

AtkinsRéalis



Natura Impact Statement

Cork County Council

19 November 2024

0085669DG0003

Passage West Pedestrian and Cycle Route

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Document history

Document title: Natura Impact Statement

Document reference: 0085669DG0003

Revision	Purpose description	Originated	Checked	Reviewed	Authorised	Date
0	Draft for comment	OOK	OOK	POD	POD	27/05/24
1	Revised for issue	OOK	OOK	POD	POD	07/06/24
2	Final	OOK & POD	POD	POD	POD	23/10/24

Client signoff

Client	Cork County Council
Project	Passage West Pedestrian and Cycle Route
Job number	0085669

**Client
signature/date**



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1. Introduction

AtkinsRéalis was commissioned by Cork County Council to prepare, on its behalf, a Natura Impact Statement (NIS) for the proposed upgrade to the Passage West Pedestrian and Cycle Route (hereafter “the proposed development”), which comprises upgrading of the existing shared pedestrian and cycle facility over a length of c. 2km from the Cork City-Cork County boundary to Mariners Quay. The proposed development is part of a larger programme of improvements along this route from Cork City to Crosshaven.

The purpose of the Passage West Pedestrian and Cycle Route project is to increase the width of the existing pedestrian and cycle path between the Cork County and City boundary and Mariners Quay from 2.5m to 4m. This portion of the Cork Harbour Greenway is an important component of the strategic inter-urban cycleway connecting Carrigaline with Cork City. The proposed route shall offer a connection to the ferry terminal facilitating access to Carrigaloe, Rushbrook and Cobh.

The proposal to widen the pathway will improve shared usage of the pathway by pedestrian, runners and cyclist. In line with Government proposals to encourage modal shift in transport, coupled with connection of the Passage Greenway into a wider network of pedestrian and cycling facilities around Cork Harbour, levels of usage are likely to increase.

This document