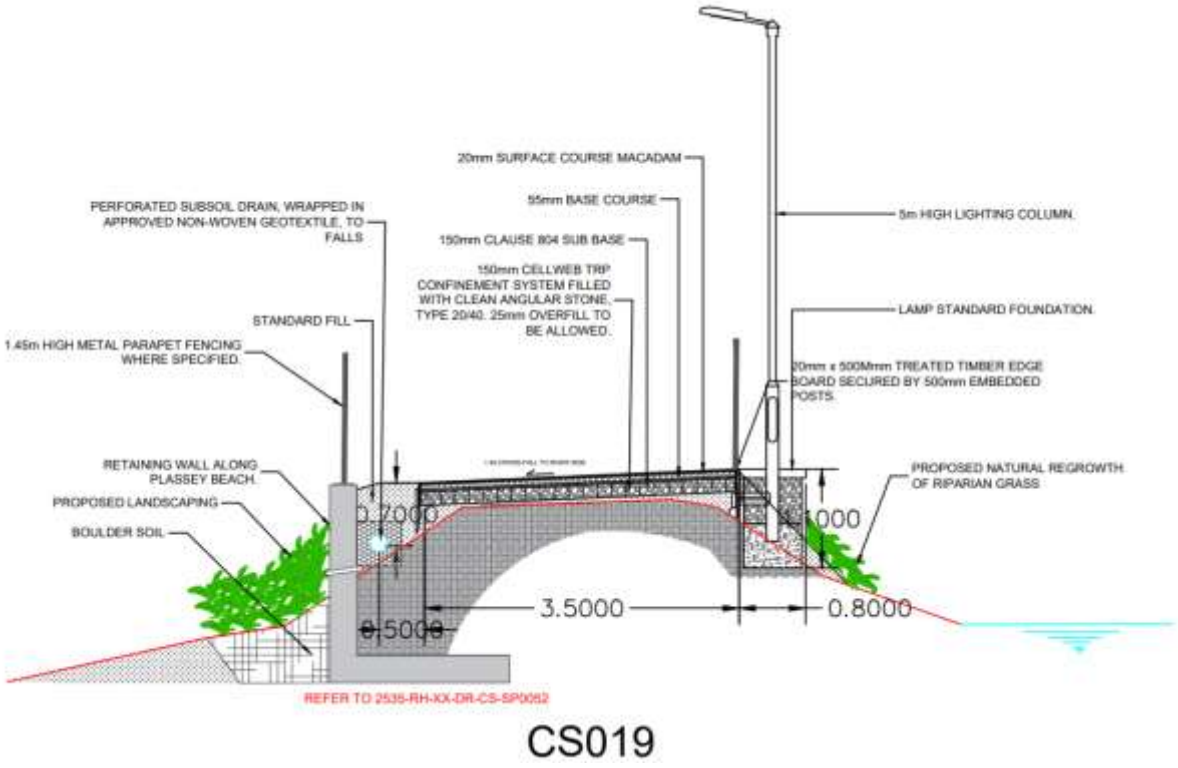

Figure 3-106: Proposed section of retaining wall for ramp at Plassey Beach

Figure 3-107: Proposed Bridge No. 5, existing embankment at Plassey Beach, and existing bridge in background

Figure 3-108: View of proposed Bridge 5 and ramp to Plassey Beach with landscaping, seating, and cycle stands

No instream works will take place at Plassey Beach or in the Plassey Mill Race. As per Bridge 1 and Bridge 2, the worksite will be protected from river water flooding by installing a water filled flood barrier on Plassey Beach, and the River Shannon and Plassey Mill Race will be protected from accidental spillages of contaminated water by proposed sheet piles and a silt curtain.

There will be a 100m long silt curtain installed in the River Shannon to catch any discharges from the worksite into the river. Silt curtains will catch materials that float or are suspended in the water. Silt curtains are typically made from PVC and closed-cell foam. They are a flexible, water permeable barrier that extends downwards in the body of water, where it is typically anchored or weighted to prevent the silt from moving. The foam provides buoyancy, while the PVC curtain controls sediment in the water. Example photos of a silt curtain in the River Corrib in Galway are provided in Figure 3-85 and Figure 3-86.

Dust will be suppressed during the construction works. To avoid water runoff carrying fines, a shade cloth will be erected immediately adjacent to the proposed concrete foundations and walls to trap dust arisings.

Dewatering of the area where the proposed foundations for the Bridge 5 abutment walls will be constructed will utilise a silt buster tank to remove silt from water before the water will be returned to the River Shannon.

The construction period of the bridge, the retaining wall, and the ramp is expected to take 4-5 weeks and the work will be carried out during the summer when it is expected to be dry and the river is at the lowest level during the year. The existing Mill Race stream under the proposed Bridge 5 will continue to run during the works and during the summer months the depth of this stream has been measured (during the summer of 2022) as being 100mm deep. The proposed sheet pile will prevent any loose soil or suspended material from running into the Mill Race stream. The proposed shade cloth will prevent airborne dust from floating onto the stream or River Shannon. The proposed water filled flood barrier will prevent river water from entering the worksite.

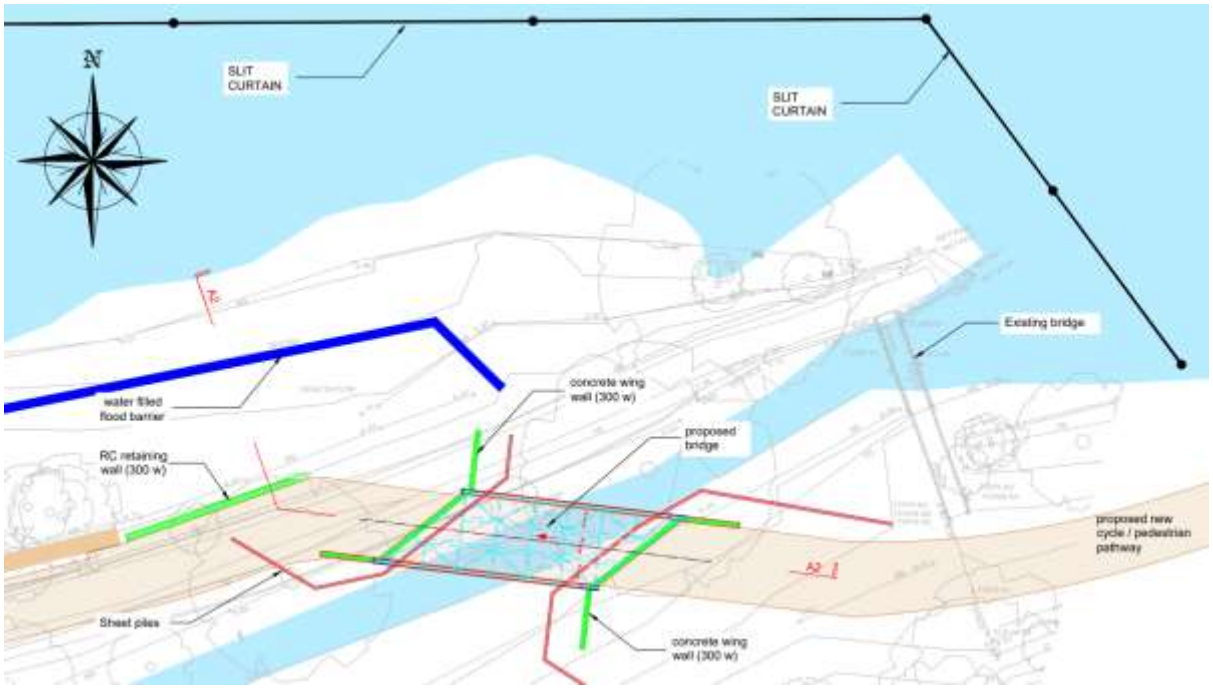

Figure 3-109: Plan of proposed Bridge 5 and proposed Ramp, showing proposed Silt Curtain, Sheet piles and water filled flood barrier (refer to drawing RHA-XX-DR-S-SP0052)

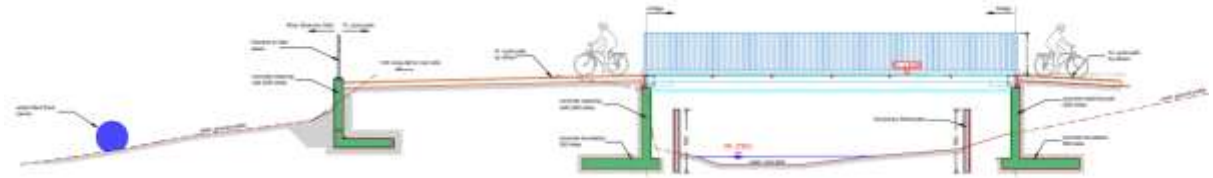

Figure 3-110: Section of retaining wall for proposed Ramp and Abutment walls for proposed Bridge 5 (refer to drawing RHA-XX-DR-S-SP0052)

The construction sequence for the bridge abutments is illustrated in the figure below.

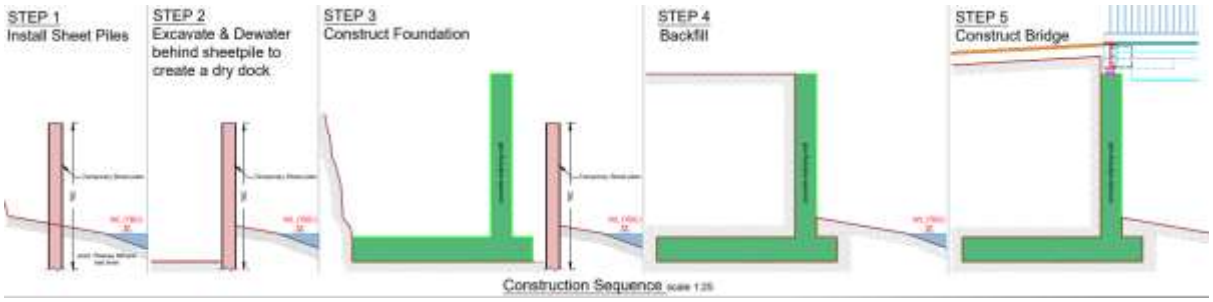

Figure 3-111: Construction sequence for abutment structures to support the steel deck of Bridge 5 (refer to drawing RHA-XX-DR-S-SP0052)

CH2250 to CH2500: Proposed Greenway on raised gravel path

East of Plassey Beach and north of Kilmurray Student village is an existing raised gravel path that will be covered with a tarmac surface. The proposed Greenway will cross an existing watercourse and the existing drainage pipe will be replaced with a proposed 900mm diameter culvert pipe.

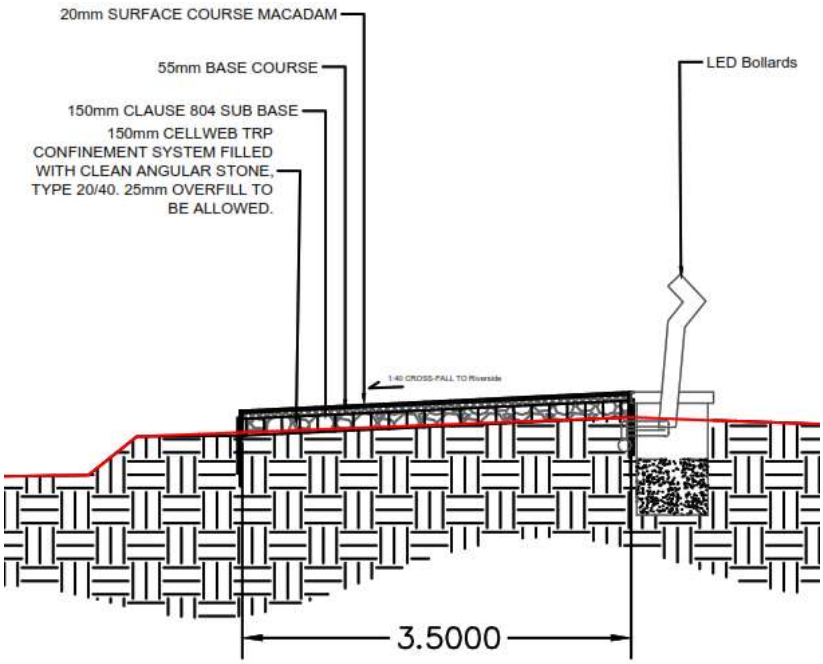

Figure 3-112: Proposed tarmac path and public lighting north of Kilmurray Student Village

At CH2500 the proposed Greenway will split into two paths. One will continue eastwards along an existing desire line to Cook Medical and onwards to McLaughlan Road. There will be a new swing gate installed at this junction so the section of proposed Greenway in the green field can be temporarily closed during and after significant flood events. The other path at the junction will turn south towards University Road and this is described in CH000_C to CH300_C.

Figure 3-113: Proposed junction on Greenway at CH2500 (refer to drawing RHA-XX-DR-C-PD0019)

CH2500 to CH3180: Proposed Greenway along desire line

The proposed Greenway route continues east and traversers amenity grassland and scrub areas where there is an unpaved desire line.

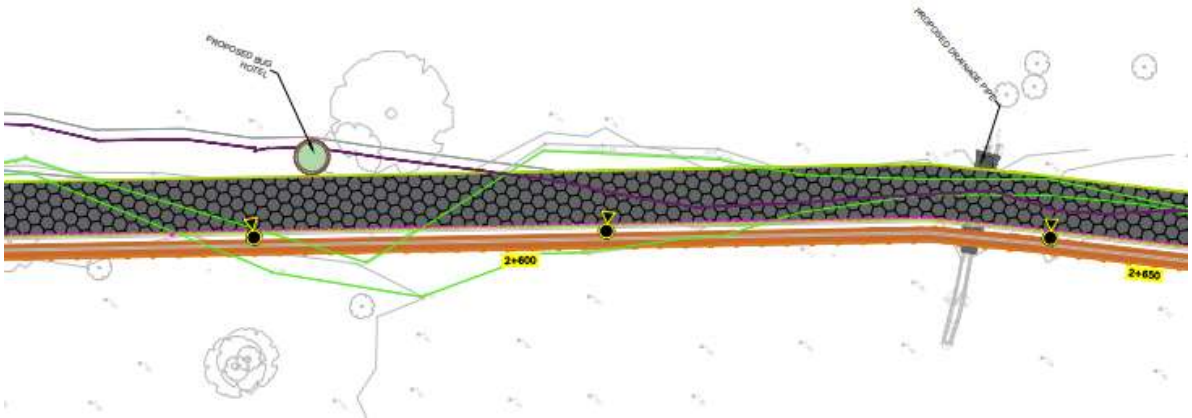

Figure 3-114: Proposed Greenway to replace existing grass desire line

There will be a new shallow land drain on the field side of the proposed Greenway and proposed drainage culverts will be constructed under the proposed path to drain surface water to the River Shannon, and to ensure the tarmac path can be utilised as soon as possible after flooding events (after LCCC maintenance personnel have inspected and cleared the path of flood debris).

The Flood Risk Assessment undertaken for this project, CFRAM flood mapping, confirms this part of the proposed Greenway will be subject to low probability (1 in 1000 year) and medium probability (1 in 100 year) flooding events. Anecdotal evidence collected during site visits and the public consultation event in August 2022 confirmed there will also be a high probability (1 in 10 year) of flooding events.

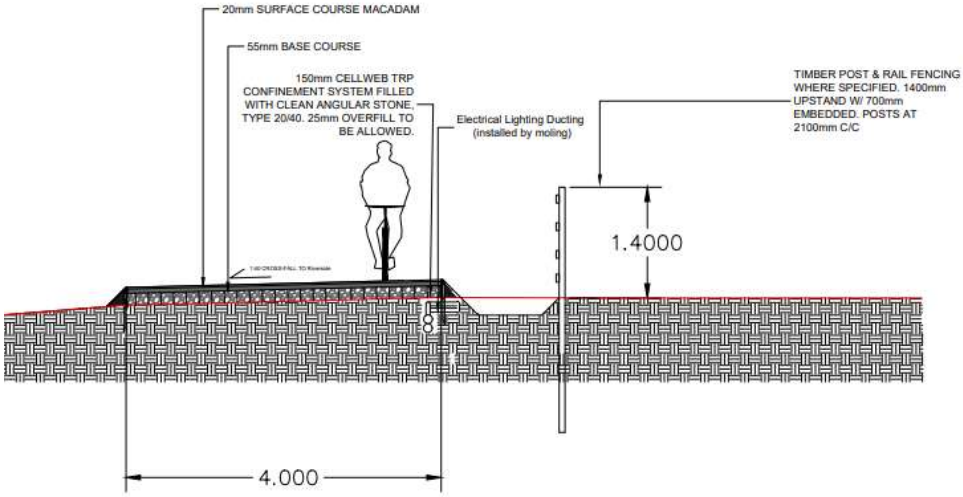

Figure 3-115: Proposed Greenway cross section in green field

CH3180 to CH3490: Proposed Greenway in green field

The proposed Greenway route turns south-east (CH 3180) to traverse the edge of trees, and through grassland and scrub areas. It will avoid the IDA's proposed surface water management system (shown in greyscale). There will be drainage channels along the east and west sides of the proposed Greenway to manage surface water and drain water towards the River Shannon.

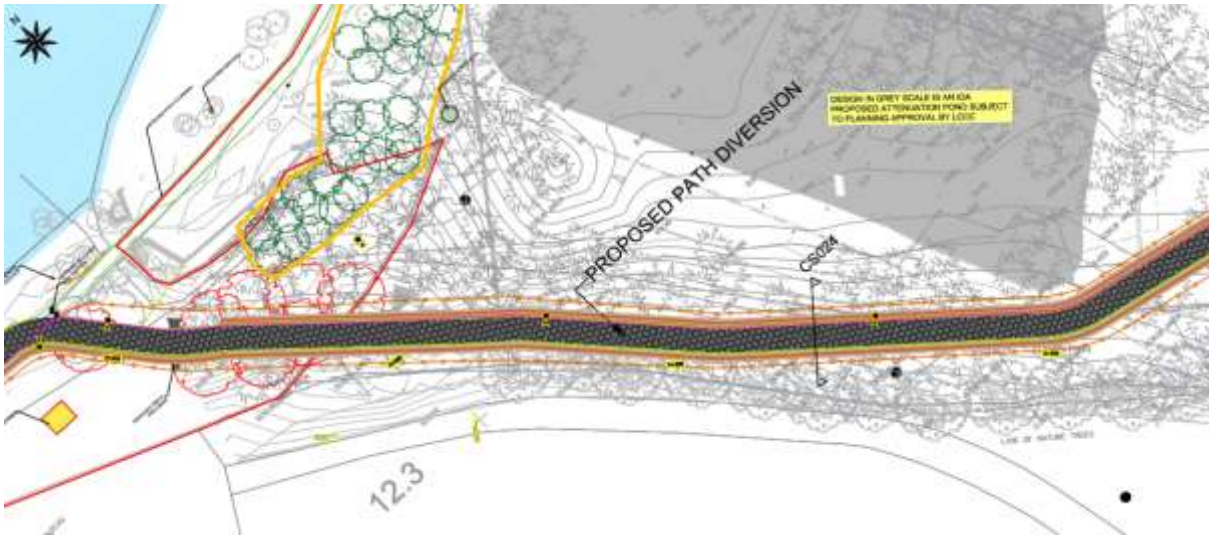

Figure 3-116: Proposed drainage alongside proposed path to manage surface water

The proposed Greenway will turn south-west to join to McLaughlan Road in the National Technology Park (NTP) at CH 3490.

CH3490 to CH3805: Proposed Cycle lane and Footpaths alongside McLaughlan Road

The proposed Greenway changes from a shared 3.5m wide greenway to Active Travel infrastructure with separate 1.8m wide footpaths and 1.8m wide cycle lanes along the eastern and western side of McLaughlan Road.

Figure 3-117: Proposed cycle lanes and footpath on McLaughlan Road where it joins the shared path

The proposed footpaths and cycle lanes will tie into existing footpaths and cycle lanes on Plassey Park Road at its junction with McLaughlan Road.

Figure 3-118: Proposed plan for footpaths and cycle lanes alongside McLaughlan Road

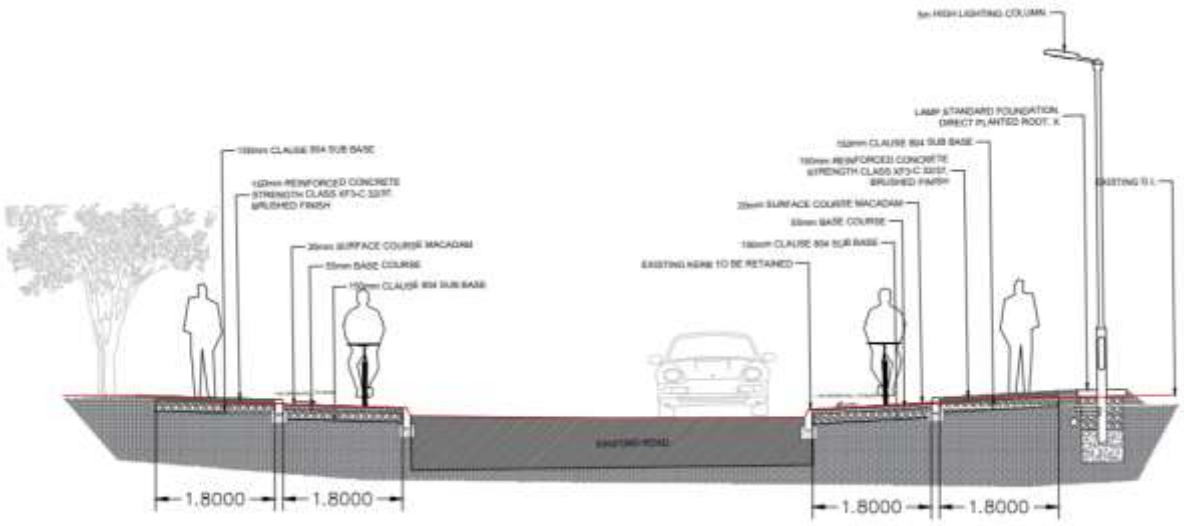

Figure 3-119: Proposed cross section for footpaths and cycle lanes alongside McLaughlan Road

An existing 2m wide raised table Zebra crossing on Plassey Park Road will be converted to a 6m wide Toucan crossing to prioritise crossings for pedestrians and cyclists and in accordance with design guidance for Toucan crossings on bus routes.

Figure 3-120: The existing Zebra crossing on Plassey Park Road proposed to be converted to a Toucan crossing

CH000_C to CH300_C:P Proposed Greenway east of Kilmurray Student Village

The proposed Greenway will run in a southerly direction past the eastern boundary of the UL Agricultural Laboratory building and Kilmurray Student Village. This short section of the Greenway will be a shared space between Greenway users and vehicles associated with the UL Agricultural laboratory, but removable bollards will be installed on the Greenway that will be operated by UL Facilities to manage vehicle movements. Typically the bollards would be locked in place to prevent unauthorized access for

vehicles to this section of the Grenway. Refer to drawing RHA-XX-DR-C-PD0029. The existing parking spaces to the east of Kilmurray Student Village will be reconstructed to accommodate the proposed Greenway. The existing rubbish bin area will be realigned for the same reason.

Figure 3-121: Proposed Greenway at UL Agricultural Laboratory building east of Kilmurray Student Village

Figure 3-122: Proposed Greenway approaching the eastern/rear entrance to Kilmurray Student Village

The proposed Greenway will leave the Kilmurray Student Village and join University Road.

Figure 3-123: Proposed Greenway at eastern entrance to Kilmurray Student Village

CH300_C to CH677_C: Proposed footpaths and cycle lanes on University Avenue

The proposed Greenway crosses the entrances to Kilmurry Student Village and the UL Gaelic grounds where it changes from a shared 3.5m wide greenway to Active Travel infrastructure with separate 1.8m wide footpaths and 2.0m wide cycle lanes along the eastern and western side of University Road.

Figure 3-124: Proposed Greenway on University Road

The proposed cycle lanes and footpaths on University Road will tie into Active Travel infrastructure which was constructed along Plassey Park Road as part of the Limerick Shannon Metropolitan Area Transport Strategy (refer to Figure 3-73).

3.3 Proposed Amenity/Rest areas, Landscaping and Tree Planting

In accordance with LCCC's replacement tree planting policy, there will be five native Irish trees (e.g.: Oak, Willow, Alder, Birch) are proposed to be planted for every tree that is cut down to enable construction of the proposed Greenway path.

There will be three new amenity/rest areas provided along the proposed Greenway with new seating and cycle stands.

There will be a new wildflower meadow (in accordance with the All-Ireland pollinator plan), a hedgerow, and tree planting south of the Fisherman cottages, and new understory planting at the Plassey Mills rest area. There will be new landscaping along the retaining wall and ramp at Plassey Beach.

CH000: Proposed Amenity/Rest area at Groody Bridge

There will be a proposed amenity/rest area east of Groody Bridge. The red line in Figure 3-125 is the SAC boundary line which passes through the existing path. Refer to drawings 2525-RHA-XX-DR-C-PD0001 and 2525-RHA-XX-DR-C-LA0002.

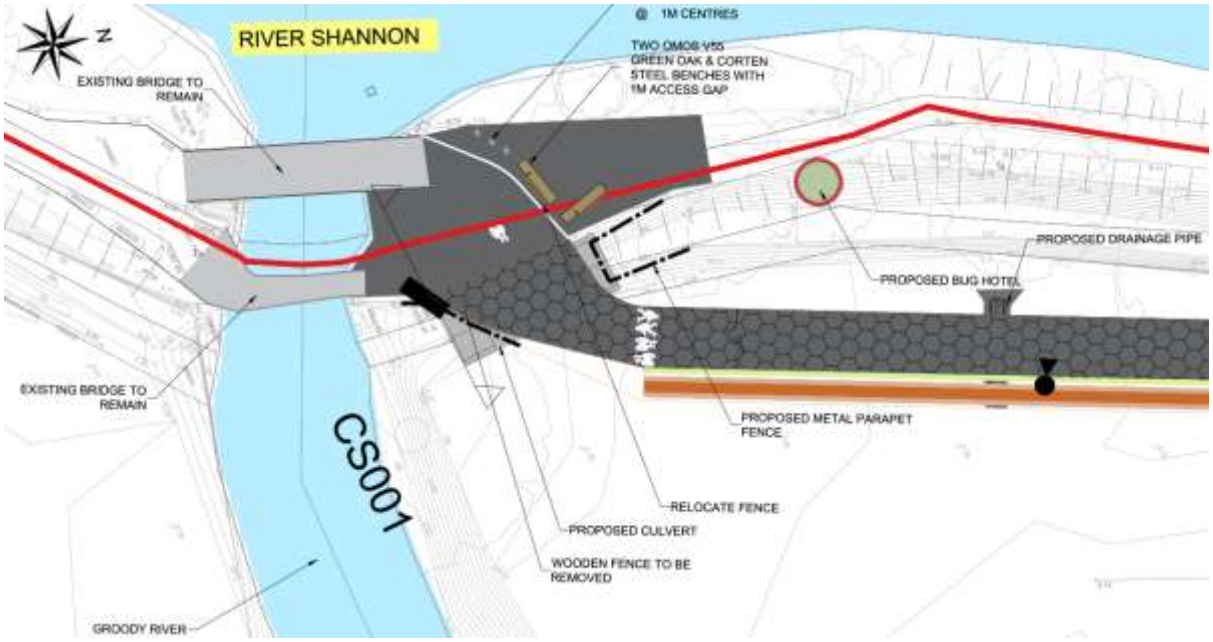

Figure 3-125: proposed amenity/rest area east of Groody Bridge

CH 770: Proposed Tree planting east of UL Boat Club

There will be native Irish trees planted along a proposed path between the proposed Greenway and an existing UL campus shared path. Refer to drawing 2525-RHA-XX-DR-C-PD0007. The replacement tree planting will support the propagation of and avoid gaps in the broad leaf woodland along the riverbank to the benefit of bats, especially the Lesser Horseshoe bat.

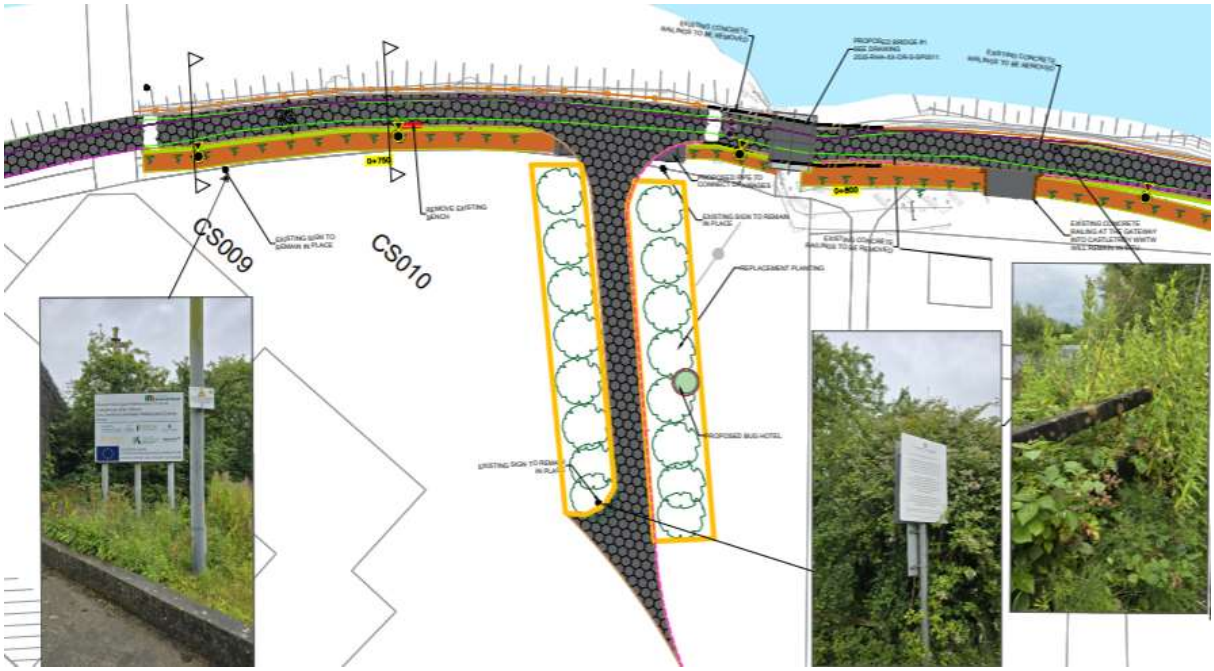

Figure 3-126: Proposed tree planting area west of proposed Bridge 1

CH1020: Proposed Amenity/Rest area at Plassey Mills

The proposed amenity/rest area at Plassey Mills will provide new seating and cycle stands. It could also function as a junction for any future usage of the currently sealed off Black bridge that crosses the River Shannon in this location.

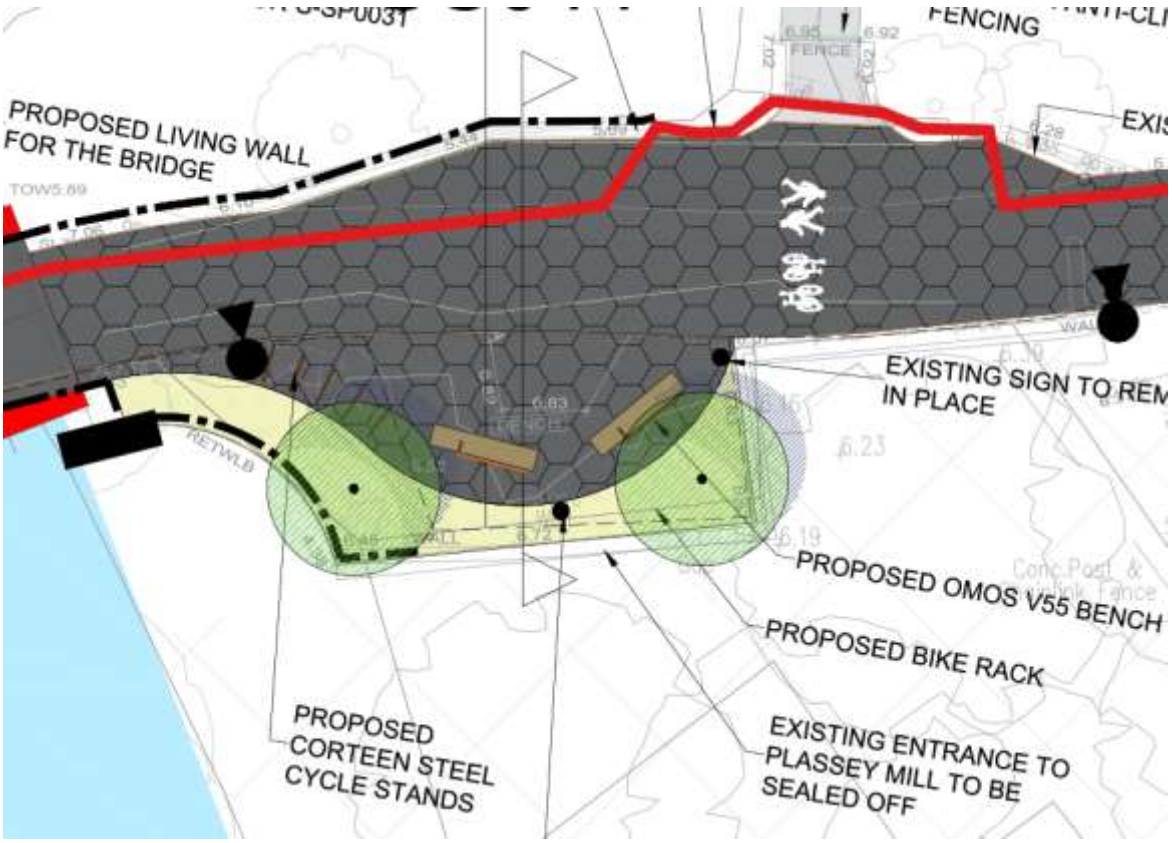

Figure 3-127: Proposed amenity/rest area at Plassey Mills

CH 1200; Proposed Landscaping south of the Fisherman cottages

There will be a new wildflower meadow (in accordance with the All-Ireland pollinator plan), a hedgerow, and tree planting south of the Fisherman cottages. Refer to drawings 2525-RHA-XX-DR-C-PD0001 and 2525-RHA-XX-DR-C-LA0003. The replacement tree planting will support the propagation of and avoid gaps in the broad leaf woodland along the riverbank to the benefit of bats, especially the Lesser Horseshoe bat.

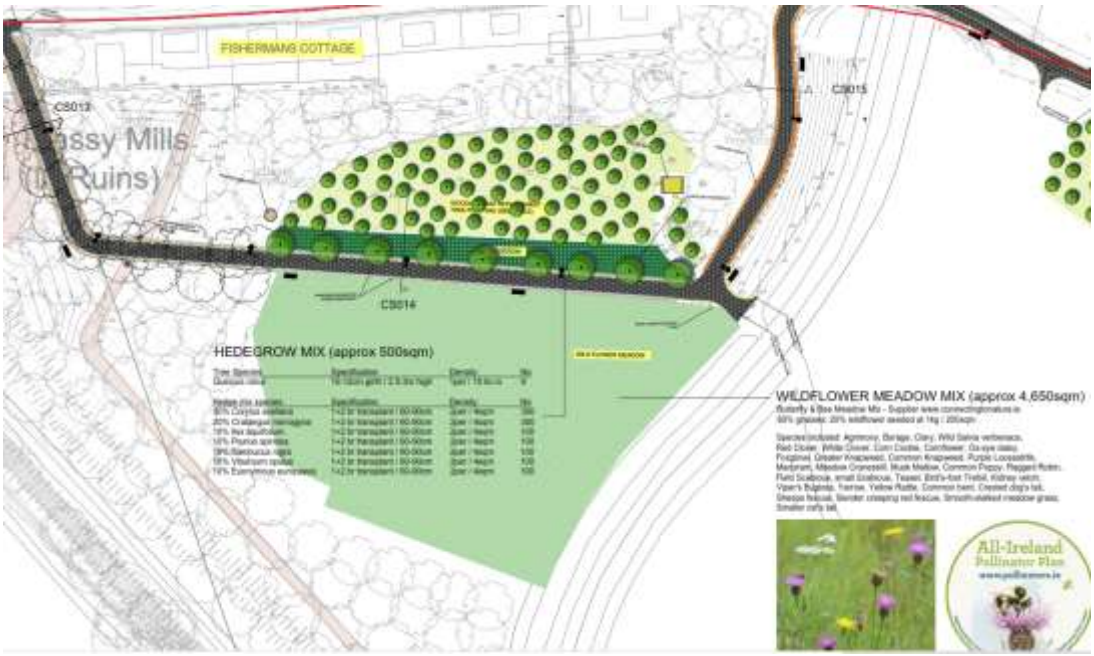

Figure 3-128: Proposed landscaping south of the Fisherman cottages

CH 1400-1520: Proposed Tree planting north of Dromroe Student Village

There will be replacement trees planted in a green field area to the north of Dromroe Student Village. Refer to drawings 2525-RHA-XX-DR-C-PD0011, 2525-RHA-XX-DR-C-PD0012, and 2525-RHA-XX-DR-C-LA0003. The replacement tree planting will support the propagation of and avoid gaps in the broad leaf woodland along the riverbank to the benefit of bats, especially the Lesser Horseshoe bat.

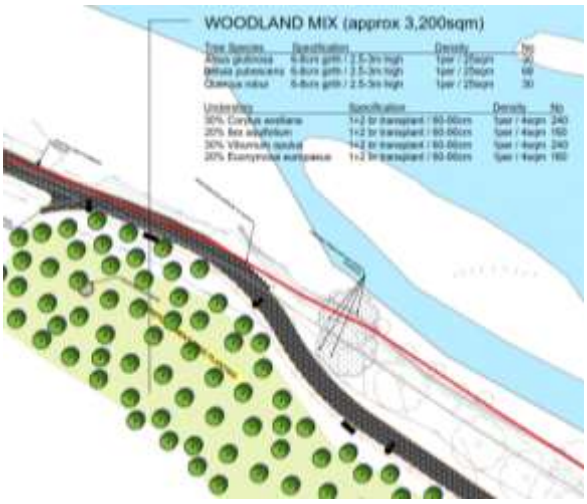

Figure 3-129: Proposed tree planting area north of Dromroe Student Village

CH 2105-2175: Proposed Landscaping and Amenity/Rest area at Plassey Beach

There will be new native Irish trees and new riverside shrubs planted at Plassey Beach. Refer to drawings 2525-RHA-XX-DR-C-PD0017 and 2525-RHA-XX-DR-C-LA0004. The replacement tree planting will support the propagation of and avoid gaps in the broad leaf woodland along the riverbank to the benefit of bats, especially the Lesser Horseshoe bat.

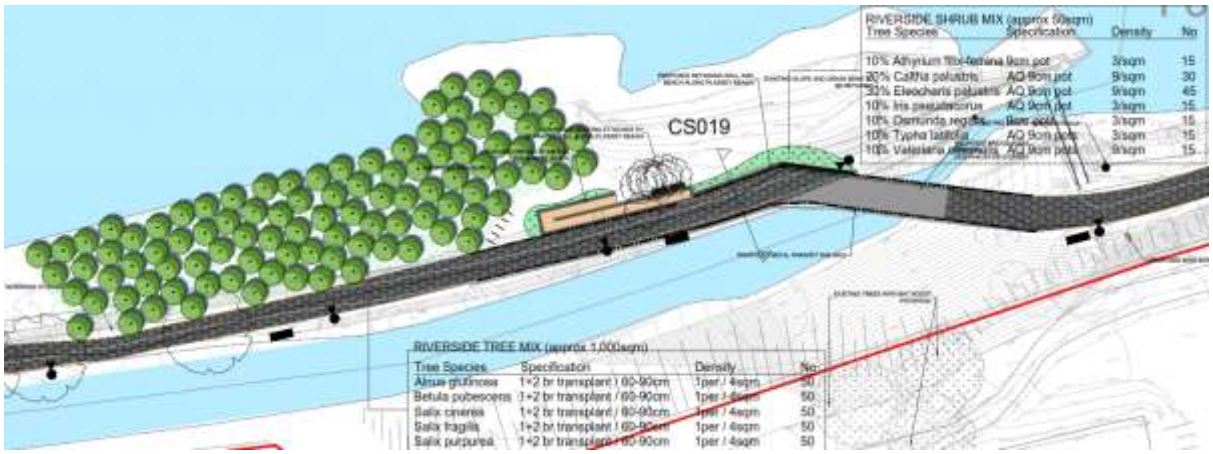

Figure 3-130: Proposed native Irish trees and new riverside shrubs at Plassey Beach

CH 3190-3450: Proposed Tree planting east of Cook Medical campus

There will be native Irish trees and an understory planted adjacent to the proposed path east of the Cook Medical campus and southwest of Troy Castle. Refer to drawing 2525-RHA-XX-DR-C-PD0023 and 2525-RHA-XX-DR-C-LA0005. The replacement tree planting will support the propagation of and avoid gaps in the broad leaf woodland along the riverbank to the benefit of bats, especially the Lesser Horseshoe bat.

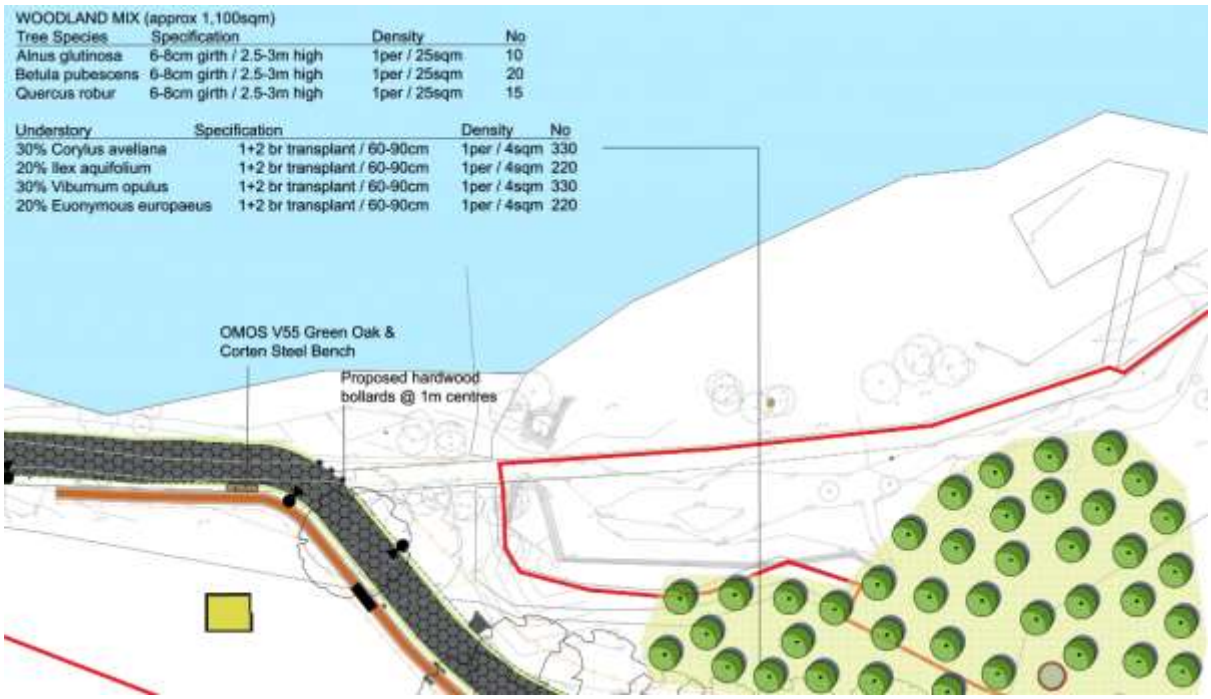

Figure 3-131: Proposed replacement tree planting east of Cook Medical

3.4 Description of Proposed Construction Works

3.4.1. Tree removal

The proposed works have been designed to minimise disturbance to the habitat and limit tree removal within the site, but there are trees that will be cut down to construct the proposed Greenway. In accordance Section 40 of the Wildlife Act 1976 as amended by Section 46 of the Wildlife Amendment Act 2000 the proposed trees can only be removed between and 1st September and the last day of February in the following year. The trees that have to be removed will be cut down during this period.

The proposed path has been designed to avoid existing mature trees except for one dead mature tree and one dead semi-mature tree that will be felled ahead of the construction works. Tree overhang from approximately 30 No. semi-mature and mature trees will be cut down along the proposed path. These trees have been assessed by an experienced and qualified Arborist and an experienced and qualified Ecologist, and they have very limited habitat potential. There is one dead mature tree and four immature trees that will be removed in the Annex 1 habitat Alluvial woodland forest (Refer to Figure 4.2). The remainder of the trees to be cut down are outside the Annex 1 habitat Alluvial woodland and they are saplings and immature trees with no habitat potential. Refer to Figure 3-132.

Figure 3-132: Saplings and immature trees that will be removed along the route of the Greenway

All trees to be cut down between September and February shall be inspected by an experienced and qualified Ecologist to check for nests and roosts and shall be laid on the ground for at least 24 hours before they will be recycled or mulched.

LCCC requires trees that are cut down to be replanted at a rate of 5:1 so over 300 native trees are proposed to be planted along the proposed Greenway. This will help to deliver the LDP Objective EH O10 to plant 'native trees, hedgerows and vegetation and the creation of new habitats in all new developments and public realm projects'.

Tree branches and immature trunks which are felled will be reused in the production of bug hotels. Any leftover trunks and branches will be chipped and mulched at the closest construction compound for reuse on site.

Figure 3-133: Scrubland that will be cleared ahead of the Greenway construction works

3.4.2. Site Clearance

Surface stripping will be required in greenfield areas where topsoil and subsoil will be stripped along the route of the path to an average depth of 300mm. The topsoil and subsoil will be mounded and seeded on the river side of the path and will be left in place as a permanent installation. To prevent soil washing into the river, a sediment barrier will be erected at the base of the mounds on the river side.

In advance of construction works existing infrastructure items will be removed and disposed off-site, these include:

- One steel kissing gates along the existing gravel track at Plassey Mills and disposal off site;
- Approximately 500m of existing wooden, concrete, and steel fencing and disposal off site;

Advance work in Section 2 will require the removal of a temporary steel bridge at the location of Bridge No. 3.

Advance works will also include cutting out of four existing concrete footbridges and one set of bridge abutments and crushing of concrete within the construction compounds so the aggregate can be reused during the construction works.

Extensive areas of vegetation will need to be cleared in advance of construction works. Trees which are felled will be chipped on site for mulch for use on site. Mulch will be added to slopes to prevent soil erosion, retain water, and manage weeds.

Vegetation clearance includes:

- Felling of trees and mulching for onsite use;
- Clearance of overhanging branches and mulching for onsite use;

- Clearance of native scrub from drainage channels, bagging, and disposal;
- Clearance of native scrub in heavy dense areas, bagging, and burial under soul mounds to prevent spread of invasive species.

A planting scheme is proposed to replace vegetation which has been removed as part of the works. Refer to the landscape drawings 2525-RHA-XX-DR-C-LA0001 to 2525-RHA-XX-DR-C-LA0005 for details of the proposed planting areas and species.

Advanced treatment and removal of invasive species including Giant Hogweed and Himalayan Balsam that have been surveyed in the work site shall be carried out ahead of construction works. Refer to the Invasive Species Management Plan in Appendix E for details.

If invasive species plants that spread by rhizomes (e.g. Japanese Knotweed) are encountered by site clearance crews, the plant will be removed in accordance with guidelines for managing invasive species, wrapped in plastic, and buried under topsoil and subsoil mounds so those invasive species plants cannot propagate. No invasive species will be moved to a different location within the works site or off site.

Site clearance will be required in advance of the Greenway's construction, as follows:

- At a minimum this will include excavation of topsoil and subsoil and establishment of permanent mounds (including reseeding) immediately alongside the stripped soil in green fields along the proposed route between Kilmurray Student village and Cook Medical;
- Existing infrastructure items obstructing the proposed path, such as metal gates, metal parapets, metal arisings from crushed concrete, and metal fences will be removed and disposed offsite to a licenced waste facility;
- Existing concrete footbridges will be or crushed in temporary construction compounds and the material will be reused as aggregate for haul roads during the works (metal arisings will be transported to a licenced waste facility);
- Vegetation clearance involves removing scrub and will be carried out in consideration of ecological restrictions between September and February.
- Trees which are felled will be mulched in a temporary construction compound for reuse on site to minimise soil erosion, keep soil wet, and prevent weed growth.
- Where excavation is required to remove roots from trees that have been cut down, any unconsolidated ground will be sown with grass seed following reinstatement to prevent erosion;

Temporary works will be put in place in advance of construction, including the provision of silt fences at all interfaces of the works area and the existing watercourse to prevent run off from the works area.

3.4.3. Temporary Construction Compounds

The temporary construction compounds will be temporarily surfaced with hard standing on a geomembrane to prevent generation and spreading of mud. Temporary perimeter fencing with silt curtains at the base and shade cloths to act as dust curtains will be erected around compounds. Delivery trucks will not cross through the compounds, and they will drop their loads within the compounds. The construction works vehicles will be permitted to work on the Greenway side of the compounds only and will not pass through the compound to exit onto public roads. This will control mud spreading onto public roads and will help to prevent the spread of invasive species that are evident along the proposed path. The compounds will be adequately buffered to prevent any surface water runoff. The construction compounds will be constructed in Flood Zone C areas only.

The compounds will comprise the following elements:

- temporary site office, portaloo toilets, facilities for staff, and car-parking areas;
- crushing and storage areas for construction materials;

- bunded containment areas for plant refuelling which will only be permitted within the compounds,
- maintenance area for construction vehicles and plant;
- wheel wash area for construction vehicles and plant with water capture and settlement to prevent the spread of invasive species;
- storage of fuels, oils, lubricants, solvents, and site generators;
- a dedicated waste storage area for any construction waste generated. Skips or bays will be provided for recyclable material;
- wheel wash area for delivery vehicles (or road cleaning to be carried out as an alternative subject to UL, IDA and LCCC requirements).

Temporary compounds and a working area will be required during the construction period to accommodate workforce and vehicle movements, stockpiling of excavated material, and the construction (and removal where required) of haul roads. For each compound the top-soil and sub soil will be removed and mounded on the compound footprint, a geotextile layer will be laid across the entre area, imported fill (40mm crushed rock) will be spread across the area, and the compounds will have a temporary fence set up on their boundary.

Provision has been made for four temporary compounds with areas typically measuring 40m x 40m but these dimensions will be adjusted to suit site conditions and avoid tree felling. There is one temporary working area proposed in Castletroy wastewater treatment plant (WwTP) to set up a crane to lift in prefabricated concrete and steel sections associated with Bridges 2 and 3. Each of the compounds facilitate access to the five different sections of the proposed Greenway. Sectioning of the route in this way will allow part of the existing path to remain open for the public while works are being carried out in other sections. Refer to Figure 3-134.

Each temporary compound and working area will be removed after works in each section are completed and the area will be reinstated back to its original state.

Upon completion of sections of the Greenway, the temporary construction compounds and haul roads will be decommissioned, and the grounds will be reinstated to their original condition. Where possible, hardstanding materials removed will be reused in the construction of other temporary compounds and used in the construction of the base layers of the proposed Greenway project.

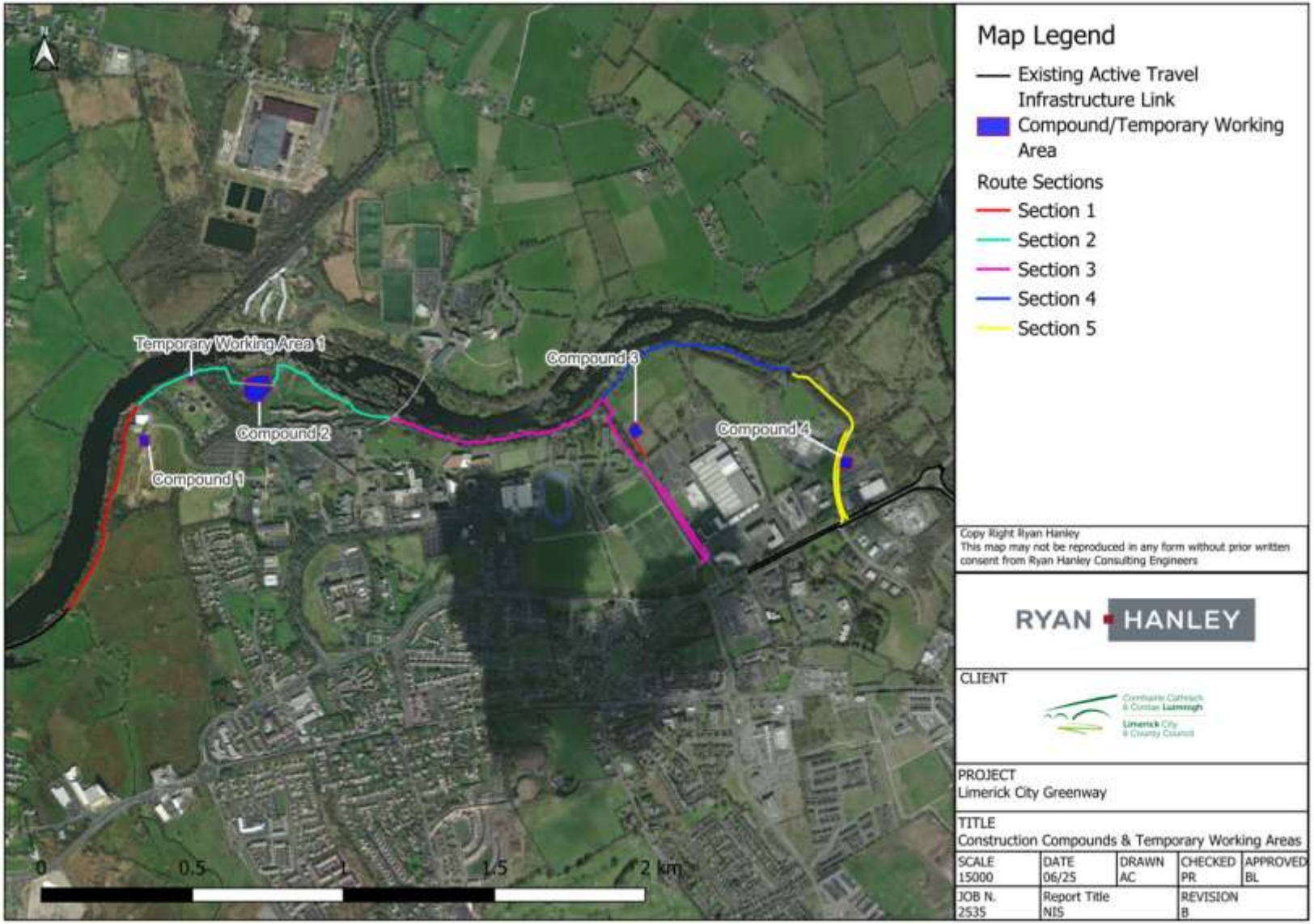

Figure 3-134: Proposed Sections, Compounds and Temporary Working area

3.4.4. Haul roads

Haul roads are required to facilitate the construction of the proposed Greenway. Haul road will be developed in green fields, scrublands, tree felling areas, and along existing gravel paths to enable construction vehicle movements. The haul roads will form the sub-base layer of the proposed path. Approximately 3.6km of haul roads will be developed along the proposed route as per Table 3-1.

Table 3-1: Lengths of Haul Roads per Section

Section Ref.	Haul Roads (m)
Section 1	736
Section 2	1005
Section 3	845
Section 4	725
Section 5	284
Total Length	3,595

The haul roads for construction vehicles will be developed along the route of the proposed path so the tarmac finished layer can be laid onto the haul road. The haul road will be approximately 3.5-4.0m wide and will comprise of the subbase layers of the proposed path: a geotextile layer, and crushed rock (UGM A). The depth of the subbase layer will generally be 300mm – 450mm depending on the ground conditions of the area and the haul roads will be laid in sections as the construction of the Greenway progresses.

Approximately 313m of temporary haul roads which do not lie along the proposed path will be constructed to facilitate access between the compounds and the works areas in each section. These haul roads will be removed after works in each section are completed and the area will be reinstated back to its original state.

Temporary haul roads will be constructed by excavating topsoil and subsoil and laying geotextile and aggregate/blinding (UGM A). The soil will be stored temporarily if it is required for reinstatement or will be permanently mounded and reseeded if it is not required for reinstatement. The haul roads will be laid in sections as construction of the path progresses.

On completion of sections of the proposed Greenway, the temporary haul roads will be removed, and materials will be reused in subsequent sections as the works advance, or the UGM A material, 55mm binder course and 20mm surface macadam course will be laid above the haul roads in greenfield areas. Lath edging (50 x 75mm) will be laid at both side of path attached to stakes located at 900mm c/c.

3.4.5. Earthworks

There will be no excavation required for the proposed Greenway along existing tarmac or gravel paths. To protect trees alongside the path a 'Cellweb®TRP' tree root protection system (or equivalent) will be laid onto the existing path and imported material (i.e., crushed rock and gravel to UGM A, overlaid with tarmacadam) will build up the level of the path. The sloping banks on the river side and the Plassey Mill Race will also have a 'Cellweb®TRP' system (or equivalent) to enable plant regrowth along the bank. Refer to Figure 3-135 for an example.

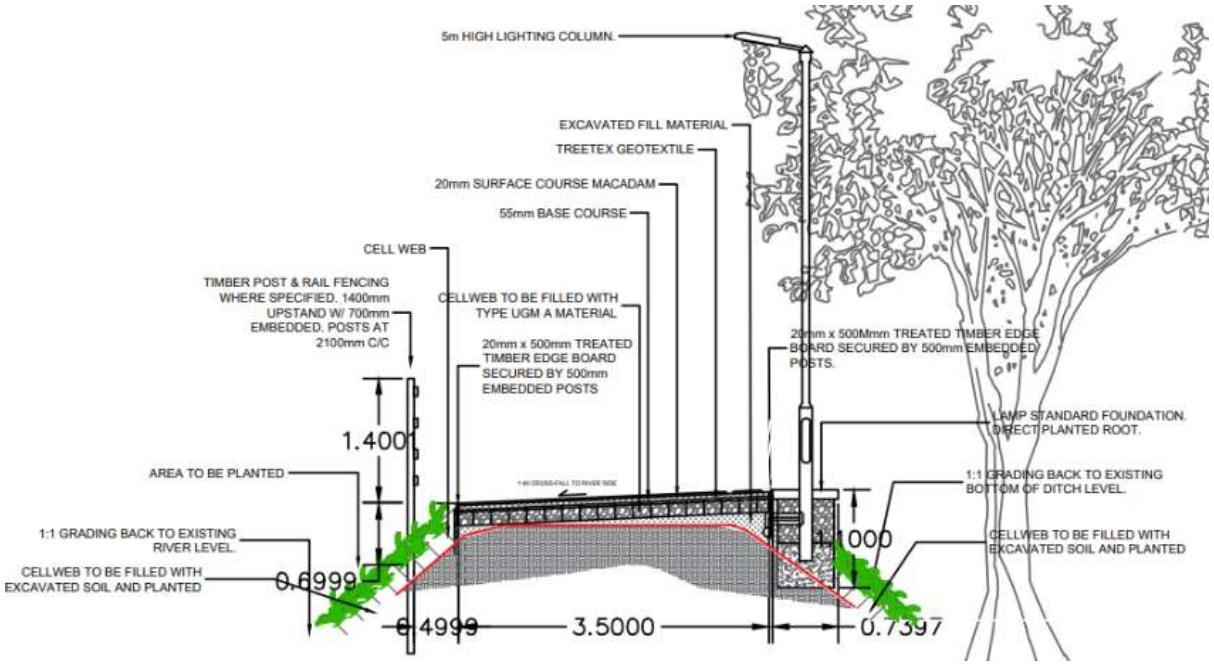

Figure 3-135: Tree root protection along proposed Greenway (Red line is existing ground level)

Excavation of topsoil and subsoil will be required where the proposed path passes through green field areas. Approx. 300mm depth of soil will be excavated and permanently left as a mound to be reseeded approximately 0.75m high and 2m wide on the river side of the path. Soil from areas that were contaminated with invasive species will be wrapped in plastic and buried under excavated soil. This accords with the project objective to ensure at least 95% of all waste is kept on site and not sent to a landfill.

Excavation of the carriageway, green verge, and footpaths will be required along University Road and McLaughlan Road to build up the concrete footpath and tarmac cycle lanes. A raised kerb will separate the existing roads from the proposed cycle lanes.

3.4.6. Testing of Imported Material

Clean Type UGM A fill material is required to be imported into the work site. To prevent cross contamination or pollution, a suite of testing from the source quarry will be required because the proposed Greenway is adjacent to water.

3.4.7. Traffic Management

A *Draft* Traffic Management Plan has been prepared for the proposed works and consultation has been carried out with UL Facilities and Uisce Éireann. The traffic management proposals have been presented to elected representatives. Construction and works delivery traffic will use the following existing roads/routes:

- The entrance road to the Castletroy WwTP;
- The road across the bridge to Co. Clare;
- University Road;
- McLaughlan Road;
- Plassey Park Road.

3.4.8. Construction of Greenway

Construction works should take place during daylight hours only with no temporary lighting on the site during the hours of darkness. Works shall only be carried between 08:00-18:00 during daytime hours

or between dawn and dusk to minimize disturbance to nocturnal Qualifying Interests species. Motion detection sensors to turn on lights were considered but have not been proposed because the existing path is well used by the public so the use of always on lights from dusk until 23:00 hours is preferred over lights turning on and off, and risking the creation of a strobe light effect for nocturnal Qualifying Interests species.

During construction, noise limits, noise control measures, hours of operation and selection of plant items will be considered in relation to disturbance of birds. Plant machinery will be turned off when not in use.

The design and construction of the 4.25km long and 3.5-4.0m wide shared path, 1.5-2.0m wide footpath, and 1.8-2.0m wide cycle lanes has been carried out in accordance with the following:

- Transport Infrastructure Ireland (TII) Rural Cycleway Design DN-GEO-03047 (2022);
- Department of the Transport and Department of Housing, Local Government and Heritage, Design Manual for Urban Roads and Streets (DMURS, 2023);
- National Transport Authority's Cycle Design Manual (2023); and,
- Department of Transport, Tourism & Sport document Traffic Signs Manual (TSM) (2019).

Construction of the path will be carried out in sections. The sequencing of works per section is flexible. Each section will be reinstated before works commence in the next section. Existing users of the gravel track along the River Shannon will be directed around each section and there are existing footpaths and cycle lanes in the UL campus and along Plassey Park Road to accommodate diversions.

Isolation of the works area, including erection of fencing around the temporary works area and traffic management will be set up as required. The fenced area will include the full area required to facilitate the works including the temporary site compounds and the temporary haul roads.

Construction of the Greenway along the existing gravel path in wooded areas will involve the installation of lath edging (50 x 75mm) at both sides of the proposed path attached to stakes located at 900mm c/c, laying a 150mm thick root protection material onto the gravel track, filling this with UGM A material, laying a 55mm binder course onto it and finishing with 20mm surface macadam course;

Construction of the path along the existing gravel path in non-wooded areas will involve the installation of lath edging (50 x 75mm) at both sides of the proposed path attached to stakes located at 900mm c/c, laying 150mm of UGM A material directly onto the existing gravel path, laying a 55mm binder course onto that, and finishing with 20mm surface macadam course;

Where the path is being laid in an area with an existing tar pavement (i.e., along University Road and McLaughlan Road, the top 250mm of the existing surface will be removed and subsequently the depth of the subbase layer in these areas will be reduced to approximately 180mm.

Storage of other excavated material will be on a temporary basis, on site within the temporary works area and separate from the topsoil storage. Excavated material will be reused on-site, primarily for backfilling against new bridge abutments and the proposed retaining wall at Plassey Beach. This material will be classified as a construction by-product in the context of Article 27 of the European Communities (Waste Directive) Regulations. If there is any surplus excavated material, it will be transported off site to an authorised waste or recovery facility. Large volumes of excavated material will not be allowed to accumulate within the temporary working areas.

The construction works for reinforced abutment walls, retaining walls, concrete culverts, open drains will be carried out in parallel with the path construction.

The construction works for lighting column foundations and trenches for ducting will be carried out in parallel with the path construction. To protect the tree roots, ducts will be moled to a minimum crown depth of 600mm wherever the ducts pass mature trees.

Additional works including the installation of; signage, safety barriers, fencing, park benches and tree planting will be completed along the path prior to reinstatement of works area and the works area being reopened.

The works area will be reinstated to its original condition. This will involve levelling, raking, and seeding with grass.

3.4.9. Construction of Bridges, Retaining wall, Ramp

The five bridges on which the proposed path will cross existing drains, a stream, and the Plassey Mill Race (at two locations). These are as follows:

- A 4.9m long single span, steel frame bridge and new concrete abutments will be constructed for both pedestrians and cyclists at CH795;
- A 9.6m long single span steel bridge and 41m of concrete retaining wall and abutments will run adjacent to an existing stone footbridge at CH970;
- A 5.4m long single span, steel frame bridge for both pedestrians and cyclists will be constructed on existing cut stone abutments at CH1000;
- A 5.1m long single span, steel frame bridge for both pedestrians and cyclists will be constructed on existing cut stone abutments at CH1045;
- A 12.9m long single span, steel frame bridge for both pedestrians and cyclists will be constructed on new concrete abutments and obliquely cross the Plassey Mill Race at CH2220-2235. 28m of concrete abutments will support the 12.9m long steel deck;
- A new 12m long concrete retaining wall will be constructed at Plassey Beach;
- A new fully accessible 20m long ramp at a 3% slope will be constructed at Plassey Beach to provide access from the proposed Greenway to the beach for all users.

Construction of the new bridges will take place as follows:

- Temporary works will be put in place including silt barrages, and temporary flumes will be installed to manage overland drainage water.
- To prevent pollution to the adjacent stream and river bio-degradable hydraulic oils are to be used in machinery, and spill kits shall be ready on site for immediate use.
- Works beside streams will be restricted as a result of the spawning season for salmonids so work will not be carried out during Nov-March.
- Biosecurity management for in-stream works will be strictly monitored. With the presence of Giant hogweed (*Heracleum mantegazzianum*) and Himalayan balsam (*Impatiens glandulifera*) along the path route, regular cleaning of machinery to prevent spread of non-native species is very important.
- The foundations and abutment walls will be excavated down to formation level. Excavated material will be stored on site for reuse as backfilling. Formwork will be erected, and aggregate and blinding will be tamped into place. Reinforcement bars will be placed into the formwork and concrete will be poured in using a concrete pump crane. After the required curing time has passed the formwork will be removed.
- The new bridges will be constructed using prefabricated steel frames that will be placed and fixed *in situ* onto the concrete abutments or onto the existing cut stone abutments. Steel frames will be delivered to the construction compound by truck, and then transported to the proposed

crossing location by digger. The steel frames will be swung into place using a crane or digger and placed and fixed by hand.

- The annulus between the new structures and the excavated areas will be backfilled with excavated material (and topped up with imported material if required), the area will be reinstated, and the section will be reopened.

3.4.10. Drainage infrastructure

A Flood Risk Assessment for the proposed greenway has been completed. The following figures illustrate the potential temporary impact that 1 in 100 year and 1 in 1000 year floods will have on the proposed Greenway, and demonstrates why a new drainage network of land drains and culverts will be required to convey surface water to the River Shannon after flood events. Maintenance of this drainage infrastructure by LCCC will be required.

Figure 3-136: Past Flood Events OPW database (www.floodinfo.ie)

Flood Mapping developed by the OPW CFRAM programme confirms that appreciable lengths of the proposed Greenway are in Flood Zone A (2.36km) and Flood Zone B (2.77km) associated with the River Shannon and its tributaries scheme floodplains.

Portions of the existing paths and the proposed greenway are below the 10% AEP flood level.

The proposed scheme, being an "Amenity open space, outdoor sports and recreation" facility, is classed as a Water Compatible development in the OPW Planning System and Flood Risk management Guidelines, and therefore is an appropriate development for both Flood Zone A and B.

A justification test for the development in accordance with the Flood Risk Management Guidelines, further confirmed that the proposed development is appropriate albeit with mitigations. The Greenway track should be constructed to be water compatible, i.e. one which is resistant to damage caused by flooding and prolonged inundation, e.g. sealed surface, appropriate drainage etc.

Figure 3-137: November 2009 River Shannon Flood Event at UL campus in Co. Limerick on left hand side, with UL campus in Co. Clare on right hand side of figure, OPW database (www.floodinfo.ie)

Figure 3-138: Sections of Greenway at Flood Risk (1 in 100 or 1% AEP)

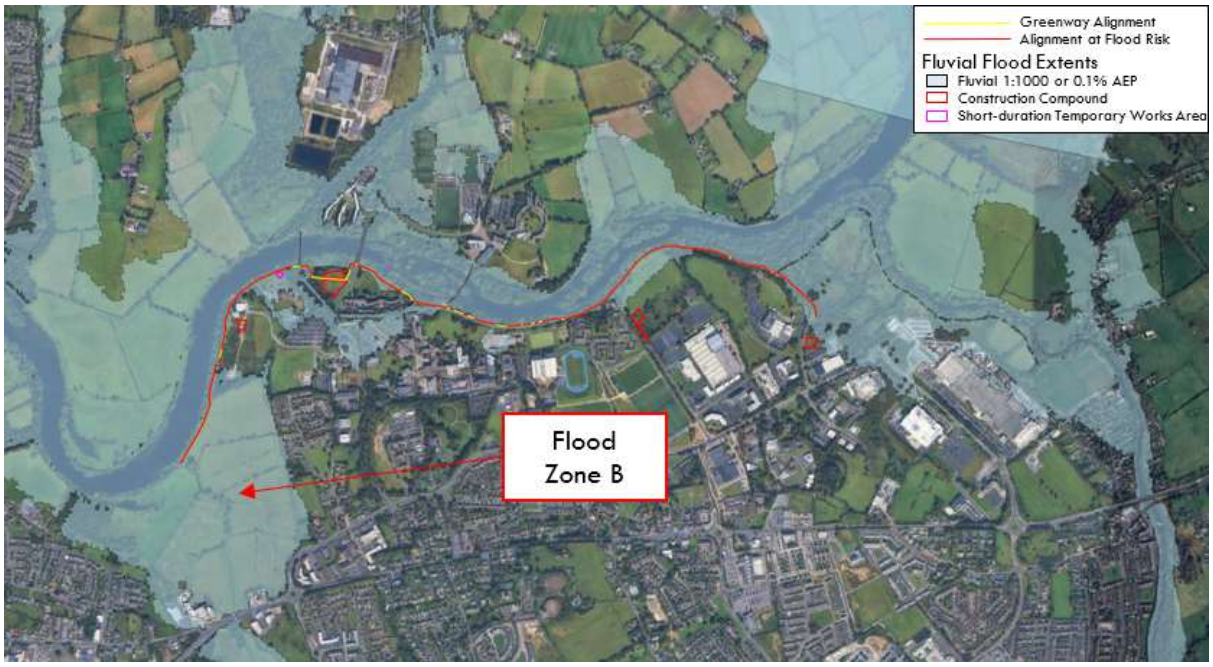

Figure 3-139: ***Sections of Greenway at Flood Risk (1 in 1000 or 0.1% AEP)***

Surface water will be managed through a series of existing open drains alongside the proposed Greenway and existing culverts under existing paths, proposed open drains alongside the proposed Greenway, and new culvert pipes under the proposed path.

There will be 5 No. box culverts constructed in existing drainage channels where the proposed Greenway will cross it. Four are new culverts and one is a replacement culvert. They will have a minimum diameter of 0.9m and range up to 2.0m cross sectional diameter (exact diameters to be confirmed after completion of the Section 50 assessment).

22 No. precast concrete culvert pipes of 0.5m diameter and 6-8m in length and associated headwalls will cross under the proposed Greenway path at 100m intervals where there are no existing culverts. The purpose of these culverts is to enable groundwater which collects in the open drains alongside the path to be discharged to the rivers. The open drains will be shallow, approximately 1.0m wide and 200mm deep. The drains will collect storm water flows from the proposed path and runoff from the hilly green field in the IDA's National Technology Park. Water will flow in the drains to the 22 No. culverts and pass under the proposed path.

Following flood events there is a risk of debris in the minor watercourses culverts and drains pipes. Post flooding maintenance to clear the culverts of debris will be required by LCCC.

3.4.11. Public Lighting

The Public Lighting design for the proposed project will use best practice guidance notes "*Bats and artificial lighting in the UK*" as published by the Bat Conservation Trust, in respect of mitigation strategies, to minimise the impact of outdoor lighting upon bat populations. The LCCC Public Lighting standard has also been followed.

There will be new public lighting along the shared path which follows the south bank of the River Shannon for approximately 3km.

Public lighting will be controlled by light sensors so their turn on time will vary during the calendar year and turn on after dusk, but lights will turn off at 23:00 hours.

Light emitting diodes (LEDs) type lanterns of the cool white type in accordance with the LCCC Public Lighting standard will be installed. They will have a Colour Temperature of 2,700°Kelvin, because it is considered less disruptive to the emergence of bats from roosts at dusk, and subsequent movement from habitats to foraging locations.

LED lanterns do not emit any ultraviolet or infra-red radiation, this again being a desirable feature in relation to impact upon bats, in terms of causing spatial exclusion from artificially lit areas.

Light levels have been kept as low as possible (P4 Class) by reference to levels specified in "Design of road lighting' - BS EN 5489-1: 2020, and these will be in accordance with the LCCC Public Lighting standard.

There will be two lighting columns; 1.6m high and 5m high. The 1.6m high lighting column will have an integrated lantern that will point directly onto the path, and they will be spaced 5m apart (Refer to the Preliminary design drawing 2535-RHA-XX-DR-C-PD-0016 for a photo of an equivalent lighting column). The Lanterns on 5m high columns will be mounted at 0° degree tilt and will be the fully cut off type with no light output above the horizontal plane. The 5m high lighting columns will be spaced approximately 35m apart to avoid siting lighting columns near mature trees with roost potential and the 1.6m high columns shall be used if there are any signs of bats in an area. The 1.6m high columns will be used in the Annex 1 Alluvial forest area.

Cable ducts for the public lighting will be installed by open trench to minimum 300mm cover in areas where no trees or tree roots are present, and by Moling technique in areas with trees. The moling will allow cable ducts to be installed to a minimum depth of 600mm so the cable ducts will pass under tree roots and protect them from damage.

Any temporary lighting required for health or safety reasons during the construction period shall be installed at a minimum of 10 metres from existing treelines and woodland habitats and directed away from such sensitive habitats.

3.4.12. Interface with roads

The proposed Greenway will interface with existing roads at several locations along the route. The features which define interfaces with roads relate to improving the safety of pedestrians, cyclists, and motorists where they interact. In addition to sign posting and path markings/decals, the following features have been included as safety measures at the interfaces with roads.

i) Tactile paving

Tactile paving will be installed on a footpath wherever a footpath crosses a road at road level and at raised tables to provide warning of approaching traffic for the visually impaired.

ii) Toucan Crossing

There will be 1 No. new Toucan crossing on Plassey Park Road to replace the existing raised table.

iii) Kerbs

Raised kerbs will run parallel to the proposed cycle lanes to provide a physical separation between the road and the proposed Greenway. At junctions, the proposed raised kerbs will transition to dipped kerbing to facilitate smooth for vehicles from the carriageway across the proposed cycle lanes and footpaths.

iv) Raised Tables

Alongside University Road, there will be raised tables crossing the road entrance into Kilmurry Village and the northern entrance to the UL Gaelic pitches. There will be raised tables at the southern part of McLaughlan Road. These raised tables will maintain a consistent level of the footpath and the cycle lanes where they cross a road, or a junction, and will signal traffic to slow down and check oncoming walkers and cyclists.

3.4.13. Road Markings

Cycle track markings will be carried out in line with Traffic Signs Manual, Chapter 7 – Road Markings – Department of Transport, Tourism & Sport (2019).

There will be decals on shared surfaces illustrating the side of the path that cyclists and walkers should adopt at transitions from shared surface paths to separated cycle lanes and footpaths.

3.4.14. Signage

There will be directional signs along the 4.25km of the proposed route. Existing signs along the proposed route will be retained. Refer to Figure 3-7 for a photo of an existing directional sign on the existing path.

Directional signage for the Greenway will be erected at the approach to junctions and interfaces with roads, and where the path splits into separate cycle lanes and footpaths. There will be signs to University Road, McLaughlan Road, Plassey Park Road, and at all the interface locations in the UL campus where the proposed path leads to other existing cycle lanes or interfaces with roads.

Speed control signs will be erected to remind cyclists to manage their speed and be mindful of other path users.

All signage will be clear and consistent and will be designed in accordance with the Department of Transport's 'Traffic Signs Manual'.

3.4.15. Information boards

Information boards will be erected at areas of interest including Plassey Beach and Plassey Mills. The information boards will include information about ecology (i.e., flora and fauna and biodiversity) and built heritage (architecture and/or structures of architectural or heritage importance).

3.4.16. Fencing

There will be 1.4m high timber post and rail fencing to Transport Infrastructure Ireland (TII) standard detail CC-SCD-00301 which will be erected at locations along the path including:

- Where the proposed Greenway runs adjacent to or crosses water
- Where the proposed Greenway approaches bridges or retaining walls;
- Where there is a ditch or steep slope adjacent to the path;
- At junctions;
- At sections of the boundary with UL;
- Along the boundary with private landowners; and,
- Along the boundary with the National Technology Park.

There will be 1.45m high corten steel fencing along the parapets of the proposed steel bridges and along the approaches to the existing stone bridges and cut stone abutments.

There will be 2.4m high anti-climb palisade fencing erected along the south-eastern boundary of Kilmurray Student Village and outside the commercial property BD-RCI Limerick on University Road to match the existing fence.

3.4.17. Amenity/Rest area Benches

Green Oak and corten steel benches will be installed in the amenity areas at Groody Bridge, Plassey Mills and Plassey Beach.

3.4.18. Construction Programme and sequencing

The construction duration for 4.25km of the proposed Greenway is approximately 30-60 months with works being carried out in one section at any one time. Sequencing of work in any of the five sections is flexible.

The works will be subject to ecological programme constraints as follows:

- Foreshore works (include preparatory work) beside all watercourses supporting salmonids shall be undertaken from May to October (inclusive) and in consultation with Inland Fisheries Ireland (IFI) to avoid accidental damage or siltation of spawning beds.
- To avoid impacting on bird nesting sites, the vegetation removal within the defined working area will not be carried out during the peak bird nesting season of March to August (inclusive) prior to the onset of works.
- Invasive species along the proposed greenway should be treated and removed prior to construction works.

3.4.19. Reinstatement works

The temporary working areas and compounds will be reinstated to their original condition following completion of the construction phase in each section.

Tree planning is proposed alongside the Greenway to compensate for tree felling along the route. For every tree that is felled, there will be five trees planted to compensate, so approximately 305 trees are proposed to be planted along the proposed Greenway.

3.4.20. Post construction Maintenance

Adherence to best practice codes such as the "Code of Best Practice for National and Regional Greenways" ensures that a continuously high standard of the proposed Greenway is provided for all users. LCCC be responsible for the upkeep and maintenance including litter control and invasive species management through ongoing maintenance plans.

4. Environmental Management

4.1 Introduction

The following sections give an overview of the construction management, waste management and invasive alien species control plans for the proposed works.

4.2 Construction Management Plans

A suite of construction management plans will be prepared by the appointed contractor to be incorporated into the detailed CEMP. These management plans be bound by the mitigation measures identified within this CEMP, NIS and associated documents and will reflect the requirements of the relevant consent applications (including planning) and any conditions by the Consenting Authority in advance of the final contract signing. The Construction Management Plans will comply with all requirements identified and include the topics listed in Sections 4.2.2 to 4.2.8 as a minimum.

4.2.1. Prevention Pollution Control Measures

The following measures will be put in place to prevent the transportation of potential silt laden water or pollutants from entering any of the drains and /or watercourses in the vicinity of the site or any of the wider environments including downstream watercourses.

- Excavation works will not take place during periods of high rainfall, and shall be scaled back or suspended if heavy rain is forecast;
- There will be no release of suspended solids to any watercourse as a direct or indirect result of the proposed works;
- Any requirement for temporary fills or stockpiles will be damped down or covered with polyethylene sheeting as required to avoid sediment release associated with heavy rainfall;
- Prior to the commencement of groundworks, silt fencing will be erected on the northern and eastern sides of the project site to prevent any runoff from the perimeter of the site. These will be embedded into the local soils to ensure all site water is captured and filtered; and
- Ground disturbance should be kept to a minimum, water from excavations should be filtered. Exposed surfaces should be re-vegetated as soon as possible following construction.

4.2.2. Dust Control

The '*Dust Minimisation Plan*' will be based on the industry guidelines in the Building Research Establishment document "*Control of Dust from Construction and Demolition Activities*."

The generation of dust and particulate matter is dependent on the construction activity being carried out and environmental factors such as rainfall, wind speed and wind direction. A worst-case scenario has been assumed in the assessment. In order to predict and reduce the volume of dust emissions pertaining to the construction phase of the proposed development, a dust minimisation plan has been developed and is included in the Construction Environmental Management Plan (CEMP). The construction works boundary is described in Section 2 of this CEMP, detailed in Chapter 4 of the EIAR and associated project drawings provided in Appendix 4A of the EIAR.

The following measures will be implemented in order to minimise dust impact:

- All site roads within the construction works boundary shall be regularly inspected, cleaned and maintained during the construction phase.
- Hard surface roads within the construction site boundary shall be regularly cleaned and dampened down to prevent the generation of dust;

- Any road that has the potential to give rise to dust emissions must be regularly inspected and watered during periods of dry and/or windy weather to minimise the movement of dust particles to the air and ensure that dust does not cause a nuisance;
- Speeds shall be restricted on hard surface roads and vehicles transporting materials with dust potential must ensure that the material is enclose or covered with tarpaulin at all times;
- The construction traffic routes as identified in Chapter 12 of the EIAR, shall be regularly inspected for cleanliness and cleaned as necessary to minimise the movement of dust particles to the air, as detailed in the CEMP;
- The dust minimisation plan shall be reviewed at regular intervals during the construction phase to ensure that best practice and procedures are in place to minimise dust emissions;
- All plant and materials shall be stored in dedicated compound areas on site;
- Stockpiling of material will be minimised, and stockpiles will be covered or fenced to prevent wind whipping. Materials which have the potential to produce dust will be removed from site as soon as possible;
- In the event of dust nuisance occurring outside the site boundary, movement of materials must be terminated immediately, and procedures implemented to rectify the problem; and
- A record of all dust and air quality complaints will be maintained, along with details of the cause of emissions and the measures implemented to reduce emissions. All records will be made available to LCCC.

4.2.3. Noise & Vibration Control

The potential noise impact of the proposed development on the surroundings will occur during the construction phase, much of which will be generated by construction plant and machinery.

There is no published statutory Irish guidance relating to the maximum permissible noise level that may be generated during the construction phase of a project. Local authorities normally control construction activities by imposing limits on the hours of operation and consider noise limits at their discretion. The majority of the construction activity is expected to occur during normal working hours.

The following documents contain guidance in relation to acceptable noise control on construction sites:

- British Standard BS 5228 – 1: 2009+A1:2014: Code of Practice for Noise and Vibration Control on Construction and Open Sites: Noise;
- British Standard BS 5228-1: 2009: Code of Practice for Noise and Vibration Control on Construction and Open Sites Part 2: Vibration; and
- National Roads Authority (NRA) Guidelines for the Treatment of Noise and Vibration in National Road Schemes (2004);

In the absence of specific noise limits, criteria relating to permissible construction noise levels for a development of this type may be found in the abovementioned documents and is summarised below.

BS 5228-1:2009 *Code of Practice for Noise and Vibration Control on Construction and Open Sites: Noise* sets out a procedure for determining the impacts of construction noise on surrounding receptors. **Table 4.1** sets out the threshold noise levels (L_{AEQ}) as set out in the Standard. The Standard recommends that total noise levels during construction should not exceed the threshold levels.

Table 4.1 Noise Threshold Levels determined in accordance with BS 5228-1:2009+A1:2014

Assessment Category and Threshold Value Period (L_{AEQ})	Threshold Value (dB)		
	Category A	Category B	Category C
Monday to Friday 07:00 to 19:00hrs Saturdays (07:00 – 13:00)	65	70	75
Monday to Friday 19:00 to 23:00hrs Saturday (13:00 – 23:00) Sunday (07:00-23:00)[i]	55	60	65
Monday – Sunday (23:00 – 07:00)	45	50	55

Note:

Category A: threshold values to use when ambient noise levels (when rounded to nearest 5 dB) are less than these values

Category B: threshold values to use when ambient noise levels (when rounded to nearest 5 dB) are the same as Category A values

Category C: threshold values to use when ambient noise levels (when rounded to nearest 5 dB) are higher than Category A values

The NRA (now known as Transport Infrastructure Ireland or TII) Guidelines for the Treatment of Noise and Vibration in National Road Schemes (2004) also recommends threshold noise levels for the construction phase of road projects. **Table 4.2** indicates the maximum permissible noise levels at the facade of dwellings during the construction period as recommended by the NRA (Now TII). These limits are widely applied in Ireland to construction projects.

Table 4.2 Maximum permissible noise levels at the facade of dwellings during construction

Days and Times	Noise Levels (dB re. $2x10^{-5}$ Pa)	
	$L_{Aeq(1hr)}$	L_{Amax}
Monday to Friday 07:00 to 19:00hrs	70	80
Monday to Friday 19:00 to 22:00hrs	60*	65*
Saturdays 08:00 to 16:30hrs	65	75
Sundays & Bank Holidays 08:00 to 16:30hrs	60*	65*

***Note:** Construction activity at these times, other than that required for emergency works, will normally require the explicit permission of the relevant local authority.

Based on the above, Table 4.3 suggests noise limits considered suitable for the construction of the proposed development. Given that the majority of receptors are located adjacent to local access routes, streets and roads, the Category B levels from Table 4.1 have been applied along with the TII (formally NRA) guidance levels. The threshold values specified in Table 4.3 should be adopted as the noise criteria at receptors

Table 4.3 Suggested noise levels at receptors during construction based on BS 5228:2009 and TII (formally NRA) Guidance

Days and Times	Noise Levels (dB re. $2x10^{-5}$ Pa)	
	$L_{Aeq(1hr)}$	L_{Amax}
Monday to Friday 07:00 to 19:00hrs	70	80
Monday to Friday 19:00 to 23:00hrs	60	65
Saturdays 07:00 to 16:30hrs	65	75
Sundays & Bank Holidays 07:00 to 23:00hrs	60	65
Night-time 23:00 to 07:00	50	60

The TII (formally NRA) guidelines from 2004 detail the permissible vibration levels during construction phase for national road schemes and it is generally accepted that vibration from construction activities will be limited to these values as outline in Table 4.4 below.

Table 4.4 *Allowable Vibration During Construction Phase*

Allowable vibration (in terms of peak particle velocity) at the closest part of sensitive property to the source of vibration, at a frequency of		
Less than 10Hz	10 to 50 Hz	50 to 100Hz (And above)
8 mm/s	12.5 mm/s	20 mm/s

In order to sufficiently improve the likely noise and vibration impacts from the proposed works, a schedule of noise and vibration control measures has been formulated for the construction phase. Best practice measures for noise control will be adhered to onsite during the construction phase of the proposed project in order to mitigate the potential temporary slight to significant negative impact associated with this phase of the Project. The measures include:

- All construction operations shall comply with guidelines set out in British Standard documents '*BS 5228-1: 2009: Code of Practice for Noise and Vibration Control on Construction and Open Sites: Noise*,' which offers detailed guidance on the control of noise & vibration from demolition and construction activities;
- All construction operations shall comply with guidelines set out in British Standard documents '*BS 5228-1: 2009: Code of Practice for Noise and Vibration Control on Construction and Open Sites Part 2: Vibration,*' which offers detailed guidance on the control of vibration from demolition and construction activities.
- Establishing channels of communication between the contractor/developer, Local Authority and residents; inform affected residents of time of anticipated noise impact 24 hours in advance;
- Appointing a site representative responsible for matters relating to noise and vibration;
- Construction noise will be limited by prescribing that standard construction work will be restricted to the specified working hours;
- Materials will be selected taking account of the characteristics for generation of noise and/or vibration emissions from each item. All materials and machinery used on site shall comply with relevant E.U. and Irish legislation in relation to noise emissions. The timing of on- and off-site movements of machinery near occupied properties will be controlled;
- Erection of noise screening (abatement) enclosures as necessary around noisy processes and items such as generators, consaw operations, heavy mechanical machinery or high duty compressors;
- Placing of noisy/vibratory machinery as far away from sensitive properties as permitted by site constraints and the use of vibration isolated support structures where necessary;

- Training and supervision of operatives in proper techniques to reduce site noise, and self-monitoring of noise levels, if appropriate;
- Where, noise levels at noise sensitive locations (NSLs) are anticipated to exceed the daytime noise criteria, hoarding for noise abatement extending to a height of 2.4 m will be erected between the works area and the NSL. If such measures are installed, the construction operations are expected to meet or be less than the 70 dB LAeq(1hr) criterion in most cases;
- Limiting the hours during which site activities likely to create high levels of noise or vibration are permitted;
- Monitoring typical levels of noise and vibration during critical periods and at sensitive locations where noise monitoring will be conducted during construction activities that have been identified as potentially exceeding the 70 dB $L_{Aeq(1hr)}$ criterion at NSLs. Vibration monitoring will measure the maximum PPV at each location over a sample period of 15 minutes, detailed notes will be taken in relation to the primary vibration sources and measurements will be conducted at the locations on a cyclical basis over the course of a typical day.

- The following mitigation measure shall be implemented in relation to exhaust emissions during the construction phase:
    - Machinery will be switched off when not in use; and
    - All construction vehicles and plant will be maintained in good operational order.
-

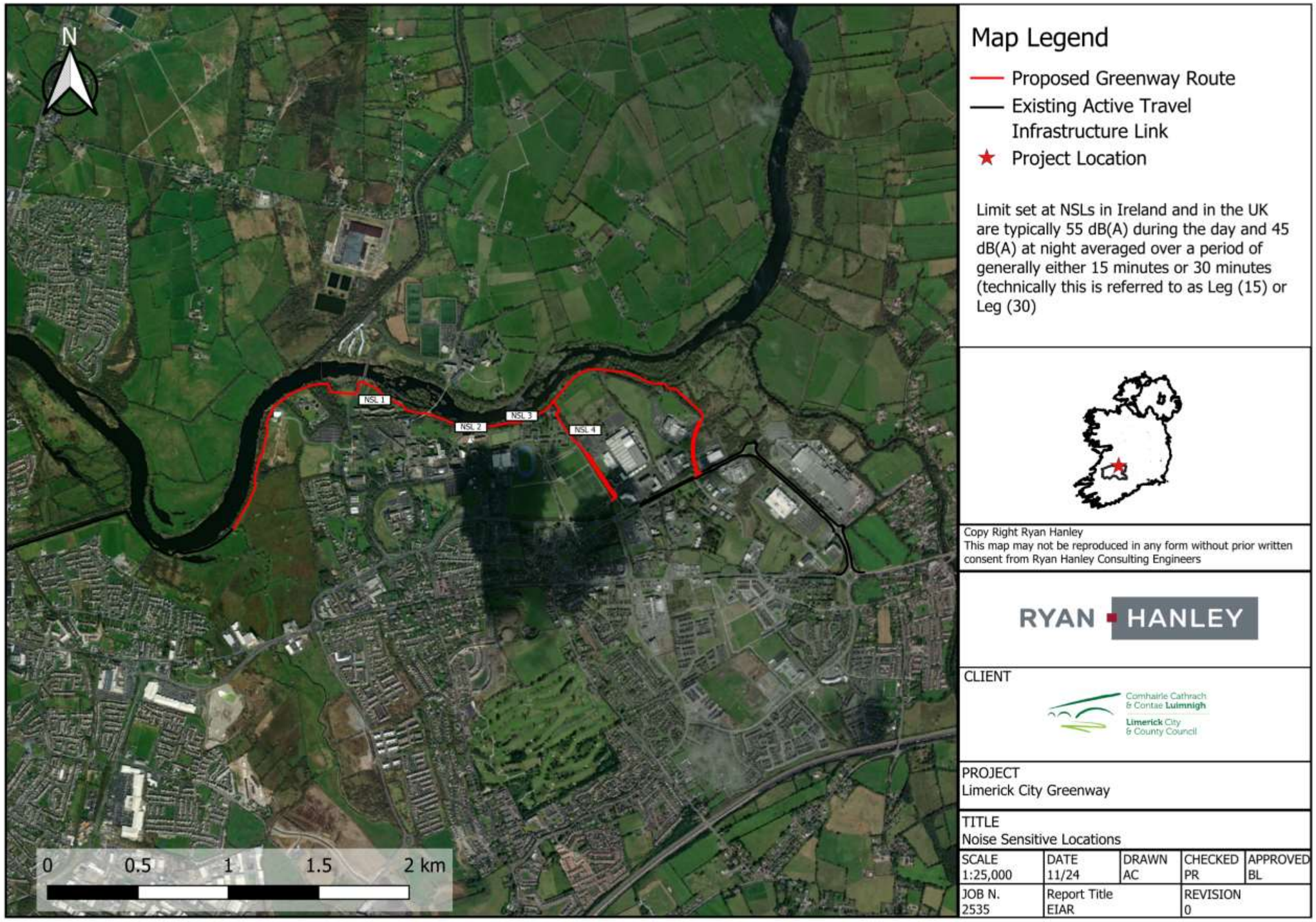

Figure 4.1 Noise Sensitive Locations (NSL) Map

4.2.4. Traffic Management

Localised traffic disruptions during the construction phase of the proposed development will be mitigated through the use of industry standard traffic management measures. These measures will be designed in accordance with the '*Guidance for the Control and Management of Traffic at Roadworks – Second Edition*' (Dept. of Transport; Road Safety Authority of Ireland – 2010).

A design stage Traffic Management Plan (TMP) with detailed drawings has been developed in advance of the construction phase which provides a basis for the management of traffic during the execution of the works by the contractor incorporating road disruptions, diversions and/or closures where necessary.

Local access will be maintained where possible throughout construction phase of the various sections of the Greenway with diversionary routes as detailed Chapter 13 of the EIAR. Any Increased vehicular activity during construction phase will be managed by the Traffic Management Plan

- Construction works will be sequenced so as to avoid unnecessary interruption to road users insofar as is practicable;
- All residents and interested parties shall be consulted when planning these road closures to optimise the timing of same;
- A complete schedule of road closures will be published in advance of the works commencing to facilitate residents in making alternative arrangements where necessary; and
- All road closures will be agreed in advance with LCCC and implemented as per conditions set out in Traffic Management Plans and Road Opening Licences.

All excavations on roads will be temporarily reinstated - with a permanent reinstatement to follow after 6 months - as per the following guidance:

- Guidelines for Managing Openings in Public Roads (April 2017) – for Local and Regional Roads.; and
- Requirements for the Reinstatement of Openings in National Roads (TII, May 2019) – for National Roads.

The following mitigation measures will also be required.

- Road signage on the public road network must comply with the Department of the Transport's Traffic Signs Manual "*Chapter 8 - Temporary Traffic Measures and Signs for Roadworks";*
- The contractor shall provide general condition and structural surveys of all transport infrastructure (roads, bridges, access tracks) on all routes, including haulage routes, that may be impacted as a result of the proposed scheme before works commence on site and after completion and provided to the relevant PSDP engineer;
- Site entrance locations from public roads may require a durable bound surface;
- Secure and visible junctions must be developed between access roads and public roads;
- A durable bound surface is required on access roads for a minimum distance of 10m from the public road;
- Adequate drainage to be maintained at all times to ensure that no surface water from the site or site access discharges to the public roads; and
- Cleaning regime for plant to be implemented in order to minimise mud/dust or other contaminants on public roads.

4.2.5. Water Quality and Soil

A '*Pollution Prevention and Control Management Plan*' will be put in place. The Plan will include the requirement for the best practice and adherence to Irish guidelines or international guidelines where relevant. This plan will

be included as part of the detailed CEMP and will include mitigations specified within the environmental reporting prepared for the project.

Material storage and handling measures will be implemented to contain potential sources of soil/groundwater pollution. Contractors will ensure that spill kits will be always accessible to construction personnel and all spills will be reported to the site environmental manager.

All contractors shall be responsible for ensuring the following measures (as well as measures specified in NIS and any relevant Environmental Management Plans) are adhered to implemented, monitored and audited:

- Engagement of an Ecological Clerk of Works (ECoW) to supervise the proposed works and implement the recommended mitigations, toolbox talks, surveys of the bankside and all areas where bank side work is proposed as well as other duties;
- Where bank side works are proposed, excessive ingress of sediment into the watercourse should be prevented where possible. Sediment barriers such as sediment netting/fences or silt traps should be used to temporarily trap sediment to prevent sediment transport into the river;
- Bankside works should be undertaken at times of good weather and low flow in the River where there is no potential for the works area to become inundated with water and no potential for significant volumes of surface water runoff from the works area;
- All works undertaken on the banks should be fully consolidated to prevent scour and run off of silt. Consolidation may include use of protective and biodegradable matting (coirmesh) on the banks and also the sowing of grass seed on bare soil;
- Dewatering of any excavation will be undertaken as necessary. In the event that dewatering pumps and silt filtration systems are required then they will be positioned in strategic locations adjacent to the excavation;
- Temporary or permanent loss of riparian and marginal habitat during both the pre- and post-construction phases should be avoided;
- To prevent noise and disturbance to designated species and habitats where possible, works should be timed to avoid the key periods of sensitivity for migratory fish species. Works and construction activities should also be confined to standard daylight hours. In order to reduce disturbance to fish species, areas where bank side works are required should be accessed from the bank/ existing path;
- There will be no refuelling of machinery near the river channel. Refuelling will take place at designated locations in the site compound on an impermeable surface at distances of greater than 30 metres from the watercourse;
- No vehicles will be left unattended when refuelling and a spill kit including an oil containment boom and absorbent pads will always be on site;
- Any fuel that is stored on the site will be in a double skinned, bunded container that will be located within a designated site compound at a location that is removed from the river;
- During the construction phase site materials will be stored in temporary construction compounds in Flood Zone C area which are outside of the present-day high likelihood flood extent. Site managers should regularly consult the Met Eireann flood warnings website https://www.met.ie/warnings/today if significant flooding is expected;
- Sediment barriers such as sediment netting/ fences or silt traps should be used to temporarily trap sediment and prevent sediment transport into watercourse, at all interfaces of the works area with a waterbody in advance of construction works on the banks of the watercourse;
- Works undertaken on the banks should be fully consolidated to prevent scour and run off of silt, Consolidation may include use of protective and biodegradable matting (coirmesh) on the banks and may also the sowing of grass seed on bare soil;

- Particular care to prevent run-off of sediment or pollutants into the river should be taken at the Compound Site 1, Compound Site 2 and Compound Site 3, where their proximity to the River as having the potential for the highest surface runoff;
- All construction materials and plant should be stored in the site compounds. Compounds will be located on ground that is not prone to flooding (in Flood Zone C). A geotextile layer will be laid across the entire compound area, imported fill (40mm crushed rock) will be spread across the area, and the compounds will have a temporary fence set up on their boundary;
- Excess top-soil and sub soil will be removed and mounded on the compound footprint;
- All vehicles should be regularly maintained and checked for fuel and oil leaks; and
- Guidelines for minimizing impacts on water quality and fisheries in relation to Construction shall be implemented including, but not limited to, CIRIA C532 *"Control of water pollution from construction sites - Guidance for consultants and contractors*", Inland Fisheries Ireland (IFI) guidelines and Transport Infrastructure Ireland (TII) guidelines.

Stockpiles

- Daily monitoring of excavations and works areas by a suitably qualified person such as the Environmental Manager (EM) or the Environmental Clerk of Works (ECoW) will occur during the construction phase.
- Run-off from works, stockpile and/or compound areas will be monitored and observed daily by ECoW to ensure that it is not impacting on any local watercourses.
- Large volumes of excavated material will not be allowed to accumulate within the temporary working areas unless to be left as a permanently mound to on the river side of the path.
- Any stockpiling of soils will be confined to compound areas and runoff will be prevented by the use of a silt fence or bund
- Stockpiles will not be located adjacent to watercourses and shall be surrounded with a continuous silt fence;

4.2.6. Biodiversity

The proposed development area is of high ecological value at a local level. It is extremely important that all measures should be taken to preserve the current ecological receptors at the site and to increase biodiversity in the operational phase.

The following measures will be implemented on site for the protection of flora and fauna:

- Any measures specified within the Natura Impact Statement (NIS) and Biodiversity Management Plan (BMP);
- A suitable qualified Ecological Clerk of Works (ECoW) shall be appointed for part time attendance for the full duration of the works and will supervise all aspects of the construction of the Greenway;
- The ECoW will hold a minimum University degree in Environmental Science, (NFQ Level 8); Minimum of 5 years' post-graduate experience in ecological assessment, appraisal techniques and mitigation monitoring;
- The ECoW will be responsible for biodiversity monitoring elements and providing toolbox talks;
- The ECoW will be responsible for monitoring water quality throughout the works duration. Discrete monitoring (field and laboratory analysis) will be undertaken during all phases of the proposed works and frequency will be determined by the Water Quality Monitoring Plan to de developed before any works commence. It is essential to monitor indicator parameters that have the greatest potential to be impacted. The main concern in relation to the construction activity and water quality are potential increases in siltation and release of P and N. At least the following surface water parameters are to be tested/analysed in the field and/or in the laboratory: alkalinity (mg/l $CaCO_3$), molybdate reactive phosphorus (mg/l P), ammonia (mg/l NH_3), nitrate (mg/l N), nitrite (mg/l N), biochemical oxygen

demand (mg/l), total suspended solids (mg/l), pH, temperature, dissolved oxygen, electrical conductivity, ammonium (NH_4), turbidity. Sondes will be employed to measure turbidity in the main channel upstream and downstream of the works area during the construction stage. Sondes will be employed within the River Shannon to determine a baseline Nephelometric Turbidity Unit (NTU) value. During the construction period, alarms will trigger where there is a 20% difference between the NTU value recorded in the upstream and downstream Sondes when NTU is above its baseline value. All works will cease immediately until the source is identified and rectified (if caused by the construction works). The ECoW, project manager and contractor site manager should be contacted. If the increase is not attributed to the construction works, works will proceed.

- All personnel involved with the project shall be informed of the requirement for protection of designated habitats including the aquatic environment, i.e. Lower River Shannon SAC, and best practice methodologies to be employed via toolbox talks or formal presentation from the ECoW;
- The ECoW shall be onsite part time until all works have finished and all machinery has been demobilised and has left the site;
- The access location to the proposed works shall be clearly marked out prior to the commencement of works. No works will be permitted outside of this works area;
- Appropriate fencing shall be installed and maintained for the duration of the works to prevent the public from entering the works site;
- Clearance of vegetation shall be undertaken as early as possible prior to the commencement of works and maintained until work commences to prevent bird nesting. In the event that vegetation clearance is not possible before the commencement of works, upon agreement by the NPWS, a check to confirm the absence of nesting birds should be carried out by a suitably experienced ecologist no more than 48 hours prior to works;
- Works shall only be carried out in dry, low flow conditions. Met Eireann five-day forecasts will be monitored on a daily basis prior to works commencing and no gravel removal will be carried out during prolonged wet weather;
- Works shall be carried out during daytime hours only (08:00-18:00);
- Full Method Statements and Risk Assessments shall be provided and approved prior to the commencement of works;
- Tree roots will be protected by using non-invasive construction methods;
    - Avoidance of digging into the existing gravel track so as not to encounter tree roots;
    - Installing Cellweb®TRP tree root protection directly onto the existing gravel path and build up od subsequent path layers on it. The system allows continued water permeation and gas exchange. It is also extremely effective at spreading point loads and reducing the load that is applied to the soils beneath. This in turn minimises soil compaction, maintaining an open soil structure which allows continued gas exchange, water permeation and migration;
    - Where dense tree coverage exists along the Greenway, service ducts for the public lighting and CCTV will be installed by Moling technique which allows for trench-less installations of services without having to excavate trenches and protecting tree roots from damage; and
- The outdoor lighting scheme, designed for proposed development, has taken into account published best practice including BS EN 5489-1: 2020 to minimise the impact of outdoor lighting upon bat populations. Warm white LED lanterns are specified which are considered least disruptive to the emergence of bats from roosts at dusk, and subsequent movement from habitats to foraging locations.

4.2.7. Refuelling, Fuel and Hazardous Material Storage

The following mitigation measures will be implemented to avoid release of hydrocarbons at the site:

- Refuelling of machinery will be carried out in a contained bunded area in the temporary construction compounds on impermeable ground by trained staff and spill kits at appropriate locations;
- Refuelling areas in the compounds will be identified prior to commencement of the project;
- Refuelling shall not be undertaken adjacent to any watercourses;
- All machinery and plant used will be regularly maintained and serviced and will comply with appropriate standards to ensure that leakage of diesel, oil and lubricants is minimised; and
- Fuels, oils, greases, and hydraulic fluids will be fully bunded (110 percent) at a designated area within the works compounds used for the storage of materials and machinery.

4.2.8. Cement Based Products Control Measures

The following mitigation measures will be implemented to avoid release of cement at the site:

- Precast concrete products and culverts will be used where possible, however where necessary, concrete pouring will be planned for dry days where possible by following weather forecasts;
- Concrete pours will be supervised by the Construction Manager;
- Where concrete is delivered to the site and pour is complete, the concrete truck will be directed to a designated tank filling area (which shall be) lined with an impermeable membrane and permitted to fill the concrete hopper/tank before leaving site to return to the origin quarry;
- No discharges of washed water shall be permitted in the construction compounds; and
- Ensure pour site is free of standing water and plastic covers will be ready in case of sudden rainfall event.

4.3 Invasive Species Management and Biosecurity Measures

Invasive alien species (IAS) surveys were carried along the route of the proposed site from 2020 to 2024 to identify the presence and location of any invasive species (listed under the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. No. 477 of 2011). A number of invasive alien species (IAS) including Himalayan balsam (Impatiens glandulifera) and Giant hogweed (Heracleum mategzzianum) were recorded during these walkovers and documented growing within the Study Area of the proposed Greenway project. A Invasive Species Management Plan (ISMP) has been developed outlining advanced treatment, biosecurity and best practice measures (Ryan Hanley, 2024).

All personnel that will be working on the proposed greenway route will be educated through tailored toolbox talks to recognise each of the invasive species present within the footprint of the works. Biosecurity zones must be established on-site prior to site works commencing and will specify the area of the zones, the required actions that must be taken in each zone and who must carry out the actions. All staff will be educated on the health and safety and biosecurity measures that should be followed around each species. Personnel must be familiar with the location of all biosecurity zones, and emergency procedures should they encounter Giant Hogweed material. Only those who have been inducted into biosecurity measures on-site should enter the biosecurity zones within the works area. Should any risk of contaminated material escaping be observed by the site supervisor, additional toolbox talks and any additional necessary training that is needed will be given.

Maintaining biosecurity measures at all times in an area where invasive species are present is essential to prevent further spread. Biosecurity measures are also necessary in areas where invasive species are not present, but where there is risk of contaminated material being brought to site- i.e., site machinery being used on multiple sites, construction staff travelling between infested and not infested sites. Careful preparation of the site and planning of the works is crucial to successful treatment of invasive species.

At all site locations during the construction stage, the contractor will adhere to the following best practice biosecurity measures to avoid the spread and introduction of invasive species where applicable:

- Adherence to biosecurity and best practice measures outlined in the Invasive Species Management Plan (ISMP);
- An Environmental Clerk of Works should be on site to monitor and oversee the implementation of this ISMP and this installation of the biosecurity zones;
- Pre-construction surveys for invasive species will be conducted at the earliest stage possible to update and inform on the status of invasive plant species in or near the works area;
- All staff will be trained by the ECoWs through tookbox talks in the identification of invasive species and noxious weeds and the associated biosecurity measures required when working on site;
- Fence off (biosecurity zones) 8m from the furthermost stand of invasive species in infested areas prior to and during construction where possible to avoid spreading seeds or plant fragments around or off the construction site. If this is not possible the biosecurity zones will be determined by a suitably qualified person in agreement with the site manager;
- Clearly identify and mark out infested areas. Erect signs at the construction site entrances and by the biosecurity zones to inform site users of the risk;
- Dedicated biosecurity zone entry and exit points should be created for operators on foot and for mobile plant equipment;
- Personnel working on or between biosecurity zones should ensure their clothing and footwear are cleaned where appropriate to prevent spread;
- Avoid, if possible, using machinery with caterpillar tracks in infested areas. Machinery tyres and tracks must be cleared prior to exiting the biosecurity zones;
- Clearly identify and mark out areas where contaminated soil is to be stockpiled in the temporary construction compounds, which will not be within 50m of any watercourse. Biosecurity zones need to be fenced and surround all stockpiles of contaminated soils containing invasive species;
- Infested areas which will not be excavated will be protected by a root barrier membrane if they are likely to be disturbed by machinery;
- Appropriate silt barriers will be installed in drains that may occur within infested areas;
- Biosecurity facilities must be installed on-site prior to site works commencing. Installation of a dedicated footwear and vehicular wheel wash down facility, into a contained area by the entrance and exit points of the construction site and in the biosecurity zones, away from drains and watercourses. All run-off will be isolated and treated as contaminated material;
- Vehicles entering and leaving the construction site and biosecurity zones will be cleaned using stiff-haired brush and pressure washers, paying special attention to any areas that might retain seed and plant material;
- Where there is potential for cross-contamination on site (machinery or personnel moving from one biosecurity zone to another or from the biosecurity zone to other areas on site), consideration should be given to designating vehicles or machinery to specific sites to prevent spread;
- Vehicles leaving the site to be inspected for any plant material and will be washed down into a dedicated wastewater contained storage area then tinkered off site to a licenced waste facility; and
- If soil is imported to the site for landscaping, infilling or embankments, the contractor shall gain documentation from suppliers that it is free from invasive species.

4.4 Waste Management

This section of the CEMP contains a summary of the information to be contained within a project Waste Management Plan (WMP), which will set out the best practice procedures during the excavation and construction stages of the proposed scheme. A WMP will be developed further by the contractor prior to construction. Section 4.4.1 below, identifies the key legislation relevant to waste management requirements. All waste disposals will be recorded by the contractor through a Waste Disposal Register.

4.4.1. Legislation

The primary legislative requirement applicable to the project and that governs waste management in Ireland is The Waste Management Act 1996 and its subsequent amendments. The Waste Management Act 1996 provide for measures to improve performance in relation to waste management, recycling, and recovery. The Act also provides a regulatory framework for meeting higher environmental standards set out by other national and EU legislation.

4.4.2. Waste Management Hierarchy

Waste management actions that can be undertaken on site should follow the principles of the waste hierarchy, where preventing waste is the preferred option and sending waste to landfill should be the last resort (**Figure 4.1**). The primary aim of a WMP is to prevent and minimise to amount of waste generated. Reuse and recycling of waste generated on site, reduces the quantities of waste required for disposal which is considered as last resort. Waste will be segregated and disposed of appropriately. Working methods will be reviewed to ensure waste minimisation and sustainability during construction.

Figure 4-1: Schematic of the Waste Hierarchy Model (Waste Framework Directive, 2020).

4.4.3. Construction Phase Waste Management

4.4.3.1. Description of the Works

The Limerick City Greenway (UL to NTP) will produce a significant volume of excavated material during the construction phase. Excavations for the proposed scheme, pedestrian/road crossings and road works will give rise to a surplus volume of material during the construction phase of the proposed scheme. The excavated material will be reused as a subbase layer and/or edge grading. It is anticipated that no soil will require exporting off site. There will be Bitumous Material and Concrete arising from existing road/footpath surfaces on University Road, and McLaughlan Road.

The main non-hazardous and hazardous waste types arising from the construction phase of the project are outlined in Table 4..5 below. The List of Waste (LoW) code (as effected from 1st of June 2015 and referred to as the European Waste Code of EWC) for each waste stream is also shown.

Table 4.5: Expected waste material arising during the Construction Stage.

Waste Material	LoW Code
Soil, stones and dredged spoil	17 05
Bituminous mixtures, coal tar and tarred products	17 03
Concrete, Bricks, Tiles and Ceramics	17 01

Metals (including their alloys)	17 04
Waste Hydraulic Oils*	13 01
Wastes of Liquid Fuels*	13 07

Note 1 * - Denotes Hazardous Materials.

Where hazardous materials are used/encountered on site, i.e. bituminous mixtures containing coal tar, timber with paint; a specialist contractor will be engaged. The specialist contractor will be licensed under the 'Waste Management (Collection Permit) Regulations, 2007' (as amended). All contaminated materials will be disposed of at an appropriately licensed facility.

The estimated construction and demolition waste resulting from the proposed scheme is provided in Table 4.6 There will be Bitumous Material and Concrete arising from existing road/footpath surfaces on University Road, and McLaughlan Road.

Table 4.6: Estimated C&D Waste resulting from the proposed scheme

Origin of Waste	LoW Code	Estimated Tonnage of Waste
Red Section	17 05/17 03	0
Cyan Section	17 05/17 03	
Magenta Section	17 05/17 03	897
Purple Section	17 05/17 03	
Yellow Section	17 05/17 03	
Orange Section	17 05/17 03	
Green Section	17 05/17 03	
Miscellaneous	17 01, 17 04, 13 01, 13 07	746
	Total	**1643**

4.4.3.2. Proposals for Minimisation, Reuse and Recycling of Construction Waste

All current and applicable waste management legislation will be applied and adhered to. Contractors that are engaged in the transport of waste off-site will comply with the provisions of the Waste Management Act (1996) (as amended), associated Regulations and the Waste Management Plan prepared in accordance with '*Best Practice Guidelines for the Preparation of Waste Management Plans for Construction and Demolition Projects (2021)*'. The Contractor must handle, transport, and dispose of waste in a manner that ensures that no adverse environmental impacts occur as a result of any of these activities. A waste collection permit to transport the waste which has been issued by the National Waste Collection Permit Office must be held by the relevant contractor.

Waste receiving facilities must also be appropriately licensed or permitted for the waste being received. Operators of such facilities cannot receive any waste, unless in possession of a waste permit granted by the Local Authority under the '*Waste Management (Facility Permit & Registration) Regulations 2007*' (as amended) or a waste license granted by the EPA. The permit/license held will specify the type and quantity of waste

able to be received, stored, sorted, recycled and/or disposed of at the specific site. The contractor shall provide details of all proposed waste facilities to the Contract Administrator before works commence on site. It has been confirmed that there are appropriate facilities in the area available to receive and process waste material.

The construction compounds for the proposed works will have a dedicated Waste Storage Area (WSA) for any construction waste generated. Receptacles/skips or bays will be provided for relevant recyclable material.

Construction workers on site will generate waste e.g., organic/food waste, dry mixed recyclables (wastepaper, newspaper, plastic bottles, aluminium cans, and tins), mixed non-recyclables and potentially sewage sludge from temporary onsite welfare facilities. Waste electrical and electronic equipment (WEEE), waste batteries and waste printer/toner cartridges may also be generated from site offices. There are numerous specialist waste service contractors in the Limerick City, County and Munster region.

Examples of appropriate measures that should be taken to ensure construction waste generated is minimised, are as follows;

- Ordering of materials should be on an '*as needed*' basis to prevent over supply to site. Co-ordination is required with suppliers enabling them to take/buy back surplus stock;
- Purchase of materials pre-cut to length to avoid excess scrap waste generated on site;
- Request that suppliers use least amount of packaging possible on materials delivered to the site;
- Ensuring correct storage and handling of goods to avoid unnecessary damage that would result in their disposal;
- Ensuring correct sequencing of operations; and
- Use reclaimed/ recycled materials in the construction works where practicable.

The contractor will address the role of monitoring and inspections to ensure that waste produced on site is dealt with in a safe, efficient, and legal manner. All waste generated on site will be segregated and placed in appropriate waste streams designated for recycling, reuse, or disposal. Waste streams will be monitored and Key Performance Indicator's (KPIs) maintained for all waste taken on site, recording quantity (tonnage) of individual waste streams. Records will be maintained.

4.4.3.3. Reuse

Possibilities for re-use of clean non-hazardous excavation material as fill on the site or in landscaping works will be considered following appropriate testing to ensure material is suitable for its proposed end use. Where excavation material cannot be re-used within the proposed works, every effort will be made to send material for re-use as a by-product, recovery or recycling as far as is reasonably practicable. If any material is to be reused on another site or construction projects in the vicinity as a by-product (and not as a waste), this will be done in accordance with Article 27 of the European Communities (Waste Directive) Regulations where the material is classified as a construction by-product.

A guide to by-products under Article 27 was produced by the EPA in 2020 and provides guidance on assessment, classification and submitting a notification of material. Plastic packaging, pallets etc. can be used to cover materials on site or reused for the delivery of other materials.

Many construction materials can be reused a number of times before they must be disposed of – examples listed below:

- It may be possible to reuse stone as aggregate backfilling material in some locations;
- Plastic packaging etc. can be used to cover materials on site or reused for the delivery of other materials; and
- Excavated subsoil will be reused as fill where possible and timber can be used several times for shuttering of concrete.

4.4.3.4. Recycling

As outlined in Section 4.4.2, if a certain type of construction material cannot be reused onsite, then recycling is the most suitable option.

All waste that is produced during the construction phase including dry recyclables will be deposited in the on-site dedicated waste skips initially and sent for subsequent recycling at an offsite facility.

4.4.3.5. Record Keeping

A recording system to be put in place to record construction waste generated on site. The system will enable the contractor to maintain records for all waste material which leaves the site, either for reuse on another site, recycling, or disposal.

The licensed waste contractor employed to remove waste from the site will be required to provide documented records for each movement of waste off-site. Each record will contain the following:

- Consignment Reference Number;
- Material Type(s) and European Waste Catalogue (EWC) Code(s);
- Company Name and Address of Site of Origin;
- Trade Name and Collection Permit Ref. of Waste Carrier;
- Trade Name and Licence Ref. of Destination Facility;
- Date and Time of Waste Dispatch;
- Registration no. of Waste Carrier vehicle;
- Weight of Material;
- Signature of Confirmation of Dispatch detail;
- Date and Time of Waste Arrival at Destination; and
- Site Address of Destination Facility.

4.4.3.6. Basic Waste Management Training

The appointed Environmental Manager or Waste Manager will communicate effectively with all employees on site in relation to the aims and objectives of the WMP. All employees working on site will be trained in materials management and should be able to:

- Distinguish reusable materials from those suitable for recycling;
- Ensure maximum segregation at source;
- Co-operate with site manager on the best locations for stockpiling reusable materials;
- Separate materials for recovery; and
- Identify and liaise with waste contractors and waste facility operators.

4.4.3.7. Waste Management Plan Conclusion

The details provided above outline some of the main objectives that are to be adhered to for the preparation of the detailed WMP to be completed at construction stage. The appointed contractor will be required to produce the detailed WMP prior to commencement of works.

5. Environmental Management Implementation

5.1 Responsibilities

5.1.1. The Contractor

A contractor will be appointed to undertake the works. The Contract will allocate responsibility for compliance with the terms of this CEMP and detailed CEMP during construction.

All staff and subcontractors have the responsibility to:

- Work to agreed methods and procedures to eliminate and minimise environmental impacts and note areas of sensitive receptors;
- Understand the importance of avoiding pollution on-site, including water, noise and dust and report all incidents to avoid or limit environmental impact; and
- Co-operate with site inspections and audits as required.

The contractor shall appoint an Environmental Manager who will be the project focal point relating to construction-related environmental issues. In general, the Environmental Manager will maintain responsibility for monitoring the Works and the contractors/sub-contractors from an environmental perspective. The Environmental Manager will act as the regulatory interface on environmental matters by reporting to and liaising with the Employer's Representative, LCCC representatives (if appropriate), and other statutory bodies as required. The Environmental Manager will report directly to the Environmental Manager.

5.1.2. Site Manager

A Site Manager will be appointed by the contractor to oversee the day-to-day management of working areas within the site and ensure that effective, safe, planned construction activities are delivered on an ongoing basis to the highest standards. The Site Manager will be a suitably qualified, competent, and experienced professional that will oversee site logistics, communicate regularly with construction staff, accommodate project-specific inductions for staff on site and ensure that all work is compliant with the relevant design standards and health and safety legislation.

5.1.3. Environmental Manager

An Environmental Manager will be appointed by the contractor to ensure that the CEMP is effectively implemented. The Environmental Manager will be a suitably qualified, competent, and experienced professional that would perform the necessary tasks, review environmental procedures, and consult with the members of the construction team and stakeholders as requited. The Environmental Manager would be responsible for:

- Preparing, maintaining, and implementing the CEMP;
- Establishing, implementing, and maintaining the Environmental Management System (EMS) in line with ISO 14001;
- Conducting regular environmental inspections and audits as specified in the contract and checking adherence to the CEMP;
- Ensuring that construction occurs in accordance with the relevant environmental requirements and that such compliance is adequately recorded and documented;
- Completing a site inspection and compiling an environmental compliance report on a monthly basis;
- Attending site and stakeholder meetings as required;
- Keeping up to date with relevant environmental best practices and legislative changes;
- Liaising with relevant staff to prepare Method Statements and relevant plans for all activities where there is a risk of environmental damage;
- Having a detailed level of knowledge on all aspects of environmental information associated with the proposed development at University Limerick greenway;
- Ensuring all personnel have undertaken adequate environmental inductions, awareness briefings and training (inducting subcontractors); and

- Managing and responding to environmental incidents and ensuring that all incidents are recorded and reported in an appropriate manner.

5.2 Environmental Awareness and Training

Environmental training and awareness are considered a crucial element in the appreciation and implementation of the detailed CEMP. The detailed CEMP will be distributed to members of the project team, including subcontractors as necessary to ensure that environmental and health and safety requirements are adequately communicated.

The Site Manager and the Environmental Manager will be responsible for ensuring that all people on-site are provided with relevant information concerning environmental obligations. All staff and operatives will receive a site-specific safety and environmental induction prior to commencing any work on-site. Toolbox talks will be provided to all staff for (but not limited to) working with concrete and biosecurity requirements on site. Training records for staff will be held on a central database. Training and awareness will be targeted at sensitive environmental elements including:

- Good Housekeeping practices, including storage of material etc;
- Archaeology;
- Traffic Management;
- Waste Management;
- Landscaping restrictions and requirements;
- Noise abatement;
- Dust control;
- Sensitive receptors (people, wildlife, water, soil etc);
- List of mitigation measures and how they will be implemented and by who doing or avoiding what and why;
- Emergency responses e.g., to an oil or fuel spill;
- Ecology – protected flora and fauna identification; and
- Awareness, when to stop working or report a concern to the supervisor or manager (taking responsibility).

5.2.1. Environmental Induction

The Environmental Induction will be integrated into the general site induction on a case-by-case basis for each member of staff employed on-site depending on their assigned roles and responsibilities on site. Where necessary, the Environmental Induction will as a minimum include:

- An outline of the CEMP structure;
- A discussion of the applicable Works Method Statements;
- The roles and responsibilities of staff, including contractors, in relation to environmental management;
- Pollution incident control and reporting;
- Basic details and information regarding the WMP; and
- An outline of the Environmental Incident Management Procedure.

5.2.2. Toolbox Talks

Toolbox talks will be held by the Environmental Manager or Site Manager at the commencement of works, or at the commencement of new activities. The aim of the toolbox talks is to identify the specific work activities that are scheduled for that day or phase of work. In addition, the necessary work method statements and sub plans would be identified and discussed prior to the commencement of the day's activities. The toolbox talks will include training and awareness on topics including:

- On-site Ecological Sensitivities both aquatic and terrestrial;

- Sediment and erosion control;
- Good site practice;
- Fuel storage; and
- Materials and waste procedures.

Site meetings will be held on a regular basis involving all relevant site personnel. The objective of site meetings is to discuss the coming week's activities and identify the relevant work method statements and sub plans that will be relevant to that week's activities. Additionally, any non-compliance identified during the previous week would also be discussed with the aim to reduce the potential of the same non-compliance reoccurring.

During construction of the proposed development, all staff will be made aware of and adhere to the most up to date version of the Health & Safety Authority's '*Guidelines on the Procurement, Design and Management Requirements of the Safety, Health and Welfare at Work (Construction) Regulations 2013*'. This will encompass the use of all necessary Personal Protective Equipment and adherence to the site Health and Safety Plan.

5.3 Environmental Legislative and Regulatory Requirements

A register of regulatory, legal, and other requirements will be developed by the Environmental Manager. This will be a summary list of the major environmental legislation and other requirements with which the project must comply. A typical register of environmental legislation is divided into several categories, which include:

- General Environmental Legislation;
- Flora & Fauna;
- Emissions to Air and Dust generation;
- Emissions to Water & Groundwater and water pollution;
- Waste Management; and
- Noise & Vibration.

For each piece of legislation, the following information will be provided:

- Index Number;
- Title of Legislation;
- Summary of Legislation; and
- Relevance.

All legislation included in this Register can be readily accessed on http://www.irishstatutebook.ie/ or will be available through the Construction Manager's office. The Register of Legislation will be reviewed and updated on a minimum six-monthly basis. This is a controlled document and as such will comply with all the requirements of the contractor document control procedure as part of the contractor's quality management procedure.

5.4 Stakeholders Liaison

The contractor will put in place a Communications Strategy (to be reviewed and agreed by the Employer and Employer's Representative) which will provide a two-way mechanism for members of the public to communicate with a designated member of the contractor's staff and for the contractor to communicate essential information on aspects of the works. The communications strategy will include:

- Procedures to inform stakeholders affected by the construction phase on schedules for any activity which is likely to affect them, and minimise any disruption;
- Preparation and distribution of information leaflets/notices to be distributed to affected parties;
- Sight and road signage;
- A Public Information Programme to provide construction and temporary traffic management information to road users, residents, businesses, consumers, trade organisations and other relevant parties; and
- Details of a contact name and number for any complaints that may arise during the works.

A complaints register/tracking system will form part of the communications strategy, and all complaints will be handled in an efficient manner. The register will have prescribed methodologies for documenting and actioning complaints received from the public and the relevant stakeholders.

6. Emergency Incident Response Plan

6.1 Overview

It shall be the responsibility of the contractor to develop an (Emergency) Incident Response Plan (IRP) which shall be subject to approval by the Employer's Representative.

The contractor shall be required to comply as a minimum with requirements for incident management in accordance with the procedures outlined in the LCCC Incident Management and Emergency Response Plan Procedure and associated documents. The contractor's IRP will take LCCC's incident management requirements into account and will form part of the contractor's detailed CEMP.

The primary objective of the IRP shall be to ensure the safety to all workers and visitors on the works site.

The IRP will detail the emergency incident response procedures that will ensure that all countermeasures proceed in a controlled manner so that greater damages are avoided and the possible effects upon persons, the environment and property are avoided or minimised.

The contractor will include within the plan, a pollution incident response procedure that is site/activity specific and will include at a minimum; locations and operating procedures for emergency equipment, identification of pollution scenarios, staff training and responsibilities as well as Safety Data Sheets (SDS) of all chemicals on site.

The IRP will be regularly reviewed by the contractor and amended to ensure it is applicable to the current construction activities, outlining the associated risks and recommended emergency responses procedures.

The IRP will provide a list of emergency contacts depending on the incident, a number of these is provided in Table 6.1 below. The IRP shall also detail the contact details for the personal assigned responsibility of following up once an incident has occurred and the procedure to be adhered to in such an event.

6.2 Incident Reporting

In the event of an incident occurring, the contractor shall be required to outline in a report at the minimum the following points:

- A detailed description of the incident, including the location, time, weather conditions, affected parties;
- Potential contributing factors;
- Negative effects;
- Current mitigation control measures in place; and
- Recommended improvements/ corrective actions to reduce risk of recurrence.

The contractor shall submit to the Employer's Representative an initial incident report as detailed above, within a 24-hour period of the incident occurring. Incidents shall be reported to the relevant Emergency Services.

6.3 Emergency Contact Details

The IRP shall include emergency contact details for key personal and emergency services, methods of notifying local authorities, statutory bodies, and relevant stakeholders. These numbers will be posted at suitable noticeboards/welfare facilities. Emergency Contracts will include (but not limited to):

Table 6-.1: Emergency Contacts

Contact	Telephone no.
Emergency Services – Ambulance, Fire, Gardaí	999/112
Hospital – University Hospital Limerick, St Nessans Road, Dooradoyle, Limerick	(061) 301 111
ESB Emergency Services	1850 372 999
Gas Networks Ireland Emergency	1850 20 50 50
Gardaí – Mayorstone Park Garda Station, Limerick	(+353) 61456980
Health and Safety Co-ordinator - Health & Safety Services	TBC
Health and Safety Authority	1890 289 389
Project Supervisor Construction Stage (PSCS)	TBC
Project Supervisor Design Process (PSDP)	TBC
Client: Limerick City & County Council (LCCC)	(+353) 61 556000

6.4 Resources and Training

The contractor shall ensure that the relevant staff will be trained in the implementation of the IRP. A list of all staff that received training on the topic shall be provided to the Employer's Site Representative outlining the person's name, contact number and the date the training was provided.

6.5 Emergency Access and Equipment

The contractor shall ensure that at each of the proposed work locations, there will be adequate space provided during construction to allow for emergency access routes. These emergency access routes shall be maintained for the duration of the construction stage.

Locations of pollution control plant/spill kits shall be provided by the contractor to the Employer's Site Representative. All pollution control equipment shall be checked regularly throughout the duration of the site works to ensure that it is in working order.

6.6 Site Evacuation/Fire Drill

A site evacuation/fire drill procedure will provide the basis for carrying out the immediate evacuation of all site personnel in the event of an emergency. The following steps will be taken:

- Notification of the emergency. Provision of a siren, fog-horn or congruent notify all personnel of an emergency;
- An assembly point will be designated in the construction compound area and will be marked with a sign. All site personnel will assemble at this point;
- A roll call will be carried out by the Site Security Officer to account for all personnel on site; and
- The Site Security Officer will inform the Site Manager when all personnel have been accounted for. The Site Manager will decide the next course of action, which will be determined by the situation that exists at that time and will advise all personnel accordingly.

All personnel will be made aware of the evacuation procedure during the site induction. The Fire Services Acts of 1981 and 2003 require the holding of fire safety evacuation drills at specified intervals and the keeping records of such drills.

6.7 Spill Control Measures

Every effort will be made to prevent an environmental incident during the construction and operational phase of the project. Oil/fuel spillages are one of the main environmental risks that will exist on the site which will require an emergency response procedure. The importance of a swift and effective response in the event of such an incident occurring cannot be over emphasised. The following steps provide the procedure to be followed in the event of such an incident:

- Stop the source of the spill and raise the alarm to alert people working in the vicinity of any potential dangers;
- If applicable, eliminate any sources of ignition in the immediate vicinity of the incident;
- Contain the spill using the spill control materials, track mats or other material as required. Do not spread or flush away the spill;
- If possible, clean up as much as possible using the spill control materials;
- Set up temporary barriers or exclusion zones to keep personnel and the public away from the contaminated area;
- Contain any used spill control material and dispose of used materials appropriately using a fully licensed waste contractor with the appropriate permits so that further contamination is limited;
- Spill containment zones will be located within the temporary construction compounds, on impermeable areas and equipped with all necessary materials to respond to any potential spill;
- Notify the EM immediately giving information on the location, type, and extent of the spill so that they can take appropriate action;
- The Site Manager will inspect the site and ensure the necessary measures are in place to contain and clean up the spill and prevent further spillage from occurring; and
- The EM will notify LCCC as the appropriate regulatory body and the Environmental Protection Agency (EPA), if deemed necessary.

The importance of a swift and effective response in the event of such an incident occurring cannot be over emphasised. Any environmental incident must be investigated in accordance with the following steps:

- The EM must be immediately notified;
- If necessary, the EM will inform the appropriate regulatory authority. The appropriate regulatory authority will depend on the nature of the incident;
- The details of the incident will be recorded on an Environmental Incident Form which will provide information such as the cause, extent, actions, and remedial measures used to follow the incident. The form will also include any recommendations made to avoid reoccurrence of the incident;
- If the incident has impacted on an ecologically sensitive receptor, such as a sensitive habitat, protected species, or designated conservation site (SPA or SAC), the EM will liaise with a project ecologist; and
- A record of all environmental incidents will be kept on file by the EM and the Main Contractor. These records will be made available to the LCCC and EPA if required.

The EM will be responsible for any corrective actions required as a result of the incident e.g., an investigative report, formulation of alternative construction methods or environmental sampling, and will advise the Main Contractor as appropriate.

6.8 Corrective Action

Where an incident has occurred, or a site audit/ inspection has identified a non-conformance, it is imperative that a reoccurrence of a similar incident is avoided. Once the source of the incident has been identified, appropriate measures shall be implemented. Depending on the correction action required, these measures may involve additional training to site personal, updating construction activity procedures, providing additional pollution protection equipment. Revised work methods, training requirements or any corrective action required to ensure an incident does not reoccur will be documented by the contractor in an updated IRP and CEMP.

6.9 Emergency Incident Response Plan – Key Points

- The IRP is a live document and shall be updated regularly by the contractor as necessary to include corrective actions implemented, revisions to regulations, and requests from Employer's Representative;
- The IRP shall full comply;
- Detail list of key personal to be contacted in the event of an emergency/incident;
- Notification of incident and detailed incident investigation report provided to the Employer's Representative;
- Identify and implement corrective actions;
- Site specific pollution emergency response plan for risks associated with chemical/fuel spills; and
- Initial training to staff prior to construction work commencing and regular training (e.g., Toolbox Talks) throughout the duration of the construction stage.

7. Mitigation and Monitoring Proposals

This section of the CEMP groups together all mitigation measures and monitoring proposals currently identified for the proposed development including those specified in the environmental reporting prepared for the project.

The mitigation measures are presented in the following pages, and a reference number has been applied to each of the measures for ease of reference.

Presenting the mitigation measures and monitoring proposals in tabular format provides an easy to audit list that can be reviewed and reported on during the project. This can be further expanded on, if necessary.

Ref No.	Reference Heading	Location	Mitigation Measure	Audit Result	Action Required
General					
MM1	Detailed CEMP and Method Statements	CEMP Sections 4.2.	A suite of **Construction Management Plans** will be prepared by the appointed contractor and included within the detailed CEMP. **Method Statements** will be provided for all works and will be approved by the Employer's Representatives prior to the commencement of constructions works. The CEMP will be distributed to members of the project team, including subcontractors as necessary to ensure that environmental and health and safety requirements are adequately communicated.		
MM2	Safety Induction	CEMP Section 5.2	All staff and operatives will receive a site-specific safety and environmental induction prior to commencing any work on-site. All personnel involved with the project shall be informed of the requirement for protection of designated habitats including the aquatic environment, i.e., River Shannon SAC, and best practice methodologies to be employed.		
MM3	Toolbox Talks	CEMP Section 5.2	Toolbox talks will be provided to all staff for (but not limited to) working with concrete and biosecurity requirements on site. Toolbox talks will be held by the Environmental Manager or Site Manager at the commencement of works, or at the commencement of new activities.		
MM6	Health and Safety	CEMP Section 4.2	During construction of the proposed development, all staff will be made aware of and adhere to the most up to date version of the Health & Safety Authority's '*Guidelines on the Procurement, Design and Management Requirements of the Safety, Health and Welfare at Work (Construction) Regulations 2013*'. This will encompass the use of all necessary Personal Protective Equipment and adherence to the site Health and Safety Plan.		
MM7	Health and Safety	General	Appropriate fencing will be erected around any excavations to prevent uncontrolled access to this area. Appropriate health and safety signage will also be erected on this fencing and at locations around the site.		
MM8	Ecological Walkover Survey	CEMP Section 4.2.6 & 4.3	An ecological walkover survey by the project ecologist and construction team will be complete prior to the commencement of works.		
MM9	Emergency Incident Response Training	CEMP Section 6.4	The contractor will ensure that the relevant staff will be trained in the implementation of the IRP. A list of all staff that received training on the		

Ref No.	Reference Heading	Location	Mitigation Measure	Audit Result	Action Required
			topic shall be provided to the Employer's Site Representative outlining the person's name, contact number and the date the training was provided.		
MM10	Emergency Access Routes	CEMP Section 6.5	The contractor shall ensure that there will be adequate space provided during construction to allow for emergency access routes. These emergency access routes shall be maintained for the duration of the construction stage.		
MM11	Site Evacuation Procedure	CEMP Section 6.6	A site evacuation/fire drill procedure will be established by the contractor and will provide the basis for carrying out the immediate evacuation of all site personnel in the event of an emergency.		
Flora and Fauna					
Biodiversity - General					
MM13	Biodiversity	CEMP Section 4.2.6	▪ The surrounding immediate construction area will be fenced off, or otherwise demarcated, to prevent inadvertent intrusion from construction plant; ▪ Adherence to LCCC Biodiversity Action Plan and Key Objectives; and ▪ Planting as per the proposed Landscape Plan shall be included at construction stage.		
Trees and Hedgerows					
MM16	Protection of Vegetation during Construction	General	▪ Good planning and site management will be followed during construction works to ensure areas are not adversely impacted by construction activities; ▪ Recommendations for the specific measures advised regarding management of the trees in relation to this development will be detailed in the Method Statements.		

Ref No.	Reference Heading	Location	Mitigation Measure	Audit Result	Action Required
MM17	Protection of Vegetation during Construction	General	▪ Removal of scrub vegetation will be performed in winter outside of the bird breeding season (1st March – 31st August); and ▪ Tree felling/Hedgerow cutting should be preceded by a competent assessment as to the presence of any protected wildlife species, where required specialist advice should be sought if necessary.		
MM18	Protection of Vegetation post-construction	General	▪ The proposed Landscape Plan should be fully implemented and monitored to ensure success of the planting scheme through periodic surveys. Additionally invasive species should be controlled to limit their growth and spread along the greenway route.		
Vegetation					
MM18	Invasive Species	CEMP Section 4.3	▪ A risk assessment and biosecurity method statement must be provided by the contractor prior to commencing works. ▪ Good construction site hygiene should be employed on site. ▪ Any material that is imported onto any site will be verified by a suitably qualified ecologist to be free from any invasive species listed on the 'Third Schedule' of Regulations 49 & 50 of the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I 477 of 2011).		
Water Quality, Soil and Groundwater					
MM19	Water Quality	General and CEMP 4.2.5 & CEMP 4.2.7.	▪ The works site and area will be strictly demarcated to prevent any machinery operation and movement or works activities on adjacent land or fields outside the site. ▪ There will be no storage of machinery (including drill rigs), fuel or chemicals in areas prone to flooding or within 30m of any drain or watercourse.		

Ref No.	Reference Heading	Location	Mitigation Measure	Audit Result	Action Required
			▪ Refuelling of machinery will be carried out off site or in a contained bunded area on site. ▪ Spill kits will always be present on sites and wherever fuel bowsers are parked or operating where there is interaction with an open waterway; ▪ Hydraulic fluid leaks will be addressed, using the Spill kit that will be present on the site as soon as they are identified. ▪ The plant in question will immediately be moved to a safe area where leakage of fluid into the water way is not possible. ▪ Storage tanks shall have secondary containment provided by means of an above ground bund to capture any oil leakage irrespective of whether it arises from leakage of the tank itself or from associated equipment such as filling and off-take points, sighting gauges, etc., all of which should be located within the bund. Bund specification should conform to the current best practice for oil storage (Enterprise Ireland, BPGCS005). ▪ Oil booms and oil soakage pads should be maintained on-site to enable a rapid and effective response to any accidental spillage or discharge. ▪ Waste oils and hydraulic fluids shall be collected in suitable leak-proof containers and transported from the Site and Off-Site Areas for disposal or recycling. ▪ Where feasible, all construction machinery shall use biodegradable oils and fuels. ▪ Machinery used on site shall be regularly inspected to ensure there is no leakage from them and to ensure the machinery shall not cause contamination of watercourses. ▪ Protection measures shall be put in place by the contractor to ensure that all hydrocarbons used during the works are appropriately		

Ref No.	Reference Heading	Location	Mitigation Measure	Audit Result	Action Required
			handled, stored, and disposed of in accordance with recognised standards as detailed by the Environmental Protection Agency. ▪ Guidelines for minimising impacts on water quality and fisheries in relation to Construction shall be implemented including, but not limited to, CIRIA C532 "Control of water pollution from construction sites - Guidance for consultants and contractors", Inland Fisheries Ireland guidelines and TII guidelines. ▪ Works shall not be carried out during or immediately following heavy rainfall events, when the potential for surface water and overland runoff is increased.		
MM20	Excavation	CEMP Section 4.2.5.	▪ Topsoil will be stripped as necessary to prepare for open cut trench excavation. ▪ Topsoil will be stockpiled for reuse within the works area or stored for reuse in a dedicated site compound which will be protected with silt fences. Where it is necessary to store topsoil for a significant period, it will be sown with grass seed to prevent any windblow or water erosion and subsequent run-off. ▪ Excavated material will be reused where possible. In the event it is not required for re-use, it will be removed by a licenced waste contractor. ▪ A silt filtration system will be used, as appropriate, to prevent contamination of any drains or watercourse.		
MM21	Pollution Control – Site Compound	CEMP Section 2.3.4, 4.2.1 & 4.2.7.	▪ The compound will be adequately buffered to prevent any surface water run off or will incorporate a surface water collection and treatment system if required. The compound areas will be monitored and observed daily to ensure that it is not impacting on any local watercourses. The site compound will also include the following mitigations:		

Ref No.	Reference Heading	Location	Mitigation Measure	Audit Result	Action Required
			▪ Bunded (minimum 110% bunding of all fuels) and impermeable containment areas for plant refuelling, maintenance, washing, storage of fuels and site generators. The bunded area shall have sufficient volume to contain any spills and all mitigation measures for these activities are outlined below in their various sections; ▪ A dedicated waste storage area for any construction waste generated. All skips or bays will be labelled/signage for segregated recyclable material i.e., a skip labelled for recycled timber; ▪ A wheel wash area for construction and delivery vehicles. ▪ Availability of a designated wash out tank for wash out of concrete trucks following concrete pours.		
MM22	Pollution Control	CEMP Section 4.2.5	▪ Dewatering of any excavation will be undertaken as necessary. In the event that dewatering pumps and silt filtration systems are required then they will be positioned in strategic locations adjacent to the excavation.		
MM23	Pollution Control	CEMP Section 4.2.1 & 4.2.7.	▪ Material storage and handling measures will be implemented to contain potential sources of soil/groundwater pollution. Contractors will ensure that spill kits will be accessible to construction personnel at all times and all spills will be reported to the site environmental manager; ▪ All liquids, solids and powder containers will be clearly labelled and stored in sealable containers; ▪ All liquid and hazardous materials will be stored in a designated and temporarily bunded areas with appropriate signage. This area should be within the construction compound or at an alternative location agreed with the Site Environmental Manager;		

Ref No.	Reference Heading	Location	Mitigation Measure	Audit Result	Action Required
			▪ All bunding must have a minimum capacity of 110% of the volume of the largest tank or 25% of the total storage capacity, whichever is the greater. Bunding shall be impermeable to the substance that is being stored in the tank; ▪ Where a contractor is responsible for materials stored in a bunded area, that contractor shall implement measures for the regular inspection of bunds and emptying of rainwater (when uncontaminated); ▪ Material storage areas will be at a safe distance from live construction activities; ▪ Spill kits will be provided in areas where liquids are stored and refuelling areas; ▪ Chemicals/fuels/materials brought on-site must be accompanied by a Safety Data Sheet (SDS). A copy of the SDS should be provided to the Site Manager and kept in a file in the site office; ▪ Materials will be stored in accordance with any specific requirements of the SDS; ▪ A complete register of all SDSs in use on-site will be maintained and retain copies of all SDS on-site; ▪ Ordering of materials will be completed in such a manner as to minimise quantities present on-site; ▪ Excess materials will not be stored on-site for extended periods; ▪ Contractors will be responsible for ensuring the regular maintenance of construction plant and equipment, to prevent leaks		
MM24	Refuelling Fuel and Hazardous Material	CEMP Section 4.2.7	▪ All machinery and plant used will be regularly maintained and serviced and will comply with appropriate standards to ensure that leakage of diesel, oil and lubricants is minimised;		

Ref No.	Reference Heading	Location	Mitigation Measure	Audit Result	Action Required
			▪ Fuels, oils, greases, and hydraulic fluids will be fully bunded (110%), works compounds used for the storage of materials and machinery will be located in a designated area; ▪ Refuelling of machinery will be carried out off site (if convenient and situation allows) or in a contained bunded area on site.		
MM25	Cement Based Products	CEMP Section 4.2.8	▪ Concrete pouring will be planned for dry days were possible by following weather forecasts; and ▪ Where concrete is delivered to the site and pour is complete, truck will be directed to a designated concrete washout area which will be lined with an impermeable membrane.		
MM26	Fuel/ Oil Spillages	CEMP Section 6.7	▪ An emergency incident response procedure will be established for oil/fuel spillages.		
Air Quality & Climate, Noise & Vibration					
MM27	Dust	CEMP Section 4.2.2	▪ Site roads/access paths shall be regularly cleaned and maintained as appropriate; ▪ Hard surface roads shall be swept to remove mud and aggregate materials from their surface while any un-surfaced roads shall be restricted to essential site traffic only. Furthermore, any road that has the potential to give rise to fugitive dust must be regularly dampened by water sprinklers, as appropriate, during dry and/or windy conditions; ▪ Vehicles using site roads shall have their speeds restricted where there is a potential for dust generation. Vehicles delivering material with dust potential should be always enclosed or covered with tarpaulin to restrict the escape of dust; ▪ Vehicles exiting the site areas shall make use of a wheel wash facility where appropriate, prior to entering onto public roads, to		

Ref No.	Reference Heading	Location	Mitigation Measure	Audit Result	Action Required
			ensure mud and other wastes are not tracked onto public roads. Public roads outside the site should be regularly inspected for cleanliness and cleaned as necessary. Before entrance onto public roads, trucks will be adequately inspected to ensure no potential for dust emissions; ▪ Material handling systems and site stockpiling of materials should be designed and laid out to minimise exposure to wind. Water misting or sprays shall be used as required if particularly dusty activities are necessary during dry or windy periods. Spoil stockpiles that will remain in-situ for a duration greater than 6 months will be hydroseeded and maintained throughout the construction phases to prevent dust; ▪ At all times, dust levels and extent as well as control the procedures put in place will be strictly monitored by the site engineer and the environmental manager and assessed and reviewed as necessary. In the event of dust nuisance occurring outside the site boundary, satisfactory procedures will be implemented to rectify the problem, in consideration of all stakeholders including pedestrians and cyclists; ▪ The dust minimisation plan shall be reviewed at regular intervals during the construction phase to ensure the effectiveness of the procedures in place and to maintain the goal of minimisation of dust using best practice and procedures;		
MM28	Noise	CEMP Section 4.2.3	▪ Management of Noise emissions will be following British Standard BS5228:2009 – Noise and Vibration control on construction and open sites Part 1 – Noise; ▪ Any plant such as generators and pumps which are required to work outside the site working hours, shall be surrounded by an acoustic		

Ref No.	Reference Heading	Location	Mitigation Measure	Audit Result	Action Required
			enclosure, or fitted with other approved noise reduction measure to the approval of the Employer's representative; ▪ Plant and machinery with low inherent potential for generation of noise and/or vibration will be selected. All construction plant and equipment to be used on-site will be modern equipment and will comply with the European Communities (Construction Plant and Equipment) (Permissible Noise Levels) Regulations; ▪ The best means practicable (BPM), including proper maintenance of plant, no idling of plant etc. 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 works; ▪ Compressors will have attenuated 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; and ▪ Machinery which are used intermittently, will be shut down or throttled back during those periods when they are not in use.		
MM29	Noise & Vibration Standards	General	It is recommended that appointed contractor(s) be required to adopt practices set out in British Standard BS 5228:2009 Code of practice for noise and vibration control on construction and open sites Part 1: Noise and Part 2: Vibration (2009). Measures recommended in the standard include: ▪ Appointing a project representative responsible for noise and vibration issues, and for liaising with local representatives. A clear communication channel should be established between all parties prior to project commencement; ▪ Requiring that contractors ensure that site personnel are familiar with potential noise and vibration issues, and that personnel apply		

Ref No.	Reference Heading	Location	Mitigation Measure	Audit Result	Action Required
			a common-sense approach to eliminating unnecessary noise emissions; ▪ Use of quieter plant and methods where possible; ▪ Installation of temporary barriers or enclosures around local sources such as compressors and generators; and ▪ Limiting times of activities which may generate elevated noise or vibration emissions.		
Waste Management					
MM30	Waste Management	CEMP Section 4.4	All current and applicable waste management legislation will be applied and adhered to. Contractors that are engaged in the transport of waste off-site will comply with the provisions of the Waste Management Act (1996) (as amended), associated Regulations and the Waste Management Plan prepared in accordance with '*Best Practice Guidelines for the Preparation of Waste Management Plans for Construction and Demolition Projects* (2006)'. As such, the contractor must handle, transport, and dispose of waste in a manner that ensures that no adverse environmental impacts occur as a result of any of these activities. A collection permit to transport waste must be held by the relevant contractor which has been issued by the Local Authority where the waste has been generated i.e., LCCC		
MM31	Waste Management	CEMP Section 4.4	▪ The construction compound for the proposed scheme should have a dedicated Waste Storage Area (WSA) for any construction waste generated. Receptacles/skips or bays will be provided for each recyclable material.		
MM32	Segregation of Waste	CEMP Section 4.4	▪ All waste generated on site will be segregated and placed in appropriate waste streams designated for recycling, reuse, or disposal.		
MM33	Waste Documentation	CEMP Section 4.4.3.5	▪ A recording system to be put in place to record construction waste generated on site. The system will enable the contractor to maintain		

Ref No.	Reference Heading	Location	Mitigation Measure	Audit Result	Action Required
			records for all waste material which leaves the site, either for reuse on another site, recycling, or disposal; ▪ The licensed waste contractor employed to remove waste from the site will be required to provide documented records for each movement of waste off-site; ▪ All information will be entered into the waste management system to be maintained on site.		
Existing Services					
MM34	Existing Services	General	The contractor must adhere to the ESB Code of Practice for Avoiding Danger from Overhead Electricity Lines, 2008 and the HSA Code of Practice for Avoiding Danger from Underground Services, 2010.		
MM35	Existing Services	General	▪ Prior to excavation, the contractor will assess record drawings and the results of the Site Investigation in order to determine the exact depth and location of the existing service networks within the works area; ▪ Prior to any excavation works all known existing underground services will be clearly marked on the ground. These will be located by personnel trained in the location of underground services; and ▪ All overhead electrical lines will be clearly marked and delineated with goalposts, Crossing points, onsite in accordance with the ESB Networks Code of Practice. All exclusion zones to be clearly identified on site and appropriate plant and machinery selected for works within the exclusion zone with particular attention given to maximum reach of the machinery being used for lifting operations while constructing for excavation works.		
MM36	Existing Services	General	▪ Any anticipated clashes between the existing utilities and the proposed works will be identified during the design phase and any		

Ref No.	Reference Heading	Location	Mitigation Measure	Audit Result	Action Required
			diversions necessary to avoid accidental clashes during the construction phase will be designed, planned, and agreed with the utility company in advance of the construction phase of the Scheme.		
Archaeology and Built Heritage					
MM37	Archaeological Monitoring	General	The area under assessment in this report comprises an area spanning the southern bank of the River Shannon, approximately 2kms to the east of Limerick City in the townlands of Dromore, Sreelane, Newcastle, and Castletroy. The proposed development extends for approximately 4.5kms within mixed use landscape. In the event that any previously unrecorded archaeological features are uncovered during monitoring of ground works then they will be recorded and securely cordoned off while the IW Project Archaeologist, the LCCC Archaeologist and the NMS are consulted to determine appropriate further mitigation measures, which may entail preservation in situ (by avoidance) or preservation by record (archaeological excavation).		

8. Programme of Works

8.1 Construction Schedule

The finalised construction works programme was not available at the time of formulating this outline CEMP, however it should include the following will be subject to the following constraints.

The following mitigation calendar shall be applied and followed to ensure protection of habitats and species during construction and operational phases of the greenway. In general, the construction works should be planned during the 'green' periods in the calendar year, as long as appropriate mitigation measures are implemented. The exception to this is Fish (salmonoid spawning) because foreshore works (including preparatory work) beside all watercourses supporting salmonids shall be undertaken from May to October (inclusive) and in consultation with Inland Fisheries Ireland (IFI) to avoid accidental damage or siltation of spawning beds.

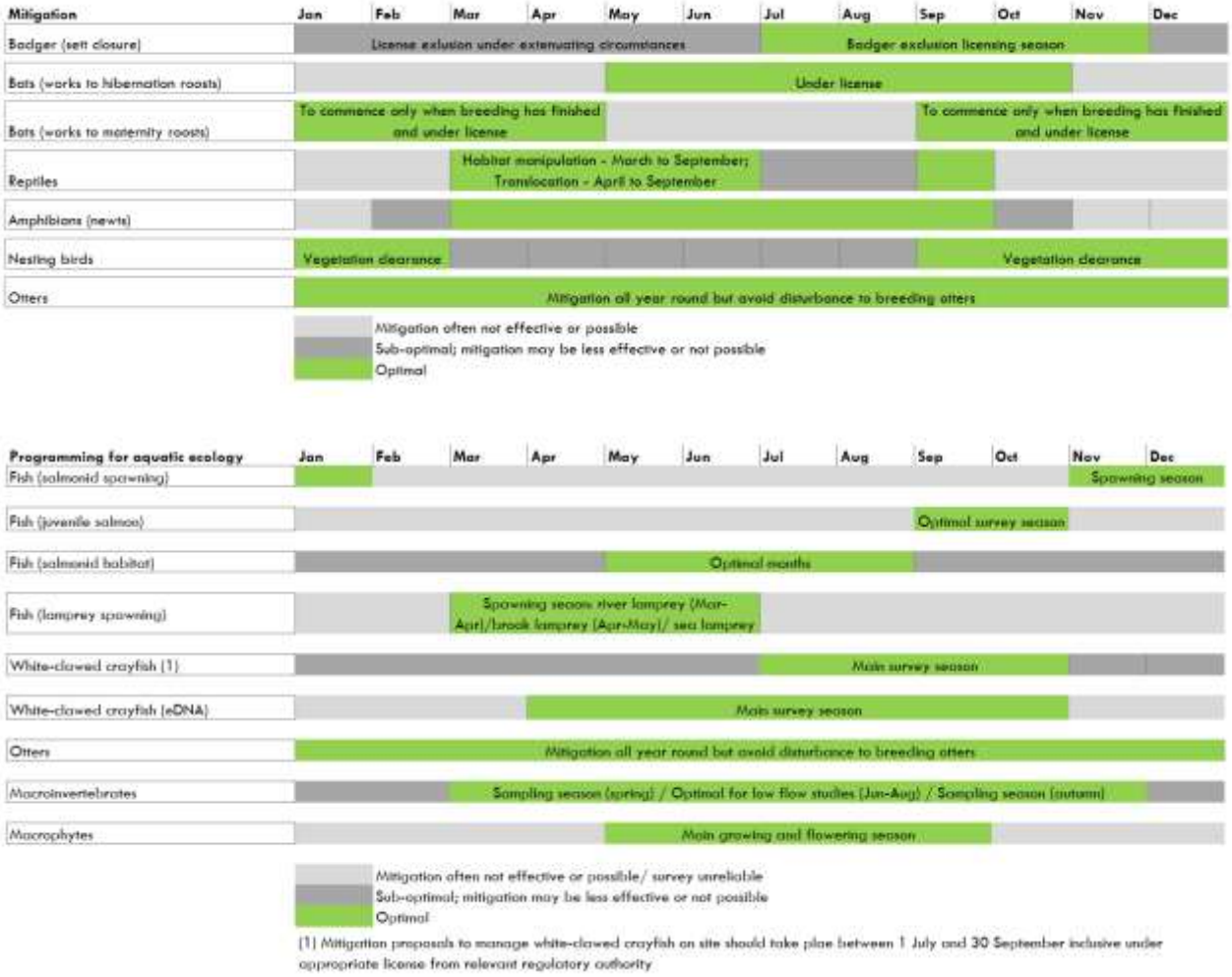

Figure 8-1: Ecological calendar

8.1.1. Ecological Clerk of Works

Where the construction programme does not allow this seasonal restriction to be observed, vegetated areas will be inspected by a suitably qualified ecologist for the presence of breeding birds prior to clearance as outlined in Section 4.2.6 of this CEMP.

8.1.2. Tree and scrub clearance

To avoid impacting on bird nesting sites, vegetation (e.g., hedgerows, woodland, tree, scrub, and grassland) will not be removed between 1st of March and 31st of August inclusive, to avoid impacts on nesting birds.

Although the Wildlife Acts provide an exemption from this seasonal restriction for road construction, there is no exemption provided for intentional nest destruction.

8.1.3. National Holidays

- Christmas non-working time is from the beginning of the third week of December to the end of the first week of January; and
- Other non-working times including bank holidays, '*builders*' holidays etc.

8.2 Working Hours

The normal working times are set out in the section below. Works other than safety requirements, security and emergency works will not be undertaken outside these working hours without the written permission from LCCC. This permission, if granted, can be withdrawn at any time should the working regulations be breached.

Night is defined as 18:00 to 08:00hrs.

No rock breaking works or works involving the using of pneumatic breaking equipment shall take place between the hours of 22:00 and 07:00. Should rock occur on sections where any night works are specified then alternative working hours shall be agreed with the Employer's Representative.

It is proposed (unless otherwise specified by the Local Authority or planning conditions) that the construction activities will operate during daylight hours and between dawn and dusk during shortened daylight hours. During daylight hours the following will constitute the normal working hours;

- Monday to Friday – 08:00 to 18:00;
- Saturday – 08:00 to 13:00; and
- Sundays or Bank Holidays – no works permitted.

Where additional or alternative working hours are required, these will be agreed in advance via written agreement with LCCC. Approval to vary the prescribed hours may be sought based on the following considerations:

- Traffic management issues;
- Safety requirements including risk to the public;
- Sequential/timing measures;
- Requirements of other authorities (e.g., ESB, Eircom); and
- Public interest.

Emergency work may include the replacement of warning lights, signs and other safety items on public roads, the repair of damaged temporary works and all repairs.

9. Compliance and Review

9.1 Site Inspections and Environmental Audits

Daily and weekly environmental inspections of construction activities will be carried out by the Environmental Manager and the Site Construction Manager in accordance with the CEMP to ensure all controls to prevent environmental impact, relevant to the construction activities taking place at the time, are in place.

9.2 Auditing

It will be the responsibility of the contractor to implement the mitigation and monitoring measures specified in the AA Screening Report and the CEMP. The contractor will also ensure that all construction staff understand the importance of implementing the mitigation measures. The implementation of the mitigation measures will be overseen by the Environmental Manager.

Throughout the construction phase, environmental audits will be carried out by a suitably qualified and experienced person. A schedule of audits will be agreed with the Employers Representative in advance of commencement of works. The purpose of the environmental audits is to identify any underlying causes of non-compliance and determine whether the CEMP is being properly implemented and maintained. Audits also allow for the identification of system and performance improvement opportunities. The contractor may carry out the environmental audit themselves or appoint external personnel acting on their behalf. The results of environmental audits will be provided to the project management team.

An audit of compliance with the pre-commencement mitigation measures will be completed by the Environmental Manager prior to the commencement of construction. Monthly audits of compliance with the construction phase mitigation measures will be completed as construction is ongoing. The findings of each audit will be documented by the Environmental Manager and made available to LCCC and other statutory bodies on request.

Once the scheme is operational and has been commissioned, a report of compliance with operational phase mitigation measures will be completed.

9.3 Environmental Compliance

The following definitions shown in Table 9.1 shall apply in relation to the classification of Environmental Occurrences during construction:

Table 9.1: Environmental Occurrences

Occurrence	Definition
Environmental Near Miss	An occurrence which if not controlled or due to its nature could lead to an Environmental Incident.
Environmental Occurrence	Any occurrence which has potential, due to its scale and nature, to migrate from source and have an environmental impact beyond the site boundary.
Environmental Exceedance Event	An environmental exceedance event occurs when monitoring results indicated that limits for a particular environmental parameter has been exceeded. An exceedance will immediately trigger an investigation into the reason for the exceedance occurring and the application of suitable mitigation where necessary.
Environmental Non-Compliance	A non-compliance occurs when there is non-fulfilment of a requirement, and includes any deviations from established procedures, programmes and other arrangements related to the Environmental Management System (EMS).

The proposed greenway project will comply with all relevant environmental regulations and guidance set out by key regulatory bodies, including the Environmental Protection Agency (EPA), the National Parks and Wildlife Service (NPWS), and other relevant authorities. The proposed development will adhere to the provision set out

in the Habitats Directive and Birds Directive, ensuring the protection of the Qualifying Interests of the Lower River Shannon Special Area of Conservation. Specific measures to prevent pollution will be in line with the Water Framework Directive and the European Communities (Water Policy) Regulations. Compliance will be ensured through monitoring, audits and consultations with the relevant authorities and any mitigation measures will be undertaken in accordance with their recommendations.

9.4 Corrective Action Procedure

A corrective action is implemented to rectify an environmental problem on-site. Corrective actions will be implemented by the Site Manager/Environmental Manager, as advised by LCCC, or the Employer's Representative. Corrective actions may be required as a result of the following:

- Environmental audits;
- Environmental Inspections and Reviews;
- Environmental Monitoring;
- Environmental Incidents; and
- Environmental Complaints.

A Corrective Action Notice will be used by the Employer's Representative to communicate the details of the action required to the main contractor. A Corrective Action Notice is a form that describes the cause and effect of an environmental problem on site and the recommended corrective action that is required. The Corrective Action Notice, when completed, will include details of close out and follow up actions.

If an environmental problem occurs on site that requires immediate attention, direct communication between the Site Manager/Environmental Manager will be conducted. This will then be passed down to the site staff involved. A Corrective Action Notice will then be completed.

Appendix A Preliminary Design Drawings

Appendix B Landscape Architecture Drawings

Appendix C Structural Design Drawings

Limerick City Greenway Aquatic Ecological Appraisal – 2025 Update

Dr Alex Seeney, Dr Lauren Vickers

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1.0	21/11/2023	All	All	First draft for client comment	LV
1.1	12/12/2023	All	All	Addressing client comments	LV
1.2	12/04/2025	All	All	Update drawings and description	LV

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1. Introduction

1.1 Purpose and Brief

APEM Ltd (APEM) were commissioned by Ryan Hanley (RH) in 2021 to provide information on the possible environmental constraints associated with construction activities required for the proposed upgrade of an existing cycleway (the 'Limerick City Greenway') on the south bank of the River Shannon, near Limerick. APEM undertook an aquatic habitat-focused ecological walkover, which informed delivery of two reports – an Aquatic Ecological Appraisal (AEA) (APEM, 2021a) and a Water Framework Directive Assessment (APEM, 2021b).

In October 2023, APEM were instructed by RH to undertake a repeat walkover in light of proposed changes to the route of the Limerick City Greenway, and to provide an update to the AEA produced in 2021. In April 2025, minor amendments were made to this report.

As this assessment is restricted to aquatic species of interest (similar to the 2021 report), species groups under consideration are fish, macroinvertebrates, macrophytes, white-clawed crayfish (*Austropotamobius pallipes*) and invasive non-native species (INNS).

1.2 Site Description

The initial and updated routes for the Limerick City Greenway are presented in Figure 1. Whereas the previous route followed the Shannon River, turning south-east to follow the Mulkear River at the confluence between the two, the revised route now starts further downstream on the Shannon River (approximate NGR R 60328 57796), and deviates away from the watercourse to the south-east to follow existing road infrastructure (approximate NGR R 62723 58588) (Figure 1).

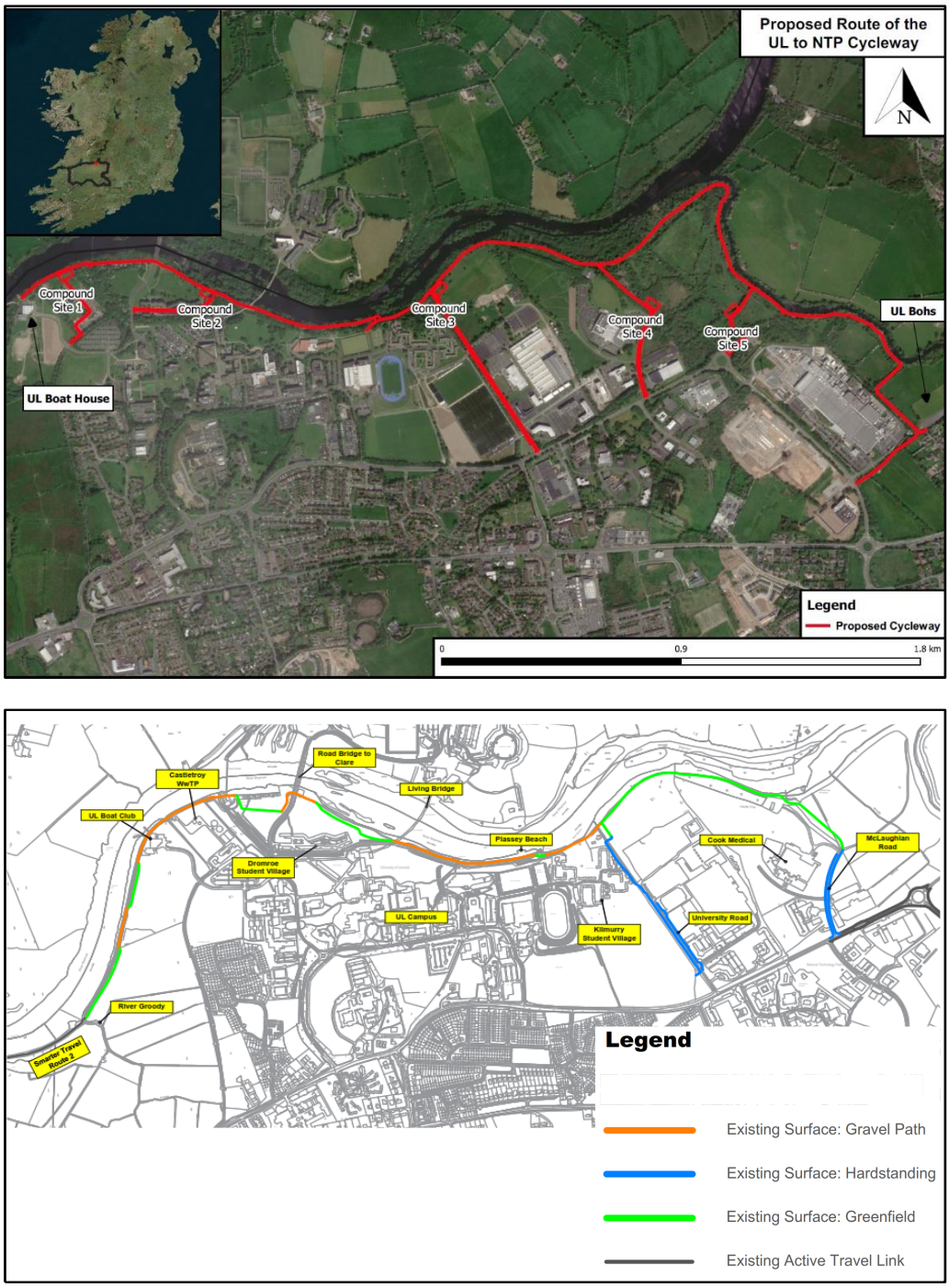


Figure 1 **The location of the original (2021, top) and revised (2025, bottom) Limerick City Greenway routes. Source: Ryan Hanley.**

1.3 Legislation and Policy

The following specific European Directives and Regulations apply when considering the proposed works outlined in Section 1.1.

1.3.1 The Wildlife Acts 1976 to 2018

The Wildlife Acts 1976 to 2018 provide a collective citation for the following:

- Wildlife Act 1976 (no. 39 of 1976)
- Wildlife (Amendment) Act 2000 (no. 38 of 2000)
- Wildlife (Amendment) Act 2010 (no. 19 of 2010)
- Wildlife (Amendment) Act 2012 (no. 29 of 2012)
- Heritage Act 2018 (no. 15 of 2018), Part 3

The Wildlife Act 1976 provided a legislative base for natural conservation, presenting species protection provisions, but with limited habitat/ site protection, even in the case of outstanding habitats or sites. The original 1976 legislation has therefore been amended several times and was updated by the Wildlife (Amendment) Act 2000 to provide statutory protection for Natural Heritage Areas, as well as legislation relating to the management and conservation of forests.

1.3.2 The European Communities (Birds and Natural Habitats) Regulations

The European Communities (Birds and Natural Habitats Regulations 2011 (S.I. No. 477 of 2011) transpose the Habitats Directive and the Birds Directive, described below.

1.3.2.1 The Birds Directive 2009

The EU Directive on the Conservation of Wild Birds (2009/147/EC) (hereafter called the 'Birds Directive') provides a framework for the conservation and management of wild birds in Europe. The relevant provisions of the Directive are the identification and classification of Special Protection Areas (SPAs) for rare or vulnerable species listed in Annex I of the Directive and for all regularly occurring migratory species (required by Article 4). The Directive required national Governments to establish SPAs and to have in place mechanisms to protect and manage them. The SPA protection procedures originally set out in Article 4 of the Birds Directive were replaced by the Article 6 provisions of the Habitats Directive.

1.3.2.2 The Habitats Directive 1992

The EU Directive on the Conservation of Natural Habitats and of Wild Fauna and Flora (92/43/EEC) provides a framework for the conservation and management of natural habitats, wild fauna (except birds) and flora in Europe. Its aim is to maintain or restore natural habitats and wild species at a favourable conservation status. The relevant provisions of the Directive are the identification and classification of Special Areas of Conservation (SACs) (Article 4) and

procedures for the protection of SACs and SPAs (Article 6). SACs are identified based on the presence of natural habitat types listed in Annex I and populations of the species listed in Annex II. The Directive required national Governments to establish SACs and to have in place mechanisms to protect and manage them.

1.3.3 The Flora (Protection) Order 2015

The Flora (Protection) Order 2015 lists the plant species afforded protection by Section 21 of the Wildlife Act 1976. The Flora Protection Order makes it illegal to cut, uproot or damage a listed species in any way. It is illegal to alter, damage or interfere in any way with their habitats. This protection applies wherever the plants are found.

1.3.4 The European Union (Invasive Alien Species) (Freshwater Crayfish) Regulations 2018

The European Union (Invasive Alien Species) (Freshwater Crayfish) Regulations 2018 (SI 354/18) provide measures to combat the threat of disease spread from several species of non-native crayfish. Ireland represents one of the largest surviving populations of the white-clawed crayfish, the only freshwater crayfish species found in Ireland.

1.3.5 Water Framework Directive

The Water Framework Directive (WFD) applies to rivers, lakes, groundwater and transitional coastal waters. Given legal effect in Ireland in 2003, it requires all member states to protect and improve water quality in all waters, with the aim of achieving 'Good' ecological status by 2015, or by 2027 at the latest.

2. Introduction

2.1 Desk Study

As part of the update to the original AEA, the desk study undertaken in 2021 was repeated to check the continued validity of the original data, and to provide any additional species or site data made available between 2021 and 2023. The National Parks and Wildlife Service (NPWS) and European Environment Agency (EEA) were consulted to identify European sites within 2 km of the proposed cycleway upgrade. However, as potential impacts on transient populations (e.g. disruption of fish migration) could affect sites considerably further afield than 2 km, potential impact pathways to all European sites within the Lower Shannon catchment designated for migratory fish were also included in this assessment.

Data was obtained from multiple sources, as follows:

- The National Biodiversity Data Centre – a search was undertaken for protected or priority aquatic species within 2 km of the site. Data was obtained from the last ten years.
- Inland Fisheries Ireland (IFI) – a search was undertaken for all fisheries records available within the last ten years. Reference is also made to older records where more recent survey data was unavailable.
- The Environmental Protection Agency – a data request was submitted for any relevant fish, macroinvertebrate or macrophyte data within the Lower Shannon catchment, limited to the last ten years.

Across all data searches, the most recent (i.e. within the last ten years) data has been used where possible.

2.2 Field Survey

The walkover survey was undertaken on the 8th of November 2023 by Adon McFarlane (Senior Fisheries Consultant).

A visual assessment of the watercourse was undertaken along the revised route of the cycleway upgrade, with particular attention paid to aquatic species or habitats which may pose ecological constraints on the work, as well as a general assessment of the watercourse and aquatic habitat for the various aquatic species associated with the Shannon River.

2.3 Limitations

The results presented in this report represent those at the time of survey and reporting, and data collected from available sources. Conclusions and mitigation advice provided in this AEA are indicative, in the absence of a Construction Environmental Management Plan (CEMP), and do not constitute an Environmental Impact Assessment Report under the Environmental

Protection Agency guidelines (2022). Mitigation advice provided in Section 4.4 may need to be revised once a final construction plan is agreed upon.

3. Results and Discussion

3.1 Designated Sites

Designated sites located within 2 km of the revised cycleway route are presented in Table 1. Designated site information was obtained from the NPWS, IFI and the National Biodiversity Data Centre.

Two sites are located either within 2 km of the proposed cycle path or have been included based on their overlap with other designated sites. The 'zone of influence' (CIEEM, 2018) for any non-statutory sites is likely to be restricted to those located on or adjacent to the Site.

Table 1 Summary of designated sites within the Zone of Influence.

Site name	Designation	Distance (km) and direction from site
Lower River Shannon SAC[1]	Special Area of Conservation (SAC)	On site
River Shannon and River Fergus Estuaries SPA[2]	Special Protection Area (SPA)	8 km south-west

The revised cycleway is located within the Lower River Shannon SAC, which stretches along the Shannon valley from Killaloe in County Clare to Loop Head/ Kerry Head – a distance of approximately 120 km. The Lower River Shannon SAC is designated for a variety of habitats including tidal mudflats and sandflats, floating river vegetation, and *Salicornia*, as well as a number of migratory fish species, including Atlantic salmon (*Salmo salar*) and all three Irish lamprey species (brook lamprey, *Lampetra planeri*; river lamprey, *Lampetra fluviatilis*; sea lamprey, *Petromyzon marinus*). Although not afforded specific protection in Ireland, the European eel (*Anguilla anguilla*) is listed as critically endangered on the IUCN Red List of Threatened Species[3].

Whilst the upper extent of the River Shannon and River Fergus Estuaries SPA is approximately 8 km downstream from the western-most end of the proposed cycle path, this SPA overlaps with the Lower River Shannon SAC, which entirely encompasses the section of the River Shannon along which the proposed cycleway would be constructed. This SPA has therefore been included within the desktop study.

[1] https://www.npws.ie/protected-sites/sac/002165

[2] https://www.npws.ie/protected-sites/spa/004077

[3] https://www.iucnredlist.org/species/60344/152845178

3.2 Habitats

3.2.1 The Lower River Shannon SAC

The Lower River Shannon SAC is selected for the following habitats listed on Annex I/ II of the EU Habitats Directive (* denotes a priority habitat):

- [1110] Sandbanks
- [1130] Estuaries
- [1140] Tidal Mudflats and Sandflats
- [1150] Coastal Lagoons*
- [1160] Large Shallow Inlets and Bays
- [1170] Reefs
- [1220] Perennial Vegetation of Stony Banks
- [1230] Vegetated Sea Cliffs
- [1310] *Salicornia* Mud
- [1330] Atlantic Salt Meadows
- [1410] Mediterranean Salt Meadows
- [3260] Floating River Vegetation
- [6410] *Molinia* Meadows
- [91E0] Alluvial Forests*

The majority of these habitat types are confined to the estuarine environment and are not present within the reach of the River Shannon that is adjacent to the revised cycleway route. However, habitat type 3260 'Floating River Vegetation' is known to be present throughout most major rivers in the Lower Shannon River SAC and is therefore highly likely to be present in the vicinity of the proposed works.

Throughout the walkover reach, the watercourse is interspersed with areas of riffle and glide, characteristic of moderate flow conditions and with a heterogeneous substrate composition. Banks are predominantly vegetated, with some areas given over to amenity use (e.g. pedestrian walkways) and agricultural land (including cattle grazing and associated poaching).

3.2.1 River Shannon and River Fergus Estuaries SPA

The River Shannon and River Fergus Estuaries SPA is primarily designated for its bird species, due to the important coastal wetland habitat it provides. This is partly due to the vast expanses of intertidal flats with associated salt marsh vegetation, which support a diverse macroinvertebrate community and provide important high tide roost areas for wintering birds.

3.2.1.1 The Arterial Drainage Act 1945

In 1945, the Arterial Drainage Act was passed to alleviate land in Ireland from 'periodic or prolonged flood damage'. The act involves a statutory requirement to maintain the drainage

works on any given channel, with approximately one fifth of watercourses being maintained in any given year (OPW, 2012).

As part of the act, the Mulkear River (Ballymakeogh) Flood Relief Scheme provides protection for properties in Newport against flooding from the Mulkear river (OPW, 2018), and covers the river down to its confluence with the River Shannon at Castletroy. However, drainage operations can eliminate desirable, natural habitats in rivers, such as meanders, holding pools and spawning beds. This is of concern given the number of migratory fish species that form part of the Lower Shannon River SAC.

3.3 Species

Species data within the vicinity of the site have been refined within the scope of an AEA to include fish (Table 2), macroinvertebrates (Table 3), macrophytes (Table 4) and white-clawed crayfish (Table 5).

3.3.1 Fish

Whilst electric fishing survey data were available for the Shannon River (IFI, 2022), these were from sites located over 100 km upstream from the proposed cycleway location, and were therefore not considered relevant to this assessment.

No further fish survey data were available for the Shannon (Lower)_060 waterbody (Waterbody ID IE_SH_25S012600). However, data were obtained from the 2017 survey of transitional waters in the Shannon International River Basin District (Coyne *et al*, 2017), in conjunction with records from the NBDC (NBDC, 2023a). These data are presented in Table 2.

Table 2 Fish species recorded in the vicinity of the proposed works.

Species	Latin name	Distance	Years
National Biodiversity Data Centre			
European eel	*Anguilla anguilla*	On site	2021 - 2023
Brook lamprey	*Lampetra planeri*	> 2km	2011 - 2021
Sea lamprey	*Petromyzon marinus*	On site	2021 - 2023
IFI Transitional Waters Report 2017 – Shannon and Fergus Estuaries (Coyne *et al*, 2017)			
Ballan wrasse	*Labrus bergylta*	> 2km	2017
Brill	*Scophthalmus rhombus*	> 2km	2017
Brown trout	*Salmo trutta*	> 2km	2017
Common dragonet	*Callionymus lyra*	> 2km	2017
Common goby	*Pomatoschistus microps*	> 2km	2017
Common sole	*Solea solea*	> 2km	2017
Conger eel	*Conger conger*	> 2km	2017
Corkwing wrasse	*Symphodus melops*	> 2km	2017

Dab	*Limanda limanda*	> 2km	2017
Dace	*Leuciscus leuciscus*	> 2km	2017
European eel	*Anguilla anguilla*	> 2km	2017
European seabass	*Dicentrarchus labrax*	> 2km	2017
Fifteen spined stickleback	*Spinachia spinachia*	> 2km	2017
Five bearded rockling	*Ciliata mustela*	> 2km	2017
Flounder	*Platichthys flesus*	> 2km	2017
Grey gurnard	*Eutrigla gurnardus*	> 2km	2017
Lesser sandeel	*Ammodytes tobianus*	> 2km	2017
Lesser spotted dogfish	*Scyliorhinus canicula*	> 2km	2017
Lumpsucker	*Cyclopterus lumpus*	> 2km	2017
Nilsson's pipefish	*Syngnathus rostellatus*	> 2km	2017
Painted goby	*Pomatoschistus pictus*	> 2km	2017
Perch	*Perca fluviatilis*	> 2km	2017
Plaice	*Pleuronectes platessa*	> 2km	2017
Pogge	*Agonus cataphractus*	> 2km	2017
Pollack	*Pollachius pollachius*	> 2km	2017
Poor cod	*Trisopterus minutus*	> 2km	2017
Pouting	*Trisopterus luscus*	> 2km	2017
Roach	*Rutilus rutilus*	> 2km	2017
Sand goby	*Pomatoschistus minutus*	> 2km	2017
Sand smelt	*Atherina presbyter*	> 2km	2017
Scad	*Trachurus trachurus*	> 2km	2017
Short spined sea scorpion	*Myoxocephalus scorpius*	> 2km	2017
Smelt	*Osmerus eperlanus*	> 2km	2017
Sprat	*Sprattus sprattus*	> 2km	2017
Thick lipped grey mullet	*Chelon labrosus*	> 2km	2017
Thornback ray	*Raja clavata*	> 2km	2017
Three spined stickleback	*Gasterosteus aculeatus*	> 2km	2017
Two spotted goby	*Gobiusculus flavescens*	> 2km	2017
Whiting	*Merlangius merlangus*	> 2km	2017
Worm pipefish	*Nerophis lumbriciformis*	> 2km	2017

Numerous records of species which undertake migratory movements through and / or take residency in freshwater habitats were found, including brook lamprey, sea lamprey, Atlantic salmon and European eel . The Atlantic salmon is protected under Annex II and V of the EU Habitats directive, whilst brook lamprey and sea lamprey are protected under Annex II of the same legislation.

It is assumed that the proposed works are temporary, and therefore no long-term impacts on these species are anticipated. However, these species may be present on site, and direct impacts to these species (such as deterioration in habitat quality due to sediment ingress and

/ or pollution incidents) are possible (and should be considered in line with best practice guidance in any construction plans).

3.3.2 Macroinvertebrates

Macroinvertebrate data were obtained from the NBDC (NBDC, 2023a) and from the National River Macroinvertebrate Surveys in Ireland, 2007 – 2018 (Feeley *et al*, 2020). Whilst data were not available for the Shannon (Lower)_060 waterbody in the immediate vicinity of the proposed cycle path, data were available immediately upstream for the Shannon (Lower)_050 waterbody (Waterbody ID IE_SH_25S012500), as well as the Mulkear (Limerick)_050 waterbody. Whilst the revised cycleway route no longer follows the Mulkear River, data from this waterbody have been included below for completeness (Table 3).

Table 3 Macroinvertebrate species recorded in the vicinity of the proposed works.

Waterbody ID	Distance	Years	Order	Family	Genus / Species
National Biodiversity Data Centre					
*	*	2021 - 2023	Unionida	Margaritiferidae	Freshwater pearl mussel (*Margaritifera margaritifera*)
National River Macroinvertebrate Surveys in Ireland, 2007 – 2018 (Feeley *et al*, 2020)					
Shannon (Lower)_050	~ 7 km	2018	Rhynchobdellida	Glossiphoniidae	*Helobdella* sp.
			Acari	-	*Acari* sp.
			Amphipoda	Corophiidae	*Corophium* sp.
				Gammaridae	*Gammarus* sp.
			Diptera	Chironomidae	-
			Ephemeroptera	Caenidae	*Canis* sp.
				Ephemerellidae	*Serratella ignita*
				Heptageniidae	*Heptagenia* sp.
			Trichoptera	Ecnomidae	*Ecnomus tenellus*
				Hydropsychidae	*Hydropsyche* sp.
				Polycentropodidae	*Polycentropus* sp.
			Myida	Dreissenidae	*Dreissena polymorpha*
			Ectobranchia	Valvatidae	*Valvata (Cincinna) piscinalis*
			Littorinimorpha	Bithyniidae	*Bithynia* sp.
			Neotaenioglossa	Hydrobiidae	*Potamopyrgus antipodarum*
			Neritopsina	Neritidae	*Theodoxus* sp.
	On site	2018	Lubriculida	Lumbriculidae	-

			Acari	-	*Acari* sp.
			Amphipoda	Gammaridae	*Gammarus duebeni*
					Gammarus zaddachi
			Coleoptera	Elmidae	*Elmis aenea*
					Limnius volckmari
			Diptera	Chironomidae	-
				Pediciidae	*Dicranota* sp.
			Ephemeroptera	Baetidae	*Alainites muticus*
				Ephemerellidae	*Baetis rhodani/atlanticus*
					Serratella ignita
				Heptageniidae	*Ecdyonurus* sp.
					Heptagenia sp.
			Plecoptera	Leuctridae	*Leuctra* sp.
				Perlidae	*Perla bipunctata*
			Trichoptera	Hydropsychidae	*Hydropsyche* sp.
			Neotaenioglossa	Hydrobiidae	*Potamopyrgus antipodarum*
			Neritopsina	Neritidae	*Theodoxus* sp.

**Sensitive species; location data not publicly available.*

Numerous aquatic macroinvertebrate taxa were identified that are known to be sensitive to reductions in water quality, including Plecoptera (stonefly) and Trichoptera (caddisfly) species. However, no species on this list are considered to be protected or threatened in Ireland (Nelson *et al*., 2019), with the exception of the freshwater pearl mussel (*Margaritifera margaritifera*).

It is assumed that the proposed works are temporary, and no long-term impacts on these species are anticipated. However, numerous macroinvertebrate taxa that are sensitive to reductions in habitat or water quality may be present on site, and direct impacts to these species (such as deterioration in habitat quality due to sediment ingress and /or pollution incidents) are possible (and should be considered in line with best practice guidance in any construction plans). Bankside works are planned at the Mill Race (approximate NGR R 61892 58401). This avoidance is important on the River Shannon which was assigned a Q-Value of 3-4, WFD Moderate; slightly polluted (Feeley et al, 2020). Avoiding degradation (or further degradation) of this river habitat would therefore be important when considering future impacts on macroinvertebrate communities.

3.3.3 Macrophytes

No historic macrophyte survey data was found for the River Shannon. However, an Ecological Impact Assessment (EIA) was carried out by Ecofact in 2014 and identified no protected macrophyte species along the existing cycle path route.

A review of the NBDC identified records of nine protected plant species between 2021 and 2023, of which three may be found in aquatic environments (Table 4).

Table 4 Protected macrophyte records in the vicinity of the proposed works.

Species	Latin name	Distance	Years
National Biodiversity Data Centre			
Irish St John's-wort	*Hypericum canadense*	> 2km	2021 - 2023
Opposte-leaved pondweed	*Groenlandia densa*	> 2km	2021 - 2023
Chickweed willowherb	*Epilobium alsinifolium*	> 2km	2021 - 2023

The Lower River Shannon SAC is designated in part for the presence of EU habitat type habitat type 3260 'Floating River Vegetation', which is known to be present throughout most major rivers in the catchment. Given the functional complexity of this habitat type, as well as the multiple ecosystem services it provides within the watercourse, any impacts of the proposed works on this habitat type may also cause knock-on effects to local habitat and species. Direct impacts to this habitat (such as through increased sediment erosion and sediment ingress into the watercourse) should be avoided in line with best practice guidance including sheet piling, dry docks, and silt curtains.

3.3.4 White-clawed crayfish

Although no survey records of white-clawed crayfish were found on the River Shannon, , a single record < 2 km upstream from the end of the proposed cycle path upgrade route on the River Mulkear was obtained, indicating that the River Mulkear (and potentially the River Shannon) offer habitat to support populations of white-clawed crayfish. Although no occurrences of non-native crayfish species have been reported in Ireland, multiple occurrences of crayfish plague have been reported in a number of Irish rivers since 2015, though no records have been reported on the River Shannon (NBDC, 2023b).

Table 5 White-clawed crayfish records in the vicinity of the proposed works.

Species	Latin name	Distance	Years
National Biodiversity Data Centre			
White-clawed crayfish	*Austropotamobius pallipes*	> 2km	2011 - 2021

3.4 Walkover

The proposed greenway will require two new bridges and deck replacements for three bridges along the banks of the Shannon River (Appendix A). New concrete abutments will be required for the two new bridges. The deck replacements will utilize the existing abutments. The walkover survey focused predominantly on aquatic habitat, with particular attention to habitat in the vicinity of the five proposed bridge locations.

At the start of the revised cycleway route, the Shannon River is very wide (approximately 90 m), characterised by glide flow typology, and with evidence of invasive non-native species present on the banks (Himalayan balsam, *Impatiens glandulifera*) (Figure 2).

Figure 2 Shannon River walkover start (left, R6032757777) and Himalayan balsam (right, R6032957781).

Small drainage ditches (Figure 3) were identified adjacent to the existing path though aquatic habitat here appeared to be characterised by stagnant flow with heavy leaf litter input. The slow flows and large amount of decaying organic matter in these ditches may offer suitable habitat for lamprey ammocoetes (depending on their connectivity with the main Shannon River channel), though this was not immediately apparent during the walkover.

Figure 3 Drainage ditches adjacent to the Shannon River (left, R6033557794; right, R6043657993).

At the proposed location for Bridge 1 (Appendix A), the Shannon River is characterised by deep glide, with shallow banks populated with grass / scrub and sporadic tree cover. Whilst water depth precluded observations of substrate, the slow-flowing aquatic habitat with marginal tree cover, undercut banks and shelter from the main channel may provide suitable refugia for salmonids, whilst marginal deposition of silt may offer habitat for lamprey ammocoetes (providing such habitat remains wetted) (Figure 4).

Figure 4 Shannon River near proposed Bridge 1, showing glide flow typology (left) and marginal silt depositions (right).

The proposed locations for Bridge 2, Bridge 3 and Bridge 4 are within a 100 m stretch between the Limerick County Council Waste Water Treatment Plant (approximate NGR R 60771 58589) and Plassey Mills (approximate NGR R 60871 58600). The new Bridge 2 will cross a very narrow stream which likely provides only ephemeral habitat, but which is hydrologically linked to the Shannon River (Figure 5, left). Bridge 3 passes over a larger stream (approximately 1 m wide and > 30 cm deep) which flows directly into the Shannon River (Figure 5, right), and may offer suitable lamprey ammocoete habitat due to its

connectivity with the Shannon River, its comparatively slower flows, and the presence of detritus and marginal sediment. There will be no abutment construction at Bridge 3.

Figure 5 Two streams beneath the proposed Bridge 2 (left) and Bridge 3 (right) locations.

Just downstream of The Living Bridge, an island network splits the main Shannon River, and a small channel (approximately 3 m wide) breaks off and follows the left-hand bank for approximately 350 m (Figure 6). This channel is characterised by faster-flowing run flow typology (estimated at 0.4 ms^{-1} at the time of survey) and is therefore unlikely to provide suitable lamprey ammocoete habitat. However, as this channel is connected to the main Shannon River at both ends, it may offer suitable habitat for salmonids due to the presence of cobble and gravel substrate with boulders, offering both refugia and foraging habitat for juvenile salmon and trout, and potentially offering suitable spawning habitat for adults. The proposed greenway path diverts away from the river edge at this location.

Figure 6 Fast-flowing run habitat downstream of The Living Bridge.

The proposed location for Bridge 5 is at the upstream end of the Mill Race, just south of Plassey Beach (approximate NGR R 61850 58383). The Mill Race is a narrow channel running parallel to the Shannon River from Plassey Beach down to the now disused Plassey Mill (approximate NGR R 60871 58600). Lamprey ammocoete habitat was identified both at the

upstream end of the Mill Race (i.e. in the vicinity of the proposed location for Bridge 5) and further downstream towards the middle of the Mill Race (Figure 7). The main Shannon River at this location is characterised by faster-flowing run and riffle habitat, supported by cobble and boulder substrate (Figure 8). Running adjacent to the Mill Race, this habitat in the main Shannon River may offer suitable spawning habitat for both river and sea lamprey. New reinforced concrete abutments for Bridge 5 will be constructed in the riverbank by utilising sheet piles, a dry dock, and a silt curtain upstream and downstream of the dry dock.

Figure 7 Lamprey ammocoete habitat in The Mill Race (upstream, left; mid-channel, right).

Figure 8 Riffle and run habitat in the Shannon River, adjacent to the Mill Race (upstream).

Approximately 500 m upstream of the Mill Race, the revised cycleway route follows existing infrastructure south, away from the Shannon River. Between this point and the Mill Race, the in-stream habitat of the Shannon River returns to slower, deeper flowing glide habitat, with dense riparian tree cover on the right-hand bank, but comparatively less cover on the left-hand bank (Figure 9).

Figure 9 **End of the walkover reach, showing deeper glide flow typology upstream of the Mill Race.**

4. Conclusions

The proposed greenway route is located within the Lower River Shannon SAC. Whilst the upper boundary of the River Shannon and River Fergus Estuaries SPA is a significant distance downstream of the proposed site, it overlaps with the lower boundary of the Lower River Shannon SAC.

The 2023 walkover and update to the 2021 AEA is based on a draft scheme for the upgrade of the current greenway, but it is understood that this will largely consist of upgrades to the surface of the current cycle path, with two key areas requiring new reinforced concrete abutments for new bridges (refer to Bridge 2 and Bridge 5 in Appendix A).

It is recommended that target lamprey surveys should undertaken within the Mill Race, prior to any site investigation or construction works that could disturb the stream. Should lamprey be recorded, a fish rescue is recommended prior to any instream works commencing. It is also recommended that white-clawed crayfish surveys are undertaken in the vicinity of any proposed riverbank works, prior to works commencing.

The site investigation and construction works have the potential to impact aquatic species and habitats (e.g. through sediment ingress or via noise and disturbance). This activity therefore has the potential to cause direct impacts to the Lower River Shannon SAC during the construction phase, whilst the installation of bridge abutment walls may result in permanent loss of habitat, particularly where this is required to take place within a riverbank (e.g. the Mill Race). Fish rescue, amongst other remedial ecological surveys, will be required prior to the commencement of any dry dock works. However, due to the small scale and temporary nature of the works, any impacts to the SAC are likely to be short-term in nature.

4.1 Habitats

Whilst the majority of qualifying habitats for the Lower River Shannon SAC are estuarine (e.g. 'Sandbanks', 'Estuaries', 'Coastal Lagoons'), the habitat type 'Floating River Vegetation' is present throughout the River Shannon and was identified during the preliminary walkover conducted in June 2021 (but not during November 2023, likely due to seasonality). This habitat type is particularly important to river habitats, as it promotes flow heterogeneity, fine sediment deposition, and shelter and food for fish and macroinvertebrates.

The proposed riverbank works may promote sediment erosion and ingress into the watercourse, which may negatively impact this habitat, with the potential to alter local sediment dynamics and modify the availability of habitat for fish and macroinvertebrates. However, a silt curtain will be deployed in the River Shannon before any sheets are piled into the riverbank, and dewatering will use a bowser to settle out silt before river water is returned to the Shannon. Impacts relating to construction activities are considered to be short-term and temporary in nature, in line with the scale and duration of the proposed works. An impact assessment of the proposed permanent structural changes (i.e. installation of new structures and associated foundations) will be undertaken separately. Impacts relating to operation of the new cycleway are uncertain in the absence of a construction plan, however, it is assumed that operation of the cycleway

will observe best practice guidance (e.g. relating to artificial lighting, pollution and drainage (Section 3.2.1.1).

4.2 Species

The Shannon River provides habitat for a number of qualifying species within the Lower River Shannon SAC, including brook lamprey, river lamprey, sea lamprey, freshwater pearl mussel and Atlantic salmon. Depending on the timing of the proposed works, different life stages of migratory fish species may be impacted by factors such as noise and disturbance associated with installation of sheet piles, or increased sediment ingress into the watercourse.

If possible, works near to the watercourse should not be carried out during periods of sensitivity for these migratory species (Table 6). If avoiding these key timings is not feasible there may be direct impacts on migratory movements and / or spawning activity, whilst impacts on the relatively immobile lamprey ammocoete life stages may occur year-round.

Table 6 Key timings of migratory fish species within the Lower River Shannon SAC. Shaded cells indicate key seasonal periods for a given species / life stage.

Species	Life stage	J	F	M	A	M	J	J	A	S	O	N	D
Atlantic salmon	Spawning & egg incubation	■	■								■	■	■
	Juveniles	■	■	■	■	■	■	■	■	■	■	■	■
	Adult U/S migration	■	■							■	■	■	■
	Smolt D/S migration			■	■	■							
Brook lamprey	Spawning & egg incubation			■	■	■	■						
	Ammocoetes	■	■	■	■	■	■	■	■	■	■	■	■
River lamprey	Spawning & egg incubation				■	■							
	Ammocoetes	■	■	■	■	■	■	■	■	■	■	■	■
	U/S migration										■	■	■
	D/S migration			■	■	■							
Sea lamprey	Spawning & egg incubation					■	■	■					
	Ammocoetes	■	■	■	■	■	■	■	■	■	■	■	■
	U/S migration			■	■	■	■						
	D/S migration	■	■	■	■	■					■	■	■

Lamprey ammocoete habitat was recorded at numerous locations throughout the walkover, including at several locations throughout the Mill Race. It is therefore possible that these works could negatively impact this habitat, and there is potential for a direct impact on lamprey ammocetes if the proposed works do take place (requiring consideration of mitigation options).

4.3 Additional Surveys Required

Although sheet piling will not be required within the river or Mill Race stream, such work adjacent to the watercourses can have impacts on aquatic species and habitats. Bankside and bank channel surveys of areas where riverbank works are proposed are recommended unless a Construction Environmental Management Plan (CEMP) is prepared to ensure no direct or indirect impacts to the watercourses. Remedial ecological surveys (e.g. fish rescue, white-clawed crayfish surveys) may also be required prior to the commencement of any works, and / or following works to assess any local impacts.

4.4 Mitigation Recommendations

Recommendations regarding protected and priority species and habitats are shown in Table 7.

Table 7 Mitigation Recommendations.

Species	Recommendations
Habitats	Where bankside works are to take place, excessive ingress of sediment into the watercourse should be prevented where possible. Where necessary, sediment netting / fences should be used to temporarily trap sediment during the works. It is assumed that any habitat loss as a result of operation of the cycleway would be minimal; however, this has not been critically assessed as part of this report.
Fish	Where possible, works should be timed to avoid the key periods of sensitivity (see Table 6). Works / construction activities should also be confined to standard daylight hours. To reduce disturbance to fish, areas where bank side works are required should be accessed from the bank / existing cycle path. Whilst a Construction Environmental Management Plan (CEMP) has not been provided, it is assumed that the following mitigation would be incorporated: • No disturbance of the river bed; • Use of silt curtains to prevent silt running into the river from bankside works; • Works to be completed in dry conditions to reduce sediment mobilisation; • Heavy plant and oils / fuel to be stored outside of the floodplain to minimise water quality issues; • Appropriate best practice / action plans to cover incidents such as fuel spills.

	Operational impacts of the new cycleway on fish are likely to be limited to disturbance and water quality impacts due to run-off. However, it is assumed that any such impacts would be negligible if best practice guidelines are observed.
Macroinvertebrates	Where riverbank works are to take place, excessive ingress of sediment into the watercourse should be prevented where possible. Where necessary, sediment netting / fences should be used to temporarily trap sediment during stabilisation works. It is assumed that recommended mitigation detailed for fish (for both construction and operational phases) will also apply to macroinvertebrates in the CEMP.
Macrophytes	Whilst some macrophyte species form the 'Floating River Vegetation' habitat type are found throughout the Shannon River, it is not anticipated that significant loss of this habitat will occur during construction works. However, appropriate mitigation should include keeping large construction equipment / machinery out of the watercourse. Operational impacts on macrophyte species are anticipated to be negligible given the short-term nature of the works. However, specialised surveys may be required to assess the presence of any designated macrophyte species in the vicinity of the proposed works.
White-clawed crayfish	Where riverbank works are to take place, excessive ingress of sediment into the watercourse should be prevented where possible. Where necessary, sediment netting / fences should be used to temporarily trap sediment during stabilisation works. Standard 'Check, Clean, Dry' procedures should be followed to minimise the risk of invasive non-native species introduction into the site. It is recommended that white-clawed crayfish surveys are undertaken in the vicinity of any proposed bank works, prior to works commencing. Providing no white-clawed crayfish habitat is removed during the construction phase, it is assumed that any operational impacts on white-clawed crayfish would be negligible. However, given the protected status of this species, it is assumed that specialist surveys will be undertaken to confirm the presence / absence of this species in proximity to the proposed works site(s), and suitable mitigation and best practice guidance will be followed.
INNS	An INNS Management Plan is required to reduce the spread of all INNS plant species during the movement of personnel and equipment into and out of the construction area.

5. References

APEM (2021a). NUI Limerick and National Technology Park Cycleway: Aquatic Ecological Appraisal. APEM Scientific Report P00006118. Ryan Hanley, July 2021, Draft Report v1.2, 23 pp.

APEM (2021b). NUI Preliminary WFD Assessment. APEM Scientific Report P00006118. Ryan Hanley, July 2021, Draft Report v1.1, 25 pp.

CIEEM. (2018). Guidelines for Ecological Impact Assessment in the UK and Ireland. Winchester: Chartered Institute of Ecology and Environmental Management.

Feeley, H.B., Bradley, C., Free, G. *et al*. A national macroinvertebrate dataset collected for the biomonitoring of Ireland's river network, 2007–2018. Sci Data 7, 280 (2020). https://doi.org/10.1038/s41597-020-00618-8

Inland Fisheries Ireland (2022). Fish in Rivers Factsheet: SHIRBD River Shannon Catchment, July 2022.

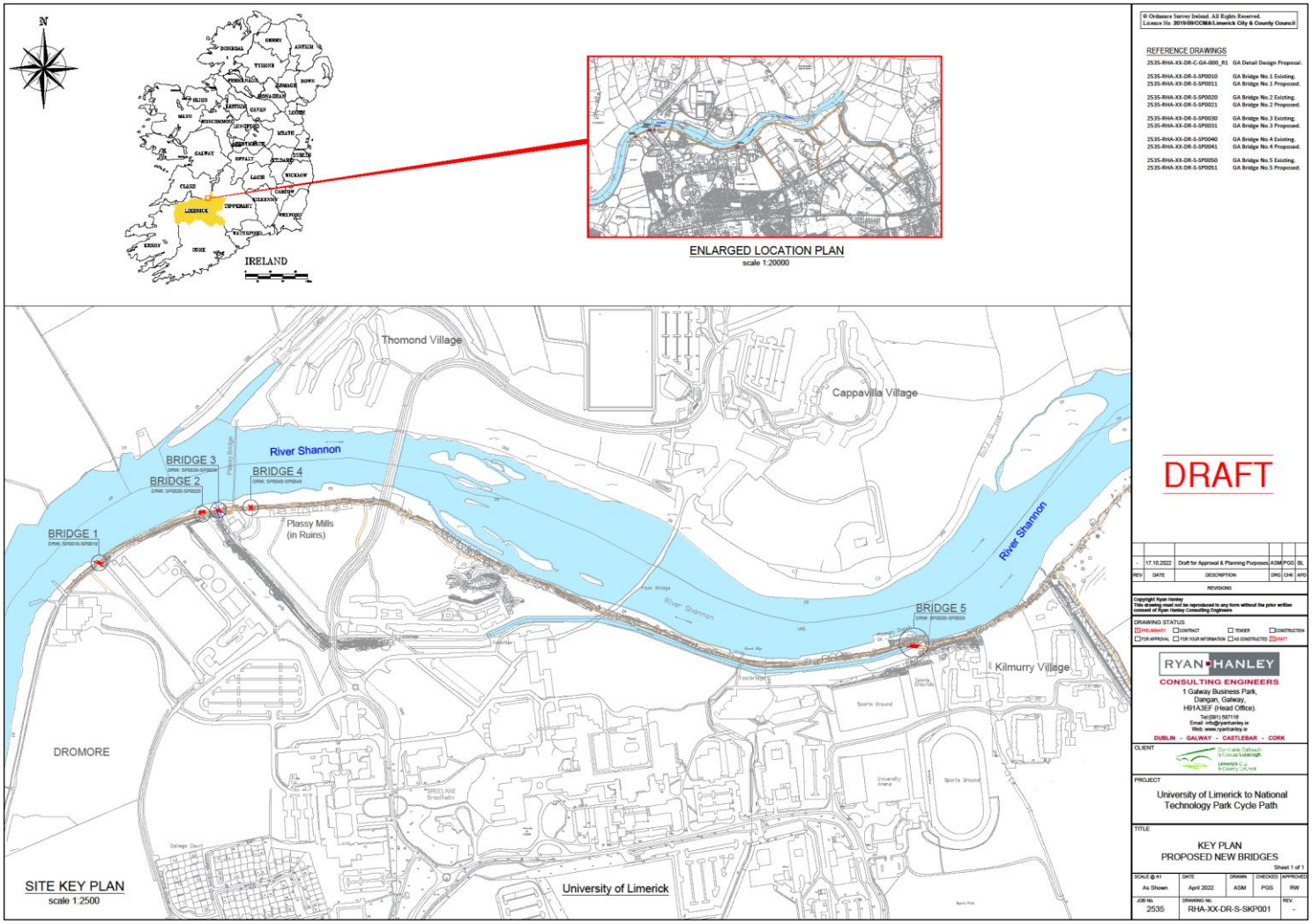
National Biodiversity Data Centre (2023a) Accessed from: https://records.biodiversityireland.ie/stats/taxon-stats?county_name=Limerick&date_range=2021-01-01%2000:00:00|2021-12-31%2023:59:59

National Biodiversity Data Centre (2023b). Crayfish plague. Accessed 16th November 2023 from: https://biodiversityireland.ie/crayfish-plague/

Nelson, B., Cummins, S., Fay, L., Jeffrey, R., Kelly, S., Kingston, N., Lockhart, N., Marnell, F., Tierney, D. and Wyse Jackson, M. (2019) Checklists of protected and threatened species in Ireland. Irish Wildlife Manuals, No. 116. National Parks and Wildlife Service, Department of Culture, Heritage and the Gaeltacht, Ireland.

The Office of Public Works (2012). Arterial Drainage Maintenance & High Risk Channel Designation Programme 2011 – 2015.

Appendix A Key Plan for Bridge locations (Ryan Hanley, Draft Drawing No. RHA-XX-DR-S-SKP001, April 2025)



Limerick City Greenway (UL to NTP)

Preliminary WFD Assessment

APEM Ref: P00006118

July 2024

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Version Number	Date	Section(s)	Page(s)	Summary of Changes	Approved by
1	13/07/2021			First draft for client review	HW
1.1	27/07/2021			Crayfish plague record update	NA
1.2	25/07/2024			Remove River Mulkear	

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Table 4-1 Summary of proposals on the River Shannon

Table 5-1 Summary of impacts on WFD classification elements

1. Introduction

APEM Ltd (APEM) were commissioned by Ryan Hanley to provide information on the possible environmental constraints associated with the proposed upgrade of an existing cycle way on the south bank of the River Shannon, near Limerick (Figure 2-3). The proposed works include the installation of sheet piling as part of works along the bank, which have the potential to adversely impact the aquatic environment.

In Ireland, the Water Framework Directive (WFD) is implemented through The European Union (Water Policy) Regulations 2014. In the event of a proposal which may have impacts on one or more water bodies, a WFD assessment is required. The aim of a WFD assessment is to determine whether a proposed scheme will:

- cause deterioration of the WFD status (or potential) of the affected water body (or water bodies); or,
- prevent the achievement of ecological objectives set for the water body (or water bodies) in the local River Basin Management Plan (RBMP).

For a proposal to be deemed compliant with the WFD, it must be demonstrated that there is a low risk that the activity will cause deterioration of water body status (or potential) or prevent good status (or potential) from being achieved.

This report presents a WFD assessment of the proposed upgrades to the cycle path on the south bank of the River Shannon, near Limerick, conducted by APEM under instruction from Ryan Hanley. This report provides:

- a summary description of the site and the scheme rational (Section 2);
- presents the WFD status and objectives of the water body (Section 3);and
- considers the likely impacts of the scheme on WFD quality elements (Section 5).

2. Site description

As part of a proposed upgrade to the cycle path along the south bank of the River Shannon (Figure 2-5), the installation of sheet piling is proposed for three newe bridges and a new ramp. Whilst these works do not require in-water activities, they have potential to directly or indirectly impact on the species and habitats of the River Shannon.

The current cycle path route follows the length of the River Shannon for approximately 3km, before turning south at two locations to travel over land to Plassey Park Road.

The reaches of the River Shannon that follow the cycle path route are typical of an urbanised river catchment. Banks on either side are dominated by dense weed and low shrub cover, with a sporadic tree canopy throughout. There is evidence of common invasive non-native plant species, including Himalayan balsam (*Impatiens glandulifera*), and giant hogweed (*Heracleum mantegazzianum*). Land use is mixed, with agricultural (livestock), amenity and green urban areas, though some of this has given way to construction and transitional woodland (CLMS, 2018).

There are three proposed locations along the bank of the River Shannon at which construction works will be required. Two locations are sited downstream (Figure 2-1) from the University of Limerick boat house. At this location, the River Shannon is very wide (approximately 90 m), with glide flow typology and densely vegetated banks. Where visible, substrate includes gravels which may be suitable for lamprey spawning, as well as large woody debris providing habitat diversity and enrichment for fish and macroinvertebrate species.

Figure 2-1 The River Shannon at the location of Bridge 1 and Bridge 2 (view downstream)

The third proposed construction location is at the site of the proposed Bridge 5 and proposed ramp at Plassey Beach (Figure 2-2). The River Shannon at this location has a shallow-to-moderate gradient, with a cobble/ boulder bed river, with riffle flow typology. The channel here is split into two distinct halves, with a large island in the middle of the channel, populated by dense shrub and tree cover.

Figure 2-2 The River Shannon at the location of the proposed Bridge 5 and Ramp at Plassey Beach (view upstream)

Further upstream, the river returns to a singular, wide channel, with glide flow typology and moderate flow with a shallow gradient (Figure 2-3). Although not part of the surveyed reach, areas of riffle habitat were visible in the channel upstream from the confluence between the River Shannon and the River Mulkear.

Figure 2-3 The River Shannon upstream of the proposed Bridge 5 and ramp at Plassey Beach (view upstream)

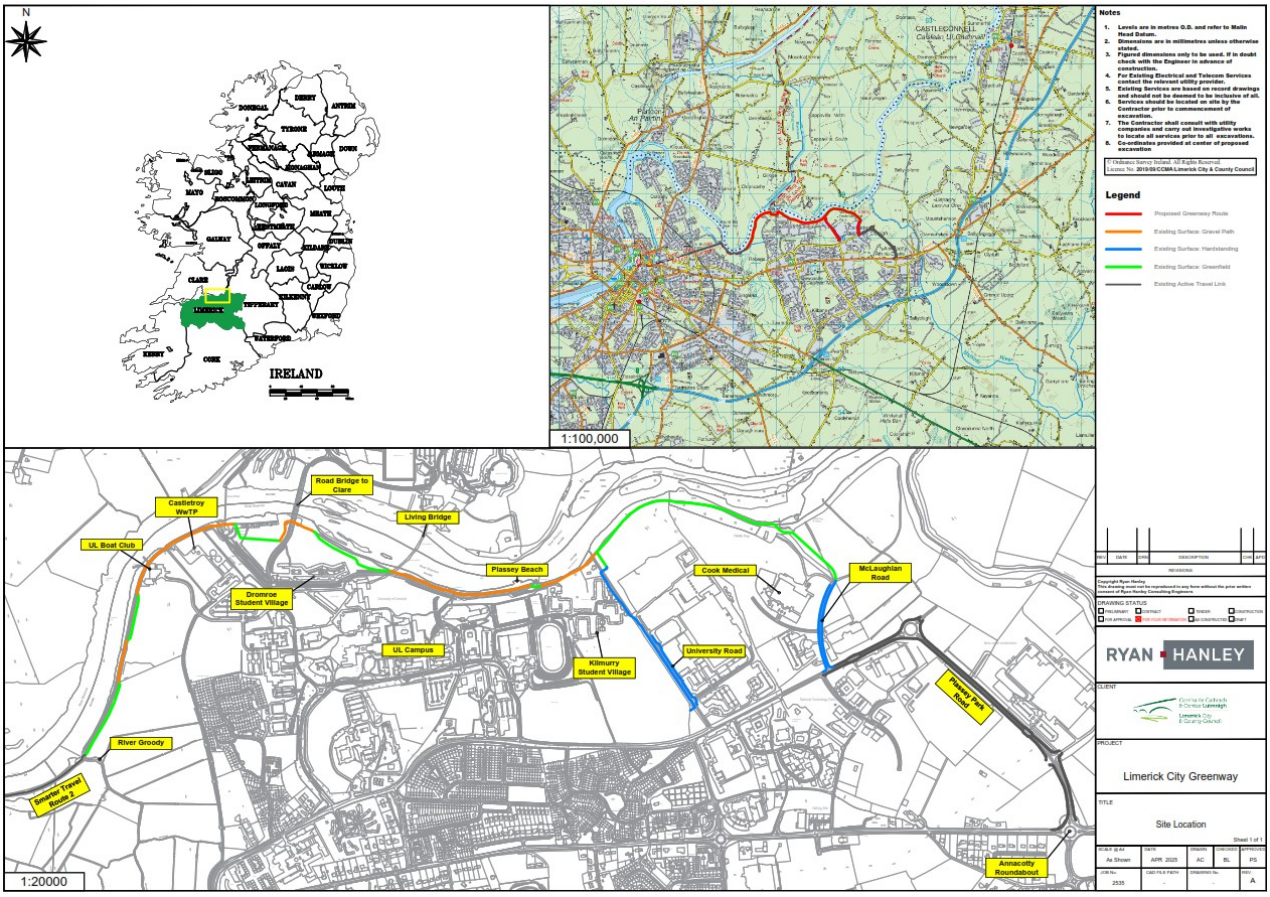

Figure 2-4 Route of the proposed cycle path upgrade

3. WFD Baseline Data

The WFD water body affected by the proposed cycle path upgrade is the 'Shannon (Lower)_060' (IE_SH_25S012600)

Although WFD cycle 2 survey data is not available for this water body, it is not listed as a priority. The 'Shannon (Lower)_060' water body WFD status is 'Unassigned', is classified as 'not at risk' (EPA, 2018). WFD classes and Q-Values were obtained from the National River Macroinvertebrate Surveys in Ireland, 2007 – 2018 (Feeley *et al*, 2020).

Table 3-1 WFD information for Shannon (Lower) 060

Water body name	Shannon (Lower)_060	
Water body ID	IE_SH_25S012600	
Water body length (km)	60.21	
Cycle 1 RBD	Shannon	
Heavily modified	Unknown	
Q-Value (Feeley *et al*, 2020)	3-4; slightly polluted	
WFD Class (Feeley *et al*, 2020)	Moderate	
Classification element	**2010 - 2012**	**2013 - 2018**
Ecological Status or Potential	Unassigned	Unassigned
Supporting Chemistry Conditions	Pass	Pass
General Conditions	Pass	Pass
• Oxygenation Conditions	Pass	Pass
- *Dissolved Oxygen (% sat)*	Not assessed	Pass
- *Other determinand for oxygenation conditions*	Not assessed	High
• Acidification Conditions	Pass	Pass
- *pH*	Pass	Pass
• Nutrient Conditions	Pass	Pass
- *Nitrogen Conditions*	High	High
- *Nitrate*	High	High
- *Ammonium*	High	High
• Phosphorous Conditions	High	High
- *Orthophosphate*	High	High

From the Environmental Protection Agency; catchments.ie

Data concerning significant pressures for the Shannon (Lower)_060 water body were not available. However, the adjoining upstream water body, 'Shannon (Lower)_50' is cited as being under significant pressure from 'hydromorphology' and 'urban wastewater treatment plants' (EPA, 2018).

4. Scheme Proposals

A final design for the upgrade of the current cycle path has not been decided upon, but it is understood that this will largely consist of upgrades to the surface of the current cycle path, with three areas requiring bridge structures to be constructed.

A summary of the proposed works is presented in Table 4-1. The works programme and methodologies for the works and subsequent upgrade of the cycle path will be selected by the Works Contractor at a later date. Therefore, design drawings and a method statement are unavailable at this time.

Table 4-1 Summary of construction proposals on southern bank of the River Shannon

Locations	R 60618 58504, R 60761 58585, R 61883 58394
Modification type	Sheet piles to be driven into the riverbank at all three locations for temporary periods during summer periods
Channel component modified	Bank material and geometry; single bank.
Length of river modified	**Not Applicable**.
Construction materials	Sheet piling, concrete.
Extent of impact	Limited to temporary, short-term in-channel impacts

5. Preliminary assessment of impacts

A preliminary assessment has been undertaken to evaluate the possible impacts of the proposed cycle way upgrade on the range of biological, chemical, hydromorphological and physico-chemical elements defined under the WFD. The assessment involved a five-step process which is summarised in the following sub-sections.

5.1 Impact of the scheme on WFD quality elements

A summary of likely impacts of the proposed cycle way upgrade on WFD classification elements is presented in Table 5-1. Overall, the proposal is not expected to result in long- term deterioration of ecological potential of the River Mulkear or the River Shannon, though there may be short-term impacts on local water quality and habitat quality within the footprint of the works and downstream.

5.2 Cumulative effects

Although individually a scheme may have an insignificant impact on WFD quality elements within a reach, the combined effect of several schemes within a water body may cause deterioration. The cumulative effects of existing pressures and other planned schemes that may have similar effects within a water body must be considered in combination with the impacts of the proposed scheme.
The proposed Bridge and Ramp construction works represent a standalone project relating to the improvement of the current cycle path, which is not part of a broader scheme of physical modifications planned on the River Shannon.

5.3 Impacts on critical habitats or species

If a scheme is likely to impact critical or sensitive habitats or species, either directly or indirectly, additional investigations may be required. Critical habitats are either of unique importance or offer a rare combination of features that are critical to the ecological health of the water body. Sensitive habitats are those which are intolerant to change and have low recoverability.

The Shannon (Lower)_060 water body is part of the Lower River Shannon SAC, which is designated for a number of species and one habitat type found in rivers. Whilst the works do not require work to be carried out in the channel itself, the proximity of these works to the watercourse may cause a number of impacts on the species and habitats of the River Shannon, both within the footprint of the works and further downstream. These impacts are discussed further in Table 5-1 , but are broadly categorised as follows:

- Noise and disturbance. Increased human activity and the use of construction and hydraulic piling equipment in the vicinity of designated sites may cause noise and/ or disturbance to designated species and habitats.

- Spread of invasive non-native species (INNS). Movement of personnel and equipment into and out of the construction area represents a risk of introducing, spreading and translocating invasive non-native species (INNS), to the detriment of designated species and habitats. Several INNS are already present within the Shannon catchment, including Himalayan balsam (*Impatiens glandulifera)* and giant hogweed (*Heracleum mantegazzianum*).

- Loss of riparian and/ or marginal habitat. There may be temporary or permanent loss of riparian and marginal habitat during both the pre- and post-construction phases.
- Reduction in habitat and/ or water quality. The works are unlikely to increase the rate of erosion of the riverbank and will have mitigation measures to prevent sediment entering the watercourse. Failure to implement mitigation measures could cause reductions in local habitat and water quality, with impacts on a number of protected fish and macroinvertebrate species.
- Pollution. The use of construction equipment in the vicinity of the watercourse presents a risk of chemical discharges in the form of fuel spills.

5.4 Impacts on proposed RBMP improvement measures

Water bodies at less than good status or potential have a series of proposed improvement and/ or mitigation measures that are intended to bring the water body up to Good Ecological Status (GES) or Good Ecological Potential (GEP). Any new scheme or activity could potentially compromise or render proposed improvement or mitigation measures ineffective which could prevent the water body from meeting its ecological objective. Under WFD, activities cannot prevent a water body from meeting the GES/ GEP by the objective deadline, by invalidating improvement measures.

The River Shannon is achieving a Passing Ecological Status/ Potential but is classed as slightly polluted and achieving a 'Moderate' WFD class with regard to macroinvertebrate communities.

Although the river does not have Reasons for Not Achieving Good status (RNAG), the River Shannon is considered to be under significant pressure from hydromorphology and urban wastewater treatment plants. The proposed works are not anticipated to cause significant changes to river hydromorphology, nor to interact with urban runoff, and are not considered to contradict objectives for the River Shannon.

5.5 Inclusion of GES/ GEP improvement measures

The approximate length of the River Shannon which will be impacted by the proposed works is 3 km, compared to a total length of 360.5 km for the entire River Shannon watercourse. It is therefore not considered feasible to incorporate GEP improvement measures into a scheme of this scale, i.e. it will not be possible to realise measurable benefits at the water body scale.

Table 5-1 Summary of impacts on WFD classification elements

Classification element	Potential impacts	Likely extent of impact	Mitigation	Overall impact	Further assessment or mitigation required?
Fish	Noise and disturbance during works.	Localised to within works footprint (<25 m), but over a length of approximately 3km of the water body (i.e. the full length of the cycle path along the riverbank). Possible temporary delays to migratory movements during seasonal windows.	Conduct work during standard daylight operating hours; avoid construction works during key periods of seasonal sensitivity if feasible.	No deterioration in WFD potential is anticipated.	No.
	Introduction and/ or spread of invasive non-native species.	Movement of INNS into and out of the construction area.	Adopt 'Check, Clean, Dry' procedures[1] when working around site.		
	Loss of riparian and/ or marginal habitat within the immediate footprint of the works.	Any permanent loss of riparian habitat is localised to works footprint; temporary loss of marginal habitat may occur during the works.	None required – any in-stream habitat loss will be temporary and limited to the duration of the works.		
	Reduction in habitat and/ or	Construction works have potential to increase	Use of silt fences during bridge and ramp constrcution works to		

[1] http://www.nonnativespecies.org/checkcleandry/

Classification element	Potential impacts	Likely extent of impact	Mitigation	Overall impact	Further assessment or mitigation required?
	water quality during works.	the volume of sediment entering the river. Generally short-term (i.e. during construction), but over a length of approximately 2km of the water body (i.e. from the most upstream construciton site to the downstream extent of the cycle path), with the possibility of further downstream impacts.	temporarily trap sediment.		
	Pollution during works.	Risk of localised pollution incidents with the possibility of effects extending further downstream.	Conduct works in accordance with best practice guidance for pollution prevention.		
Macroinvertebrates	Noise and disturbance during works.	None – noise and disturbance on the riverbank is not likely to affect this species group.	None required – negligible impact.	No deterioration in WFD potential is anticipated.	No.
	Introduction and/or spread of invasive non-native species.	Generally short-term (i.e. during construction), but over a length of approximately 3km of the water body, with the possibility of further	Adopt 'Check, Clean, Dry' procedures when working around site.		

Classification element	Potential impacts	Likely extent of impact	Mitigation	Overall impact	Further assessment or mitigation required?
		downstream impacts.			
	Loss of riparian and/ or marginal habitat within the immediate footprint of the works.	Temporary loss of marginal habitat may affect some macroinvertebrate groups which use this habitat, but this impact would be negligible when considering the number of individuals affected.	None required – negligible impact.		
	Reduction in habitat and/ or water quality during works.	Construction works could cause an increase in the volume of sediment entering the river. Generally short-term (i.e. during construction), but over a length of approximately 2km of the water body (i.e. from the most upstream construction site to the downstream extent of the cycle path), with the possibility of further downstream impacts.	Use of silt fences during the works to temporarily trap sediment.		
	Pollution during works.	Risk of localised pollution incidents with the possibility of effects extending further	Conduct works in accordance with Guidance for Pollution Prevention.		

Classification element	Potential impacts	Likely extent of impact	Mitigation	Overall impact	Further assessment or mitigation required?
		downstream.			
Macrophytes	Noise and disturbance during works.	No impact pathway, therefore, no impact.	None required – no impact.	No deterioration in WFD potential is anticipated.	No.
	Introduction and/or spread of invasive non-native species.	As works will not be taking place in the water, the risk of introduction of aquatic INNS is negligible in tandem with standard 'Check, Clean, Dry' procedures.	Adopt 'Check, Clean, Dry' procedures when working around site.		
	Loss of riparian and/ or marginal habitat within the immediate footprint of the works.	No impact likely – loss of riparian and marginal habitat is not expected to affect in-stream macrophytes.	None required – no impact.		
	Reduction in habitat and/or water quality during the works.	Construction works could cause an increase in the volume of sediment entering the river. Generally short-term (i.e. during construction), but over a length of approximately 2km of the water body (i.e. from the most upstream construction site to the	Use of silt fences during works to temporarily trap sediment.		

Classification element	Potential impacts	Likely extent of impact	Mitigation	Overall impact	Further assessment or mitigation required?
		downstream extent of the cycle path), with the possibility of further downstream impacts.			
	Pollution during works.	Risk of localised pollution incidents with the possibility of effects extending further downstream.	Conduct works in accordance with Guidance for Pollution Prevention.		
White-clawed crayfish	Noise and disturbance during works.	Noise and disturbance should not impact crayfish or their habitat – impacts are therefore anticipated to be negligible.	None required – negligible impact.	No deterioration in WFD potential is anticipated.	No.
	Introduction and/or spread of invasive non-native species.	Ireland remains the only part of the EU with no introduced crayfish species. Multiple occurrences of crayfish plague have been reported in a number of rivers in Ireland since 2015, though no records have been reported on the River Shannon (NBDC, 2021). The risk of introduction of INNS significant to crayfish is therefore considered to	None required – negligible impact.		

Classification element	Potential impacts	Likely extent of impact	Mitigation	Overall impact	Further assessment or mitigation required?
		be negligible in tandem with standard 'Check, Clean, Dry' procedures.			
	Loss of riparian and/or marginal habitat within the immediate footprint of the works.	White-clawed crayfish show a preference for large stony substrate as refugia (Peay, 2002), and are therefore not likely to be impacted by loss of marginal habitat.	None required – no impact.		
	Reduction in habitat and/or water quality during the works.	Siltation and reductions in water quality are identified as two main threats to white-clawed crayfish (Peay, 2002). Excess sediment runoff may reduce local habitat quality and cause an increase in the volume of sediment settling on the substrate in areas of slower flow further downstream.	Use of silt fences during works to temporarily trap sediment.		
	Pollution during works.	Risk of localised pollution incidents with the possibility of effects extending further downstream.	Conduct works in accordance with Guidance for Pollution Prevention.		

6. Summary and conclusions

A preliminary WFD assessment has been conducted to determine the likely impacts of upgrading the cycle path from The Groody River bridge to 50m west of Troy Castle in Castletroy, Co. Limerick. The proposals involve upgrading the existing path, with bridge and ramp construction works planned at three locations on the southern bank of the River Shannon.

There is one WFD water body affected by the proposal. The 'Shannon (Lower)_060 - IE_SH_25S012600' water body does not currently have a WFD status assigned to it but is classified as 'not at risk' (EPA, 2018), and is achieving a Moderate WFD classification for macroinvertebrates (Feeley *et al*, 2020).

Based on the current initial plans for implementation of the upgrade, the proposed works are not expected to cause the WFD classification of either water body to deteriorate, or to prevent either water body from achieving their objective of GEP.

On this basis, a detailed impact assessment is not considered necessary, as the proposed works are deemed to be compliant with the WFD. However, this may need to be re-evaluated once a method statement and design drawings have been made available by the Works Contractor.

7. References

Copernicus Land Monitoring Service (CLMS) (2018). *CORINE Land Cover*. Accessed 6th July 2021 from https://land.copernicus.eu/pan-european/corine-land-cover

Environmental Protection Agency (2018). *Lower Shannon & Mulkear Catchment Assessment (HA 25D)*. December 2018, Version no. 3.

Feeley, H.B., Bradley, C., Free, G. *et al. A national macroinvertebrate dataset collected for the biomonitoring of Ireland's river network, 2007–2018*. Sci Data 7, 280 (2020). https://doi.org/10.1038/s41597-020-00618-8

King, J.J. and Wightman, G. (2008). *Ecological Impact Assessment (EcIA) of The Effects of Statutory Arterial Drainage Maintenance Activities on Three Lamprey species (*Lampetra planeri *Bloch,* Lampetra fluviatilis *L., and* Petromyzon marinus *L.)*. Series of ecological assessments on arterial drainage maintenance No. 9. ISSN 1649-9840.

National Biodiversity Data Centre (2021). Crayfish plague. Accessed 27th July 2021 from: https://www.biodiversityireland.ie/projects/invasive-species/crayfish-plague/

Peay, S. (2002). *Guidance on habitat for white-clawed crayfish and its restoration*. Environment Agency Technical Report W1-067/TR.

The Office of Public Works (2012). *Arterial Drainage Maintenance & High Risk Channel Designation Programme 2011 – 2015*.

The Office of Public Works (2018). *Flood Risk Management Plan – Shannon Upper & Lower*.

Comhairle Cathrach & Contae Luimnigh

Limerick City & County Council

Limerick City Greenway (UL to Annacotty), Co. Limerick

Bat Activity Survey 2024

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1 INTRODUCTION

Ryan Hanley has been commissioned by Limerick City and County Council (LCCC) to undertake a Bat Activity Survey along the route of the proposed Limerick City Greenway (University of Limerick (UL) to Annacotty). The site had previously been surveyed by O'Donnell Environmental in 2021, but in this timeframe the scope of works has changed, with proposed routes being altered, necessitating the requirement to resurvey.

1.1 Aims & Objectives

The aims of the study were to determine the following:

- The areas and habitats within the zone of influence of the proposed works which are being used by bats (including commuting routes and foraging areas), focusing on the new route locations;
- The diversity and relative abundance of bats present; and
- Comparison of results with the data collected by O'Donnell Environmental in 2021.

Figure 1.1 shows the proposed cycle route, along with the zone of influence determined to be 50m. The proposed development adjoins the River Shannon.

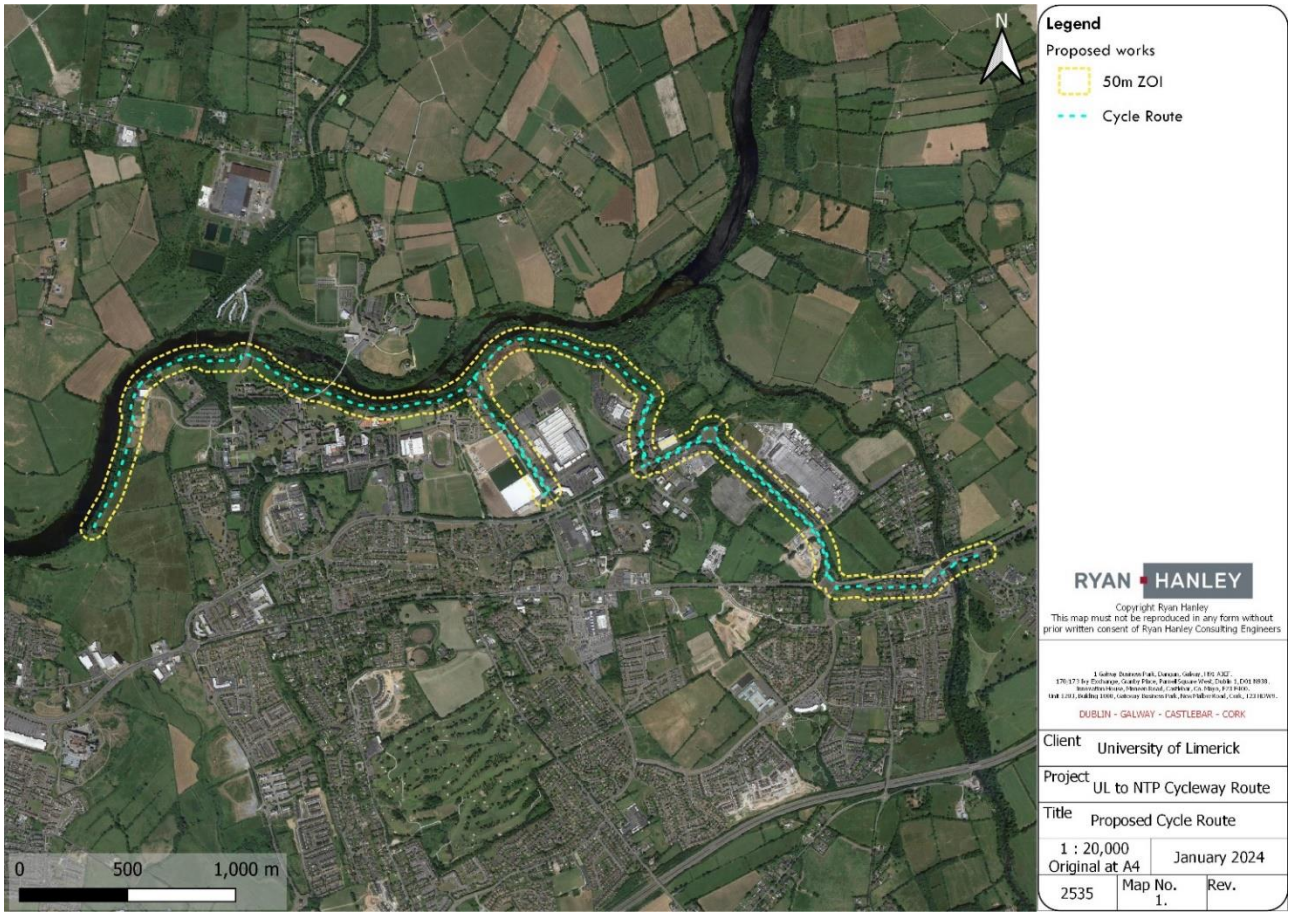


Figure 1.1: Aerial Imagery Showing Proposed Cycle Route for Bat Activity Survey

1.2 Legislative Context

All bat species occurring in Ireland are protected under both European and National legislation. All species are European Protected Species, listed on Annex IV of the EU Habitats Directive (92/43/EEC), transposed into Irish law under the European Communities (Birds and Natural Habitats) Regulations 2011. Lesser Horseshoe Bat (*Rhinolophus hipposideros*) are afforded special protection as an Annex II listed species. At national level, all bat species are protected under the Wildlife Acts (1976 and 2000), as amended.

1.3 Conservation Status

A total of nine species of bats are resident in Ireland. The overall conservation status of each of these species, as assigned by the NPWS (2019) is as follows:

- Lesser Horseshoe Bat is inadequate and deteriorating - although population in Ireland appears to be increasing steadily;
- Common Pipistrelle is favourable and improving;
- Soprano Pipistrelle is favourable and improving;
- Nathusius Pipistrelle is unknown;
- Natterer's Bat is favourable and stable;
- Daubenton's Bat is favourable and improving;
- Whiskered Bat is favourable and stable;
- Brown long-eared bat is favourable and improving; and
- Leisler's bat is favourable and improving.

1.4 Proposed Development

Limerick City and County Council (LCCC) intend to develop a 5.5km long greenway from the River Groody Bridge, along the River Shannon, through Annacotty, and terminate at Cappamore junction. The proposed works will involve the construction of 3.1km of haul roads, six construction compound sites, six new bridges, public lighting, and clearance of trees and shrubs.

Elements of the proposed works which have potential to impact on bats include the following:

- Loss of trees and disturbance to man-made structures with potential for bat roosting;
- Loss of potential foraging or commuting habitat for bats; and
- Disturbance from artificial lighting and noise within the proposed works area.

To facilitate the construction of the 5.5km cycle pathway, the removal of some vegetation, deadwood and the felling of 85 trees will be required, while the existing path is to be widened, requiring the pruning or removal of trees at sections. Bats and their roosts are protected by law, under the Wildlife

Act 1976 (as amended), as such it is an offence to disturb, injure or kill bats or disturb or destroy bat roosts.

2 METHODOLOGY

2.1 Desk Study

A search for records of bat species held by the National Biodiversity Data Centre (NBDC) website for 10km hectad R65 (10km grid square study site is located within) was completed on January 5th 2024 and updated on the 23rd of July 2024. The bat landscapes suitability index hosted on the NBDC website, https://maps.biodiversityireland.ie/Map for the project site and surrounding area was also reviewed. A review of previous bat surveys completed for this project was also conducted.

2.2 Bat Activity Survey

Bat activity was surveyed by completing nighttime bat walkover (transect) surveys and by deployment of passive detectors (automated/static surveys). Guidelines for planning and conducting bat activity surveys were followed as per the Bat Conservation Trust, "Bat Surveys for Professional Ecologists, Good Practice Guidelines" (Collins, 2023).

2.2.1 Nighttime bat walkover (Transect Surveys)

Walked dusk transects were undertaken on the 19th of June and 10th of July 2024 by Ryan Hanley Ecologists Aoife Fogarty and Breda Quinn. The surveys were carried out in suitable weather conditions (minimum 10°C, light wind and no precipitation). Surveys were carried out using a Full Spectrum Anabat Scout recorder and a Magenta 5 heterodyne recorder. Devices were swapped on the second survey occasion to ensure each transect was assessed at least once with the Anabat Scout.

The aim of the nighttime bat walkovers was to investigate bat activity in the zone of influence of the proposed works in the new route locations and to detect any bats which may be emerging from roosts at dusk. While a daytime visual inspection may detect signs of any large aggregations of roosting bats, smaller numbers of bats or bats roosting in discrete locations may not be apparent during daytime visual inspection. The night-time activity surveys primarily utilised visual detection, with the support of ultrasonic detection equipment.

Transect surveys were carried out on foot. Figure 3.3 shows the survey routes used as recorded by the Anabat Scout. The transect routes were selected to cover areas that may not have been captured in the O'Donnell 2021 surveys due to route amendments and to provide an updated reflection of bat activity in the area. All transects were walked at least once and the direction of travel was alternated between survey nights.

2.2.2 Passive (Automated/Static) Detector Survey

Passive ultrasonic bat detectors were deployed in two locations along the proposed scheme. The locations chosen had suitable bat habitat and had been identified in previous surveys as areas with high suitability for bat foraging. The locations of passive bat monitoring points are shown in **Figure 3.3**. Both passive

detectors were located in areas of broadleaf woodland where the woodland borders the current pathway near sections of riparian vegetation and the banks of the River Shannon.

Recording was carried out at 'Bat_01' for 7 nights from the nights of 19th of June to the 25th of June 2024 inclusive. Recording was carried out at 'Bat_02' for 7 nights from the 3rd of July to the 9th of July 2024 inclusive. Anabat Swift full spectrum detectors were utilised for passive surveys. Details of the survey period including average nightly weather conditions are shown in **Table 2.1.** The purpose of passive surveys was to supplement information gathered during the nighttime bat walkover (transect) surveys to identify any species present in the area which may not have been detected during the active surveys. The passive recording results also provide a robust baseline for future monitoring.

Table 2.1 – Details of passive monitoring survey period

Date [night of]	Sunrise	Sunset	Temp. °C	Wind km/h	Precipitation
19/06/2024	05:10	22:01	13	14	Dry
20/06/2024	05:10	22:02	13	13	Dry
21/06/2024	05:10	22:02	13	19	Dry
22/06/2024	05:10	22:02	14	15	Dry
23/06/2024	05:11	22:02	18	11	Dry
24/06/2024	05:11	22:02	18	11	Dry
25/06/2024	05:11	22:02	15	13	Dry
03/07/2024	05:16	22:00	13	17	Dry
04/07/2024	05:17	21:59	13	17	Dry
05/07/2024	05:18	21:59	13	17	Dry
06/07/2024	05:19	21:58	17	19	Light Rain
07/07/2024	05:20	21:57	19	33	Dry
08/07/2024	05:21	21:57	16	11	Dry
09/07/2024	05:22	21:56	15	6	Dry

Weather information: https://www.timeanddate.com/

Solar information: *https://www.timeanddate.com/*

2.2.3 Data Analysis

Bat activity sonograms were analysed using Anabat Insight sound analysis software and identifications were manually verified.

2.2.4 Evaluation & Impact Assessment

Evaluation of ecological features follows the NRA (now TII) publication 'Guidelines for Assessment of Ecological Impacts of National Roads Schemes' (2009). Impact assessment follows 'Guidelines on The Information to be Contained in Environmental Impact Assessment Reports' published by the EPA (2017).

Reporting follows Chartered Institute of Ecology and Environmental Management (2018) 'Guidelines for Ecological Impact Assessment in the UK and Ireland – Terrestrial, Freshwater, Coastal and Marine'.

3 RESULTS

3.1 Desktop Review

3.1.1 Existing Environment

The proposed scheme runs through an area of mixed broadleaf forestry, mostly along an existing pathway and roads, with smaller pockets running through woodland.

Table 3.1: Habitats within Proposed Scheme

Habitat (Fossitt Code)	Description	Approx. % Cover in ZoI
(Mixed) broadleaved woodland (WD1)	Dense population of broadleaved species forming primary aspect of survey. Forming large spreading canopy in open mature woodland. Species include Oak (*Quercus* spp.), Sycamore (*Acer pseudoplatanus*), Beech (*Fagus sylvatica*).	20%
Depositing/lowland rivers (FW2)	Deep, fast-flowing river in the form of the River Shannon. Runs adjacent to the proposed scheme for about 50% of the route.	15%
Buildings and artificial surfaces (BL3)	Residential accommodation, industrial facilities, commercial facilities and outlets. Habitat also includes road surfaces and carparks.	22%
Treelines (WL2)	Narrow strips of tree-lined roads, laneway and property boundaries. Treelines are planted, with even spacing between.	10%
Scrub (WS1)	Small, dispersed open pockets of scrub throughout ZoI, mainly comprised of Bramble (*Rubus fructicosus*).	5%
Riparian woodland (WN5)	Occurring along river margin fringe of WD1 to FW2 habitat, species included Willow *Salix* spp.	18%
Wet grassland (GS4)	Damp underfoot flat lowland areas. Species present include Rushes (*Juncus* spp.), small sedges (Carex spp.), and fringing Yorkshire fog (*Holcus lanatus*).	3%
Amenity grassland (improved) (GA2)	Intermittent pockets of managed species-poor grasslands forming sections of industrial or accommodational properties.	7%

3.1.2 National Biodiversity Data Centre (NBDC)

A review of National Biodiversity Data Centre (NBDC) revealed historical records for bat species within the area of search shown in **Table 3.2.** It is important to note that an absence of other bat species records is reflective of a lack of surveys undertaken to date rather than absence of bat species.

Table 3.2: Bat Species recorded in Hectad R65 Over the Previous 12 Years (National Biodiversity Data Centre)

Species Name	Record Count	Title of Dataset	Date of Last Record
Brown Long Eared Bat (*Plecotus auritus*)	1	National Bat Database of Ireland	28/09/2004
Daubenton's Bat (*Myotis daubentonii*)	143	National Bat Database of Ireland	25/08/2021
Lesser Horseshoe Bat (Rhinolophus hipposideros)	9	National Lesser Horseshoe Bat Database	27/01/2015
Lesser Noctule (*Nyctalus leisleri*)	8	National Bat Database of Ireland	22/05/2019
Myotis Bat species (*Myotis*)	1	National Lesser Horseshoe Bat Database	29/06/2014
Common Pipistrelle (Pipistrellus pipistrellus sensu lato)	10	National Bat Database of Ireland	07/06/2022
Soprano Pipistrelle (*Pipistrellus pygmaeus*)	9	National Bat Database of Ireland	22/05/2019

Bat Conservation Ireland conducted a search of available bat records within 10km of the study area on 15th November 2021 at the request of O'Donnell Environmental, and roost records were provided, and these are described in **Table 3.3.** The locations are shown in **Figure 3.1** and refer to the 1km grid square in which the roost was recorded. There are previous records for a Brown Long-eared roost within the boundaries of the proposed cycleway (Irish Grid Reference: R6158). There are previous records for a roost of the Annex II (EU Habitats Directive) species Lesser Horseshoe Bat roost at Doonass, Parteen, Co. Limerick (Irish Grid Reference: R6461), approximately 2.2km from the proposed works.

Table 3.3– Bat Conservation Ireland records for bat roosts within 10km of the study area.

Grid Reference	Species	Address
R5353	Soprano Pipistrelle, Brown Long-eared Bat	Dromdarrig, Mungret, Co. Limerick
R5860	Lesser Horseshoe Bat, Brown Long-eared Bat, *Myotis* sp.	Parteen, County Clare
R6461	Lesser Horseshoe Bat	Doonass, Parteen, Co. Limerick
R6163	Leisler's Bat	Clonlara, Co. Clare
R6158	Brown Long-eared Bat	Garraun, Co. Limerick

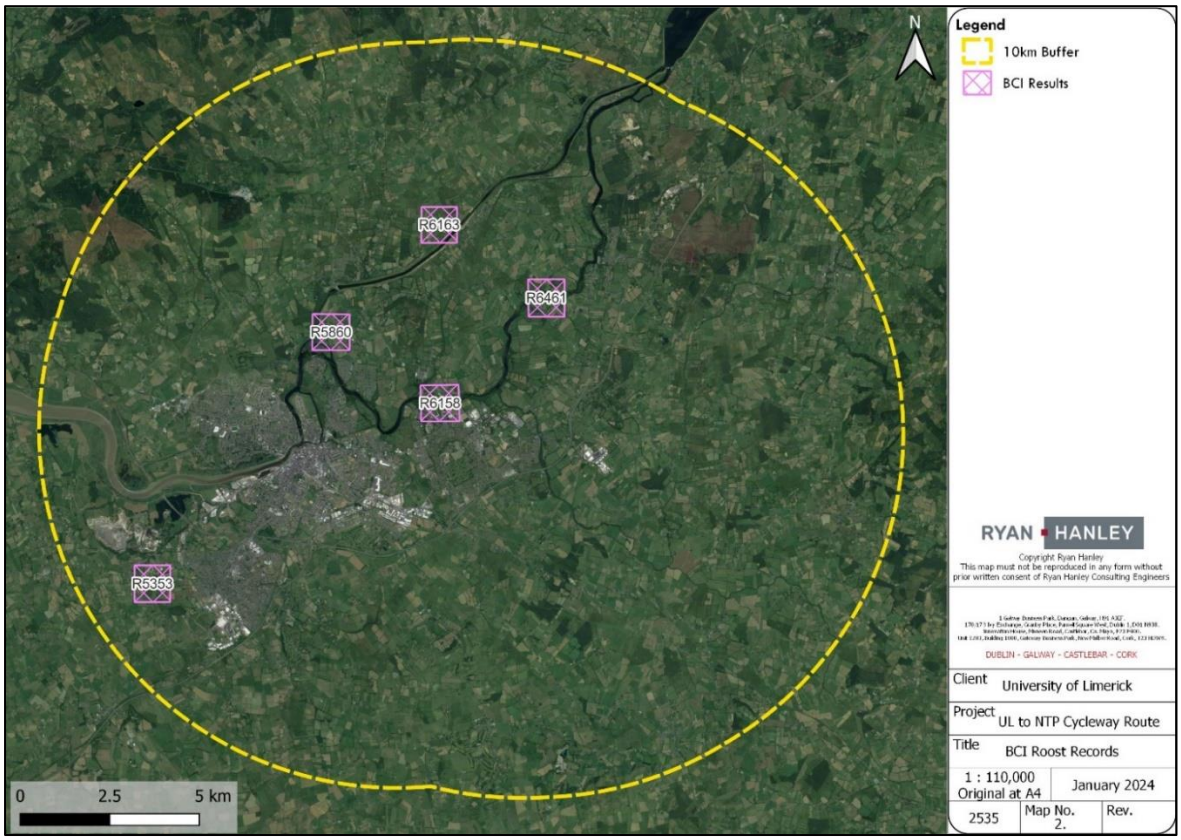


Figure 3.1: Roost Records Within 10km Of Proposed Cycle Route (Bat Conservation Ireland).

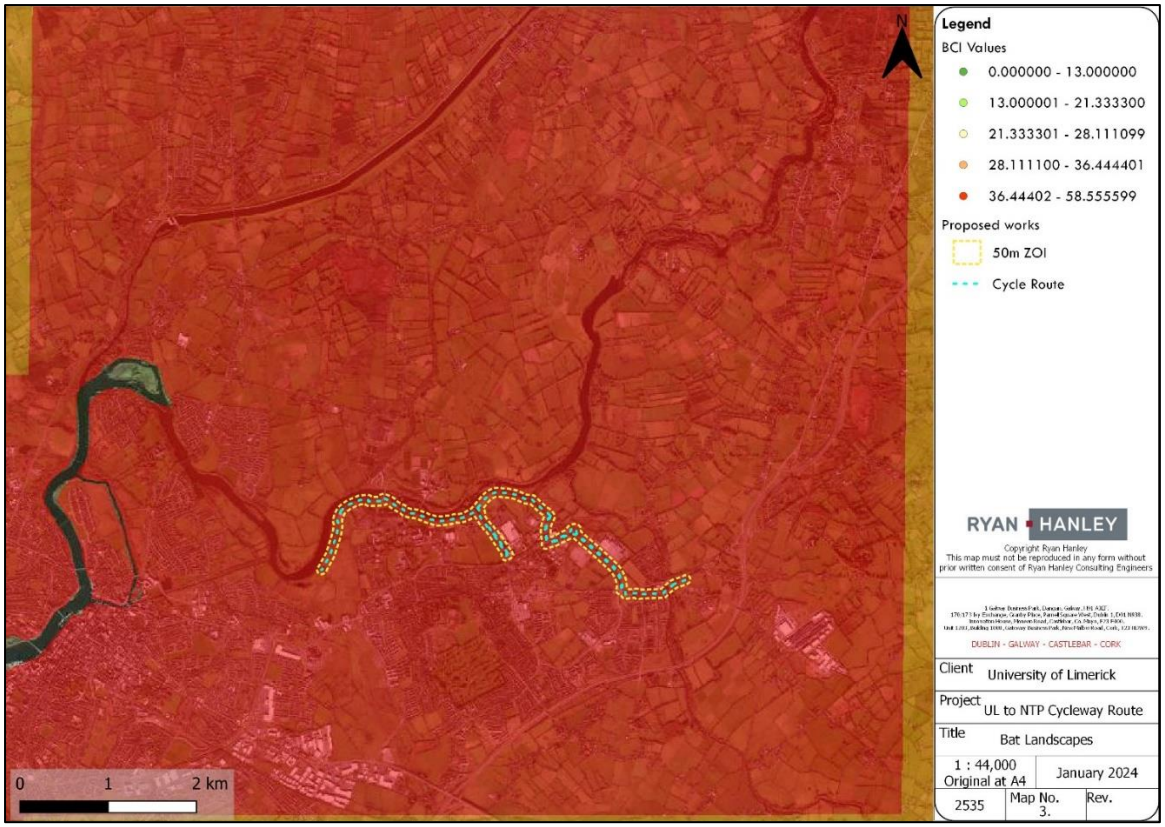


Figure 3.2: Bat Habitat Landscape

The All-Ireland Bat Landscape Classification has classified the area in which the project site is located as being of high potential (>36.44401) for supporting all bat species occurring in Ireland. *Note, results depicted in January 2024 map were confirmed as accurate by updated review of NBDC bat suitability index map on the 23rd of July 2024.*

The overall bat suitability index value (42.56 as per NBDC) according to 'Model of Bat Landscapes for Ireland' (Lundy *et al.* 2011) suggests the landscape in which the proposed works will take place is of high suitability for bats in general. Species specific scores are provided in **Table 3.4**. The Annex II (EU Habitats Directive) listed bat species, Lesser Horseshoe Bat, is assigned a score of 18.

Table 3.4: Bat Landscape scores: Suitability of the study area for the bat species according to 'Model of Bat Landscapes for Ireland' (Lundy *et al.* 2011) – accessed via NBDC database.

Common name	Scientific name	Suitability index
All bats		42.56
Soprano Pipistrelle	Pipistrellus pygmaeus	56
Brown long-eared bat	Plecotus auritus	55
Common Pipistrelle	Pipistrellus pipistrellus	64
Lesser horseshoe bat	Rhinolophus hipposideros	18

Leisler's bat	Nyctalus leisleri	64
Whiskered Bat	Myotis mystacinus	38
Daubenton's bat	Myotis daubentonii	42
Nathusiius Pipistrelle	Pipistrellus nauthusii	16
Natterer's bat	Myotis nattererii	30

3.1.3 Sites of International Importance

Under the EU Habitats Directive (92/43/EEC) and Birds Directive (2009/147/EC), areas which support habitats and species of conservation importance which are designated for the conservation of flora, fauna and habitats of European importance are referred to as a Special Area of Conservation (SAC). Areas which are designated for the protection and conservation of bird species and habitats of European importance are referred to as a Special Protected Area (SPA). These protected sites form part of Natura 2000, a network of protected areas throughout the European Union (EU). The development site is located within such a site: the Lower River Shannon SAC. Seven additional Natura 2000 sites are located within the potential zone of influence of the proposed works. The Natura 2000 site Dane's Hole, Poulnalecka SAC (000030) lists the Annex II Lesser Horseshoe Bat as one of the site's conservation objectives. No other internationally designated sites are relevant to the current assessment.

Table 3.5: SAC & SPA within the potential zone of influence of the proposed works

Site Name	Site Code	Distance (km)
Lower River Shannon SAC	002165	0
Glenomra SAC	001013	8.8
Glenstal Wood SAC	001432	9.3
Clare Glen SAC	000930	12.7
Slieve Bernagh Bog SAC	002312	13.9
Dane's Hole, Poulnalecka SAC	000030	14.9
River Shannon and River Fergus Estuaries SPA	004077	3.4
Slievefelim to Silvermines Mountains SPA	004165	12.3

3.1.4 Sites of National Importance

In Ireland, at a national level, Natural Heritage Areas (NHA) or proposed Natural Heritage Areas (pNHA) are designated to protect habitats, flora, fauna and geological sites of national importance.

There are no NHAs within 5km of the proposed site. Five pNHA sites are located within 5km of the proposed site (see **Table 3.6**). Two pNHA sites are nationally important as they are bat roosts. Castleconnell pNHA (000433) was designated as nationally important as it is a residential dwelling that is host to a maternity roost of Daubenton's Bats. Cloonlara House pNHA is a Leisler's Bat maternity roost. This site supports one of the largest maternity roosts of Leisler's Bats in Ireland and Europe which makes it internationally important as well.

Table 3.6 NHA/pNHA within the potential zone of influence of the proposed works

Site Name	Site Code	Distance (km)
Castleconnell (Domestic Dwelling, Occupied) pNHA	000433	2.4
Knockalisheen Marsh pNHA	002001	3.4
Cloonlara House pNHA	000028	3.4
Inner Shannon Estuary – South Shore pNHA	000435	4.3
Fergus Estuary And Inner Shannon, North Shore pNHA	002048	2.9

3.1.5 Previous Surveys

O'Donnell Environmental (O'Donnell, 2021) conducted a suite of bat surveys for this project in December 2021. This consisted of:

- -Daytime walkover surveys to identify any bat roosting potential which may exist within the zone of influence of the proposed works;
- -Structure Surveys: Non-destructive, and relevant visual inspections to identify any evidence of bat roosting. Signs of bat use include bat droppings, feeding remains, potential bat access points identified by characteristic staining and scratches, noise made by bats etc. Buildings and bridges were surveyed in July and September 2021; and Bat activity surveys in the form of
    - Transect Survey (Now called Night-time Bat Walkover (Collins, 2023)) undertaken July 19th and September 9th, 2021;
    - Passive Detector Survey with detectors deployed at two locations along the proposed scheme layout for 13 nights from the nights of 9th September to 21st September 2021 inclusive. These results can be seen in the Appendix, in sections A-D; and
    - Ground-level roost assessments were carried out on 19th July 2021 and October 2021 during daylight hours.

A ground level tree assessment (GLTA) was carried out in January 2024 along the proposed cycle route by Ryan Hanley Ecologist Damien McAndrew. The objective of the GLTA was to assess a tree potential to support roosting bats. The survey involves a surveyor making an external assessment of the tree whilst

stood on the ground, noting potential bat entry/exit points, potential roosting features (PRFs), and any evidence of bats seen. The trees are graded for their potential to support roosting bats (None, Further Assessment Required (FAR), Potential Roost Feature (PRF) or specialist Inspection Surveys required (PRF-Insp.)) in accordance with Bat Conservation Trust guidelines (Collins, 2023), which will inform the need for further survey effort if required such as a Potential Roost Feature (PRF) Inspection.

This survey primarily focused on trees and built structures which have the potential to be impacted (earmarked for felling and demolition) as a result of works on the existing pathways to accommodate the proposed route and newly added sections of the route, and any other trees and structures in the site ZoI which have the potential to contains PRFs. While no bat roosts were identified during this survey, bat boxes were noted within the 50m ZoI of the proposed development, which should be considered potential bat roosts, along with a large bat house (UL Bat House).

3.1.6 Previous Results

3.1.6.1 Roost survey 2021

During the O'Donnell Environmental 2021 survey, no bat roosts were identified during inspections of structures within the survey area. Structures were assessed for their suitability for roosting bats following Collins (2016).

- Three buildings (or clusters of buildings) were identified within the 'zone of influence' which had 'moderate' suitability to support roosting bats. These included two ruined castles and an unfinished/disused house. The two castle ruins had considerable number of crevices between the masonry work and unfinished/disused house along the waterway has numerous entry points for bats in the eaves of the roof.
- -Three buildings (or clusters of buildings) were identified within the 'zone of influence' which had 'low' suitability for roosting bats. Two of the structures with low suitability for roosting bats included detached residential dwellings that were occupied and based on visual inspection from public area, numerous small gaps between the eaves and the wall of the houses were apparent. The third low suitability structure included a cluster of residential dwellings on the eastern side of the proposed development.
- Remaining structures were considered to have 'negligible' potential to support roosting bats based on available information. The buildings considered to have negligible suitability for roosting bats were mainly those of student accommodation, office buildings and a sports centre; these were all relatively recently built.
- No roosting bats were encountered in trees, and no unoccupied roosts which contained signs of bat occupation were encountered. A total of seven trees were identified to have 'low' suitability for roosting bats. Trees with 'low' potential are described where they are within or immediately adjoining the proposed works area. No 'moderate' or 'high' suitability trees were present. None of the potential roosting features in trees inspected during the current survey had potential as a

maternity roost for any bat species. Mature trees tend to occur in the western areas of the scheme.

- All seven trees considered to have low value PRFs were mature and consisted of three tree species: Oak (*Quercus petraea*), Beech (*Fagus sylvatica*) and Sweet Chestnut (*Castanea sativa*). All of these had some or all of the following PRFs: welts, wounds, tear-outs, hazard beams and compression forks or had dense ivy surrounding the stem of the tree. These features can provide roosting space for bats within the trees for crevice dwelling bat species. It is likely that some of these features may be used at least occasionally by bats and their value to bats may increase over time (O'Donnell, 2021).

3.1.6.2 Echolocation survey 2021

O'Donnell Environmental conducted a bat activity survey using active bat activity (walked transect) surveys and passive bat surveys. These were carried out to characterise bat activity in the zone of influence of the proposed works and to detect any bats which may be emerging from roosts at dusk.

Bat echolocation detections are quantified here as bat "registrations". A registration for the relevant species is attributed when any bat echolocation signal occurs in one recording, which are up to 15 seconds in length. Bat registrations do not equate to numbers of bats as individual bats of the same species cannot be differentiated. A single bat continuously foraging in proximity to the detector can generate a large number of registrations in one night. Variability occurs in the likelihood of detection between species. For example, Leisler's Bats emit a loud low frequency call which travels further and is more easily detected than the quiet higher frequency calls of Brown Long-eared Bats.

Eight species of bat were recorded (discussed below) including the Annex II (EU Habitats Directive) listed Lesser Horseshoe Bat. The following species were recorded along the proposed cycleway during the passive and active surveys:

- Soprano Pipistrelle;
- Brown Long-eared Bat;
- Common Pipistrelle;
- Leisler's Bat;
- Lesser Horseshoe Bat;
- Daubenton's Bat;
- Natterer's Bat; and
- Whiskered Bat

3.1.6.3 Active bat surveys 2021

Over 350 individual registrations of bats were recorded during the course of the bat transect surveys. These surveys were carried out in July and September 2021. Soprano Pipistrelles were the most frequently recorded species during both active surveys. At least six species were recorded on handheld

bat detectors during active surveys. These species were Soprano and Common Pipistrelle, Leisler's Bat, Daubenton's Bat, Natterer's Bat and Lesser Horseshoe Bat. Lesser Horseshoe Bat was recorded during the transect survey in July 2021 (3 registrations) only. Overall, Common and Soprano Pipistrelle and Leisler's Bat were highly abundant along the walked transect. It is likely that they utilise all habitat types within the zone of influence (50m buffer surrounding the proposed development). Leisler's bats were mainly recorded along the treeline edge when in the vicinity of open habitat, e.g., playing pitches or disused rough grasslands, while Pipistrelle species were more associated with the treeline along the water's edge and along those connectivity corridors running north-south from the river into the main campus (near the Kilmurry Student Village and along McLaughlan Road). Daubenton's Bats were only recorded where access to the water's edge was available to Surveyors, e.g., swimming areas or where there was no bankside vegetation. However, it is considered extremely likely that they utilise all sections of the waterway bordering the proposed development. Lesser horseshoe bats were recorded along the central connectivity corridor, near the Kilmurry Student Village. These passes were likely from an individual foraging or commuting along this treeline. Relatively lower levels of bat activity were recorded in the western areas of the scheme during transect surveys. This is likely to be because of a smaller productive foraging habitat and light pollution from nearby buildings and public lights when compared to eastern areas (O'Donnell, 2021).

3.1.6.4 Passive survey 2021

Two passive detectors were deployed at suitable locations on the scheme to provide a larger dataset and detect species which may not have been recorded during active surveys. Eight species of bat were recorded on the passive detectors. A high level of bat activity was recorded during the passive survey period. 22,282 bat registrations were recorded on the passive detectors during the survey period. Registrations and results for individual species are detailed below in the Appendix, sections A-D.

3.1.6.5 Conclusion (2021 surveys)

O'Donnell Environmental conducted a comprehensive and appropriate study to identify the importance of the study area for bats. No bat roosts were identified but some suitable bat roosting opportunities were identified for crevice dwelling bats in trees and structures within the study area. A high level of bat activity was recorded overall from at least eight species during the active bat surveys.

Taking all the above into consideration, the work carried out by O'Donnell in 2021 concluded the study area is considered to be of '**local importance, higher value**' to bats. No roosting bats were encountered during the surveys carried out, and no bat roosts are likely be disturbed as a result of the works assuming the mitigation measures outlined in the report (O'Donnell 2021) are implemented. Overall, the report completed by O'Donnell in 2021 concluded the proposed works overall are likely to have a '**not significant' negative** impact on bat conservation at a local scale.

3.1.6.6 Ground Level Tree Assessment (GLTA) 2024

A *Ground Level Tree Assessment* at sections focused along the cycle route was carried out on 10/01/2024. None of the potential roosting features in trees inspected during the survey were identified as having potential as a maternity roost for any bat species. No unoccupied roosts which contained signs of bat occupation (droppings, staining) were encountered. Overall, the trees assessed on site have some minor potential to function as hibernating roost for bats and have some potential to function as roosting sites for bats during the bat activity season.

Trees earmarked in the area to be felled do not support viable PRFs and offer no potential roosting habitat for bat species. The felling of these trees is not predicted to result in the loss of any moderate to high potential roosting features. Ivy was recorded on the majority of trees; no growth was greater than 5cm or detached from these trees. Ivy growth on trees was not fully accessible to assess, due to height and may have potential to support hibernating bats within the higher reaches. One tree (Ash (*Fraxinus excelsior*) near a footbridge at the start of the proposed cycleway route with a large split, hazard beam, and lifted bark has a number of features namely splits in limbs, lifted bark, and fissures as well as smaller cracks that increase the potential for roosting bats to lower. This tree is not located in an area marked for tree felling and so will not be directly impacted by the proposed works. Mitigation measures outlined in the later sections in this report with regards to lighting, noise and root exclusion zones will ensure that there is no significant impact on this tree during the proposed works.

Based on the field survey findings during the ground level tree assessment in January 2024, the habitats on site are deemed to be of local ecological importance for bat species and provide suitable grounds for both commuting and foraging bats. The River Shannon in particular is an important corridor which bisects the busier urban area of University of Limerick and adjacent areas of Limerick suburbs, and the agricultural landscape beyond. The findings of GLTA indicate there is potential roosting habitat within the vicinity of the proposed route, but no significant potential roosting features were noted during the survey, with the exception of the bat house established at Dromroe Student Village and ruins of Black Castle.

3.2 Bat Activity Survey 2024 Results

Bat activity was surveyed in June and July 2024 using nighttime bat walkover (transect) surveys and passive (automated/static) bat surveys. These were carried out to characterise bat activity in the zone of influence of the proposed works and to detect any bats which may be emerging from roosts at dusk.

Eight species of bat were recorded. The following species were recorded along the proposed cycleway during the passive and active surveys:

- Soprano Pipistrelle;
- Brown Long eared Bat;
- Common Pipistrelle.

- Leisler's Bat;
- Daubenton's Bat;
- Natterer's Bat;
- Whiskered Bat; and
- Nathusius' Pipistrelle.

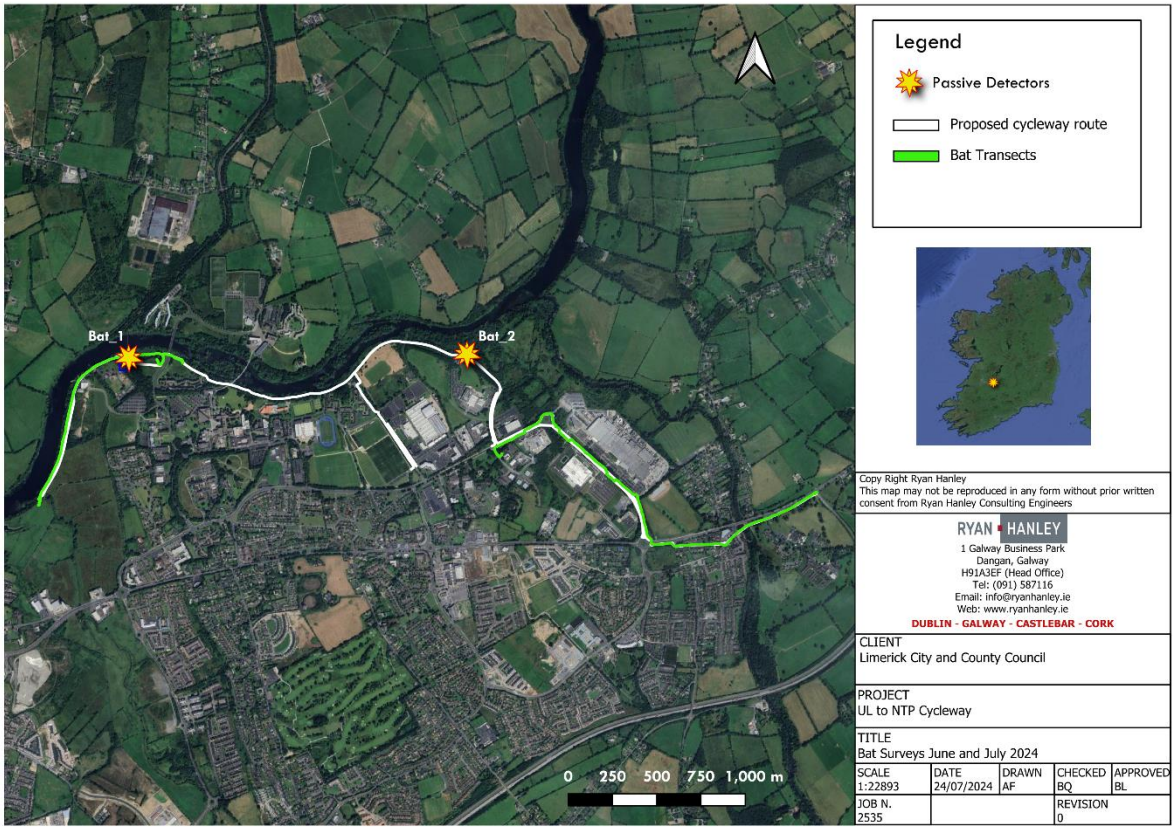


Figure 3.3: Map of Passive Detector and Transect Locations in UL in Limerick

3.2.1 Active: Nighttime bat walkover (transect) surveys

350+ individual registrations of bats were recorded during the course of the nighttime walkover (transect) surveys. These surveys were carried out in June and July 2024. Soprano Pipistrelles were the most frequently recorded species along the river near UL boathouse on the 19th of June 2024 whereas Common Pipistrelles were most frequently recorded in the western section of the scheme near the National Technology Park on the 10th of July 2024. At least four species were recorded on handheld bat detectors during the transect surveys. These species were Soprano and Common Pipistrelle, Leisler's Bat and Daubenton's Bat. The locations of all registrations are shown in **Figure 3.4**.

Overall, Common Pipistrelle, Soprano Pipistrelle and Leisler's Bat were highly abundant along the walked transects. It is likely that they utilise all habitat types within the zone of influence (50m buffer surrounding the proposed development). Daubenton's Bats were only recorded where access to the

water's edge was available to surveyors, e.g. along the Bridge in Annacotty or along more visible sections of the River Shannon. However, it is likely that they utilise all sections of the waterway bordering the proposed development. This is consistent with findings by O'Donnell Environmental in 2021 who recorded similar levels of bat activity and species during their active surveys.

Relatively lower levels of bat activity were recorded in the eastern transect through the National Technology Park into Annacotty. This is likely because there is less productive foraging habitat for bat species relative to the transect following the river in the west. The area is quite built up with light pollution from nearby commercial buildings and regular streetlights. There is a large wind turbine along the route also and regular car and bus traffic. The treelines in the northern section of this transect had the highest levels of activity as well as the treelines and adjacent grasslands in the southeastern section. The bridge in Annacotty was also a site of high activity and had a number of Daubenton's bats foraging under it during the survey on the 19th of June 2024.

Table 3.7 – Registrations for each species recorded during nighttime walkover (transect) surveys in 2024.

Detector	19th June 2024	10th of July 2024
Daubenton's Bat	Heterodyne recordings	Heterodyne recordings
Leisler's Bat	38	19
Common Pipistrelle	44	49
Soprano Pipistrelle	152	42
Total	**237**	**113**

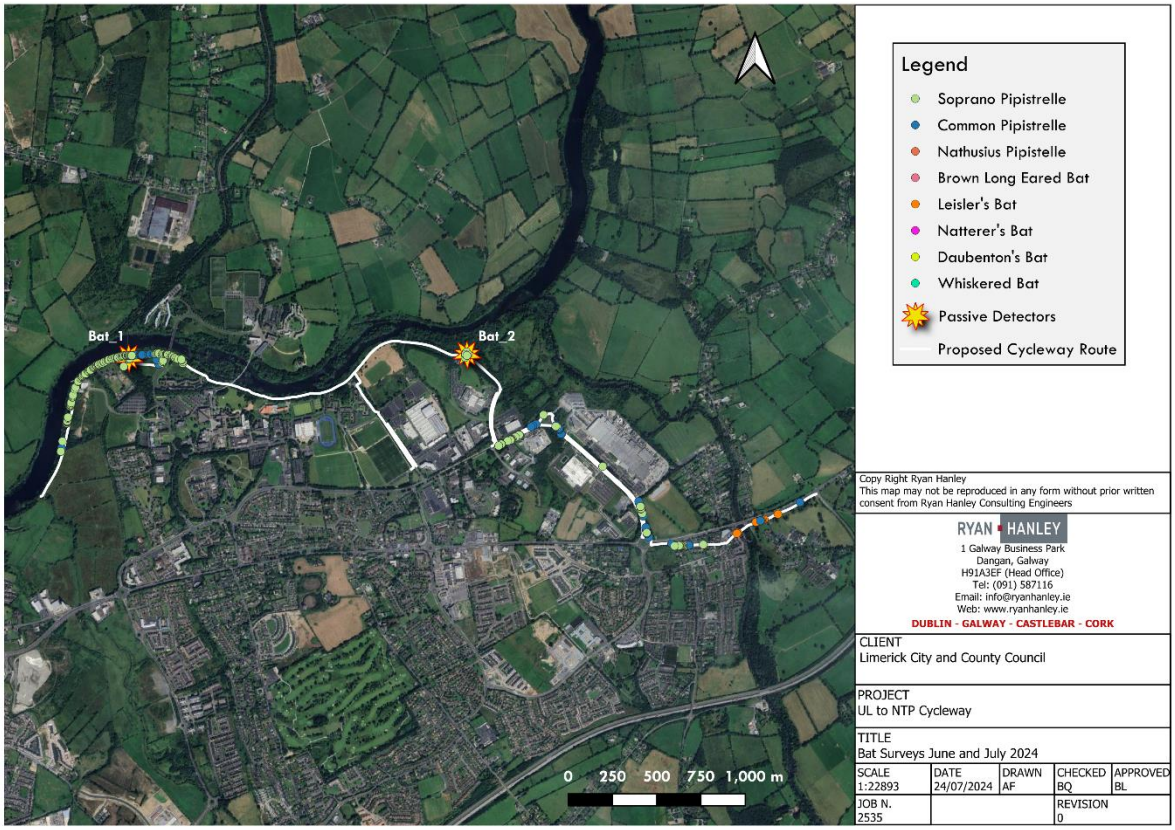


Figure 3.4: Map of Bat Species Identified during activity surveys

3.2.2 Passive Bat Surveys

Two passive detectors were deployed at suitable locations on the scheme to provide a larger dataset and detect species which may not have been recorded during active surveys. Eight species of bat were recorded on the passive detectors. A high level of bat activity (2285 bat registrations) was recorded during the passive survey period. Soprano pipistrelles, Common Pipistrelles and Daubenton's Bats were the most common species recorded. Registrations for individual species are detailed below in **Table 3.8.**

Table 3.8– Registrations for each species recorded during passive surveys in 2024.

Detector	Bat_1 (19th -25th of June 2024)	Bat_2 (03rd to 09th of July 2024)
Daubenton's Bat	95	277
Whiskered Bat	9	25
Natterer's Bat	3	2
Leisler's Bat	82	23
Common Pipistrelle	134	30
Soprano Pipistrelle	817	756

Brown Long-eared Bat	11	0
Nathusius' Pipistrelle	2	0
Total	**1163**	**1122**

Figure 3.5 presents the time distribution of all bat registrations recorded over the 7-night survey period at 'Bat_1' (19th to the 25th of June 2024) and 'Bat_2' (03rd to the 9th of July 2024) and the recordings taken during the transect surveys on the 19th of June and the 10th of July 2024.

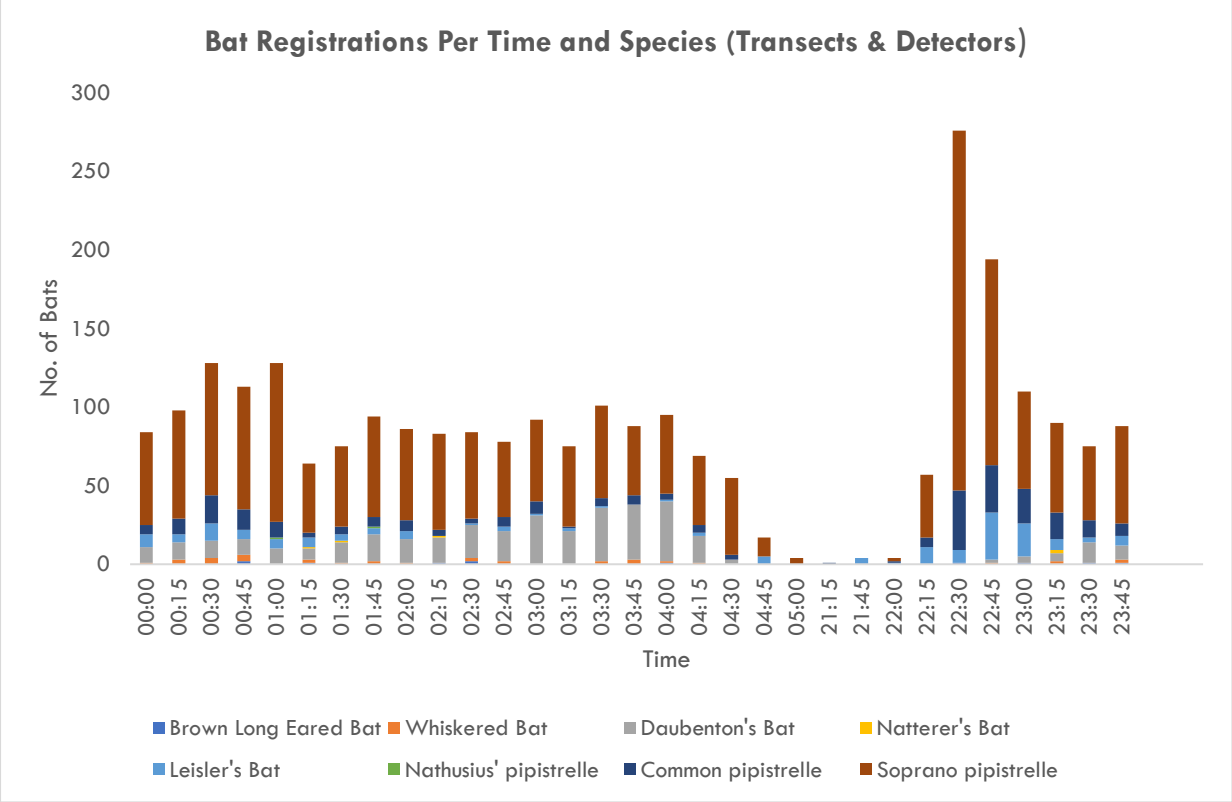


Figure 3.5: Time Distribution of All Bat Registrations (Passive and Transects)

Figure 3.6 and **Figure 3.7** present the time distribution of all bat registrations recorded over the 7-night survey period at 'Bat_1' and 'Bat_2' respectively.

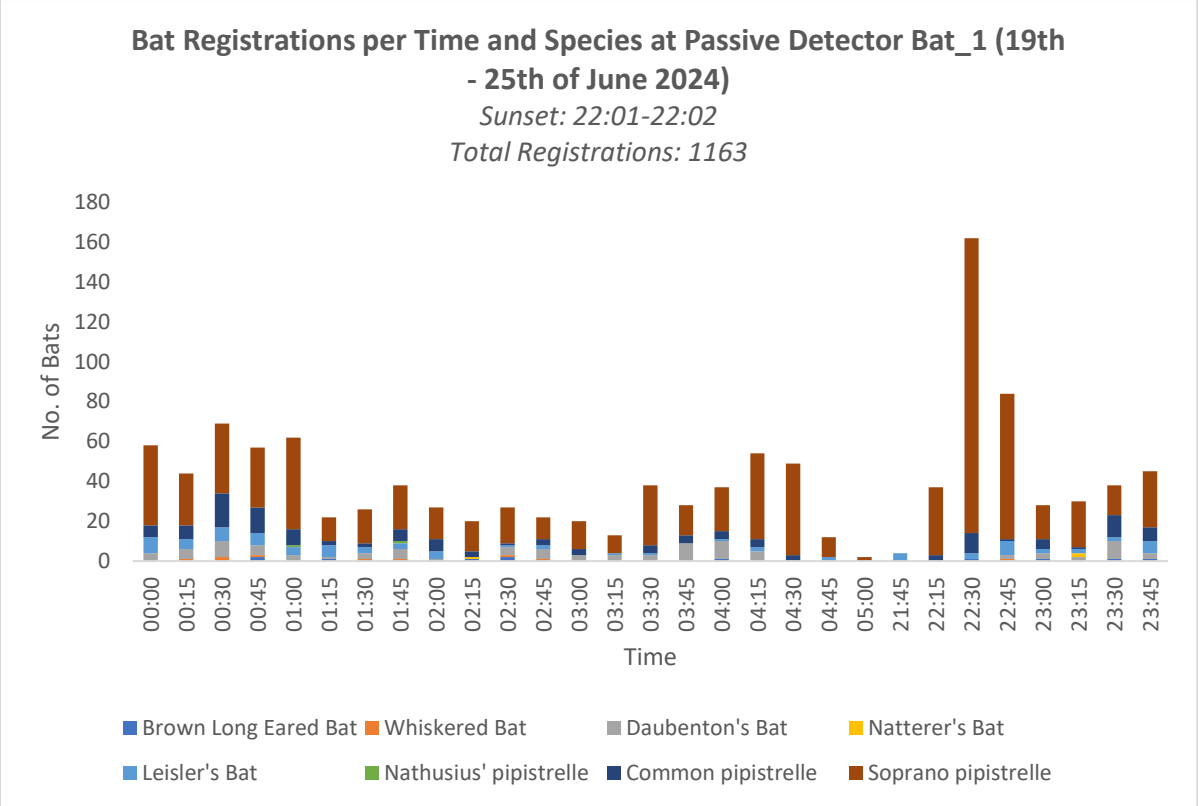


Figure 3.6: Time Distribution of Bat Registrations (Bat_1)

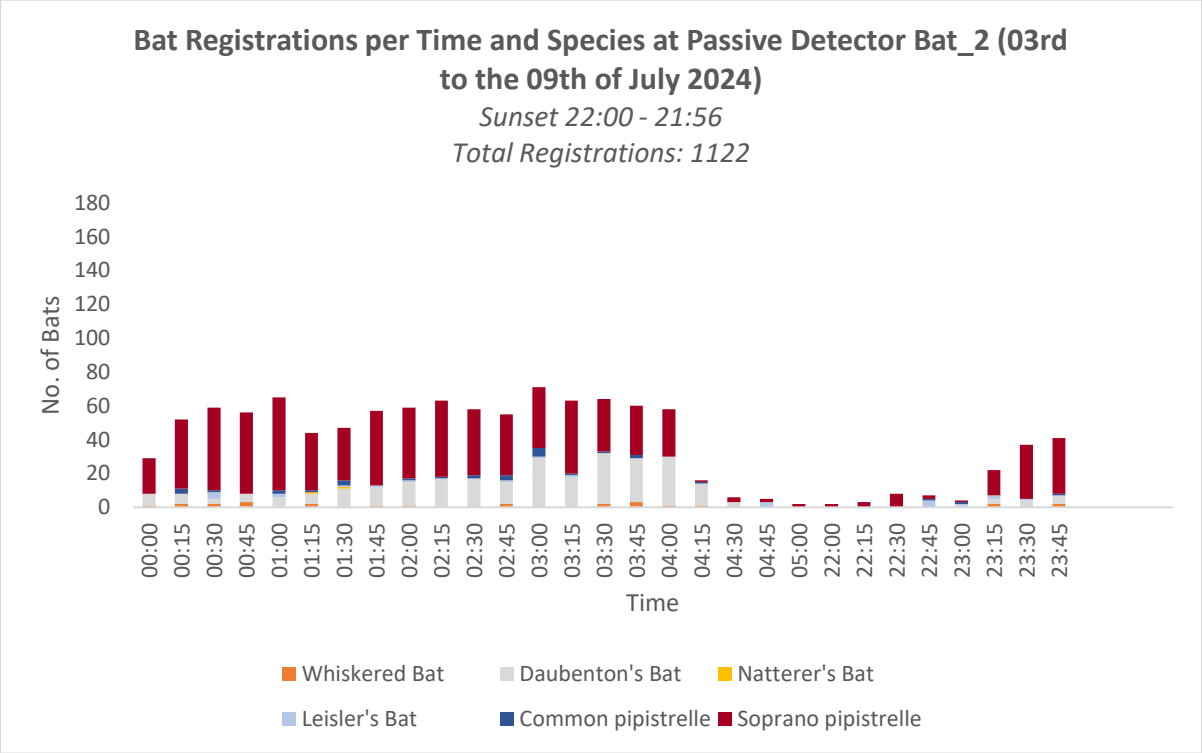


Figure 3.7: Time Distribution of Bat Registrations (Bat_2)

Relatively higher levels of activity are observed in the earlier part of the night with a drop and then consistent patterns of activity throughout the night which gradually dissipates closer to dawn. The river corridor is used particularly by Soprano Pipistrelles in the earlier part of the night, and to a lesser extent Common Pipistrelle and Daubenton's Bat. This is consistent with the findings from O'Donnell Environmental in 2021 who also reported a large number of Soprano Pipistrelles emerging soon after sunset in the western section of the scheme.

The high level of activity shortly after sunset in Bat_1 in the western section of the scheme would suggest that there is a Soprano pipistrelle roost nearby this area as high numbers of recordings are registered approximately 30 mins after sunset. The relatively consistent numbers throughout the night would suggest this area is also a good foraging and commuting area. Less activity in the earlier part of the night is seen in Bat_2 in the eastern part of the scheme. There are low levels of activity shortly after sunset that gradually increase as the night goes on and remains consistent until close to dawn. It is likely this is a good foraging area that bats commute to regularly throughout the night. Similar levels of bat activity were observed at both detectors although Bat _1 had a slightly higher number (1163 vs 1122) and a greater variety of species (8 vs 6). Bat_1 was deployed slightly closer to the river than Bat_2 which may place it along the commuting routes of more species. Two species were detected at Bat_1 that were not detected at Bat_2. Nathusius' pipistrelle is a rare-occasional bat species and is typically associated with wetlands, waterbodies and broadleaf woodland. Brown Long Eared bats typically prefer sheltered habitats such as wooded river valleys and dense woodland edge. This species also tends to forage close to roost sites (within 2km) in woodland. Despite their absence from the Bat_2 registrations in the eastern part of the scheme, the habitat where the detector was deployed would still be suitable for both species as it is a dense patch of woodland close to the River Shannon.

Soprano Pipistrelles were the most frequently recorded species on both detectors during the passive survey period. The first detection of this species was frequently a few minutes after sunset. The average emergence time for Soprano Pipistrelles is approximately 20-30 minutes after sunset. Soprano Pipistrelle bats (and possibly other species) are likely to be roosting in relative proximity to the site due to the relatively early detection of this species on the passive detectors, particularly at Bat_1 in the western section of the scheme. There are a wide variety of roosting opportunities present locally which may be exploited by crevice dwelling bat species such as Pipistrelles. Common pipistrelles are more likely to be found along linear habitats which might explain the higher numbers detected at Bat_1 which was placed close to the existing path at a woodland edge bordering the River Shannon. More Common pipistrelles were detected in the east by O'Donnell Environmental in 2021, however the detector at this time was placed along the Mulkear River (riparian linear habitat).

Daubenton's Bats were recorded widely throughout the route with higher numbers detected in the eastern part of the scheme at Bat_2. This is consistent with findings by O'Donnell Environmental in 2021 who detected more Daubenton activity in the eastern section of the route (Detector deployed in 2021 was located close to the Mulkear River). As the proposed cycleway route closely follows the River Shannon,

the presence of this species is expected. These bats tend to forage over open water and areas of complex bankside vegetation such as riparian woodland. They can, on occasion forage in woodlands away from water also. This species generally avoids street lighting which may explain the higher numbers of this species recorded by Bat_2 in the northeastern part of the route. Bat_2 was placed in a bit more secluded area than Bat_1 which was located on a more established walking path by the river and in close proximity to UL campus and a number of residential buildings. The adjacent black castle ruins at near Bat_2 may also be an attractive roost spot for this species.

More Leisler's Bats were detected in the western section at Bat_1. Contrastingly the 2021 surveys detected higher numbers of Leisler's in the east although this difference may be accounted for by the detectors location along the Mulkear river in 2021. This species is very adaptable and can utilise most habitats although can favour pasture and areas of freshwater. It is often found in urban parks and forages on medium sized swarming insects. It is often observed feeding on insects attracted to streetlights and this may explain the higher numbers detected by Bat_1 which was less secluded than Bat_2 and in closer proximity to street lighting and parkland by the UL campus. Leisler's bats emerge early (typically 10-15 minutes before sunset) which explains the detections recorded prior to sunset at Bat_1.

A higher number of whiskered bats were detected in the eastern section of the scheme at Bat_2. This species favours riparian mixed woodland as a foraging ground and generally avoids wetland and grassland areas. The denser woodland cover where Bat_2 was located may explain the higher numbers detected at this location. This is consistent with findings from the 2021 surveys which also recorded higher numbers of this species in the east.

No Annex II Lesser Horseshoe Bat activity was detected during either the passive or active transect surveys during 2024 however registrations were detected by O'Donnell Environmental in 2021. Lesser horseshoe bats were recorded along the central connectivity corridor, near the Kilmurry Student Village. These passes were likely from an individual foraging or commuting along this treeline. 16 registrations were also recorded by a passive detector along the Mulkear River in the east in 2021. This species favours broadleaved woodland and riparian vegetation and avoids artificial light at night and urban areas. The lesser horseshoe bat is listed on Annex 2 of the EU's Habitats Directive and there are 41 Special Areas of Conservation for which this species is a Qualifying Interest. The most recent estimate of the lesser horseshoe bat's population is 12,790 individuals. Although population monitoring indicates that the species' numbers are increasing, the bat is confined to six western counties, occurring in clusters, with large areas that contain few or no colonies (NPWS & VWT, 2022).

The results overall were consistent with the surveys carried out by O'Donnell Environmental in 2021. Although higher levels of activity were detected by the surveys carried out in 2021, the passive detectors deployed at this time were left out for 13 nights in comparison with the 7 nights in 2024. The location of the detectors was also slightly different between the two years. 16,000+ registrations were detected at the passive detector deployed along the Mulkear River in 2021. This area would have a greater variety of semi natural habitats that could be utilised by bat species, and it is along a linear riparian

habitat that would be highly attractive as a commuting and foraging route. The timing of the deployments may also cause some difference in activity levels. The passive detectors in 2021 were deployed in September. At this point in the year, females and new young will have left the maternity roosts to forage on late summers insects and mating usually takes place from mid-August onwards. The 2024 surveys took place in late June and early July when it is likely more female bats will be in the maternity roost. Numbers of bats in a nursery roost build gradually until the time that the mothers give birth, around late June or early July (BC1 website, accessed July 2024).

4 DISCUSSION

High levels of bat activity and species diversity were recorded along the proposed scheme, particularly in the early hours of the night in the western part of the scheme suggesting roosts in close proximity to the study area.

The consistent levels of activity throughout the night suggest the area is regularly used by bat species for foraging and commuting and is of local ecological importance. The area is classed as a high potential bat landscape (NBDC & Lundy *et al.*, 2011) and the River Shannon in particular is an important corridor which bisects the busier urban area of UL and the agricultural landscape beyond.

Species and levels of activity recorded were consistent with survey results from O'Donnell Environmental in 2021. While Annex II Lesser Horseshoe Bat was not detected during the surveys carried out in 2024, it was identified in the 2021 surveys. Considering this finding alongside the records reported by the NBDC, BCI and protected areas (SAC/pNHA) in the zone of influence of the scheme with this species as their qualifying interest, it is prudent to assume Lesser Horseshoe Bat will be active in the area. The high levels of Soprano pipistrelles detected early in night at Bat_1 near UL Boathouse suggest there is a potential roost in close proximity to this area. This is consistent with findings by O'Donnell Environmental in 2021.

The ground level tree assessment in January 2024 indicate there is potential roosting habitat within the vicinity of the proposed route, but no significant potential roosting features were noted during the survey, with the exception of the bat house established at Dromroe Student Village and ruins of Black Castle.

Taking this into account, the proposed cycleway development, while on a small scale may result in negative consequences on local populations of bats which utilise the River Shannon corridor and parkland as a commuting route or foraging habitat.

5 POTENTIAL IMPACTS

Lighting:

Illumination of treelines and woodland at night can disturb roosting, commuting and foraging bats. It can delay emergence from roosts, impede commuting routes and reduce available foraging space. Delayed emergence from roosts can reduce available foraging time and cause bat species to miss out on peak nocturnal insect abundance (typically around dusk). It can also increase the chances of predation by aerial predators such as owls. Bats will often rely on visual clues (e.g., treelines, hedgerows) in addition to using echolocation for both commuting and foraging, with their vision functioning better in low lit areas. Illuminated areas can upset bat activity by affecting visibility. Bats may also adjust their behaviour to avoid illuminated areas. Light sensitive species such as Lesser Horseshoe Bat and less light tolerant species, such as the Daubenton's bat will avoid lighting. Some bats such as Leisler's Bat and Pipistrelle species can be attracted to lights and will forage on the swarming insects that gather there. This can disturb existing patterns of foraging activity and may provide a competitive advantage over less light tolerant species. Strong ultra-violet (UV) component and white and blue (cool) lighting attracts more insects than low UV and warmer colour temperature lighting (Bat Conservation Trust, 2018). The installation of public lighting is proposed along various sections of this scheme, parts of which are not currently illuminated. There is a high potential impact of illumination from public lighting to disrupt bat activity, deter and displace bats from the area. In order to maintain the quality of this habitat for both foraging and commuting bats, it is recommended that the public lighting is limited and designed in such a way as to minimise the impact on bats.

Noise and Vibration:

Noise and vibration as a result generators that may be left running at night during construction can impact bat species and their echolocation. This will impact upon their foraging, commuting and communication.

Damage to trees:

Machinery used during construction, particularly in the root zone, can result in damage to trees and increased tree mortality. It may also cause damage to the trunk and branches of trees.

Disturbance to roosting sites:

No buildings or structures will be impacted by the proposed works. Surveys carried out by O'Donnell Environmental in 2021 revealed that one tree of above "negligible" suitability to support roosting bats is located in an area marked for clearance (T-05 in O'Donnell 2021 report). The latest design drawings for the project as of July 2024 indicate this tree is not marked for felling because the route has moved

and thus the tree will not be directly impacted by the proposed works. Works will take place in close proximity to other trees with some suitability to host roosting bats.

The GLTA carried out in January 2024 detected no unoccupied roosts which contained signs of bat occupation (droppings, staining). It determined the trees assessed on site have some minor potential to function as a hibernating roost for bats and have some potential to function as roosting sites for bats during the bat activity season. Trees earmarked in the area to be felled do not support viable PRFs and offer no potential roosting habitat for bat species. The felling of these trees is not predicted to result in the loss of any moderate to high potential roosting features. One tree (Ash (*Fraxinus excelsior*) near a footbridge at the start of the proposed cycleway route was found to have a number of features namely splits in limbs, lifted bark, and fissures as well as smaller cracks that increase the potential for roosting bats. This tree is not located in an area marked for tree felling and so will not be directly impacted by the proposed works. Mitigation measures outlined in the later sections in this report with regards to lighting, noise and root exclusion zones will ensure that there is no significant impact on this tree during the proposed works. Machinery operating in the root zone of trees may result in damage to trees and increased tree mortality if measures are not taken to protect trees which are being retained during the proposed works.

Loss of foraging habitat:

The large variety of species detected during the surveys is reflective of the wide variety of foraging habitats present throughout the scheme area. There are areas of urban parks, open pasture, woodland and riparian habitats that can be utilised by a variety of bat species with different foraging tactics. Eight species of bat were detected during the 2024 surveys and an additional ninth species (Annex II Lesser Horseshoe Bat) was detected during the 2021 surveys with NBDC and BCI records confirming its presence in the area. Loss of vegetation will likely reduce the quality of local foraging habitat, but this is unlikely to be significant given the route will largely be along existing pathways and there will be relatively small amount of habitat loss in the context of the wider landscape.

Impaired ability to commute:

Linear landscape features such as rivers, hedgerows and treelines are used by bat species to commute and navigate through the wider landscape. They can also serve as protection for bat species from predators. The removal or severing of such landscape features may reduce the ability of bat species to commute through the landscape which may reduce available foraging habitat and isolate bats from alternative roosts. The impairment of flightlines in proximity to roost sites can be particularly impactful. A number of trees are required to be removed during this project, but they are largely located to adjoining existing infrastructure or in woodland where it will not significantly impact upon the ability of

bats to commute. No removal or severing of existing linear features is expected to occur as a result of the proposed works and thus there is no expected impact on the commuting ability of bats.

In agreement with the findings of O'Donnell Environmental in 2021, the GLTA carried out by Ryan Haney in January 2024 and the activity surveys carried out in June and July 2024, in the absence of mitigation measures, the above impacts would be expected to result in a **"slight" negative impact** on bat ecology at a local scale.

6 MITIGATION & ENHANCEMENT

The following mitigation measures should be implemented as part of the proposed project.

Lighting:

Construction works should take place during daylight hours only with no lighting on the site during the hours of darkness. Any lighting required for health or safety reasons should be installed at a minimum of 10 metres from existing treelines and woodland habitats and directed away from such sensitive habitats. The proposed public lighting should be designed to minimise light spill on to habitat features, such as the River Shannon or the bat boxes present along the pathway, and concentrate artificial light only where required.

Where public lighting is to be installed along the proposed scheme, the following recommendations are proposed:

- Lighting should be minimised wherever possible in terms of number of lights, the power of the lights (lux level), as well as the UV content. Using powerful lighting on wildlife corridors can, for some species, effectively sever connectivity.
- Directional lighting, facing and located away from the surrounding vegetation should be used, e.g., the use of hoods, cowls.

Table 6.1 Criteria for Suggested Lighting Plan (BCT, 2023).

Criteria	Guidelines	Project Recommendations
Appropriate luminaire specifications	No UV component/ Preferentially cool LED (<3000 Kelvin (K))	A cool white light source to be adopted to reduce blue light component.
Height of light	<5m.	
Directionality	Downwards focused to reduce spill, Minimise light spills using shields, masking & louvres. Light can be restricted and directed to below the horizontal plane, preferably at an angle of less than 70°.	
Timing of lights	Restrict lights to ensure that there are dark hours in place.	

Criteria	Guidelines	Project Recommendations
Avoidance of key areas	Buffer zones of 50m maintained for key features (treelines, hedgerows, woodland). No light around roosts.	
Brightness	No specific guideline available – not as relevant for bats given the spectral sensitives. Lux values under 0.5 in the vertical plane are considered ideal for corridors for bats.	

Noise and vibration:

Generators or other sources of noise, vibration and emissions should not be located with 50m of the existing woodland habitat throughout the site. There should be avoidance of noise and vibration in so far as possible.

Tree protection and impact on bat roosts:

Consultation with an arboriculturist should be sought to protect the trees to be retained during the proposed works. Root protection zones should be established prior to commencement of any works and there should be an appropriate barrier to prevent access by machinery. Trees should not be felled within the bird nesting season from 1st March to 31st August under the Wildlife Act, unless under licence granted from NPWS or with a felling licence. The most appropriate time for felling of trees for bats is September to late October when bats are capable of flight (young bats) and have not yet commenced hibernation.

In line with Bat Conservation Trust Guidance, (2023), at least one bat survey should be undertaken during the appropriate bat survey season to assess potential use of the tree by bats in advance of any felling, and to assess the need for mitigation, if required. This survey will be inclusive of:

- General bat species and quantity within the site ZoI;
- Use of tree as roosting sites; and
- Use of trees as potential roosting sites.

In the event bat(s) are present, the tree may only be removed with a roost derogation license issued by NPWS. Following this inspection and the suitable confirmation of the absence of roosting bats, the trees should be felled according to the following procedure:

Where a large machine such as an excavator is to be used to fell trees, pre-emptive warning should be given to alert any unrecorded roosting bats that may be present by pushing the tree gently 3 to 4 times with the excavator bucket. A pause of 30 seconds should be implemented between each push. The tree should then be pushed to the ground slowly and should remain in place until it has been inspected by the on-site Ecologist.

Where a chainsaw is to be used, limbs free of Ivy will be first cut and allowed to fall to the ground. For the felling of the main Ivy-covered trunks ropes or winches will be put in place so that once the trunk is cut at the base it can be lowered slowly to the ground to thus avoiding any high impact a potential fatality to any unidentified bats present in the Ivy cover.

The Ecologist should be present for the felling of the tree and the tree should be left on the ground for 48 hours to allow for exit. In the event that no bats are identified during the activity survey, the tree should be inspected immediately prior to felling with the month of September an appropriate time for this activity.

In addition to measures to avoid impacts, there is opportunity for ecological enhancement for bats as part of the proposed development. To augment roosting opportunities available to local bat populations at present, additional of bat boxes in a variety of designs suitable for bats with differing roosting habits could be installed on mature trees within the final design to supplement those already present. Bat boxes should be installed on mature trees, positioned to face south, southeast, or southwest and at heights no less than 4m above ground level to avoid predations and allow appropriate access and exit (Bat boxes are available from a variety of commercial outlets). Bat boxes can be positioned at any time of year, but they are more likely to be used during their first Summer if they are put up before the bats emerge from hibernation in late Spring. A suitably experienced Ecologist must oversee the installation of the boxes. All personnel should wear gloves to reduce transmission of human pheromones, which may reduce or delay uptake of boxes by bats.

Reduced foraging habitat & impaired ability to commute:

Prior to construction, vegetation to be retained will be demarcated in consultation with an ecologist and fenced off. This exclusion area should be maintained throughout the entire construction process. Loss of trees or tree cover should be mitigated for by replanting throughout the scheme boundary as close as possible to where the original trees will be removed.

Following implementation of the avoidance and mitigation measures outlined above, the potential for temporary disturbance due to the proposed works is minimised. The loss of commuting and foraging habitat will be minor and temporary in nature throughout most of the scheme. Some loss of trees will occur as part of the proposed works which will result in a loss of potential roosting sites and reduced protection from predators from tree cover. The provision of bat boxes in suitable locations will partially mitigate in the short to medium term for the potential loss of any potential roosting features. Replanting

of trees throughout the scheme boundary will provide potential roosting features in the long term. Overall, in conclusion with the findings of O'Donnell Environmental in 2021 and the Ground Level Tree Assessment carried out by Ryan Hanley in January 2024, the results of this activity survey determine the proposed scheme is likely to result in a permanent, **"non-significant" negative effect** on bat ecology at a local scale.

7 CONCLUSION

As a result of the surveys by O'Donnell Environmental in 2021, the Ground Level Tree Assessment carried out by Ryan Hanley in January 2024 and the activity and passive surveys carried out in June and July 2024, a comprehensive study has been conducted to understand the importance of the study area in Castletroy & Annacotty in Limerick for bat species. No bat roosts were identified however there are a number of suitable bat roosting opportunities throughout the area, particularly for crevice dwelling species such as pipistrelles. The early detection of large numbers of soprano pipistrelles indicate a roost in proximity to the study site. High levels of bat activity and 8 (2024) – 9 (2021) species were detected during the activity surveys. The findings from the separate assessments indicate the study area to be of **"Local importance, (Higher value)**" to bats.

Works during the construction of the proposed cycleway will require felling of a number of trees and some vegetation clearance. The loss of foraging habitat or impact upon commuting ability is not expected to be significant following the mitigation measures outlined above. No roosting bats were encountered on any of the surveys conducted to date and following the implementation of the mitigation measures specified above, no bat roosts are likely to be disturbed as a result of the proposed works. Lighting should be designed as outlined in the mitigation section above to take into consideration wildlife and bats.

Overall, in conclusion with the findings of O'Donnell Environmental in 2021 and the Ground Level Tree Assessment carried out by Ryan Hanley in January 2024 and the activity and passive surveys carried out in 2024, it can be concluded that the proposed scheme is likely to result in a permanent, **"non-significant" negative effect** on bat ecology at a local scale.

8 REFERENCES

Bat Conservation Trust (2009) Bats and lighting in the UK – bats and the built environment series

Bat Conservation Trust (2018) Bats and artificial lighting in the UK. Guidance Note 08/18. Available at: https://cdn.bats.org.uk/uploads/pdf/Resources/ilp-guidance-note-8-bats-and-artificial-lighting-compressed.pdf?v=1542109349.

BCT (2023) *Bats and Artificial Lighting at Night*. Guidance Note GN08/23. Bat Conservation Trust: Institution of Lighting Professionals.

Collins, J. (2023) *Bat Surveys for Professional Ecologists*. 4th edn. Bat Conservation Trust.

O'Donnell, T. (2021) *UL to NTP Cycleway Route, Limerick*. Bat Survey Report.

Collins, J. (ed) (2016). Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edn). The Bat Conservation Trust, London.

CIEEM (2018). Guidelines for Ecological impact Assessment in the UK And Ireland - Terrestrial, Freshwater, Coastal and Marine. Version 1.1.

EPA (2017). Draft Guidelines on the Information to be Contained in Environmental Impact Assessment Reports.

Lundy, M.G., Aughney, T., Montgomery, W.I. & Roche, N. (2011). Landscape Conservation for Irish Bats & Species-Specific Roosting Characteristics. Bat Conservation Ireland.

NPWS (2019). The Status of EU Protected Habitats and Species in Ireland. Volume 3: Species Assessments.

Unpublished NPWS report. Edited by: Deirdre Lynn and Fionnuala O'Neill.

NPWS & VWT (2022) Lesser Horseshoe Bat Species Action Plan 2022-2026. National Parks and Wildlife Service, Department of Housing, Local Government and Heritage, Ireland.

NRA (national Roads Authority, now TII). (2009). Guidelines for Assessment of Ecological Impacts of national Roads Schemes. Revision 2, 1st June 2009. NRA, Dublin.

Roche & Torsney, 2021. Ireland's Biodiversity. Identification guide to Ireland's Bats. National Biodiversity Data Centre & Bat Conservation Ireland.

Transport Infrastructure Ireland (TII) (2006). Guidelines for the Treatment of bats during the construction of National Road Schemes.

Voigt, C.C. et al. (2018) Guidelines for consideration of bats in lighting projects. Guidance document 8. Available at: https://www.eurobats.org/sites/default/files/documents/publications/publication_series/WEB_DIN_A4_EUROBATS_08_ENGL_NVK_2802 2019.pdf

Wray, S., Wells, D., Long, E. and Mitchell-Jones, T. (2010) Valuing Bats in Ecological Impact Assessment. In Practice: Bulletin of the Institute of Ecology and Environmental Management (No. 70)

9 APPENDIX

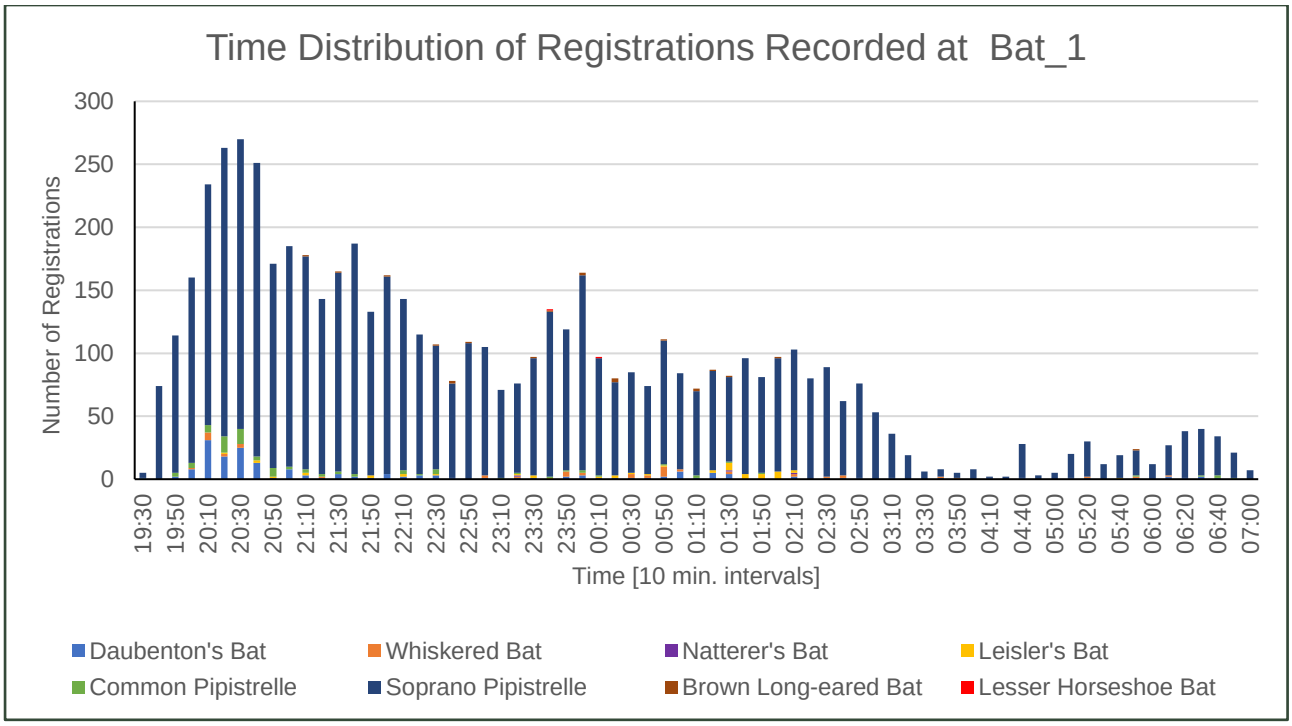
A: DETAILS OF PASSIVE MONITORING SURVEY PERIOD (O'DONNELL, 2021)

Date [night of]	Sunrise	Sunset	Temp. °C	Wind km/h	Precipitation
09/09/2021	06:58	20:03	18	15	Dry
10/09/2021	07:00	20:01	16	17	Dry
11/09/2021	07:02	19:58	15	11	Dry
12/09/2021	07:03	19:56	15	9	Dry
13/09/2021	07:05	19:54	17	9	Dry
14/09/2021	07:07	19:51	16	11	Dry
15/09/2021	07:08	19:49	14	9	Dry
16/09/2021	07:10	19:46	18	30	Dry
17/09/2021	07:12	19:44	14	9	Dry
18/09/2021	07:13	19:42	14	7	Dry
19/09/2021	07:15	19:39	15	11	Dry
20/09/2021	07:17	19:37	15	9	Dry
21/09/2021	07:18	19:34	16	15	Dry

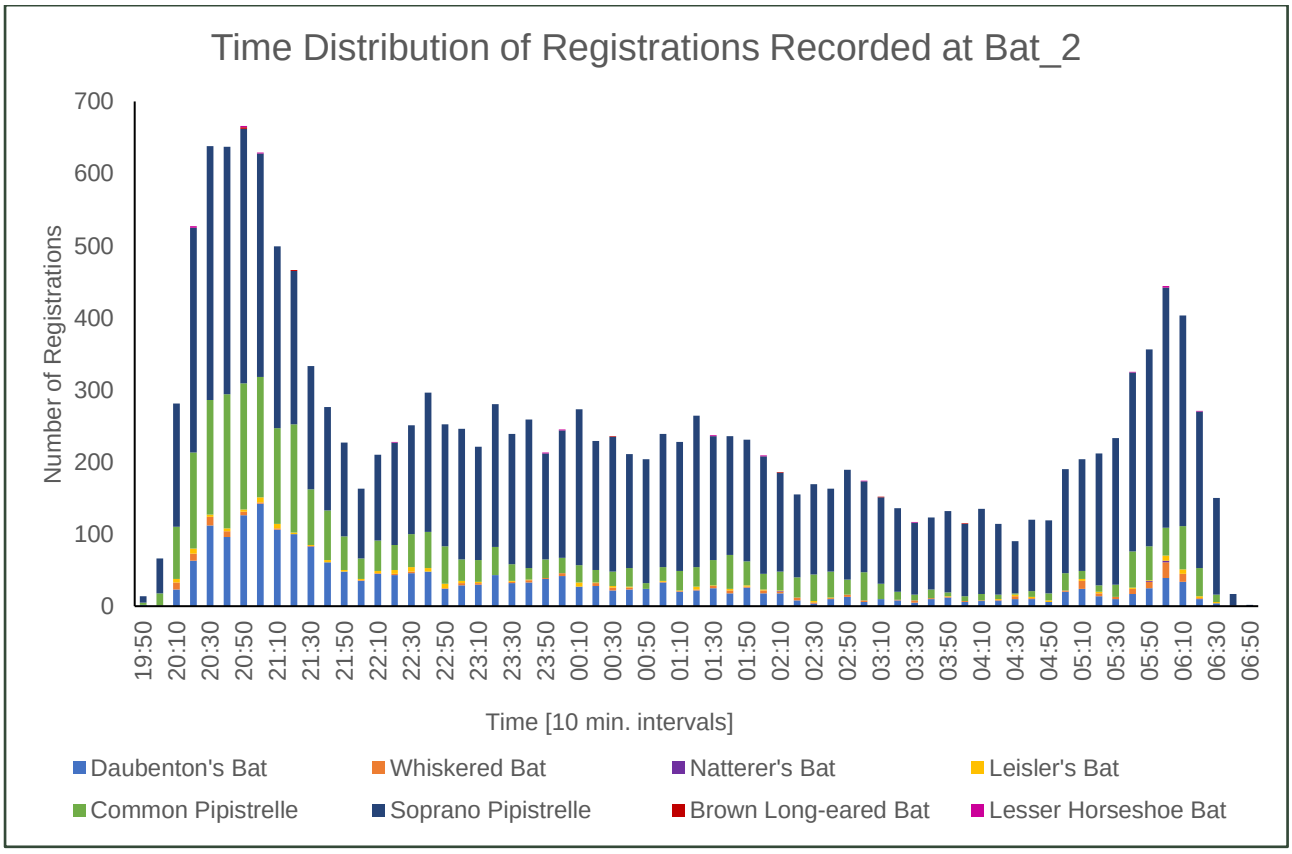
B: REGISTRATIONS FOR EACH SPECIES RECORDED DURING PASSIVE SURVEYS (O'DONNELL, 2021)

Detector	Bat_1	Bat_2
Daubenton's Bat	178	2080
Whiskered Bat	49	193
Natterer's Bat	3	8
Leisler's Bat	46	140
Common Pipistrelle	84	2723
Soprano Pipistrelle	5545	11187
Brown Long-eared Bat	21	7
Lesser Horseshoe Bat	2	16
Total	5928	16360

C: RESULTS OF PASSIVE BAT MONITORING AT MONITORING POINT BAT_1 (O'DONNELL, 2021)



D: RESULTS OF PASSIVE BAT MONITORING AT MONITORING POINT BAT_2 (O'DONNELL, 2021)



E: Deployment Location of Passive (Automated/Static) Detector Bat_1

F: Deployment Location of Passive (Automated/Static) Detector Bat_2

Limerick City Greenway (UL to Annacotty)

Breeding Bird Survey

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Client	Limerick City & County Council
Project No.	2535
Project Title	Limerick City Greenway (UL to Annacotty)
Report Title	Breeding Bird Survey

Rev.	Status	Author	Reviewed By	Approved By	Issue Date
0	Draft for Client Review	BQ	TS	BL	23/07/2024

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1 INTRODUCTION

Breeding bird surveys were conducted within the 2023 breeding bird season, in addition to the surveys that were carried out in 2021/2022, due to a change in the proposed Limerick City Greenway route. These surveys were undertaken to assess the presence, pattern of usage and current conservation status of breeding bird species found within and in the vicinity of the route **(Figure 3-1).** These surveys were also used to evaluate the importance and potential ecological significance of the study area and its environs to support breeding avifauna.

1.1 Project Description

The Limerick City Greenway (UL to Annacotty) forms part of a larger cycleway plan, the proposed Castletroy Cycle Network as outlined in the Limerick Metropolitan Cycle Network Study (LMCNS) 2025. The focus of the LMCNS is to promote cycling as a realistic choice as a mode of transport in the Limerick Metropolitan Area, making it an attractive location for cyclists of all ages and abilities by proposing the development of a consistent, clear, and continuous network of urban and suburban cycle networks throughout the area.

1.2 Aims of the Proposed Survey

- To survey the new routes added to the proposed UL Greenway and,
- To record quantitative spatial data on breeding birds within the footprint, environs and Zone of Influence of the proposed Limerick City Greenway (UL to Annacotty).

1.3 Brief Description of the Study Site

The Limerick City Greenway (UL to Annacotty) Project will form an extension to the already constructed Limerick Smarter Travel, Route 2, which involved the upgrade of an existing pathway, 1.5km in length between University of Limerick and the Guinness Bridge along the bank of the River Shannon which connects directly into the city centre.

The proposed Greenway route will continue from the existing Limerick Smarter Travel, Route 2 west of the River Groody bridge and extend along an existing section of paved and gravel pathway along the River Shannon, providing for access to and from the University of Limerick and the National Technology Park in Castletroy. The proposed Greenway will connect along University Road and McLoughlin Road via (existing Active Travel infrastructure) to Plassey Park Road through Annacotty Village and ends at Cappamore Junction as its eastern extent.

The Study Area covers approximately 5.8 km^2 in the Counties of Limerick and Clare encompassing the main UL campus, the NTP, sections of the Dublin Road (R445) and northern banks of the Lower River Shannon, including the UL campus located in Cappavilla, Co. Clare (**Figure 2.1**).

The Study Area is situated within the Lower Shannon River Catchment, with two main water bodies present including the Lower River Shannon which traverses through the centre of the Study Area and Mulkear River to the east of the Study Area. A small section of the Blackwater (Clare) river is present to the north of the Study Area near the Cappavilla UL campus (See **Figure 1.1**).

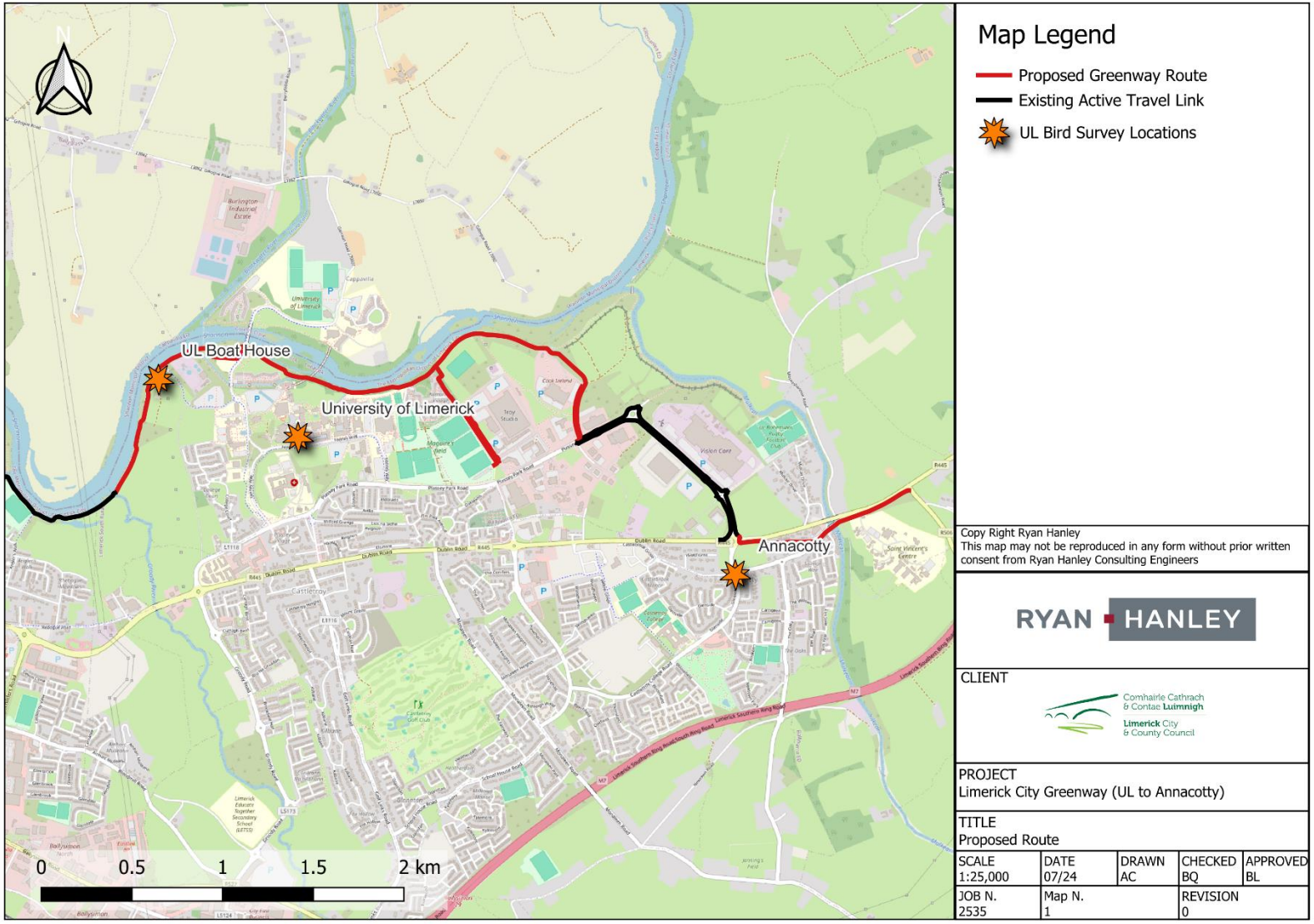

Figure 1-1: Study area and extent of the proposed greenway

2 METHODOLOGY

2.1.1 Bird Surveys

Bird Survey methodology undertaken for the Limerick City Greenway (UL to Annacotty) included four line transects. Four belted transects (T1-T4) were surveyed with all birds seen or heard recorded (Bibby *et al*. 2000) and line transect methodologies presented in BirdWatch Ireland (2012). Birds were recorded in three distance bands from the observer: <25m, 25-100m and >100m.

Five survey visits were conducted; an early breeding season survey (before May 15th) to identify and determine the occurrence abundances of resident breeding birds and a second later breeding season survey (after May 15th) to identify the occurrence and abundance of all breeding bird species including migratory breeding bird species. Surveys commenced in late 2021, missing the early breeding survey window. Therefore, it was decided to complete both early and late breeding bird surveys in 2022 to fully provide a baseline of breeding bird activity at the proposed greenway development site. Results of these surveys can be seen in the Draft UL Breeding Bird Survey Report (Delichon Ecology, 2022).

Due to a route change, two more surveys were conducted in the early and late breeding season of 2023. The first of which was completed in the early breeding season of the 3rd of May and the second was within the late breeding season of the 14th of June.

The survey area extent and the line transects are based on a representative sample of the proposed greenway footprint and surrounding environs, focusing mainly on the new route areas.

The line transect locations are presented in **Figure 3.1**. The survey locations remained the same for both field visits.

Two field walkover surveys were undertaken between May 2023 and June 2023, during suitable weather conditions (Bibby *et al*. 2000). Survey dates and survey conditions are provided in **Table 2.1** below.

Table 2-1: Breeding bird survey dates

Survey Date and Period	Survey Time (Extent)	Survey Conditions	Survey Effort
May 3rd 2023 (Eary season)	06.45 – 09.00	Cool and dry. 4 degrees Celsius. Good visibility. Cloud cover at 55%.	Breeding Bird survey – line transect surveys and scan / overview of adjacent lands.
June 14th 2023 (Late season)	07.30 – 09:30	Cool and dry. 5 degrees Celsius. Good visibility. Cloud cover at 70%.	Breeding Bird survey – line transect surveys and scan / overview of adjacent lands.

All bird species encountered (seen or heard) during the surveys were recorded, together with the abundance of each species. Birds flying over the site were also included as part of the observations. Casual records of birds encountered during the spot counts and field walkovers, but outside of dedicated survey period were also noted.

2.1.2 Conservation Status of Bird Species

The conservation status of bird species recorded during the transect surveys and scoping exercise was assessed with reference to the EU Birds Directive (2009/147/EC) Annex I list and Birds of Conservation Concern in Ireland (BoCCI), (Gilbert & Lewis, 2021)[1]. For the BoCCI list, Red-listed species are of high conservation concern in Ireland, Amber-listed species are considered of medium conservation concern,

[1] Gilbert G, Stanbury A and Lewis L (2021), "Birds of Conservation Concern in Ireland 2020 –2026". Irish Birds 9: 523—544

while Green-listed species are not of conservation concern in Ireland at present. Bird species listed on Annex I of the EU Birds Directive have been identified as requiring special conservation measures in relation to their habitats and have been listed due to risk of extinction; vulnerability to specific changes in their habitat and due to their relatively small population size or restricted distribution[2]. The numbers of birds along each transect was recorded and breeding evidence / behaviour of the birds identified were recorded in accordance with the breeding status codes outlined by the British Trust for Ornithology (BTO)[3]. The BTO Breeding Status Codes are presented in **Appendix A** (Delichon Ecology, 2022).

2.1.3 Zone of Influence

The current guidance on ecological assessments (CIEEM, 2017) recommends that all ecological features that occur within a Zone of Influence (ZoI) for a proposed development are investigated.

The ZoI for these breeding bird surveys are as follows:

- areas directly within the proposed greenway;
- areas adjoining and in proximity to the proposed greenway providing suitable breeding avifaunal habitat;
- areas adjoining the proposed greenway footprint subject to indirect impacts (such as disturbance impacts) from the proposed works;
- areas which will be temporarily affected during construction;
- areas where there is a risk of pollution and noise disturbance during construction and/or operation.

The ZoI is variable depending on the ecological receptors affected. Given the extent of the proposed cycleway study area (**Figure 3.1**), in this case the ZoI is the footprint of the proposed greenway and immediately adjoining and surrounding lands (Delichon Ecology, 2022).

[2] https://www.npws.ie/directive-2009147ec-conservation-wild-birds-codified-version
[3] https://www.bto.org/our-science/projects/birdatlas/methods/breeding-evidence

3 RESULTS

3.1 Birds in the Existing Environment

The breeding birds recorded during the 2023 surveys were typical species found within the UL Greenway environs (**See Table 3.1 & Table 3.2**). Breeding bird abundances were moderate – high within the woodland, scrub and riverine habitats adjacent to some of the transects. These habitats are highly suitable for breeding birds, providing plenty of shelter, water and food. Instream and/or riverside breeding birds were less abundant than the woodland avifauna.

Kingfisher was not recorded within the 2023 breeding bird survey but has been recorded within the 2023/2024 Winter Bird survey (Winter Bird Survey Report, 2024) and again in June 2024 during an Invasive Alien Plant Species (IAPS) Survey. Both times the kingfisher was spotted using the Groody River, west of the UL Boat house, where the UL Greenway works are proposed to start. Suitable habitat for this species, including overhanging branches and fringing vegetation, is found within the River Shannon for this species.

All four transects were adjoined by woodland/treeline habitats which supported consistent activity and numerous territories of resident breeding passerine species including Wren, Robin, Song Thrush, Blackbird, Blue tit, Great tit, Chaffinch, Bullfinch, Goldfinch and Dunnock. These were typically associated with areas of scrub and woodland adjoining the proposed greenway footprint within Transect 1. Mute Swan, Mallard, Grey Wagtail, Greylag Geese and Cormorants were identified along the main channel of the River Shannon within Transect 1 also.

Migratory species identified within the survey area included Willow Warbler, Chiffchaff, Blackcap, Sand martin, Swallow, and House martin. These species were mostly identified during the second (late season) survey. Willow Warbler and Blackcap were associated with the scrub and wet woodland habitats within Transects 1 & 3. Sand Martin, House martin and Swallow were identified foraging over urban and peri-urban habitats within the University of Limerick campus and Annacotty urban environs.

The transects undertaken for the 2023 Breeding bird surveys focused mainly on the new route locations. They do not cover the full extent of the proposed greenway, but in conjunction with the 2022 Breeding birds survey (UL Breeding Bird Survey, 2022), most of the proposed greenway has been covered. Transects 1 – 4 range from riverine habitats, treelines, woodlands, scrub and urban habitats. A brief analysis of each transect is provided below. The findings of the breeding bird survey results are presented in full in **Table 3.1** (early season 2023) and **Table 3.2** (late season 2023) below. This includes the number of bird species identified in addition to the British Trust for Ornithology Breeding Status Codes for each breeding bird species identified (See **Appendix A**).

Line Transect 1 – This transect is located west of the UL Boat house, commencing in a south-westerly direction until the Groody River bridge (See **Figure 3-1**). The transects follows the existing tarmac pathway, which is surrounded by grassy verges, which have been dominated by IAPS, treelines, woodland and riverine habitats surrounding the River Shannon. This transect contained the most amount of bird species variety, due to the differing habitats. Within the treeline and woodland, a range of common passerine species including Wren, Robin, Song Thrush, Blackbird, Blue Tit, Great tit, Chaffinch, Blackcap and Coal Tit were recorded, all of which were exhibiting breeding activity. Mallard, Mute Swan, Greylag Goose, Grey Heron, Kingfisher (within the 2024 breeding bird season) and Grey Wagtail were all recorded within the River Shannon and its tributaries. The greenway footprint along transect 1 and its immediate environs do not provide suitable breeding habitat for these species.

Line Transect 2 – This transect is located to the east of the UL campus, traversing the Kilmurry Village accommodation and local roads adjacent to Maguires Pitches. The northern half of this transect is adjacent to a broadleaved woodland where common passerines were recorded, including Wren, Great tit, and Goldfinch. This habitat is screened off by a fence. Migratory species, including the Swallow, were recorded in the later breeding season utilising the urban nature of Kilmurry Village accommodation. The rest of the transect included treelines, amenity grassland and urban habitats where some passerines and corvid species were recorded. The treelines and woodland may provide suitable habitat for breeding passerines.

Line Transect 3 – This transect is located east of the UL campus, within woodland, McLaughlan Road and Plassey Park Road. The woodland to the south of the transect is dominated by willows and provides optimal cover for passerines and migratory warbler species, as seen in the results of the breeding bird surveys completed in 2021, 2022 and 2023. Evidence of probable or possible breeding activity by Wren, Goldfinch, Goldcrest, Song Thrush and Blackbird was identified in addition to possible or probable breeding activity by migratory species including Blackcap, Willow Warbler and Chiffchaff.

Line Transect 4 – This transect is located in the urban environments of Ashgrove and Woodstown roads, as well as the Annacotty Heron's Bridge. This habitat includes treelines, private gardens, the Mulkear River, broadleaved woodland and amenity grass land. The treeline and woodland habitats provide optimal habitat for breeding passerines, including Wren, House sparrow, corvid species, Goldcrest, Bullfinch, Chaffinch, and Robin. In the later season survey, migratory species, Sand martins were recorded flying under and around the Annacotty Heron's bridge. These species were also recorded in June 2024, during the IAPS survey.

Table 3-1: Breeding Bird Survey Results May 2023[4]

Species Name[5]	Transect 1	Transect 2	Transect 3	Transect 4
Starling (*Sturnus vulgaris*)	7 (H,S)		4 (F)	
Magpie (*Pica pica*)	1 (F)		1 (H)	
Blue Tit (*Cyanistes caeruleus*)	2 (H,S)		1 (H,S)	1 (H)
Blackbird (*Turdus merula*)	7 (H,S)	2 (H)	6 (H,S)	4 (H,S)
Great Tit (*Parus major*)	1 (F)			
Wren (*Troglodytes troglodytes*)	10 (H,S)	3 (H,S)	5 (H,S)	4 (H,S)
Blackcap (*Sylvia atricapilla*)	3 (H)		2 (H,S)	2 (H)
Willow Warbler (*Phylloscopus trochilus*)	5 (H,S)		4 (F)	5 (H,S)
Bullfinch (*Pyrrhula pyrrhula*)	1 (F)		1 (H)	
Chaffinch (*Fringilla coelebs*)	1 (H)		1 (H)	3 (H)
Jackdaw (*Corvus monedula*)	2 (F)		2 (F)	2 (H)
Robin (*Erithacus rubecula*)	7 (H,S)		2 (H,S)	3 (H,S)
Collared dove (*Streptopelia decaocto*)	1 (H)			
Woodpigeon (*Columba palumbus*)	1 (H)		2 (H)	2 (H)
Dunnock (*Prunella modularis*)	1 (H,S)			

[4] Numbers of birds identified along each transect are presented in this table. In addition, the British Trust for Ornithology Breeding Status Codes are also included for each species identified.

[5] Conservation status assigned by 'traffic light' system of colour coding, in accordance with the Birds of Conservation Concern in Ireland (Gilbert *et al.*, 2021).

Species Name[5]	Transect 1	Transect 2	Transect 3	Transect 4
Goldcrest (*Regulus regulus*)	1 (H)	1 (H)		3 (H,S)
Greylag goose (*Anser anser*)	12 (H)			
Mallard (*Anas platyrhyncos*)	4 (H)			
Mute swan (*Cygnus olor*)	1 (H)			
Hooded Crow (*Corvus corone*)		1 (H,S)		
Song thrush (*Turdus philomelos*)		2 (H,S)		
Pied wagtail (*Motacilla alba yarrellii*)		1 (H)		
Chiffchaff (*Phylloscopus collybita*)				4 (H,S)
Rook (*Corvus frugilegus*)	1 (F)			
Coal Tit (*Periparus ater*)	1 (H)			

Table 3-2: Breeding Bird Survey Results June 2023[6]

Species Name[7]	Transect 1	Transect 2	Transect 3	Transect 4
Starling (*Sturnus vulgaris*)	5 (F)		9 (F)	
Magpie (*Pica pica*)	4 (F)		2 (H)	5 (F)
Blue Tit (*Cyanistes caeruleus*)	5 (H,S)		3 (H,S)	2 (H)

[6] Numbers of birds identified along each transect are presented in this table. In addition, the British Trust for Ornithology Breeding Status Codes are also included for each species identified.
[7] Conservation status assigned by 'traffic light' system of colour coding, in accordance with the Birds of Conservation Concern in Ireland (Gilbert *et al.*, 2021).

Breeding Bird Survey 2023

Species Name[7]	Transect 1	Transect 2	Transect 3	Transect 4
Blackbird (*Turdus merula*)	2 (H,S)	1 (H)	3 (H,S)	2 (H,S)
Great Tit (*Parus major*)	5 (H,S)	1 (S)	3 (H,S)	2 (P)
Wren (*Troglodytes troglodytes*)	5 (H,S)	2 (S)	2 (H)	2 (H,S)
Blackcap (*Sylvia atricapilla*)	4 (H,S)			
Willow Warbler (*Phylloscopus trochilus*)	2 (H,S)		2 (H,S)	
Bullfinch (*Pyrrhula pyrrhula*)	2 (H,S)		2 (H,S)	
Chaffinch (*Fringilla coelebs*)	2 (H)			2 (H)
Jackdaw (*Corvus monedula*)	7 (F)		4 (F)	6 (F)
Robin (*Erithacus rubecula*)	3 (H,S)		2 (H,S)	1 (S)
Grey heron (*Ardea cinerea*)	1 (H)			
Woodpigeon (*Columba palumbus*)	4 (H)		1 (S)	2 (F)
House sparrow (*Passer domesticus*)		4 (F)	3 (H)	12 (F)
Goldcrest (*Regulus regulus*)				1 (H,S)
Greylag goose (*Anser anser*)	6 (H)			
House martin (*Delichon urbicum*)			2 (F)	
Mute swan (*Cygnus olor*)	2 (H)			
Hooded Crow (*Corvus corone*)		4 (F)		
Song thrush (*Turdus philomelos*)		1 (S)		

Breeding Bird Survey 2023

Species Name[7]	Transect 1	Transect 2	Transect 3	Transect 4
Pied wagtail (*Motacilla alba yarrellii*)		1 (F)		
Chiffchaff (*Phylloscopus collybita*)			3 (H,S)	
Rook (*Corvus frugilegus*)	5 (F)			
Cormorant (*Phalacrocorax carbo*)	3 (F,H)			
Sand martin (*Riparia riparia*)				17 (F)
Grey wagtail (*Motacilla cinerea*)	1 (H)			
Swallow (Hirundo rustica)		5 (F)	7 (F)	

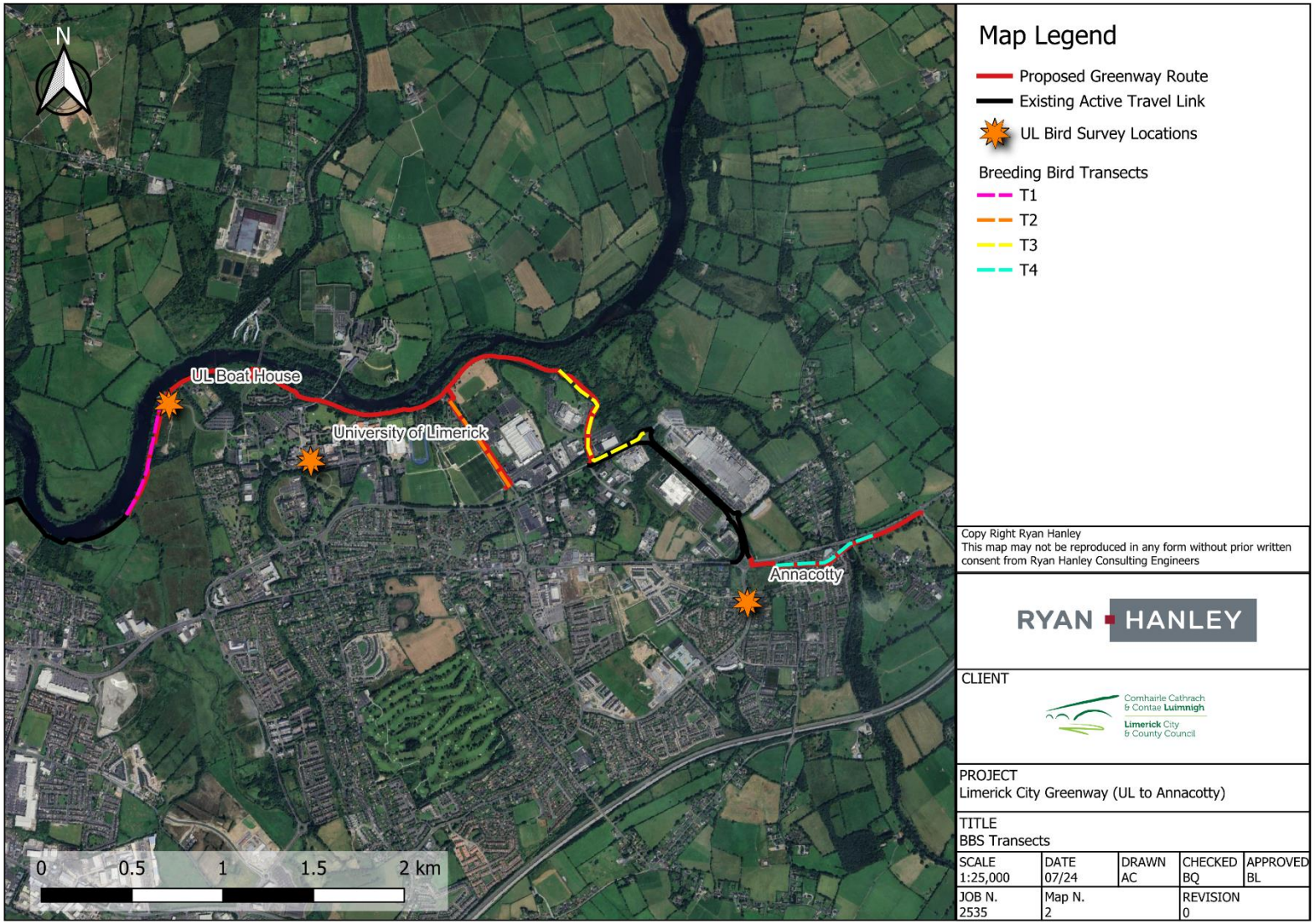

Figure 3-1: Breeding Bird Survey Line Transect Locations

3.2 Summary and Conclusions

The proposed greenway is surrounded by treelines, woodland or scrub for most of its footprint. These habits provide suitable cover and refuge to support breeding birds, particularly the passerine species.

Breeding passerine birds were commonly found throughout the four transects but were in their largest abundance and occurrence within transect 1, which had treeline, woodland and riverine habitats. The species most commonly identified birds within these areas include Wren, Robin, Song Thrush, Blackbird, Chaffinch, Blue Tit, Great Tit, Goldcrest and corvid species.

Migratory species were also recorded during the 2023 breeding bird survey, mainly during the late (second) survey. Willow warbler and blackcap were recorded within wet woodland and scrub habitat, while Swallows, House martins and Sand martins were recorded within more urban habitats.

Amber listed species identified during the 2023 breeding bird survey included the Starling, Willow warbler, Goldcrest, Greylag goose, Mallard, Mute swan, House sparrow, Cormorant, Sand martin and Swallow. The Mute swan, cormorant, mallard and greylag geese were recorded within transect 1 and were associated with the River Shannon riverine habitats. Sand martins were also associated within riverine habitat but were recorded foraging under and over the bridge in Annacotty which crossed the Mulkear River. Starlings and goldcrest were mainly recorded within treeline/woodland habitats while swallows and house sparrows were recorded in the more urban environments surrounding the proposed greenway. Willow warblers were mainly recorded within wet woodland habitats.

Kingfisher was not recorded during the 2023 breeding bird survey but had been recorded during the 2022 breeding bird survey and in the breeding season of 2024. In 2022, breeding activity was not confirmed, but it is highly likely that Kingfisher hold territory along the section of the River Shannon north of the Greenway, in addition to another potential territory along the Mulkear River (Delichon Ecology, 2022). In 2024, one Kingfisher was seen in June foraging and calling out throughout the Groody river and the River Shannon.

Grey wagtail, a Red listed species, was recorded during the 2023 breeding bird survey, within transect 1, near the UL pontoon. Grey Wagtail generally nests along streams and rivers, within the riverbank, among tree roots or within suitable bridges. Theres are some small stone bridges within the UL greenway proposed route which may be suitable for grey wagtail to nest within, therefore any works on these bridges must be completed outside of the breeding bird season. As these bridges are quite small, these birds may utilise the dense woodland and scrub covered islands within the main channel of the River Shannon instead.

The proposed greenway footprint and environs do not provide suitable habitat for ground nesting wading or wildfowl species, given the abundance of tree and scrub cover and the baseline levels of anthropogenic activity and associated baseline disturbances to ground nesting bird species (Delichon Ecology, 2022).

4 REFERENCES

Bibby, C., Burgess, N., Hill, D & Mustoe, S. (2000). Bird Census Techniques: Second Edition. Academic Press: London, United Kingdom

BWI, 2012. CBS Manual - Guidelines for Countryside Bird Survey participants, Kilcoole, Wicklow: Birdwatch Ireland in conjunction with the National Parks and Wildlife Service .

Colhoun., K., Cummins, S., 2013. Birds of Conservation Concern in Ireland. Irish birds 9; 523- 544.

Crowe, O. (2005) Ireland's Wetlands and their Waterbirds: Status and Distribution. BirdWatch Ireland: Kilcoole, Co. Wicklow.

Delichon Ecology. (2022) Draft University of Limerick Breeding Bird Survey 2022.

Fossitt, J. (2000) A Guide to Habitats in Ireland. The Heritage Council, Kilkenny.

Gilbert G, Stanbury A and Lewis L (2021), "Birds of Conservation Concern in Ireland 2020 –2026". Irish Birds 9: 523—544

Gilbert, G., Gibbons, D.W., and Evans J., (1998). Bird Monitoring Methods – A manual for key UK species. RSPB

APPENDIX A – BTO Breeding Status Codes

Breeding Status Codes

Non-breeding	
F	**F**lying over
M	Species observed but suspected to be still on **M**igration
U	Species observed but suspected to be s**U**mmering non-breeder
Possible breeder	
H	Species observed in breeding season in suitable nesting **H**abitat
S	**S**inging male present (or breeding calls heard) in breeding season in suitable breeding habitat
Probable breeding	
P	**P**air observed in suitable nesting habitat in breeding season
T	Permanent **T**erritory presumed through registration of territorial behaviour (song etc) on at least two different days a week or more part at the same place or many individuals on one day
D	Courtship and **D**isplay (judged to be in or near potential breeding habitat; be cautious with wildfowl)
N	Visiting probable **N**est site
A	**A**gitated behaviour or anxiety calls from adults, suggesting probable presence of nest or young nearby
I	Brood patch on adult examined in the hand, suggesting **I**ncubation
B	Nest **B**uilding or excavating nest-hole
Confirmed breeding	
DD	**D**istraction-**D**isplay or injury feigning
UN	**U**sed **N**est or eggshells found (occupied or laid within period of survey)
FL	Recently **FL**edged young (nidicolous species) or downy young (nidifugous species). Careful consideration should be given to the likely provenance of any fledged juvenile capable of significant geographical movement. Evidence of dependency on adults (e.g. feeding) is helpful. Be cautious, even if the record comes from suitable habitat.
ON	Adults entering or leaving nest-site in circumstances indicating **O**ccupied **N**est (including high nests or nest holes, the contents of which can not be seem) or adults seen incubating
FF	Adult carrying **F**aecal sac or **F**ood for young
NE	**N**est containing **E**ggs
NY	**N**est with **Y**oung seen or heard

2023/
2024

Limerick City Greenway (UL to Annacotty)

Winter Bird Survey

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Client	Limerick City & County Council
Project No.	2535
Project Title	Limerick City Greenway (UL to Annacotty)
Report Title	Winter Bird Survey 2023/2024

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0	Draft for Client review	BQ	TS	BL	23/07/2024

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1 INTRODUCTION

Winter bird surveys were conducted within the 2023/2024 wintering bird season, in addition to the surveys that were carried out in 2021/2022, due to a change in the proposed Limerick City Greenway route. These surveys were undertaken to assess the presence, pattern of usage and current conservation status of wintering bird species found within and in the vicinity of the new route **(Figure 3-1).** These surveys were also used to evaluate the importance and potential ecological significance of the study area and its environs to support wintering avifauna.

1.1 Project Description

The Limerick City Greenway (UL to Annacotty) forms part of a larger cycleway plan, the proposed Castletroy Cycle Network as outlined in the Limerick Metropolitan Cycle Network Study (LMCNS) 2025. The focus of the LMCNS is to promote cycling as a realistic choice as a mode of transport in the Limerick Metropolitan Area, making it an attractive location for cyclists of all ages and abilities by proposing the development of a consistent, clear, and continuous network of urban and suburban cycle networks throughout the area.

1.2 Aims of the Proposed Survey

- To survey the new routes added to the proposed UL Greenway and,
- To record quantitative spatial data on wintering birds within the footprint, environs and Zone of Influence of the proposed Limerick City Greenway (UL to Annacotty), and
- To map bird species number and distribution, foraging, resting and roosting areas/activity.

1.3 Brief Description of the Study Site

The Limerick City Greenway (UL to Annacotty) Project will form an extension to the already constructed Limerick Smarter Travel, Route 2, which involved the upgrade of an existing pathway, 1.5km in length between University of Limerick and the Guinness Bridge along the bank of the River Shannon which connects directly into the city centre.

The proposed Greenway route will continue from the existing Limerick Smarter Travel, Route 2 west of the River Groody bridge and extend along an existing section of paved and gravel pathway along the River Shannon, providing for access to and from the University of Limerick and the National Technology Park in Castletroy. The proposed Greenway will connect along University Road and McLoughlin Road via (existing Active Travel infrastructure) to Plassey Park Road through Annacotty Village and ends at Cappamore Junction as its eastern extent.

The Study Area covers approximately 5.8 km^2 in the Counties of Limerick and Clare encompassing the main UL campus, the NTP, sections of the Dublin Road (R445) and northern banks of the Lower River Shannon, including the UL campus located in Cappavilla, Co. Clare.

The Study Area is situated within the Lower Shannon River Catchment, with two main water bodies present including the Lower River Shannon which traverses through the centre of the Study Area and Mulkear River to the east of the Study Area. A small section of the Blackwater (Clare) river is present to the north of the Study Area near the Cappavilla UL campus (See **Figure 1.1** below).

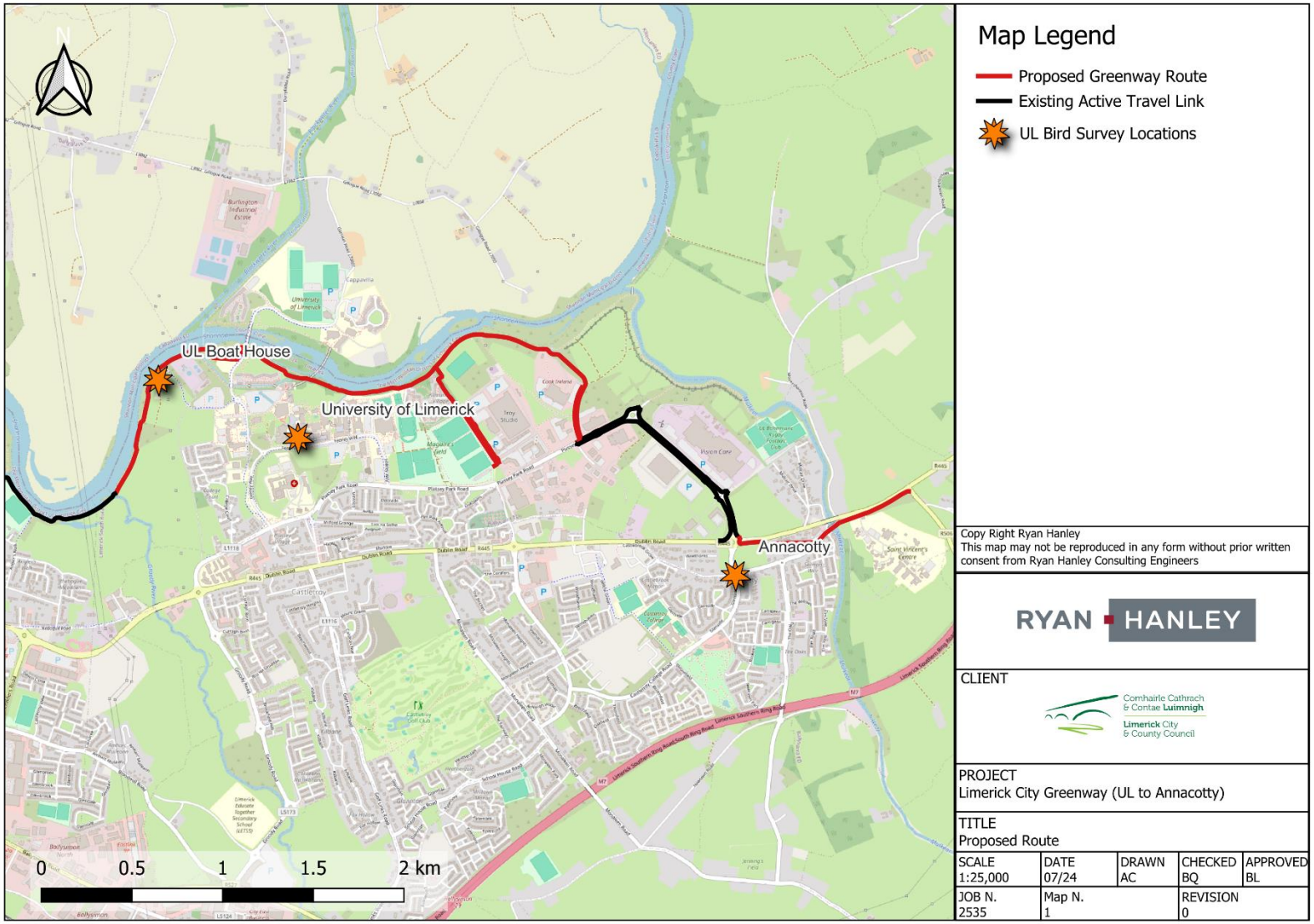

Figure 1-1: Study area and extent of proposed greenway

2 METHODOLOGY

2.1.1 Bird Surveys

Bird Survey methodology undertaken for the Limerick City Greenway (UL to Annacotty) Winter Bird Surveys included spot-counts while walking the new route transects. Two main areas were surveyed, the new route to the west of the UL Boat House and the bridge in Annacotty. The bird surveys were conducted in accordance with the methodology described by Bibby *et al.* (2000).

Six survey visits were conducted: one survey per month from October 2023 to March 2024, between 08.00 – 17.00 hrs, during suitable weather conditions (Bibby *et al.* 2000). Survey dates are provided in **Table 2.1**.

Five survey visits were completed between November 2021 and March 2022, by Delichon Ecology and results are discussed and concluded within the Draft Wintering Bird Survey report (Delichon Ecology, 2022).

The survey locations are presented in **Figure 3.1**.

Table 2-1: Winter bird survey dates

Survey Date	Survey Effort	Survey Conditions
October 24th 2023	Wintering Bird Survey – spot counts and targeted site walkover surveys	Dry, 90% cloud cover. 8 degrees Celsius. Good visibility. No rain.
November 14th 2023	Wintering Bird Survey – spot counts and targeted site walkover surveys	Clear, 90% cloud cover. 6 degrees Celsius. Good visibility. Occasional showers.
December 13th 2023	Wintering Bird Survey – spot counts and targeted site walkover surveys	Clear, 70% cloud cover. 7 degrees Celsius. Good visibility. No rain.
January 10th 2024	Wintering Bird Survey – spot counts and targeted site walkover surveys	Cold and icy with 50% cloud cover. 1 degrees Celsius. Good visibility. No rain.
February 27th 2024	Wintering Bird Survey – spot counts and targeted site walkover surveys	Clear, 95% cloud cover. 6 degrees Celsius. Good visibility. Occasional showers/misty rain.
March 21st 2024	Wintering Bird Survey – spot counts and targeted site walkover surveys	Dry, 80% cloud cover. 7 degrees Celsius. Good visibility. No rain.

All bird species encountered (seen or heard) during the surveys were recorded, together with the abundance of each species. Birds flying over the site were also included as part of the observations. Casual records of birds encountered during the spot counts and field walkovers, but outside of dedicated survey period were also noted.

2.1.2 Conservation Status of Bird Species

The conservation status of bird species recorded during the surveys and scoping exercise was assessed with reference to the EU Birds Directive (2009/147/EC) Annex I list and Birds of Conservation Concern in Ireland (BoCCI), (Gilbert & Lewis, 2021)[1]. For the BoCCI list, Red-listed species are of high conservation concern in Ireland, Amber-listed species are considered of medium conservation concern, while Green-listed species are not of conservation concern in Ireland at present. Bird species listed on Annex I of the EU Birds Directive have been identified as requiring special conservation measures in relation to their habitats and have been listed due to risk of extinction; vulnerability to specific changes in their habitat and due to their relatively small population size or restricted distribution[2]. The Conservation Status of each bird species recorded during the Winter Bird Surveys 2023/2024 can be seen in **Appendix A**.

[1] Gilbert G, Stanbury A and Lewis L (2021), "Birds of Conservation Concern in Ireland 2020 –2026". Irish Birds 9: 523—544

[2] https://www.npws.ie/directive-2009147ec-conservation-wild-birds-codified-version

2.1.3 Zone of Influence

The current guidance on ecological assessments (CIEEM, 2017) recommends that all ecological features that occur within a Zone of Influence (ZoI) for a proposed development are investigated.

The ZoI for these wintering bird surveys are as follows:

- areas directly within the proposed greenway;
- areas adjoining and in proximity to the proposed greenway providing suitable wintering avifaunal habitat;
- areas adjoining the proposed greenway footprint subject to indirect impacts (such as disturbance impacts) from the proposed works;
- areas which will be temporarily affected during construction;
- areas where there is a risk of pollution and noise disturbance during construction and/or operation.

The ZoI is variable depending on the ecological receptors affected. Given the extent of the proposed greenway study area (**Figure 3-1**), in this case the ZoI is the footprint of the proposed greenway and immediately adjoining and surrounding lands (Delichon Ecology, 2022).

3 RESULTS

3.1 Birds in the Existing Environment

The wintering birds recorded during the 2023/2024 surveys were typical species found within the UL Greenway environs. A brief analysis of bird activity at the survey locations within the study area is provided below. Please refer to **Figure 3-2** to **Figure 3-7** which displays the extent and location of the survey sections.

Spot-count/Transect 1 – This transect included the new route area located west of the UL Boat house, commencing in a south-westerly direction until the Groody River bridge as well as following the pathway east of the UL boat house, towards University Bridge (See **Figure 3-1**). The transects follow the existing pathway, which is surrounded by grassy verges, which have been dominated by IAPS, treelines, woodland and riverine habitats surrounding the River Shannon.

Bird activity within this area included passerine birds (Blue tit, Great tit, Coal tit, Long-tailed tit, Treecreeper, Blackbird, Chaffinch, Song thrush, Wren, Pied wagtail and Robin) and corvid species using the adjacent mixed broadleaved woodland and treeline habitats. Kingfisher was also recorded in March, within the Groody River (See **Figure 3-7**). The main channel of the River Shannon supported consistent occurrences of the following riverine, aquatic and semi-aquatic species including Greylag Geese, Mallard, Cormorant, Black-headed Gull, Herring Gull, Water rail, Grey wagtail, Curlew and Mute Swan. Greylag Geese utilise improved grassland fields on the northern bank of the river, north-west of UL boathouse. Gull species, mainly the Black-headed Gull utilise the main channel of the River Shannon throughout the survey season, using built structures and the main channel of the river for roosting and foraging respectively. The Grey wagtail utilised the main river channel as well as the build structures. Mallard, Cormorant and Mute Swan utilised the main channel and the fringing habitats within the river channel margins in small numbers. Mallards were mainly recorded within the flooded treelines. One singular Water rail was also recorded within this flooded habitat. A flock of Curlew (n-46) were recorded utilising the main river channel and the agricultural fields in January 2024 (See **Figure 3-5**).

Spot-count/Transect 2 – This site included the Annacotty Heron's bridge, which crossed the Mulkear river and its immediate surroundings (See **Figure 3-1**). Some passerines (Wren, Robin, Blackbird, Song thrush, Blue tit, Pied wagtail, Great tit and Chaffinch) as well as some corvid species, were recorded utilising the surrounding treelines and built structures. While the Grey heron and Cormorant were recorded utilising the main river channel.

The rest of the proposed greenway route was recorded by Delichon Ecology in 2021/2022 and the results can be frond in the Draft Wintering Bird Survey Report. (Delichon Ecology, 2022)

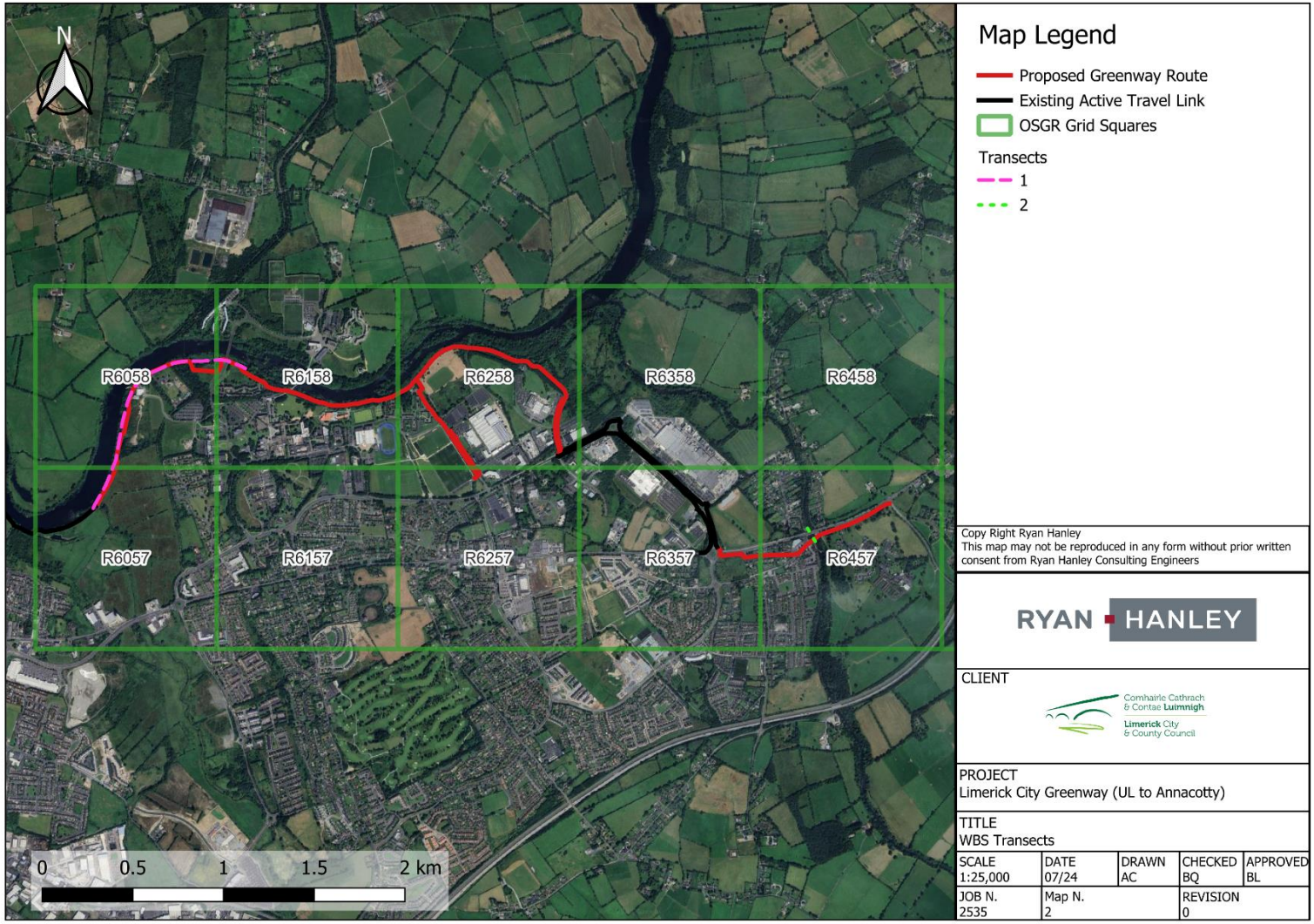

Figure 3-1: Winter Bird Survey Spot-count/Transect Locations

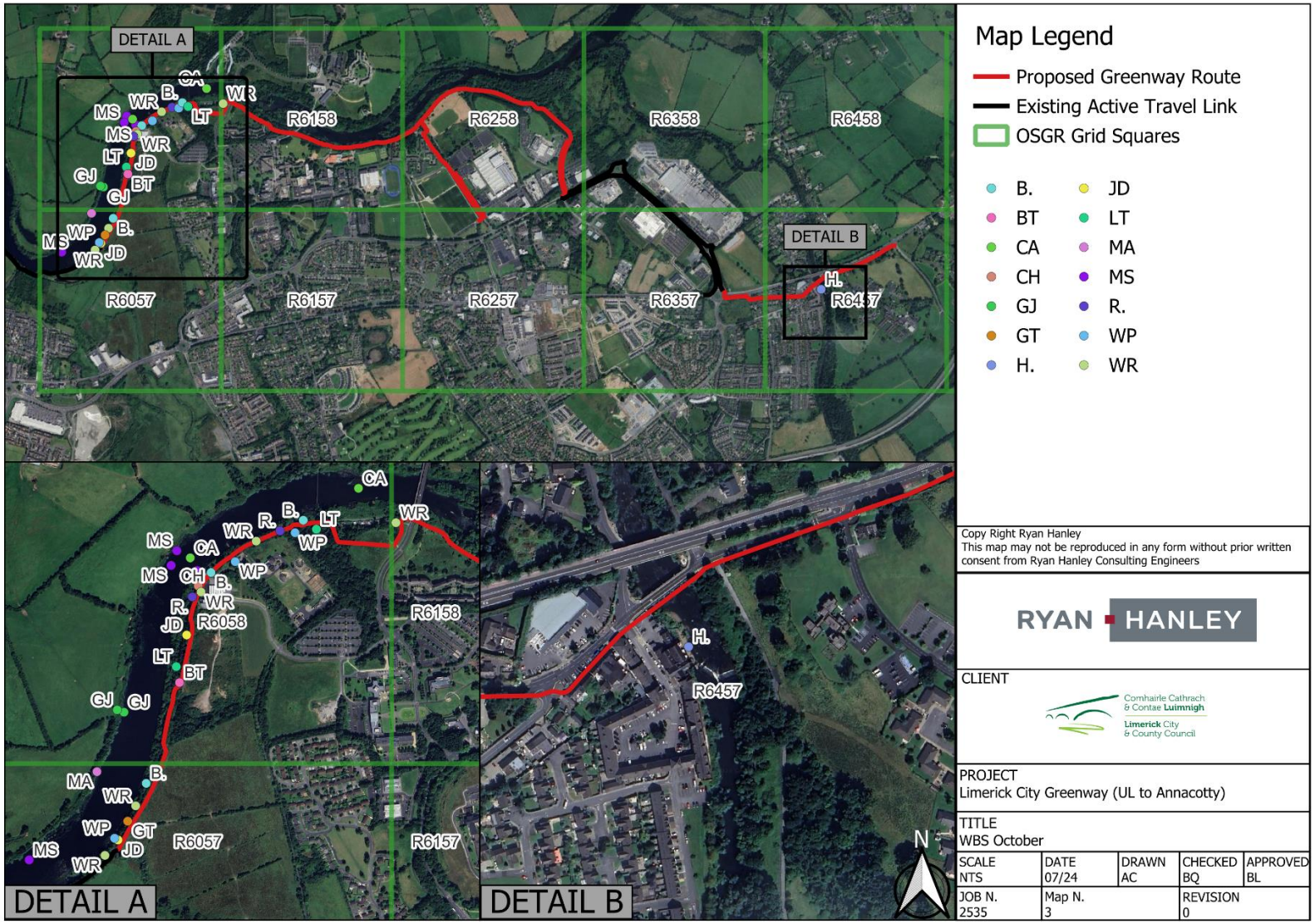

Figure 3-2: Winter Bird Survey October 2023 results

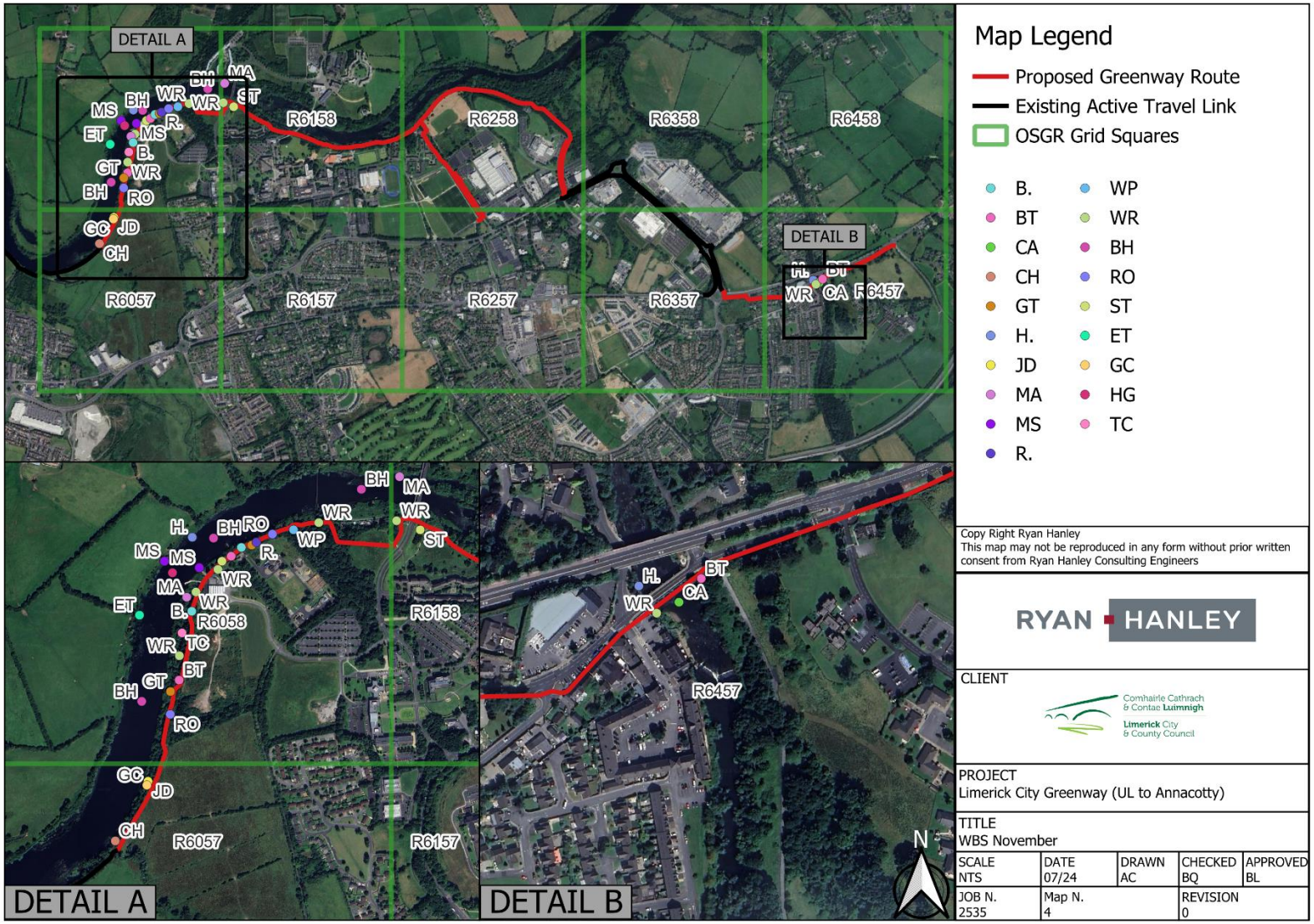

Figure 3-3: Winter Bird Survey November 2023 results

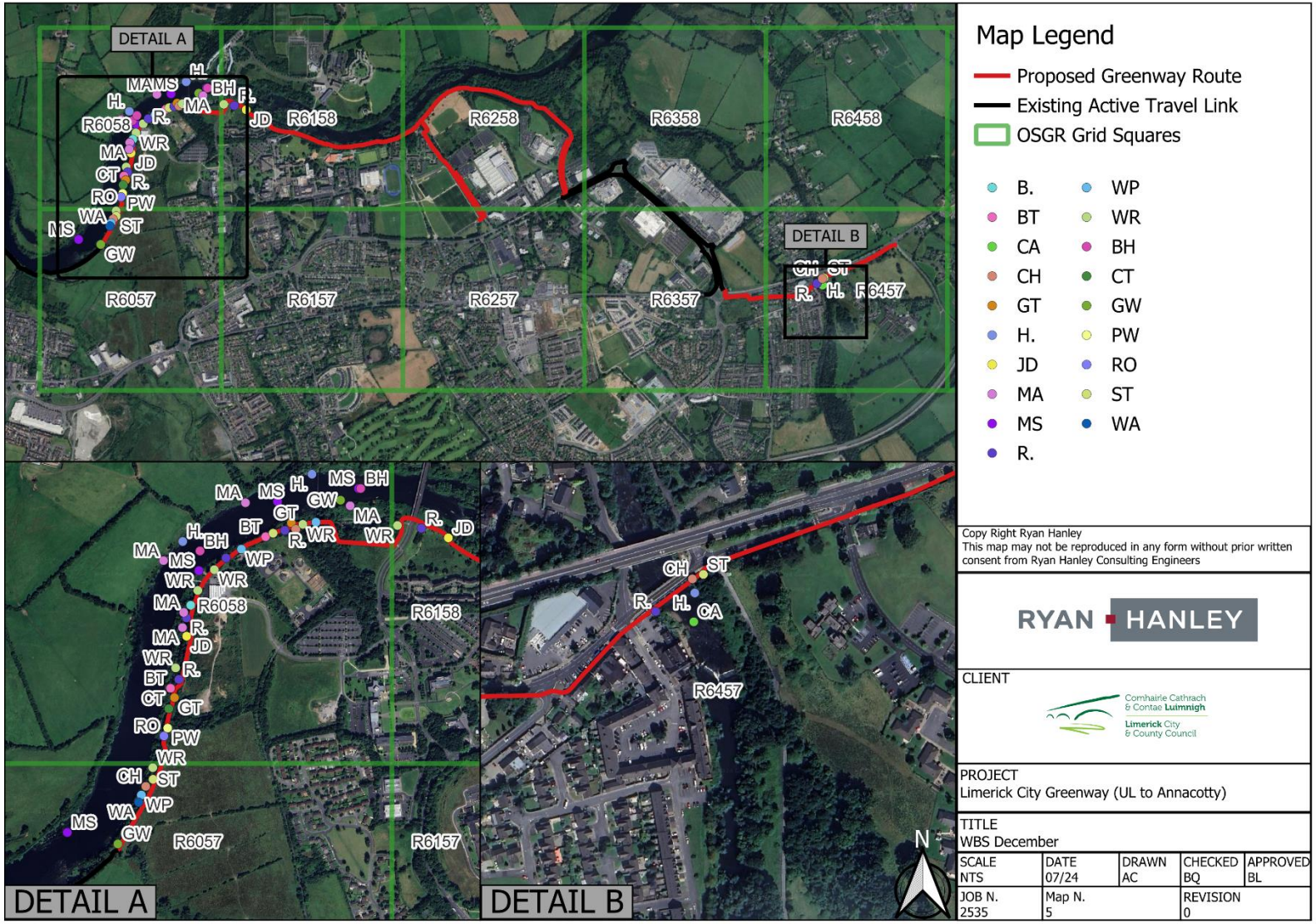

Figure 3-4: Winter Bird Survey December 2023 results

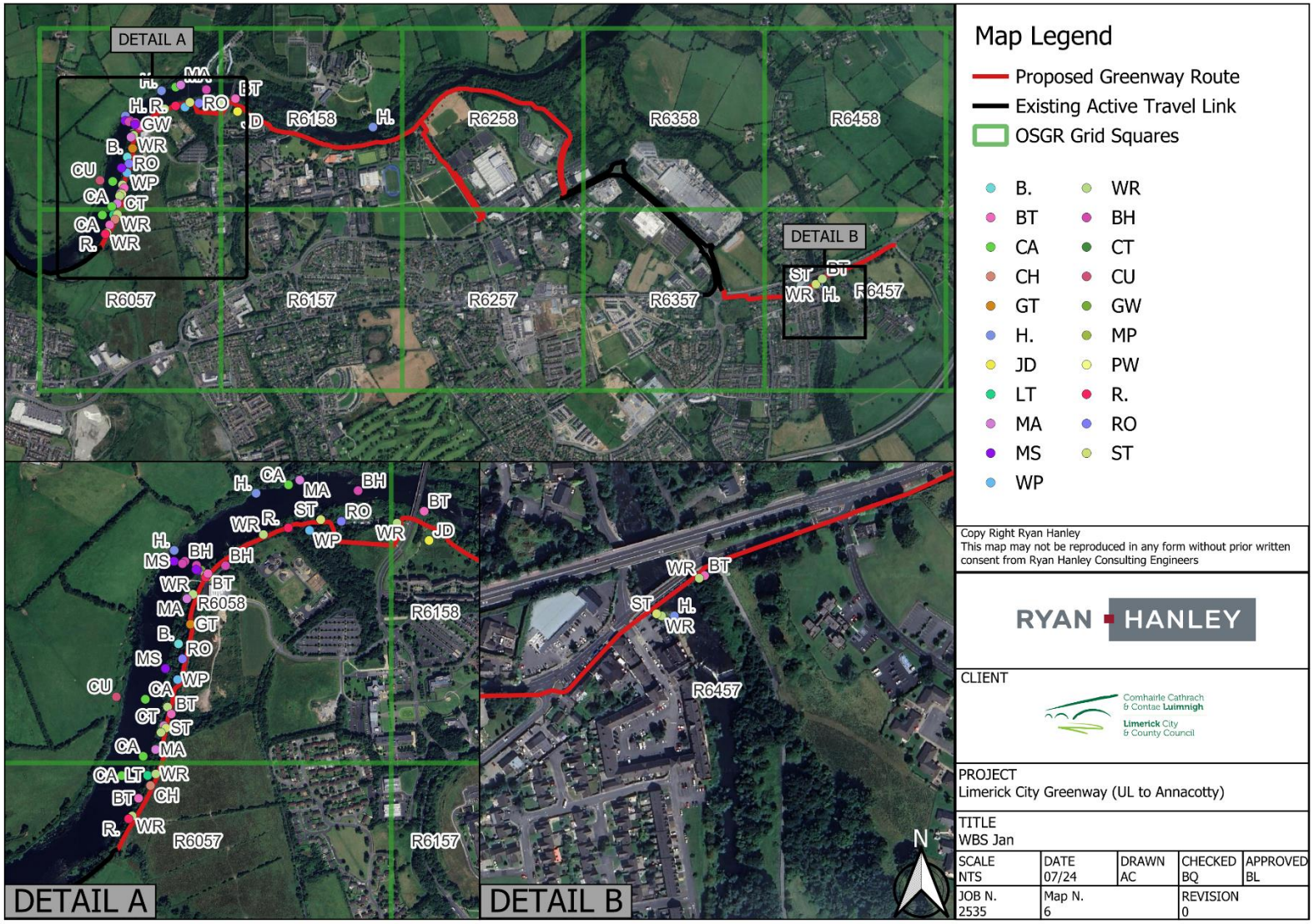

Figure 3-5: Winter Bird Survey January 2024 results

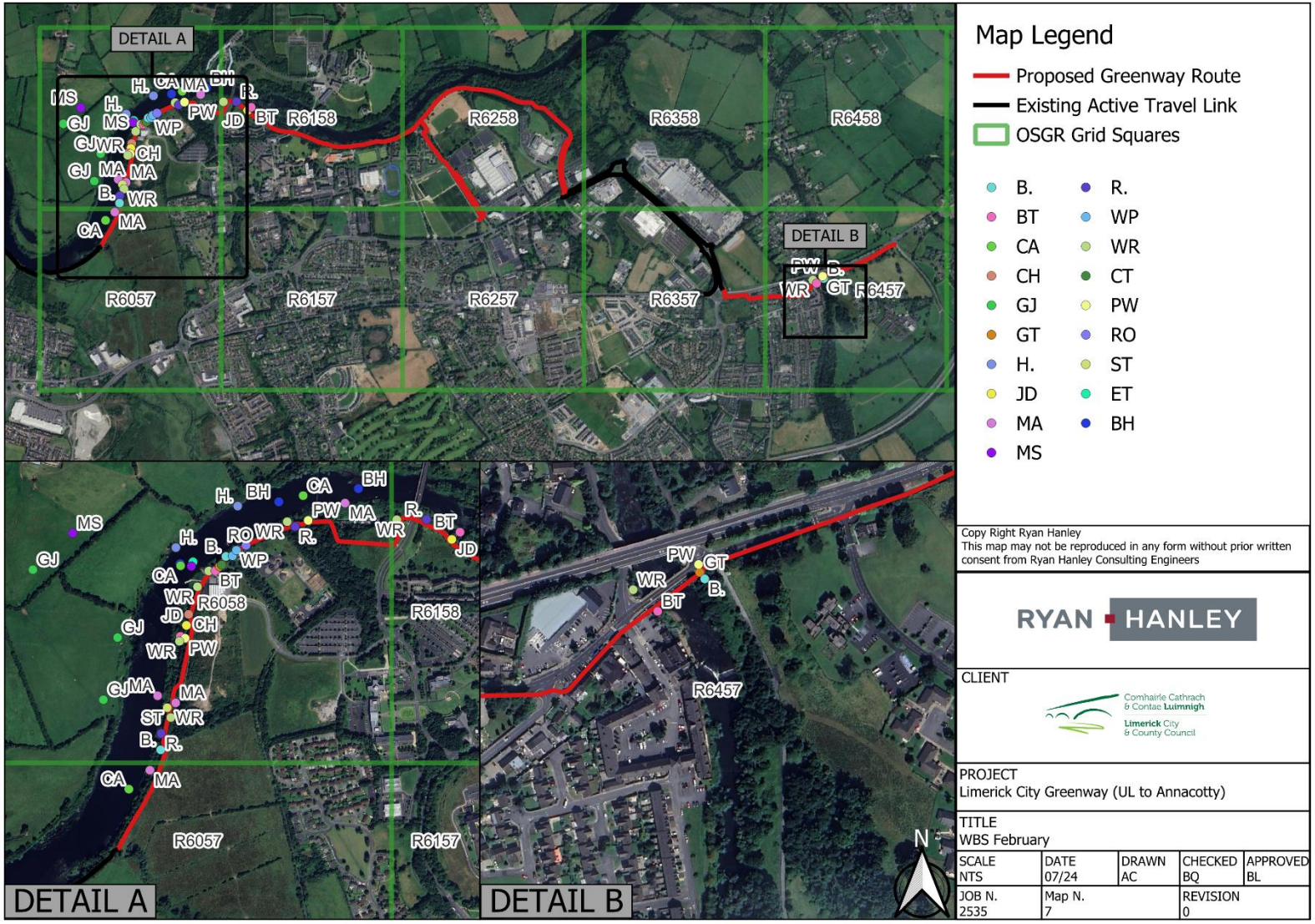

Figure 3-6: Winter Bird Survey February 2024 results

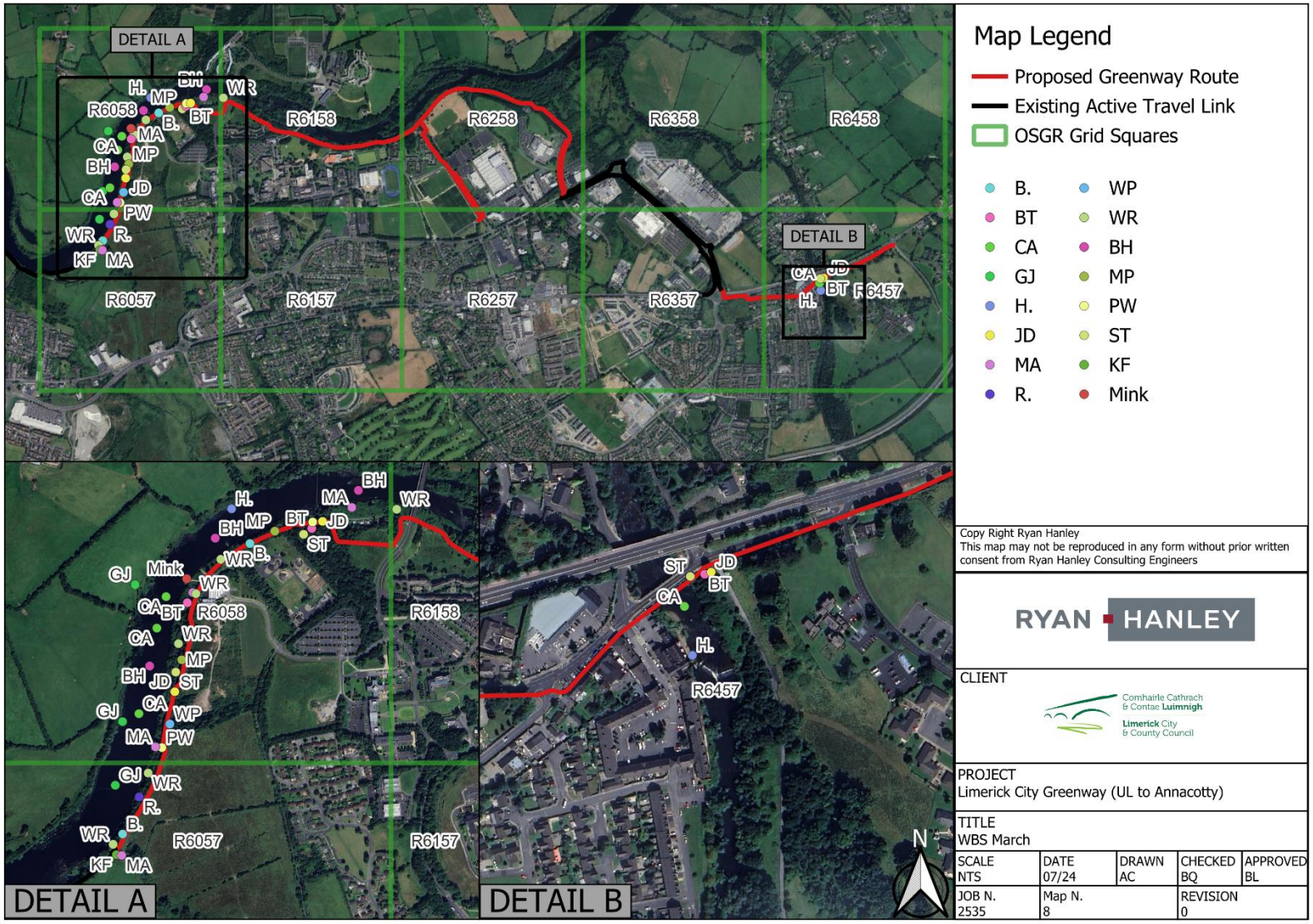

Figure 3-7: Winter Bird Survey March 2024 results

3.2 Summary and Conclusions

The new route sections of the proposed greenway are located adjacent to the River Shannon and the Mulkear River. Both sections include riverine habitats, with Transect 2 being located within a more urban environment while Transect 1 is located along an existing pathway surrounded by treelines and agricultural fields. All species recorded and their conservation status can be seen in **Appendix A – Field Data.**

Mute swan, Cormorant, Greylag geese, Mallard, Black-headed gulls and Grey herons were the most consistent wintering species recorded throughout the winter bird survey season. All of which could be found within Transect 1, while Transect 2 only recorded the Grey heron and Cormorants.

Passerine species were also abundant throughout the winter bird survey season, including the Wren, Blue tit, Great tit, Long-tailed tit, Coal tit, Song thrush, Blackbird, Chaffinch, Goldcrest, Pied wagtail, Wood pigeon and corvid species.

Amber listed species identified during the winter bird surveys included Mute swan, Mallard, Cormorant, Black-headed gull, Herring gull, Greylag goose, Goldcrest and Kingfisher. Mute Swan was recorded within Transect 1 from October to March. The Mute swan is largely sedentary, and the winter and breeding distributions are very similar (Balmer *et al*, 2013), which is true in this case based on the Breeding Bird Report 2023 (Ryan Hanley, 2024). Greylag geese were recorded with Transect 1 in October and then again in February and March. These birds were mainly recorded roosting and foraging in lowland agricultural grasslands adjacent to the river or within the River Shannon itself. These birds have also been recorded during the breeding season also. Mallards were recorded throughout the winter survey season also, mainly roosting within the flooded banks and treeline of the River Shannon and within the River Shannon itself. Cormorants were again recorded each month of the winter bird survey season. They were recorded foraging within and/or flying over the River Shannon and the Mulkear river. Black-headed gull were recorded within Transect 1 from November to March. Larger numbers were found roosting with the River Shannon as well as on built structures near the river. They were also recorded flying up and downstream of the River Shannon in smaller numbers. One single Herring gull was recorded within Transect 1 in October. Kingfisher was recorded withing the Groody River in Transect 1 in March 2023. It was also noted here in June 2024 (during a bat survey) in the same location.

Red listed species identified during the winter bird surveys included the Grey wagtail and Curlew. Grey wagtail was recorded in December 2023 and January 2024 within Transect 1, flying and foraging near the River Shannon. Curlew were identified along the River Shannon and its adjoining agricultural lands, on one occasion over the wintering period (January 2024). It is likely that they utilise this area intermittently and opportunistically for foraging and roosting purposes.

Results for the rest of the proposed UL Greenway route can be found within the University of Limerick Wintering Bird Survey repost (Delichon Ecology, 2022).

4 REFERENCES

Balmer, D.E., Gillings, S., Caffrey, B.J., Swann, R.L., Downie, I.S. & Fuller, R.J. 2013. *Bird Atlas 2007-11: The breeding and wintering birds of Britain and Ireland*. BTO Books, Thetford.

Bibby, C., Burgess, N., Hill, D & Mustoe, S. (2000). Bird Census Techniques: Second Edition. Academic Press: London, United Kingdom

BWI, 2012. CBS Manual - Guidelines for Countryside Bird Survey participants, Kilcoole, Wicklow: Birdwatch Ireland in conjunction with the National Parks and Wildlife Service .

Colhoun., K., Cummins, S., 2013. Birds of Conservation Concern in Ireland. Irish birds 9; 523- 544.

Crowe, O. (2005) Ireland's Wetlands and their Waterbirds: Status and Distribution. BirdWatch Ireland: Kilcoole, Co. Wicklow.

Delichon Ecology. (2022) Draft University of Limerick Winter Bird Survey 2022.

Fossitt, J. (2000) A Guide to Habitats in Ireland. The Heritage Council, Kilkenny.

Gilbert G, Stanbury A and Lewis L (2021), "Birds of Conservation Concern in Ireland 2020 –2026". Irish Birds 9: 523—544

Gilbert, G., Gibbons, D.W., and Evans J., (1998). Bird Monitoring Methods – A manual for key UK species. RSPB

APPENDIX A – WBS Field Data

LAND PLANNING & DESIGN

CUNNANE STRATTON REYNOLDS

TREE SURVEY

Limerick City Greenway,
Limerick.

July 2024

CUNNANE STRATTON REYNOLDS
LAND PLANNING & DESIGN
www.csrlandplan.ie

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Summary

1. Introduction

2. Description of Existing Trees

3. Arboricultural Impact Assessment

4. Recommendations – AMS

Limitations & References

Appendix 1: Tree Survey Schedule

SUMMARY

This report presents a record of those trees existing located along an existing pedestrian route following the southern bank of the River Shannon starting at the eastern side of University of Limerick campus and continuing west along the southern bank of the River Shannon as far as McLoughlin Road in the adjoining National Technology Park campus, where it then follows the Plassey Park Road out of the UL campus onto the Dublin Road and Annacotty. There is also a spur section through Kilmurray Student Village.

Trees have been surveyed as groups in the case of continuous areas of woodland that is broadly uniform in character, with any individual trees of particular merit or note within these groups being identified and surveyed individually, in accordance with BS 5837 (2012). Following initial site surveys undertaken in May and June 2021, the most recent survey was undertaken over February 2024 by Cunnane Stratton Reynolds arborist;

Keith Mitchell Diploma Arboriculture (Level 4)
Technician Member Arboricultural Association (UK)
Tree Risk Assessment Qualification (International Society of Arboriculture)
MA(Hons) Landscape Architecture
Member of the Irish Landscape Institute
Chartered Member of the Landscape Institute (UK)
Diploma EIA Management

This survey and report are based on the topographic site survey information supplied in the following drawing;

- Apex Surveys – 2D Topographic Survey Dwg 4566 04/05/21

A full survey record is presented in Appendix 1, together with accompanying drawings Tree Constraints Dwg No 21537_T_101, Arboricultural Impact Assessment Dwg No 21537_T_102 and Tree Protection Plan Dwg No 21537_T_103. After introducing the terms of reference and the methodology of the survey, the report summarises the survey findings in an overview of the existing tree cover within the site.

A total of one hundred and thirty two individual trees and twenty-four tree groups were recorded as part of the survey.

The proposed route contains a very large number of number of trees, with riparian tree cover being almost continuous along this the River Shannon section. Tree quality varies over the route, with a mix of trees from low to high quality in all stages of development from sapling to veteran – collectively providing an exceptionally valuable continuum of tree cover both in arboricultural and ecological terms. Every effort has been made to access all trees for inspection, however in many instances site conditions prevent full access and measurements may be visually estimated.

The report concludes with recommendations for protection measures to ensure the conservation of retention trees during the proposed development.

1. INTRODUCTION

Terms of Reference

Cunnane Stratton Reynolds (CSR) were instructed to undertake a tree survey, to inform the planning, design and layout of a proposed cycleway by Ryan Hanley Consulting Engineers.

Following site surveys, CSR considered those tree and tree groups that might potentially be impacted by the proposed development and produced a subsequent tree survey report presenting our findings, (in accordance with BS 5837:2012), together with recommendations for their best practice management in relation to the proposed development.

This involved a survey of the principal trees / tree groups concerned in accordance with BS 5837 (2012).

Documents supplied to CSR for purposes of conducting a tree survey include:

- Apex Surveys – 2D Topographic Survey Dwg 4566 04/05/21
- Ryan Hanley – Proposed Compounds and Tree Clearing Plates 1-50.

Site Inspection & Methodology

The site was surveyed in May and June 2021 as well as February 2024 by a qualified Arborist walking the route. A visual inspection from the ground was performed on all relevant existing trees / tree groups on site. Where access allowed, principal individual trees were examined, and critical measurements were taken and observations made.

A description was recorded of trees / group of trees, their species, age class, all relevant measured dimensions (height, stem diameter, crown spread radii and crown clearance height) and an assessment of the tree health / vitality, structural form, life expectancy and quality categorisation. Any recommended remedial works required were outlined in accordance with BS 5837 (2012).

The findings of the survey are recorded and presented in this Tree Survey Report and Tree Schedule (Appendix 1). A Tree Classification and Constraints drawing was produced to inform the planning and design process. An Arboricultural Impact Assessment and Tree Protection Proposals were considered on completion of the proposed scheme layout.

This report is subject to the scope and limitations as given at the end of the report.

Accompanying Drawings

The tree survey report should be read in conjunction with;

- Tree Classification & Constraints (Dwg No 21537/T/101).
- Arboricultural Impact Assessment (Dwg No 21537/T/102).
- Tree Protection (Dwg No 21537/T/103).

A1 size colour coded drawings accompany this report, (monochrome drawings should not be relied upon). These drawings are based upon the topographical drawings supplied to CSR.

Site Location

The site is located between the eastern edge of University of Limerick campus on the southern banks of the river Shannon, passes through the National Technology Park and extends to Annacotty village Dublin Road.

2. DESCRIPTION OF EXISTING TREES

2.1 The route of the proposed cycleway, (approximate route highlighted red – Fig 1), starts in the east as an existing pedestrian riverside pathway hugging the southern bank of the River Shannon before linking into an existing path and cycleway network through IDA Ireland national technology Park, before exiting on to Dublin Road and travelling eastward through Annacotty.

The path servicing the western portion of the route located in the University of Limerick campus is a well-defined and maintained bound gravel surface, averaging 1.8m in width and is raised above the adjoining river on top of the embankment. This section of the route can be described as high-quality riverside woodland with a broad age profile from large veteran trees to self-regenerating saplings and other understory species. Natural riparian tree species such as Willow, Alder and Ash dominate however a number of other species such as Beech and Oak are also present, which are of an age that suggest they were probably planted by the original estate owners prior to the development of the University on these lands.

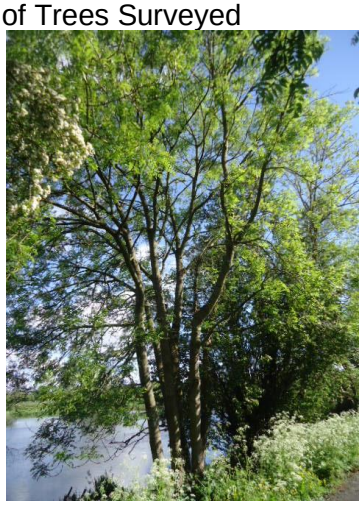
Approximately half-way along the route the path exits the University of Limerick campus and enters the adjoining IDA Ireland National Technology Park where it extends connections to existing footpaths and cycleways. Most of the trees in this section are relatively young roadside verge / street trees planted as part of the campus landscape scheme. The route exits the Technology Park at Dublin Road where it continues to the nearby Annacotty Village where it passes a mix of street trees .

Figure 1: Low resolution satellite image of approximate tree survey area in red (courtesy of Google Earth).

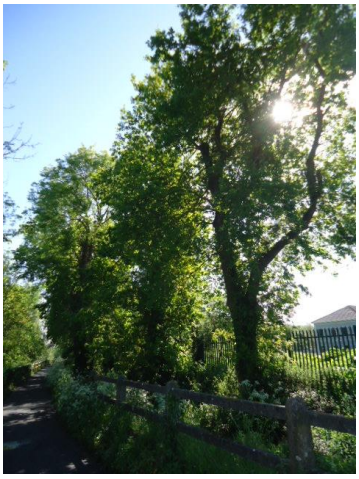
Their location, size and quality category may be reviewed with reference to the accompanying Tree Survey Dwg No 21537/T/101 and the tree survey (Appendix 1).

2.2 Photographic Summary of Trees Surveyed

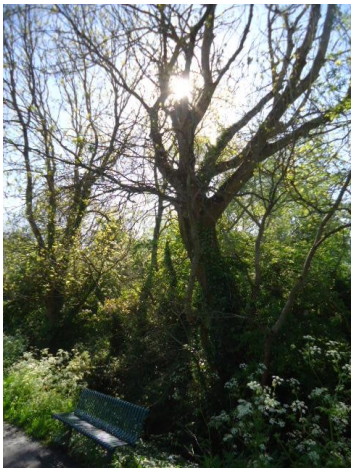
T1



T2



T3/T4/T5

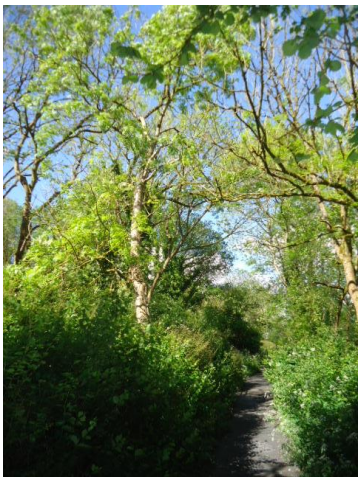


T6 / T7

T8

T9/T10

T11



T12

T13

Tree Group 22 (mixed broadleaf)

TG1

T14

T15

T16/T17

T18-T22

T23

T25

T25

T24

T26/T27/T28

T29

T31/T32

T33/T34

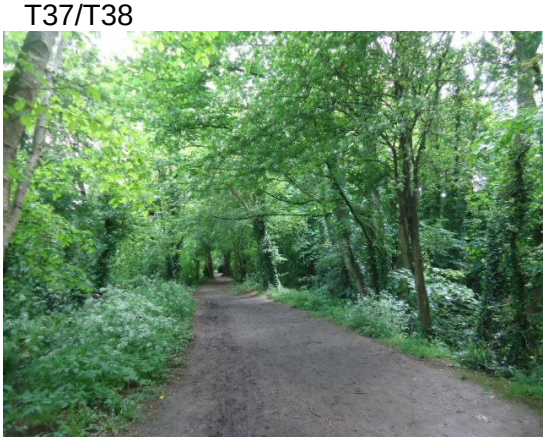
TG2

T35/T36/TG3/TG4

TG5

T37/T38

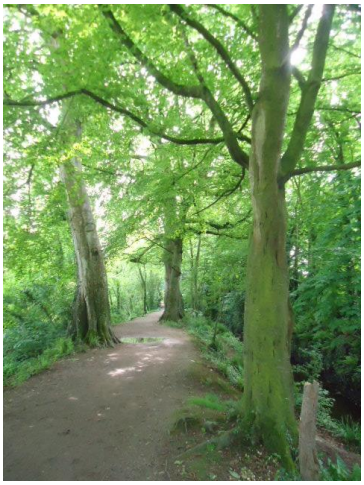
T37



T40/T41/T42/T43

T39

T41



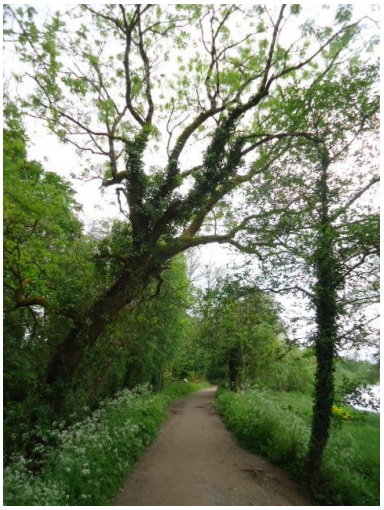
T44/T44A/T44B

T45

T46

T47/T48/T49/TG6

T8



T52

T53

TG9

TG9

TG9

TG9

TG10/T57/T58/59

T55/T56

T61

T62

T63/T64

T65 / T66

T67/TG12

Tree Group 23 (mixed broadleaf)

Tree Groups 13-20 (Willow scrub)

T835

T888

T887

Tree Group 21 (Alder Willow mix to waterside / mixed broadleaf to fieldside)

T836

T837

T838

T839/T840

T841

T842

T843

T844/T845/T846

T847

T848

T849

T850

T851

T852

T853a/T853b

T854/T855/T856

T857

T858

T859

Tree Group 24

Tree Group 24

T860

T861

T862-T868

T869/T870/T871

T872/T873/T874/T875

T876

T877

T878

T879

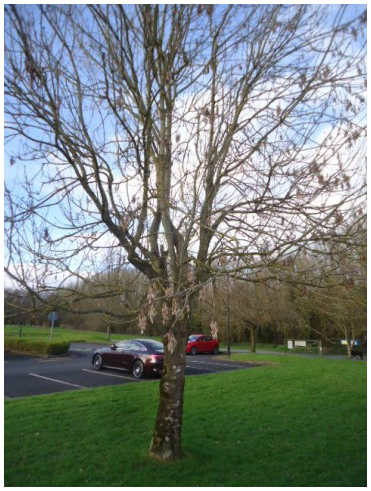
T880

T881

T882

T883

T884



T885

T886

2.3 The proposed route alignment stretches from beyond UL Boathouse in the west to just beyond Annacotty village in the east.

The first half of the proposed cycle route, starting at from UL Boathouse and moving from east is based on an existing pedestrian walkway along the south side of the river Shannons embankment. Dense native riparian woodland dominated by Alder and Willow is generally present on the riverbank side of the path with dense high-quality mixed broadleaf woodland composed mainly of native and naturalised tree species is generally present of the other side of the path.

The age profile of this woodland is balanced with a healthy understory of emerging saplings in addition to the upper canopy of middle aged and mature trees.

A number of the trees are of exceptional age and size and are probably originally associated with the historic Plassey House domain. Whilst many of these old trees have significant defects, (which is normal in trees of this age), there is evidence that they are being proactively managed in such as manner as they can be retained at an acceptable level of risk – for example trees with significant cavities resulting in structural weakness have been ‘monolithed’ or reduced to a safe height.

This is an appropriate management strategy and allows the retention of the significant benefits trees of this age offer such as ecological and habitat value, heritage value, genetic diversity and aesthetic benefit.

The significant size of many of these trees means that their root zones are likely to extend for significant distances as illustrated in the Classification & Constraints Dwg 21537_T_101.

The spur access departs from the riverside path at Kilmurry Village, running south east parallel to an established linear group of early mature mixed deciduous trees, (largely utilising existing pedestrian and vehicular surfaces).

The riverside path continues eastwards until just before the ruins of Castletroy, where it diverges from the river course to meet and follow McLoughlin Drive within the National Technology Park, where it passes a mix of young to early mature street trees. From this point the path links with existing active travel infrastructure on Plassey park Road before eventually exiting on to the Dublin Road. After a short distance it diverts on to the Ashgrove Road to Annacotty village passing a relatively small number of street and garden trees before crossing the Mulkear River and exiting the village at the St Vincent's Special School Entrance to rejoin the Dublin Road, where it runs parallel to an agricultural field with a number of mature trees before ending at the R506 junction.

Trees often become more valuable as collective groups, than they might be when considered solely as individuals in isolation - a grouping or woodland being generally of significant visual and ecological value. As such it should be noted that the cumulative value of evaluated Tree Groups often reflects an increased catergorised value than might be awarded to the constituent trees if they were assessed in isolation as individuals.

3. ARBORICULTURAL IMPACT ASSESSMENT

3.1 This section discusses the potential impact of the proposed development on the existing tree cover on site and considers the need for mitigation measures, in accordance with BS 5837 (2012), for sustainable development.

3.2 Category 'U' trees are recommended for immediate removal, (fell or monolith to safe height), on general management grounds, irrespective of site development – no U class trees were identified as such during this survey.

Direct Loss of Trees

3.3 The proposed greenway route alignment has in so far as possible sought to avoid direct conflict with existing trees in order to minimise impacts and tree loss.

In some cases the proposed alignment may not clash directly with the tree, but it may traverse a portion of the trees root protection area. Where feasible alternative non-dig construction method has been employed to avoid compromising the trees roots and loosing the tree.

There are situations however where avoidance or alternative construction methods are not possible for a variety of different reasons, resulting in the requirement to remove some trees to facilitate the proposed development.

The proposed scheme is currently in conflict with the following trees and or a significant portion of their calculated root protection area, making their retention unviable in the context of the proposed development.

Tag No	Tree Species	Tree Class	Number of trees
T6	Ash (Fraxinus excelsior)	B1	1
T7	Ash (Fraxinus excelsior)	B1	1
T12	Ash (Fraxinus excelsior)	B2	1
T41	Beech (Fagus sylvatica)	B1	1
T48	Sycamore (Acer pseudoplatanus)	B1	1
T49	Sycamore (Acer pseudoplatanus)	B1	1
T51	Sycamore (Acer pseudoplatanus)	B1	1
T837	Ash (Fraxinus excelsior)	C1	1
T840	Ash (Fraxinus excelsior)	C1	1
T841	Sycamore (Acer pseudoplatanus)	B1	1
T842	Sycamore (Acer pseudoplatanus)	B1	1
T843	Sycamore (Acer pseudoplatanus)	B1	1
T852	Sycamore (Acer pseudoplatanus)	B1	1
T853	Sycamore (Acer pseudoplatanus)	B1	1
T888	Ash (Fraxinus excelsior)	U	1
TG4	Mixed broadleaf	B2	Approx 21
TG8	White Willow (Salix Alba)	B2	5
TG20	White Willow (Salix Alba)	B2	Approx 10
TG21	Mixed broadleaf	B2	2
TG22	Mixed broadleaf	B2	Approx 15
TG24	Mixed broadleaf & Leylandii	B2	Approx 17

Indirect Impacts

3.4 Cognisance must also be given to indirect impacts - in particular care must be taken to ensure the proposed development and ancillary works do not represent an unacceptable conflict with the calculated 'Root Protection Area' of the existing trees proposed for retention.

Disturbance of 'Root Protection Area' may just as readily kill or destabilise a tree over time, by means of root damage/severance and or earth compaction/covering preventing essential transfer of water, air and nutrients to roots.

A significant portion of the proposed greenway proposes the use of a specialist non-dig construction method, (as detailed on the tree protection drawing Dwg 21537_T_103), as an alternative to traditional path construction method which allows the route to traverse portions of tree root protection areas without compromising the trees long term viability.

Good planning and site management therefore will be required during construction works to ensure these areas are not adversely impacted by construction activities. It is important that the site manager carefully review the tree protection drawing Dwg 21537_T_103, prior to commencement of works on site and raise any queries prior to commencement of works.

The use of tree protection fencing to exclude construction access to root protection areas of trees and hedgerows identified for retention, as illustrated in tree protection drawing Dwg 21537_T_103, will be critical to avoiding detrimental impacts and the long-term viability of the retained tree.

Proposed tree protection measures should be in place from the outset prior to the commencement of works. Any queries should be raised with the project Arborist prior to commencement of works on site.

Provided proper tree protection measures are adhered to it is not anticipated that any further trees will require removal due to indirect impact**s.**

Additional Considerations

3.5 Scrub and tree removal should take place outside the bird nesting season (1st March – 31st August).

'Ash dieback' is a disease caused by the *Hymenoscyphus fraxineus* fungi which is developing rapidly across Ireland since its presence was first detected in Ireland in 2012. The disease is spread by windborne spores and once a tree is infected it will lead to its terminal decline within a few years.

At present there is no available remedy and the outlook for the survival of Ash trees in Ireland is poor, with infection rates appearing to accelerate over the past couple of years. It is hoped that genetic diversity may mean some trees might prove resistant to the disease, however there is still great uncertainty at this time regarding survival rates. The Woodland Trust estimate that at least 80% of Ash trees in the UK will die.

The retention or removal of Ash trees must therefore be viewed in the context of Ash Dieback disease, and the likelihood that at least 80% of Ash trees are likely to die over the coming years.

New tree planting. The proposed development offers an opportunity for new tree planting which will assist in mitigating against proposed losses. It is suggested that a mix of species be planted using native and high ecological value non-native trees to mitigate against loss of existing trees and their associated ecological value.

Summary

3.6 Table 1 illustrates trees to be removed and their classification.

Table 1.

Tree Class	**Trees proposed for removal**
A Class Trees (High Quality)	0
B Class Trees (Moderate Quality)	82
C Class Trees (Low Quality)	2
U Class Trees (Recommended Removal)	1
TOTAL	**85**

Tree Protection

3.7 Adequate protection and so successful retention of those trees to be retained within the land take area, will be achieved by rigidly excluding all construction activities from tree root protection areas by fit for purpose barriers/fencing and/or additional ground protection.

3.8 Tree Protection Areas (TPAs) are proposed, as indicated on accompanying Tree Protection Plan (Dwg No 23375_T_103). Protective fence line locations and details for these fences are also illustrated on the plan.

Services

3.9 Any services that are planned as part of this project must also avoid designated ‘Root Protection Area’ of tree / tree groups for retention.

4. RECOMMENDATIONS – Arboricultural Method Statement

Recommendations for the specific measures advised regarding management of the trees in relation to this development are detailed within Appendix 1, (note some recommendations may be superseded by tree removal in some instances - if planning is granted). These recommendations should inform, and be referred to in, the method statements submitted for approval prior to commencement by the responsible building/engineering and landscape contractors whose works (subject to grant of permission) will affect retained trees and the Tree Protection Areas.

1. *Tree Works*.

Subject to the required permissions removal / felling works as specified on Dwg No 21537_T_102, should be performed prior to project commencement, by reputable contractors in accordance with BS 3998:2010 and current best practice. (Removal of scrub vegetation and ivy clearance should preferably be performed in winter outside of the bird nesting season. Tree felling should be preceded by a competent assessment as to the presence of any protected wildlife species, where required specialist advice should be sought if necessary).

2. *Protective Fencing.*

Protective fencing (barriers) should be erected in the positions and alignments as indicated on the Tree Protection Plan (Dwg No 21537_T_102).

Fencing should be in accordance with BS 5837:2012 unless otherwise agreed with the planning authority. Commencement of development should not be permitted without adequate protective fencing being in place. This fencing, enclosing the minimum tree protection areas indicated, must be installed prior to any plant, vehicle or machinery access on site. Fencing should be signed 'Tree Protection Area – No Construction Access'. Fencing is not to be taken down or re-positioned without written approval of the project Arborist. No excavation, plant or vehicle movement, materials handling or soil storage is to be permitted within the fenced tree protection areas indicated on plan.

4. *Non dig path construction*

The proposed development includes a section of footpath and cycleway which traverses root protection areas of trees proposed for retention. In order to achieve these without compromising the trees, a non-dig construction method such as Cellweb TRP, (installed in full accordance with manufacturers specifications), must be used in conjunction with a permeable asphalt surface finish, (refer to Dwg No 21537_T_103 for details).

5. *Landscape Works*

Proposed landscaping works including new planting, shall be performed in accordance with BS 5837:2012. During these works, the ground around retained trees must not compacted by vehicles, nor be mechanically excavated for planting, nor be significantly altered in terms of ground levels.

6. *Monitoring & Compliance*

As there are a number of critical tree protection works required in order to ensure the successful retention of many of the existing trees. It is therefore recommended that a professionally qualified Arborist be consulted on an ongoing basis as required by the principal contractor or developer during the construction phase to monitor compliance and advise as issues arise.

It is advised that tree protection fencing, any required special engineering and supervision works etc must be included / itemised in the main contractor tender document, including responsibility for the installation, costs and maintenance of tree protection measures throughout all construction phases.

Copies of the Tree Survey and all accompanying drawings, a copy of BS 5837:2012 and NJUG 4 (2007)*'Guidelines for the planning, installation and maintenance of utility apparatus in proximity to trees'* should all be kept available on site by the contractor during development. All works are to be in accordance with these documents.

Limitations and Scope of this Survey Report

This report covers only those trees individually inspected, (shown on the 'Tree Survey Drawings' and described in the 'Schedule'), reflecting the condition of those trees at the time of inspection. Inspection is limited to visual examination of the subject trees from the ground without; test boring, use of tomographic equipment, dissection, probing, coring, ivy removal or excavation to establish structural integrity.

The trees were not climbed and dimensions are approximate, but considered a reasonable reflection of the trees measurements. A number of trees were visually obscured by heavy ivy / epicormic growth / scrub vegetation, which could potentially hide from view existing faults or weaknesses, as such they would benefit from re-inspection upon removal of such growth. This survey can only therefore be regarded as a preliminary assessment.

There is no warranty or guarantee, expressed or implied, that problems or deficiencies of the subject trees may not arise in the future. The currency of this survey report and its recommendations is one year.

The accompanying drawings are illustrative and based on the land (topographical) survey information supplied; CSR Ltd accept no legal liability or responsibility for any errors in the information contained in the supplied drawings.

CSR Ltd accept no responsibility for the performance of trees subject to pruning or other site works (including construction activities) not performed in strict accordance with recommendations as specified in this report and/or in accordance with BS 3998:2010 and BS 5837:2012

All retained trees mentioned in this report should be subject to expert re-inspection within 12 months and prior to completion of development works and public occupancy of the site.

This report was produced as a part of a planning application for the scheme; the author accepts no responsibility or liability for actions taken by reason of this report by the client or their agents unless subsequent contractual arrangements are agreed. Public disclosure or submission of any part of this report without title, or permission from the author, renders this report invalid and legally inadmissible.

References/Bibliography

BS 5837 (2012). *Trees in Relation to Design, Demolition and Construction - Recommendations*. British Standards Institution. TSO, London.

BS 3998 (2010) *Tree Work - Recommendations*. British Standards Institution. TSO, London.

NJUG 4 (2007) *Guidelines for the Planning, Installation and Maintenance of Utility Apparatus in Proximity to Trees (Issue 2).* National Joint Utilities Group

TREE SURVEY KEY

Information in the attached schedule is given under the following headings:

Tree No.

Individual trees have been numbered and tagged on site with corresponding survey tag or treated as a group where appropriate (e.g. Woodlands/hedgerows) and illustrated on accompanying tree survey drawing.

Species

Common & Latin names of species are provided

Height

Overall estimated height given in meters (measured using Truplus 200 Laser Rangefinder).

Stem Diameter

The diameter of the main trunk taken at a height of 1.5m on a single stem tree, or, on each branch of multi-stemmed (MS) trees.

Crown Spread

The largest radius of branch spread is provided in meters for North / East / South and West directions.

Height of lowest branch

The distance between ground level and first significant branch or canopy (and direction of growth) given in meters (m).

Any measurement or dimension that has been estimated (for offsite or otherwise inaccessible trees where accurate data cannot be recovered) is identified by the suffix #.

Life stage

The tree's age is defined as:

Y = Young, in first third of life (tree which has been planted in the last 10 years or is less than 1/3 the expected height of the species in question).

MA = Middle Age, in second third of life (tree, which is between a 1/3 and 2/3's the expected height of the species in question).

M = Mature, in final third of life (tree that has reached the expected height of the species in question, but still increasing in size).

OM = Over mature (tree at the end of its life cycle and the crown is starting to break up and decrease in size).

V = Veteran Tree (exceptionally old tree).

Physiological Condition

The tree's physiological condition is defined as:

Good -Good vitality: normal bud growth, leaf size, crown density and wound closure

Fair - Average to below average vitality: reduced bud growth, smaller leaf size, lower crown density and reduced wound closure

Poor - Low vitality: limited bud growth, small chlorotic leaves, sparse crown, poor wound closure

Dead - No longer living.

Structural Condition

The trees structural condition is defined as:

Good - No major structural defects observed (possibly some minor defects)

Fair - Minor defects present, (such as bark wounds, isolated decay pockets or structure affected due to overcrowding), that could be alleviated by tree surgery/management

Poor - Major structural defects present such as extensive deadwood, decay or defective to the point of being dangerous. (Significant defects are noted e.g. decay, collapsing etc).

Preliminary Management Recommendations & Timescale

Recommendations actions based on limitations of survey – (may include further investigation and or assessment of suspected defects by means and or methods not undertaken / within the remit of this survey).

Estimated Remaining contribution (Years)

Life of the tree is given as;

10 < less than 10 years remaining
10 + in excess of 10 years remaining
20 + in excess of 20 years remaining
40 + in excess of 40 years remaining

Tree Quality Assessment Category

U Those in such a condition that they cannot realistically be retained as living trees in the context of the current land use for longer than 10 years.

• Trees that have a serious, irremediable, structural defect, such that their early loss is expected due to collapse, including those that will become unviable after removal

of other category U trees (e.g. where, for whatever reason, the loss of companion shelter cannot be mitigated by pruning)

• Trees that are dead or are showing signs of significant, immediate, and irreversible overall decline

• Trees infected with pathogens of significance to the health and/or safety of other trees nearby, or very low quality trees suppressing adjacent trees of better quality

(NOTE: Category U trees can have existing or potential conservation value which it might be desirable to preserve).

A High quality

Trees of high quality with an estimated remaining life expectancy of at least 40 years

A1 Trees that are particularly good examples of their species, especially if rare or unusual; or those that are essential components of groups or formal or semi-formal arboricultural features (e.g. the dominant and/or principal trees within an avenue)

A2 Trees, groups or woodlands of particular visual importance as arboricultural and/or landscape features

A3 Trees, groups or woodlands of significant conservation, historical, commemorative or other value (e.g. veteran trees or wood-pasture)

B Moderate quality

Those trees of moderate quality with an estimated remaining life expectancy of at least 20 years.

B1 Trees that might be included in category A, but are downgraded because of impaired condition (e.g. presence of significant though remediable defects, including unsympathetic past management and storm damage), such that they are unlikely to be suitable for retention for beyond 40 years; or trees lacking the special quality necessary to merit the category A designation.

B2 Trees present in numbers, usually growing as groups or woodlands, such that they attract a higher collective rating than they might as individuals; or trees occurring as collectives but situated so as to make little visual contribution to the wider locality.

B3 Trees with material conservation or other cultural value

C Low quality

Trees of low quality with an estimated remaining life expectancy of at least 10 years, or young trees with a stem diameter below 150 mm.

C1 Unremarkable trees of very limited merit or such impaired condition that they do not qualify in higher categories.

C2 Trees present in groups or woodlands, but without this conferring on them significantly greater collective landscape value; and/or trees offering low or only temporary/transient landscape benefits.

C3 Trees with no material conservation or other cultural value.

APPENDIX 1

No	Species	Height (m)	Crown Spread (m) N/S/E/W	Diameter (mm)@ 1.5m	RPA circle radius (m)	Lowest branch (m) & direction of growth	Life Stage	Estimated remaining years	Physiological Condition	Structural Condition	Preliminary management recommendations	Category of retention + sub-category	Notes
1	Fraxinus excelsior	15	4/4/4/4	300x5	8.04	0m all	MA	40+	Good	Fair		B1	
2	Fraxinus excelsior	15	5/5/5/5	300x6	8.81	0m all	MA	40+	Good	Fair		B1	
3	Quercus robur	14	5/4/3/3	750	9.00	2m all	MA	40+	Good	Fair	Remove Ivy	A1	
4	Quercus robur	13	4/3/3/3	750	9.00	2m all	MA	40+	Good	Fair	Remove Ivy	A1	
5	Quercus robur	16	5/5/5/5	1200	14.40	4m all	MA	40+	Good	Fair	Remove Ivy & Crown Clean	A1	
6	Fraxinus excelsior	16	5/5/6/6	1000	12.00	4m all	MA	40+	Good	Fair	Remove Ivy & Crown Clean	B1	
7	Fraxinus excelsior	17	4/4/4/4	900	10.80	3m all	MA	40+	Good	Fair	Remove Ivy & Crown Clean	B1	
8	Fraxinus excelsior	11	4/4/4/4	250x3	5.20	1m all	MA	40+	Fair	Fair	Remove Ivy	B2	Ash dieback
9	Fraxinus excelsior	12	4/4/4/4	250x3	5.20	0m all	MA	40+	Fair	Fair	Remove Ivy	B2	
10	Fraxinus excelsior	11	3/3/4/4	250x4	6.00	0m all	MA	40+	Good	Fair	Remove Ivy	B2	
11	Fraxinus excelsior	12	3/3/3/3	350x2	5.94	0m all	MA	40+	Good	Fair	Remove Ivy	B1	
12	Fraxinus excelsior	10	3/3/3/3	220	2.64	3m s	Y	40+	Good	Good		B2	
13	Fraxinus excelsior	9	2/2/2/2	200	2.40	5m all	Y	40+	Good	Good		B2	
14	Populus nigra	6	1/1/1/1	80	0.96	2m all	Y	40+	Good	Good		C1	
15	Quercus robur	4	1/1/1/1	50	0.60	1m all	Y	40+	Good	Good		C1	
16	Fagus sylvatica	17	6/6/6/6	1250	15.00	3m all	M	40+	Good	Fair		A1	
17	Fagus sylvatica	15	5/5/5/5	950	11.40	4m all	M	40+	Good	Fair		A1	occluded wound
18	Fagus sylvatica	22	6/6/6/6	1200	14.40	4m all	M	40+	Good	Fair		A1	
19	Fagus sylvatica	20	6/5/5/5	1000	12.00	3m all	M	40+	Good	Fair	Remove Ivy	A1	
20	Fagus sylvatica	17	6/5/4/4	980	11.76	3m all	M	40+	Good	Fair	Remove Ivy	A1	
21	Fagus sylvatica	20	3/6/4/4	950	11.40	4m all	M	40+	Good	Fair	Remove Ivy	A1	
22	Fagus sylvatica	22	5/6/5/5	1100	13.20	4m all	M	40+	Good	Fair	Remove Ivy	A1	
23	Fagus sylvatica	16	5/6/5/5	980	11.76	4m all	M	10+	Good	Poor	Monolith	B1	cavity / split bole
24	Fagus sylvatica	18	6/4/5/5	970	11.64	5m all	M	40+	Good	Fair		A1	
25	Fagus sylvatica	15	5/8/5/5	1010	12.12	2m s	M	10+	Fair	Poor	Monolith	B1	decay cavity x2
26	Fagus sylvatica	17	7/0/5/5	950	11.40	6m all	MA	40+	Good	Fair	Remove Ivy	A1	
27	Fagus sylvatica	14	6/3/4/4	680	8.16	4m all	MA	40+	Good	Fair	Remove Ivy	A1	
28	Fagus sylvatica	18	7/2/5/5	720	8.64	5 n	MA	40+	Good	Fair	Remove Ivy	A1	
29	Fagus sylvatica	10	3/3/3/3	850	10.20	5m all	MA	20+	Good	Poor	Remove ivy	B1	monolith (cavity)
30	Fagus sylvatica	15	4/5/5/5	1000	12.00	6m all	MA	40+	Good	Fair	Remove Ivy	A1	heavily obscured
31	Fagus sylvatica	15	5/5/5/5	1100	13.20	4m all	M	40+	Good	Fair	Remove Ivy	A1	heavily obscured
32	Fagus sylvatica	15	5/5/5/5	1250	15.00	3m all	M	40+	Good	Fair	Remove Ivy	A1	
33	Quercus robur	9	3/3/3/3	350	4.20	1m w	Y	40+	Good	Fair		B1	
34	Fagus sylvatica	14	6/6/6/6	600	7.20	1m all	MA	40+	Good	Fair	Remove Ivy	A1	
35	Castanea sativa	11	5/5/4/4	900	10.80	4m n	M	20+	Good	Fair	Remove Ivy	B1	heavily obscured
36	Castanea sativa	8	4/4/6/6	900	10.80	0m all	M	20+	Good	Fair		B1	fallen tree
37	Castanea sativa	13	4/8/3/3	1400	15.00	1m s	V	20+	Fair	Fair	Remove Ivy	A1	
38	Fagus sylvatica	15	5/5/5/5	620	7.44	3m all	MA	40+	Good	Good	Remove Ivy	A1	
39	Fagus sylvatica	16	7/7/7/7	850	10.20	4m all	MA	40+	Good	Fair	Remove Ivy	A1	cavity
40	Fagus sylvatica	17	7/7/7/7	600	7.20	3m e/w	MA	40+	Good	Good		A1	

No	Species	Height (m)	Crown Spread (m) N/S/E/W	Dia' (mm)@ 1.5m	RPA circle radius (m)	Lowest branch (m) & direction of growth	Life Stage	Estimated remaining. years	Physiological Condition	Structural Condition	Preliminary management recommendations	Category of retention + sub-category	Notes
41	Fagus sylvatica	19	9/6/7/7	1300	15.00	8m all	OM	20+	Good	Poor		B1	cavity (fall to river)
42	Fagus sylvatica	19	5/8/5/5	660	7.92	4m all	MA	40+	Good	Fair		A1	
43	Fagus sylvatica	19	8/7/8/8	1280	15.00	5m all	M	40+	Good	Fair		A1	
44	Fagus sylvatica	18	8/5/5/5	1100	13.20	4m n	M	40+	Good	Fair		A1	
44a	Aesculus hippocastanum	15	7/2/4/4	650	7.80	3m all	MA	40+	Good	Fair		A1	
44b	Fagus sylvatica	18	7/7/7/7	980	11.76	4m e	M	40+	Good	Fair		A1	
45	Acer pseudoplatanus	13	4/6/5/2	700	8.40	2m e	MA	40+	Good	Fair		B1	
46	Fraxinus excelsior	16	6/6/6/6	700/400	9.67	1m n	MA	40+	Good	Fair		A1	
47	Quercus robur	17	9/9/9/9	800/700/ 500/400	14.88	0m all	M	40+	Good	Good		A1	exceptional
48	Acer pseudoplatanus	15	5/5/5/5	750	9.00	6m all	MA	40+	Good	Fair		B1	
49	Acer pseudoplatanus	15	5/5/5/5	750	9.00	8m all	MA	40+	Good	Fair		B1	
50	Fraxinus excelsior	16	5/5/5/5	900	10.80	3m all	MA	10<	Poor	Fair		C1	severe dieback
51	Acer pseudoplatanus	12	4/4/4/4	550	6.60	4m all	MA	40+	Good	Fair		B1	
52	Fraxinus excelsior	10	7/1/3/3	700	8.40	4m all	MA	40+	Fair	Fair		B1	overhangs path
53	Salix alba	19	7/6/5/5	1250	15.00	3m n/s	M	40+	Good	Fair		A1	
54					0.00				Dead			C1	
55	Ulmus sp.	18	5/5/5/5	900	10.80	8m all	MA	40+	Good	Fair		A1	
56	Ulmus sp.	18	5/3/3/0	1000	12.00	8m all	MA	40+	Good	Fair		A1	
57	Pinus sylvestris	18	5/5/5/5	750	9.00	4m all	MA	40+	Good	Fair		A1	
58	Fagus sylvatica	18	5/5/5/5	700	8.40	3m all	MA	40+	Good	Fair		A1	
59	Populus alba	20	6/6/6/6	860	10.32	8m all	M	40+	Good	Fair		A1	
60	Populus alba	20	7/7/7/7	870	10.44	7m all	M	40+	Good	Fair		A1	
61					0.00				Dead				
62	Aesculus hippocastanum	12	1/7/7/1	1000	12.00	0m all	OM	10+	Fair	Fair		B2	fallen tree regrowth
63	Salix alba	14	5/7/6/6	500x3	10.39	0m all	M	20+	Good	Fair		B2	fallen tree regrowth
64	Salix alba	14	5/7/6/6	500x3	10.39	0m all	M	20+	Good	Fair		B2	fallen tree regrowth
65	Alnus glutinosa	8	3/3/3/3	300x5	8.04	0m all	Y	40+	Good	Fair		B2	
66	Quercus robur	6	3/3/3/3	375	4.50	0m all	Y	40+	Good	Fair		B2	
67	Quercus robur	9	5/5/5/5	480	5.76	1m all	MA	40+	Good	Good		B1	
68	Crataegus monogyna	8	4/4/4/4	350x2	5.93	1m all	M	20+	Good	Good	Remove Ivy	B1	
69	Crataegus monogyna	5	2/0/2/2	180	2.16	3m all	MA	20+	Fair	Fair	Remove Ivy	C1	
70	Fraxinus excelsior	9	4/4/4/4	450x2	7.63	1m all	MA	10<	Poor	Fair	Fell	C1	Ash dieback
71	Fraxinus excelsior	10	2/4/4/6	200x3	4.15	1m all	MA	40+	Good	Fair	Remove Ivy & Crown Clean	B1	
72	Alnus glutinosa	13	2/3/3/3	375x2	4.50	1m n/s	MA	40+	Good	Fair	Remove Ivy & Crown Clean	B1	
73	Fraxinus excelsior	18	6/6/6/6	450x4	10.08	1m all	MA	40+	Good	Fair	Remove Ivy & Crown Clean	A1	
74	Fraxinus excelsior	20	7/7/7/7	480x4	11.52	1m all	MA	40+	Good	Fair	Remove Ivy & Crown Clean	A1	
75	Quercus robur	18	8/8/8/8	1250	15.00	6m all	M	40+	Good	Fair	Remove Ivy & Crown Clean	A1	exceptional
76	Aesculus hippocastanum	16	7/7/7/7	700	8.40	6m all	M	40+	Good	Fair	Remove Ivy & Crown Clean	A1	v good

Tag	Species	Height (m)	Crown Spread (m) N/S/E/W	Girth (mm)@ 1.5m	RPA circle radius (m)	Lowest branch (m) & direction of growth	Life stage	Estimated remaining contribution (years)	Physiological Condition	Structural Condition	Preliminary management recommendations	Category of retention + sub-category	Notes
835	Salix alba		5/5/5/5	1250	15.00	0m all		20+	Fair	Fair		B1	branch split
836	Fagus sylvatica	28	5/4/5/5	850	10.20	8m nw		40+	Good	Fair	Crown Clean	A1	dead branch
837	Fraxinus exclesior	9	3/1/2/2	190	2.28	4m all		10<	Poor	Fair		C1	ash dieback
838	Fagus sylvatica	28	6/6/6/6	980	11.76	3m s		40+	Good	Fair	Crown Clean	A1	compression fork investigate
839	Fraxinus exclesior	9	1/2/2/2	180	2.16	3m all		10<	Fair	Poor		C1	Ash dieback
840	Fraxinus exclesior	9	1/2/2/2	170	2.04	3m all		10<	Fair	Poor		C1	Ash dieback
841	Acer pseudoplatanus	10	3/3/3/4	400	4.80	4m e/w		40+	Good	Fair		B1	
842	Acer pseudoplatanus	10	3/3/3/3	450	5.40	3m all		40+	Good	Fair		B1	
843	Acer pseudoplatanus	10	4/4/4/4	460	5.52	3m all		40+	Good	Fair		B1	
844	Fraxinus exclesior	10	2/2/2/2	230	2.76	4m all		10<	Fair	Poor		C1	
845	Acer pseudoplatanus	10	3/0/1/3	350	4.20	4m all		10<	Fair	Poor		C1	
846	Acer pseudoplatanus	9	2/2/2/3	330	3.96	4m all		40+	Good	Fair		B1	
847	Acer pseudoplatanus	10	4/4/4/4	420	5.04	4m all		40+	Good	Fair		B1	
848	Acer pseudoplatanus	10	4/4/4/4	400	4.80	4m all		40+	Good	Fair		B1	
849	Acer pseudoplatanus	9	4/3/4/4	400	4.80	3m all		40+	Good	Fair		B1	
850	Acer pseudoplatanus	6	3/3/3/3	340	4.08	2m n/s		40+	Good	Fair		B1	
851	Acer pseudoplatanus	10	4/4/4/5	420	5.04	3m all		40+	Good	Fair		B1	
852	Acer pseudoplatanus	10	4/3/4/4	450	5.40	4m all		40+	Good	Fair		B1	
853	Acer pseudoplatanus	11	3/3/0/5	400	4.80	3m e/w		40+	Good	Fair		B1	
853a	Acer pseudoplatanus	12	4/4/4/4	400x2	6.78	2m e/w		40+	Good	Fair		B1	in field
854	Acer pseudoplatanus	8	2/2/2/2	390	4.68	3m all		40+	Good	Fair		B1	
855	Acer pseudoplatanus	8	2/2/2/4	530	6.36	3m all		40+	Good	Fair		B1	
856	Acer pseudoplatanus	8	3/3/3/3	320	3.84	4m all		40+	Good	Fair		B1	
857	Quercus robur	12	3/6/3/5	480	5.76	2m all		40+	Good	Fair	Remove Ivy & Crown Clean	A1	
858	Fraxinus exclesior	13	3/5/5/5	610	7.32	2m all		10<	Poor	Fair		C1	Ash dieback
859	Quercus robur	11	5/5/5/5	800	9.60	1m all		40+	Good	Fair	Remove Ivy & Crown Clean	A1	
860	Quercus robur	9	3/4/4/4	360	4.32	3m all		40+	Good	Good		B1	
861	Tilia cordata	8	3/3/3/3	390	4.68	3m all		40+	Good	Good		B1	
862	Tilia cordata	8	3/3/3/3	390	4.68	3m all		40+	Good	Good		B1	
863	Tilia cordata	8	3/3/3/3	390	4.68	3m all		40+	Good	Good		B1	
864	Tilia cordata	8	3/3/3/3	390	4.68	3m all		40+	Good	Good		B1	
865	Tilia cordata	8	3/3/3/3	390	4.68	3m all		40+	Good	Good		B1	
866	Tilia cordata	8	3/3/3/3	390	4.68	3m all		40+	Good	Good		B1	
867	Tilia cordata	8	3/3/3/3	390	4.68	3m all		40+	Good	Good		B1	
868	Salix alba	16	4/4/4/4	620	7.44	3m e/w		20+	Good	Good		B1	
869	Tilia euclora	8	3/3/3/3	390	4.68	3m all		40+	Good	Good		B1	
870	Tilia cordata	8	3/3/3/3	390	4.68	3m all		40+	Good	Good		B1	
871	Tilia cordata	8	3/3/3/3	390	4.68	3m all		40+	Good	Good		B1	
872	Acer platanoides	9	4/4/4/4	390	4.68	2m all		40+	Good	Good		B1	

Tag	Species	Height (m)	Crown Spread (m) N/S/E/W	Girth (mm)@ 1.5m	RPA circle radius (m)	Lowest branch (m) & direction of growth	Life Stage	Estimated remaining contribution (years)	Physiological Condition	Structural Condition	Preliminary management recommendations	Category of retention + sub-category	Notes
873	Acer platanoides	8	4/4/4/4	360	4.32	2m all	MA	40+	Good	Good		B1	
874	Acer platanoides	8	4/4/4/4	470	5.64	2m all	MA	40+	Good	Good		B1	
875	Acer platanoides	7	4/4/4/4	370	4.44	2m all	MA	40+	Good	Good		B1	
876	Tilia cordata	7	3/3/3/3	340	4.08	2m all	Y	40+	Good	Good		B1	
877	Betula pendula	6	4/4/4/4	180x7	5.72	0m all	MA	40+	Good	Good		B1	
878	Quercus robur	5	3/3/3/3	180x2	3.05	0m all	Y	40+	Good	Fair		B1	prune compression bole
879	Fraxinus exclesior	7	2/2/2/2	200	2.40	2m all	Y	10<	Poor	Fair		C1	ash dieback
880	Aesculus hippocastanum	5	2/2/2/2	220	2.64	2m all	Y	40+	Good	Good		B1	
881	Quercus robur	7	3/3/3/3	290	3.48	2m all	Y	40+	Good	Good		B1	
882	Fraxinus exclesior	8	4/4/4/4	420	5.04	2m all	MA	10<	Fair	Fair		C1	Ash dieback
883	Quercus robur	7	3/3/3/3	250	3.00	0m all	Y	40+	Good	Good		B1	crown raise
884	Quercus robur	8	4/4/4/4	350	4.20	2m all	Y	40+	Good	Good		B1	
885	Fraxinus exclesior	7	3/3/3/3	350	4.20	2m all	MA	10<	Poor	Fair		C1	Ash dieback
886	Aesculus hippocastanum	6	3/3/3/3	340	4.08	2m all	Y	40+	Good	Good		B1	
887	Quercus robur	17	6/6/6/6	900	10.80	4m all	MA	40+	Good	Fair	Remove Ivy	A1	
888	Fraxinus exclesior	15	3/6/3/3	500	6.00	6m all	MA	40+	Poor	Poor	Fell	U	basal cavity / ash dieback
TG1	Willow						Y	40+	Good	Fair		C2	
TG2	Mixed broadleaf						MA	40+	Good	Fair		B2	
TG3	Mixed broadleaf						MA	40+	Good	Fair		B2	
TG4	Mixed broadleaf						MA	40+	Good	Fair		B2	
TG5	Willow						Y	40+	Good	Fair		B2	
TG6	Alder / Willow / Mixed Broadleaf						MA	40+	Good	Fair		B2	
TG7	Alder / Willow / Mixed Broadleaf						MA	40+	Good	Fair		B2	
TG8	Willow						MA	40+	Good	Fair		B2	
TG9	Mixed broadleaf						MA	40+	Good	Fair		A2	
TG10	Willow / Mixed broadleaf						MA	40+	Good	Fair		B2	
TG11	Willow						Y	40+	Good	Fair		B2	
TG12	Willow						Y	40+	Good	Fair		B2	
TG13	Willow						Y	40+	Good	Fair		B2	
TG14	Willow						Y	40+	Good	Fair		B2	
TG15	Willow						Y	40+	Good	Fair		B2	
TG16	Willow						Y	40+	Good	Fair		B2	
TG17	Willow						Y	40+	Good	Fair		B2	
TG18	Willow						Y	40+	Good	Fair		B2	
TG19	Willow						Y	40+	Good	Fair		B2	
TG20	Willow						Y	40+	Good	Fair		B2	
TG21	Alder / Willow / Mixed Broadleaf						MA	40+	Good	Fair		B2	
TG22	Mixed broadleaf						MA	40+	Good	Fair		B2	
TG23	Mixed broadleaf						MA	40+	Good	Fair		B2	
TG24	Mixed broadleaf						MA	20+	Good	Fair		B2	

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- CALCULATED ROOT PROTECTION AREA (RPA)

NOTE:

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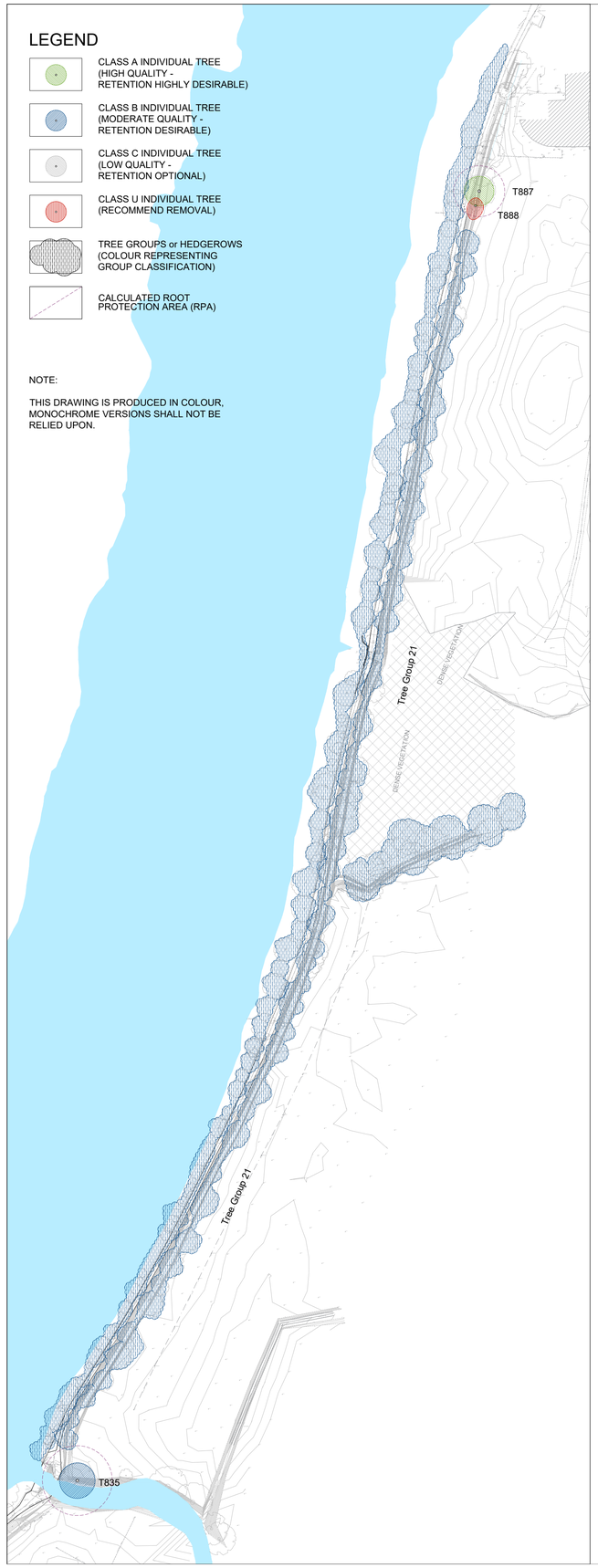

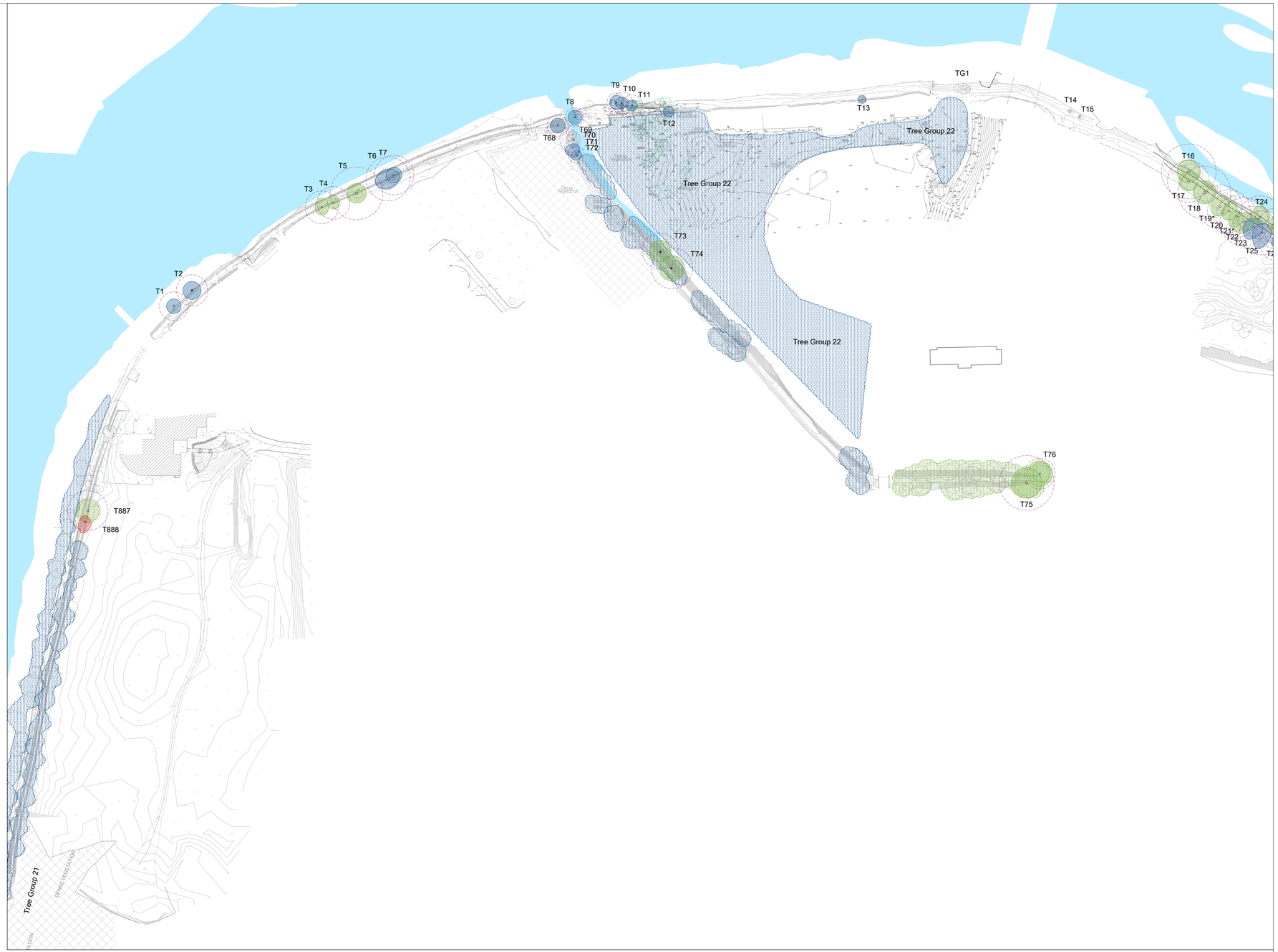

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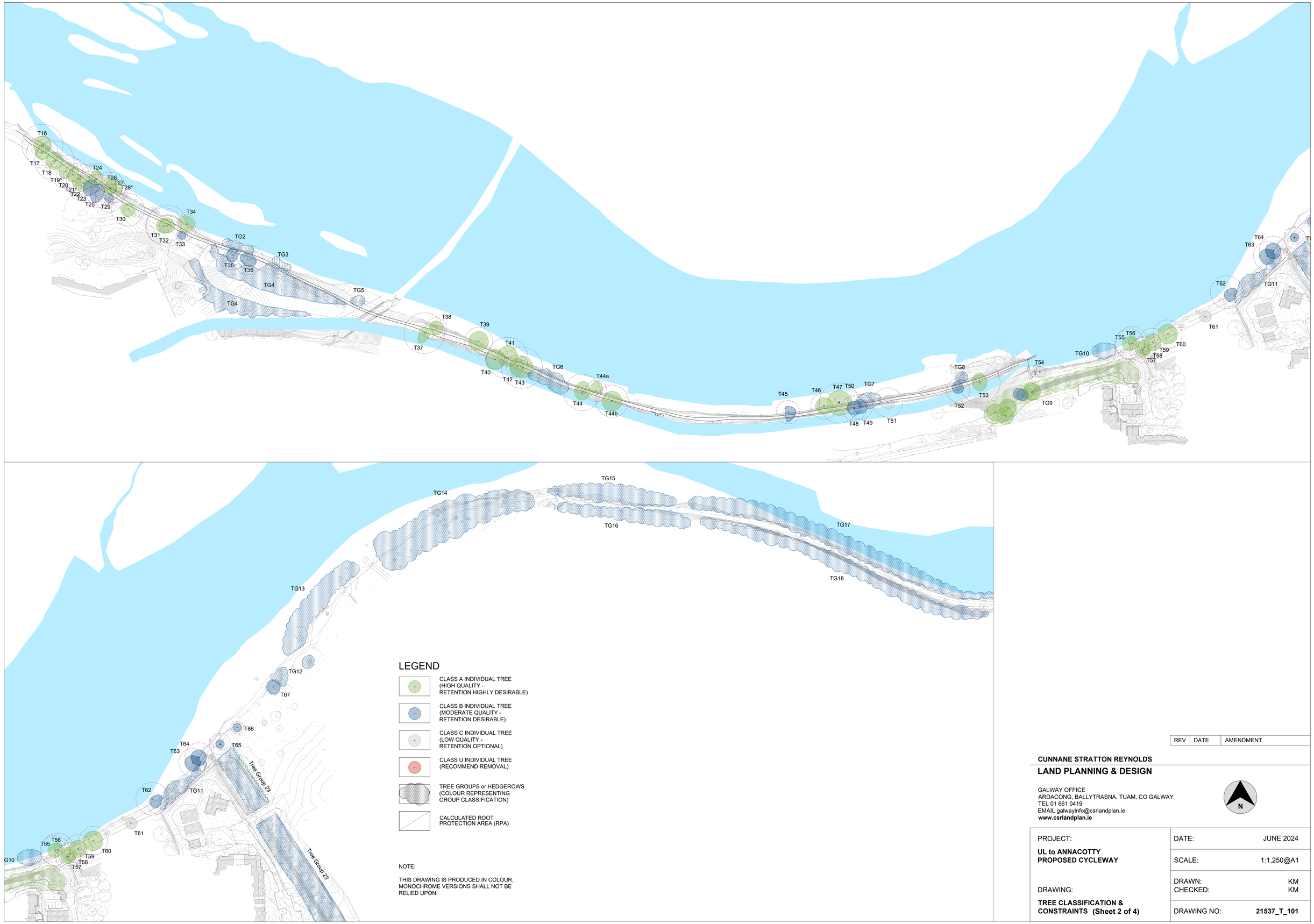
PROJECT: **UL to ANNACOTTY PROPOSED CYCLEWAY**	DATE: JUNE 2024
	SCALE: 1:1,250@A1
DRAWING: **TREE CLASSIFICATION & CONSTRAINTS (Sheet 1 of 4)**	DRAWN: KM CHECKED: KM
	DRAWING NO: **21537_T_101**



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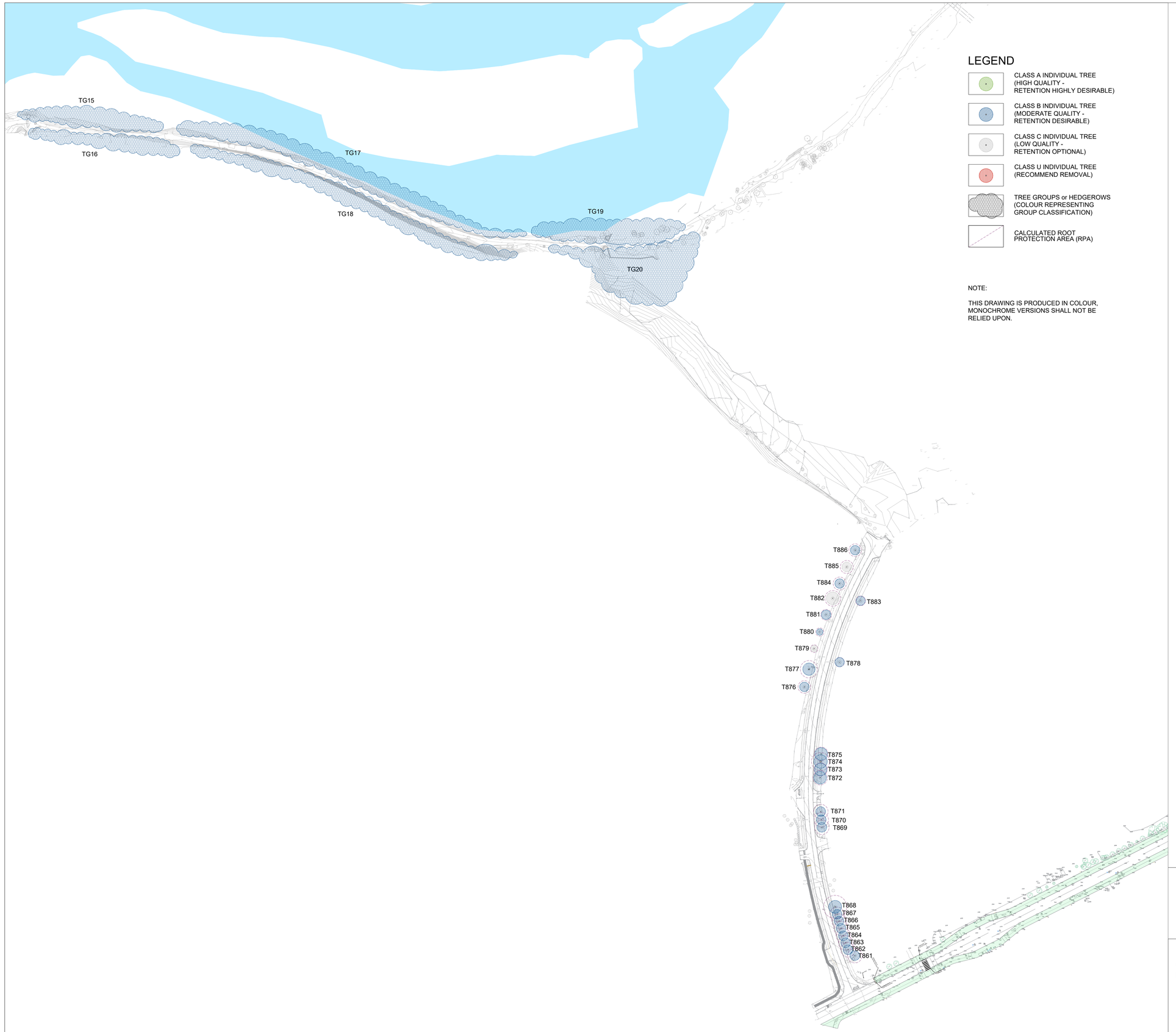

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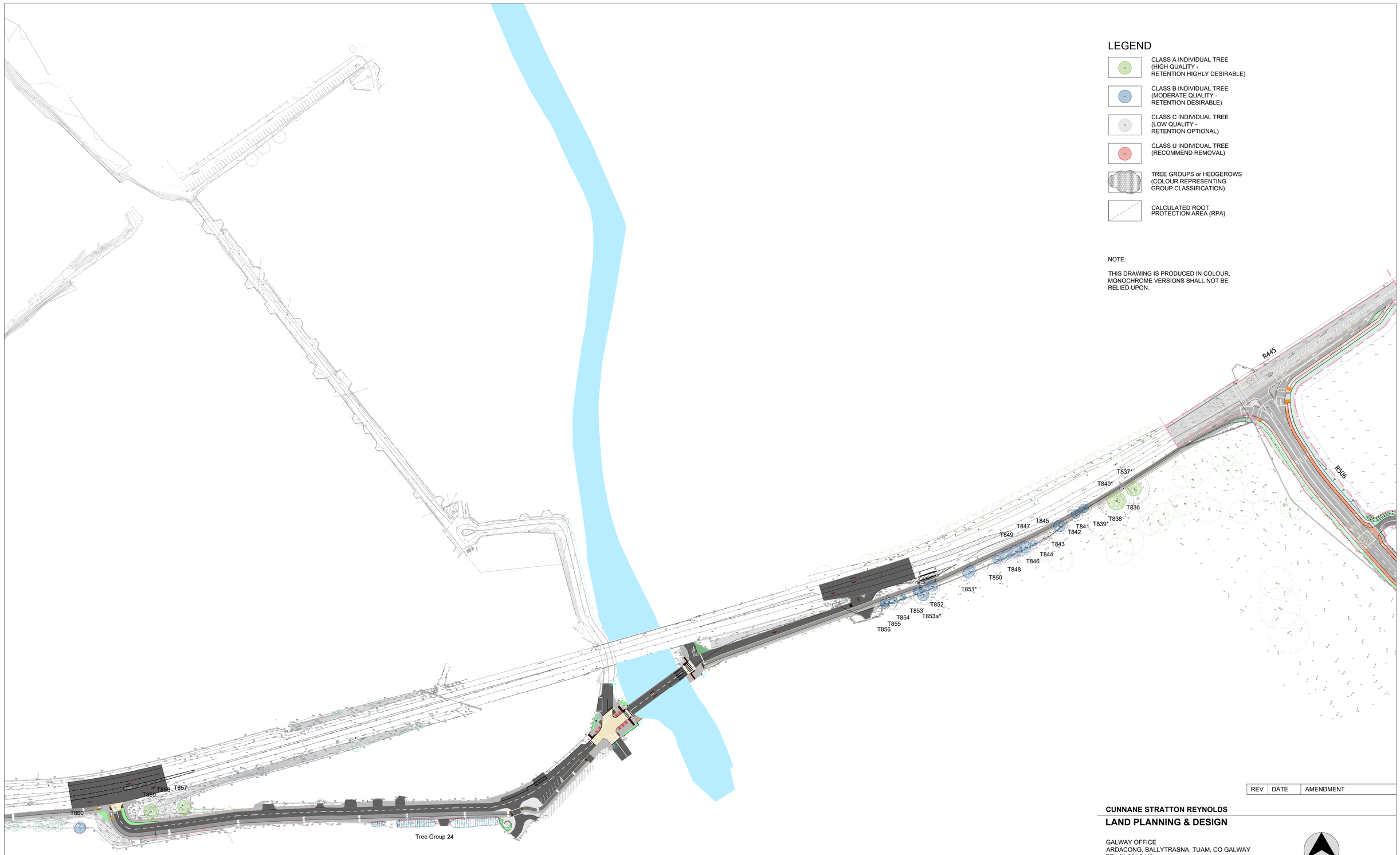

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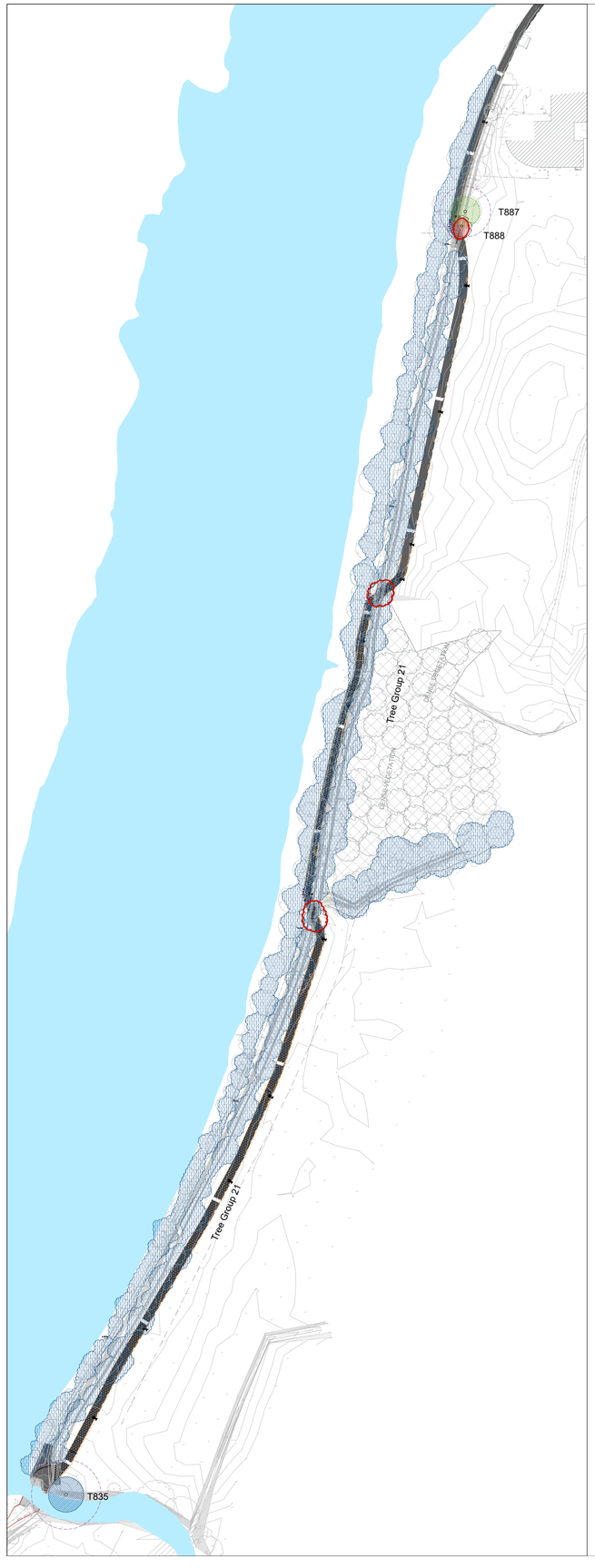

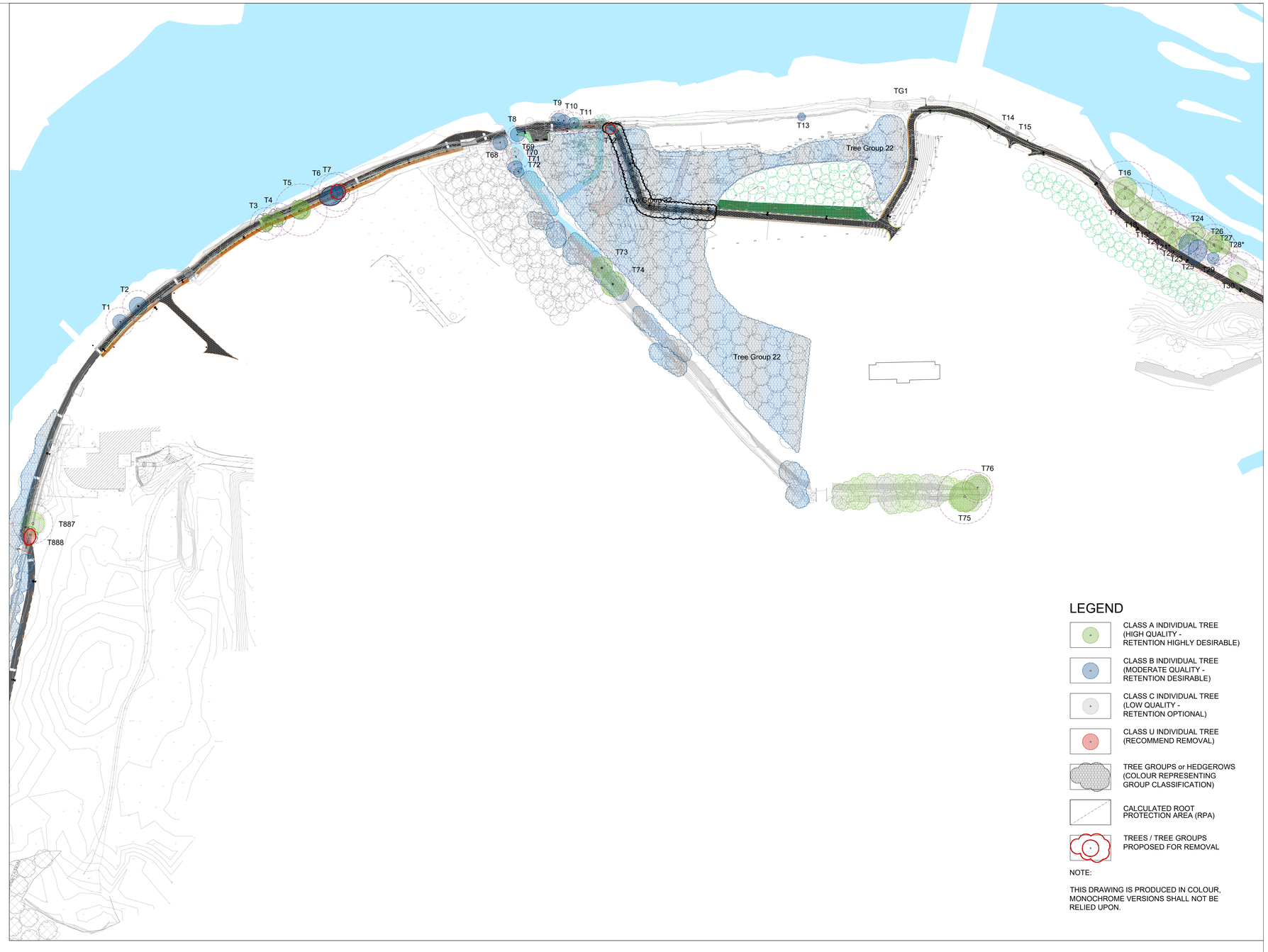

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- TREES / TREE GROUPS PROPOSED FOR REMOVAL

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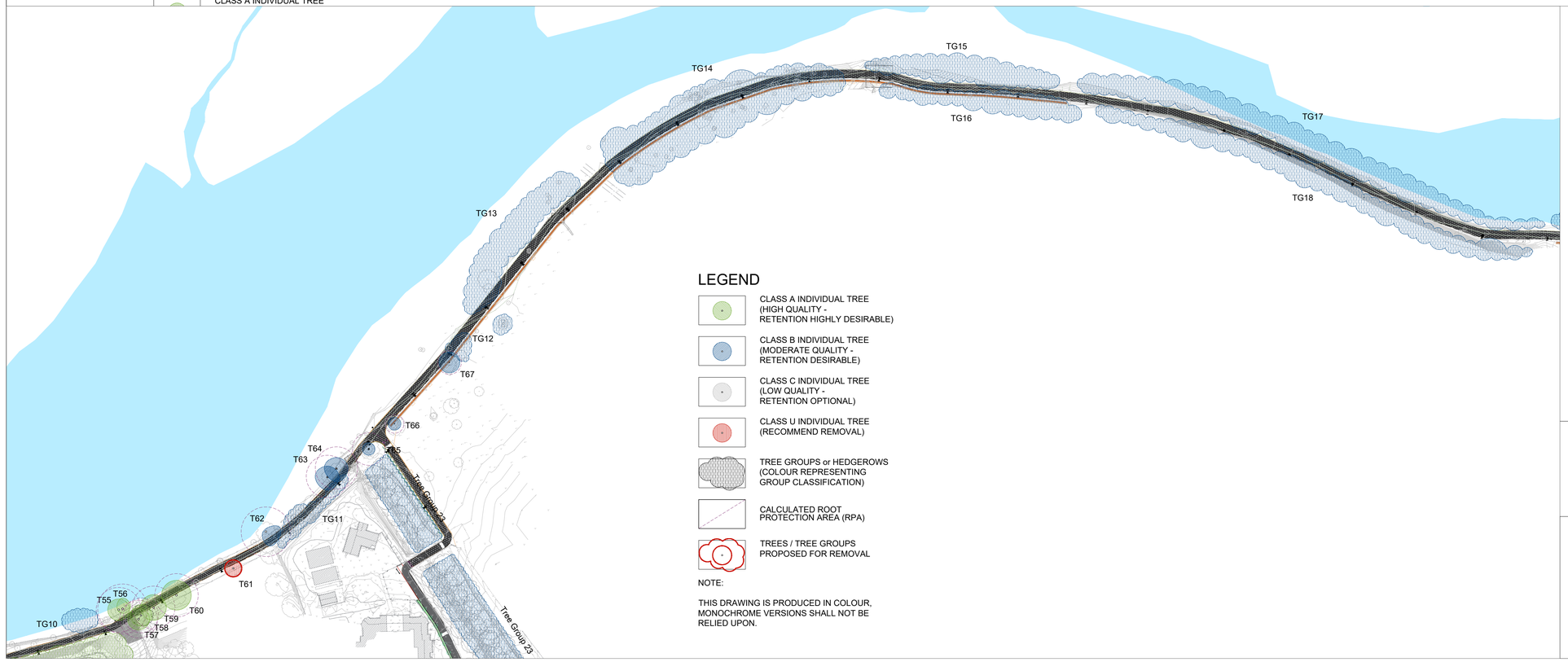
DRAWING: **ARBORICULTURAL IMPACT ASSESSMENT (Sheet 1 of 4)**	DRAWN: KM CHECKED: KM
	DRAWING NO: **21537_T_101**



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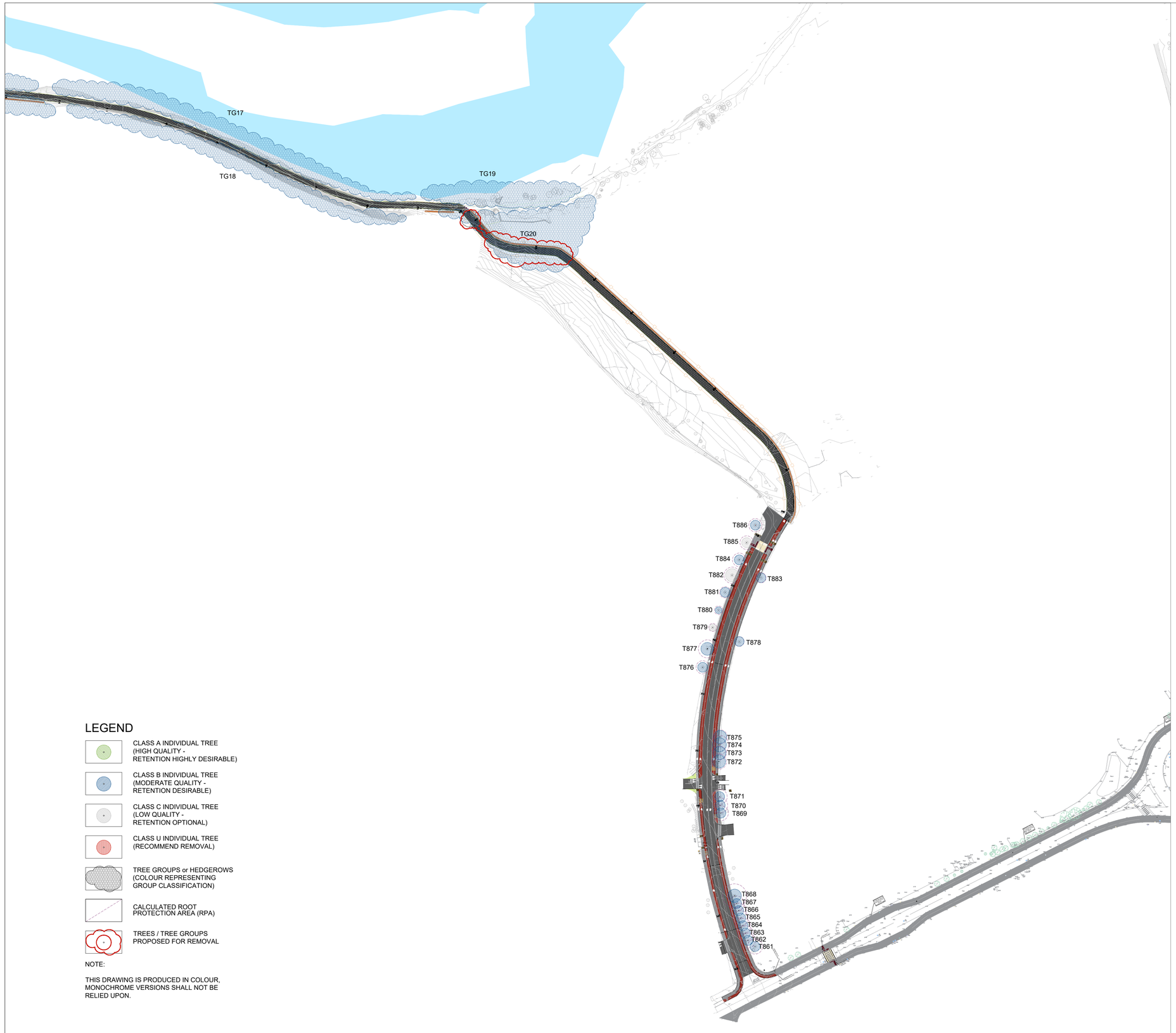

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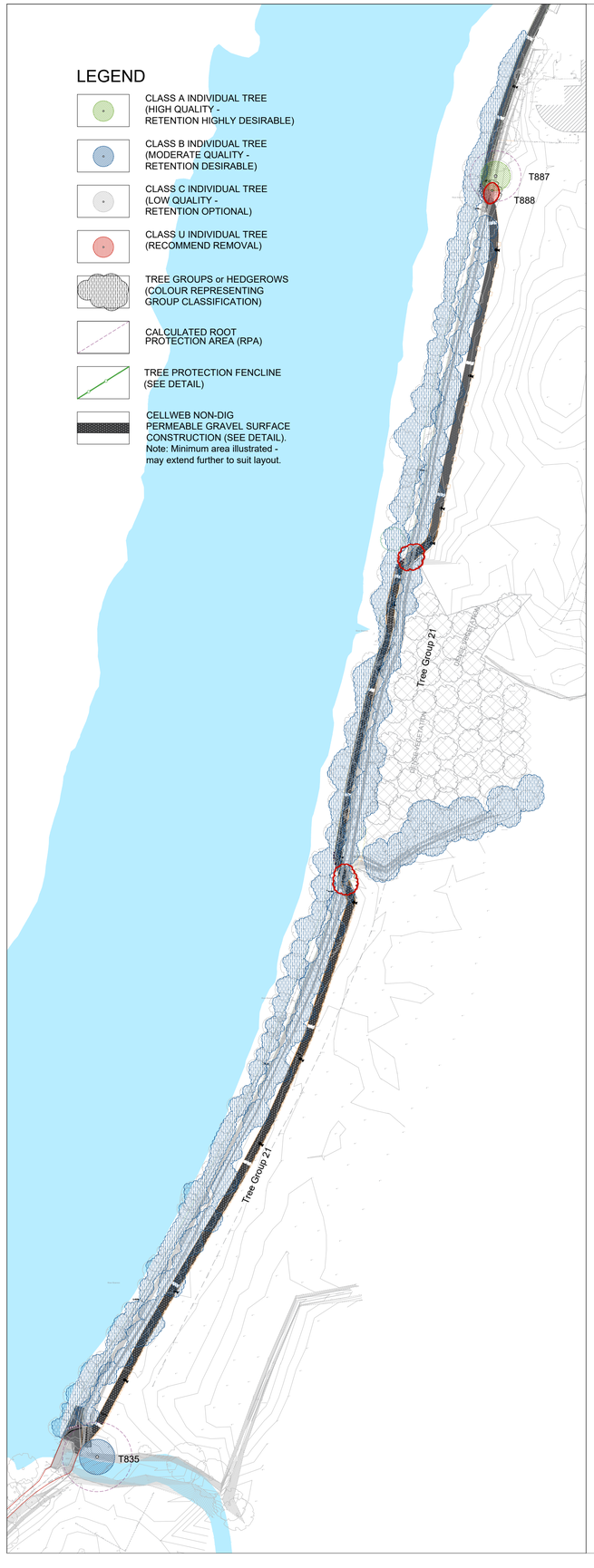

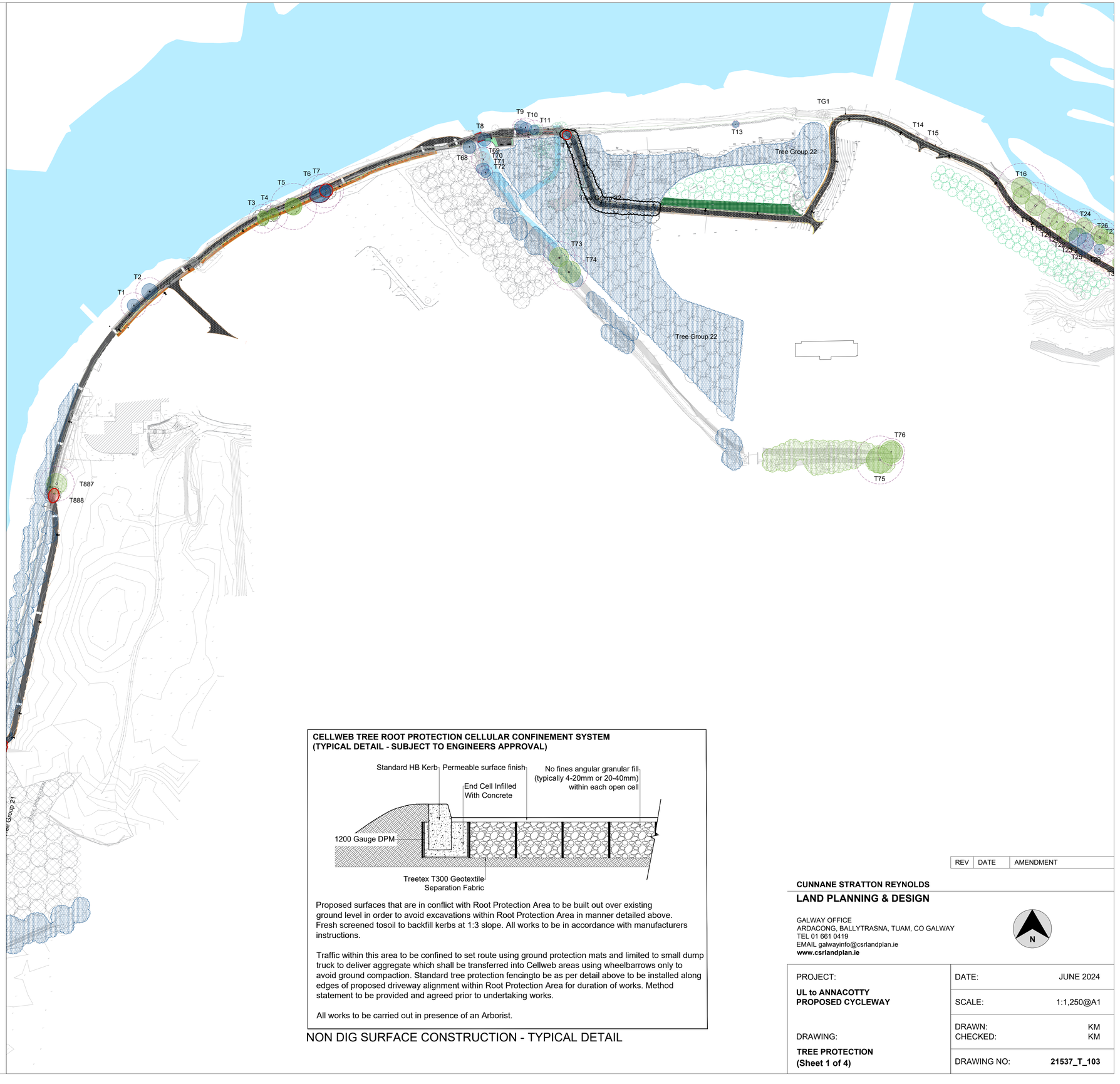

CELLWEB TREE ROOT PROTECTION CELLULAR CONFINEMENT SYSTEM (TYPICAL DETAIL - SUBJECT TO ENGINEERS APPROVAL)

Proposed surfaces that are in conflict with Root Protection Area to be built out over existing ground level in order to avoid excavations within Root Protection Area in manner detailed above. Fresh screened tosoil to backfill kerbs at 1:3 slope. All works to be in accordance with manufacturers instructions.

Traffic within this area to be confined to set route using ground protection mats and limited to small dump truck to deliver aggregate which shall be transferred into Cellweb areas using wheelbarrows only to avoid ground compaction. Standard tree protection fencingto be as per detail above to be installed along edges of proposed driveway alignment within Root Protection Area for duration of works. Method statement to be provided and agreed prior to undertaking works.

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NON DIG SURFACE CONSTRUCTION - TYPICAL DETAIL

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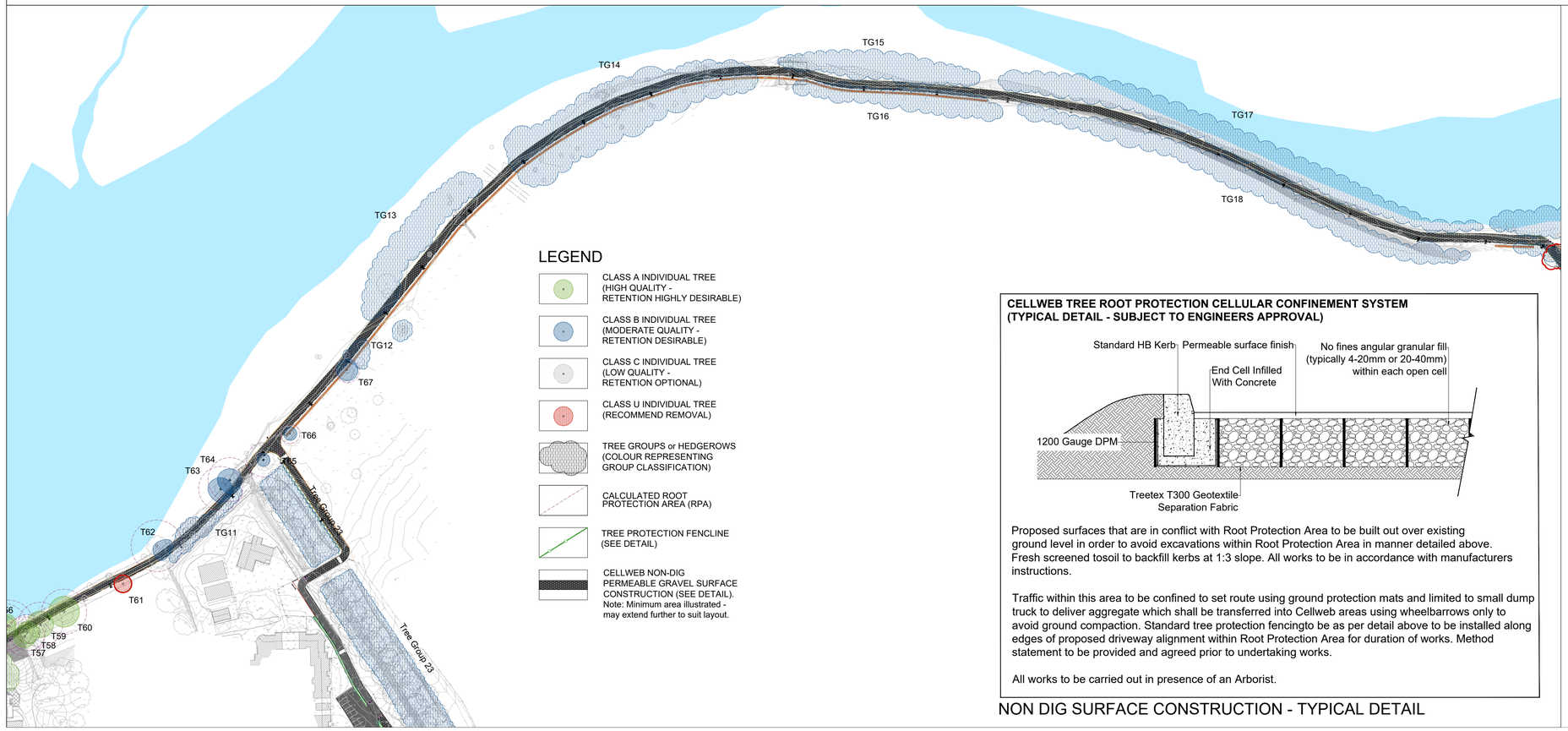

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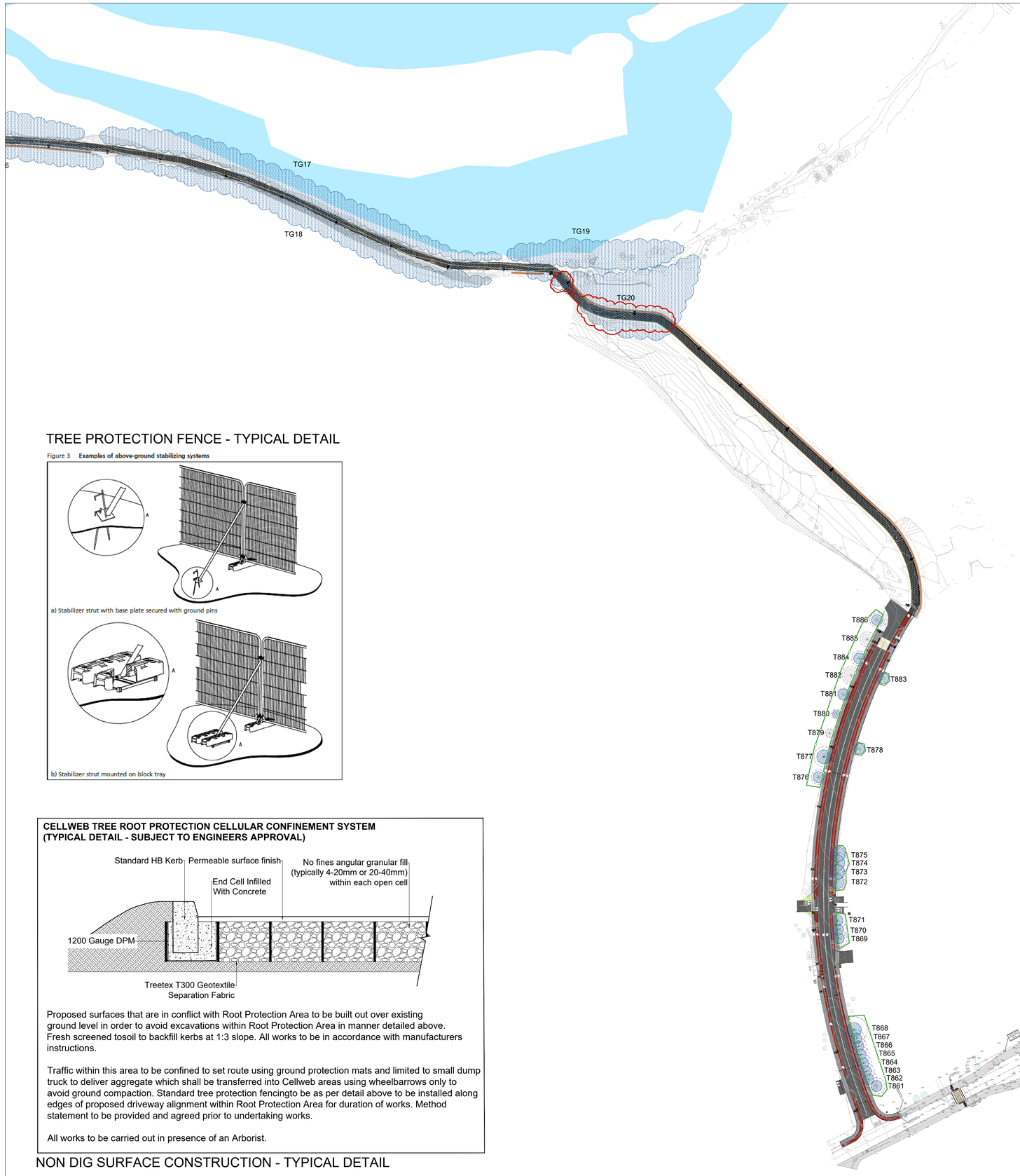

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TREE PROTECTION FENCE - TYPICAL DETAIL

Figure 3 **Examples of above-ground stabilizing systems**

a) Stabilizer strut with base plate secured with ground pins

b) Stabilizer strut mounted on block tray

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DRAWING: **TREE PROTECTION (Sheet 3 of 4)**	DRAWN: KM CHECKED: KM
	DRAWING NO: **21537_T_103**

TREE PROTECTION FENCE - TYPICAL DETAIL

Figure 3 **Examples of above-ground stabilizing systems**

a) Stabilizer strut with base plate secured with ground pins

b) Stabilizer strut mounted on block tray

LEGEND

- CLASS A INDIVIDUAL TREE (HIGH QUALITY - RETENTION HIGHLY DESIRABLE)
- CLASS B INDIVIDUAL TREE (MODERATE QUALITY - RETENTION DESIRABLE)
- CLASS C INDIVIDUAL TREE (LOW QUALITY - RETENTION OPTIONAL)
- CLASS U INDIVIDUAL TREE (RECOMMEND REMOVAL)
- TREE GROUPS or HEDGEROWS (COLOUR REPRESENTING GROUP CLASSIFICATION)
- CALCULATED ROOT PROTECTION AREA (RPA)
- TREE PROTECTION FENCLINE (SEE DETAIL)
- CELLWEB NON-DIG PERMEABLE GRAVEL SURFACE CONSTRUCTION (SEE DETAIL). Note: Minimum area illustrated - may extend further to suit layout.

REV	DATE	AMENDMENT

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PROJECT: **UL to ANNACOTTY PROPOSED CYCLEWAY**	DATE: JUNE 2024
	SCALE: 1:1,250@A1
DRAWING: **TREE PROTECTION (Sheet 4 of 4)**	DRAWN: KM CHECKED: KM
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Comhairle Cathrach & Contae Luimnigh

Limerick City & County Council

Limerick City Greenway (UL to NTP) Project

Draft Traffic Management Plan

June 2025

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1. Introduction

1.1. Purpose of the Project

The purpose of the University of Limerick City Greenway (UL to NTP) Cycle Path Project is to provide a safe transport route connecting the UL and NTP to the city whilst also enhancing amenity value of the area.

The Limerick Shannon Metropolitan Area Transport Strategy (LSMATS) references the proposed Greenway as part of Limerick's Cycle Network to develop a consistent, clear and continuous network of urban and suburban cycle networks to ensure cycling becomes a realistic choice as a mode of transport, making it an attractive location for cyclists of all ages and abilities by proposing the development of a consistent, clear, and continuous network of urban and suburban cycle networks throughout the area.

The UL to NTP Project will extend from the already constructed Limerick Smarter Travel, Route 2, which involved the upgrade of an existing pathway, 1.5km in length between University of Limerick and the Kevin Hannan Bridge along the bank of the River Shannon and connects directly into the city centre.

1.2. Purpose of this Report

The purpose of this Design Process Traffic Management Plan is to outline a practical solution to facilitate safe passage of traffic, including pedestrians and vulnerable road users, past the works, and to ensure that the safety of the workforce is not compromised during the construction contract period.

1.3. Design Guidelines

This document has been prepared in accordance with the Department of Transport (in conjunction with Local Authorities, the National Roads Authority, the Health and Safety Authority, and Local Government Management Services Board) publications:

- Traffic Signs Manual; Chapter 8 – Temporary Traffic Measures and Signs for Roadworks, Department of Transport (Aug, 2019); and,
- Guidelines for Working on Roads – Guide to the Safety, Health and Welfare at Work (Construction) (Amendment No. 2) Regulations 2008, Health and Safety Authority.

The Contractor shall appoint a Temporary Traffic Operations Supervisor, who will be required to supervise traffic management at road works and be on site when temporary traffic management signs and devices are being installed, modified, or removed. Signing, Lighting and Guarding at Roadworks must be supervised by at least one competent person. This person must have completed the Signing, Lighting and Guarding at Roadworks Construction Skills Certification Course (SLG CSCS) and possess a valid and relevant registration card.

The Contractor shall minimise disruption to residents and passing traffic. The Contractor shall provide for safe diversion and control of traffic in and around the Contract Works and shall provide for continuing operation and maintenance of the foregoing traffic diversions and controls for the duration of the construction works. The Contractor shall provide for traffic regulation in and around the works. Roads must be kept open at all times unless a temporary closure order has been granted. The Contractor may not assume that road closures will be granted at any location.

1.4. Objectives of Traffic Management Design

The primary objective in the planning and design of traffic management is to maximise the safety of the workforce and the travelling public and the main secondary objective is to keep traffic flowing as freely as possible and reduce the impact of the road works to a minimum (See **Appendix A** for Preliminary Traffic Management Proposal).

1.5. Principles of Traffic Management

Safe and efficient traffic management is founded upon the following principles:

- Development of traffic management proposals in accordance with the principles of prevention (Safety Health and Welfare at Work Act 2005) and by following the hierarchy of risk prevention and protection;
- Provision of clear and early warning of obstructions in the roadway;
- Optimisation of road space and the provision of adequate safety zone and workspace at work locations;
- Provision of clear directions relating to the decisions/actions required from road users;
- Minimisation of potential conflict between road users;
- Provision of credible traffic signs and temporary requirements;
- Provision of appropriate speed limits and restrictions.

1.6. Definitions

Throughout this report there are key words and expressions used. These are defined in Table 1.

Table 1: Key Word Definitions

Key Word	Definition
Cone Height	This is the minimum height of the cone permitted.
Cone Spacing	The recommended maximum spacing of cones required at tapers and longitudinally. Closer spacing may be needed at some locations, e.g. at short lengths of roadworks in urban areas or on tight bends.
Cumulative Distance	Spacing of signs is measured by placing the first Sign WK 001 at the cumulative distance of the spacing of all the advance signs from the start of the taper.
Lamp	Lamps to be used along lines of cones or barriers are to be battery operated steady lamps with amber light.
Minimum Lane Width	The minimum width of traffic lane to be maintained at all times for use by the road user. This may vary depending on the characteristics of the traffic being catered for.

Key Word	Definition
Number of Signs	This is the number of signs required in advance of the start of the taper. The first sign shall be Sign WK 001. The number of signs specified is for the left hand side only. For roads with two or more lanes in one direction additional signs should be placed on the right hand side of the road or on the central reserve at the same spacing.
Distance Between	The distance between signs is measured from the first Sign WK 001 at the specified distance
Safety Zone	Longitudinal and Lateral Safety Zones are areas between the works and the cones or barriers adjacent to the running traffic lane. They are the minimum clear distances required for the safety of the workers and must be clearly defined and kept free of all operations, stationary vehicles or materials except for mobile lane vehicles or crash cushions. The Lateral Safety Zone is measured from the trafficked edge of the cone or barrier to the edge of the works area. This area must be kept free of all operations, stationary vehicles, materials and personnel thus ensuring a clear safe distance back from the edge of the live traffic. The Longitudinal Safety Zone is measured from the end of the taper to the start of the works. It provides an area for an errant vehicle to come to a stop before reaching the work area.
Set Back	The minimum clearance, required on Level 6 roads, from the edge of the traffic lane to the front face of a temporary barrier or cones. It is provided for the safety of the road user and allows for driver judgement when travelling next to a physical barrier. Set back does not include the space required for the swing or overhang of site vehicles.
Sign Visibility	The uninterrupted sight distance of an approaching vehicle to the first Sign WK 001, Roadworks Ahead.
Speed Limit	The permanent posted speed limit or, if applicable, the roadworks speed limit for the temporary traffic management measures being implemented.
Taper	The required length for the reduction in width of a single lane or hard shoulder. The taper length is calculated using the specified rate of taper multiplied by the hazard width, including lateral safety zones, and rounded up to the nearest cone spacing.
Transition Length	The distance required between the first taper and the start of the next taper for the reduction of a number of lanes on multi-lane carriageways. A transition length will be

Key Word	Definition
	needed following each lane closed when two or more lane closures occur on the same carriageway.

1.7. Duties and Responsibilities

The roles and responsibilities of the various duty holders that relate to the specific elements of the traffic management design process are outlined below.

1.7.1. The Client

The following duties must be carried out by the Client:

- Appoint, in writing at the start of the Design Process, a project supervisor for the design process (PSDP) who has adequate training, knowledge, experience and resources; such an appointment can be changed, renewed or terminated as necessary;
- Appoint, in writing before construction begins, a project supervisor for the construction stage (PSCS) who has adequate training, knowledge, experience and resources; such an appointment can be changed, renewed or terminated as necessary;
- Be satisfied that each designer and contractor appointed has adequate training, knowledge, experience and resources for the work to be performed;
- Cooperate with the project supervisor and supply necessary information;
- Retain and make available the Safety File for the completed roadworks: the Safety File contains information on the completed roadworks that may be required for future maintenance works;
- Provide a copy of the Preliminary Safety and Health Plan prepared by the PSDP to every person tendering for the project;
- Notify the HSA of the appointment of the PSDP where construction is likely to take more than 500 person days or 30 working days.

1.7.2. The Project Supervisor Design Process (PSDP)

A competent PSDP must be appointed, in writing, by the Client for each project. The key duties of the PSDP are outlined below:

- Identify hazards arising from the design or technical, organisational, planning, or time related aspects of the project;
- Eliminate, where possible, the hazards and reduce the risk;
- Communicate necessary control measures, design assumptions, or remaining risks to the PSCS so they can be dealt with in the developed Safety and Health Plan;
- Ensure that the work of designers, including the Designer (TTM) and other Designers, is coordinated to ensure safety;
- Organise cooperation between Designers;

- Prepare a written Preliminary Safety and Health Plan for any project where construction work is likely to take more than 500 person days or 30 working days or where the Particular Risk and deliver the plan to the Client prior to tender;
- Ensure that a Temporary Traffic Management Plan prepared by the Designer (TTM) is available to the PSCS prior to construction works;
- Coordinate any revisions made to the Temporary Traffic Management Plan during the project;
- Prepare a Safety File for the completed project;
- Notify the HSA and Client of non-compliance with any written directions issued (the PSDP may issue directions to Designers, Contractors, or others).

1.7.3. The Designer

The key duties of the Designer are outlined below:

- Take account of the 'general principles of prevention';
- Identify hazards that the design may present during construction and subsequent maintenance;
- Eliminate, where possible, the hazards or reduce the risk, by completing design risk assessments;
- Communicate as necessary control measures, design assumptions or remaining risks to the PSDP so they can be dealt with in the Safety and Health Plan;
- Cooperate with other Designers and the PSDP or PSCS;
- Take account of any existing Safety and Health Plan or Safety File;
- Comply with directions issued by the PSDP and PSCS;
- Where no PSDP has been appointed, inform the Client that a PSDP must be appointed.

1.7.4. The Designer (TTM)

The key responsibilities of the Designer (TTM) are outlined below:

- Responsible for the design of the temporary traffic management arrangements and the preparation of the Temporary Traffic Management Plan;
- Update the Temporary Traffic Management Plan where it is found to be operationally deficient;
- Provide Temporary Traffic Management Plan to PSDP for inclusion in Preliminary Safety and Health Plan.

1.7.5. The Project Supervisor Construction Stage (PSCS)

A competent PSCS must be appointed, in writing, by the Client for each project. A PSCS may appoint, in writing, a named individual as Health and Safety Coordinator to assist the PSCS in carrying out the duties of the PSCS, however, responsibility for carrying out these duties cannot be delegated to a Health and Safety Coordinator. The key duties of the PSCS are outlined below:

- Coordinate the identification of hazards, the elimination of hazards or reduction of risks to an acceptable level during construction;
- Further develop the Preliminary Safety and Health Plan before construction commences; where further development of the Temporary Traffic Management Plan has been identified, the PSCS may consult

with a Designer (TTM) to ensure that the works operations and the Temporary Traffic Management Plan are compatible;

- Coordinate the implementation of the Construction Regulations by contractors;
- Organise cooperation and the provision of information between contractors;
- Coordinate the reporting of accidents to the HSA;
- Notify the HSA before construction commences if construction is likely to take more than 500 person days or 30 working days;
- Provide information to site safety representatives;
- Coordinate the checking of safe working procedures;
- Coordinate measures to restrict entry to the site;
- Coordinate the provision and maintenance of welfare facilities;
- Coordinate the arrangements to ensure that workers have valid CSCS cards, including the CSCS Signing, Lighting and Guarding at Roadworks and the CSCS Health and Safety at Roadworks;
- Coordinate the appointment of a site safety representative if there are more than 20 persons on site;
- Coordinate the implementation and operation of the Temporary Traffic Management Plan;
- Appoint a safety advisor if there are more than 100 workers on site;
- Provide all necessary Safety File information to the PSDP;
- Monitor the compliance of contractors and others and take corrective action where necessary;
- Notify the HSA and the Client of any instances of non-compliance with any written directions issued.

On site the PSCS can adjust the Temporary Traffic Management Plan to take account of the progress of the works. Should any adjustments require design input, the PSCS may, as necessary, require the Designer (TTM) to review and/or modify the plan; the Designer (TTM) shall work under the coordination of the PSDP.

1.7.6. The Contractor

The key responsibilities of the Contractor are outlined below:

- Cooperate with the PSCS and where required the PSDP to ensure works are coordinated;
- Provide a copy of their safety statement and relevant information to the PSCS – the names of the relevant CSCS card holders should be contained in the Safety Statement including the names of CSCS Signing, Lighting and Guarding and CSCS Health and Safety at Roadworks cardholders;
- Promptly provide the PSCS with information required for the Safety File;
- Comply with directions from the PSDP and PSCS;
- Report accidents to the HSA and to the PSCS if any Employee cannot perform his/her normal work for more than 3 days;
- Comply, and ensure Employees comply, with site rules and the Safety and Health Plan including the Temporary Traffic Management Plan. e.g. keep safety zones clear of personnel, plant and material;
- Identify hazards, eliminate hazards, or reduce risks during construction;
- Facilitate the site safety representative;

- Ensure the relevant workers have a safety awareness card and a construction skills card where required, including the CSCS Signing, Lighting and Guarding Card and CSCS Health and Safety at Roadworks card;
- Appoint a safety officer if there are more than 20 persons on site or 30 persons employed;
- Consult workers and safety representatives;
- Monitor compliance and take appropriate corrective action.

1.7.7. The Temporary Traffic Operations Supervisor

The Temporary Traffic operations Supervisor must hold a valid SLG CSCS card and will be required to:

- Supervise traffic management roadworks and be available at short notice to deal with issues at particular site locations;
- Be on site when temporary traffic management signs and devices are being installed, modified or removed, e.g. a SLG CSCS cardholder is required on site when switching between traffic lights and STOP/GO operations; be on site to install traffic management arrangements diverting pedestrians or cyclists onto the roadway; perform inspections of the traffic management and record same; report issues or accidents relating to the temporary traffic management to the PSCS; and liaise directly with the Designer (TTM) where required.

1.7.8. The CSCS Health and Safety at Roadworks Cardholder

A Health and Safety at Roadworks CSCS cardholder is required to be present on site if a SLG CSCS cardholder is not present and construction works are taking place on the road. The Health and Safety at Roadworks CSCS cardholder is responsible for:

- Making minor alterations to the temporary traffic arrangements as necessary, such as cleaning/correcting of devices and replacing devices that may have been moved or dislodged;
- Reporting incidents that affect the safety, health and welfare of operatives on site to his/her supervisor.

The Health and Safety at Roadworks CSCS cardholder's duties do not extend to modifying the traffic management arrangements at a road works site.

2. Location of the Proposed Works

This Project is located in Castletroy, Co. Limerick. The proposed Limerick City Greenway (University of Limerick (UL) to National Technology Park (NTP)) will be 4.25km long and will consist of a 3.3km long and 3.0-4.0m wide shared path on existing paths or in green fields, and 0.9km of separated 1.8m wide footpaths and 1.8-2.0m wide cycle lanes alongside the eastern and western sides of University Road and McLaughlan Road. The proposed Greenway will extend between the River Goody bridge and Plassey Park Road.

3. Undertaking of Works

Due to the linear nature of the proposed works the proposed cycle path has been divided into sections, each serviced by separate temporary construction compounds (in Flood Zone C areas) and site access routes, to facilitate sequencing of works. This sectional approach will mean that one section of the proposed cycle lanes can be constructed while the other sections are kept in use for cyclists and pedestrians. The proposed path has been sectioned into Red, Cyan, Magenta, Blue, and Yellow Sections (also referred to as Sections 1-5 respectively) from west to east as illustrated in the drawings included in Part 3 - Appendices of the EIA report.

3.1. Access Routes

Linking the site with the Regional Road Network, namely the Dublin Road (R445) are a series of Local Roads including Plassey Park Road, Mc Laughlan Road, University Road, and unnamed roads through the UL campus.

3.1.1. Red Section

Construction vehicle access to the proposed construction Compound 1 for the Red Section of the proposed cycle lanes will be via Harvard Close, which is the existing service road to the Castletroy Wastewater Treatment Plant (WwTP). This route is normally only accessed by maintenance and operations vehicles. A section of haul road will require construction linking the existing road network to the construction compound.

3.1.2. Cyan Section

Construction vehicle access to Temporary Works Area 1 for the Cyan Section of the proposed greenway will be through the Castletroy WwTP site. The WwTP site is accessed via Harvard Close. The temporary working area will require the construction of a temporary haul road to connect to the existing road in the WwTP.

Construction vehicle access to Construction Compound 2 will be via an unnamed road to the west of Dromroe Student Village within the UL Campus.

3.1.3. Magenta Section

Construction vehicle access to the proposed Construction Compound 3 for the Magenta Section of the proposed cycle lanes will be via University Road. A section of haul road will require construction linking the compound to University Road.

3.1.4. Blue Section

The Blue Section will also utilise construction Compound 3. Vehicle access to the proposed Construction Compound for the Blue Section of the proposed cycle lanes will be via University Road. A section of haul road will require construction linking the compound to University Road.

3.1.5. Yellow Section

Construction vehicle access to the proposed Construction Compound 4 for the Magenta Section of the proposed cycle lanes will be via McLaughlan Road. A section of haul road will require construction linking the compound to McLaughlan Road.

3.2. Overview of Traffic Control Measures

Existing traffic, together with pedestrian walkways and cycleways will have to be facilitated alongside construction traffic along all access routes, for the duration of the works.

Traffic Control measures in the form of a static lane closure will be required on University Road through the National Technology Park (NTP), to facilitate construction works for the cycle lane to the west and east of the road, including in the verge, parking bay and along the footpath to the edge of the road.

Out of hours work is needed at the entrance and exit car parks of premises accessed via University Road, including Troy Studios, H&MV Engineering, Collins McNicholas Recruitment and HR and BD-RCI Limerick, while construction works are ongoing for the cycle lane passing along the entrance and exit of the organisation's car park.

Traffic control measures in the form of a static lane closure will be required at the entrance and exit car parks of premises accessed via University Road, including Troy Studios, H&MV Engineering, Collins McNicholas Recruitment and HR and BD-RCI Limerick while construction works are ongoing for the cycle lane passing along the entrance of the organisation's car park.

Traffic Control measures in the form of a static lane closure will be required on McLaughlan Road, to facilitate construction works for the cycle lane on the footpath at the eastern and western edge of the road.

Out of hours work is needed at the entrance and exit to Cook Medical, Three Ireland and Greentech Plastics Ltd, accessed via McLaughlan Road while construction works are ongoing for the cycle lane passing along the entrance and exit of the organisation's car park.

Traffic control measures in the form of a static lane closure will be required for the entrance to Cook Medical, Three Ireland and Greentech Plastics Ltd carparks accessed via McLaughlan Road will be required while construction works are ongoing for the cycle lane passing along the entrance of the organisation's car park.

Traffic Control measures related to works at a junction will be required at the entrance/exit of McLaughlan Road to facilitate the merging of the cycle path onto an existing cycle track at the edge of the road, at this location.

Cycle and pedestrian traffic diversions for the duration of works will be carried out along the proposed path where required.

Flagmen should be positioned at the entrances to the construction site to control construction traffic entering and leaving the site.

Where traffic control measures are required their impact on roads and footpaths is to be minimised. The Contractor shall inform local businesses/education facilities and the public in advance of the works by means of written communications, local signs and VMS boards, and detailing construction from "start date" to "end date".

Temporary safety barriers placed around the working area should be clearly defined by temporary road markings, signage and coning as specified in the Traffic Signs Manual. The PSCS shall carry out a risk assessment before commencing any works on site, to determine the type of barriers and cones most suitable for the works.

The appropriate level of signage and temporary traffic measures required for a static lane closure is detailed in Section 4 of this report. Following lane closure design, the PSCS shall develop a suitable method of controlling vehicular/cycle/pedestrian traffic passing the works sites. The factors affecting the choice of traffic control method are summarised in Table 2. The PSCS shall consult Limerick City and Council's Roads Department, The University of Limerick, The IDA, and An Garda Siochána prior to implementing traffic control measures on site.

Table 2: Factors affecting the choice of traffic control method

Method	Maximum Speed Limit	Coned Area Length	Maximum Traffic Flow
Give and Take	50 km/h	50m maximum	400 vph and 20 HGV/hr
Priority (Yield Sign)	100 km/h	80m maximum	850 vph
STOP and GO battens	100 km/h	100m 200m 300m 400m 500m	1400 vph 1250 vph 1050 vph 950 vph 850 vph
Temporary Traffic Signals	100 km/h	500m maximum	Not applicable
ALL STOP	100 km/h	Not applicable	Not applicable

Note: Where shuttle working is required, a 45 degree taper shall be used on both approaches in conjunction with a suitable method of traffic control.

In addition to layout design, passive/active traffic control is required to regulate the flow and speed of traffic through or around a site. The main factors affecting the selection of the most appropriate type of control are:

- Visibility through the works area;
- Length of the controlled area;
- Volume of traffic flow;
- Duration of the works;
- Proximity of junctions, pedestrian crossings, or railway crossings.

3.3. Public Liaison

After the Works Programme is developed, the Contractor's Public Liaison Officer shall liaise and consult with local residents, the business community, and Limerick City and County Council. Representatives of the Employer and Contractor's site teams shall be available to attend meetings with An Garda Siochána, Limerick City and County Council, the University of Limerick, The IDA, local residents, and the business community when required during the contract period.

3.4. Working Hours

The working hours are as defined as follows;

'Working hours shall be restricted to 07:00 to 19:00 Monday to Friday and 08:00 to 13:00 Saturdays. Work outside of these hours shall only be by permission of the Employers Representative'.

However, it is recognised that it may be necessary to carry out some works outside normal working hours to reduce the impact on vehicular and pedestrian movements.

3.5. Temporary Pedestrian Routes

A temporary route should be clearly delineated using appropriate barriers and it is preferable to keep the temporary route off the roadway. Where containment barriers are used to delineate pedestrian routes, they should be brightly coloured and highly visible to facilitate people with vision impairments. Scaffolding or hoarding should be highlighted in a contrasting colour to aid detection by people with vision impairments.

Pedestrian routes are not part of the works area and no construction activity should take place within a designated route. The route must be kept clear of obstacles, trip hazards, overhanging objects and the surface should be suitable for all pedestrians, including people with disabilities.

Where a footway is diverted onto a roadway, the longitudinal and lateral safety zones should be located between the footway and live traffic. A lateral safety zone is not required where a continuous containment barrier is provided between the pedestrian route and live traffic.

Where a roadway crossing is out of use due to construction works, existing signs and crossing controls should be removed or covered as appropriate. Pedestrians should be directed to the nearest alternative crossing. Pedestrian barriers should be used to prevent pedestrian access onto the roadway and encourage pedestrian to cross the roadway at designated crossing points only. The 'Pedestrians' sign, WK 140, should be used where pedestrians are directed to cross the roadway at locations where motorists would not normally expect to encountered pedestrian movements.

Where the temporary route directs pedestrians onto the roadway, kerb ramps or raised footways should be provided to maintain access for wheelchair and buggy users. Ramps should have a slip resistant surface and a maximum gradient of 1:12. The use of handrails should also be considered.

3.6. Cyclists

Where possible, the temporary route provided for cyclists at roadworks should mirror the permanent arrangements. If cycle routes cannot be kept open through the works site, it may be necessary for cyclists to use the running lane on the roadway, take an alternative diversion route or dismount and use temporary pedestrian facilities provided.

When cycle lanes are affected by the road works, the changes should be clearly signed well in advance of the road works using sign RUS 009 with P010 (Section 0) where appropriate. Alternative routes should be adequately signed and where possible be independent of vehicular traffic.

Temporary signals should give cyclists sufficient time to pass through road works site, particularly where shuttle systems are in operation. The cycle route through the road works site should be kept as level as practicable; potholes, gullies, metal plates, sloping fillets and cable protectors can be particularly hazardous. In situations

where vehicles are unable to pass cyclists safely, where the lane width is less than 3.5m, the use of 'Cycle Warning' sign WK 143 should be considered.

3.7. University Road

Construction traffic will use University Road though the NTP to access to the Magenta and Blue Section of the proposed path and Compound 3. Works to include pedestrian and cycle lanes on both the east and west sides of the road in addition to a raised table to the north extent of the road.

It is planned that the western lane of the unnamed road through the NTP (Link A) will be temporarily closed during the works to permit construction of the proposed cycle and pedestrian paths. The proposed cycle path will be situated in the existing grassed verge area to the west of the road. The proposed pedestrian path will occupy the western extent of the existing parking bays. The existing footpath on the eastern side of the road will remain in use during the works.

Once construction on the cycle path to the west has been complete, it is planned that the eastern lane of the University Road through the NTP will be temporarily closed during the works to permit construction of the proposed cycle and pedestrian paths. The proposed cycle path will be situated in the existing footpath and verge to the east of the road. The proposed footpath on the western side of the road will remain in use during the works.

It will be the responsibility of the PSCS to maintain the footpaths for the duration of the works. The requirements of clause 8.3.11 of 'Traffic Signs Manual (Chapter 8 – Temporary Traffic Measures and Signs for Roadworks)' must be adhered to.

A shuttle system shall be adopted to enable traffic to pass through the works using one lane. This may be operated by two methods:

- Stop and Go
- Temporary Traffic Signals

3.7.1. STOP and GO

STOP and GO battens, which can be either manual or mechanically operated, allows traffic flow to move according to demand. It is ideal during peak traffic flow periods and may be coupled with temporary traffic signal during off-peak periods. Signing using Sign No's. RUS 060 and RUS 061 (Refer to **Appendix B**) and coning for the STOP and GO system shall be in accordance with 'Traffic Signs Manual (Chapter 8 - Temporary Traffic Measures and Signs for Roadworks)' and 'Guidance for the Control and Management of Traffic at Roadwork Manual'. This operation must be undertaken by trained personnel and wearing high visibility garments.

The Road Authority or the Contractor must consult with the Gardaí prior to the implementation of STOP and GO battens. Battens shall be used in accordance with sign numbers RYS060 and RUS061 (**Appendix B**). Temporary signage in advance of the manually controlled stopping point shall include the use of sign WK 061 (**Appendix B**).

The use of manually operated STOP and GO battens is preferred where traffic is reduced to shuttle working. This will allow traffic flows to move according to the actual demand, thereby reducing congestion, delay, and driver frustration. This operation must be undertaken by trained personnel wearing high visibility garments.

For short works (20m or less) manual control at one end or in the middle may be sufficient. For short works at site crossing points or exits, a single operator may use a double-sided STOP batten to control traffic. For works longer than 20m, but less than 200m, remotely operated STOP and GO battens may be used provided the operator has an unobstructed view of both ends of the site and is not more than 100m from either end.

Two operators are required for works longer than 200m – one at either end of the controlled section. Additional operators may be required to regulate traffic emerging from any junctions within the controlled section. The work site should be limited to 500m maximum length, including tapers. Operators should be in contact by a suitable means, e.g. two-way radios.

STOP and GO method should be replaced by temporary traffic signals for night time working. If the night time use of STOP and GO is required for a particular operation, appropriate flood lighting must be provided to illuminate battens and flagmen on all approaches. Signing and coning for the STOP and GO batten method should be in accordance with Figure 1. The cross-over and cross-back gaps at the respective leading and trailing tapers should be 20m (10m minimum and only where HGVs are not expected). For 20m in advance of the STOP/GO positions, cones should be placed along the centre line where space permits or otherwise along the verge, to highlight the approaching manually controlled stopping point to the driver.

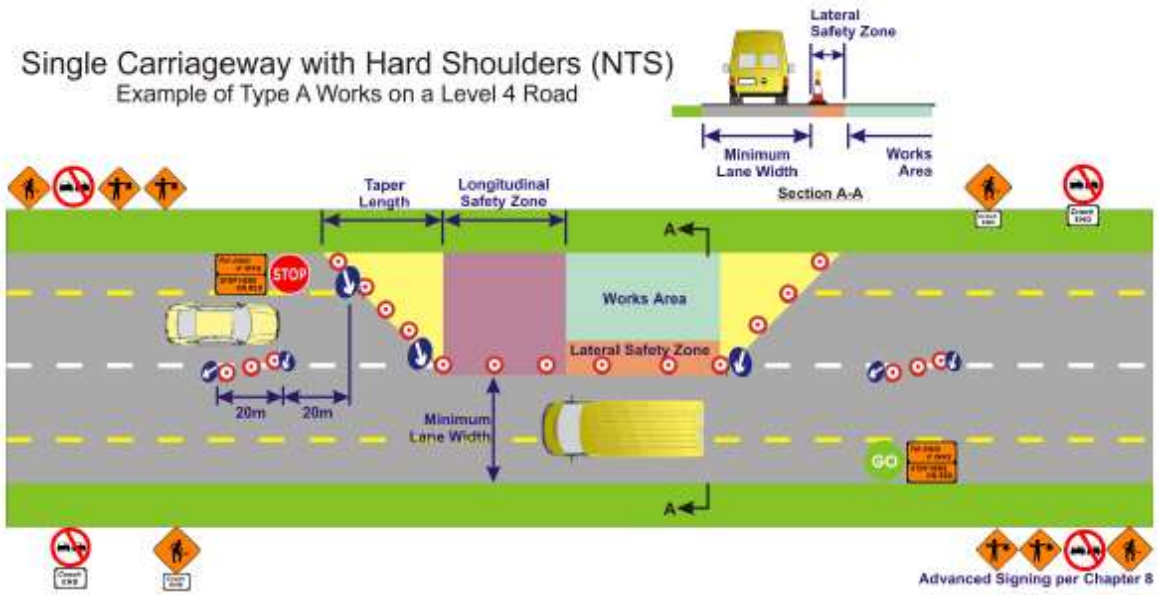


Figure 1: Shuttle system at static works with STOP/GO traffic control

3.7.2. Temporary Traffic Signals

The Road Authority or Contractor must consult with the Gardaí prior to the implementation of temporary traffic signals. Temporary traffic signals may be used on single carriageway roads where traffic is reduced to shuttle working at all times on low traffic volume roads and at off-peak times only on roads with high traffic volume. Temporary signage in advance of the signal-controlled stopping point shall include the use of sign WK 060 (Refer to **Appendix B**). Temporary traffic signals should be positioned with adequate forward visibility and,

where possible, have inter-visibility. The recommended maximum distance between signals is 500m. The design and calculation of timings and phases should be as for permanent traffic signals. The design should include fixed and variable timings, where applicable, and the length of restriction to be installed. Traffic signals should be bagged/covered or removed when they are not in use for any significant period of time.

In order to react manually to actual traffic demands, the use of temporary traffic signals may have to be suspended at peak traffic flow periods in favour of a STOP and GO batten system. Signing and coning for the temporary traffic signal method should be in accordance with Figure 2. The cross-over and cross-back gaps at the respective leading and trailing tapers should be 20m (10m minimum and only where HGVs are not expected). For 20m in advance of the temporary traffic signal, cones should be placed along the centre line where space permits or otherwise along the verge, to highlight the approaching manually controlled stopping point to the driver.

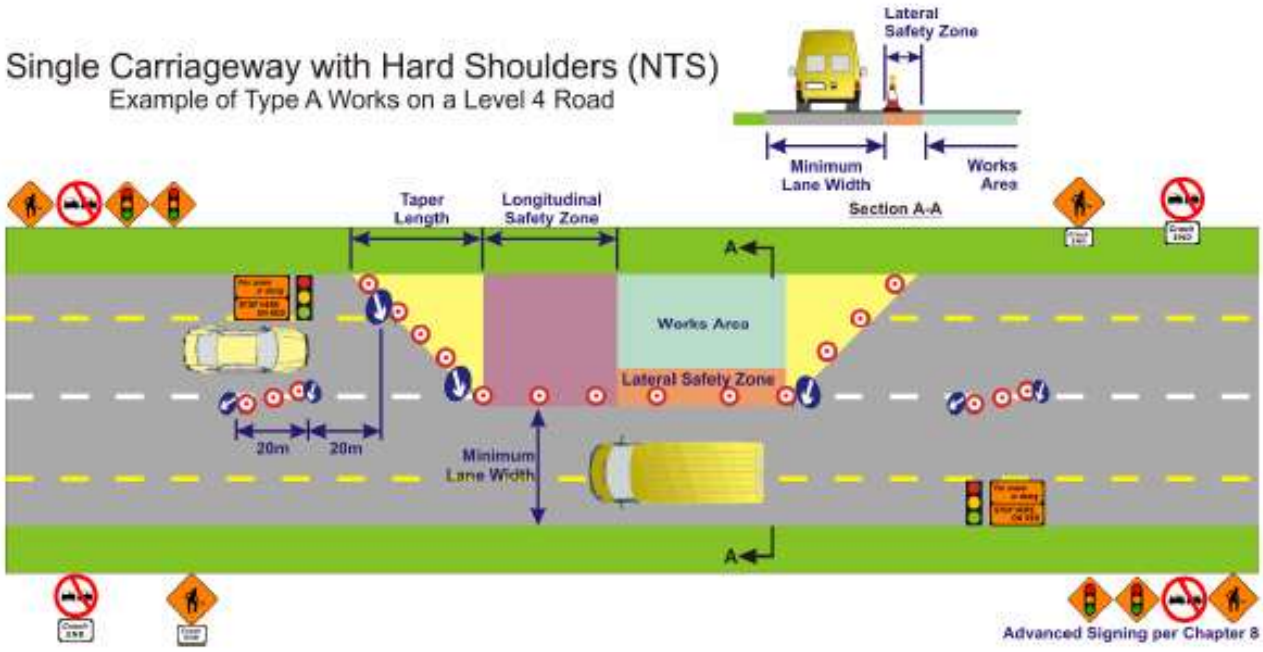


Figure 2: Shuttle system at static works with traffic signals

3.8. McLaughlan Road

Construction traffic to the Yellow Section of the proposed path will use McLaughlan Road. Works to include pedestrian and cycle lanes on both the east and west sides of the road in addition to a raised table at the northmost extent of the road.

It is planned that the eastern lane on McLaughlan Road will be temporarily closed during the works to permit construction of the proposed combined cycle and pedestrian path. At which point the proposed combined cycle and pedestrian path will be constructed along the eastern extent of the existing road in place of the existing footpath and verge. The existing footpath on the western side of the road will remain in use during this stage of works.

It is planned that the western lane on McLaughlan Road will be temporarily closed during the works to permit construction of the proposed combined cycle and pedestrian path. At which point the proposed combined cycle

and pedestrian path will be constructed along the western extent of the existing road in place of the existing footpath and verge. The newly constructed cycle and pedestrian path on the eastern side of the road will remain in use during this stage of works.

It will be the responsibility of the PSCS to maintain the footpaths for the duration of the works. The requirements of clause 8.3.11 of 'Traffic Signs Manual (Chapter 8 – Temporary Traffic Measures and Signs for Roadworks)' must be adhered to.

A shuttle system shall be adopted to enable traffic to pass through the works on one lane. This may be operated by two methods:

- Stop and Go
- Temporary Traffic Signals

3.9. Plassey Park Road

Works related to the end of the pedestrian and cycle path on McLaughlan Road, will be carried out at the junction of McLaughlan Road and Plassey Park Road. The proposed path will merge onto Plassey Park Road and connect to existing active travel infrastructure at this location.

3.9.1. Junctions

The preferred objective is to maintain two-way traffic past the obstruction when it is safe to do so. Traffic restrictions such as the prohibition of turning movements may be required, subject to agreement of the Local Road Authority in consultation with the Gardaí. If suitable, convenient alternative roads are available, temporary diversions should be arranged and signed.

If the road width available to traffic has to be reduced to less than 5.0m, it will be necessary to control traffic by means of STOP/GO battens or temporary traffic signals as illustrated in Figure 3.

If the road width available in the side road is sufficient for one-way traffic only, all turns from the major road must be prohibited, subject to agreement of the Local Authority in consultation with the Gardaí, so that the side road operates one-way only past the obstruction. A diversion should then be signed to permit access to the side road. It may be possible to operate shuttle working past the obstruction under the following circumstances: the side road is a cul-de-sac; diversion routes are impracticable; and/or traffic is very light and there is little risk of traffic on the main road being inconvenienced. Permanent signage and road markings should be temporarily masked or removed as appropriate.

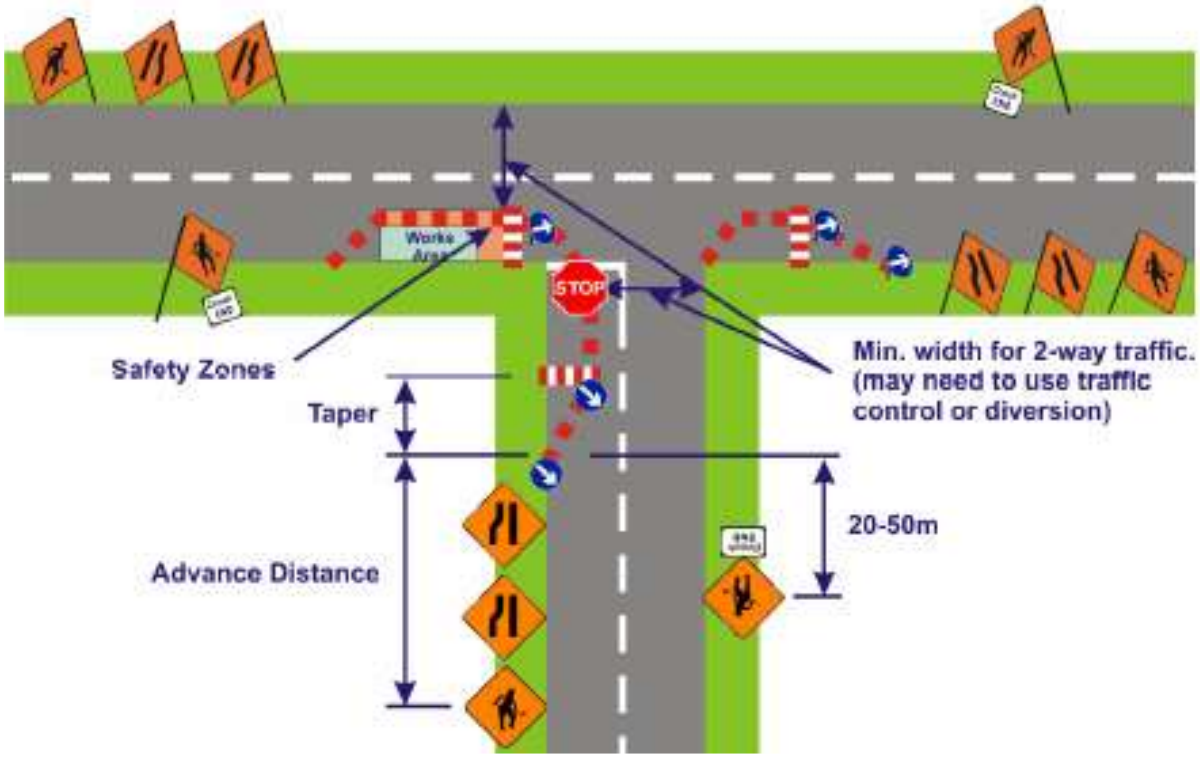


Figure 3: Works at Junctions (Main Road)

4. Traffic Management for the Proposed Works

4.1. Introduction

Existing traffic, together with access for businesses and local property owners, will have to be facilitated along Harvard Close, within the University of Limerick Campus, Plassey Park Road, University Road, and McLaughlan Road.

The works on the Plassey Park Road are located on a 60km/h road. In accordance with Chapter 8 of the Traffic Signs Manual, the designation of the road for Traffic Management Design Parameters will be Level 1. Refer to Section 4.3.

University Road and McLaughlan Road, are also assumed to be 50 or 60km/h roads as no special speed limit is signalled for the roads. In accordance with Chapter 8 of the Traffic Signs Manual, the designation of the road for Traffic Management Design Parameters will be Level 1. Refer to Section 4.3.

Works on University of Limerick Campus Roads are on 40km/h roads represent Level 1 roads, in accordance with Chapter 8 of the Traffic Signs Manual, the designation of the road for Traffic Management Design Parameters.

Harvard close is assumed to be a 40km/h road as no special speed limit is signalled for the roads. In accordance with Chapter 8 of the Traffic Signs Manual, the designation of the road for Traffic Management Design Parameters will be Level 1. Refer to Section 4.3.

4.2. Pedestrian and cyclist diversion routes

Construction of the cycleway is to be carried out in sections, as per drawings included in **Appendix A**. Diversions will be set in place for cyclists and pedestrians around each section of the towpath while works are ongoing. Diversion signage WK 090 as illustrated in **Appendix B** will be used at the beginning, end, and at junctions within each diversion route to signal the diversion, its direction and length.

Possible diversion routes for each of the construction sections are illustrated in **Appendix A** and described in the sections below.

4.2.1. Red Section

During construction along the Red section of the proposed path, cyclists and pedestrians will be allowed to use the existing gravel towpath for much of its length between the River Groody and Construction Compound 1 as the red section diverts of the existing path in many locations. In areas between the River Groody and Construction Compound 1 where the proposed route overlaps the existing towpath, a pedestrian route will be maintained at all times. Once pedestrians reach the Construction Compound 1, they will be diverted away from the Red Section and towards UL Boat House, past the entrance of Castletroy WwTP until reaching the Tierney Building. They will then head north for a short distance and rejoin the tow path at the Cyan Section via the existing gravel path along the mill race.

4.2.2. Cyan Section

During construction along the Cyan Section of the proposed path, cyclists and pedestrians will be diverted away from the tow path at the UL Boat House and continue past the entrance of Castletroy WwTP until reaching the Tierney Building. They will then head north for a short distance until travelling through Dromroe Student Village and to the Foundation Building. From here they will continue past the White House and rejoin the tow path at the Magenta section via an existing footbridge at the back of the PESS building.

4.2.3. Magenta Section

During construction along the Magenta Section of the proposed path, cyclists and pedestrians will be diverted away from the tow path at Dromroe Student Village and be diverted to the Foundation Building. From here they will continue past the White House and behind the PESS building, a hockey pitch and tennis court until reaching Kilmurry Student Village. Pedestrians will then use the existing pathway from Kilmurry Student Village which runs between the Acres Maguires Pitches until reaching Plassey Park Road.

4.2.4. Blue Section

During construction along the Blue Section of the proposed path, cyclists and pedestrians will be diverted away from the tow path at Kilmurry Student Village and be diverted along University Road until reaching Plassey Park Road.

4.2.5. Yellow Section

During construction along the Yellow Section of the proposed path, cyclists and pedestrians will be diverted away from the tow path at Kilmurry Student Village and be diverted along University Road until reaching Plassey Park Road.

4.3. Design Parameters for a Level 1 road

The design parameters for Level 1 roads relevant to construction works i.e. ii – iv. are provided in Table 3 to Table 5. If a road is assumed to be 50 or 60km/h, upper design requirements of a level 1 (iv) road is applied.

Table 3: Design Parameters for Level 1 (iv) Road (Single Carriageway 60km/h)

Design Parameters	Roadworks Type A (Full-Time)	Roadworks Type B (Part-Time)	Roadworks Type C (Single Vehicle Operation)
Speed Limit	60km/h		60km/h
Temporary Signs			
Sign Visibility (m)	60		60

No. of Signs	3	-
Cumulative Distance (m)	60	-
Distance between advance signs (m)	20	-
Minimum Rate of Taper		
Taper at Lane (m)	1 in 10	-
Taper at Hard Shoulder (m)	1 in 10	-
Maximum Lamp Spacing		
At Taper (m)	6	-
Longitudinal (m)	12	-
Maximum Cone Spacing		
At Tapers (m)	3	-
Longitudinal (m)	6	-
Cone Height (mm)	750	-
Safety Zone		
Longitudinal (m)	15	-
Lateral (m)	0.5	-
Minimum Lane Width		
Min Lane Width (m)	3.0	-

Table 4: Design Parameters for Level 1 (iii) Road (Single Carriageway 50km/h)

Design Parameters	Roadworks Type A (Full-Time)	Roadworks Type B (Part-Time)	Roadworks Type C (Single Vehicle Operation)
Speed Limit	50km/h		50km/h
Temporary Signs			
Sign Visibility (m)	50		50
No. of Signs	2		-
Cumulative Distance (m)	40		-
Distance between advance signs (m)	20		-
Minimum Rate of Taper			
Taper at Lane (m)	1 in 5		-
Taper at Hard Shoulder (m)	1 in 5		-
Maximum Lamp Spacing			
At Taper (m)	6		-
Longitudinal (m)	6		-
Maximum Cone Spacing			
At Tapers (m)	3		-
Longitudinal (m)	3		-
Cone Height (mm)	750		-
Safety Zone			
Longitudinal (m)	5		-
Lateral (m)	0.5		-

Minimum Lane Width		
Min Lane Width (m)	3.0	-

Table 5: Design Parameters for Level 1(ii) Road (Single Carriageway 40km/h)

Design Parameters	Roadworks Type A (Full-Time)	Roadworks Type B (Part-Time)	Roadworks Type C (Single Vehicle Operation)
Speed Limit	40km/h		40km/h
Temporary Signs			
Sign Visibility (m)	35		35
No. of Signs	2		-
Cumulative Distance (m)	30		-
Distance between advance signs (m)	15		-
Minimum Rate of Taper			
Taper at Lane (m)	1 in 1		-
Taper at Hard Shoulder (m)	1 in 1		-
Maximum Lamp Spacing			
At Taper (m)	3		-
Longitudinal (m)	6		-
Maximum Cone Spacing			
At Tapers (m)	1		-
Longitudinal (m)	3		-
Cone Height (mm)	750		-

Safety Zone		
Longitudinal (m)	0.5	-
Lateral (m)	0.5	-
Minimum Lane Width		
Min Lane Width (m)	3.0	-

4.4. Harvard Close

It is proposed that construction traffic will access proposed construction Compound 1 and Temporary Works Area 1 along the red section of the proposed path via Harvard Close. The road is normally only used by maintenance and operations vehicles accessing the WwTP. The entrance to Harvard Close off Plassey Park road is illustrated in Figure 4. Harvard Close crosses the road, path and cycle track leading to UL boat club on the UL campus as illustrated in Figure 5. Adequate signage will be required along this route during construction works to ensure the safety of existing users.

Figure 4: Entrance to Harvard Close via Plassey Park Road.

Figure 5: Intersection between Harvard Close and road accessing UL boat club on UL campus.

4.5. Dromroe Student Village

It is proposed that construction traffic will access a proposed Construction Compound 2 along the Cyan Section of the proposed path via the road to the west of Dromroe Student Village on the UL campus. The road is normally used to access Dromroe Student Village and the North UL Campus including Thomand and Cappavilla Student Village via the road bridge over the River Shannon. Pedestrian and Cycle lanes are present on both the west and east lane of the road. The entrance road along the entrance to Dromroe Student Village is illustrated in Figure 6. The proposed location for construction Compound 2 is illustrated in Figure 7.

Figure 6: Entrance to Dromroe Student Village.

Figure 7: Proposed location for construction Compound 2

4.6. University Road

It is proposed that construction traffic will access construction Compound 3 along the Magenta and Blue Sections of the proposed path via University Road. Refer to Figure 8 for a photo of a section of University Road. It is proposed to facilitate existing traffic, and pedestrian walkway along University Road.

Figure 8: University Road Looking South

The works along University Road will operate in all flow and visibility conditions and will remain in position for a duration of more than 24 hours, it is anticipated that the class of the roadworks will be 'Type A'.

Refer to Table 6 for details. Adequate signage will be required along this route during construction works to ensure the safety of existing users.

Table 6: Road and Traffic Management details at University Road

Works Class	Speed Limit (kph)	Footpath	Road Width	Hazard	Traffic Management Layout	Notes
A	Assumed 50 - 60	Existing along eastern side of road to remain operational throughout the works	Varies, approx. 7-12m	Existing road traffic, pedestrians, construction traffic accessing Compound 3.	One lane closure with stop and go, or traffic lights	Provision must be maintained for pedestrian use of footpath. The proposed pedestrian path will occupy approx. 50% of the width of the parking bays at the

						western side of the road.

4.7. Mc Laughlan Road

It is proposed that construction traffic will access proposed construction Compound 4 along the Yellow Section of the proposed path via McLaughlan Road. Refer to Figure 9 for a photo of a section of Mc Laughlan Road. It is proposed to facilitate existing traffic, and pedestrian walkway, along the section of McLaughlan Road.

Figure 9: McLaughlan Road looking north

The works along Mc Laughlan Road will operate in all flow and visibility conditions and will remain in position for duration of more than 24 hours, it is anticipated that the class of the roadworks in will be 'Type A'. Works along the entrance and exit to the car park of Cook Medical, Greentech Plastics Ltd will be temporary and it is anticipated that the class of the roadworks in will be 'Type B'. Refer to Table 7 for details.

Table 7: Road and Traffic Management details at Mc Laughlan Road

Works Class	Speed Limit (kph)	Footpath	Road Width	Hazard	Traffic Management Layout	Notes
A	Assumed 50 - 60	Existing along both sides of road. Path along one side of road to remain operational	Varies, 5 -10m	Existing road traffic, pedestrians, construction traffic accessing Yellow Section of proposed	One lane closure with stop and go, or traffic lights	Provision must be maintained for pedestrian use of footpath

		throughout the works		route and Compound 3		
B	Assumed 50 - 60	Existing along both sides of road. Path along one side of road to remain operational throughout the works	Approx. 7m	Existing road traffic, pedestrians, construction traffic accessing Yellow Section of proposed route and Compound 3	One lane closure with stop and go, or traffic lights	Provision must be maintained for pedestrian use of footpath

4.8. Plassey Park Road

Works related to the end of the pedestrian and cycle path on McLaughlan Road, will be carried out at the junction of McLaughlan Road and Plassey Park Road. The proposed path will merge onto Plassey Park Road and connect to existing active travel infrastructure at this location. Refer to Figure 10 for a photo of the junction between McLaughlan Road and Plassey Park Road from McLaughlan Road.

Figure 10: Looking south from McLaughlan Road to Plassey Park Road

The proposed cycle path is due to merge onto Plassey Park Road at its junction with McLaughlan Road. Refer to Figure 11 for a photo of where the proposed path will merge with existing active travel infrastructure on Plassey Park Road.

Figure 11: Location of Plassey Park Road junction with McLaughlan Road

It is proposed to facilitate existing traffic, and pedestrian walkways, along Plassey Park Road. The works will operate in all flow and visibility conditions and will be temporary, it is anticipated that the class of the roadworks will be 'Type B'. Refer to Table 8 for details.

Table 8: Road and Traffic Management details at Plassey Park Road

Works Class	Speed Limit (kph)	Footpath	Road Width	Hazard	Traffic Management Layout	Notes
B	60	Existing along both sides of road. Path along southern side of road to remain operational throughout the works	Approx. 8m	Existing traffic, existing pedestrian and cyclist traffic	Works at a Junction in addition to 'Stop and Go' or 'Temporary Traffic Signals'	Provision must be maintained for pedestrian use of footpath

5. Construction Stage Traffic Management Plan

The PSCS/Contractor shall develop the DPTMP described herein into a Construction Stage Traffic Management Plan. This Plan must be submitted to Limerick City and County Council for review and agreed prior to work commencing and shall include drawings detailing all proposed arrangements including those listed below:

- The location and details of any proposed road closures including temporary diversions and duration of proposed closure;
- Provision for pedestrians and local access. Where pedestrian facilities exist, the PSCS is responsible for maintaining them during the duration of the works unless otherwise stated;
- The location and details of all temporary signage to be erected by the PSCS; and
- Details of any arrangements for the delivery and storage of materials.

Advance advertising in local press, local radio, advisory road signs and leaflet drops will be required to notify the public of any changes to be implemented in the management of traffic in and around the sites. The PSCS shall also provide information including qualifications of the Traffic Operations Supervisor, who shall be responsible for the implementation of the developed TMP onsite.

6. Key Personnel, Organisations and Responsibilities

In all aspects of the management of traffic, the PSCS shall liaise with the following parties;

- Limerick City and County Council Roads Department;
- The University of Limerick;
- The National Technology Park;
- Garda Síochána;
- Employer's Representative;
- PSDP; and,
- Emergency Services.

The PSCS shall consult all relevant authorities as listed above during the development of the Construction Stage Traffic Management Plan. The PSCS shall co-ordinate the implementation of the developed traffic management plan throughout the duration of the work. Where a problem arises with traffic management, the PSCS shall consult with Limerick City & County Council to revise the traffic management plan, as necessary. The PSCS shall take into account the impact of the construction works on general traffic, businesses, schools and property owners.

7. Road Closures

The PSCS should allow at least 6 weeks for the Roads Authority to rule on an application for a Temporary Closing of Roads Order.

8. Temporary Road Works Speed Limit Order

It is proposed that a 30 km/h Road Works Speed Limit Order is enforced on all roads affected by the proposed works. The PSCS shall allow a notification and consultation period of least 6 weeks for the Roads Authority to rule on an application for a Temporary Road Works Speed Limit Order. The speed limit signs shall be in accordance with the 'Traffic Signs Manual (Chapter 8 – Temporary Traffic Measures and Signs for Roadworks).

9. Other Traffic Control Tools

The PSCS shall allow for a notification and consultation period for the Roads Authority to rule on applications for traffic diversions, lane width restrictions, footpath alterations and restrictions or alterations to parking.

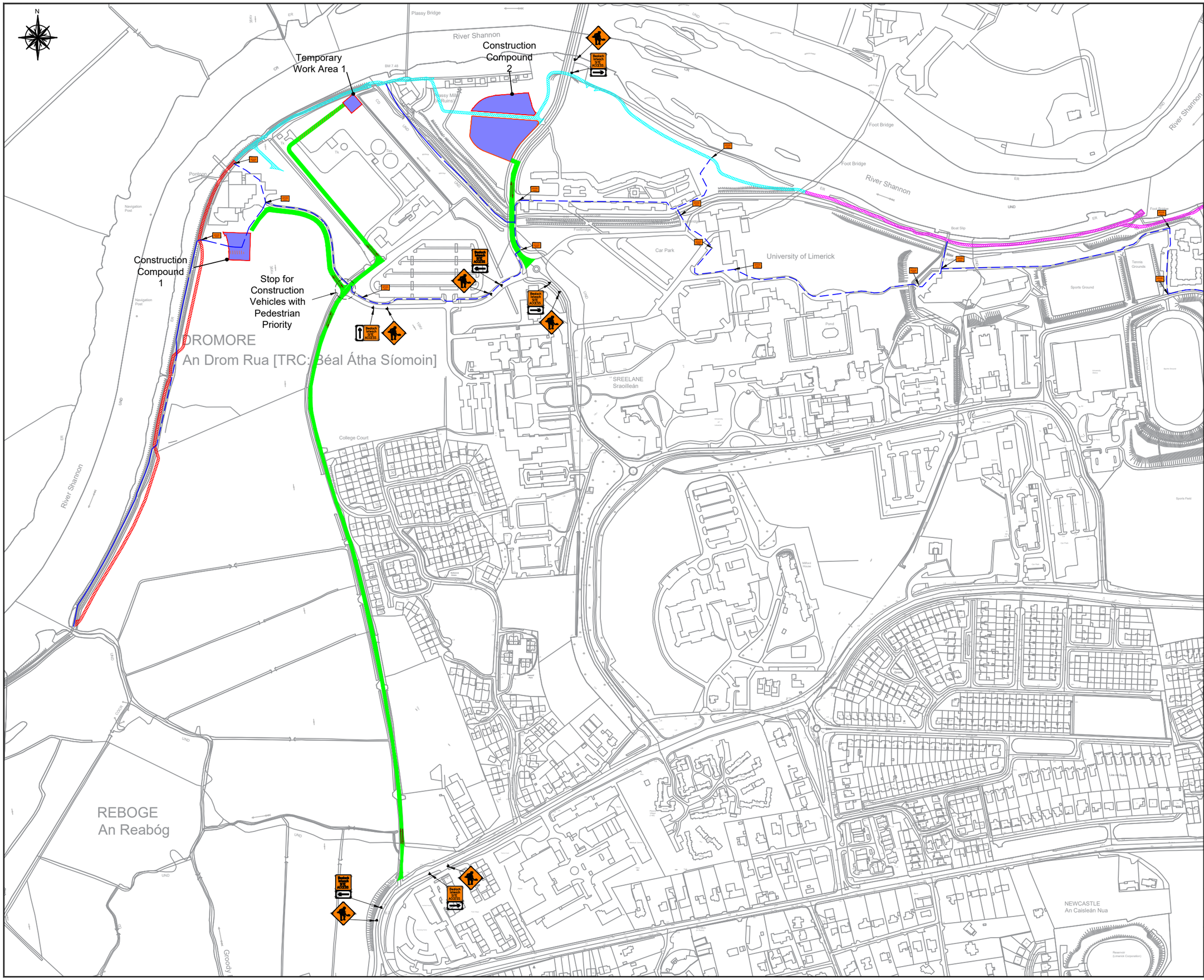
10. Public Notices

The PSCS shall liaise with the Roads Authority in respect of any temporary road closures, diversion routes, and other traffic management controls required to be carried out to ensure the safety of the workforce and the general public during the duration of the works. The advertising of such notices in local press, local radio, and leaflet drops will be required to warn motorists of the changes involved and new road layouts to be expected.

11. Temporary Road Surface

It is anticipated that traffic will be running on temporary surfaces during the works prior to permanent reinstatement of road carriageway areas. It is the duty of the PSCS to ensure temporary signage is erected prior to permanent reinstatement of surfaces to ensure road users are aware of temporary surfaces. The Contractor shall be responsible for the temporary restoration of the existing carriageways, in the event that they are damaged as a result of the Works. Any temporary restoration in roads shall be carried out in accordance with the Particular Specification and relevant Standard Detail Drawings. No more than 30 metres of trench shall be left un-restored at any time and no traffic shall be permitted to enter un-restored areas. Manholes and valve chambers should have permanent covers secured prior to permitting traffic to pass over reinstated areas. In the event of any interference with road markings, the Contractor shall arrange for immediate replacement with temporary markings and arrange with Limerick City & County Council to have permanent markings restored in conjunction with the permanent trench reinstatement. Road markings shall comply with Clause 1211 of the TII Specification for Roadworks.

APPENDIX A - Preliminary Traffic Management Plan Drawings



Notes

1. **Levels are in metres O.D. and refer to Malin Head Datum.**
2. **Dimensions are in millimetres unless otherwise stated.**
3. **Figured dimensions only to be used. If in doubt check with the Engineer in advance of construction.**
4. **For All existing utilities the contractor shall contact the relevant utility provider.**
5. **Existing Services are based on record drawings and should not be deemed to be inclusive of all.**
6. **Services should be located on site by the Contractor prior to commencement of excavation.**
7. **The Contractor shall consult with utility companies and carry out investigative works to locate all services prior to all excavations.**

Legend

- Proposed Route - Section 1
- Proposed Route - Section 2
- Proposed Route - Section 3
- Proposed Route - Section 4
- Proposed Route - Section 5
- 2-Way Construction Access (via Existing Road)
- 2-Way Construction Access (Haul Road to be Laid)
- STOP/GO Construction Access (via Existing Road)
- STOP/GO Construction Access (Haul Road to be Laid)
- Proposed Construction Compound
- Proposed Motorist Detour Route
- Proposed Pedestrian Detour Route

REV	DATE	DRN	DESCRIPTION	CHK	APD

REVISIONS

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DRAWING STATUS

☒ PRELIMINARY ☐ CONTRACT ☐ TENDER ☐ CONSTRUCTION
☐ FOR APPROVAL ☐ FOR YOUR INFORMATION ☐ AS CONSTRUCTED

CLIENT

PROJECT
Limerick City Greenway (UL to NTP)

TITLE
Traffic Management Plan

Sheet 1 of 2

SCALE @ A3	DATE	DRAWN	CHECKED	APPROVED
1:5000	DEC 2024	AC	BL	PS

JOB No.	DRAWING No.	REV.
2535	TMP001	0

Construction Compound 3

Construction Compound 4

CASTLETROY
Caladh an Treoigh

NEWCASTLE
An Caisleán Nua

Halting Site

National Technology Park Limerick

River Shannon

Castle Troy

Kilmurry Village

Factory

Hotel

Castletroy House

Brierfield

Sports Ground

Tennis Grounds

Sports Field

Foot Bridge

Boat Slip

Elm Green Close

The Orchard

The Grotto

The Meadows

The Coppice

The Conifers

The Paddocks

Kilmurry Crescent

Kilmurry Road

STOP

GO

Redirect Motorist to ACCESS

Redirect Motorist to EXIT ACCESS

Notes

1. **Levels are in metres O.D. and refer to Malin Head Datum.**
2. **Dimensions are in millimetres unless otherwise stated.**
3. **Figured dimensions only to be used. If in doubt check with the Engineer in advance of construction.**
4. **For All existing utilities the contractor shall contact the relevant utility provider.**
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- Proposed Route - Section 1
- Proposed Route - Section 2
- Proposed Route - Section 3
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- Proposed Route - Section 5
- 2-Way Construction Access (via Existing Road)
- 2-Way Construction Access (Haul Road to be Laid)
- STOP/GO Construction Access (via Existing Road)
- STOP/GO Construction Access (Haul Road to be Laid)
- Proposed Construction Compound
- Proposed Motorist Detour Route
- Proposed Pedestrian Detour Route

REV	DATE	DRN	DESCRIPTION	CHK	APD

REVISIONS

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DRAWING STATUS

☒ PRELIMINARY ☐ CONTRACT ☐ TENDER ☐ CONSTRUCTION
☐ FOR APPROVAL ☐ FOR YOUR INFORMATION ☐ AS CONSTRUCTED

CLIENT

PROJECT
Limerick City Greenway
(UL to NTP)

TITLE
Traffic Management Plan
Sheet 2 of 2

SCALE @ A3	DATE	DRAWN	CHECKED	APPROVED
1:5000	DEC 2024	AC	BL	PS

JOB No.	DRAWING No.	REV.
2535	TMP002	0

APPENDIX B - Warning Signs for use at Roadworks

Sign No.	Sign Face	Description
WK 001	 	**Roadworks Ahead:** this sign shall be the first temporary sign visible to the road user on the approach to any roadworks. It may be supplemented with a Supplementary Plate P 082 indicating the nature of the works. At some sites, it is necessary to provide additional Signs WK 001 well in advance of the start of the roadworks. Where this is the case, the signs shall have a Supplementary Plate P 001 indicating the distance to the start of the works. **End of Roadworks**: the 'Roadworks Ahead' sign shall be erected together with a Supplementary Plate P 010, End, as the last temporary sign visible to the road user leaving any roadworks. This 'End' plate marks the finish of all other roadworks warning signs used within the site. **Cautionary Speed:** the 'Roadworks Ahead' sign may also be used at intervals through the roadworks together with Supplementary Plate P 011, Cautionary Speed (see Section 8.3.3).
WK 010		**One-lane Crossover (Out):** this sign should be used on divided carriageways to depict traffic crossing the central reserve in a single lane from one carriageway to that of the opposing traffic, forming a contra flow.
WK 011		**One-lane Crossover (Back):** this sign should be used on divided carriageways to depict traffic crossing the central reserve in a single lane from the carriageway of the opposing traffic back to the original side at the end of a contraflow.
WK 012		**Move to Left (One Lane):** this sign should be used to depict traffic being diverted to the left by approximately one lane width, once the traffic is operating in a single lane. When this sign is used to direct traffic onto the hard shoulder, it should be used in conjunction with Supplementary Plate P 083, Use Hard Shoulder.
WK 013		**Return to Main Carriageway (One Lane):** this sign should be used to depict traffic being diverted to the right. It is generally used to direct traffic back from the hard shoulder into the near-side lane of the main carriageway.

WK 014		**Move to Left (Two Lanes):** this sign should be used on a two or more lane carriageway to depict two lanes of traffic being diverted to the left by approximately one lane width. When this sign is used to direct traffic onto the hard shoulder, it should be used together with Supplementary Plate P 083, Use Hard Shoulder.
WK 015		**Return to Main Carriageway (Two Lanes):** this sign should be used on a two or more lane carriageway to depict traffic deviating to the right from the hard shoulder and lane 1 back onto the normal lanes. It may also be used for similar manoeuvres in three or more lane carriageways.
WK 016		**Obstruction Between Lanes:** this sign should be used to depict traffic travelling in the same direction being divided to pass on either side of an obstruction.
WK 017		**End of Obstruction Between Lanes:** this sign should be used to depict the end of traffic travelling in the same direction being divided on either side of an obstruction.
WK 018		**Start of Central Reserve or Obstruction:** this sign should be used to depict the start of a separation of traffic travelling in opposing directions either side of a central reserve or obstruction.
WK 019		**End of Central Reserve or Obstruction:** this sign should be used to depict the end of a central reserve or obstruction separating traffic travelling in opposing directions.
WK 020		**Lanes Diverge at Crossover:** this sign should be used on a dual carriageway to depict traffic in the near-side lane carrying straight on by deviating to the left and traffic in the off-side lane crossing the central reserve to the opposite carriageway at the start of a contra-flow.
WK 021		**Lanes Rejoin at Crossover:** this sign should be used on a dual carriageway to depict traffic in the near-side lane carrying straight on by deviating back to the right and traffic in the off-side lane crossing back over the central reserve at the end of a contra-flow.

WK 022		**Two-lane Crossover (Out):** this sign should be used on a dual carriageway to depict two lanes of traffic crossing the central reserve to the opposing carriageway side by side at the start of a contra-flow.
WK 023		**Two-lane Crossover (Back):** this sign should be used on a dual carriageway to depict two lanes of traffic crossing back over the central to the left-hand carriageway side by side at the end of a contra-flow.
WK 030		**Single Lane (for Shuttle Working):** this sign should be used to indicate that a length of road is operating with a single lane of traffic where the opposing traffic is either stopped or diverted. It is intended to reassure drivers that they will not encounter oncoming traffic.
WK 031		**Two-way Traffic:** this sign should be used where a one-way street or part of a dual carriageway is converted to a two-way operation for the purpose of carrying out roadworks. It may also be used to highlight a two-way diversion around the works.
WK 032		**Road Narrows on Left:** this sign should be used to depict roadworks on the left side of the carriageway on sections of two-lane road where a sudden reduction in carriageway width creates a potential hazard. It may also be used at roadworks with 'Priority', 'Give and Take' or shuttle working.
WK 033		**Road Narrows on Right:** this sign should be used to depict roadworks on the right side of the carriageway on sections of two-lane road where a sudden reduction in carriageway width creates a potential hazard. It may also be used at roadworks with 'Priority', 'Give and Take' or shuttle working.
WK 034		**Road Narrows on Both** Sides: this sign should be used to depict roadworks on both sides of the carriageway on sections of two-lane road where a sudden reduction in carriageway width creates a potential hazard. It may also be used at roadworks with 'Priority', 'Give and Take' or shuttle working.

WK 040		**Offside Lane (of Two) Closed:** this sign should be used on a two-lane one-way street or dual carriageway to depict an offside lane closure.
WK 041		**Nearside Lane (of Two) Closed:** this sign should be used on a two-lane one-way street or dual carriageway to depict a nearside lane closure.
WK 042		**Offside Lane (of Three) Closed:** this sign should be used on a three-lane one-way street or dual carriageway to depict an offside lane closure.
WK 043		**Nearside Lane (of Three) Closed:** this sign should be used on a three-lane one-way street or dual carriageway to depict a nearside lane closure.
WK 044		**Two Offside Lanes (of Three) Closed:** this sign should be used on a three-lane one-way street or dual carriageway to depict closure of both the centre and offside lanes.
WK 045		**Two Nearside Lanes (of Three) Closed:** this sign should be used on a three-lane one-way street or dual carriageway to depict closure of both the centre and nearside lanes.
WK 046		**Offside Lane (of Four) Closed:** this sign should be used on a dual four-lane carriageway to depict an offside lane closure.
WK 047		**Nearside Lane (of Four) Closed:** this sign should be used on a dual four-lane carriageway to depict a nearside lane closure.
WK 048		**Two Offside Lanes (of Four) Closed:** this sign should be used on a dual four-lane carriageway to depict closure of lanes 3 and 4 on the offside.

WK 049		**Two Nearside Lanes (of Four) Closed:** this sign should be used on a dual four-lane carriageway to depict closure of lanes 1 and 2 on the nearside.
WK 050		**Side Road on Left:** this sign should be used to indicate the presence of a road junction ahead to the left created by the roadworks.
WK 051		**Side Road on Right:** this sign should be used to indicate the presence of a road junction ahead to the right created by the roadworks.
WK 052		**Site Access on Left:** this sign should be used to indicate the position of a site entrance and/or exit to the left. On roads with a speed limit of >80km/h., an additional sign WK 052 should be positioned 100m in advance of the entrance, with a Supplementary Plate P001 stating the distance. At sites with several entrances, a supplementary colour code or numbering system may be used with this sign.
WK 053		**Site Access on Right:** this sign should be used to indicate the position of a site entrance and/or exit to the right. On roads with a speed limit of >80km/h., an additional sign WK 053 should be positioned 100m in advance of the entrance, with a Supplementary Plate P 001 stating the distance. At sites with several entrances, a supplementary colour code or numbering system may be used with this sign.
WK 060		**Temporary Traffic Signals:** this sign should be used to indicate the presence ahead of traffic control by means of temporary traffic signals. This sign may be used with a Supplementary Plate P 001 stating the distance if forward visibility is poor and on roads with speed limits of >80km/h.
WK 061		**Flagman Ahead:** this sign should be used to indicate the presence ahead of manual or automated traffic control by means of Stop & Go/Téigh discs. This sign may be used with a Supplementary Plate P 001 stating the distance if forward visibility is poor and on roads with speed limits of >80km/h.

WK 062		**Queues Likely:** this sign should be used where queues are likely to occur in an unexpected location due to roadworks. It may be used on high-speed roads or where a queue may form just after a bend. This sign shall always be preceded by a Roadworks Sign WK 001 with a Supplementary Plate P 001 stating the distance to the start of the roadworks.
WK 070		**Hump or Ramp:** this sign should be used to indicate the presence of a hump in the road either due to roadworks or to a traffic calming measure.
WK 071		**Uneven Surface:** this sign may be used to indicate that there is an uneven surface for vehicles, usually associated with the different layers of surfacing. At the start of the relevant section of road, this sign should be erected with supplementary Plate P 080, Slow. Sign WK 071 with Supplementary Plate P 010, End, should be erected to mark the end of the section affected. However, if this coincides with the end of the roadworks, Sign WK 001 with Supplementary Plate P 010 should be erected instead.
WK 072		**Slippery Road:** this sign should be used to warn that the danger of vehicles skidding is greater than normal. The degree of danger cannot be defined as it depends on the skid resistance, speed of traffic, superelevation, weather and other factors. The sign will normally be used where traffic is running on a temporary surface or the final surfacing has not yet been laid. Supplementary Plate P 085, Unfinished Road Surface, and Plate P 011, Cautionary Speed, may be used in conjunction with Sign WK 072. Sign WK 072 with Supplementary Plate P 010, End, should be erected to mark the end of the section affected. However, if this coincides with the end of the roadworks, Sign WK 001 with Supplementary Plate P 010 should be erected instead. Where roadworks are substantially complete but it is necessary for a road to remain for a period with a surface other than the permanent final surface course, Sign WK 072 should be used. Since this is a roadworks sign with an orange background, it must be preceded by Sign WK 001 even though other traffic management measures are removed.

WK 073		**Loose Chippings:** this sign should be used to indicate that there is a risk of airborne chips or stones due to a surfacing operation being undertaken. At the start of the relevant section of road, this sign may be erected with Supplementary Plate P 080, Slow, or P 011, Cautionary Speed. Sign WK 073 with Supplementary Plate P 010, End, should be erected to mark the end of the section affected. However, if this coincides with the end of the roadworks, Sign WK 001 with Supplementary Plate P 010 should be erected instead.
WK 074		**Soft Verge:** Where it is considered necessary to warn drivers of soft verges, Sign WK 074, Soft Verges, may be erected. Sign WK 074 with Supplementary Plate P 010, End, should be erected to mark the end of the section affected. However, if this coincides with the end of the roadworks, Sign WK 001 with Supplementary Plate P 010 should be erected instead.
WK 080		**Pedestrians Cross to Left:** this sign should be used to indicate that a footway is closed ahead and pedestrians should cross to the left at this point.
WK 081		**Pedestrians Cross to Right:** this sign should be used to indicate that a footway is closed ahead and pedestrians should cross to the right at this point
WK 090		**Detour:** these signs should be used in advance and at the start of a diversion route for any road that is closed due to roadworks. They indicate to the traffic the distance to the start of the detour. The distance displayed should be in accordance with Table 8.2.3.
WK 091	 	**Diverted Traffic:** these signs should be used to indicate straight ahead, left or right at every decision point, for the road user to follow a diversion route for any road that is closed due to roadworks. The arrow direction may be varied to suit. On diversions with long distances between decision points, it is recommended that the straight ahead variant be repeated at intervals, to reassure drivers that they are still on the correct route.

WK 092		**End of Detour:** this sign should be placed at the end of a diversion route, to advise drivers that they are back on the original route.
WK 093	 Typical sign	**Detour Destination:** for complicated diversion routes, Signs WK 093, are to be used in place of the Diverted Traffic (along the diversion) signs. These are direction or advance direction signs, designed in accordance with Chapter 2 but with an orange background. Such signs should show one or more destinations and the route number and only be used for diversion routes. Existing direction signs that do not contradict the roadwork signs, shall remain in place for the duration of the works.
WK 094		**Road Closed:** this sign should only be used in conjunction with WK 001 when a road has been closed to facilitate roadworks.
WK 095		**Stop Here On Red:** this sign may be used to indicate to drivers where to stop when temporary traffic controls are in place.
WK 096		**Free Recovery:** this sign should be used to indicate to drivers that there is a free recovery service in operation within the works. The sign should be repeated at 500m intervals. The telephone number must be varied to suit.
WK 097		**Free Recovery End:** this sign should be used to indicate to drivers where the end of the free recovery service takes effect beyond the works.

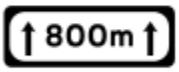
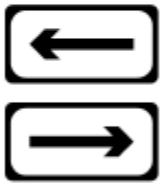
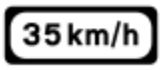
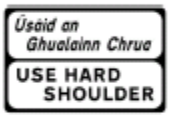
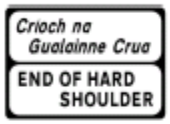
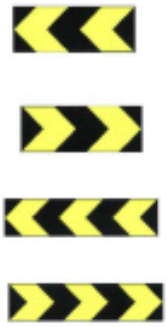
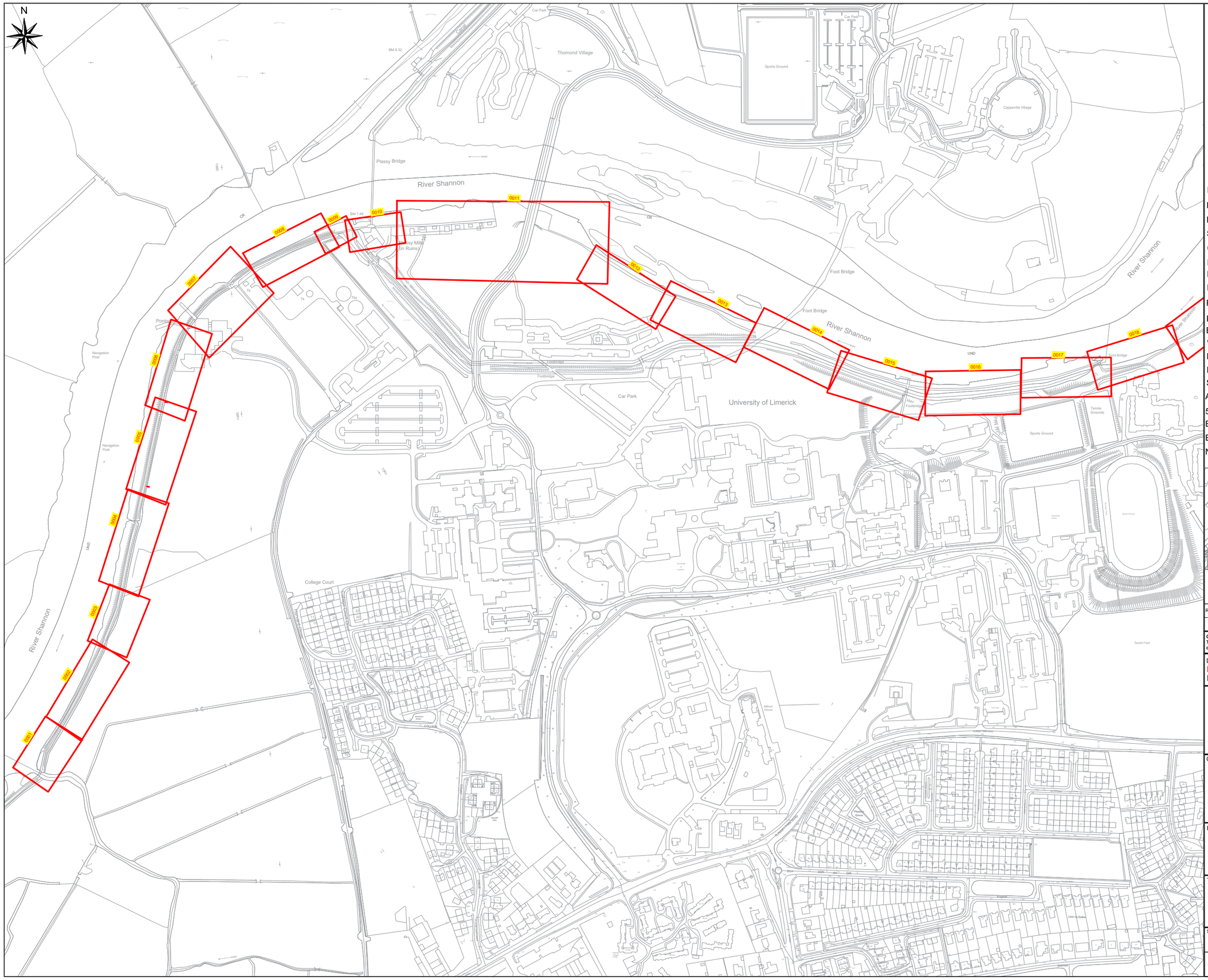
Plate No.	Sign Face	Description
P 001		**Distance:** This plate may be used in conjunction with any roadworks sign to indicate the distance to a hazard. The distance shown on the plate shall be in accordance with Table 8.2.3.
P 002		**Length:** This plate may be used in conjunction with any roadworks sign to indicate the extent of the hazard. The distance shown on the plate shall be in accordance with Table 8.2.3.
P 003L P 003R		**Direction:** These plates may be used in conjunction with any roadworks sign to indicate the direction to a hazard.
P 004L P 004R		**Direction and Distance:** These plates may be used in conjunction with any roadworks sign to indicate the direction and distance to a hazard. The distance shown on the plate shall be in accordance with Table 8.2.3.
P 010		**End:** this plate may be used in conjunction with any roadworks sign to highlight to the road user that the end of a specific hazard or operation has been reached.
P 011		**Cautionary Speed**: this plate may be used in conjunction with Sign WK 001, Roadworks Ahead, Sign WK 072, Slippery Road, or Sign WK 073, Loose Chippings, to indicate the speed which traffic is recommended not to exceed. The speed displayed must be one from the following list: 25, 35, 45, 55, 65 or 75km/h. See Section 8.3.3.
P 069		**Safe Height for Overhead Electric Cables:** this plate must be used in conjunction with sign W 111 to advise vehicles of the safe height available. The safe height should be agreed with the owner of the electrical cables and rounded down to the nearest 0.1m.
P 080		**Slow:** this plate may be used in conjunction with any roadworks sign to highlight to the road user that speed should be reduced when passing a particular hazard or operation.

Plate No.	Sign Face	Description
P 081		**Concealed Entrance:** this plate may be used in conjunction with signs WK 050, WK 051, WK 052 or WK 053 to indicate the presence of a concealed site entrance or existing entrance within the works.
P 082	 Typical sign	**Type of Works:** these plates may be used in conjunction with Sign WK 001 at the start of roadworks to highlight to the road user a specific type of operation is being carried out. One of the following alternatives, in bilingual format, should be used as appropriate: Bridge Inspection — Iniúchadh Droichid Bridge Repairs — Deisiú Droichid Grass Cutting — Bearradh Féir Gritting — Grean á Leagan Gully Emptying — Folmhú Clasáin Hedge Cutting — Bearradh Fáil Line Painting — Línphéinteáil Litter Picking — Bailiú Brusca Mobile Roadworks — Oibreacha Bóthair Soghluaiste Road Marking — Marcáil Bóthair Road Repairs — Deisiú Bóthair Road Resurfacing — Athdhromchlú Salting — Sailleadh Stud Fitting — Feistiú Stoda Surveying — Suirbhéireacht Sweeping — Scuabadh Tree Cutting — Bearradh Crann Weed Spraying — Spraeáil Fiailí
P 083		**Use Hard Shoulder:** this plate may be used in conjunction with Signs WK 012 and WK 014 where it is necessary for the hard shoulder to be used as a traffic lane.
P 084		**Hard Shoulder Closed:** this plate may be used in conjunction with Sign WK 001 to indicate that the hard shoulder, but not the traffic lanes, is closed temporarily.
P085		**Unfinished Road Surface**: this plate should be used in conjunction with Sign WK 072, Slippery Road, to indicate that the final surfacing has not yet been laid.
P086		**On Slip Road**: this plate should be used in conjunction with sign WK001 and all other advanced warning signs on the mainline or side roads to indicate that the works are being carried out on the diverge or merge slips.

Sign No.	Sign Face	Description
W 062 W 063		**Chevron Boards:** Chevron boards are used to direct traffic at a change of direction. At roadworks, they are normally situated behind a line of cones or other barrier in the line of sight of approaching drivers. Standard chevron boards have two or three chevrons, but longer boards may be used (see Chapter 6).
W 110		**Restricted Headroom:** Where a warning sign is appropriate, Sign W 110 should be used, with the available headroom indicated in metres to one decimal place.
W 111		**Overhead Electrical Cables:** Where there is a danger that high vehicles may contact overhead electrical cables, Sign W 111, Overhead Electrical Cables, should be provided on each approach (see Chapter 6). Sign W 111 shall be erected together with Supplementary Plate P 069, Safe Height, to advise vehicles of the safe height available. The safe height should be agreed with the owner of the electrical cables and rounded down to the nearest 0.1m..
W 183 W 184 W185		**Barrier Boards:** Barrier boards indicate that a lane is closed. At roadworks, they are normally situated behind a line of cones or other barrier to indicate the start of a closed lane. Barrier boards may be repeated at intervals along the closed lane. Standard barrier boards have three, four or five red bars. They shall always start and finish with a red bar (see Chapter 6).
RUS 039 to RUS 044	 RUS 043 RUS 042	**Speed Limit:** Speed limit signs (RUS 039 to RUS 044) indicate the maximum allowable speed applying to a length of road. At roadworks, they may indicate the permanent speed limit for that length of road, or a roadworks speed limit implemented for the particular works. Speed Limit signs may show a speed of a 120, 100, 80, 60, 50 or 30km/h. No other speed limit value shall be used. A speed limit sign should be erected on both sides of the carriageway. Repeater signs should be provided at a maximum of 500m intervals and after a junction. See Section 8.3.3 and Chapter 5 for further details.

Sign No.	Sign Face	Description
RUS 014	 	**No Overtaking:** No Overtaking sign prohibits overtaking at locations where it is considered dangerous to do so (see Chapter 5). At the point where the overtaking restriction ends, Sign RUS 014 shall be erected together with a Supplementary Plate P 010, End.
RUS 026		**Yield:** The Yield Sign imposes a requirement on all approaching vehicular traffic to yield (see Chapter 5). It is generally provided in association with a Yield Line, RRM 018 (see Chapter 7).
RUS 027		**Stop:** The Stop Sign imposes a requirement on all approaching vehicular traffic to stop (see Chapter 5). It is generally provided in association with a Stop Line, RRM 017 (see Chapter 7).
RUS 001		**Keep Left:** Traffic must pass to the left of the sign. Used at a nosing or similar, where all traffic must pass to the left (see Chapter 5).
RUS 002		**Keep Right:** Traffic must pass to the right of the sign. Used at a nosing or similar, where all traffic must pass to the right (see Chapter 5).
RUS 003		**Pass Either Side:** Traffic may pass to either the left or right of the sign. Used at a nosing or similar, where traffic splits to pass either side of an island, or some traffic diverges (see Chapter 5).
RUS 060 RUS 061		**Stop and Go:** Stop and Go discs shall display 'STOP' with a red background on one side and 'GO' or '*Téigh*' with a green background on the reverse. These signs are used for controlling traffic by manual or automated methods. See Sections 8.2.7 and 8.3.9 and Chapter 5. If a sign is to be used to stop both streams of traffic at the one time, such as at a site exit, then a panel displaying 'STOP' on both sides should be used.
RUS ...	Various	**Other Regulatory Signs:** Where a need arises, any of the regulatory signs in Chapter 5 may be used at roadworks.
F401		**Speed Limit Ahead:** this sign may be used to warn traffic of a roadworks speed limit ahead. The distance shown on the plate shall be in accordance with Table 8.2.3. The speed limit displayed shall match the regulatory speed limit for which this sign is advance notification. See Section 8.3.3 and Chapter 4.



Notes

1. **Levels are in metres O.D. and refer to Malin Head Datum.**
2. **Dimensions are in millimetres unless otherwise stated.**
3. **Figured dimensions only to be used. If in doubt check with the Engineer in advance of construction.**
4. **For Existing Electrical and Telecom Services contact the relevant utility provider.**
5. **Existing Services are based on record drawings and should not be deemed to be inclusive of all.**
6. **Services should be located on site by the Contractor prior to commencement of excavation.**
7. **The Contractor shall consult with utility companies and carry out investigative works to locate all services prior to all excavations.**

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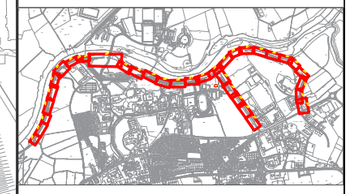
Legend

- Proposed Greenway /Root Protection
- Footpath
- Existing Road Surface
- Structural Bridge/Deck
- Cycle Lane
- Proposed Raised Table
- Proposed Corduroy Tactile Paving
- Proposed Blister Tactile Paving
- Proposed Grading
- Proposed Drain
- Existing Path
- Wooden Post & Rail Fencing
- Metal Parapet
- Electrical Ducting for Lighting
- SAC Boundary Line
- Area for Replacement Tree Planting
- 5m High Lighting Column
- Existing Tree - To Be Retained
- Existing Tree - To Be Removed
- New Tree - To Be Planted



REV	DATE	DRN	DESCRIPTION	CHK	APD

REVISIONS

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DRAWING STATUS

☒ PRELIMINARY ☐ CONTRACT ☐ TENDER ☐ CONSTRUCTION
☐ FOR APPROVAL ☐ FOR YOUR INFORMATION ☐ AS CONSTRUCTED ☐ DRAFT

RYAN HANLEY now Stantec

CLIENT

Comhairle Cathrach & Contae Luimnigh
Limerick City & County Council

PROJECT

Limerick City Greenway
(UL to NTP)

TITLE

Planning Drawings

Sheet 1 of 2

SCALE @ A1	DATE	DRAWN	CHECKED	APPROVED
1:2500	OCT 2023	KB	BL	PS

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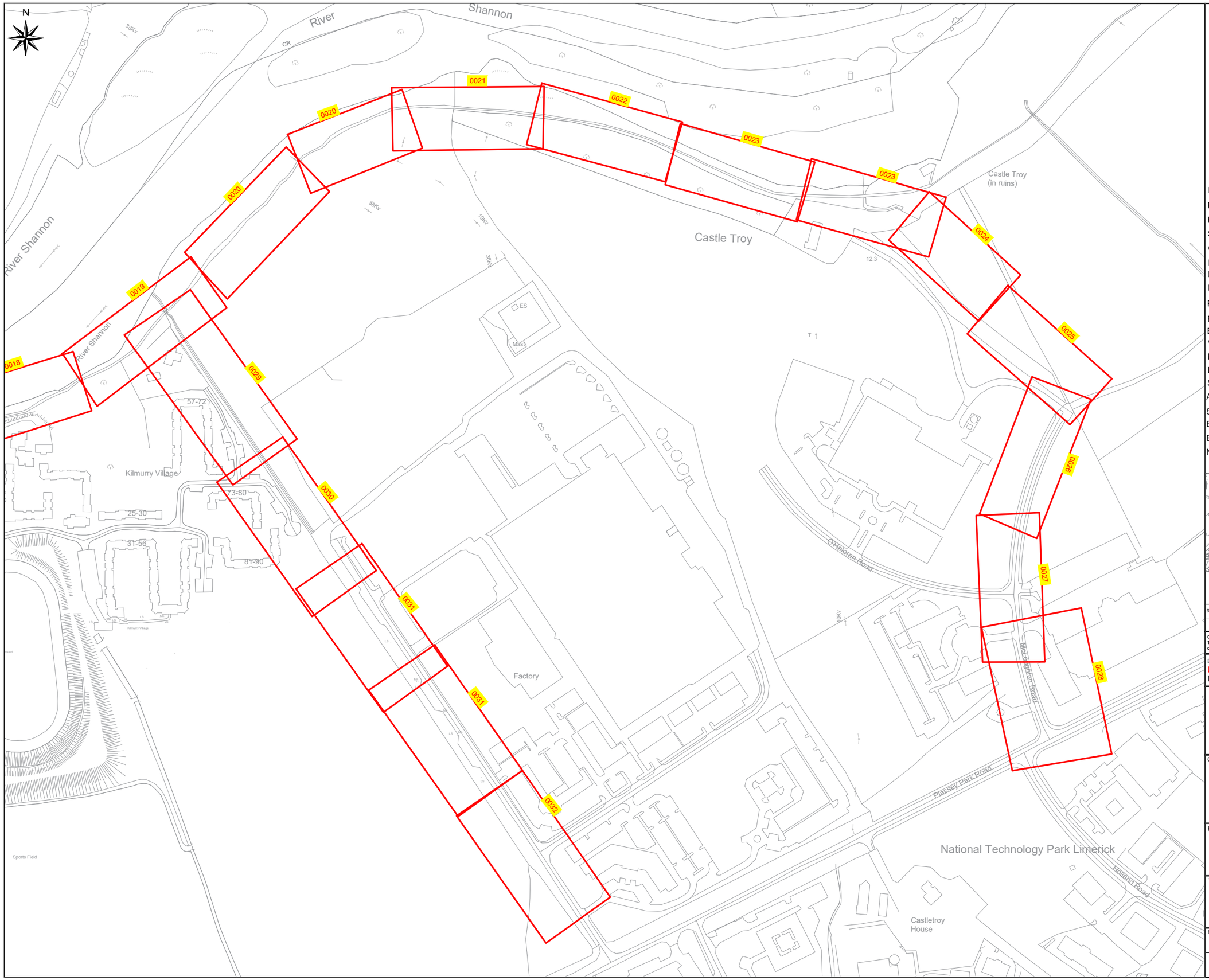

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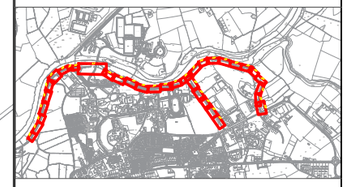

REV	DATE	DRN	DESCRIPTION	CHK	APD

REVISIONS

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RYAN HANLEY now Stantec

CLIENT

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Limerick City & County Council

PROJECT

Limerick City Greenway
(UL to NTP)

TITLE

Planning Drawings

Sheet 2 of 2

SCALE @ A1	DATE	DRAWN	CHECKED	APPROVED
1:200	OCT 2023	KB	BL	PS

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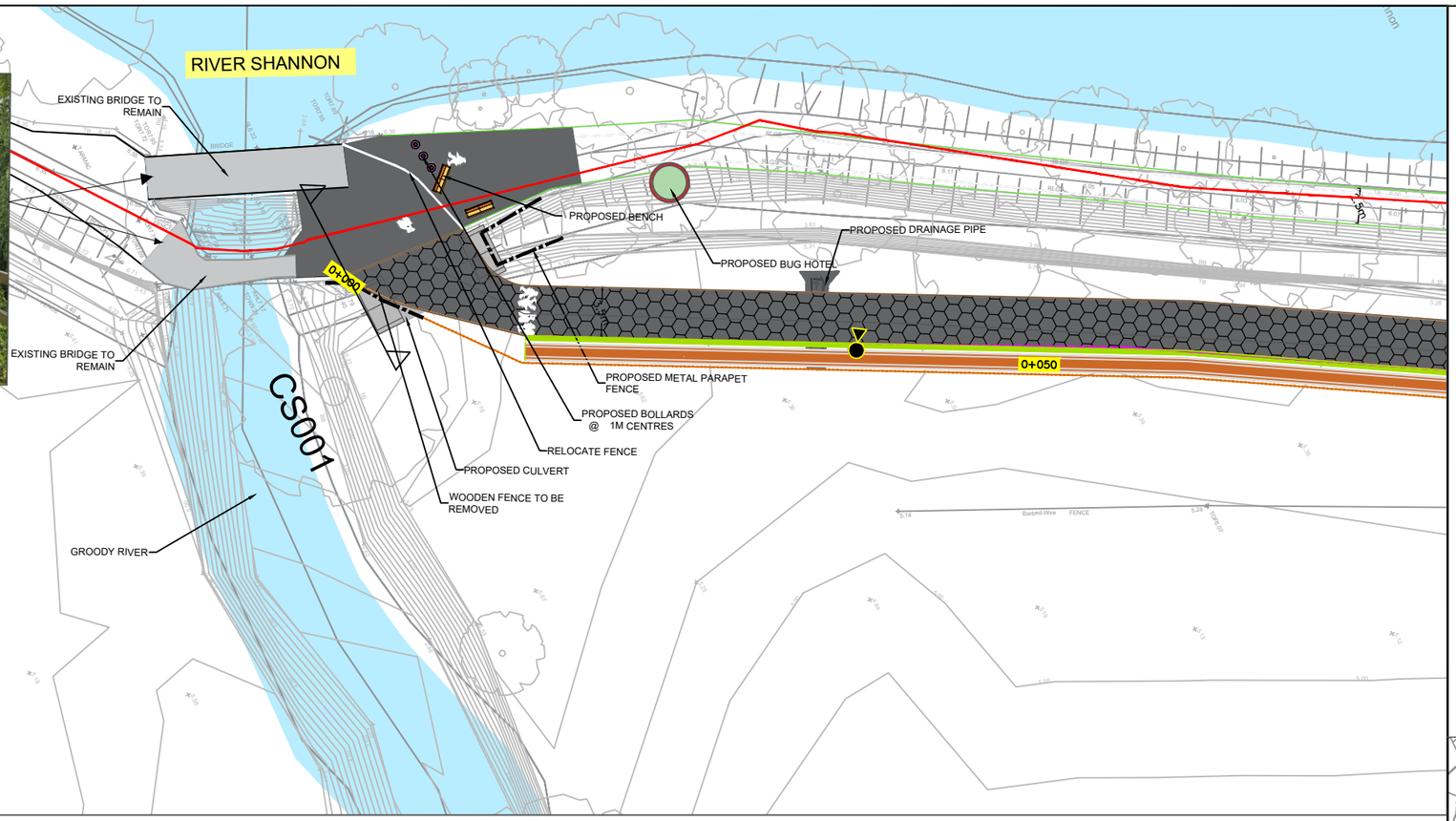

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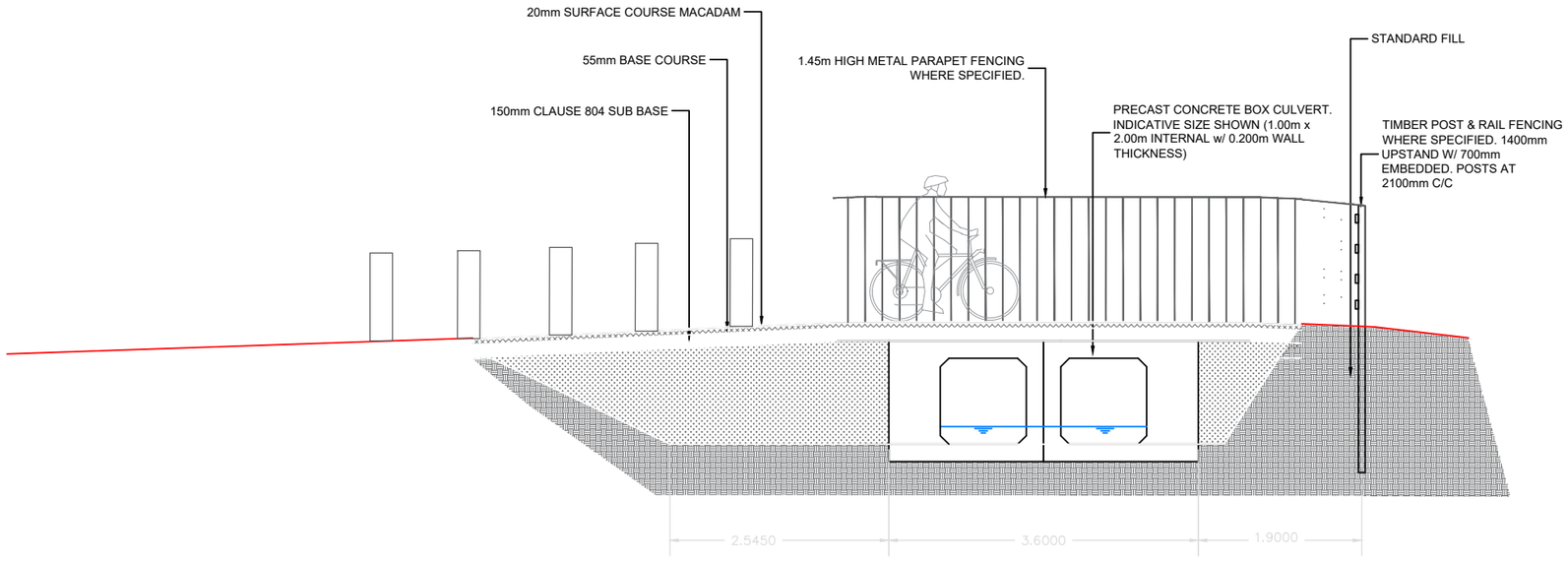

CS001

Notes

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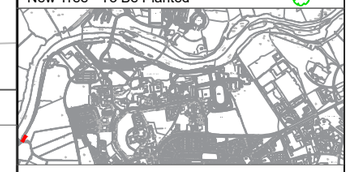
Legend

- Proposed Greenway /Root Protection
- Footpath
- Existing Road Surface
- Structural Bridge/Deck
- Cycle Lane
- Proposed Raised Table
- Proposed Corduroy Tactile Paving
- Proposed Blister Tactile Paving
- Proposed Grading
- Proposed Drain
- Existing Path
- Wooden Post & Rail Fencing
- Metal Parapet
- Electrical Ducting for Lighting
- SAC Boundary Line
- Area for Replacement Tree Planting
- 5m High Lighting Column
- Existing Tree - To Be Retained
- Existing Tree - To Be Removed
- New Tree - To Be Planted



REV	DATE	DRN	DESCRIPTION	CHK	APD

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RYAN HANLEY now Stantec

CLIENT

Comhairle Cathrach & Contae Luimnigh
Limerick City & County Council

PROJECT

Limerick City Greenway
(UL to NTP)

TITLE

Planning Drawings

Sheet 1 of 32

SCALE @ A1	DATE	DRAWN	CHECKED	APPROVED
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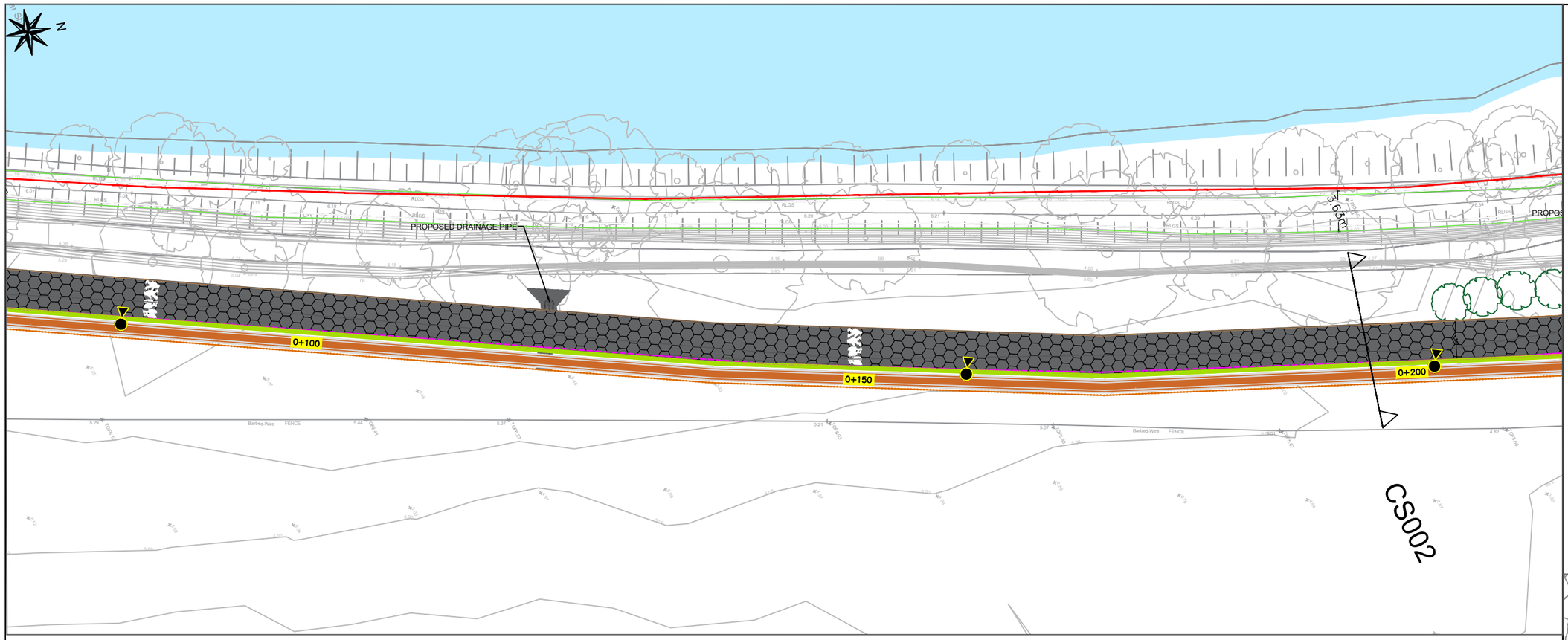

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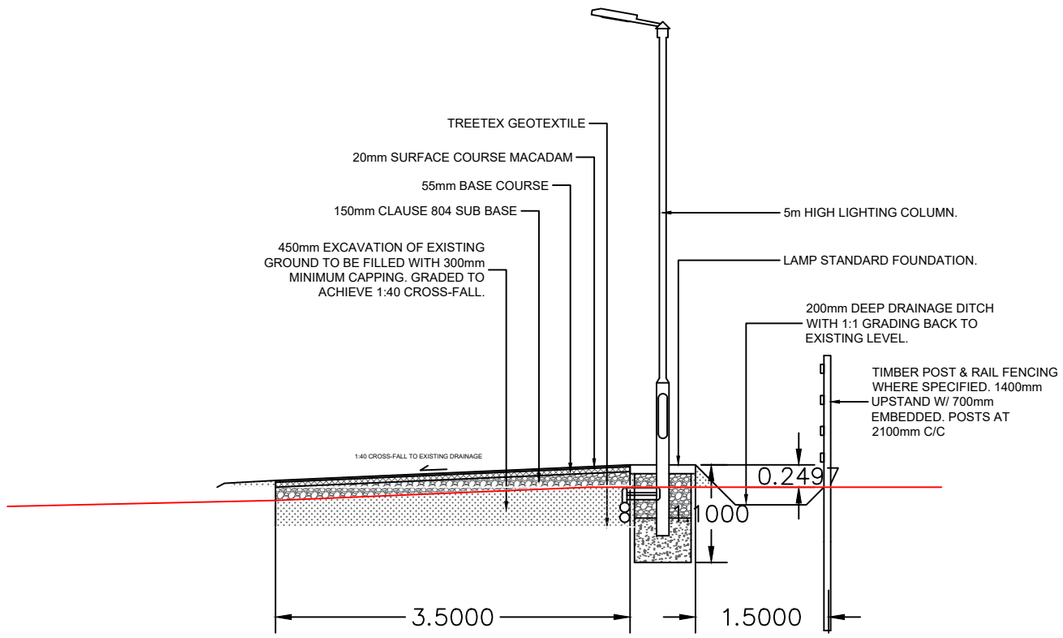

CS002

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- Area for Replacement Tree Planting
- 5m High Lighting Column
- Existing Tree - To Be Retained
- Existing Tree - To Be Removed
- New Tree - To Be Planted

REV	DATE	DRN	DESCRIPTION	CHK	APD

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Limerick City & County Council

PROJECT

Limerick City Greenway
(UL to NTP)

TITLE

Planning Drawings

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SCALE @ A1	DATE	DRAWN	CHECKED	APPROVED
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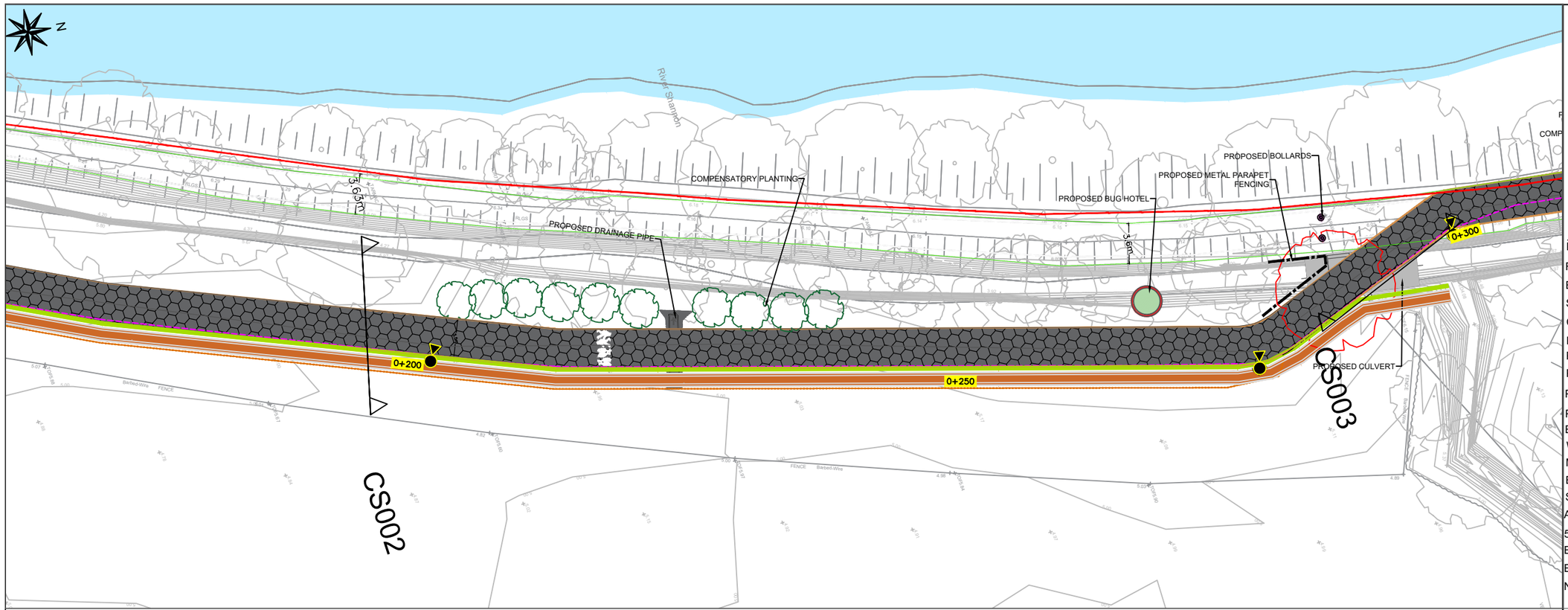

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- Existing Tree - To Be Retained
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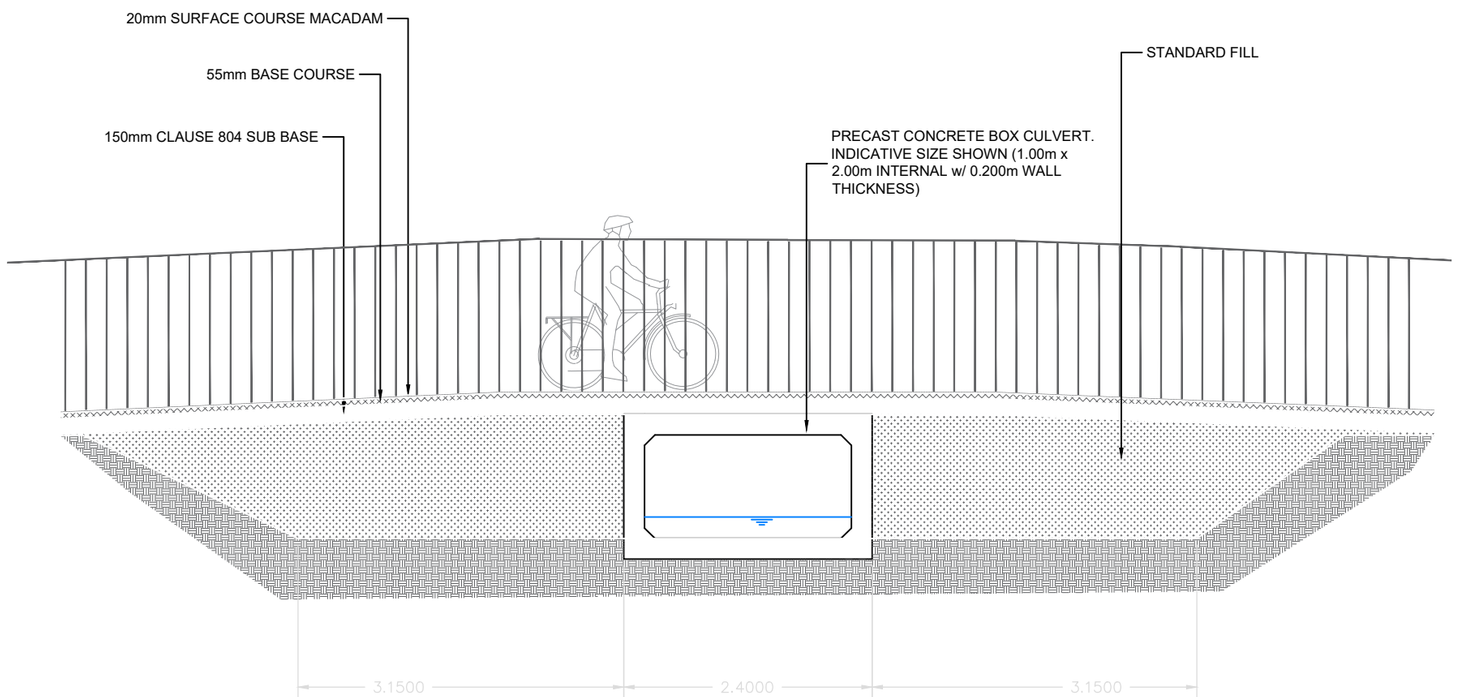
PLATE NO.3



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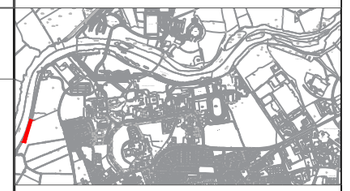

REV	DATE	DRN	DESCRIPTION	CHK	APD

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PROJECT

Limerick City Greenway
(UL to NTP)

TITLE

Planning Drawings

Sheet 3 of 32

SCALE @ A1	DATE	DRAWN	CHECKED	APPROVED
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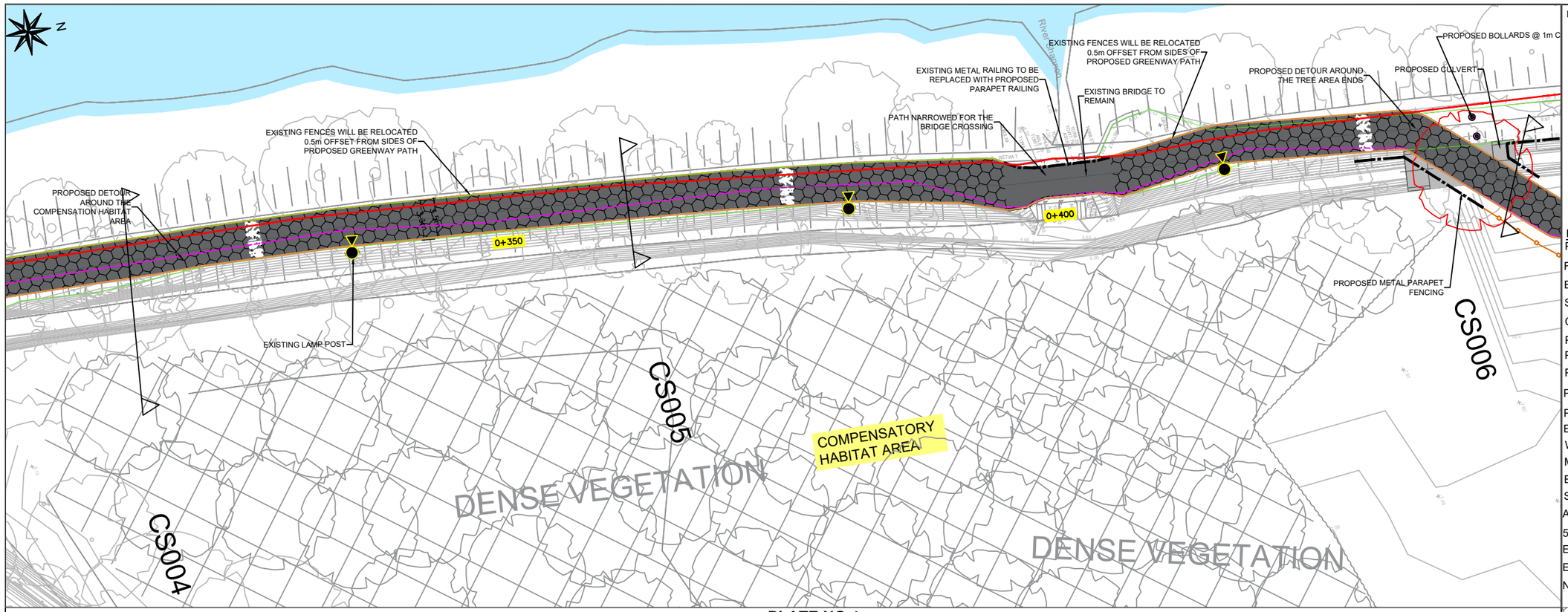

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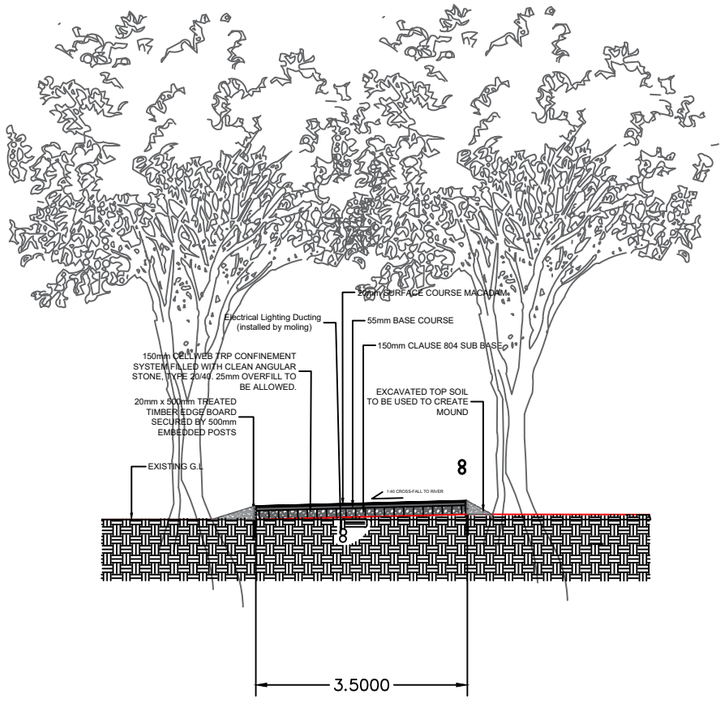
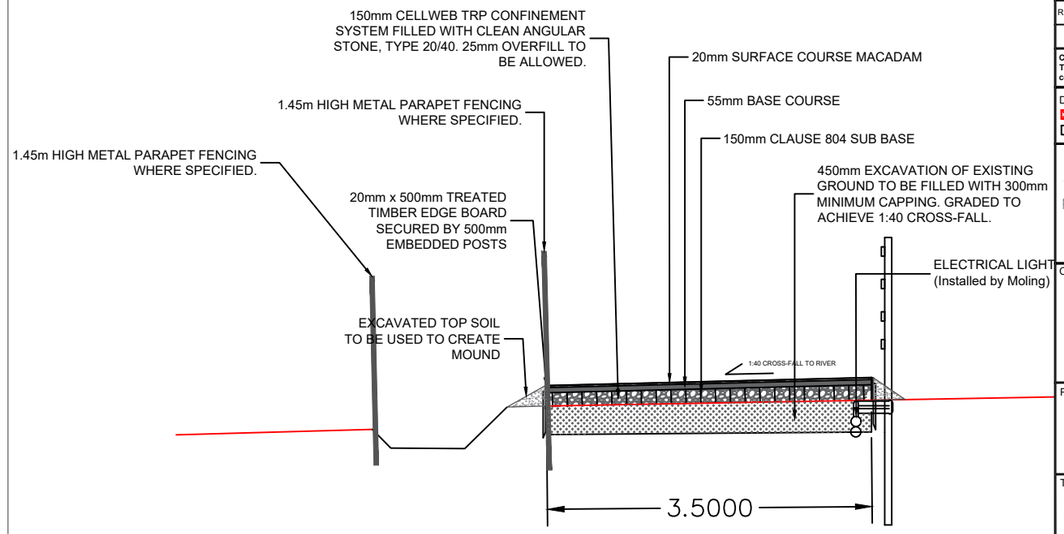


CS004 and CS005



CS006

Notes

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- Existing Tree - To Be Removed
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REV	DATE	DRN	DESCRIPTION	CHK	APD

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PROJECT

Limerick City Greenway (UL to NTP)

TITLE

Planning Drawings

Sheet 4 of 32

SCALE @ A1	DATE	DRAWN	CHECKED	APPROVED
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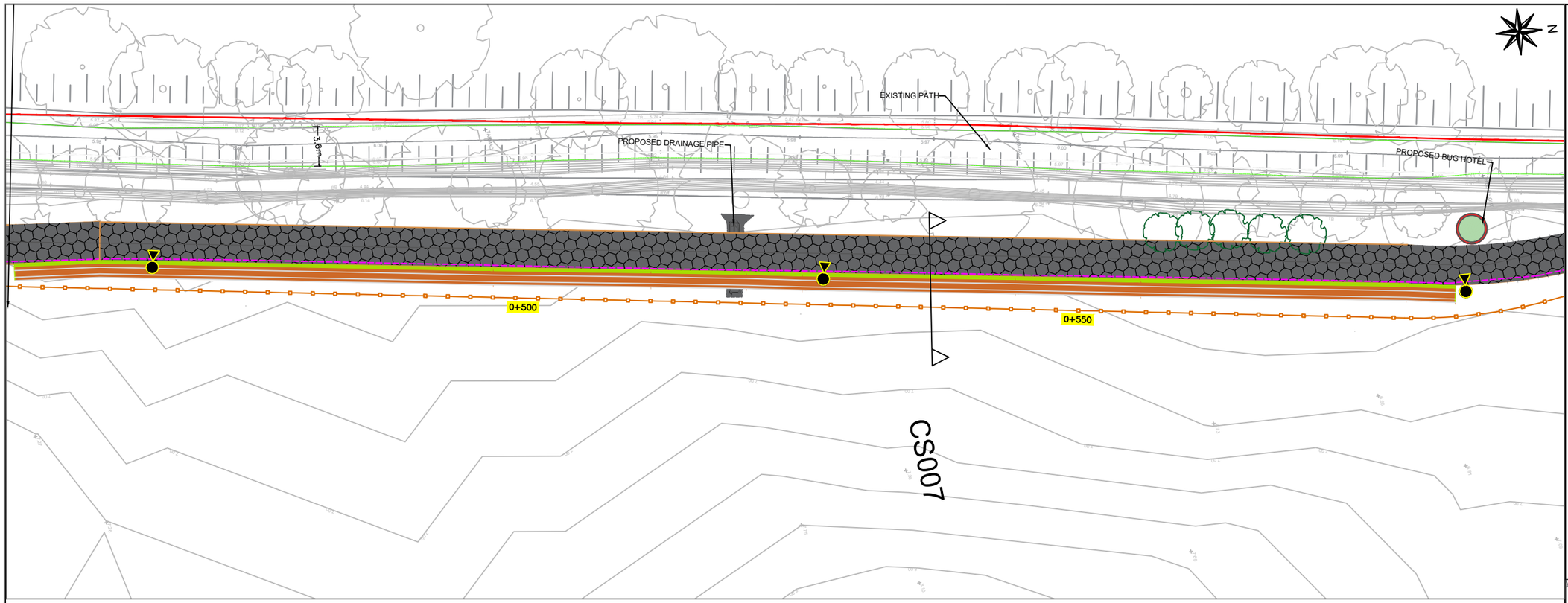

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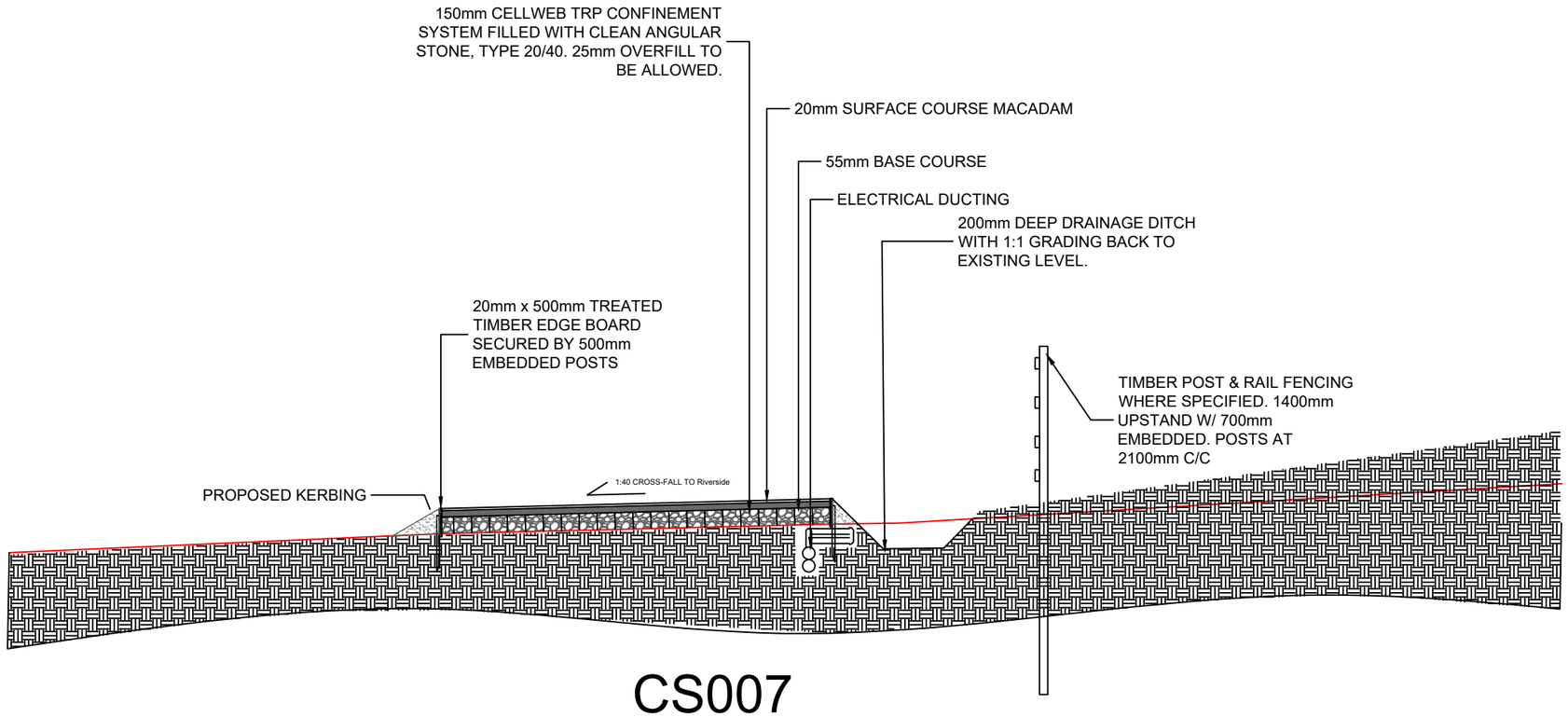

CS007

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PROJECT

Limerick City Greenway (UL to NTP)

TITLE

Planning Drawings

Sheet 5 of 32

SCALE @ A1	DATE	DRAWN	CHECKED	APPROVED
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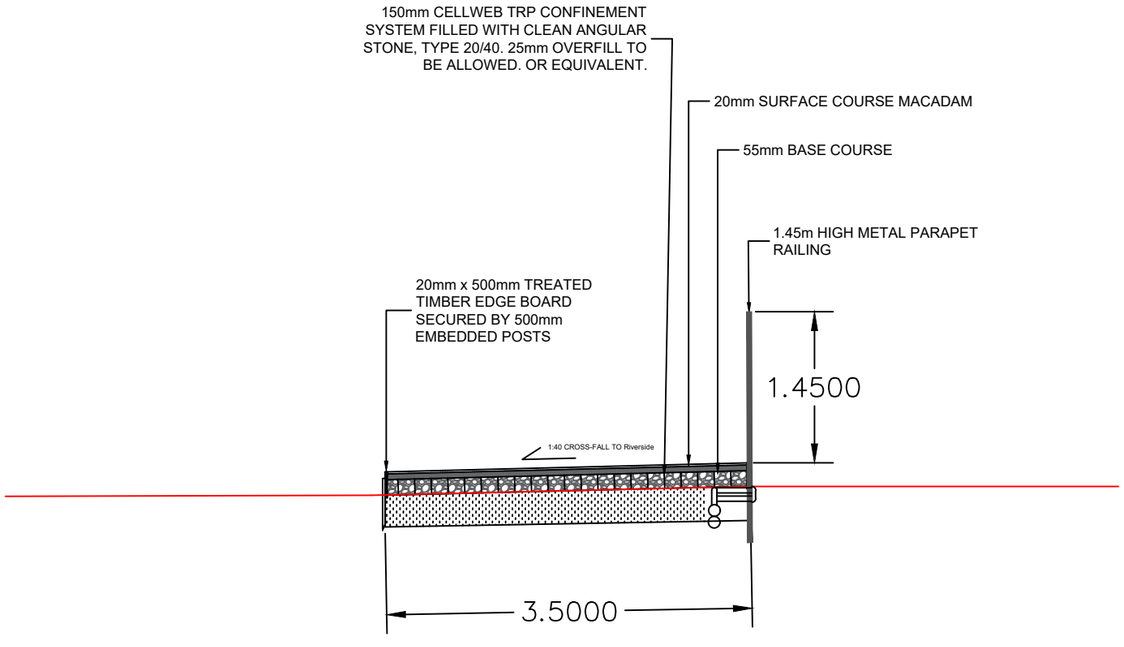

CS008

Notes

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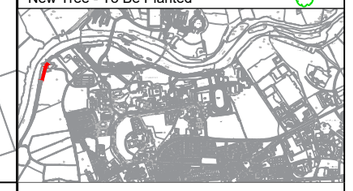

REV	DATE	DRN	DESCRIPTION	CHK	APD

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PROJECT

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(UL to NTP)

TITLE

Planning Drawings

Sheet 6 of 32

SCALE @ A1	DATE	DRAWN	CHECKED	APPROVED
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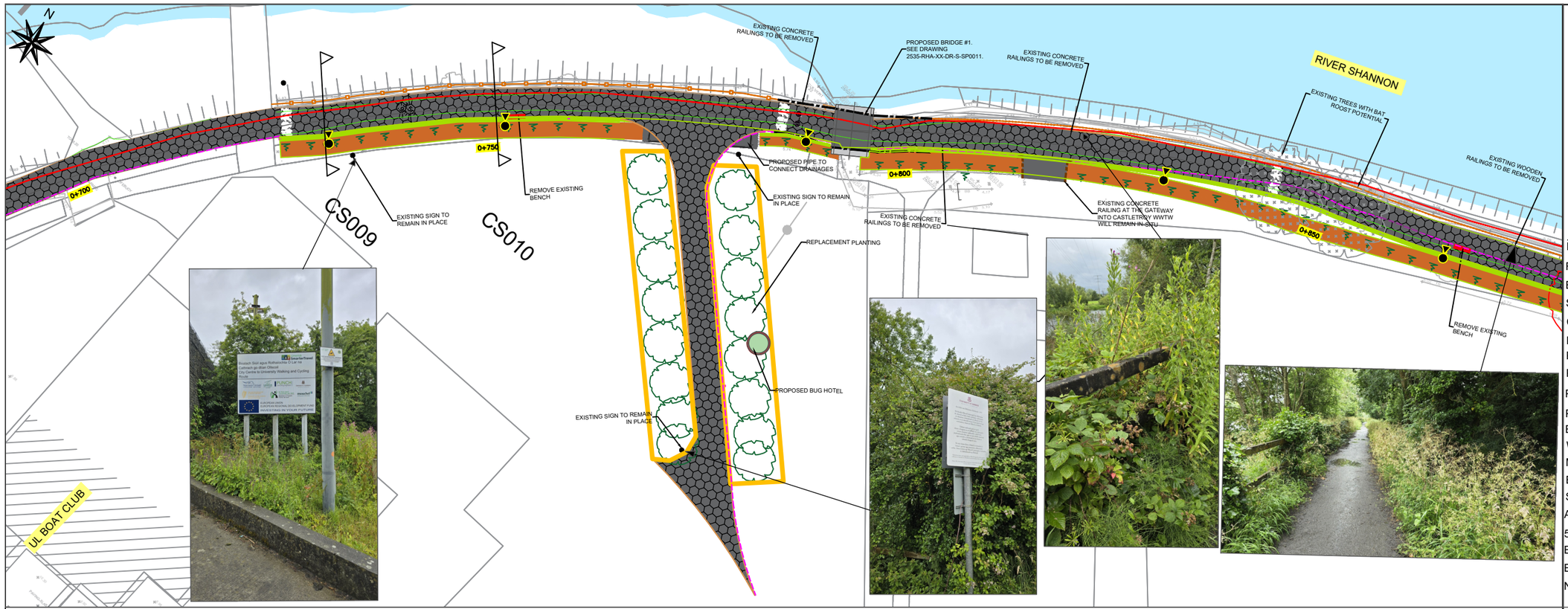

PLATE NO. 7

Notes

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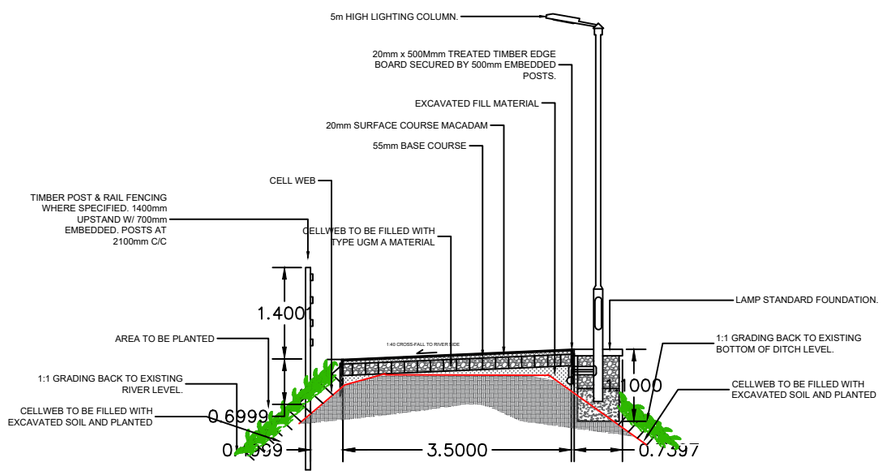

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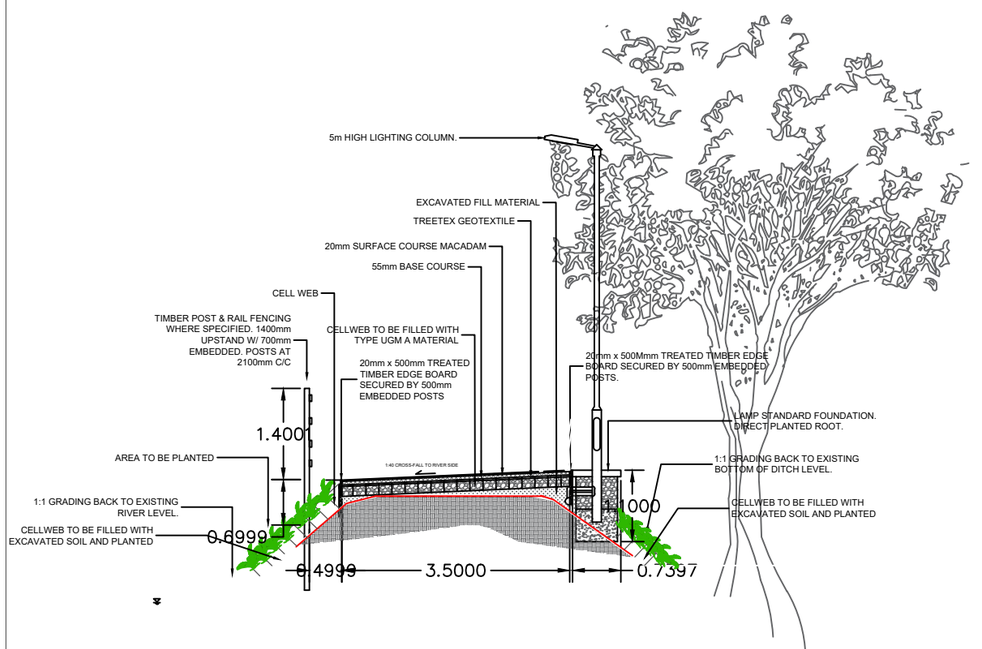

CS0010

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TITLE

Planning Drawings

Sheet 7 of 32

SCALE @ A1	DATE	DRAWN	CHECKED	APPROVED
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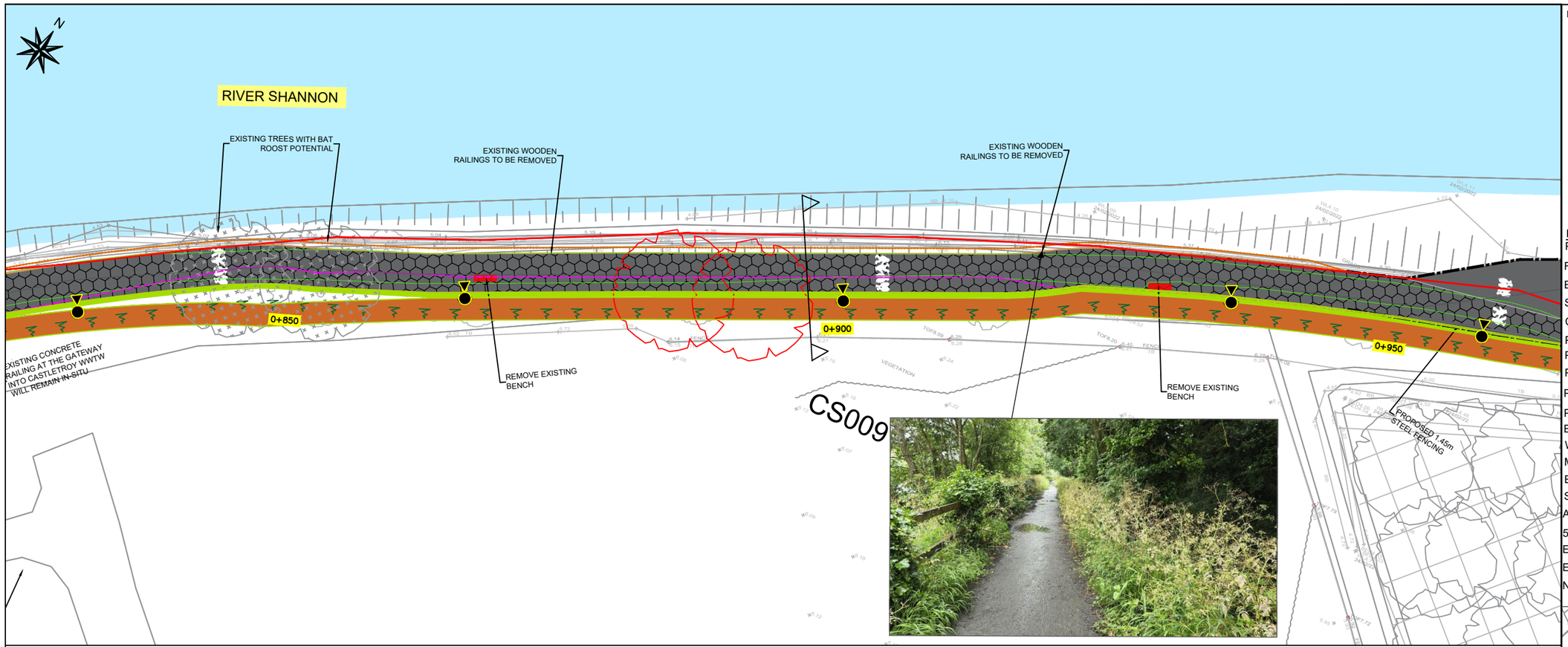

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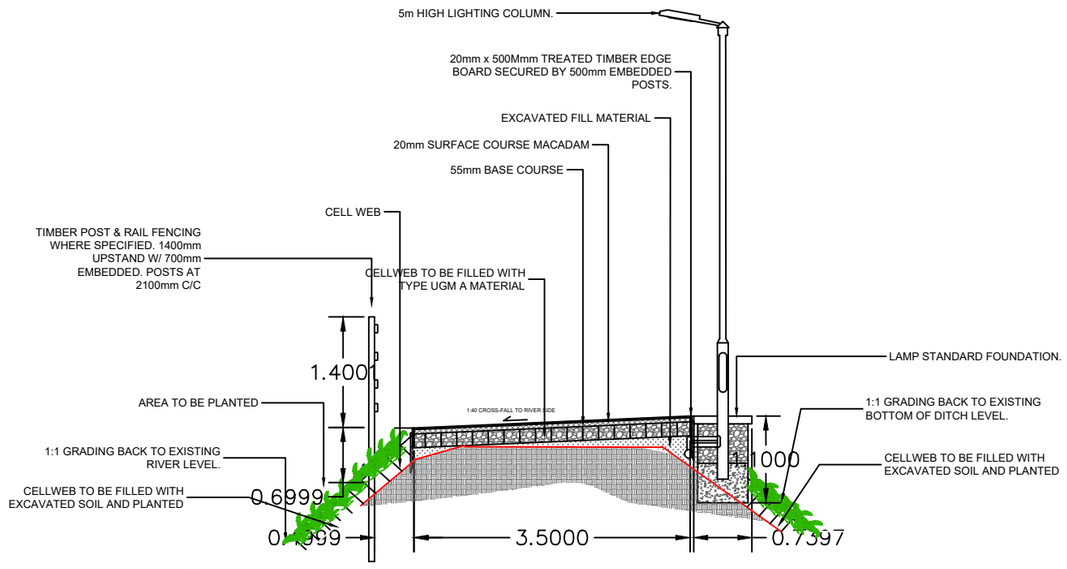

CS009

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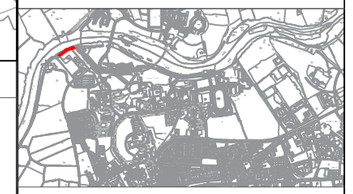

REV	DATE	DRN	DESCRIPTION	CHK	APD

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Planning Drawings

Sheet 8 of 32

SCALE @ A1	DATE	DRAWN	CHECKED	APPROVED
1:200	OCT 2023	KB	BL	PS

JOB No.	CAD FILE PATH	DRAWING No.	REV.
2535	2535 / 04 / DD / 01	PD0008	

PROPOSED 1.45m STEEL FENCING

PROPOSED BRIDGE #2.
SEE DRAWING RHA-XX-DR-S-SP0021

PROPOSED LIVING WALL FOR THE BRIDGE

METAL PARAPET TO TIE INTO EXISTING WOODEN RAILINGS

EXISTING SIGN TO REMAIN IN PLACE

EXISTING STONE PARAPET

PROPOSED 1.45m STEEL FENCING

PROPOSED 1.45m STEEL FENCING

0+950

Notes

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Legend

- Proposed Greenway /Root Protection
- Footpath
- Existing Road Surface
- Structural Bridge/Deck
- Cycle Lane
- Proposed Raised Table
- Proposed Corduroy Tactile Paving
- Proposed Blister Tactile Paving
- Proposed Grading
- Proposed Drain
- Existing Path
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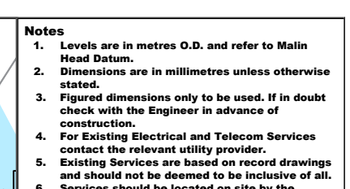
- Metal Parapet
- Electrical Ducting for Lighting
- SAC Boundary Line
- Area for Replacement Tree Planting
- 5m High Lighting Column
- Existing Tree - To Be Retained
- Existing Tree - To Be Removed
- New Tree - To Be Planted



REV	DATE	DRN	DESCRIPTION	CHK	APD

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RYAN HANLEY now Stantec

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Limerick City & County Council

PROJECT

Limerick City Greenway
(UL to NTP)

TITLE

Planning Drawings

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JOB No.	CAD FILE PATH	DRAWING No.	REV.
2535	2535 / 04 / DD / 01	PD0009	

PLATE NO.9

CS011

PROPOSED BRIDGE #3.
SEE DRAWING 2535-RHA-DR-S-SP0031

PROPOSED LIVING WALL
FOR THE BRIDGE

RAISE EXISTING PARAPET
TO 1m ABOVE GL

PROPOSED 1.45m STEEL
FENCING WITH 0.5m
EMBEDDED

EXISTING PEDESTRIAN
BRIDGE / PROPOSED
FUTURE GREENWAY LINK
TO KILLALOE

2.4m HIGH ANTI-CLIMB MESH
FENCING

EXISTING GATE TO REMAIN

1+000

EXISTING SIGN TO REMAIN
IN PLACE

PROPOSED PLASSEY MILL
LAY-BY AREA

PROPOSED BENCH

PROPOSED BIKE RACK

PROPOSED BENCH

EXISTING ENTRANCE TO
PLASSEY MILL TO BE
SEALED OFF

EXISTING SIGN TO REMAIN
IN PLACE

EXISTING CHAIN LINK TO
REMAIN

PLASSEY MILLS

EXISTING OVERSPILL FOR
PLASSEY MILL RACE

PET TO TIE
G WOODEN
RAILINGS

REMAIN

CS012

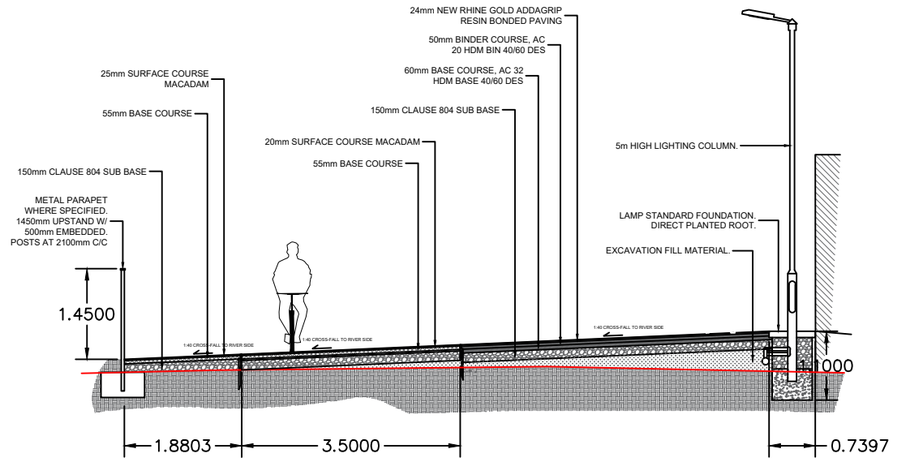
PROPOSED BRIDGE #4.
SEE DRAWING 2535-RHA-DR-S-SP0041

PROPOSED 1.45m
STEEL FENCING

PROPOSED GREENWAY DIVERGES FROM
EXISTING PATH TO AVOID MATURE
TREES ALONG THE RIVER BANK

PROPOSED
KISSING GATE

1+050



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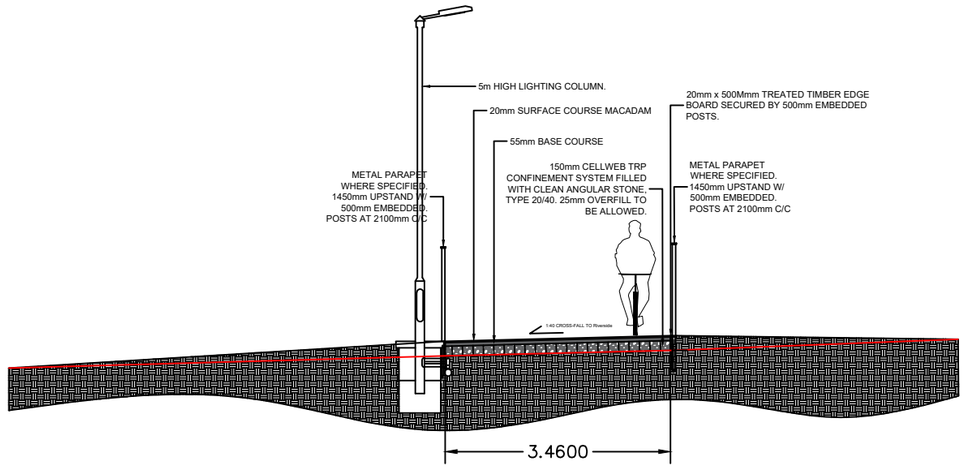

CS012

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REV	DATE	DRN	DESCRIPTION	CHK	APD

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Planning Drawings

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JOB No.	CAD FILE PATH	DRAWING No.	REV.
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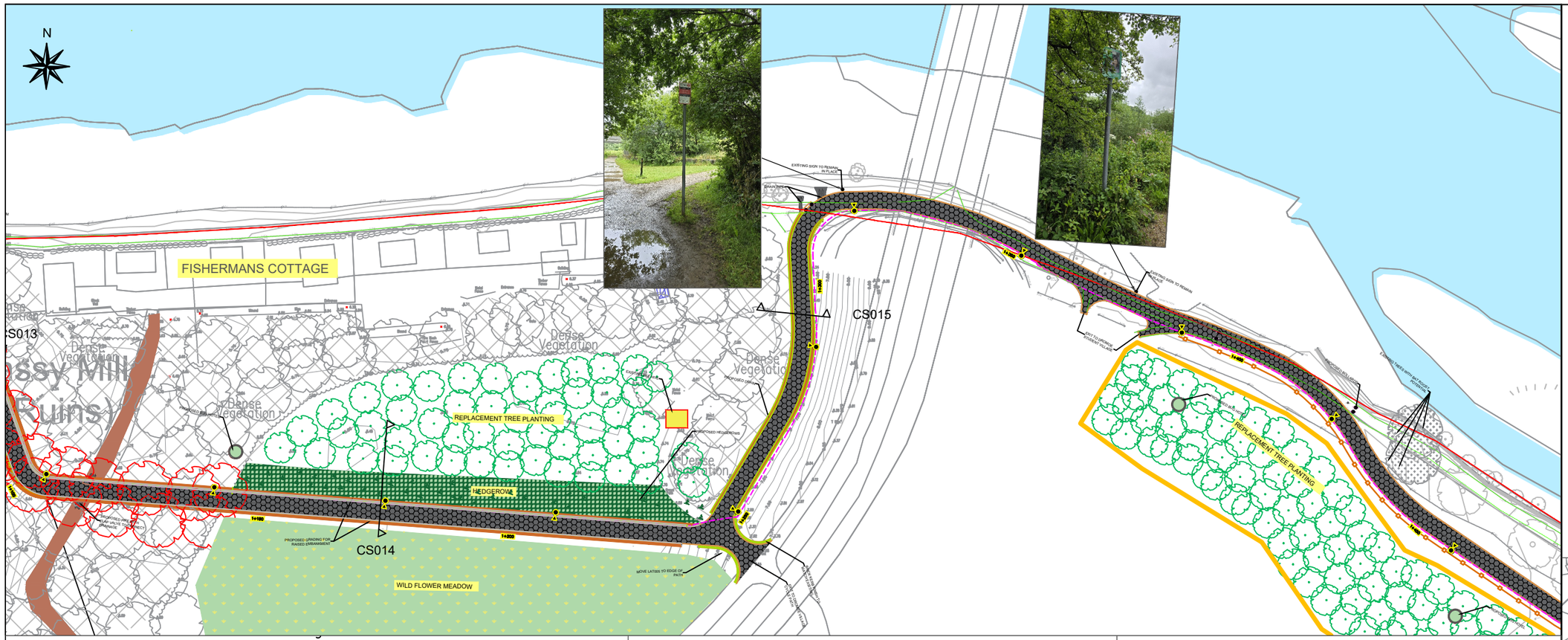
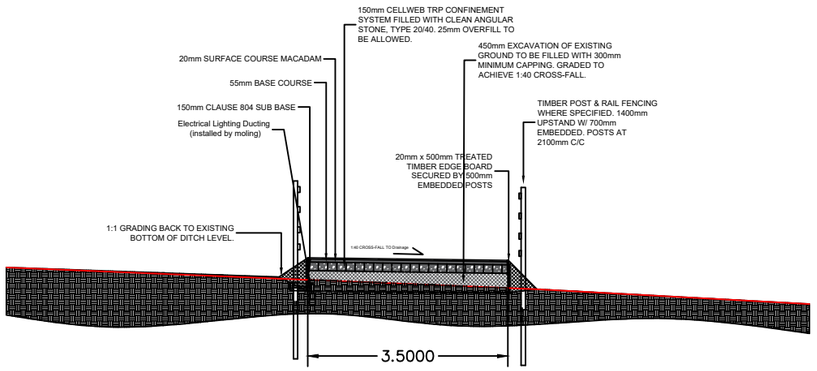
PLATE NO.10





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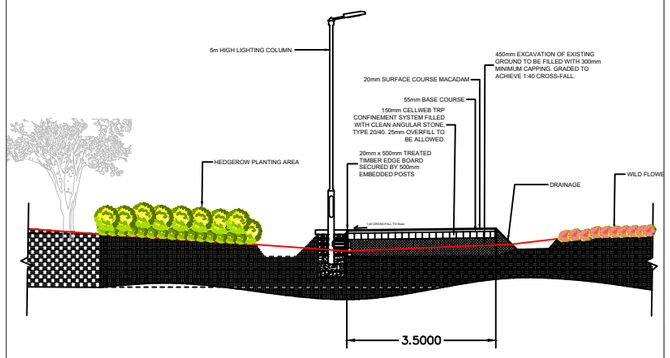

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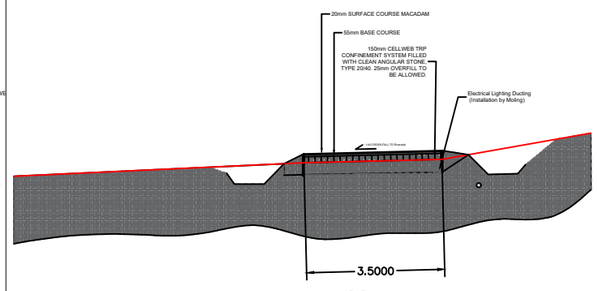

CS015

PLATE NO.11

Notes

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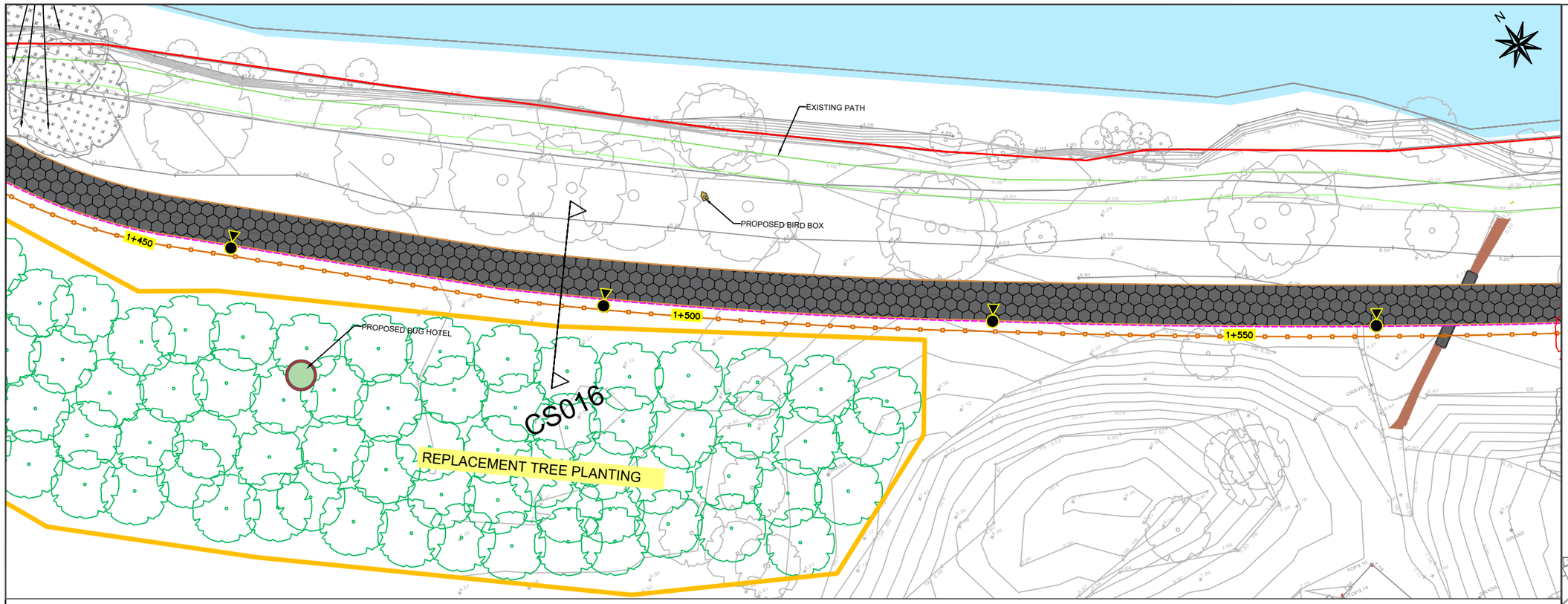

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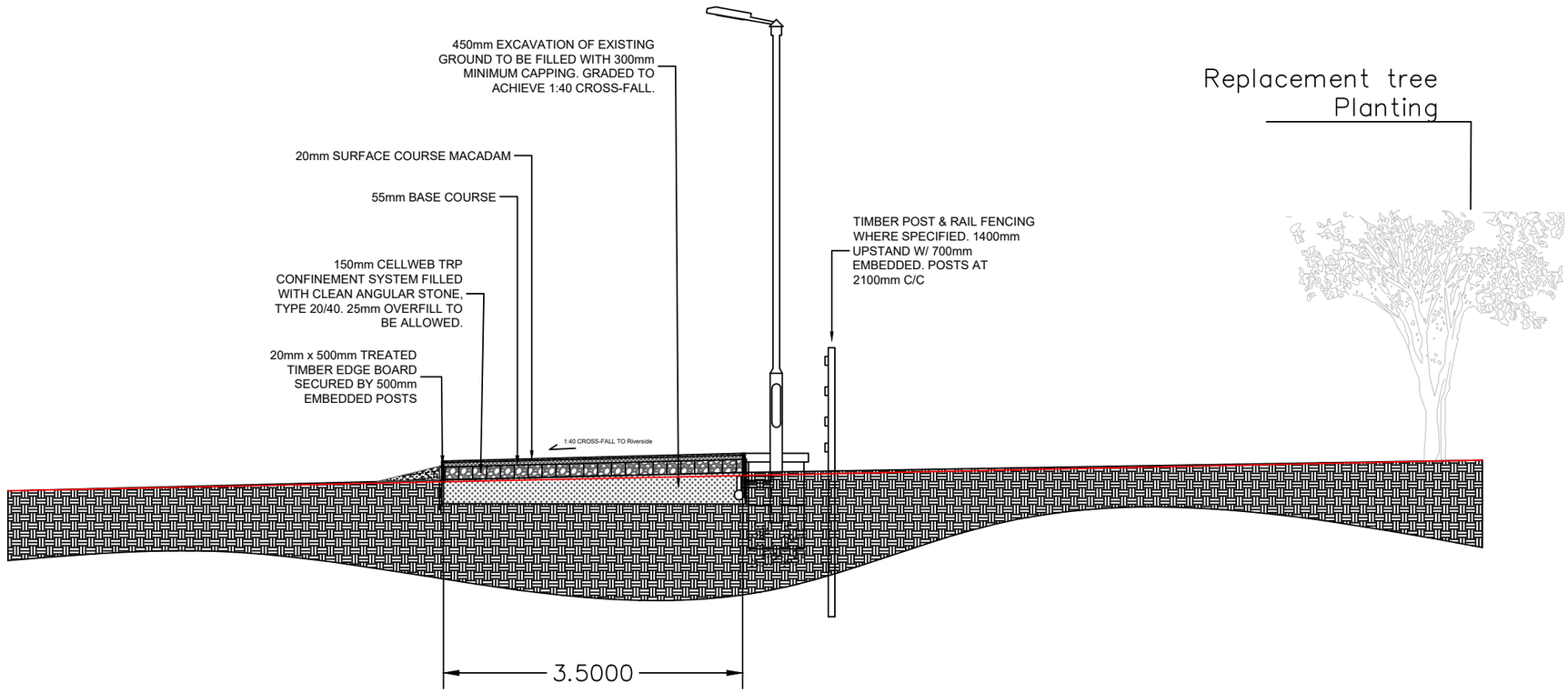

CS016

Notes

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(UL to NTP)

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Planning Drawings

Sheet 12 of 32

SCALE @ A1	DATE	DRAWN	CHECKED	APPROVED
1:200	OCT 2023	KB	BL	PS

JOB No.	CAD FILE PATH	DRAWING No.	REV.
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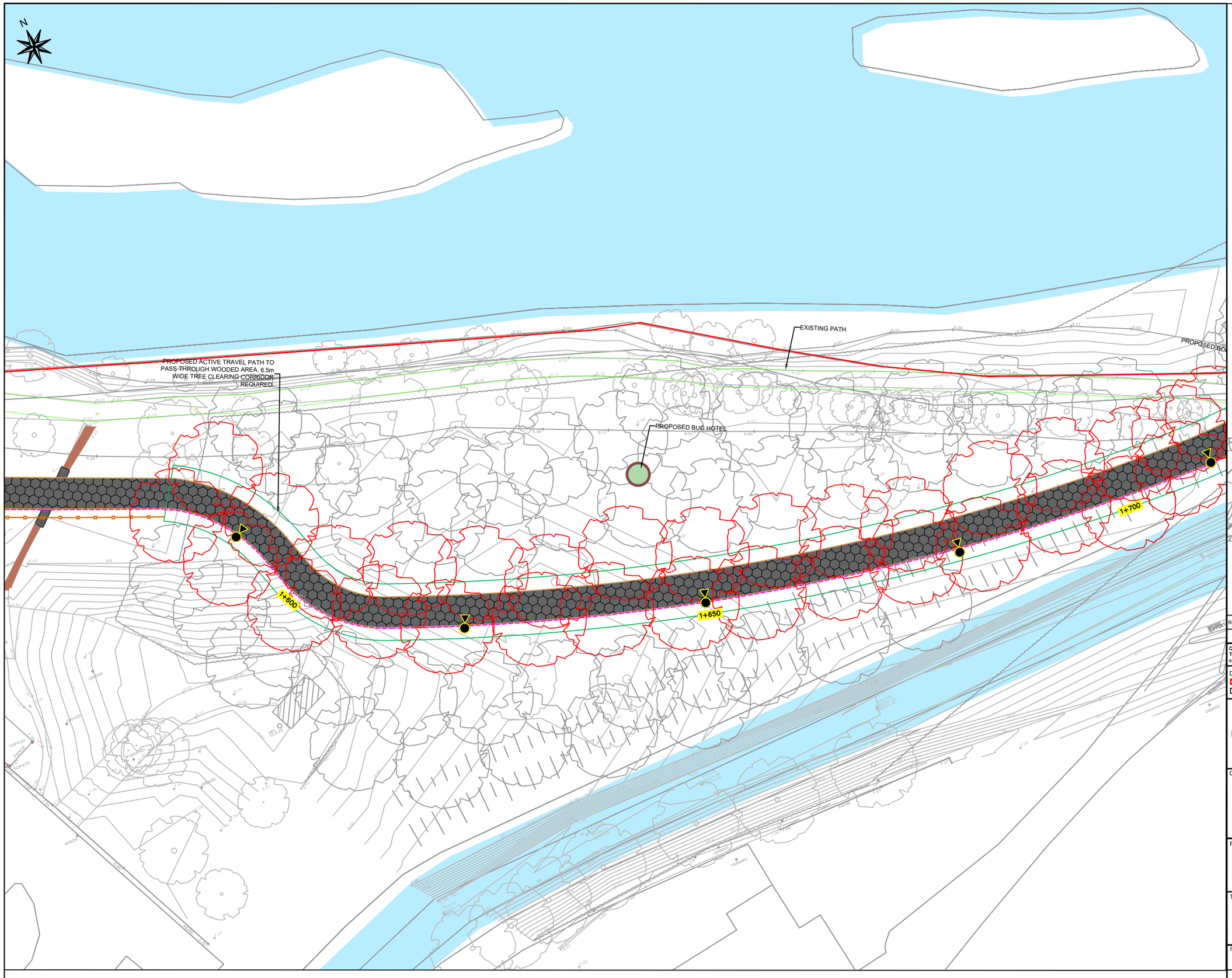

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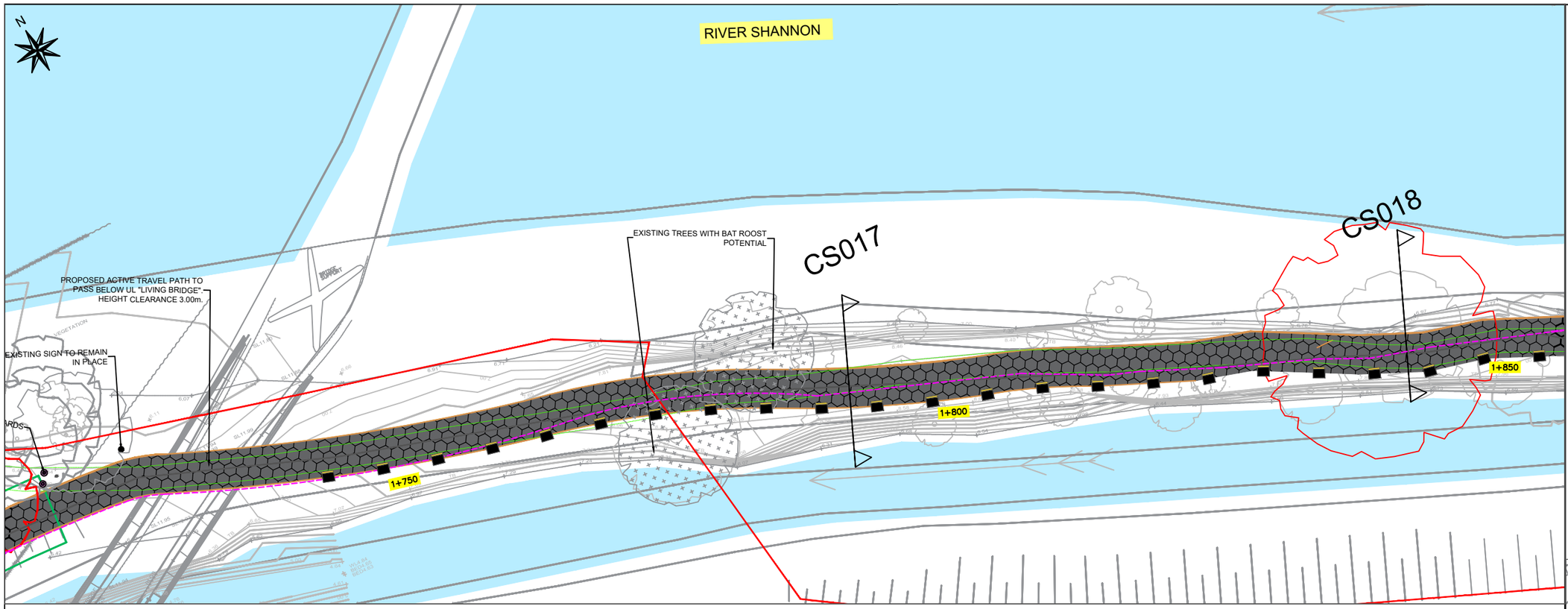
1:200	OCT 2023	KB	BL	PS

JOB No.	CAD FILE PATH	DRAWING No.	REV.
2535	2535 / 04 / DD / 01	PD0013	

PLATE NO.13



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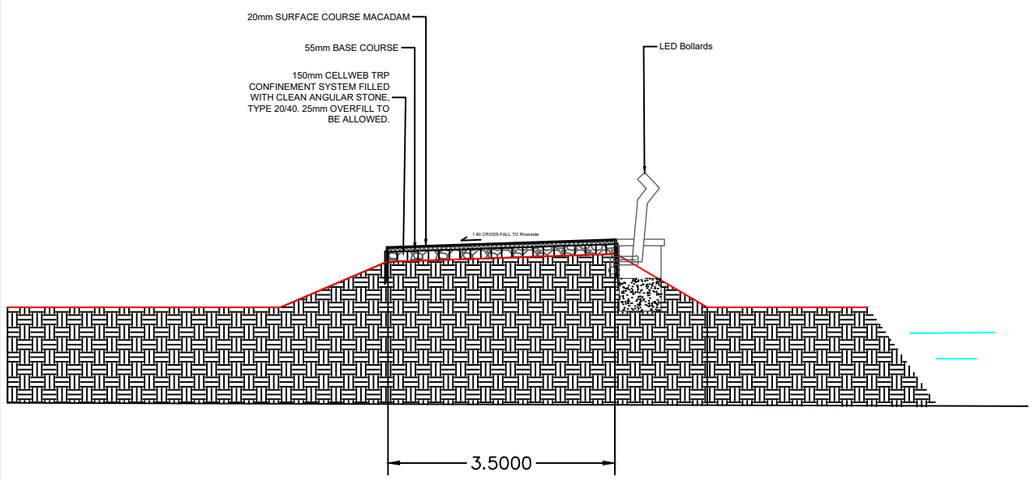
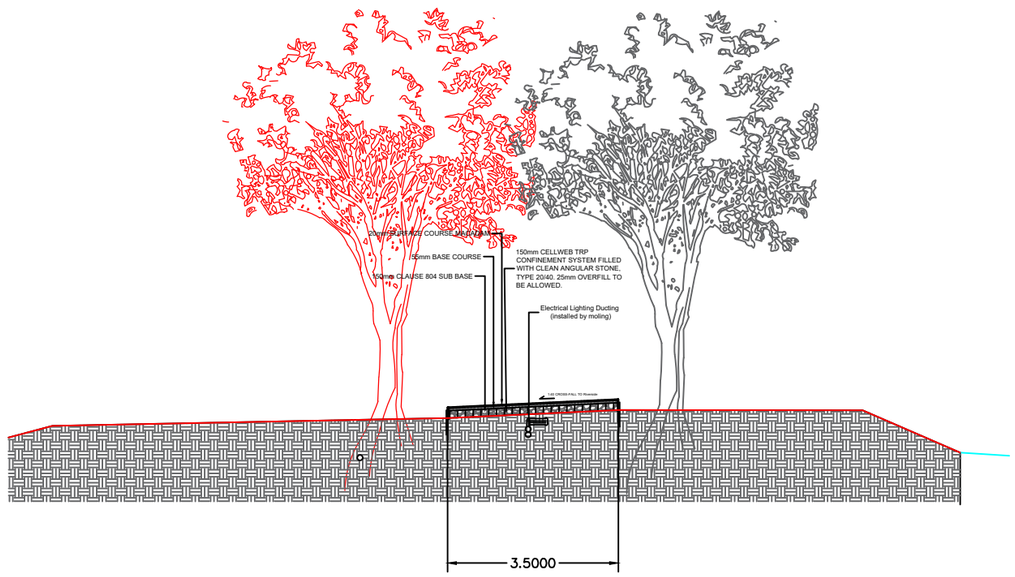


CS017



CS018

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PROJECT

Limerick City Greenway (UL to NTP)

TITLE

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2535	2535 / 04 / DD / 01	PD0014	

RIVER SHANNON

EXISTING SIGN TO REMAIN IN PLACE

EXISTING SIGN TO BE RELOCATED AS SHOWN

PATH NARROWS TO AVOID EXISTING TREE

PATH NARROWS TO AVOID EXISTING TREE

1+950

1+900

EXISTING BRIDGE TO REMAIN

Footbridge

PLATE NO. 15

Notes

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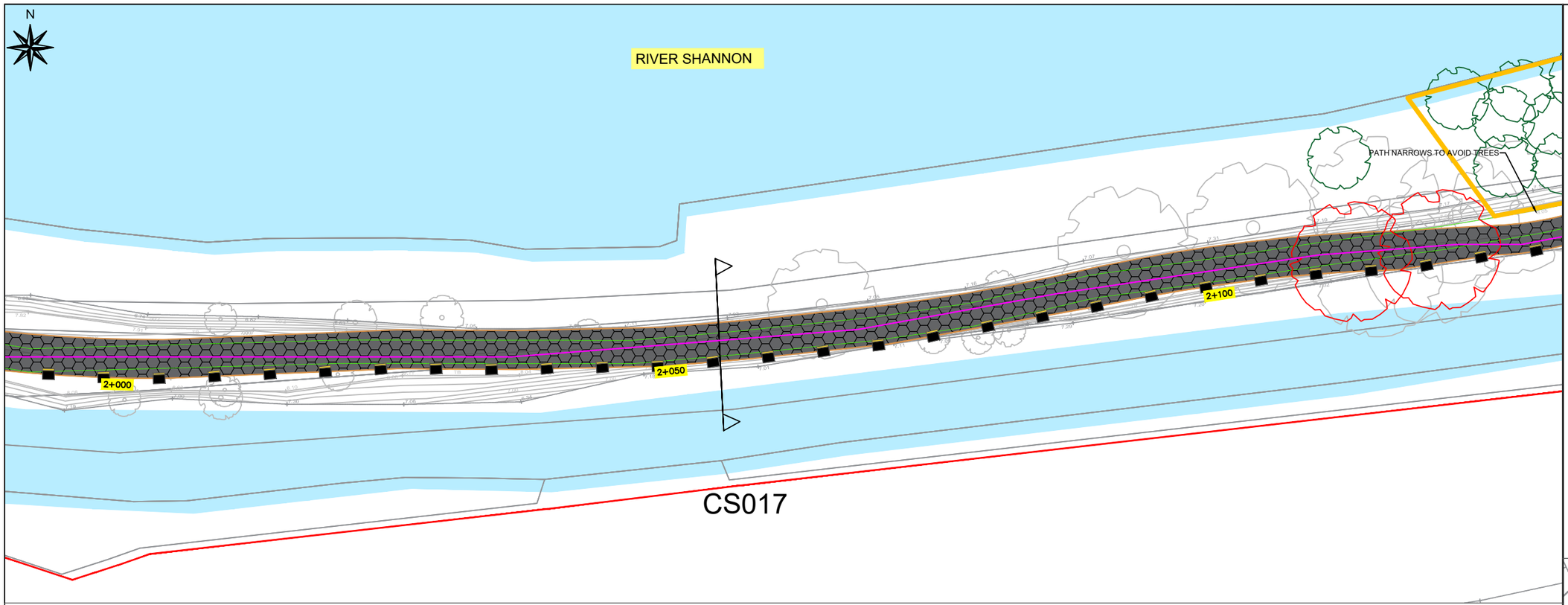

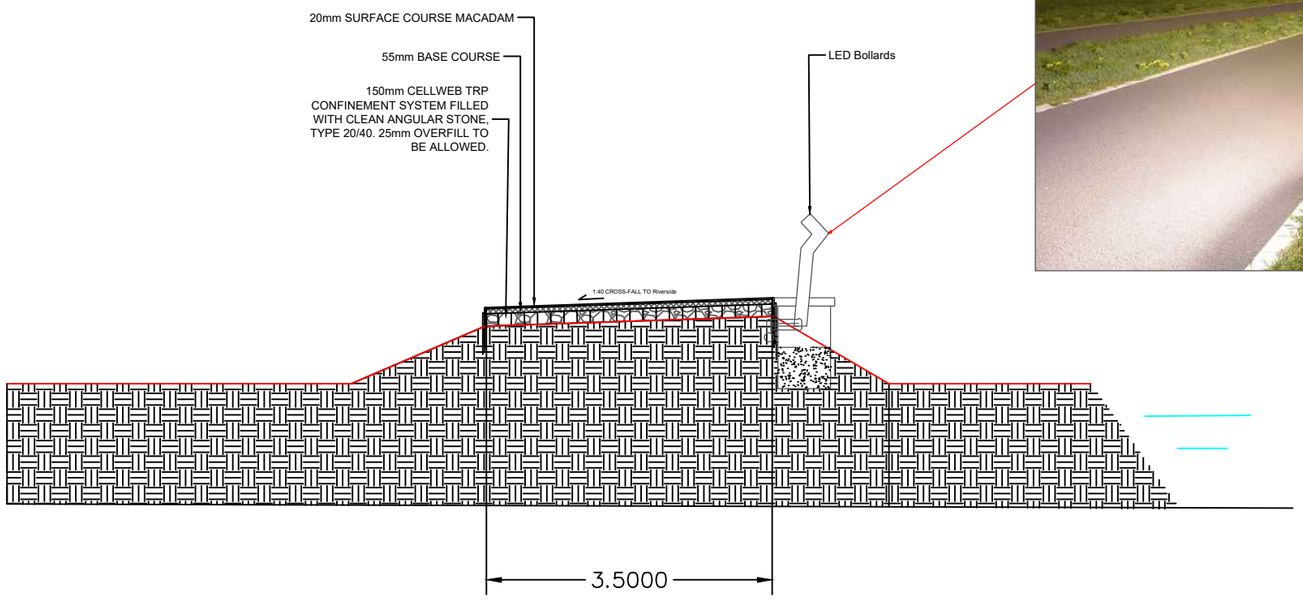

CS017

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JOB No.	CAD FILE PATH	DRAWING No.	REV.
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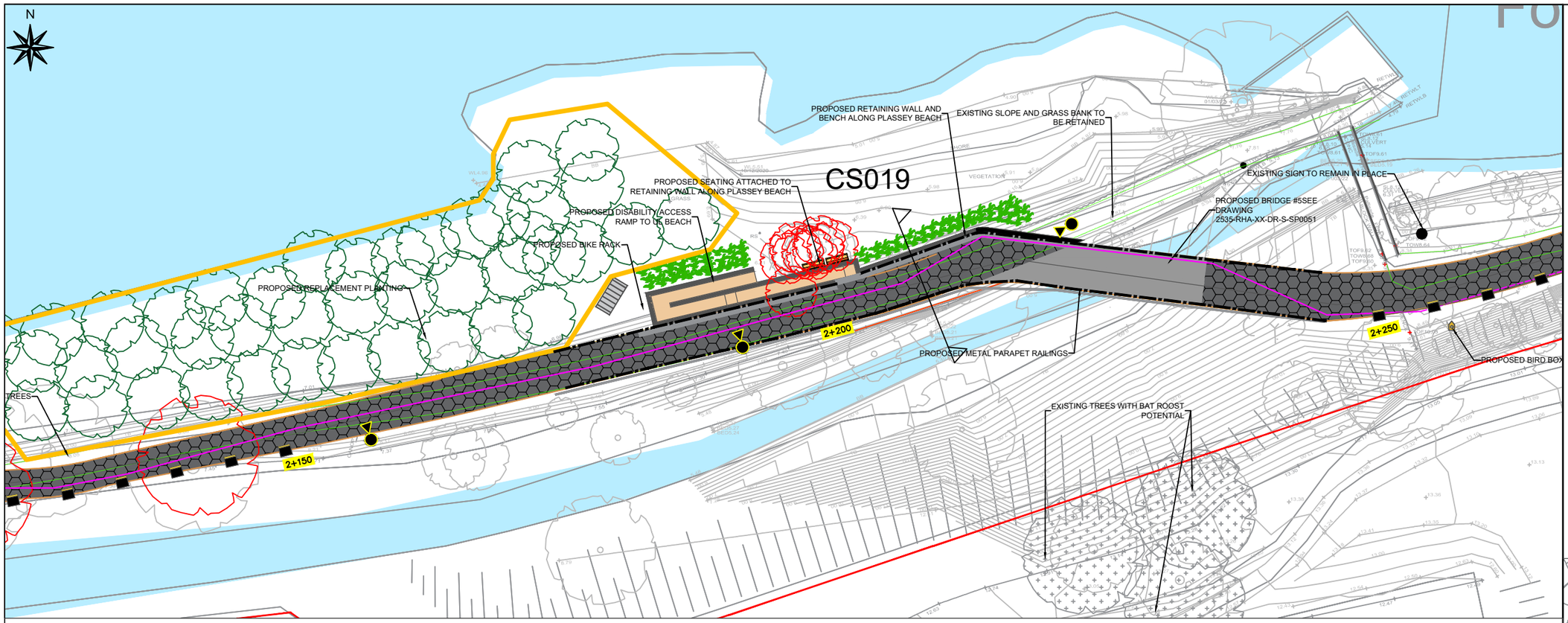
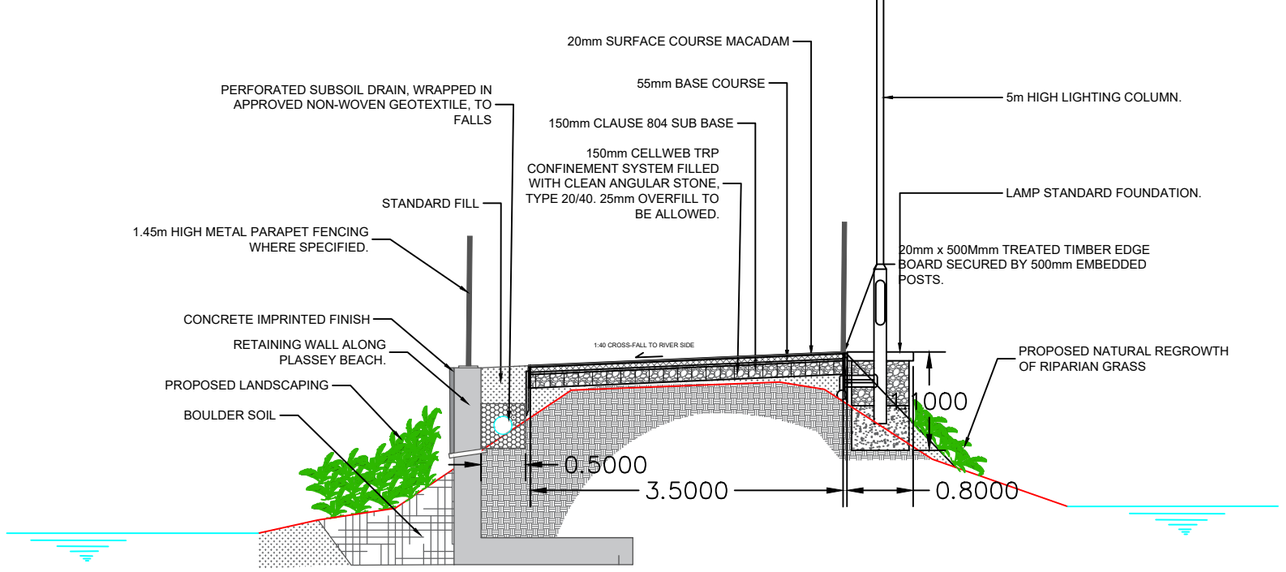
PLATE NO.16





REFER TO 2535-RH-XX-DR-CS-SP0052

CS019

PLATE NO.17

Notes

1. Levels are in metres O.D. and refer to Malin Head Datum.
2. Dimensions are in millimetres unless otherwise stated.
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Legend

- Proposed Greenway /Root Protection
- Footpath
- Existing Road Surface
- Structural Bridge/Deck
- Cycle Lane
- Proposed Raised Table
- Proposed Corduroy Tactile Paving
- Proposed Blister Tactile Paving
- Proposed Grading
- Proposed Drain
- Existing Path
- Wooden Post & Rail Fencing
- Metal Parapet
- Electrical Ducting for Lighting
- SAC Boundary Line
- Area for Replacement Tree Planting
- LED Bollard
- 5m High Lighting Column
- Existing Tree - To Be Retained
- Existing Tree - To Be Removed
- New Tree - To Be Planted

REV	DATE	DRN	DESCRIPTION	CHK	APD

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Limerick City & County Council

PROJECT

Limerick City Greenway
(UL to NTP)

TITLE

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JOB No.	CAD FILE PATH	DRAWING No.	REV.
2535	2535 / 04 / DD / 01	PD0017	

RIVER SHANNON

PROPOSED BRIDGE #5SEE DRAWING 2535-RHA-XX-DR-S-SP0051

2+250

2+300

2+350

PROPOSED BIRD BOX

EXISTING SIGN TO REMAIN IN PLACE

EXISTING STONE WAY

KILMURRAY STUDENT VILLAGE

KEEP

CLEAR

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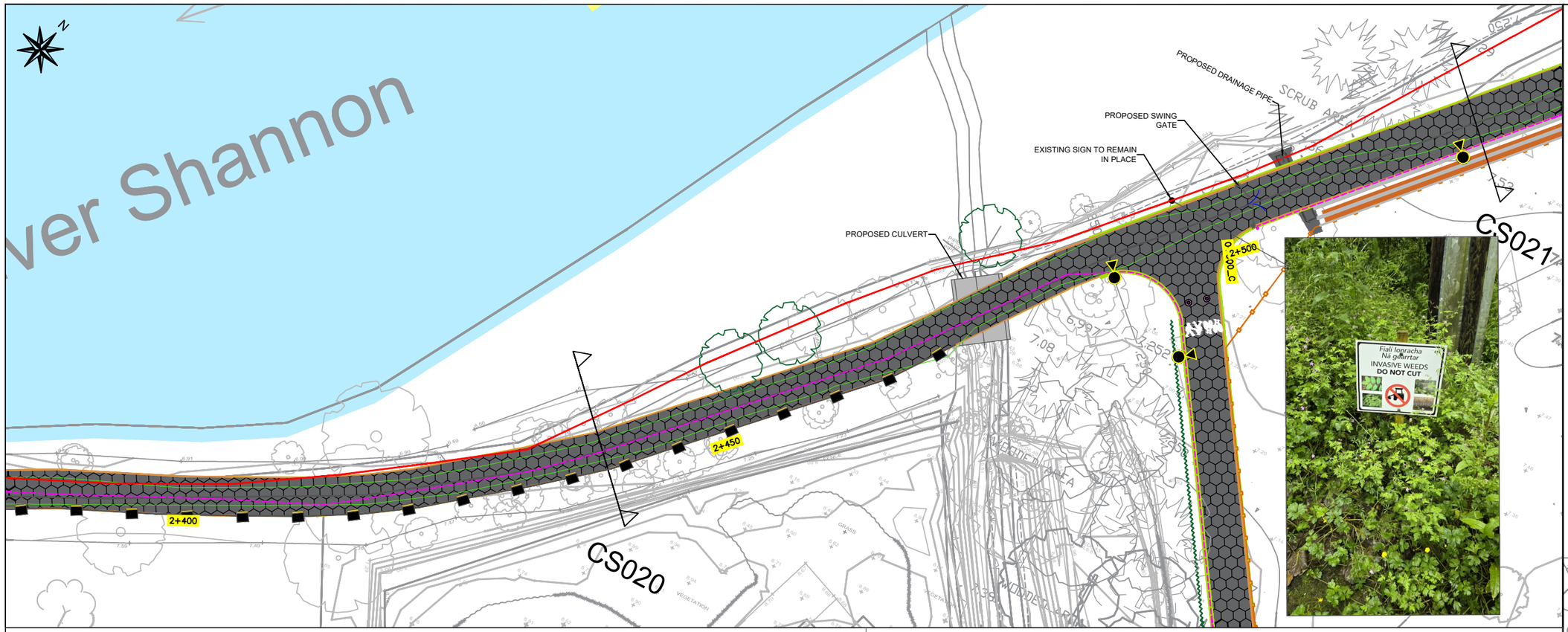
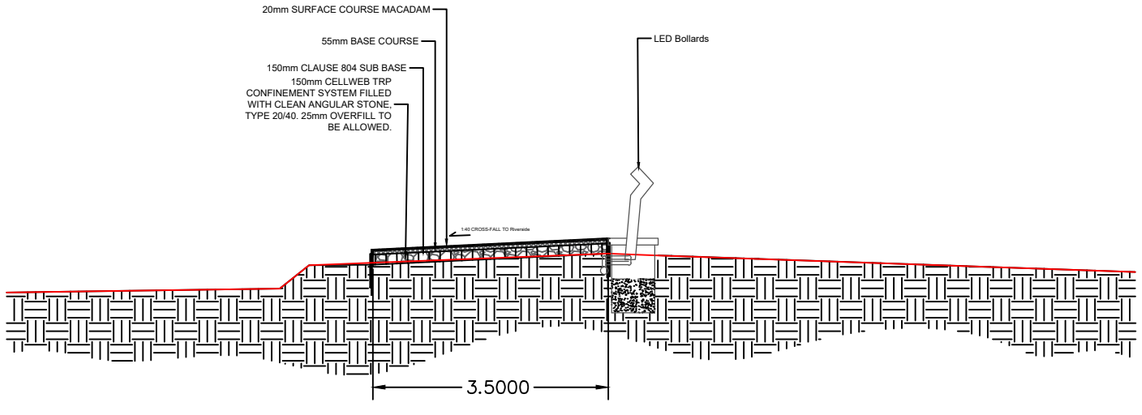
SCALE @ A1	DATE	DRAWN	CHECKED	APPROVED
1:200	OCT 2023	KB	BL	PS

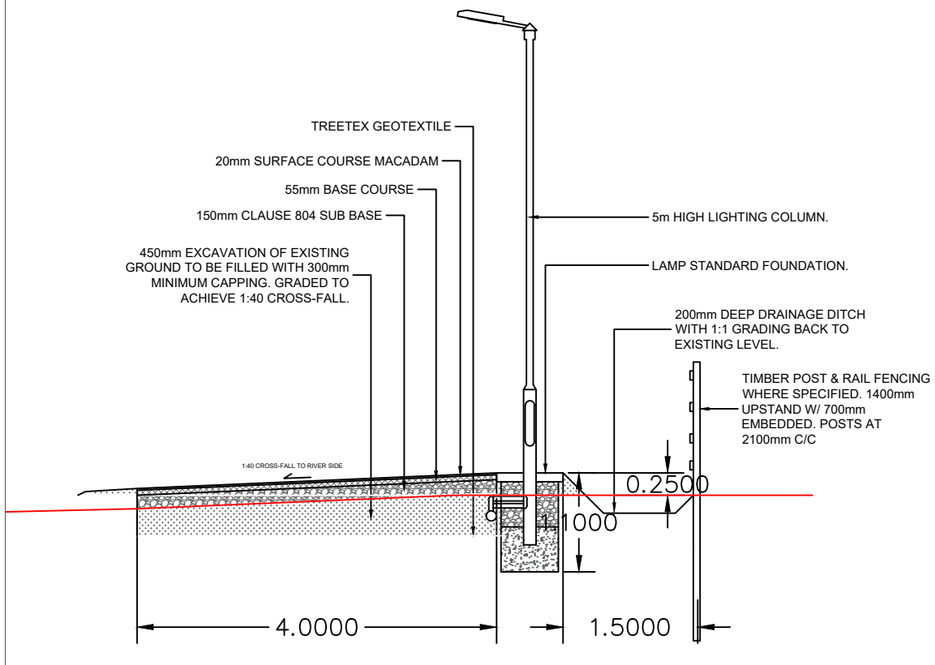
JOB No.	CAD FILE PATH	DRAWING No.	REV.
2535	2535 / 04 / DD / 01	PD0018	

PLATE NO. 18





CS020



CS021

Notes

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REV	DATE	DRN	DESCRIPTION	CHK	APD

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TITLE

Planning Drawings

Sheet 19 of 32

SCALE @ A1	DATE	DRAWN	CHECKED	APPROVED
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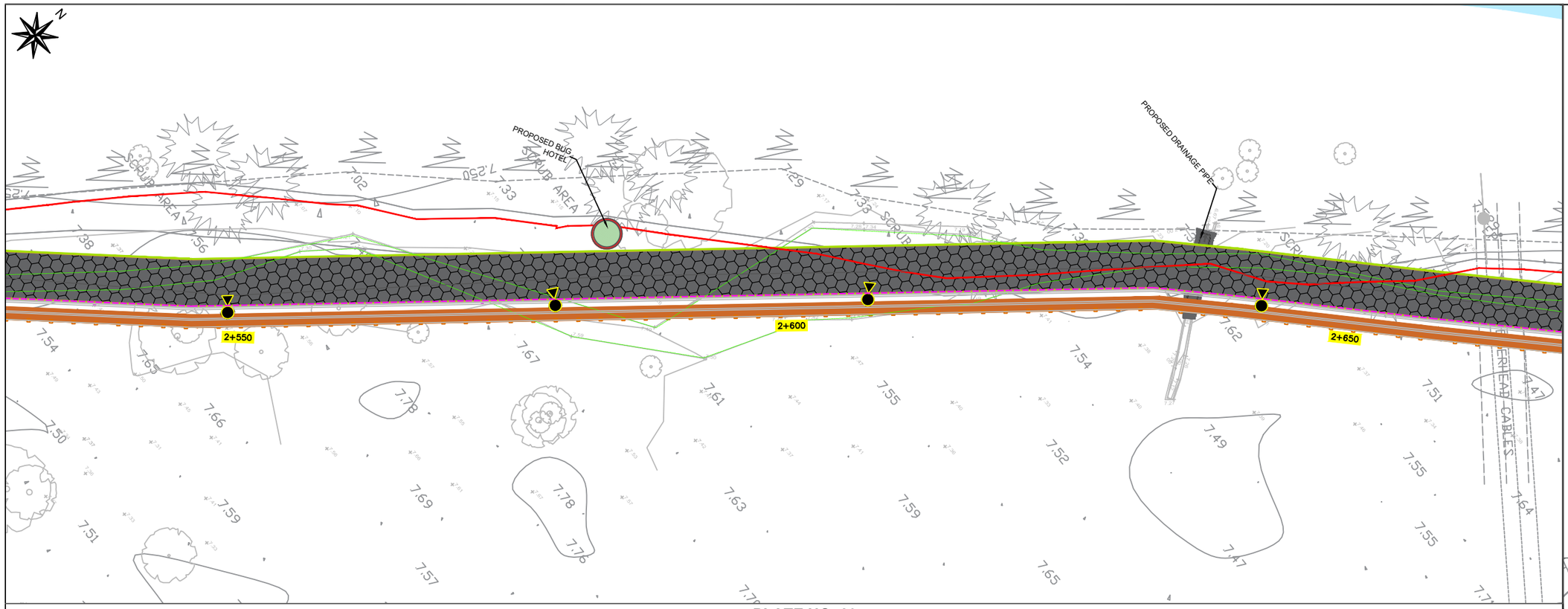
PLATE NO. 19



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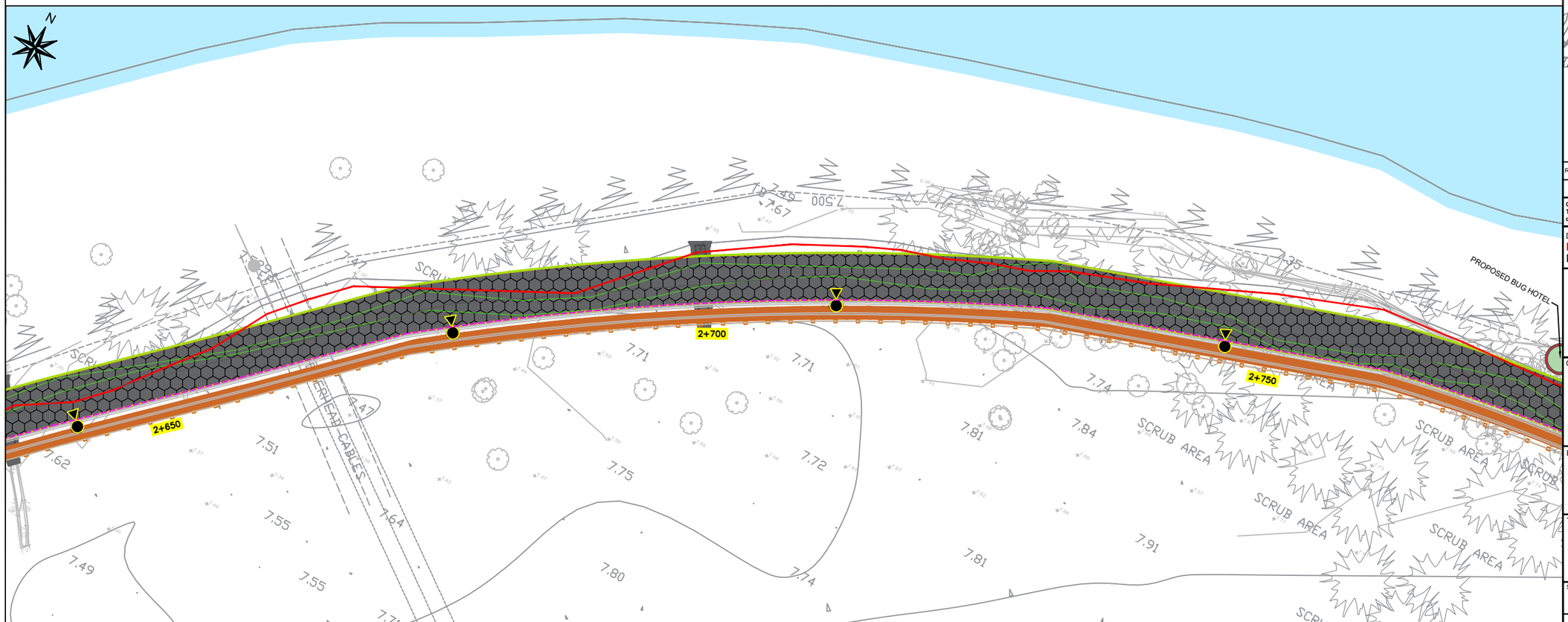

PLATE NO. 21

Notes

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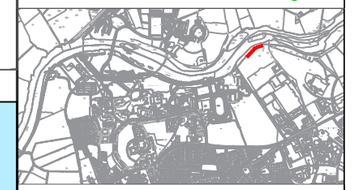
- Existing Tree - To Be Retained
- Existing Tree - To Be Removed
- New Tree - To Be Planted



REV	DATE	DRN	DESCRIPTION	CHK	APD

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Planning Drawings

Sheet 20 of 32

SCALE @ A1	DATE	DRAWN	CHECKED	APPROVED
1:200	OCT 2023	KB	BL	PS

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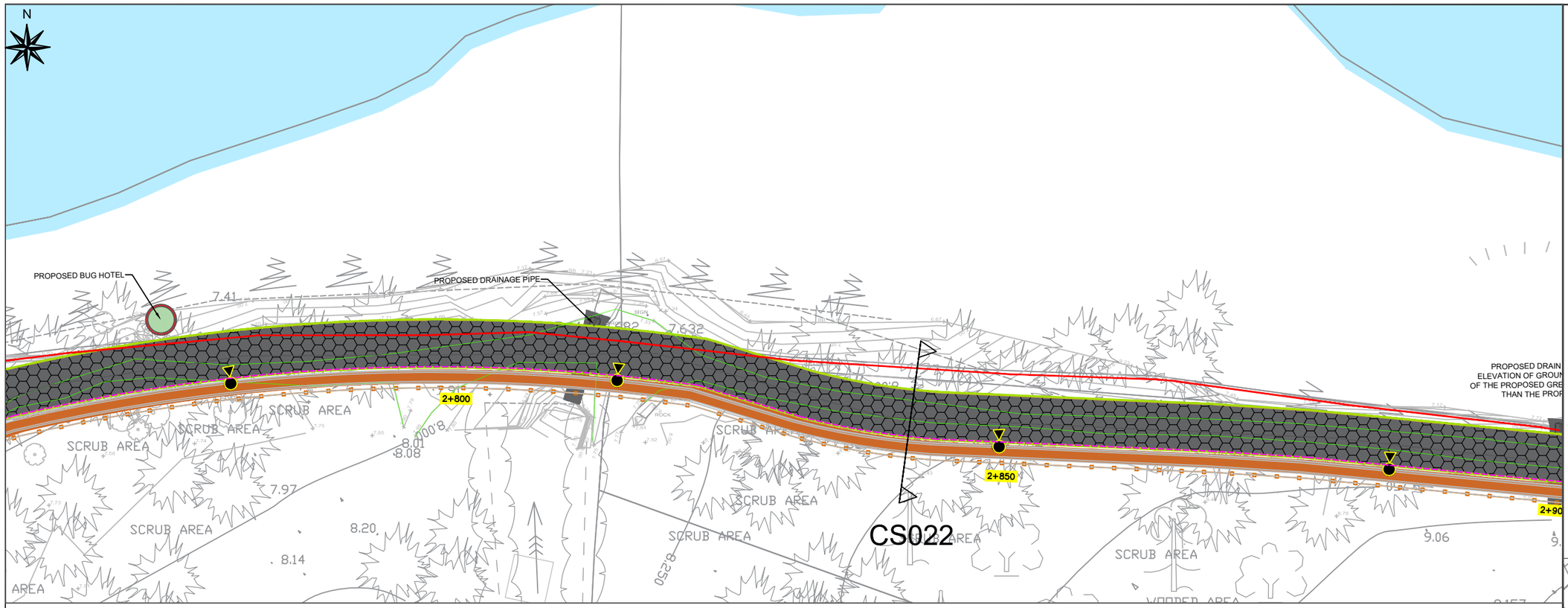

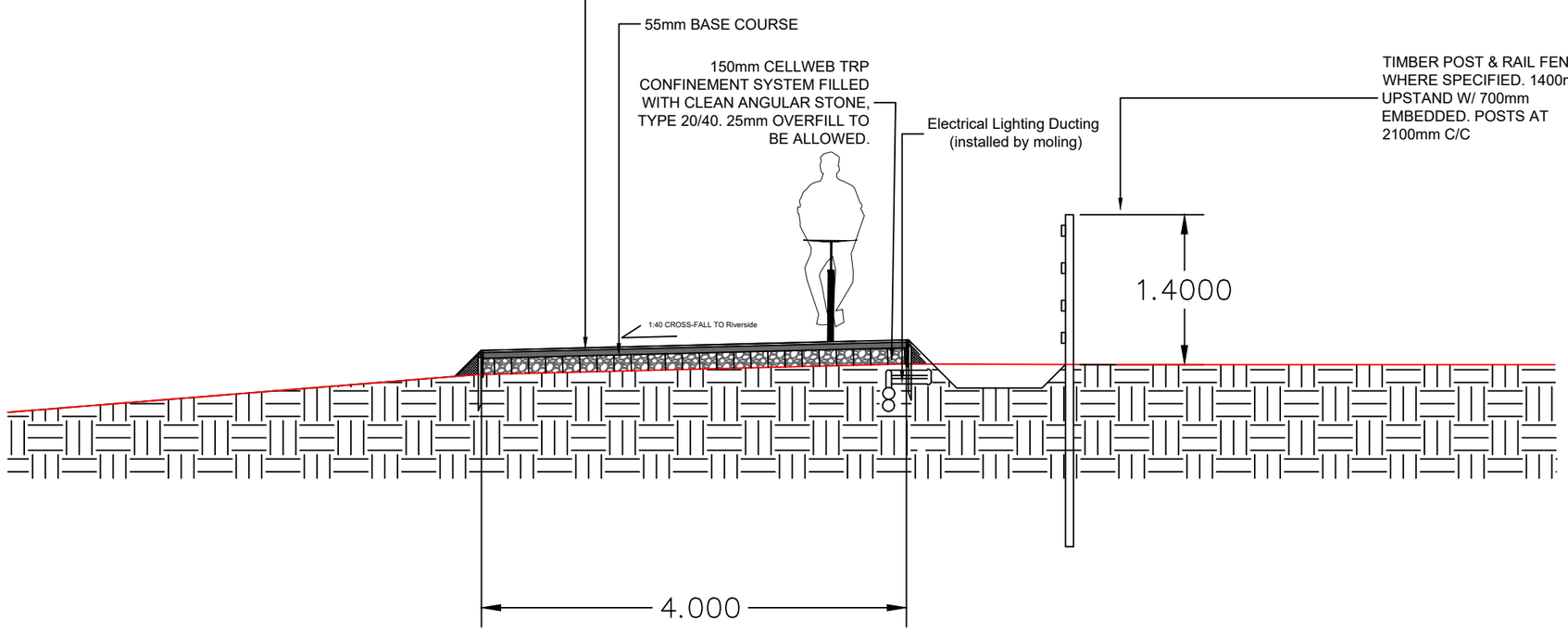

CS022

PLATE NO. 22

Notes

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- 5m High Lighting Column
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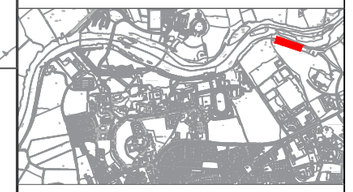

REV	DATE	DRN	DESCRIPTION	CHK	APD

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PROJECT

Limerick City Greenway
(UL to NTP)

TITLE

Planning Drawings

Sheet 21 of 32

SCALE @ A1	DATE	DRAWN	CHECKED	APPROVED
1:200	OCT 2023	KB	BL	PS

JOB No.	CAD FILE PATH	DRAWING No.	REV.
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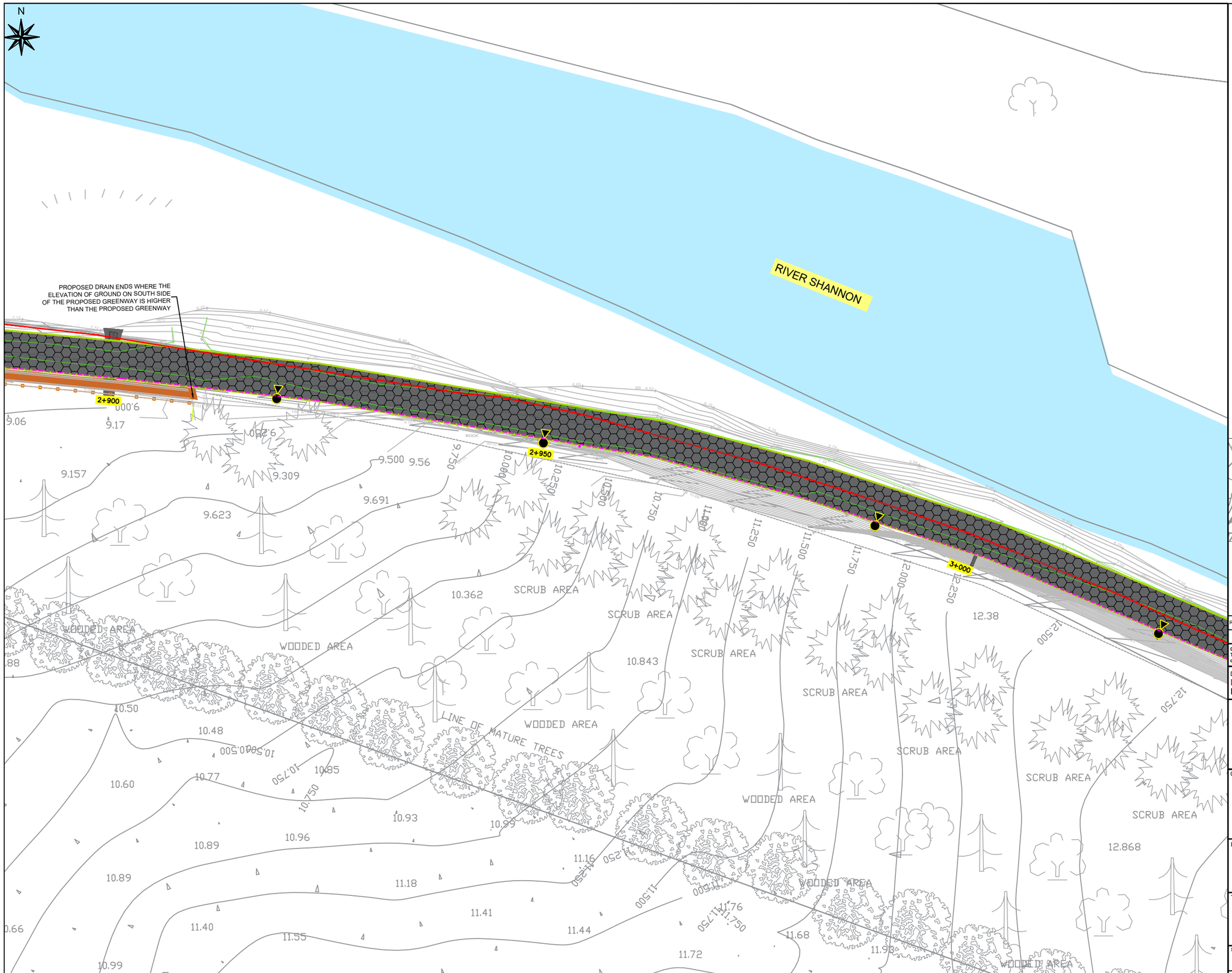

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1:200	OCT 2023	KB	BL	PS

JOB No.	CAD FILE PATH	DRAWING No.	REV.
2535	2535 / 04 / DD / 01	PD0022	

PLATE NO. 23

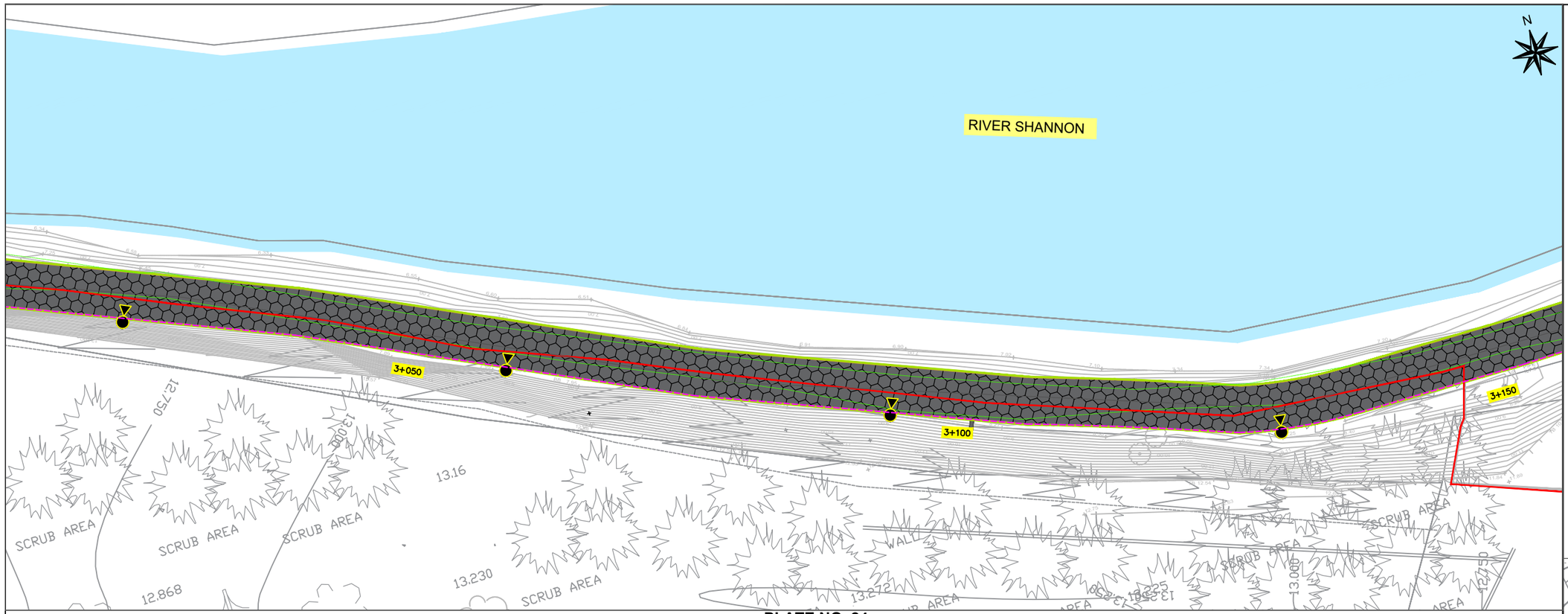

PLATE NO. 24

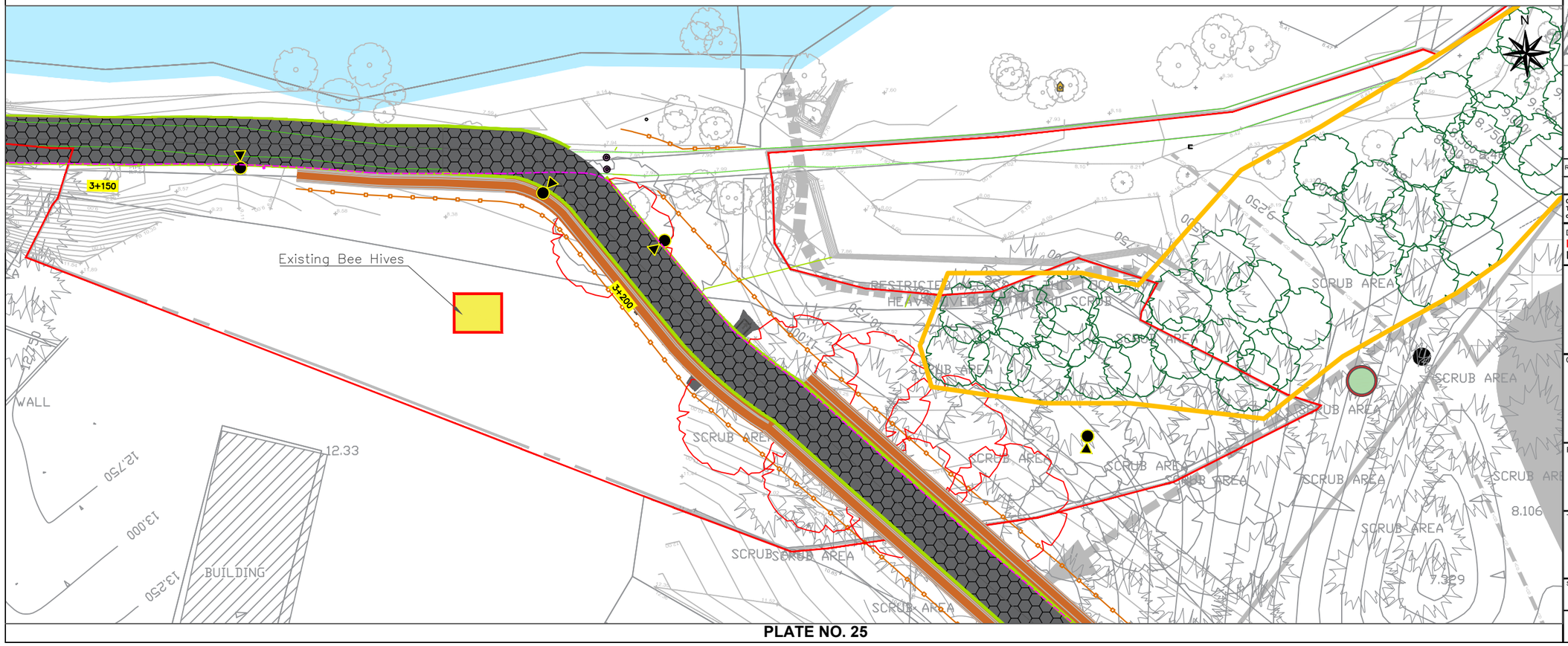

PLATE NO. 25

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REV	DATE	DRN	DESCRIPTION	CHK	APD

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Sheet 23 of 32

SCALE @ A1	DATE	DRAWN	CHECKED	APPROVED
1:200	OCT 2023	KB	BL	PS

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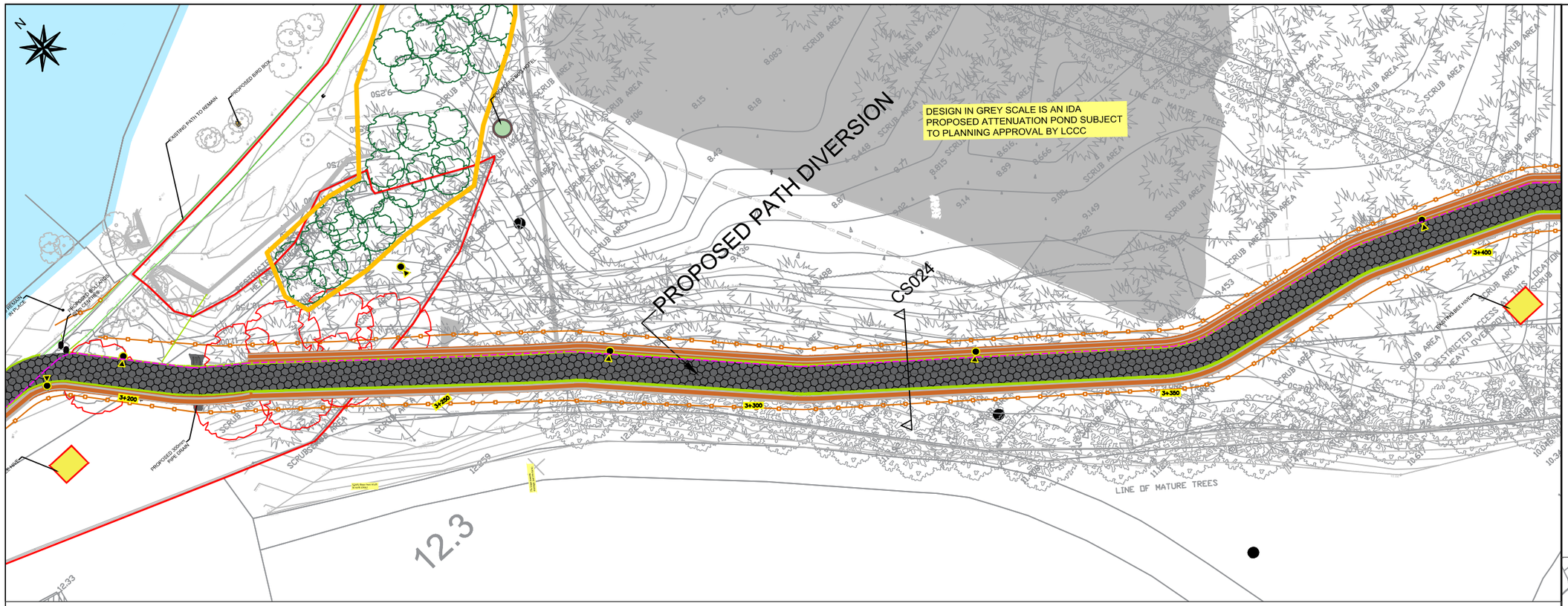

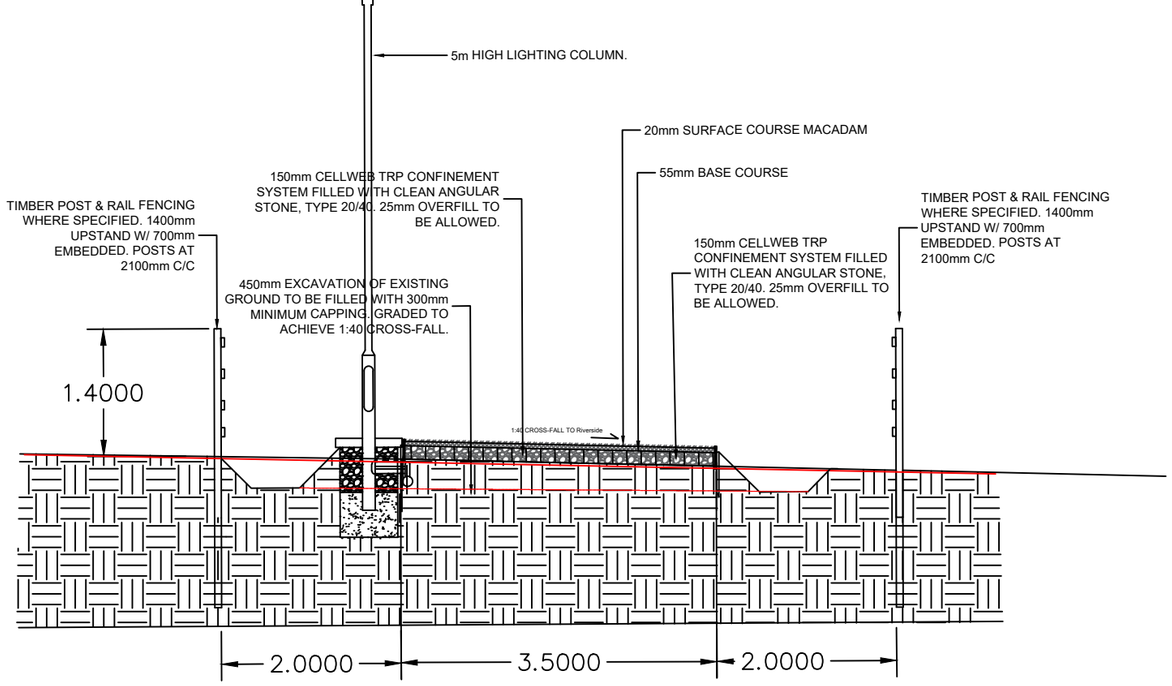

CS024

PLATE NO. 26

Notes

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TITLE

Planning Drawings

Sheet 24 of 32

SCALE @ A1	DATE	DRAWN	CHECKED	APPROVED
1:200	OCT 2023	KB	BL	PS

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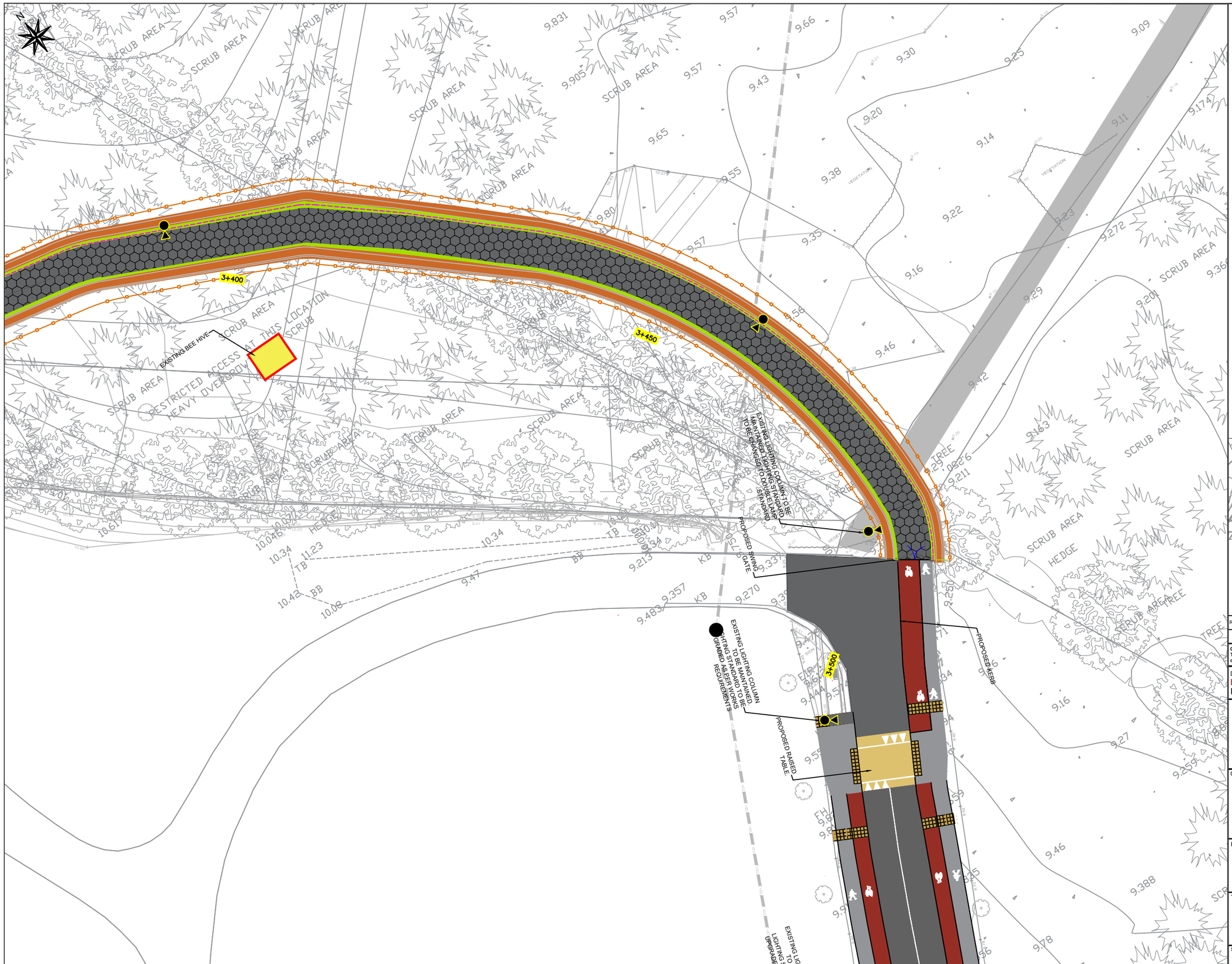

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Limerick City & County Council

PROJECT

Limerick City Greenway
(UL to NTP)

TITLE

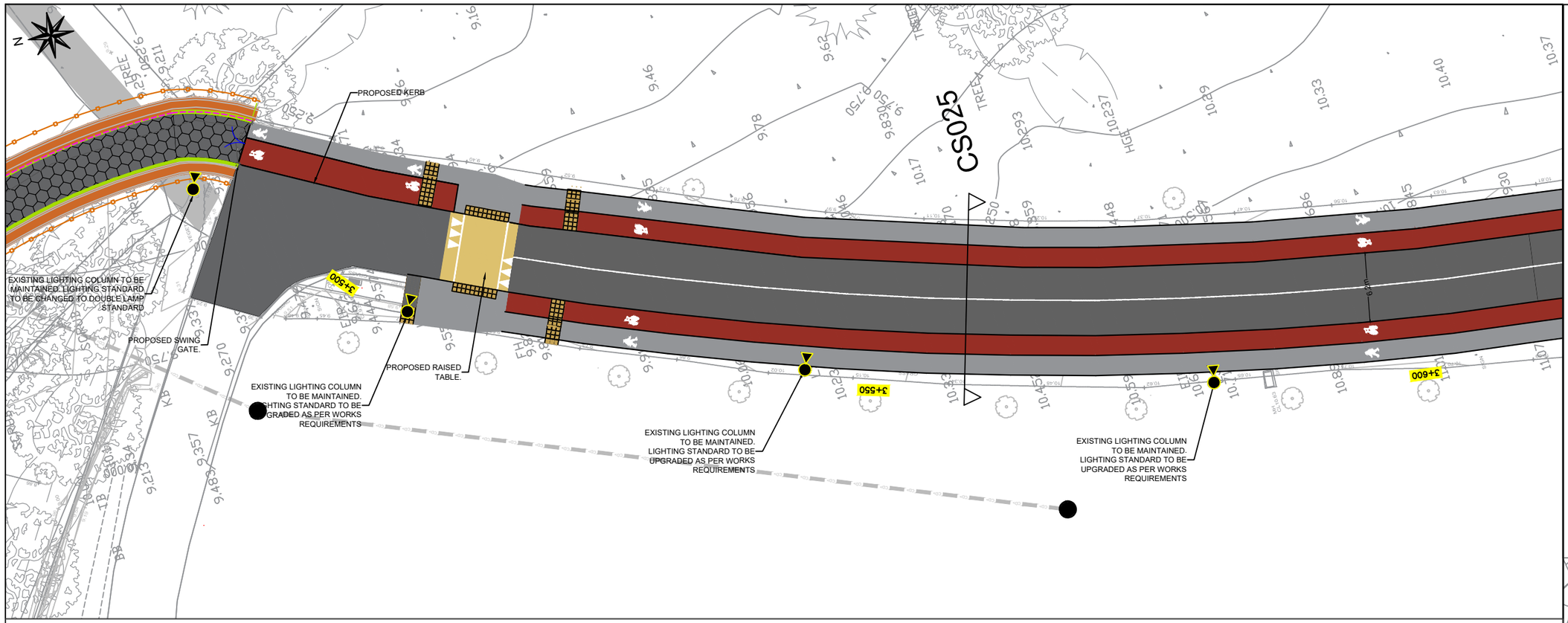
Planning Drawings

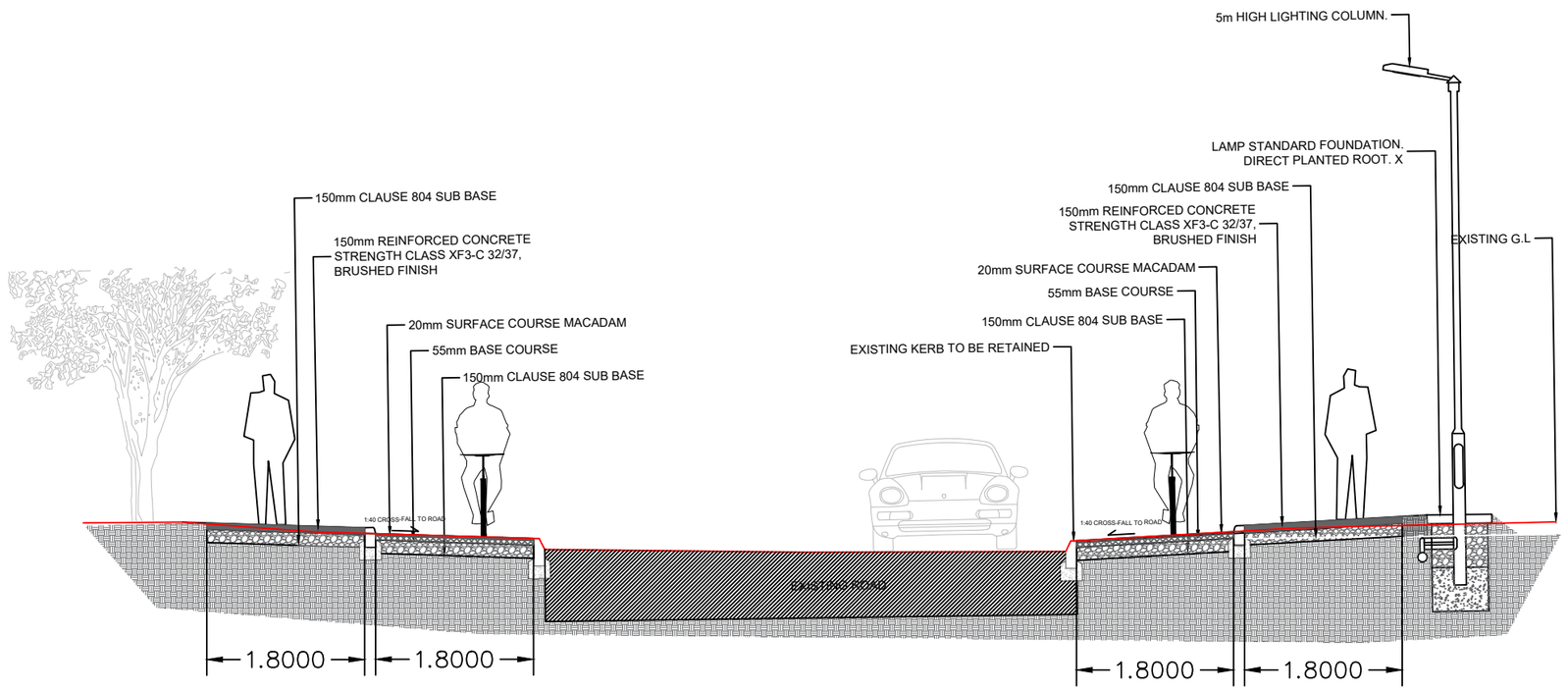
Sheet 25 of 32

SCALE @ A1	DATE	DRAWN	CHECKED	APPROVED
1:200	OCT 2023	KB	BL	PS

JOB No.	CAD FILE PATH	DRAWING No.	REV.
2535	2532 / 04 / DD / 01	PD0025	

PLATE NO. 27





CS025

PLATE NO. 28

Notes

1. Levels are in metres O.D. and refer to Malin Head Datum.
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Legend

- Proposed Greenway /Root Protection
- Footpath
- Existing Road Surface
- Structural Bridge/Deck
- Cycle Lane
- Proposed Raised Table
- Proposed Corduroy Tactile Paving
- Proposed Blister Tactile Paving
- Proposed Grading
- Proposed Drain
- Existing Path
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- Metal Parapet
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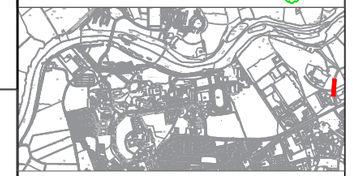
- SAC Boundary Line
- Area for Replacement Tree Planting
- 5m High Lighting Column
- Existing Tree - To Be Retained
- Existing Tree - To Be Removed
- New Tree - To Be Planted



REV	DATE	DRN	DESCRIPTION	CHK	APD

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DRAWING STATUS

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RYAN HANLEY now Stantec

CLIENT

Comhairle Cathrach & Contae Luimnigh
Limerick City & County Council

PROJECT

Limerick City Greenway (UL to NTP)

TITLE

Planning Drawings

Sheet 26 of 32

SCALE @ A1	DATE	DRAWN	CHECKED	APPROVED
1:200	OCT 2023	KB	BL	PS

JOB No.	CAD FILE PATH	DRAWING No.	REV.
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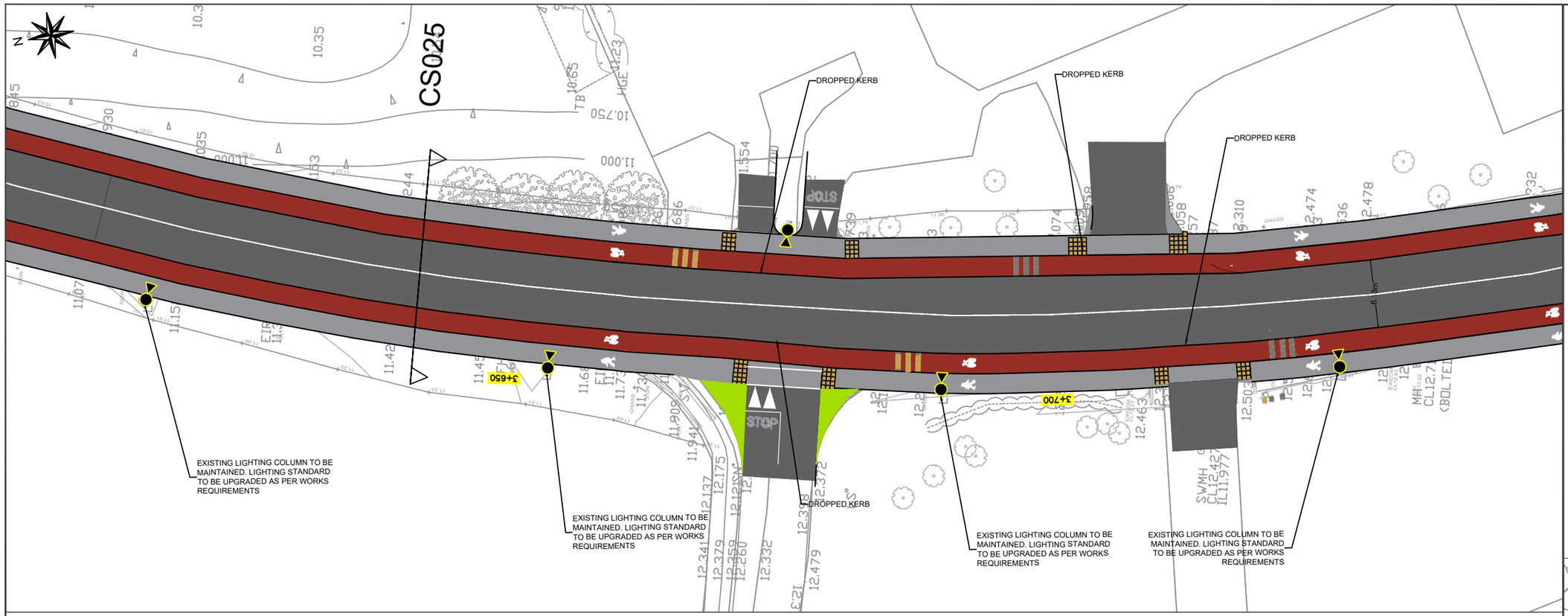

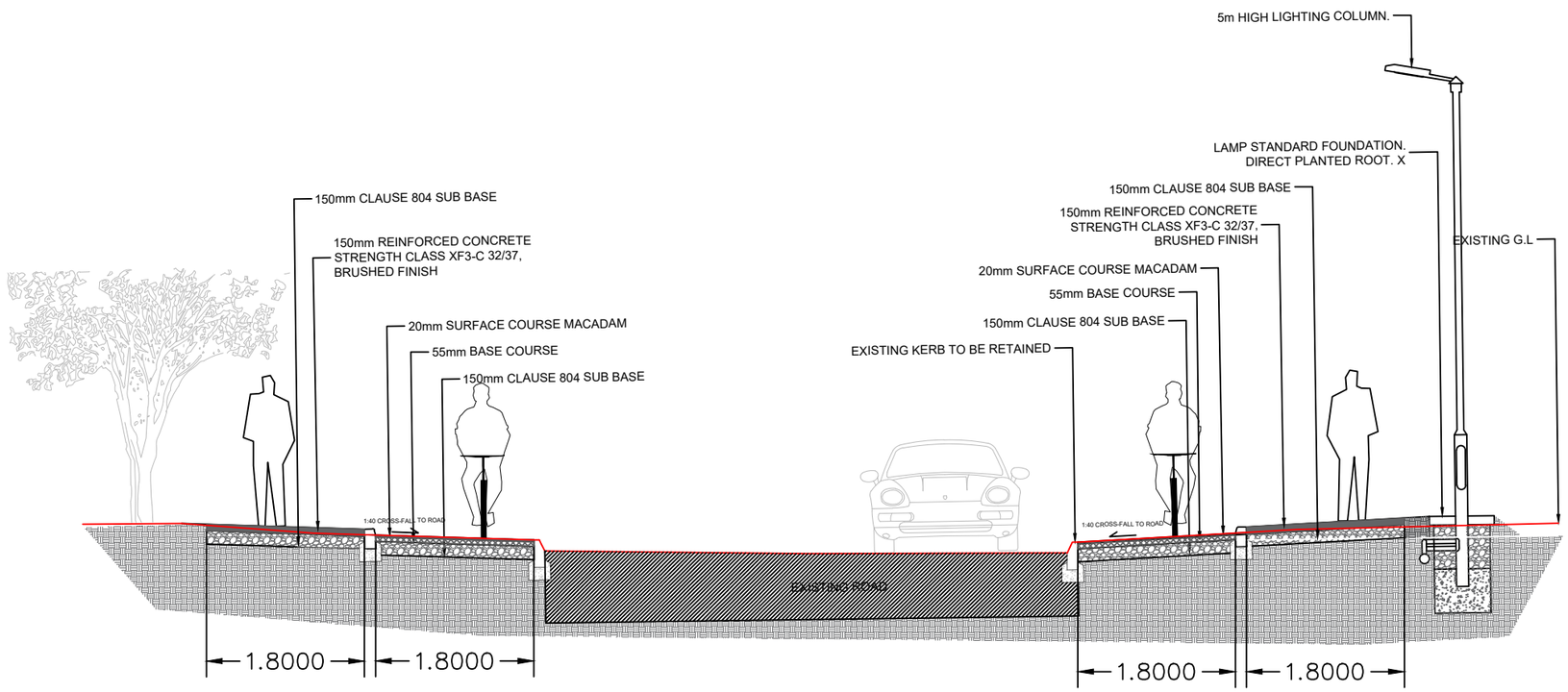

CS025

PLATE NO. 29

Notes

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REV	DATE	DRN	DESCRIPTION	CHK	APD

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Limerick City & County Council

PROJECT

Limerick City Greenway
(UL to NTP)

TITLE

Planning Drawings

Sheet 27 of 32

SCALE @ A1	DATE	DRAWN	CHECKED	APPROVED
1:200	OCT 2023	KB	BL	PS

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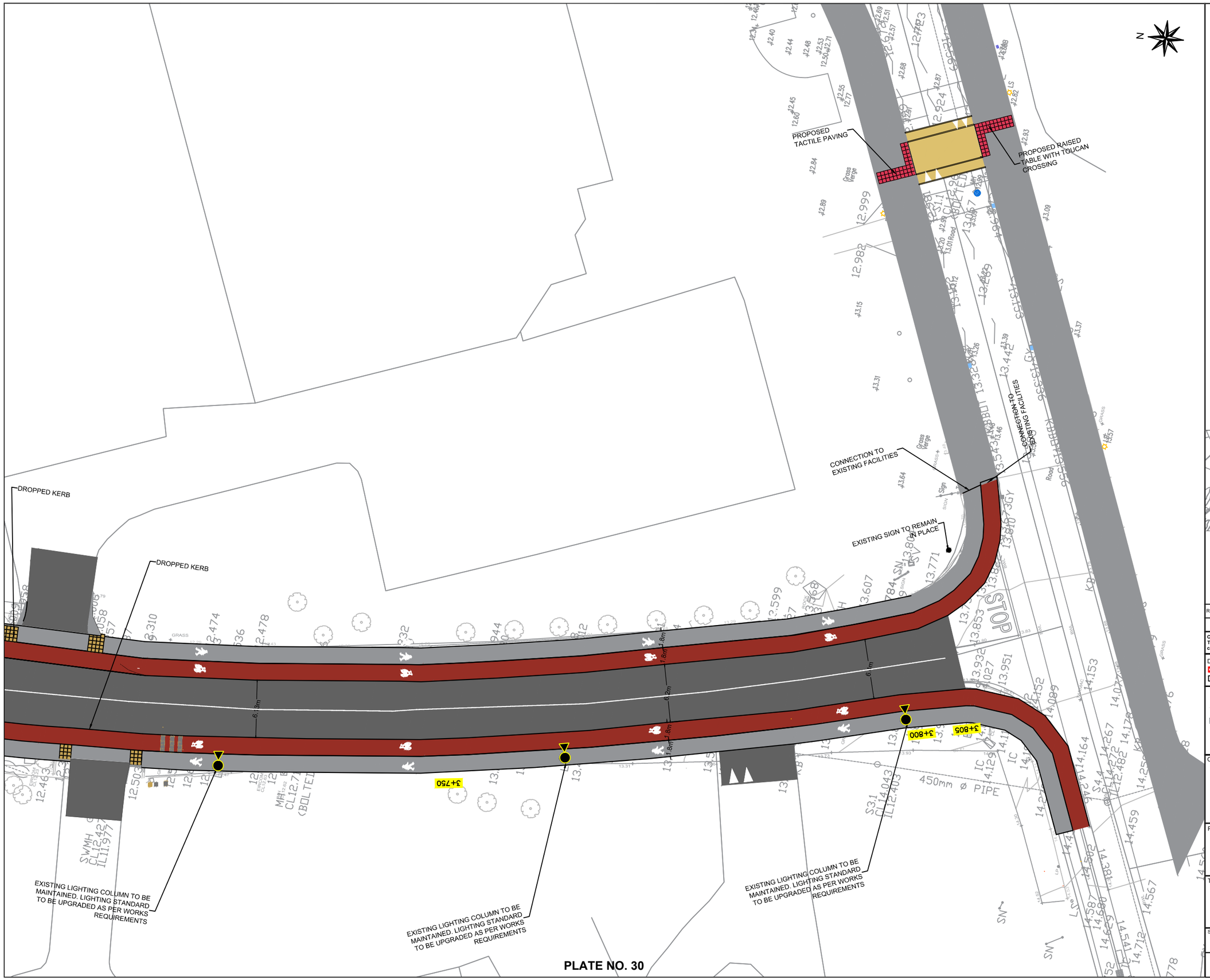

PLATE NO. 30

Notes

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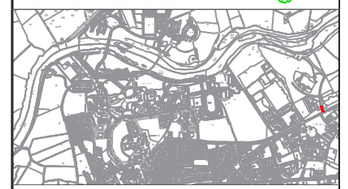

REV	DATE	DRN	DESCRIPTION	CHK	APD

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Limerick City Greenway (UL to NTP)

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Planning Drawings

Sheet 28 of 32

SCALE @ A1	DATE	DRAWN	CHECKED	APPROVED
1:200	OCT 2023	KB	BL	PS

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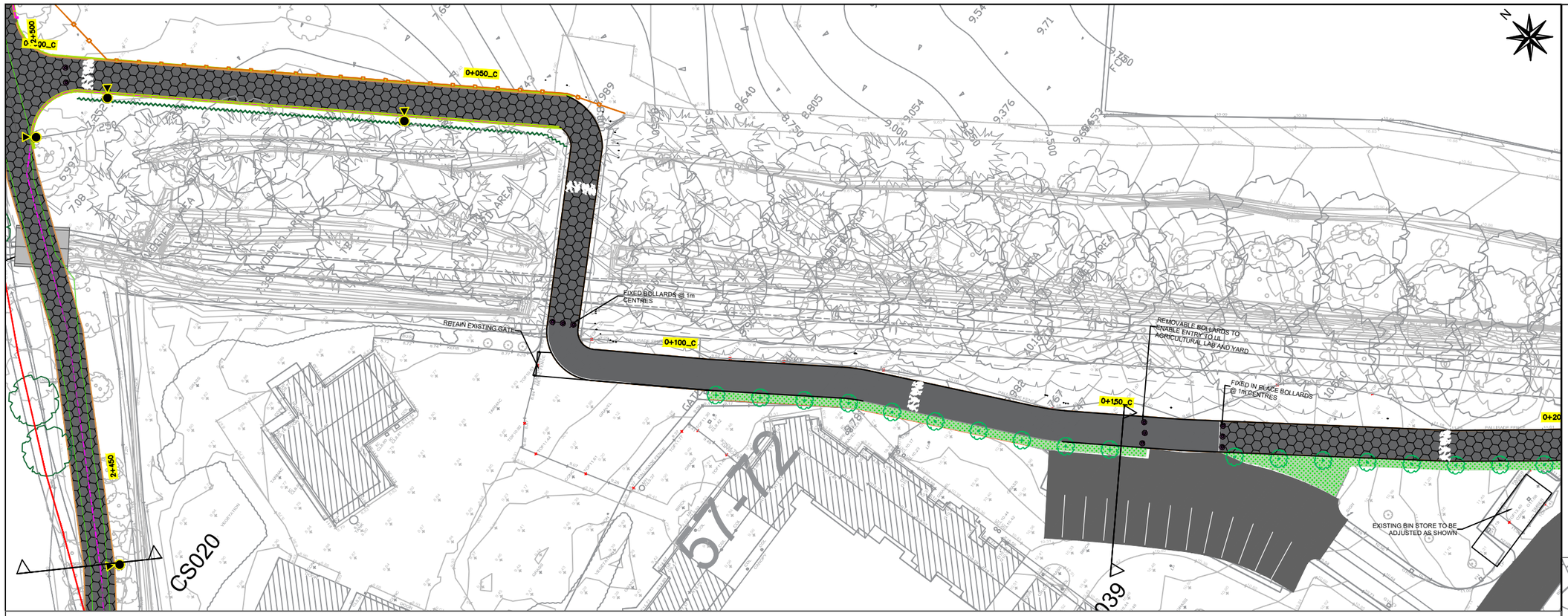

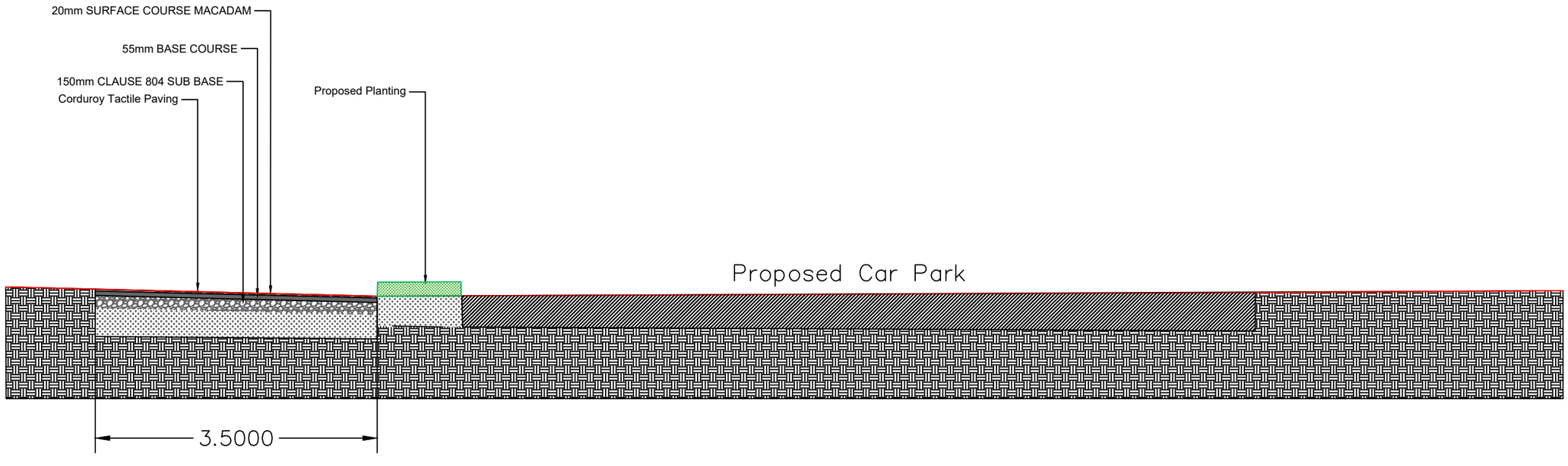

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(UL to NTP)

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Planning Drawings

Sheet 29 of 32

SCALE @ A1	DATE	DRAWN	CHECKED	APPROVED
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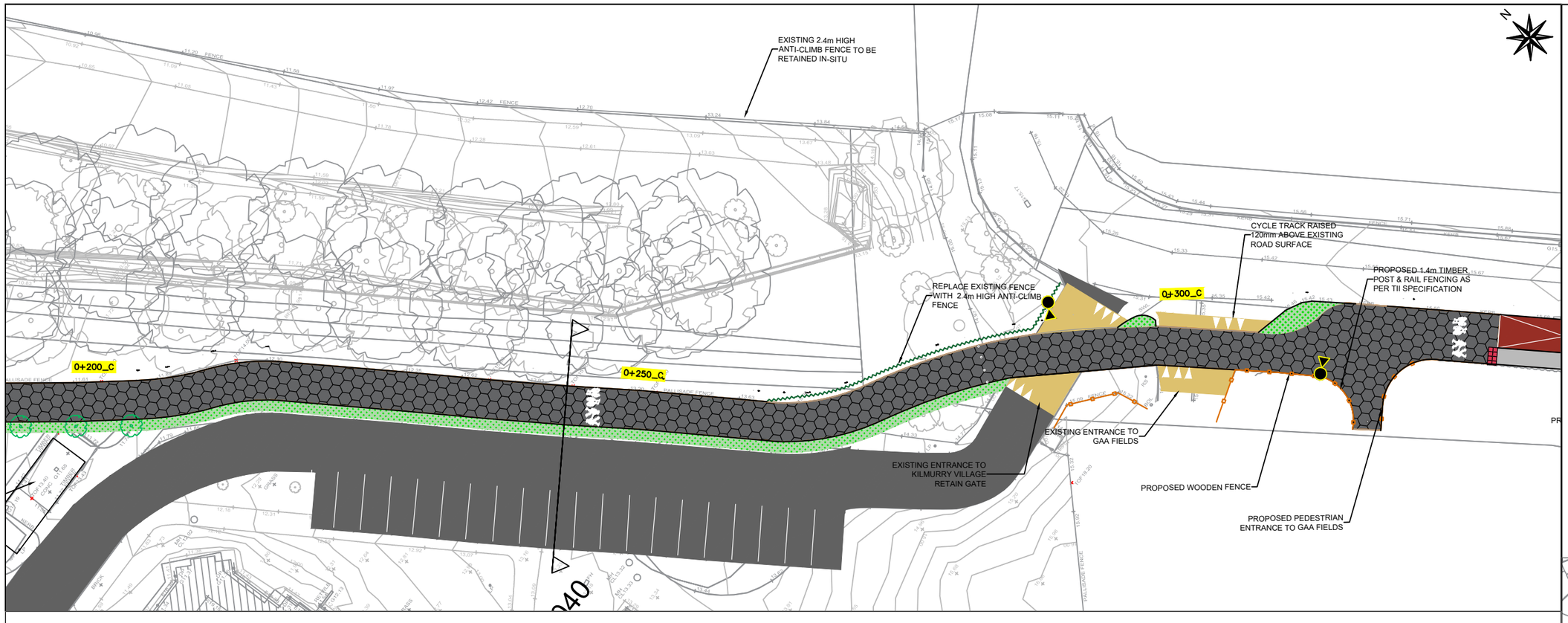
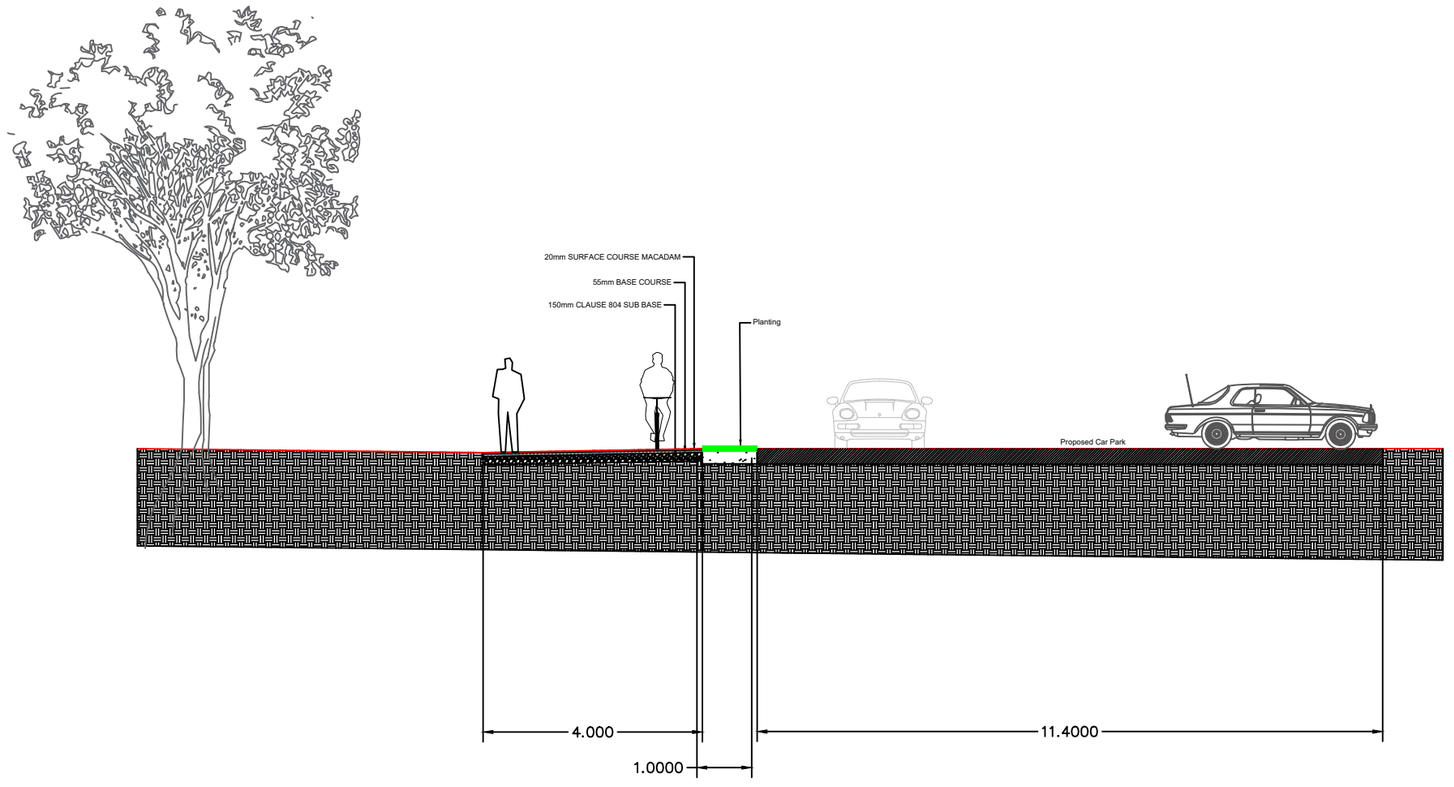
PLATE NO. 31





CS040

PLATE NO. 32

Notes

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SCALE @ A1	DATE	DRAWN	CHECKED	APPROVED
1:200	OCT 2023	KB	BL	PS

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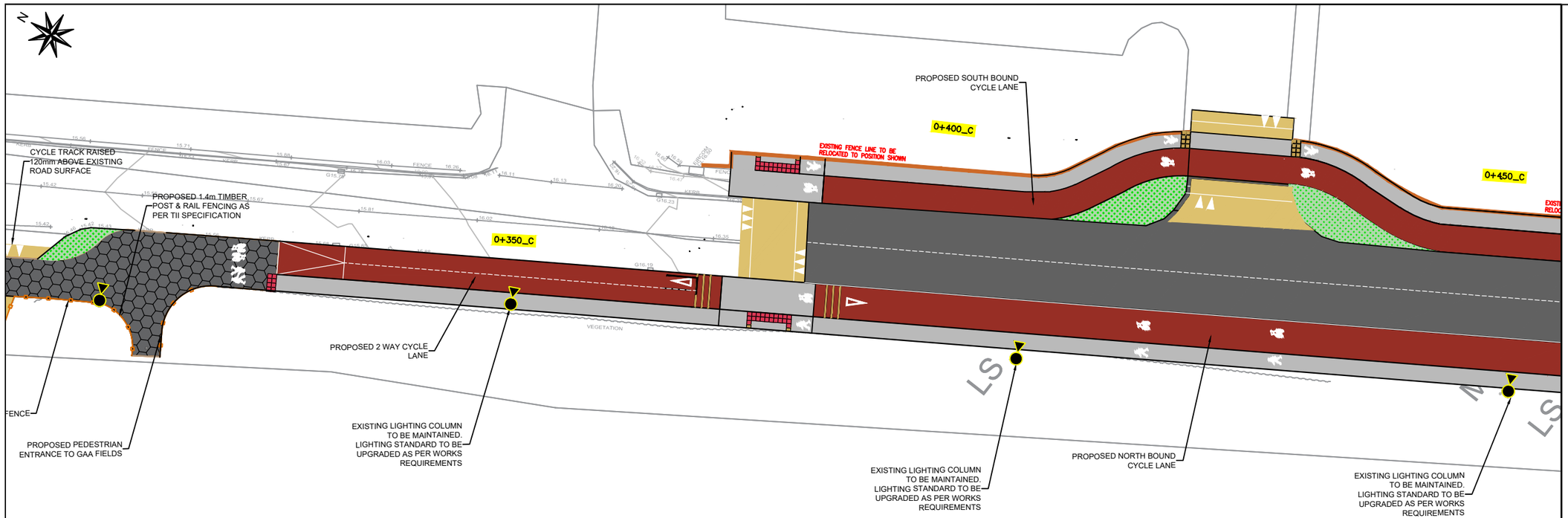

PLATE NO. 33

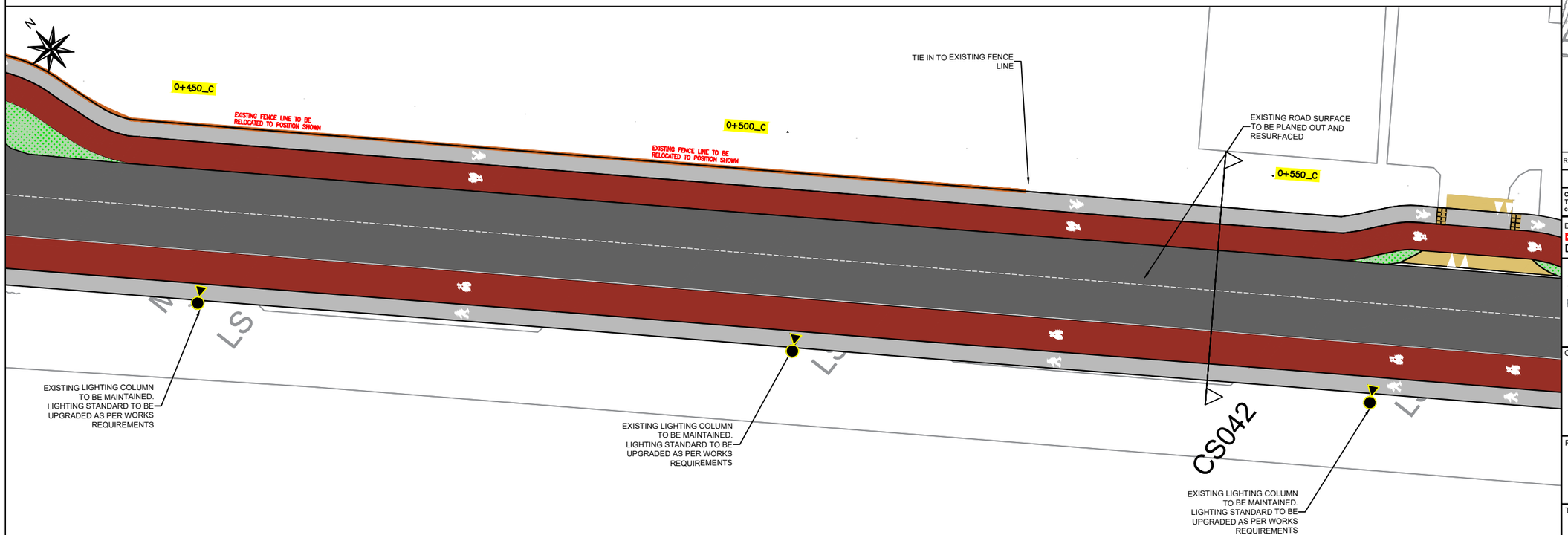

PLATE NO. 34

Notes

1. Levels are in metres O.D. and refer to Malin Head Datum.
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RYAN HANLEY now Stantec

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Limerick City & County Council

PROJECT

Limerick City Greenway (UL to NTP)

TITLE

Planning Drawings

Sheet 31 of 32

SCALE @ A1	DATE	DRAWN	CHECKED	APPROVED
1:200	OCT 2023	KB	BL	PS

JOB No.	CAD FILE PATH	DRAWING No.	REV.
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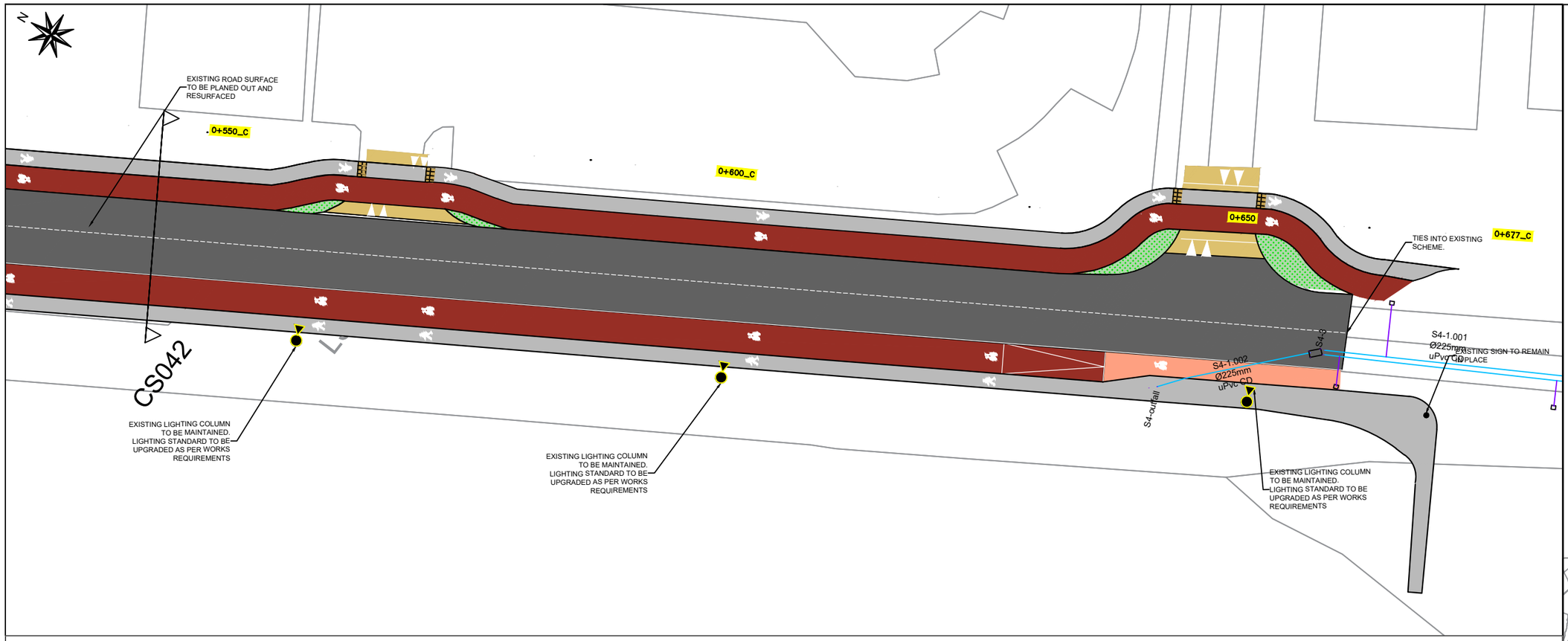

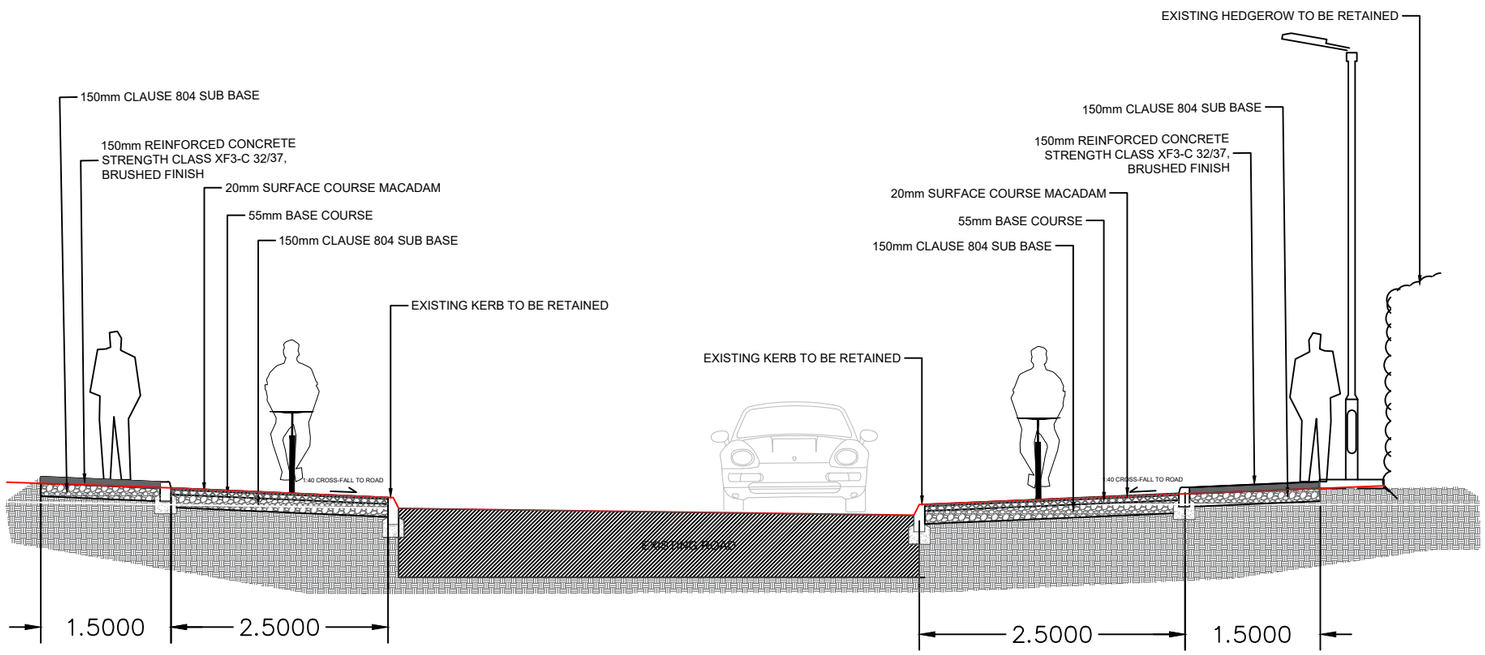

CS042

PLATE NO. 35

Notes

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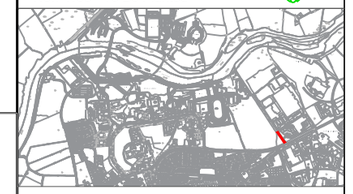

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Sheet 32 of 32

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1:200	OCT 2023	KB	BL	PS

JOB No.	CAD FILE PATH	DRAWING No.	REV.
2535	2535 / 04 / DD / 01	PD0032	

AREA 1

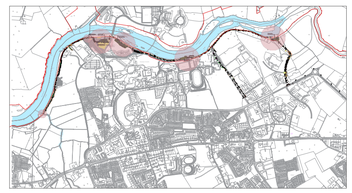
AREA 2

AREA 3

AREA 4

AREA 5

AREA 6



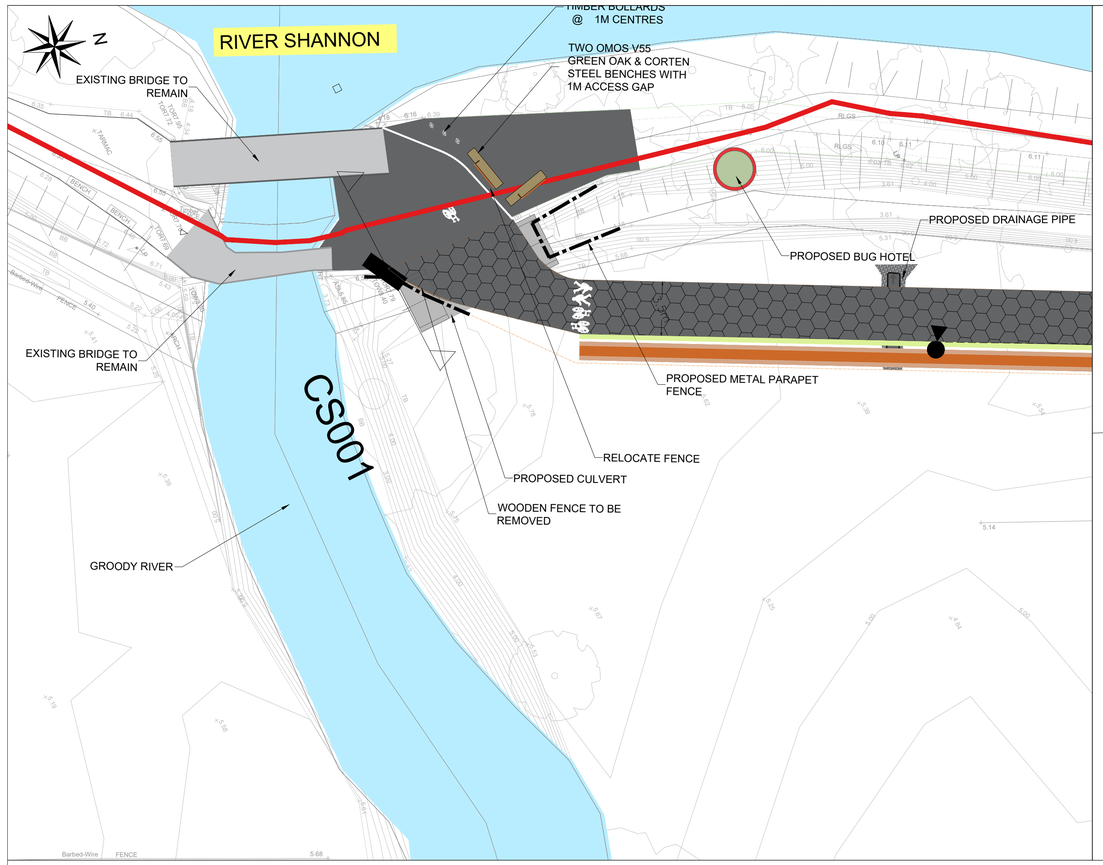
REV	DATE	AMENDMENT

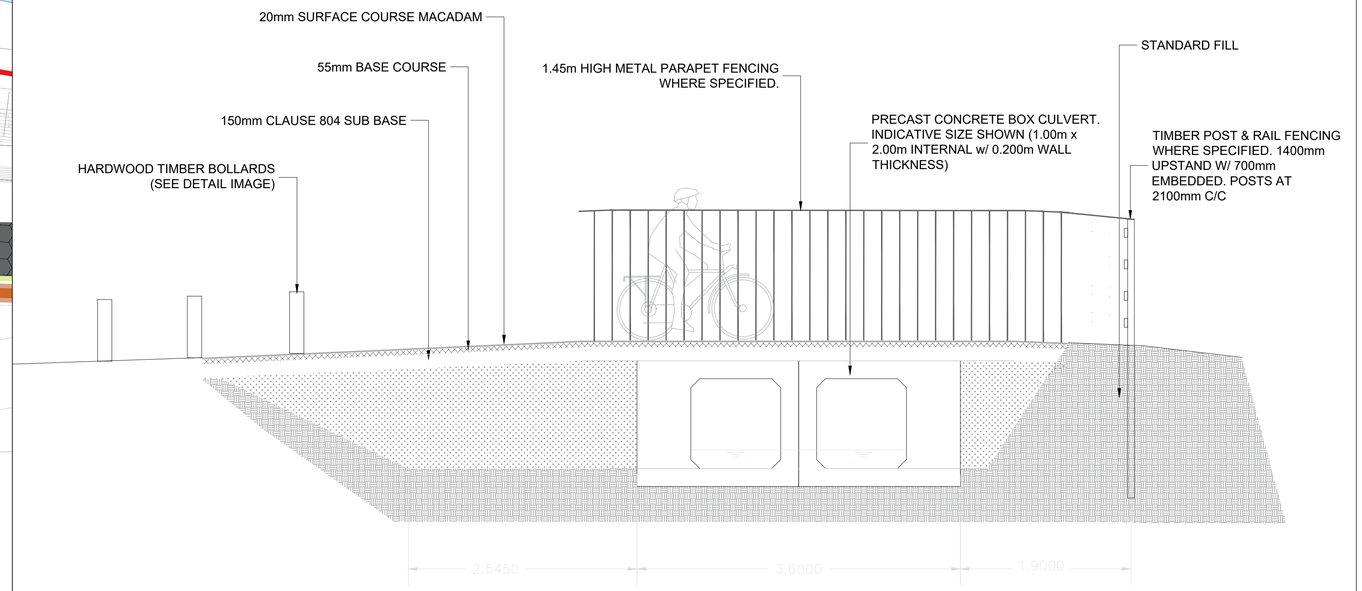
CUNNANE STRATTON REYNOLDS

LAND PLANNING & DESIGN

GALWAY OFFICE
ARDACONG, BALLYTRASNA, TUAM, CO GALWAY.
TEL 093 60854
EMAIL galwayinfo@csrlandplan.ie
www.csrlandplan.ie

PROJECT: **LIMERICK CITY GREENWAY (UL to ANNACOTTY)**	DATE: JANUARY 2025
	SCALE: 1:500 @ A1
DRAWING: **LANDSCAPE MASTERPLAN**	DRAWN: KM CHECKED: KM
	DRAWING NO: **2535-RHA-XX-DR-C-LA0001**





CS001

v55 Seat

OMOS V55 Green Oak & Corten Steel Bench
Supplier : OMOS
www.omos.ie
info@omos.ie

Green Oak hardwood timber bollards with engraved and painted detail as required.

KEY:

- PROPOSED TREES
- PROPOSED UNDERSTORY
- PROPOSED WILDFLOWER MEADOW
- PROPOSED NATIVE HEDGEROW
- SAC BOUNDARY

REV	DATE	AMENDMENT

CUNNANE STRATTON REYNOLDS
LAND PLANNING & DESIGN

GALWAY OFFICE
ARDACONG, BALLYTRASNA, TUAM, CO GALWAY.
TEL 093 60854
EMAIL galwayinfo@csrlandplan.ie
www.csrlandplan.ie

PROJECT: **LIMERICK CITY GREENWAY (UL to ANNACOTTY)**	DATE: JANUARY 2025
	SCALE: 1:200 @ A1
	DRAWN: KM CHECKED: KM
DRAWING: **LANDSCAPE MASTERPLAN AREA 1**	DRAWING NO: **2535-RHA-XX-DR-C-LA0002**

N

7..48

WOODLAND MIX (approx 32sqm)

Tree Species	Specification	Density	No
Quercus robur	10-12cm girth / 2.5-3m high	1per / 10lin.m	2

Understory	Specification	Density	No
25% Corylus avellana	1+2 br transplant / 60-90cm	1per / 4sqm	2
25% Ilex aquifolium	1+2 br transplant / 60-90cm	1per / 4sqm	2
25% Viburnum opulus	1+2 br transplant / 60-90cm	1per / 4sqm	2
25% Euonymous europaeus	1+2 br transplant / 60-90cm	1per / 4sqm	2

WOODLAND MIX (approx 1900sqm)

Tree Species	Specification	Density	No
Alnus glutinosa	6-8cm girth / 2.5-3m high	1per / 25sqm	20
Betula pubescens	6-8cm girth / 2.5-3m high	1per / 25sqm	35
Quercus robur	6-8cm girth / 2.5-3m high	1per / 25sqm	20

Understory	Specification	Density	No
30% Corylus avellana	1+2 br transplant / 60-90cm	1per / 4sqm	150
20% Ilex aquifolium	1+2 br transplant / 60-90cm	1per / 4sqm	100
30% Viburnum opulus	1+2 br transplant / 60-90cm	1per / 4sqm	150
20% Euonymous europaeus	1+2 br transplant / 60-90cm	1per / 4sqm	100

WOODLAND MIX (approx 3,200sqm)

Tree Species	Specification	Density	No
Alnus glutinosa	6-8cm girth / 2.5-3m high	1per / 25sqm	30
Betula pubescens	6-8cm girth / 2.5-3m high	1per / 25sqm	68
Quercus robur	6-8cm girth / 2.5-3m high	1per / 25sqm	30

Understory	Specification	Density	No
30% Corylus avellana	1+2 br transplant / 60-90cm	1per / 4sqm	240
20% Ilex aquifolium	1+2 br transplant / 60-90cm	1per / 4sqm	160
30% Viburnum opulus	1+2 br transplant / 60-90cm	1per / 4sqm	240
20% Euonymous europaeus	1+2 br transplant / 60-90cm	1per / 4sqm	160

CS011 CS012 CS013 CS014 CS015 CS016

FISHERMANS COTTAGE

PLASSEY MILLS

Plassy Mills (in Ruins)

WOODLAND MIX REPLACEMENT TREE PLANTING (SEE TABLE)

HEDGEROW

WILD FLOWER MEADOW

REPLACEMENT TREE PLANTING

HEDEGROW MIX (approx 500sqm)

Tree Species	Specification	Density	No
Quercus robur	10-12cm girth / 2.5-3m high	1per / 10 lin.m	9

Hedge mix species	Specification	Density	No
30% Corylus avellana	1+2 br transplant / 60-90cm	2per / 4sqm	300
20% Crataegus monogyna	1+2 br transplant / 60-90cm	2per / 4sqm	300
10% Ilex aquifolium	1+2 br transplant / 60-90cm	2per / 4sqm	100
10% Prunus spinosa	1+2 br transplant / 60-90cm	2per / 4sqm	100
10% Sambucus nigra	1+2 br transplant / 60-90cm	2per / 4sqm	100
10% Viburnum opulus	1+2 br transplant / 60-90cm	2per / 4sqm	100
10% Euonymous europaeus	1+2 br transplant / 60-90cm	2per / 4sqm	100

WILDFLOWER MEADOW MIX (approx 4,650sqm)

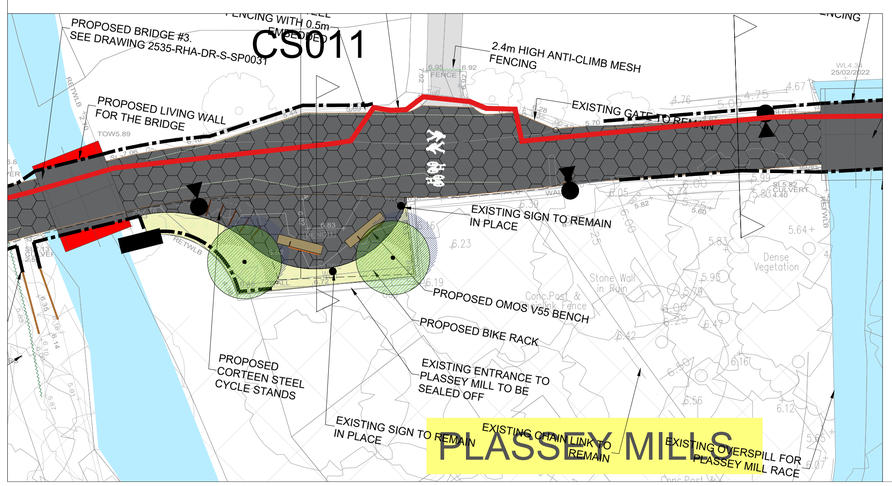
Butterfly & Bee Meadow Mix - Supplier www.connectingtonature.ie
80% grasses: 20% wildflower seeded at 1kg / 200sqm.

Species included: Agrimony, Borage, Clary, Wild Salvia verbenaca, Red Clover, White Clover, Corn Cockle, Cornflower, Ox-eye daisy, Foxglove, Greater Knapweed, Common Knapweed, Purple Loosestrife, Marjoram, Meadow Cranesbill, Musk Mallow, Common Poppy, Ragged Robin, Field Scabious, small Scabious, Teasel, Bird's-foot Trefoil, Kidney vetch, Viper's Bugloss, Yarrow, Yellow Rattle, Common bent, Crested dog's tail, Sheeps fescue, Slender creeping red fescue, Smooth-stalked meadow grass, Smaller cat's tail.

All-Ireland Pollinator Plan www.pollinators.ie

KEY:

- PROPOSED TREES
- PROPOSED UNDERSTORY
- PROPOSED WILDFLOWER MEADOW
- PROPOSED NATIVE HEDGEROW
- SAC BOUNDARY



v55 Seat

OMOS V55 Green Oak & Corten Steel Bench
Supplier : OMOS
www.omos.ie
info@omos.ie

Corten Steel Cycle Stand
Supplier : Corteen Steel Ireland
www.cortensteelireland.ie
info@cortensteelireland.ie

REV	DATE	AMENDMENT

CUNNANE STRATTON REYNOLDS

LAND PLANNING & DESIGN

GALWAY OFFICE
ARDACONG, BALLYTRASNA, TUAM, CO GALWAY.
TEL 093 60854
EMAIL galwayinfo@csrlandplan.ie
www.csrlandplan.ie

PROJECT: **LIMERICK CITY GREENWAY (UL to ANNACOTTY)**	DATE: JANUARY 2025
	SCALE: 1:500 / 1:200 @ A1
	DRAWN: KM CHECKED: KM
DRAWING: **LANDSCAPE MASTERPLAN AREAS 2, 3 & 4**	DRAWING NO: **2535-RHA-XX-DR-C-LA0003**

N

CS019

PROPOSED RETAINING WALL AND BENCH ALONG PLASSEY BEACH

EXISTING SLOPE AND GRASS BANK TO BE RETAINED

PROPOSED SEATING ATTACHED TO RETAINING WALL ALONG PLASSEY BEACH

PROPOSED DISABILITY ACCESS RAMP TO UL BEACH

PROPOSED BIKE RACK

PROPOSED REPLACEMENT PLANTING

PATH NARROWS TO AVOID TREES

PROPOSED METAL PARAPET RAILINGS

EXISTING TREES WITH BAT ROOST POTENTIAL

EXISTING SEATING REMAIN IN PLACE

PROPOSED BRIDGE #5SEE CE DRAWING 2535-RHA-XX-DR-S-SP0051

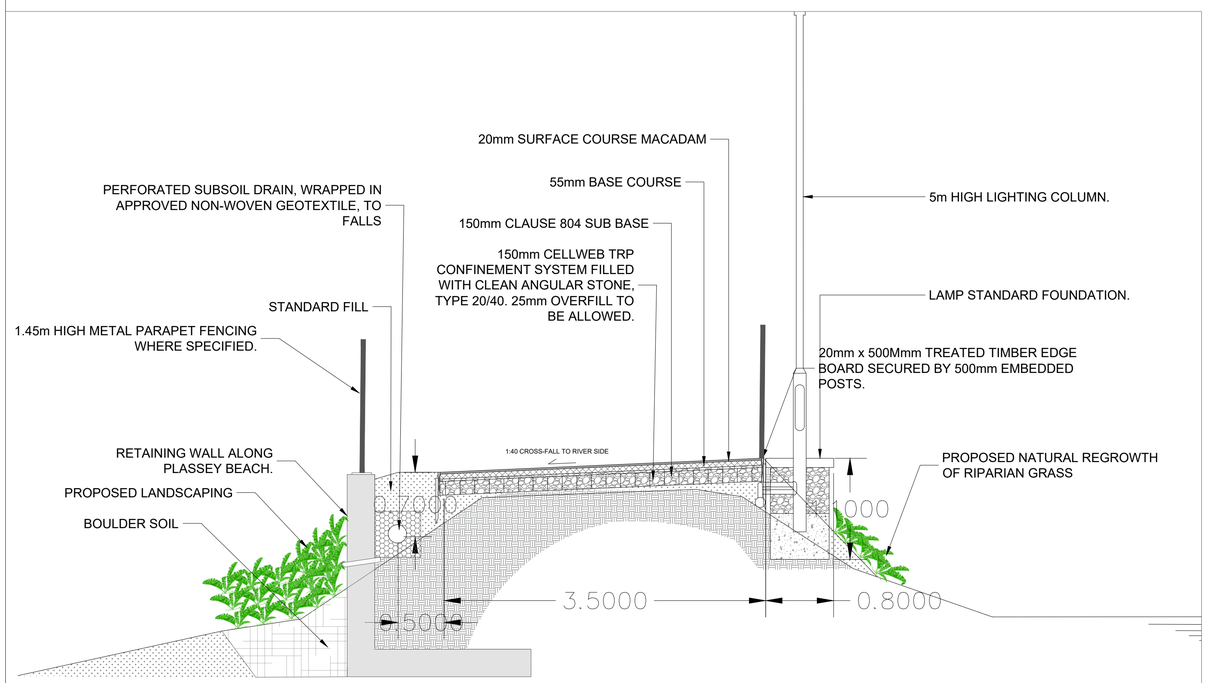
PROPOSED BIRD BOX

RIVERSIDE SHRUB MIX (approx 50sqm)

Tree Species	Specification	Density	No
10% Athyrium filix-femina	9cm pot	3/sqm	15
20% Caltha palustris	AQ 9cm pot	9/sqm	30
30% Eleocharis palustris	AQ 9cm pot	9/sqm	45
10% Iris pseudacorus	AQ 9cm pot	3/sqm	15
10% Osmunda regalis	9cm pots	3/sqm	15
10% Typha latifolia	AQ 9cm pots	3/sqm	15
10% Valeriana officinalis	AQ 9cm pots	9/sqm	15

RIVERSIDE TREE MIX (approx 1,000sqm)

Tree Species	Specification	Density	No
Alnus glutinosa	1+2 br transplant / 60-90cm	1per / 4sqm	50
Betula pubescens	1+2 br transplant / 60-90cm	1per / 4sqm	50
Salix cinerea	1+2 br transplant / 60-90cm	1per / 4sqm	50
Salix fragilis	1+2 br transplant / 60-90cm	1per / 4sqm	50
Salix purpurea	1+2 br transplant / 60-90cm	1per / 4sqm	50



REFER TO 2535-RH-XX-DR-CS-SP0052

CS019

Corten Steel Cycle Stand
Supplier : Corteen Steel Ireland
www.cortensteelireland.ie
info@cortensteelireland.ie

KEY:

- PROPOSED TREES
- EXISTING VEGETATION UNDERSTORY
- PROPOSED RIPARIAN PLANTING
- SAC BOUNDARY

REV	DATE	AMENDMENT

CUNNANE STRATTON REYNOLDS
LAND PLANNING & DESIGN

GALWAY OFFICE
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TEL 093 60854
EMAIL galwayinfo@csrlandplan.ie
www.csrlandplan.ie

PROJECT: **LIMERICK CITY GREENWAY (UL to ANNACOTTY)**	DATE: JANUARY 2025
	SCALE: 1:500 @ A1
DRAWING: **LANDSCAPE MASTERPLAN AREA 5**	DRAWN: KM CHECKED: KM
	DRAWING NO: **2535-RHA-XX-DR-C-LA0004**

WOODLAND MIX (approx 1,100sqm)

Tree Species	Specification	Density	No
Alnus glutinosa	6-8cm girth / 2.5-3m high	1per / 25sqm	10
Betula pubescens	6-8cm girth / 2.5-3m high	1per / 25sqm	20
Quercus robur	6-8cm girth / 2.5-3m high	1per / 25sqm	15

Understory	Specification	Density	No
30% Corylus avellana	1+2 br transplant / 60-90cm	1per / 4sqm	330
20% Ilex aquifolium	1+2 br transplant / 60-90cm	1per / 4sqm	220
30% Viburnum opulus	1+2 br transplant / 60-90cm	1per / 4sqm	330
20% Euonymous europaeus	1+2 br transplant / 60-90cm	1per / 4sqm	220

OMOS V55 Green Oak &
Corten Steel Bench

Proposed hardwood
bollards @ 1m centres

KEY:

- PROPOSED TREES
- EXISTING VEGETATION UNDERSTORY
- SAC BOUNDARY

v55 Seat

OMOS V55 Green Oak & Corten Steel Bench
Supplier : OMOS
www.omos.ie
info@omos.ie

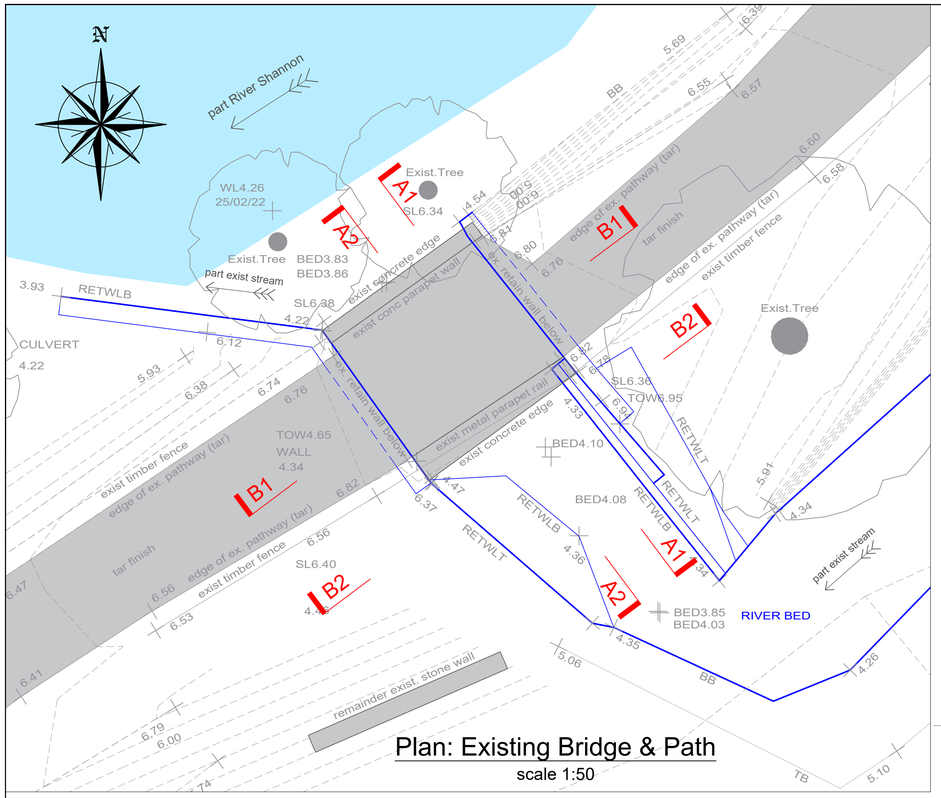
Green Oak hardwood timber bollards with engraved and painted detail as required.

REV	DATE	AMENDMENT

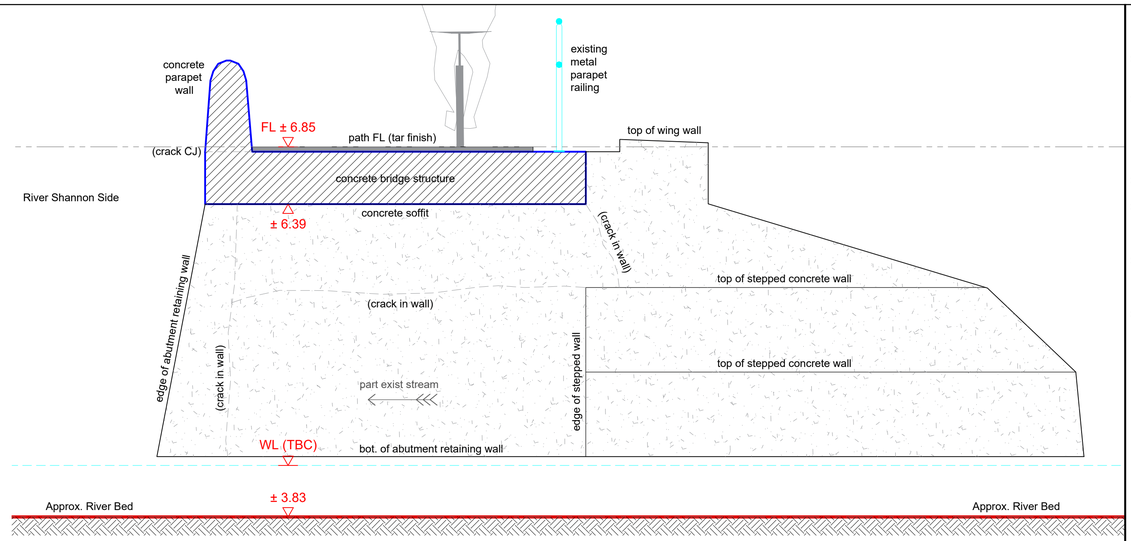
CUNNANE STRATTON REYNOLDS
LAND PLANNING & DESIGN

GALWAY OFFICE
ARDACONG, BALLYTRASNA, TUAM, CO GALWAY.
TEL 093 60854
EMAIL galwayinfo@csrlandplan.ie
www.csrlandplan.ie

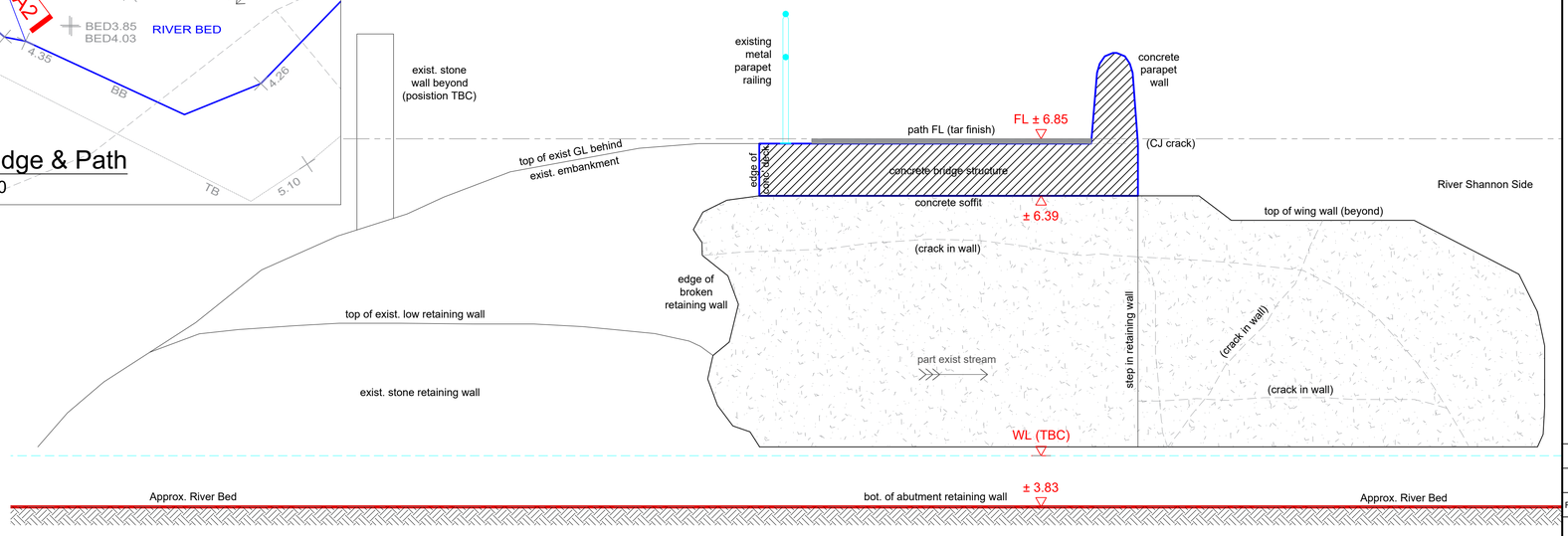
PROJECT: **LIMERICK CITY GREENWAY (UL to ANNACOTTY)**	DATE: JANUARY 2025
	SCALE: 1:500 @ A1
DRAWING: **LANDSCAPE MASTERPLAN AREA 6**	DRAWN: KM CHECKED: KM
	DRAWING NO: **2535-RHA-XX-DR-C-LA0005**



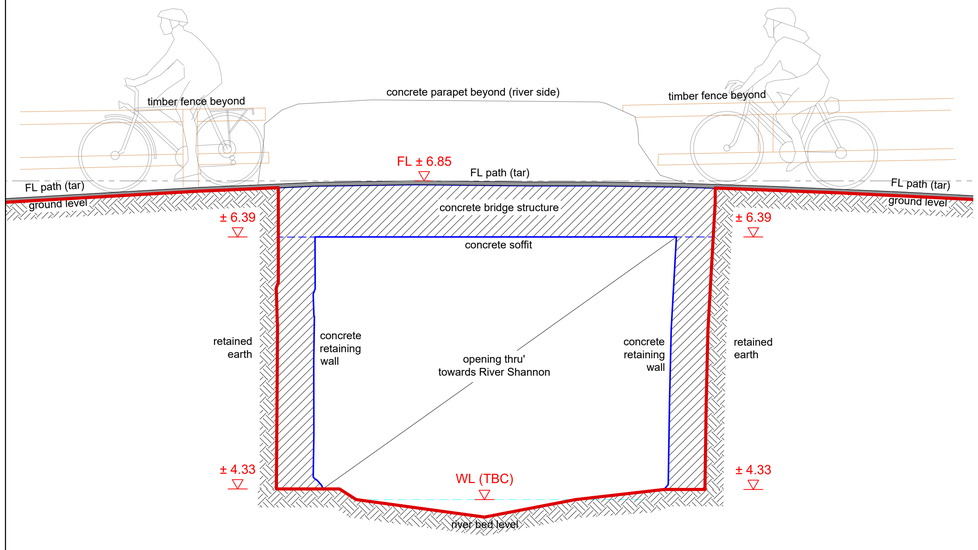
Plan: Existing Bridge & Path
scale 1:50



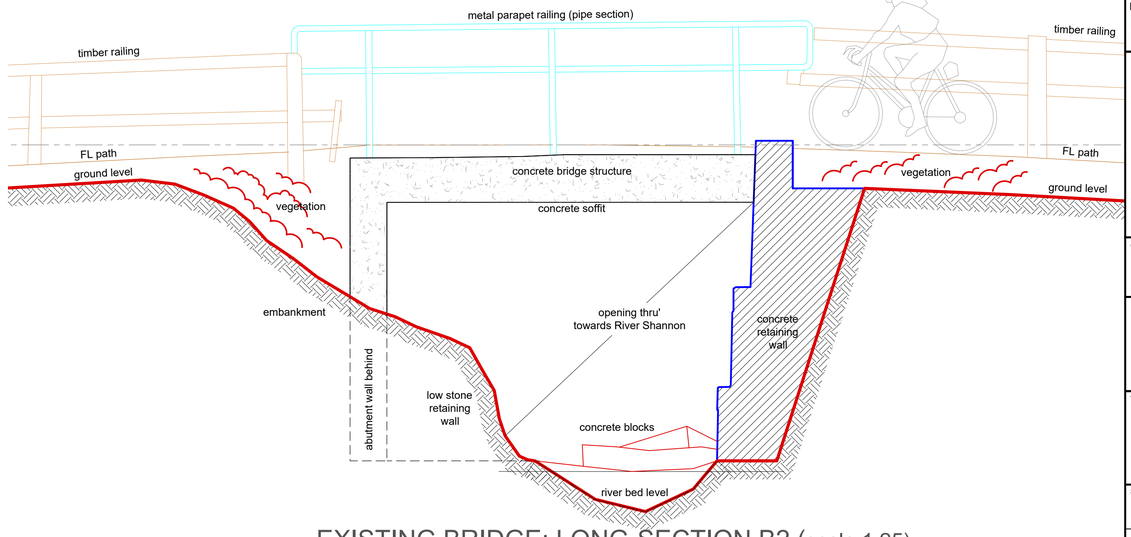
EXISTING BRIDGE: SECTIONAL-ELEVATION A1 scale 1:25



EXISTING BRIDGE: SECTIONAL-ELEVATION A2 (scale 1:25)



EXISTING BRIDGE: LONG-SECTION B1 (scale 1:25)



EXISTING BRIDGE: LONG-SECTION B2 (scale 1:25)

GENERAL NOTES

G1. This drawing is to be read in conjunction with all the relevant Architect's and Engineers' drawings and specifications.

G2. Do not scale off this drawing. All details and dimensions are to be checked by the Contractor and Manufacture on site prior to commencement of construction/fabrication. Any existing dimensions noted on this drawing are to be checked by the contractor prior to commencement of the works.

G3. Any discrepancies are to be reported to the Engineer.

G4. All dimensions are in millimetres unless noted otherwise. All levels are in metres relative to Ordnance Datum (OD) at Malin Head.

G5. All proprietary materials and products shall be installed and used in accordance with the manufacturer's details and specification.

G6. The design of temporary works and the provision of stability of all elements of the work during Construction is the responsibility of the Contractor.

REFERENCE DRAWINGS

2535-RHA-XX-DR-C-GA-000_R1	GA Detail Design.
2535-RHA-XX-DR-S-SKP001	Key Plan New Bridges.

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REV	DATE	DESCRIPTION	DRG	CHK	APD
-	17.05.2022	Draft for Approval & Planning Purposes	ASM	PGS	BL

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DRAWING STATUS
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Email: info@ryanhanley.ie
Web: www.ryanhanley.ie
DUBLIN - GALWAY - CASTLEBAR - CORK

CLIENT
Comhairle Cathrach & Contae Luimnigh
Limerick City & County Council

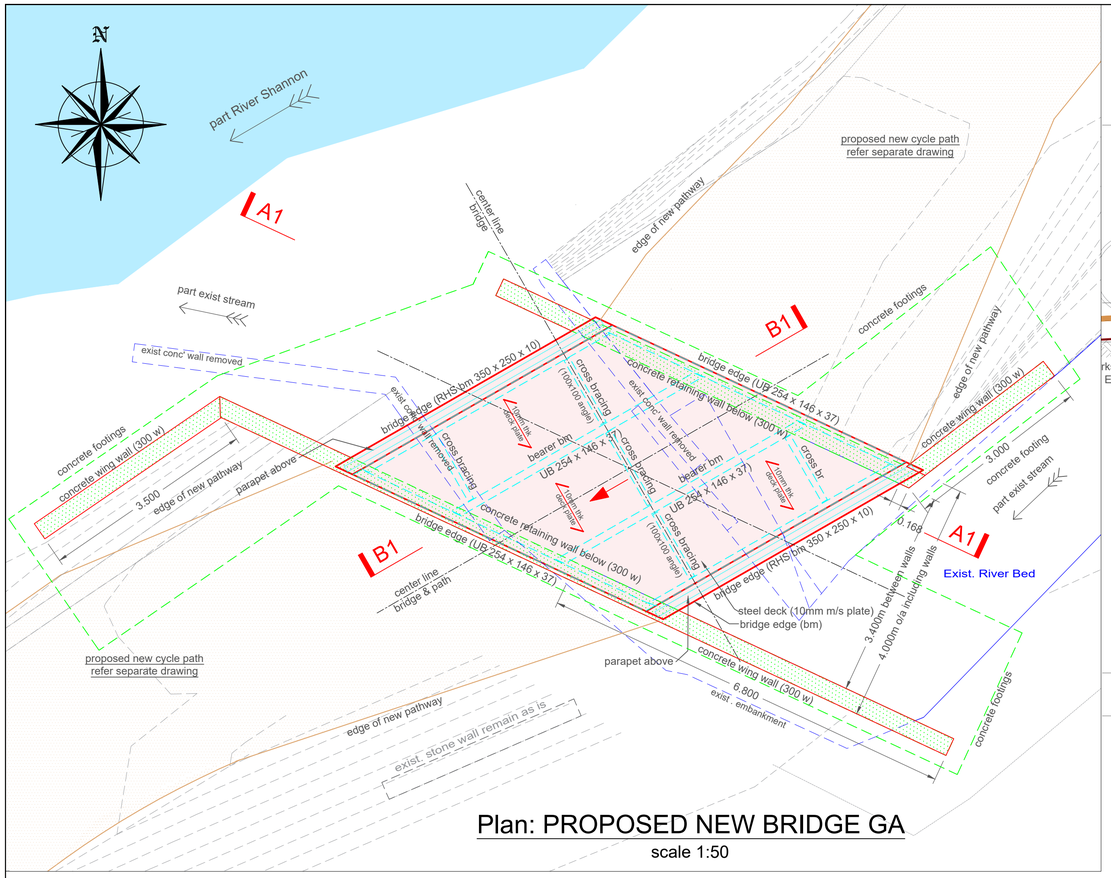
PROJECT
University of Limerick to National Technology Park Cycle Path

TITLE
BRIDGE 1: EXISTING PLAN ELEVATIONS & SECTIONS

Sheet 1 of 1

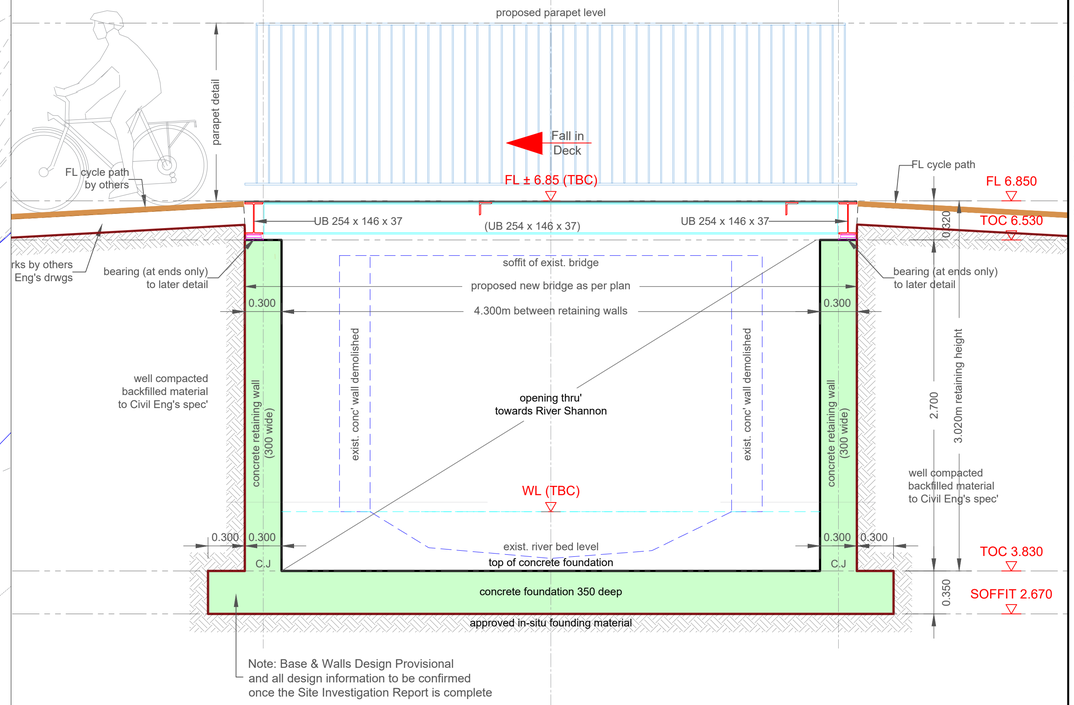
SCALE @ A1	DATE	DRAWN	CHECKED	APPROVED
As Shown	April 2022	ASM	PGS	RW

JOB No.	DRAWING No.	REV.
2535	RHA-XX-DR-S-SP0010	-

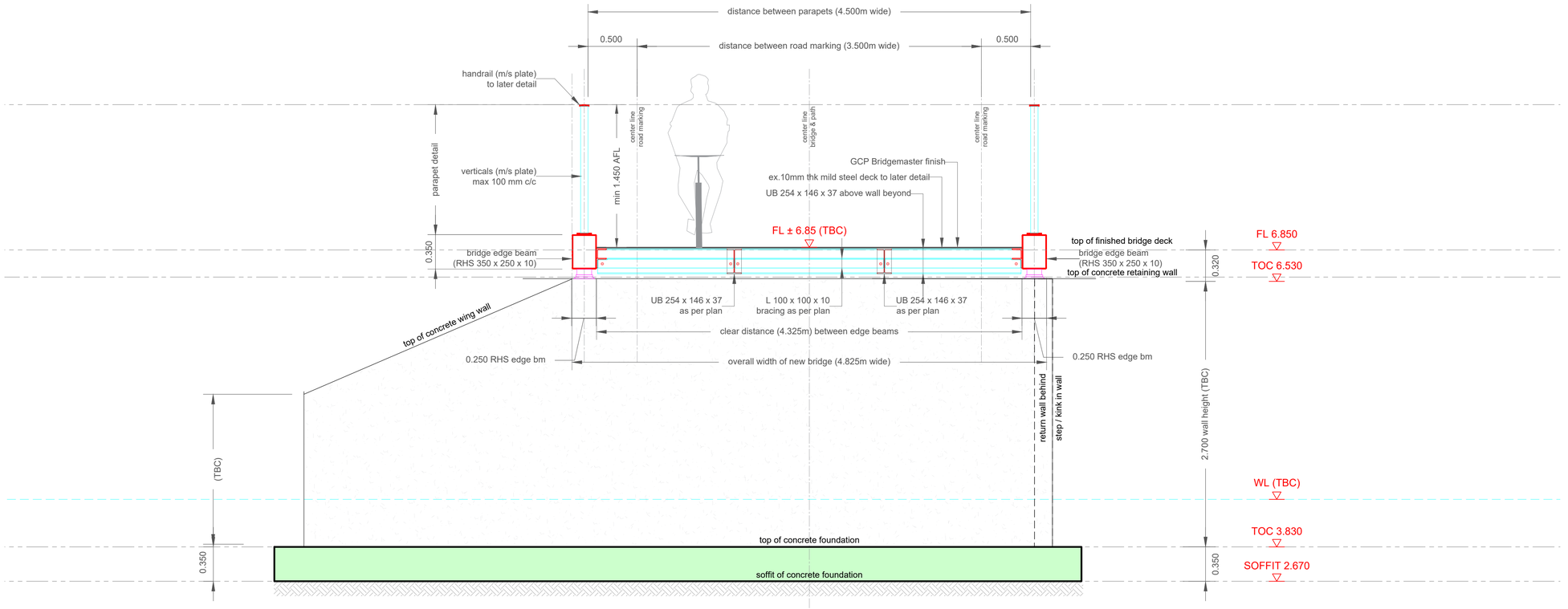


Plan: PROPOSED NEW BRIDGE GA

scale 1:50



PROPOSED BRIDGE: LONG-SECTION B1 scale 1:25



PROPOSED BRIDGE: SECTIONAL-ELEVATION A1 scale 1:25

GENERAL NOTES

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REFERENCE DRAWINGS

2535-RHA-XX-DR-C-GA-000_R1	GA Detail Design.
2535-RHA-XX-DR-S-SKP001	Key Plan New Bridges.
2535-RHA-XX-DR-S-SP0010	Existing Plan & Elevations.

NOTE: AWAITING FINAL SITE INSVESTIGATION REPORT

Foundations and Walls Design are Provisional, and all the information shown to be confirmed once the Final Site Investigation Report is complete and confirmed.

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REV	DATE	DESCRIPTION	DRG	CHK	APD
-	17.05.2022	Draft for Approval & Planning Purposes	ASM	PGS	BL

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DUBLIN - GALWAY - CASTLEBAR - CORK

CLIENT
Comhairle Cathrach & Contae Luimnigh
Limerick City & County Council

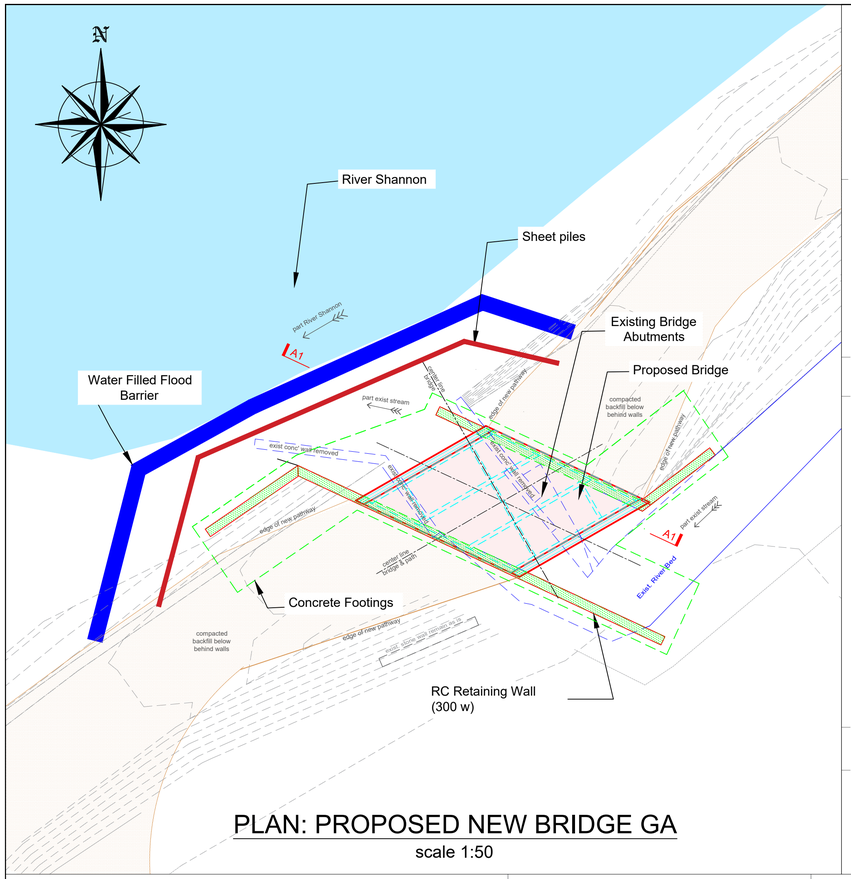
PROJECT
University of Limerick to National Technology Park Cycle Path

TITLE
BRIDGE 1: PROPOSED PLAN ELEVATIONS & SECTIONS

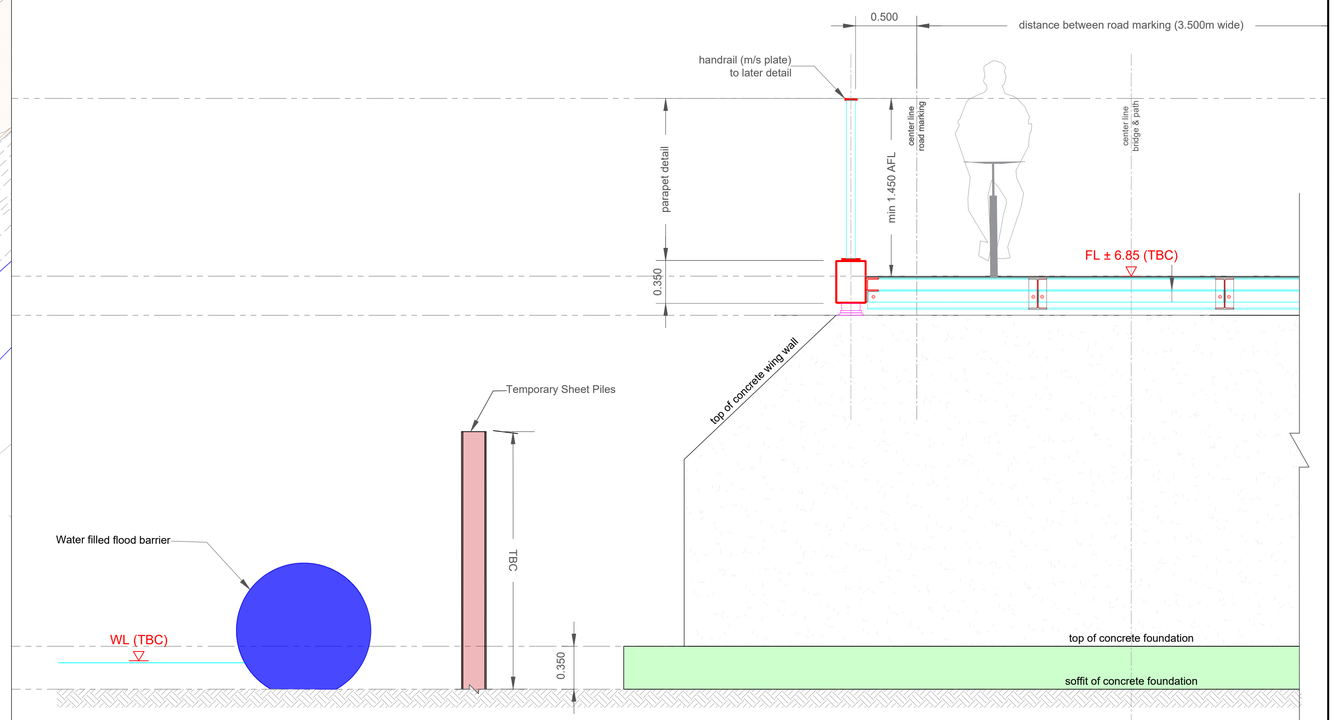
Sheet 1 of 1

SCALE @ A1	DATE	DRAWN	CHECKED	APPROVED
As Shown	April 2022	ASM	PGS	RW

JOB No.	DRAWING No.	REV.
2535	RHA-XX-DR-S-SP0011	-



PLAN: PROPOSED NEW BRIDGE GA
scale 1:50



PROPOSED BRIDGE: SECTIONAL-ELEVATION A1 scale 1:25

GENERAL NOTES

G1. This drawing is to be read in conjunction with all the relevant Architect's and Engineers' drawings and specifications.

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G5. All proprietary materials and products shall be installed and used in accordance with the manufacturer's details and specification.

G6. The design of temporary works and the provision of stability of all elements of the work during Construction is the responsibility of the Contractor.

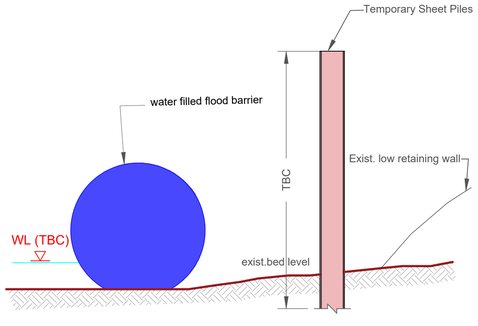
REFERENCE DRAWINGS

2535-RHA-XX-DR-C-GA-000_R1	GA Detail Design.
2535-RHA-XX-DR-S-SKP001	Key Plan New Bridges.
2535-RHA-XX-DR-S-SP0010	Existing Plan & Elevations.
2535-RHA-XX-DR-S-SP0011	Proposed Plan & Elevations.

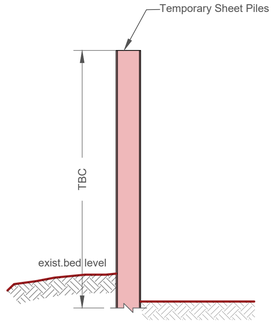
NOTE: AWAITING FINAL SITE INSVESTIGATION REPORT

Foundations and Walls Design are Provisional, and all the information shown to be confirmed once the Final Site Investigation Report is complete and confirmed.

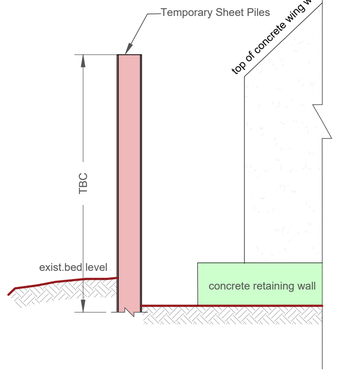
STEP 1
Install water barrier & sheet piles



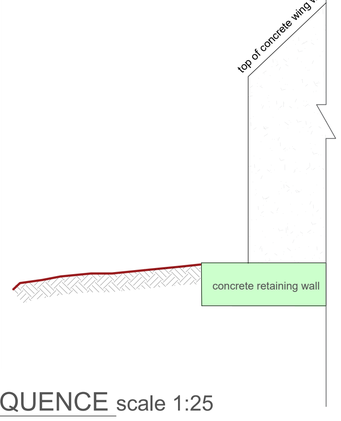
STEP 2
Take down existing bridge abutments.Store on site to be reused as backfill. Excavate behind sheetpile.



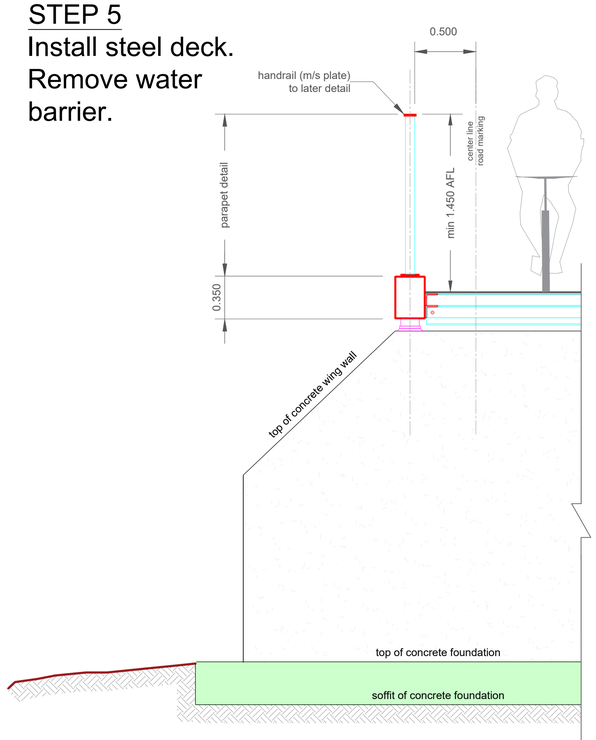
STEP 3
Construct proposed abutments.



STEP 4
Remove sheetpiles and backfill



STEP 5
Install steel deck. Remove water barrier.



PROPOSED CONSTRUCTION SEQUENCE scale 1:25

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REV	DATE	DESCRIPTION	DRG	CHK	APD

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Web: www.ryanhanley.ie
DUBLIN - GALWAY - CASTLEBAR - CORK

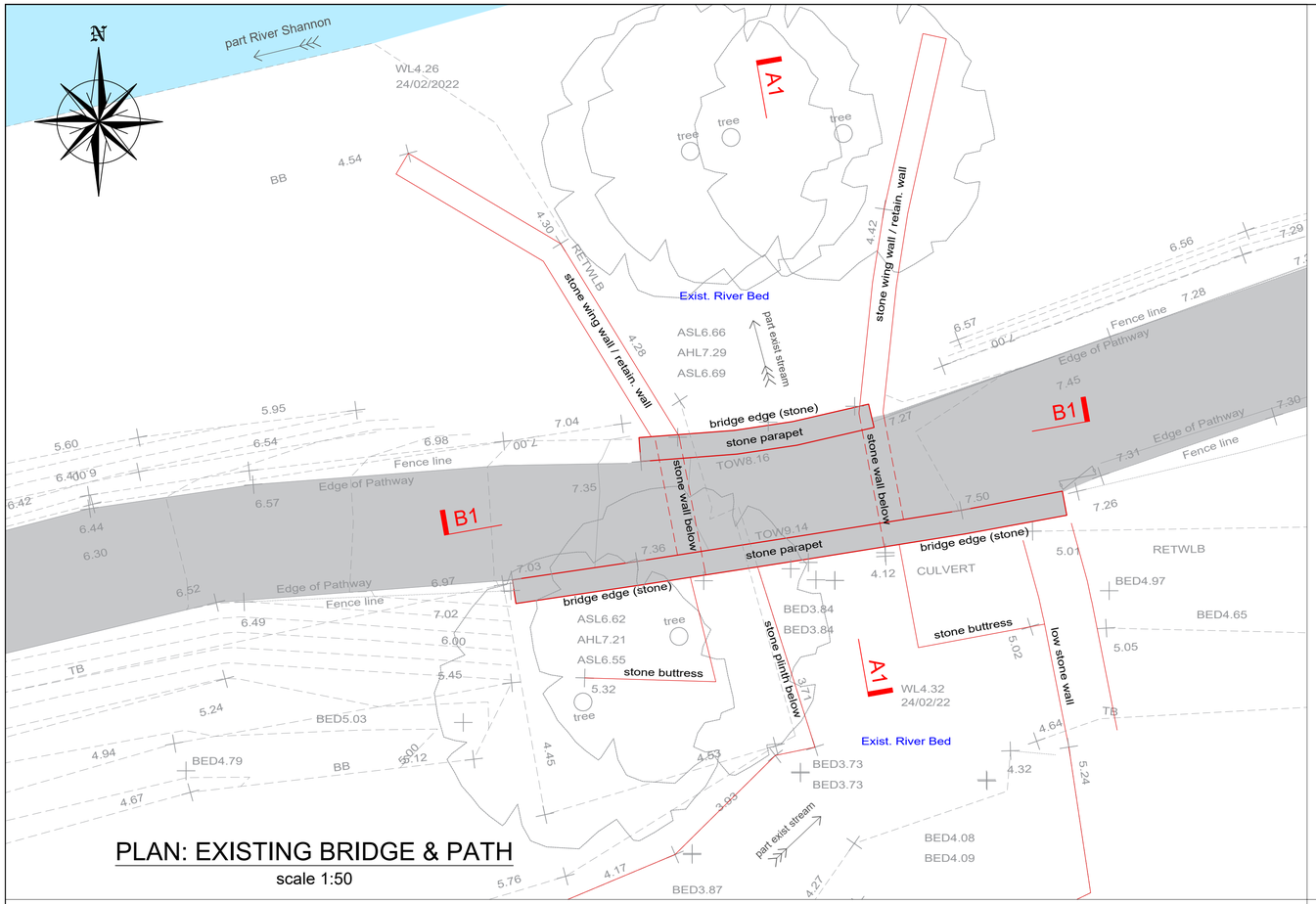
CLIENT

PROJECT
University of Limerick to National Technology Park Cycle Path

TITLE
BRIDGE 1: POSSIBLE CONSTRUCTION SEQUENCE PLAN & SECTIONS
Sheet 1 of 1

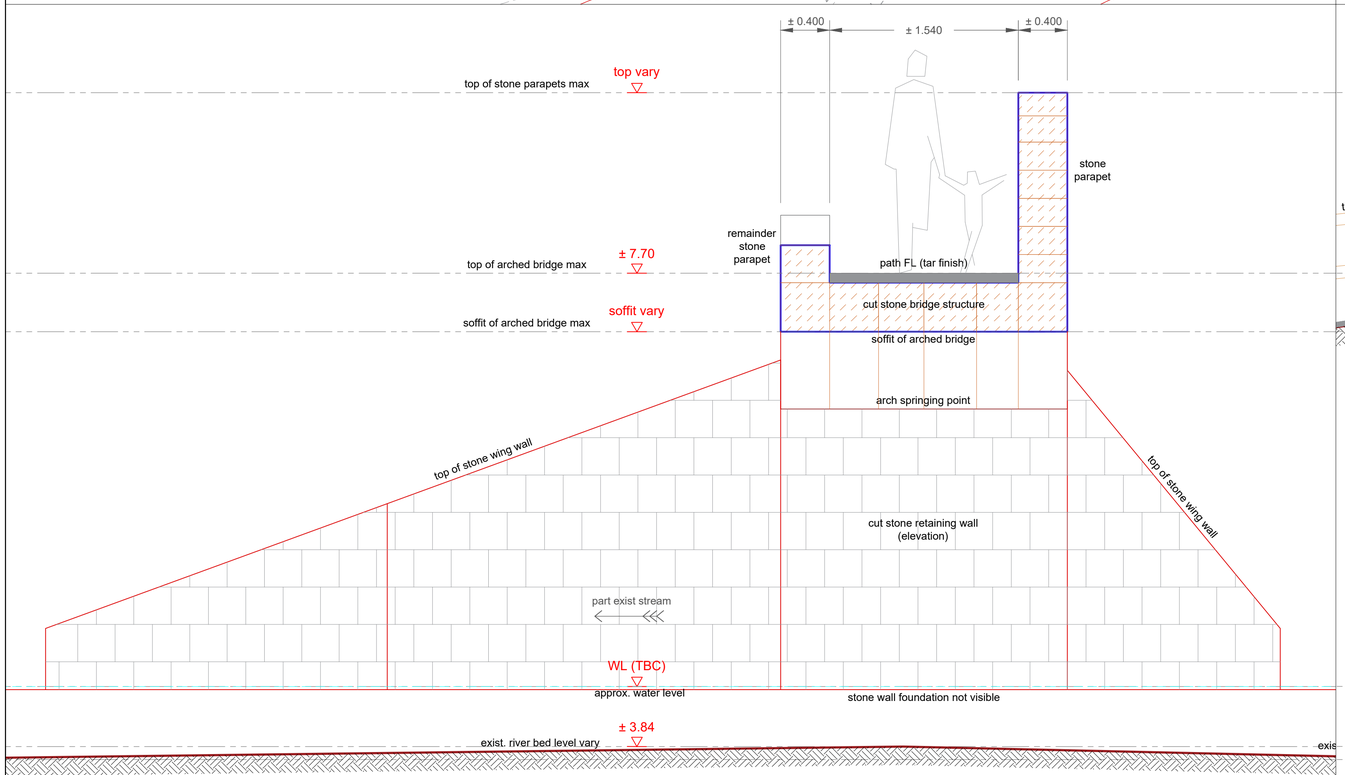
SCALE @ A1	DATE	DRAWN	CHECKED	APPROVED
As Shown	May 2025	AMR	BL	BL

JOB No.	DRAWING No.	REV.
2535	RHA-XX-DR-S-SP0012	-

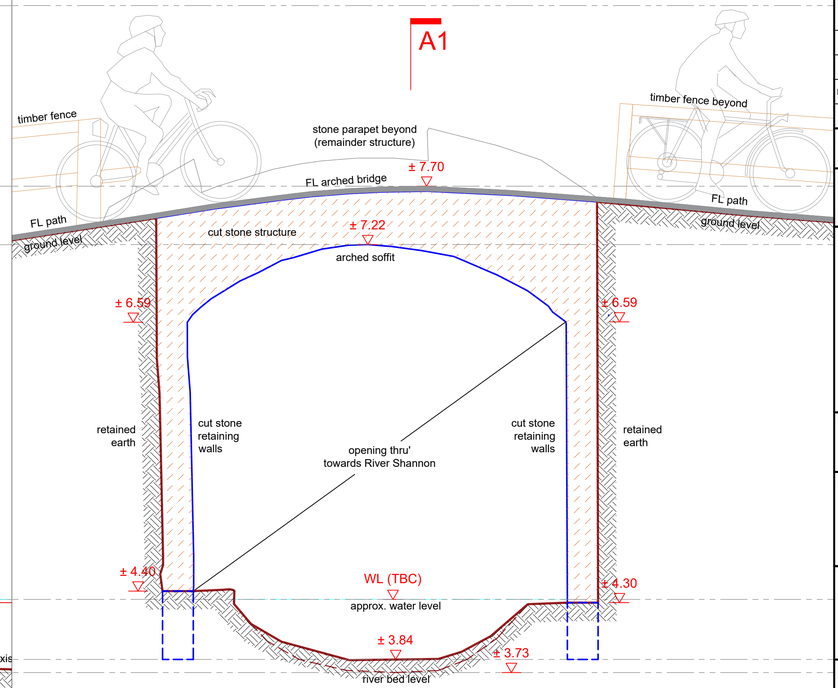


PLAN: EXISTING BRIDGE & PATH

scale 1:50



EXISTING BRIDGE: SECTIONAL-ELEVATION A1 (scale 1:25)



EXISTING BRIDGE: SECTION B1 scale 1:25

GENERAL NOTES

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REFERENCE DRAWINGS

2535-RHA-XX-DR-C-GA-000_R1	GA Detail Design.
2535-RHA-XX-DR-S-SKP001	Key Plan New Bridges.

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-	17.05.2022	Draft for Approval & Planning Purposes	ASM	PGS	BL

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DRAWING STATUS

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CLIENT

Comhairle Cathrach & Contae Luimnigh
Limerick City & County Council

PROJECT

University of Limerick to National Technology Park Cycle Path

TITLE

BRIDGE 2: EXISTING PLAN ELEVATIONS & SECTIONS

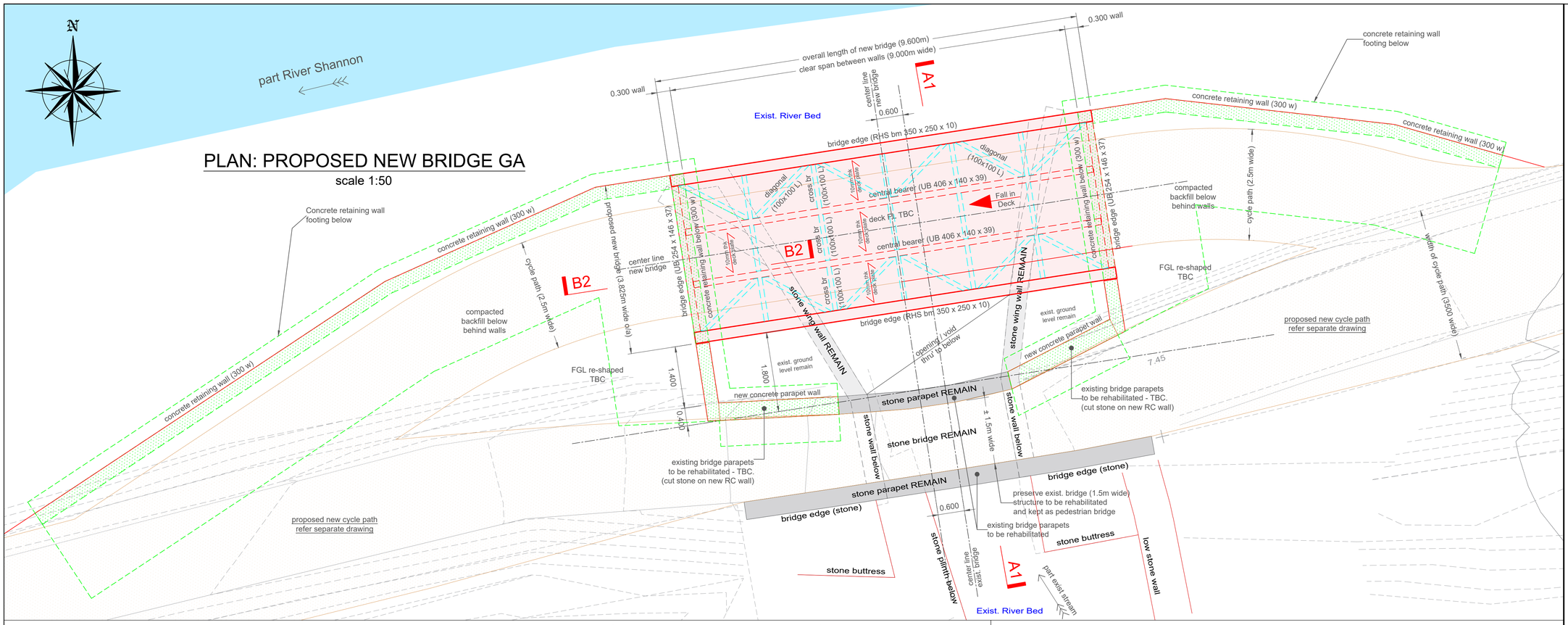
Sheet 1 of 1

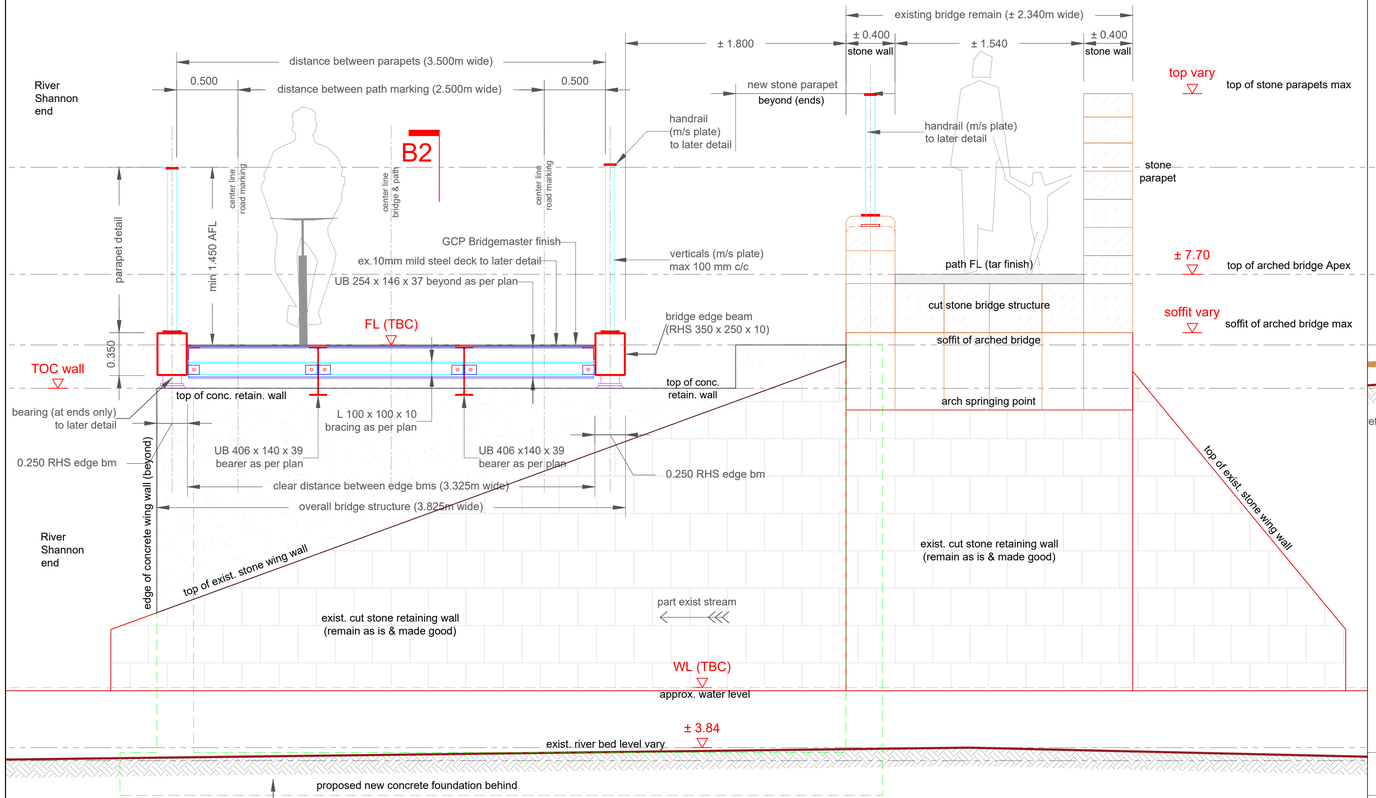
SCALE @ A1	DATE	DRAWN	CHECKED	APPROVED
As Shown	April 2022	ASM	PGS	RW

JOB No.	DRAWING No.	REV.
2535	RHA-XX-DR-S-SP0020	-

PLAN: PROPOSED NEW BRIDGE GA

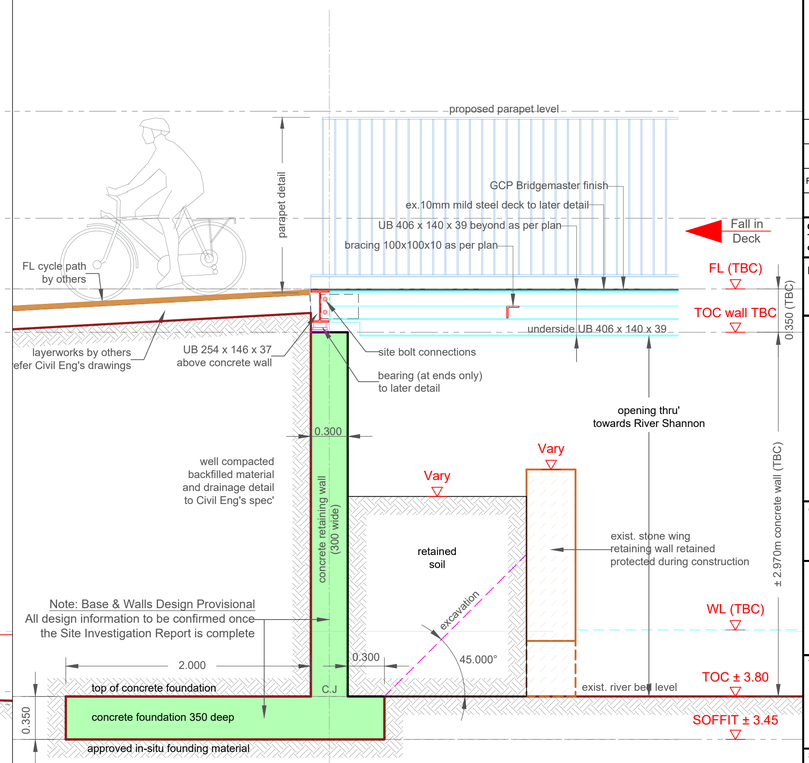
scale 1:50





Note: Base & Walls Design Provisional
All design information to be confirmed once the Site Investigation Report is complete

PROPOSED BRIDGE: SECTIONAL-ELEVATION A1 (scale 1:25)



PROPOSED BRIDGE: ABUTMENT SECTION B2 (scale 1:25)

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REFERENCE DRAWINGS

2535-RHA-XX-DR-C-GA-000_R1	GA Detail Design.
2535-RHA-XX-DR-S-SKP001	Key Plan New Bridges.
2535-RHA-XX-DR-S-SP0020	Existing Plan, Section & Elevation

NOTE: AWAITING FINAL SITE INSVESTIGATION REPORT

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PROJECT

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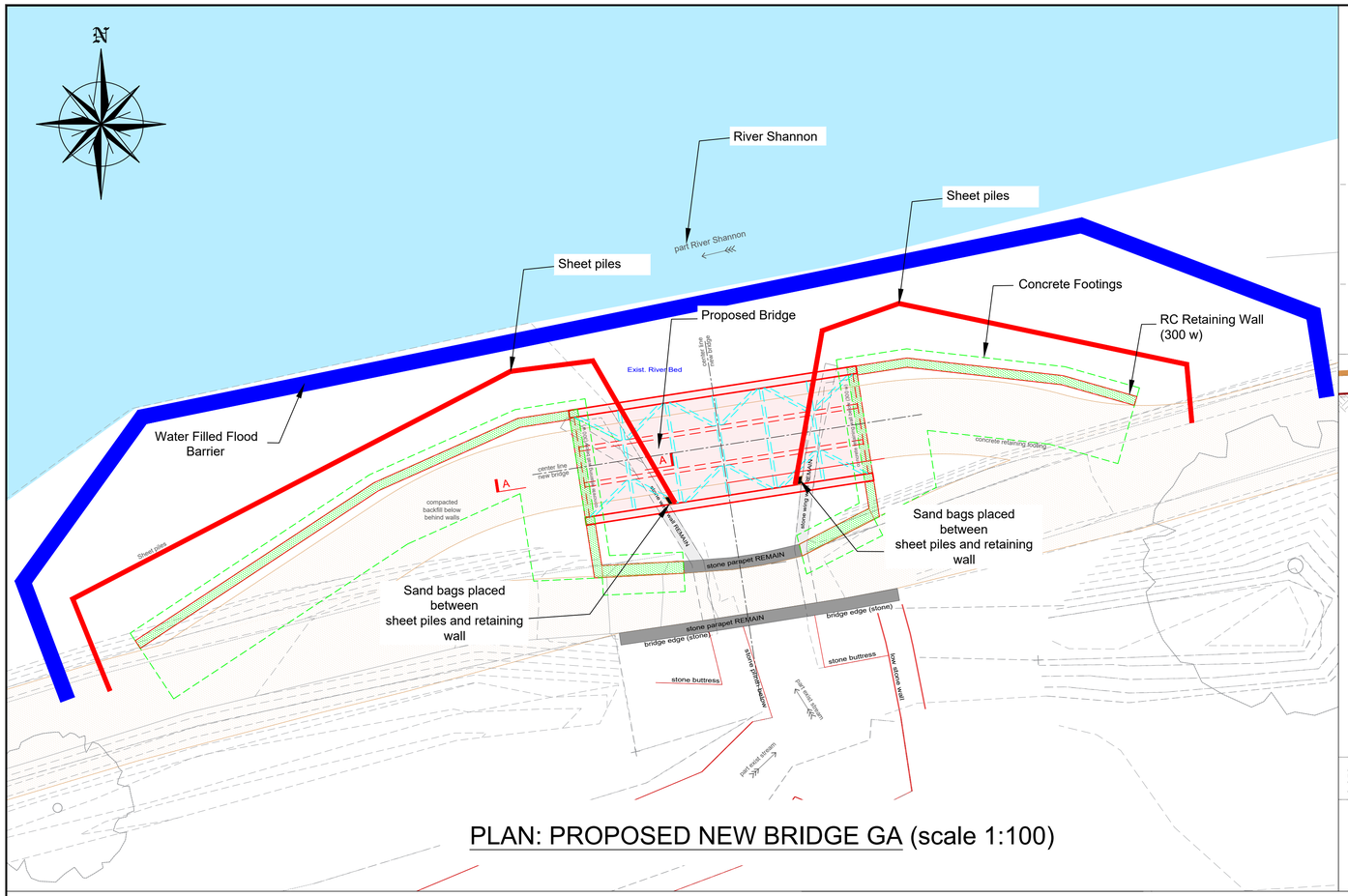
TITLE

BRIDGE 2: PROPOSED PLAN ELEVATIONS & SECTIONS

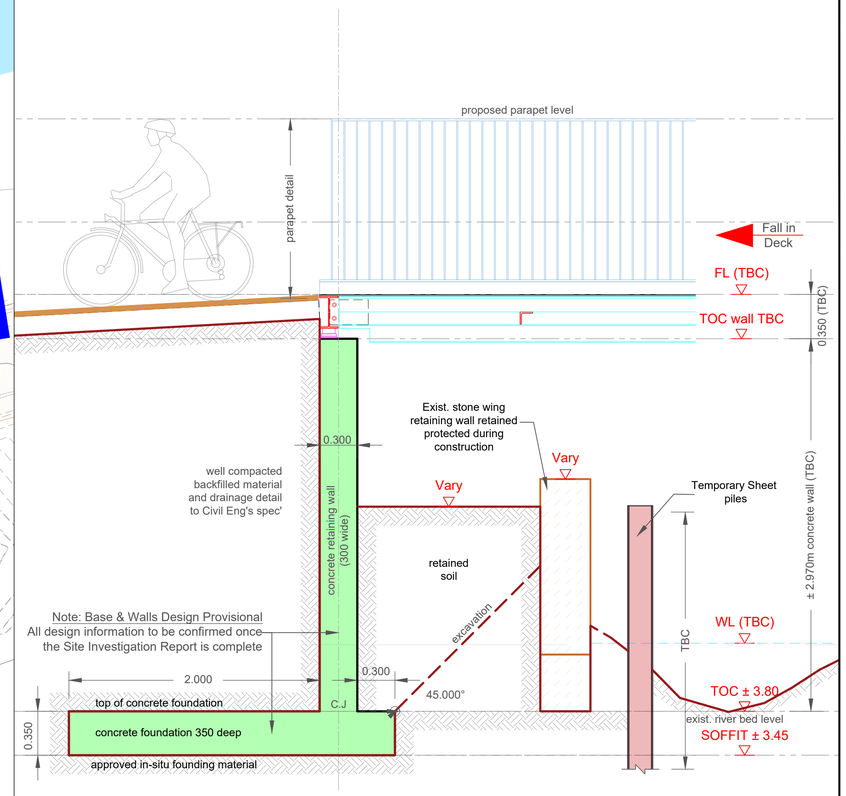
Sheet 1 of 1

SCALE @ A1	DATE	DRAWN	CHECKED	APPROVED
As Shown	April 2022	ASM	PGS	RW

JOB No.	DRAWING No.	REV.
2535	RHA-XX-DR-S-SP0021	-



PLAN: PROPOSED NEW BRIDGE GA (scale 1:100)



PROPOSED BRIDGE: ABUTMENT SECTION A (scale 1:25)

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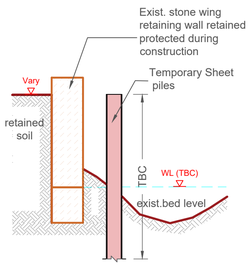
2535-RHA-XX-DR-C-GA-000_R1	GA Detail Design.
2535-RHA-XX-DR-S-SKP001	Key Plan New Bridges.
2535-RHA-XX-DR-S-SKP0020	Existing Plan & Elevation
2535-RHA-XX-DR-S-SKP0021	Proposed Plan & Elevation

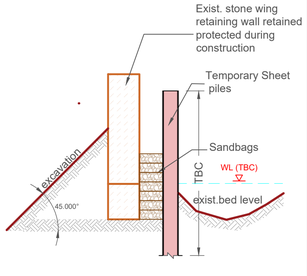
NOTE: AWAITING FINAL SITE INSVESTIGATION REPORT

Foundations and Walls Design are Provisional, and all the information shown to be confirmed once the Final Site Investigation Report is complete and confirmed.

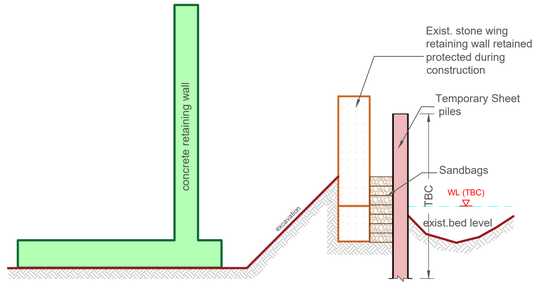
STEP 1
Install water barrier & sheet piles



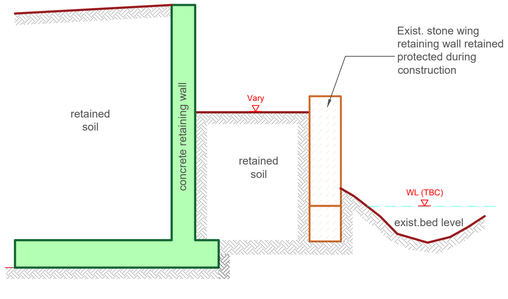
STEP 2
Place sandbags, Dewater & Excavate



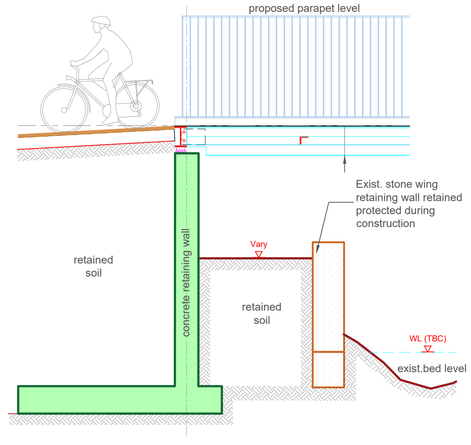
STEP 3
Construction proposed abutments and retaining walls



STEP 4
Remove sheet piles and backfill



STEP 5
Install steel deck & remove water barrier



PROPOSED BRIDGE: CONSTRUCTION SEQUENCE (scale 1:40)

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REV	DATE	DESCRIPTION	DRG	CHK	APD

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Limerick City & County Council

PROJECT
University of Limerick to National Technology Park Cycle Path

TITLE
BRIDGE 2: PROPOSED CONSTRUCTION SEQUENCE PLAN & SECTIONS

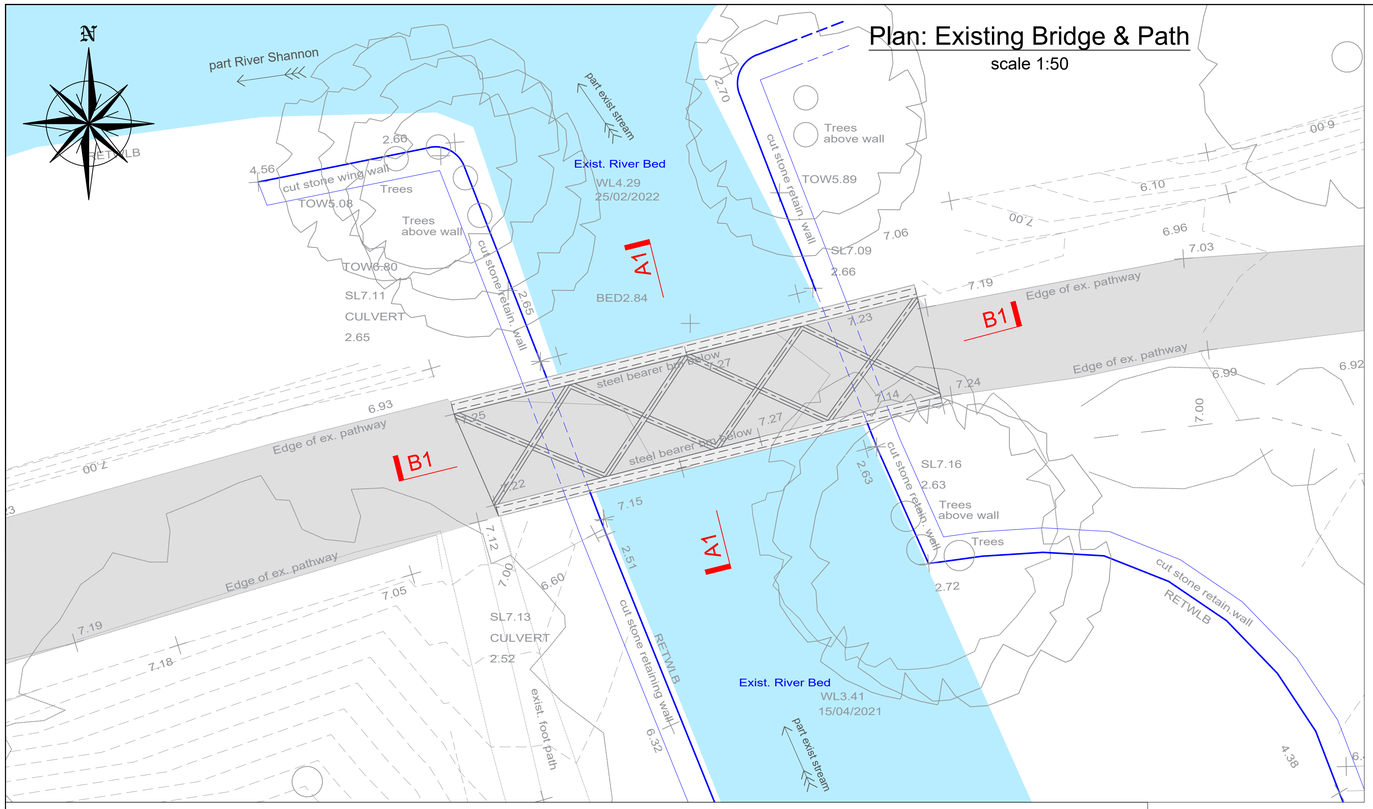
Sheet 1 of 1

SCALE @ A1	DATE	DRAWN	CHECKED	APPROVED
As Shown	March 2025	ASM/AMR	BL	BL

JOB No.	DRAWING No.	REV.
2535	RHA-XX-DR-S-SP0022	-

Plan: Existing Bridge & Path

scale 1:50



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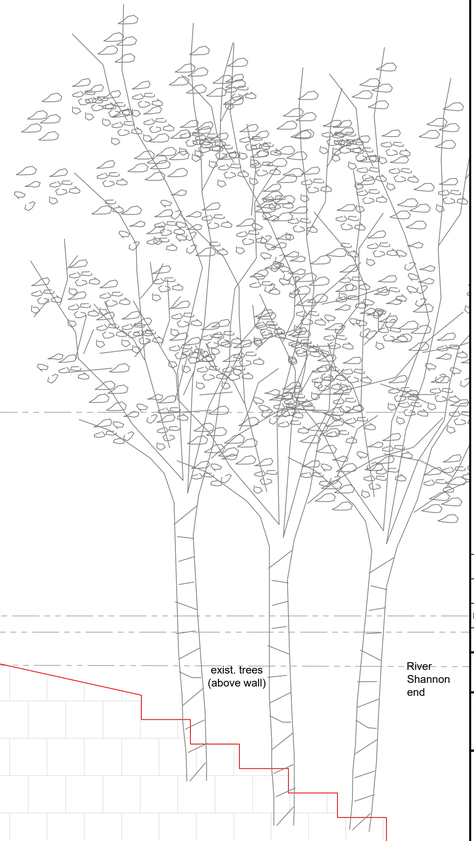
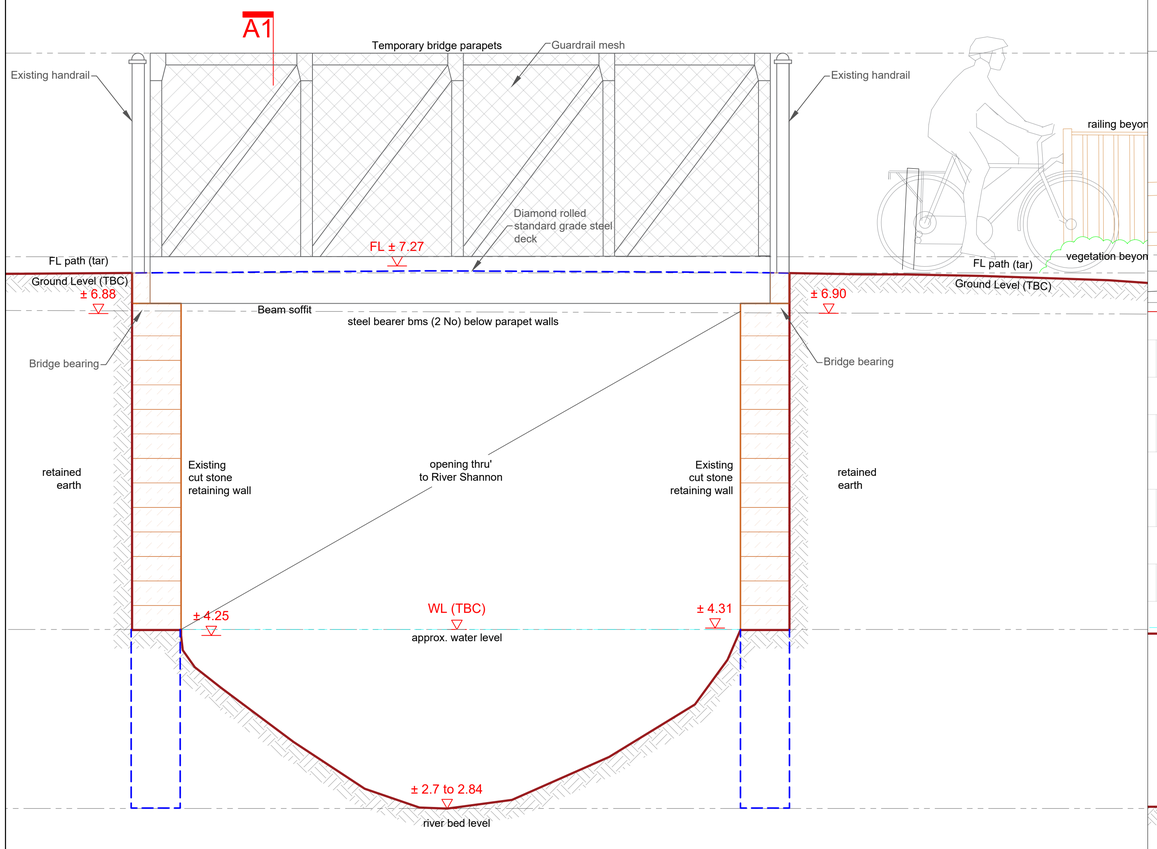
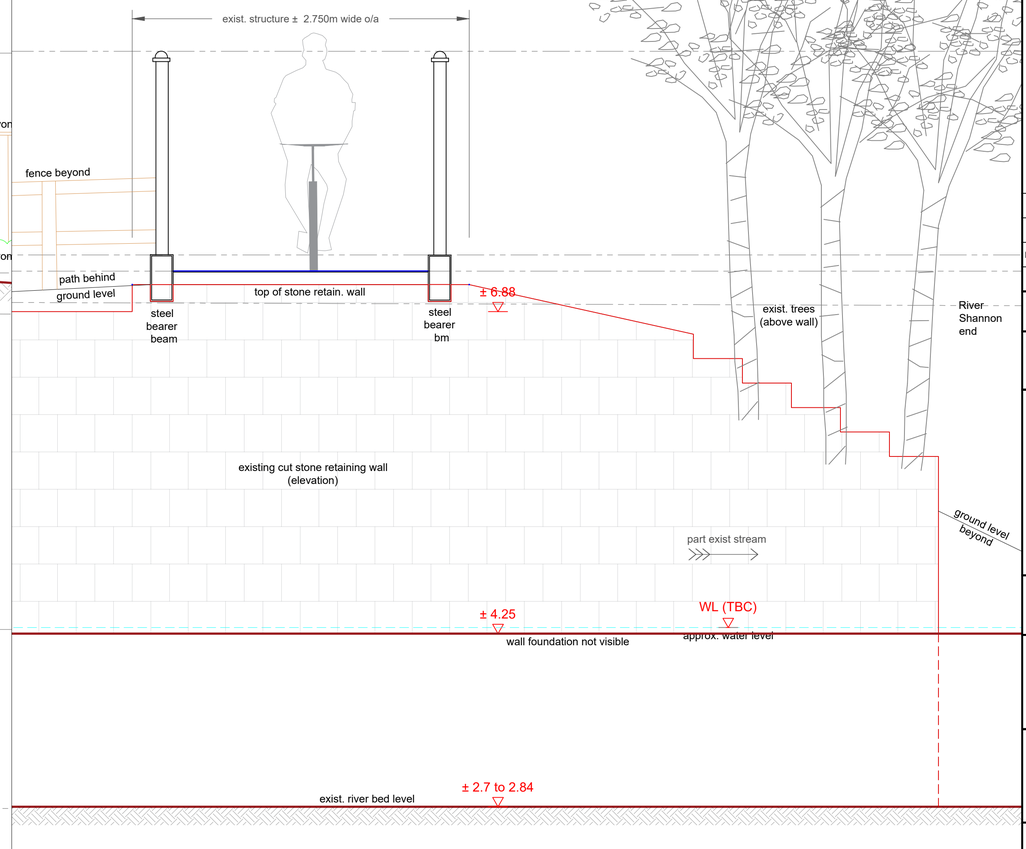




EXISTING BRIDGE: LONG-SECTION B1 scale 1:25



EXISTING BRIDGE: SECTIONAL-ELEVATION A1 scale 1:25

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PROJECT

University of Limerick to National Technology Park Cycle Path

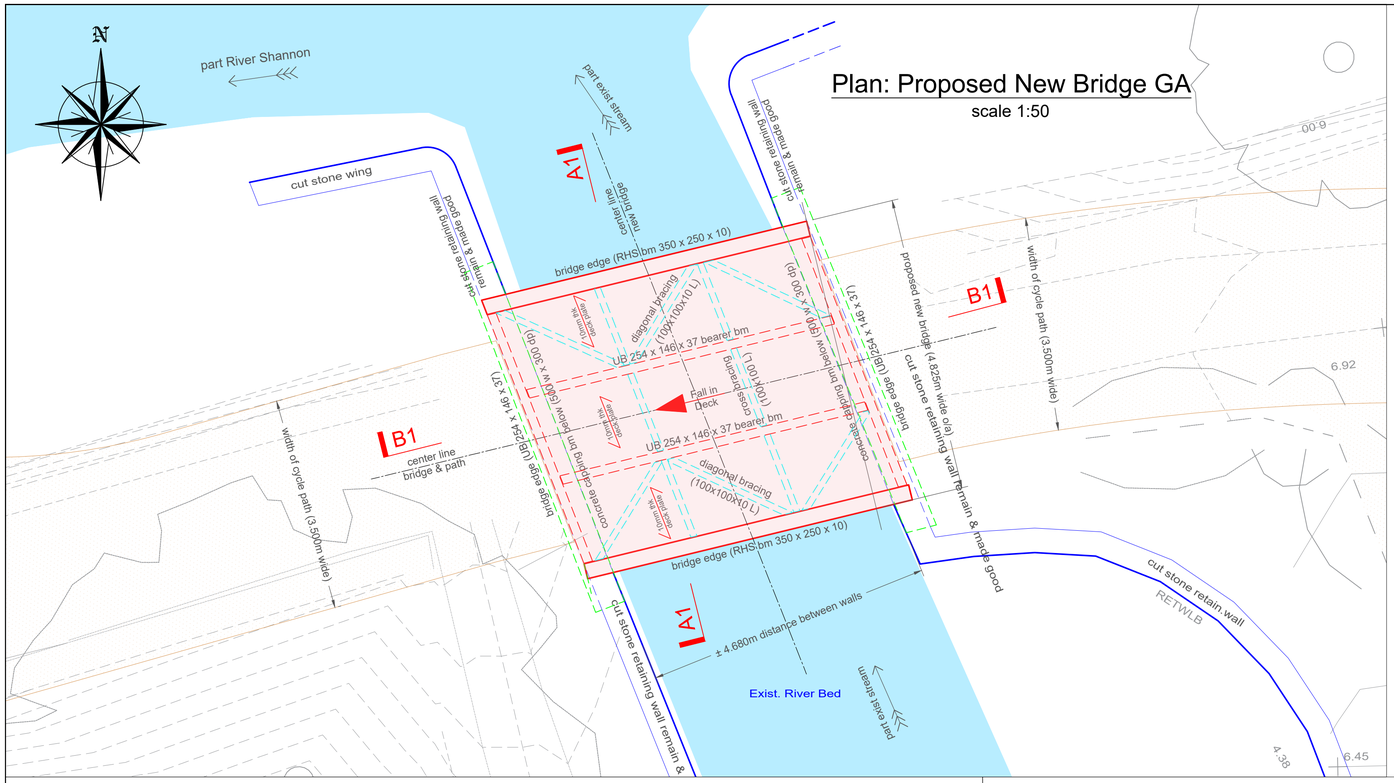
TITLE

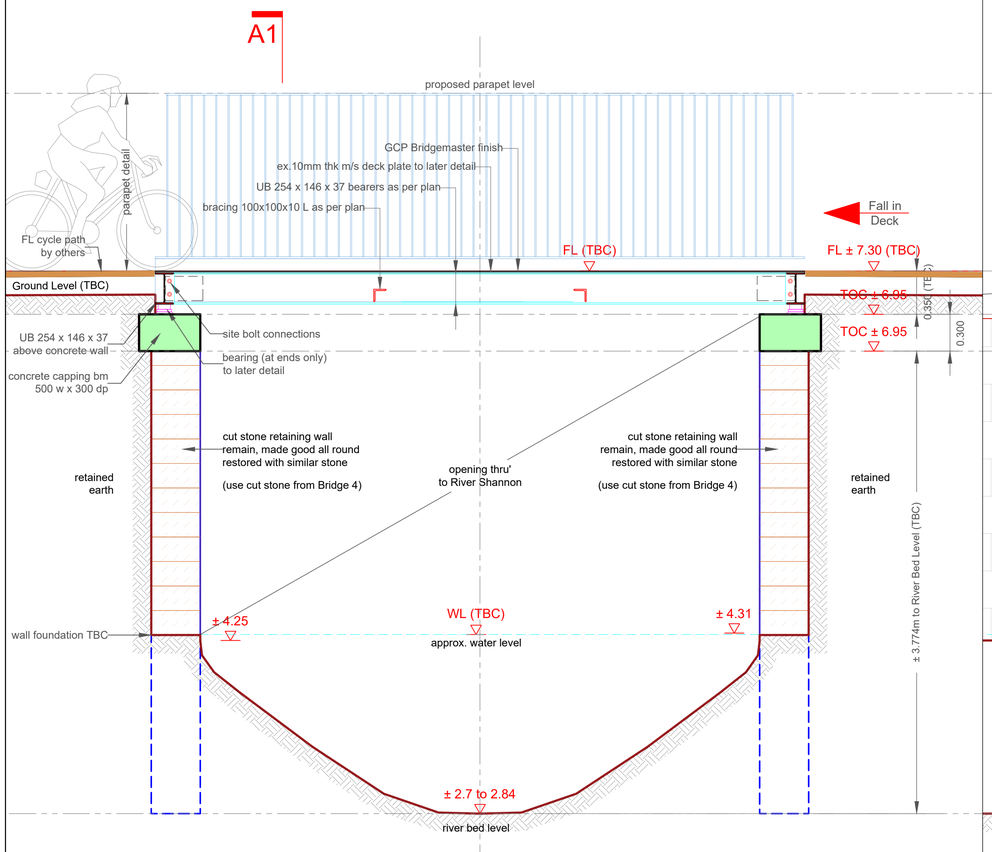
BRIDGE 3: EXISTING PLAN ELEVATIONS & SECTIONS

Sheet 1 of 1

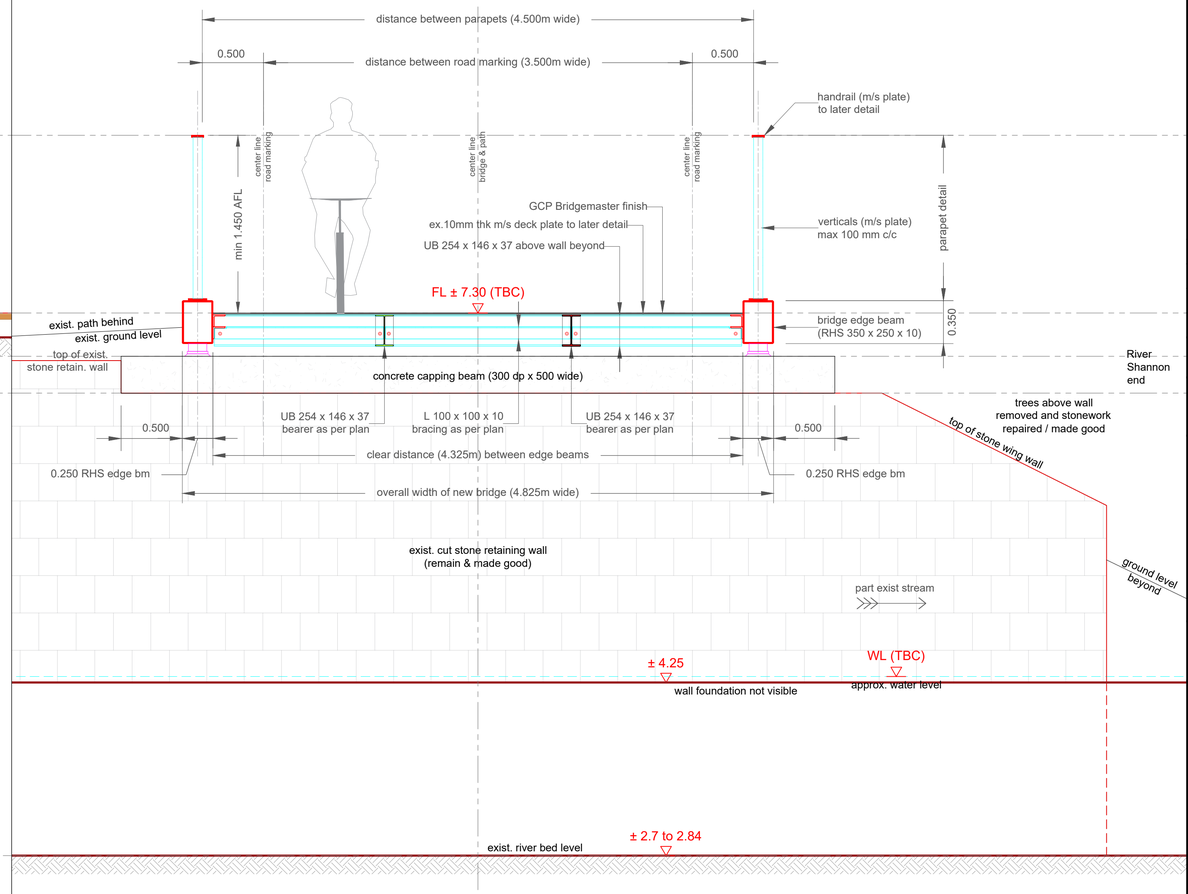
SCALE @ A1	DATE	DRAWN	CHECKED	APPROVED
As Shown	April 2022	ASM	PGS	RW

JOB No.	DRAWING No.	REV.
2535	RHA-XX-DR-S-SP0030	-





PROPOSED BRIDGE: LONG-SECTION B1 scale 1:25



PROPOSED BRIDGE: SECTIONAL-ELEVATION A1 scale 1:25

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REFERENCE DRAWINGS

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2535-RHA-XX-DR-S-SKP001	Key Plan New Bridges.

NOTE: AWAITING FINAL SITE INSVESTIGATION REPORT

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TITLE

BRIDGE 3: PROPOSED PLAN ELEVATIONS & SECTIONS

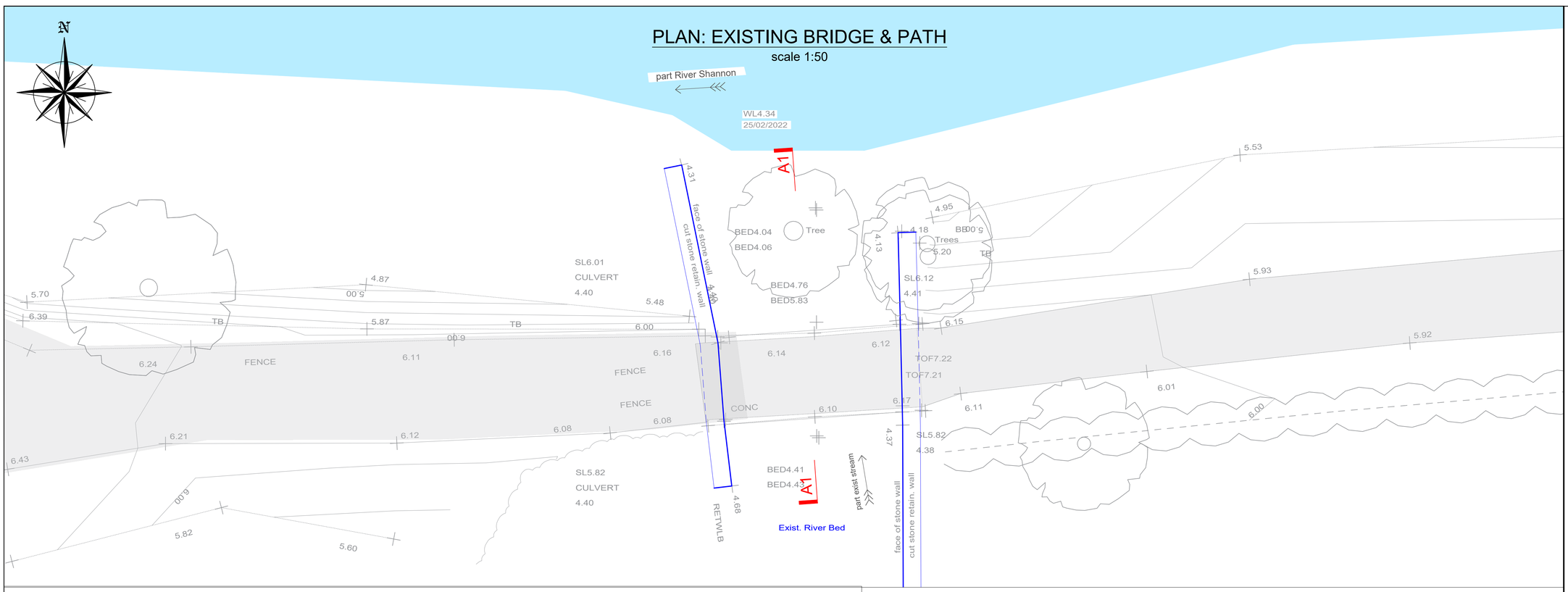
Sheet 1 of 1

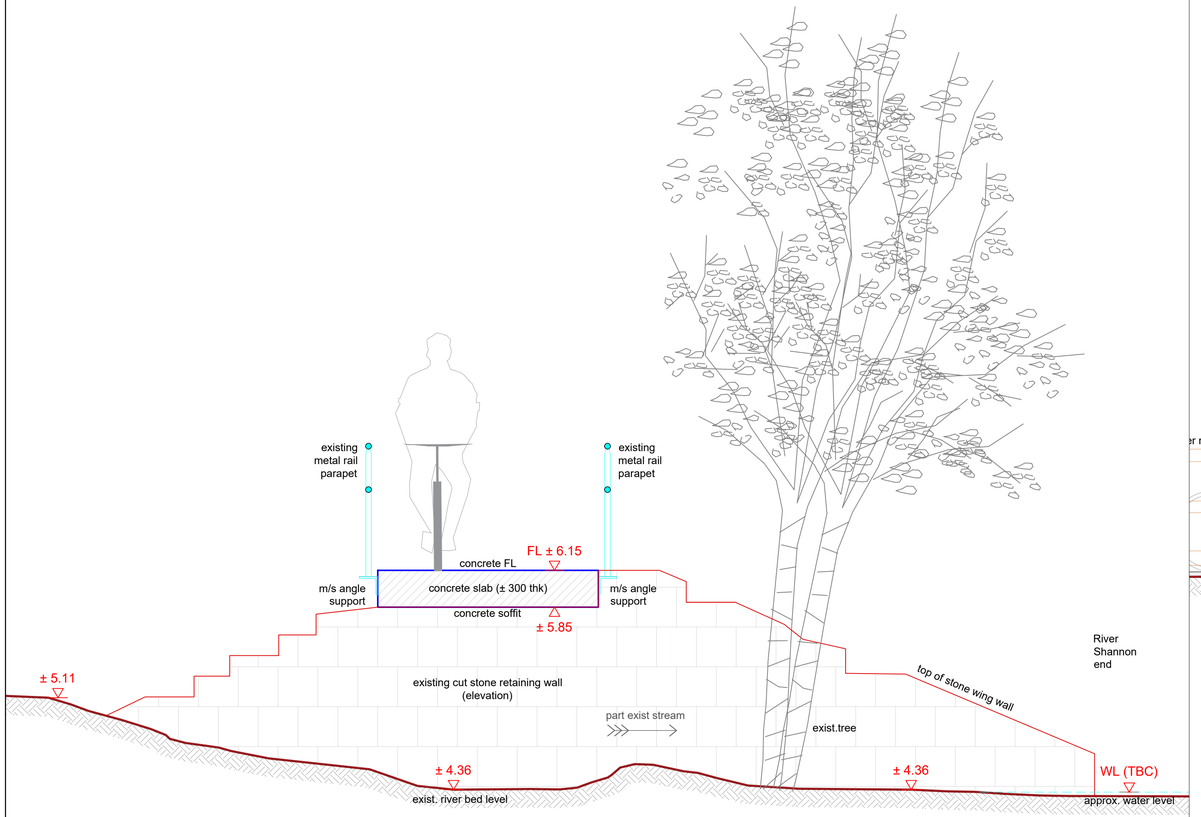
SCALE @ A1	DATE	DRAWN	CHECKED	APPROVED
As Shown	April 2022	ASM	PGS	RW

JOB No.	DRAWING No.	REV.
2535	RHA-XX-DR-S-SP0031	-

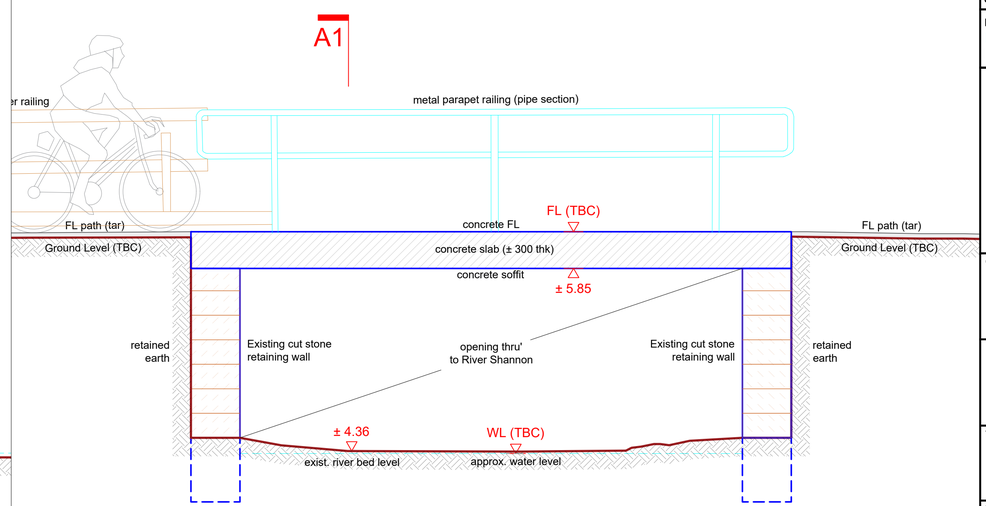
PLAN: EXISTING BRIDGE & PATH

scale 1:50





EXISTING BRIDGE: SECTIONAL-ELEVATION A1 scale 1:25



EXISTING BRIDGE: LONG-SECTION B1 scale 1:25

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BRIDGE : EXISTING PLAN ELEVATIONS & SECTIONS

Sheet 1 of 1

SCALE @ A1	DATE	DRAWN	CHECKED	APPROVED
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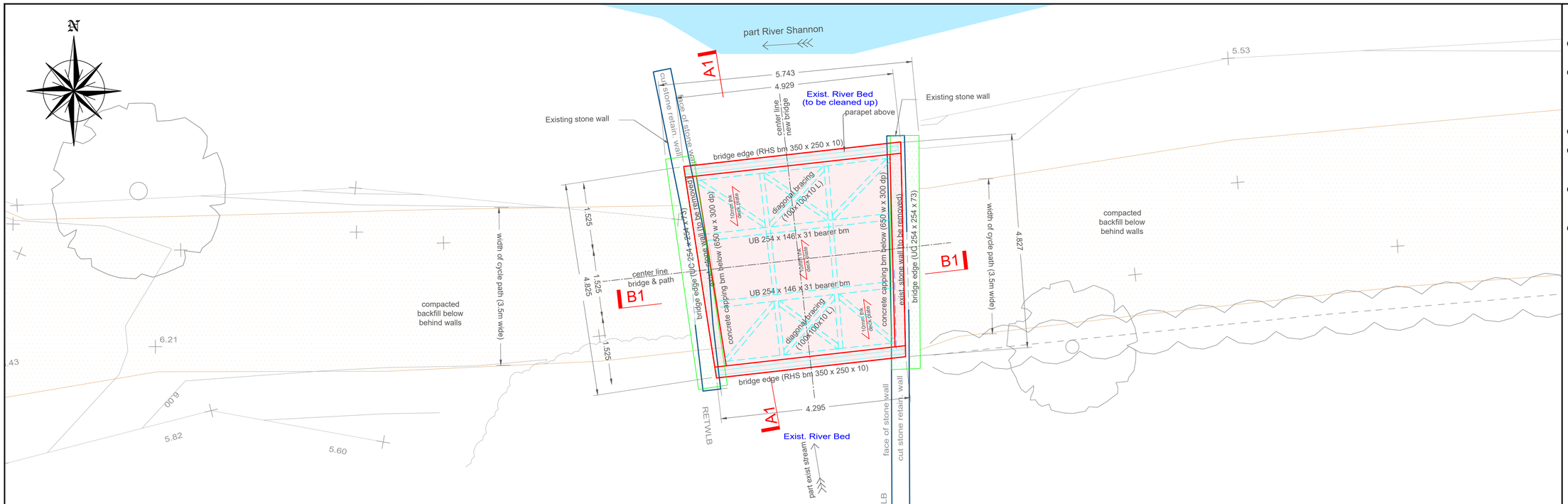
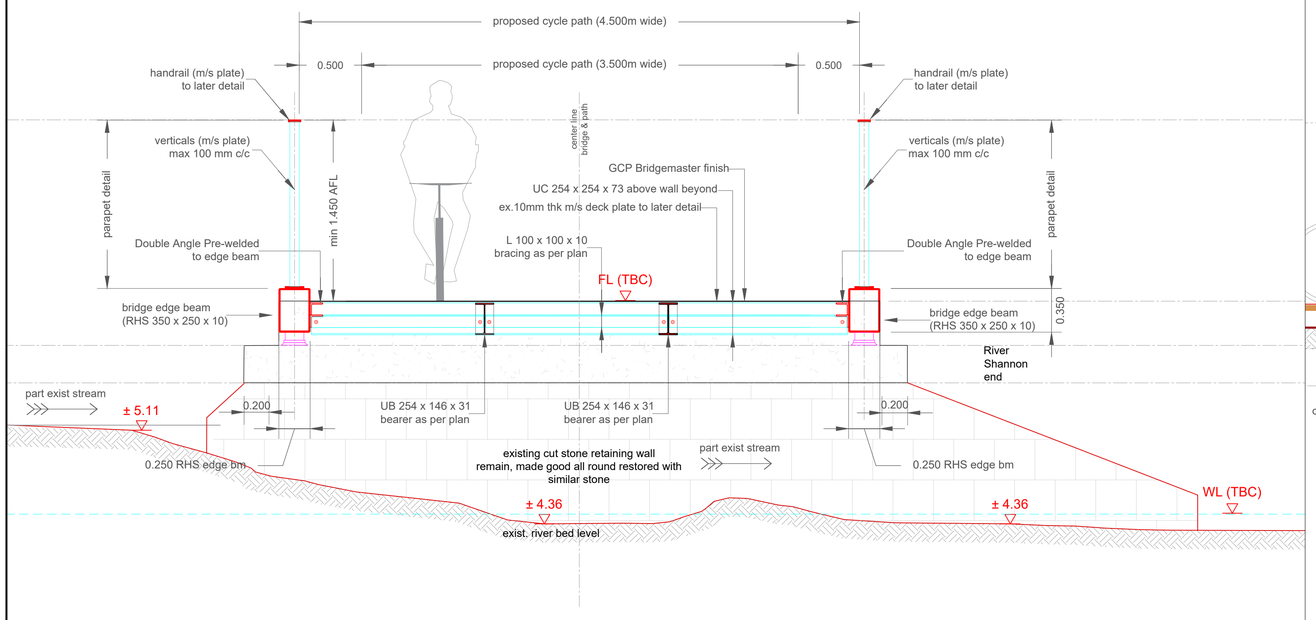
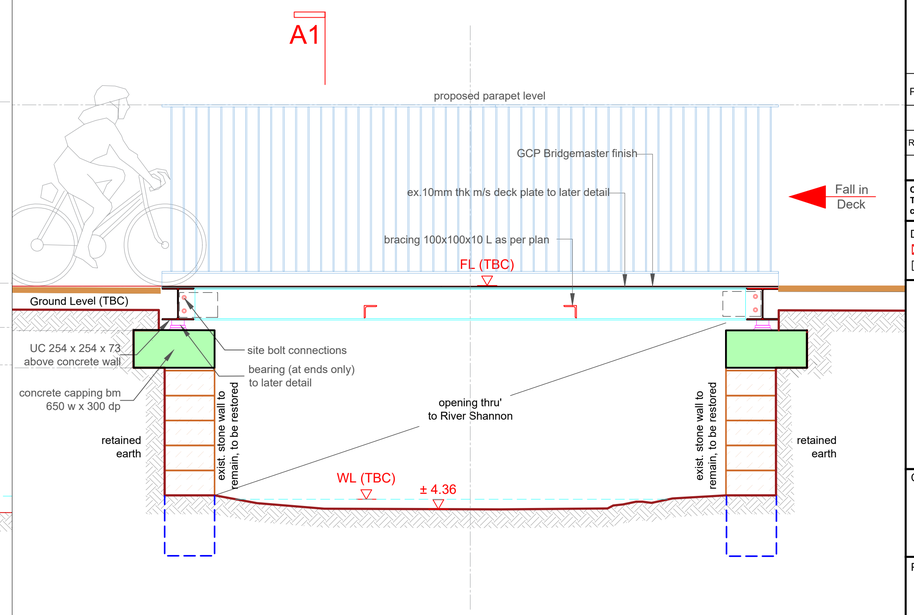


PLAN: PROPOSED NEW BRIDGE GA

scale 1:50



PROPOSED BRIDGE: SECTIONAL-ELEVATION A1 scale 1:25



PROPOSED BRIDGE: LONG-SECTION B1 scale 1:25

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REFERENCE DRAWINGS

2535-RHA-XX-DR-C-GA-000_R1	GA Detail Design.
2535-RHA-XX-DR-S-SKP001	Key Plan New Bridges.

NOTE: AWAITING FINAL SITE INSVESTIGATION REPORT

Foundations and Walls Design are Provisional, and all the information shown to be confirmed once the Final Site Investigation Report is complete and confirmed.

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REV	DATE	DESCRIPTION	DRG	CHK	APD
P01	04.07.2024	Draft for Approval & Planning Purposes. Culvert omitted and new bridge design	AR	RW	BL
-	17.05.2022	Draft for Approval & Planning Purposes.	ASM	PGS	BL

REVISIONS

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DRAWING STATUS

☒ PRELIMINARY ☐ CONTRACT ☐ TENDER ☐ CONSTRUCTION
☐ FOR APPROVAL ☐ FOR YOUR INFORMATION ☐ AS CONSTRUCTED ☐ DRAFT

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CLIENT

Comhairle Cathrach & Contae Luimnigh
Limerick City & County Council

PROJECT

University of Limerick to National Technology Park Cycle Path

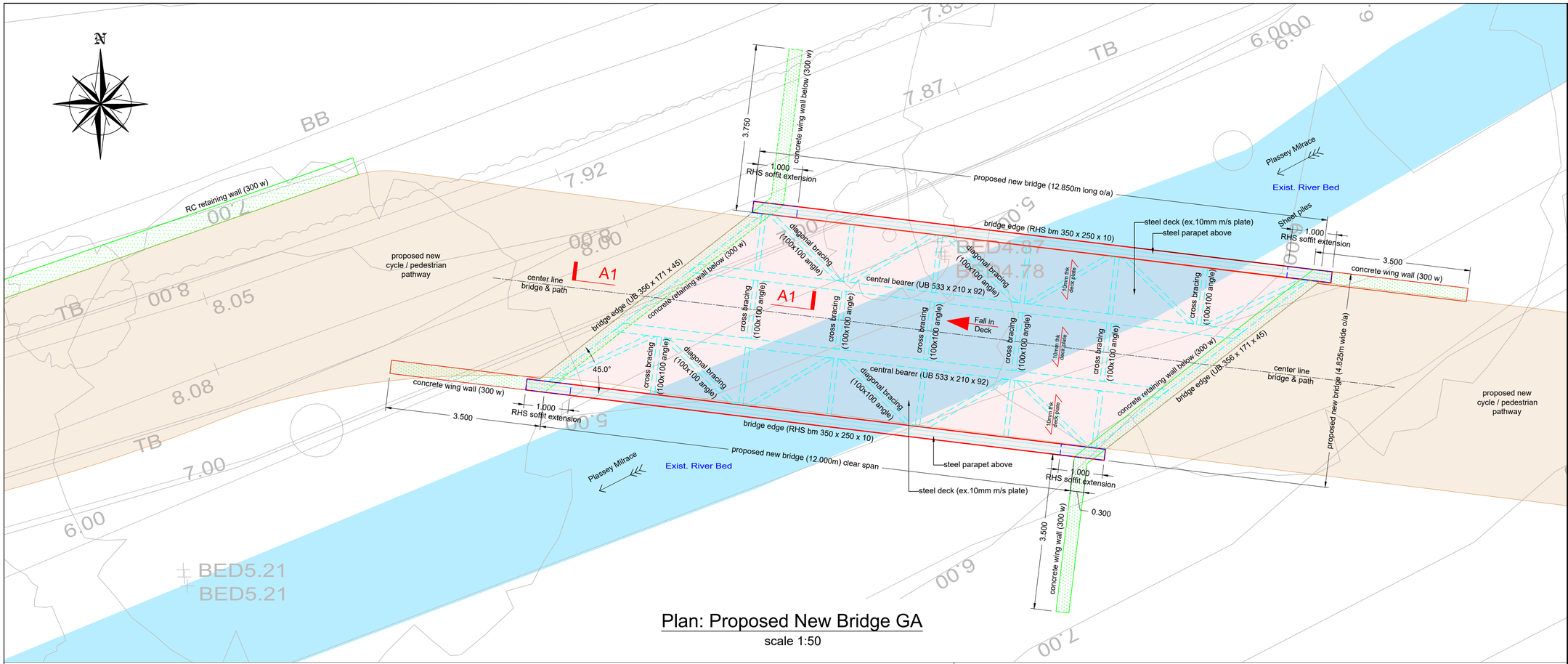
TITLE

BRIDGE 4: PROPOSED PLAN ELEVATIONS & SECTIONS

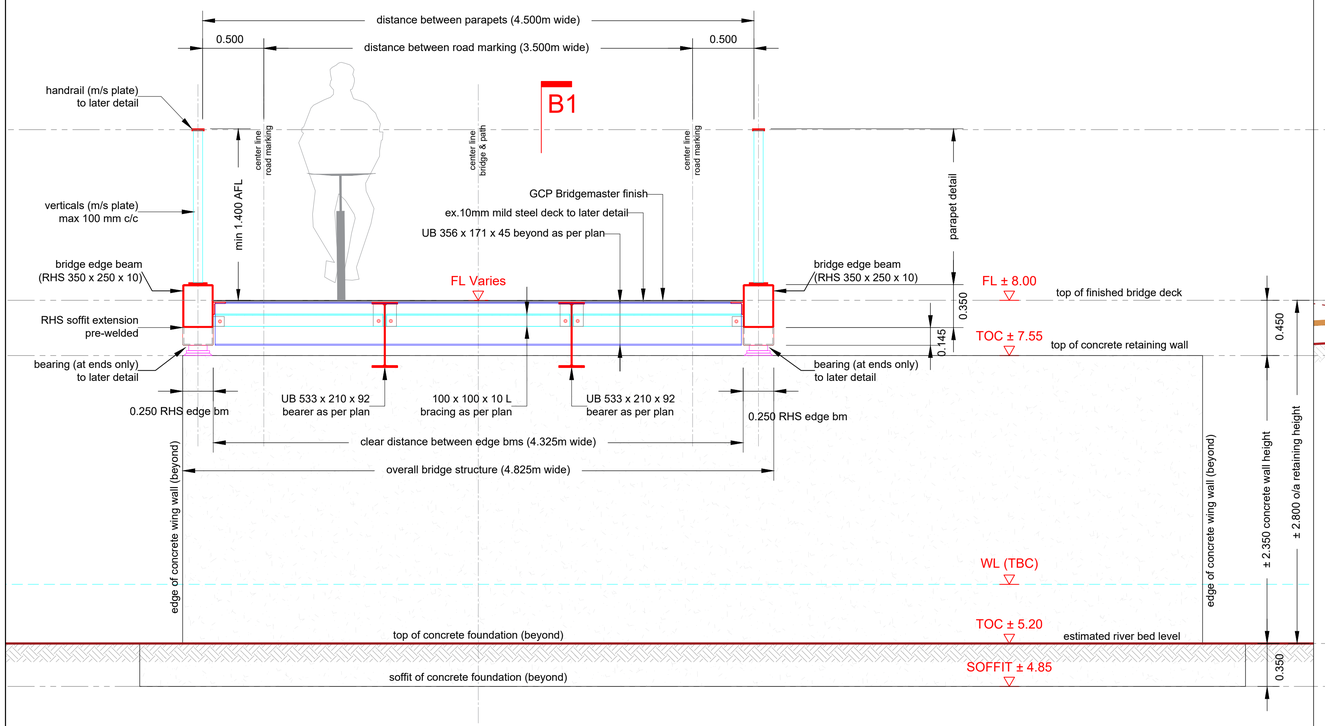
Sheet 1 of 1

SCALE @ A1	DATE	DRAWN	CHECKED	APPROVED
As Shown	April 2022	ASM	PGS	RW

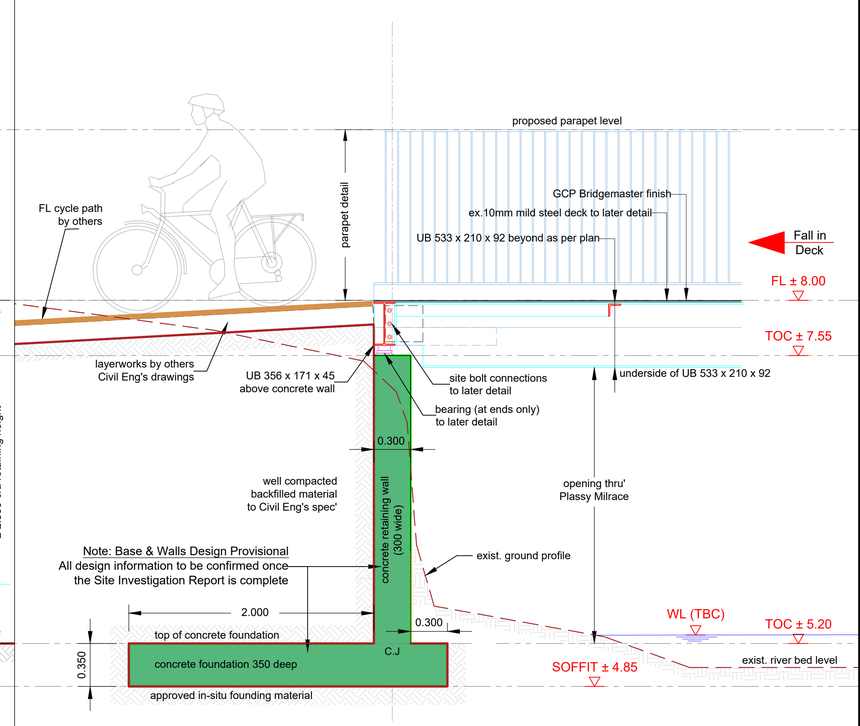
JOB No.	DRAWING No.	REV.
2535	RHA-XX-DR-S-SP0041	P01



Plan: Proposed New Bridge GA
scale 1:50



Proposed Bridge: Sectional-Elevation A1 scale 1:25



Proposed Bridge: Abutment Section A1 scale 1:25

GENERAL NOTES

G1. This drawing is to be read in conjunction with all the relevant Architect's and Engineers' drawings and specifications.

G2. Do not scale off this drawing. All details and dimensions are to be checked by the Contractor and Manufacture on site prior to commencement of construction/fabrication. Any existing dimensions noted on this drawing are to be checked by the contractor prior to commencement of the works.

G3. Any discrepancies are to be reported to the Engineer.

G4. All dimensions are in millimetres unless noted otherwise. All levels are in metres relative to Ordnance Datum (OD) at Malin Head.

G5. All proprietary materials and products shall be installed and used in accordance with the manufacturer's details and specification.

G6. The design of temporary works and the provision of stability of all elements of the work during Construction is the responsibility of the Contractor.

REFERENCE DRAWINGS

2535-RHA-XX-DR-C-GA-000_R1	GA Detail Design.
2535-RHA-XX-DR-S-SKP001	Key Plan New Bridges.

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REV	DATE	DESCRIPTION	DRG	CHK	APD
-	10.05.2022	Draft for Approval & Planning Purposes	ASM	PGS	BL

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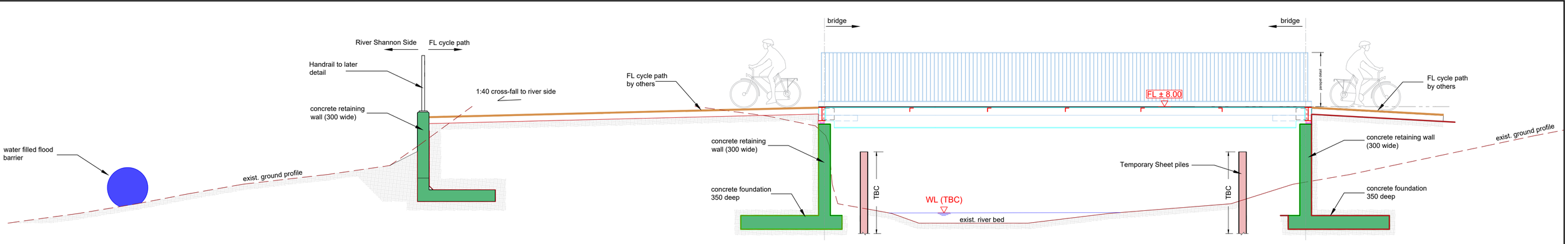
PROJECT
University of Limerick to National Technology Park Cycle Path

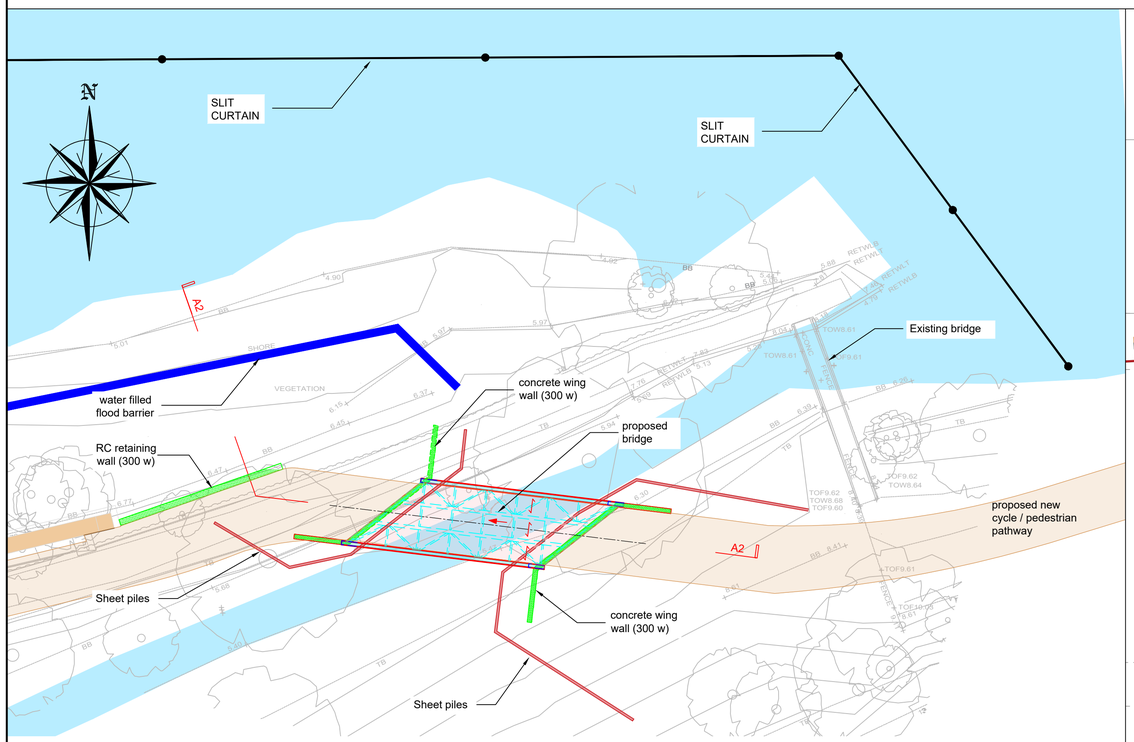
TITLE
BRIDGE 5: PROPOSED PLAN ELEVATION & SECTIONS
Sheet 1 of 1

SCALE @ A1	DATE	DRAWN	CHECKED	APPROVED
As Shown	April 2022	ASM	PGS	RW

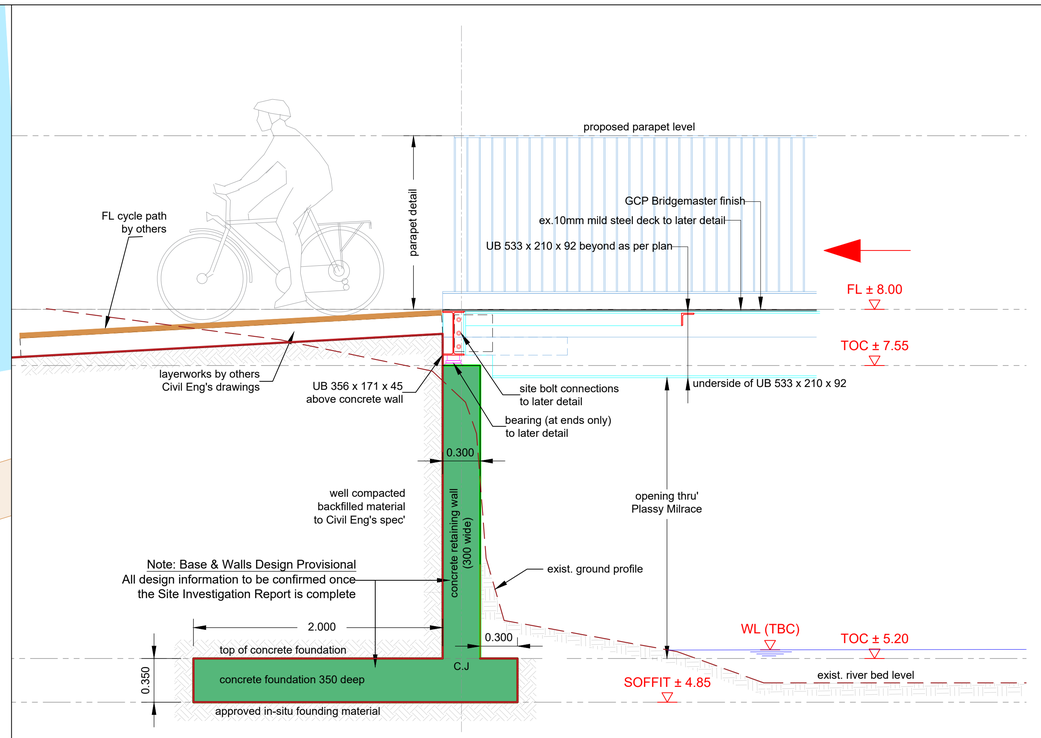
JOB No.	DRAWING No.	REV.
2535	RHA-XX-DR-S-SP0051	-



Section A2 scale 1:50



Plan: Proposed New Bridge GA scale 1:200



Proposed Bridge: Abutment Section A1 scale 1:25

GENERAL NOTES

G1. This drawing is to be read in conjunction with all the relevant Architect's and Engineers' drawings and specifications.

G2. Do not scale off this drawing. All details and dimensions are to be checked by the Contractor and Manufacture on site prior to commencement of construction/fabrication. Any existing dimensions noted on this drawing are to be checked by the contractor prior to commencement of the works.

G3. Any discrepancies are to be reported to the Engineer.

G4. All dimensions are in millimetres unless noted otherwise. All levels are in metres relative to Ordnance Datum (OD) at Malin Head.

G5. All proprietary materials and products shall be installed and used in accordance with the manufacturer's details and specification.

G6. The design of temporary works and the provision of stability of all elements of the work during Construction is the responsibility of the Contractor.

REFERENCE DRAWINGS

2535-RHA-XX-DR-C-GA-000_R1	GA Detail Design.
2535-RHA-XX-DR-S-SKP001	Key Plan New Bridges.
2535-RHA-XX-DR-S-SP0050	Existing Plan & Elevation
2535-RHA-XX-DR-S-SP0051	Proposed Plan & Elevation

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REV	DATE	DESCRIPTION	DRG	CHK	APD

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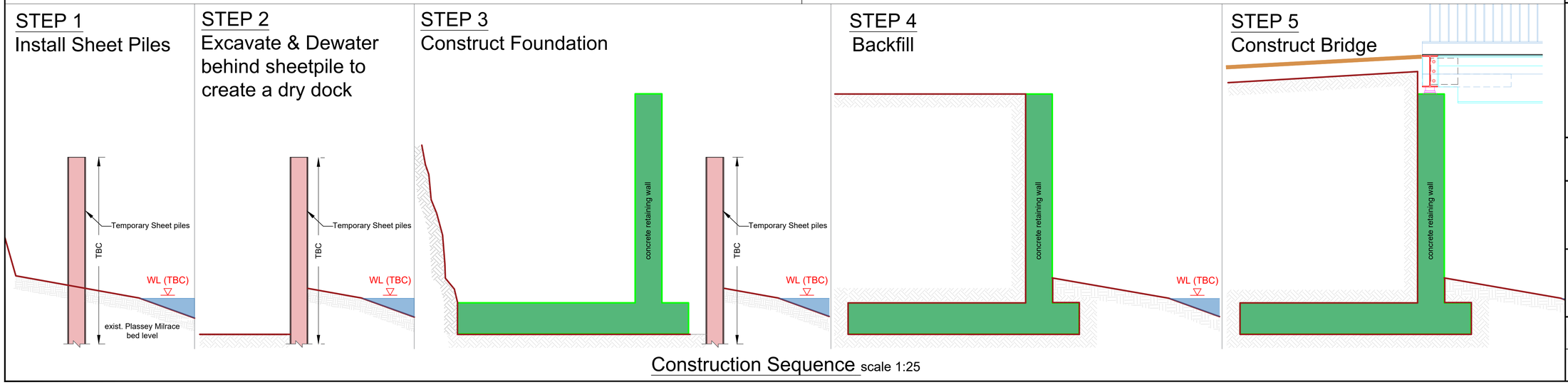

Construction Sequence scale 1:25

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PROJECT
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TITLE
BRIDGE 5: POSSIBLE CONSTRUCTION SEQUENCE PLAN & SECTION
Sheet 1 of 1

SCALE @ A1	DATE	DRAWN	CHECKED	APPROVED
As Shwon	JAN 2025	ASM/AMR	RW	BL

JOB No.	DRAWING No.	REV.
2535	RHA-XX-DR-S-SP0052	-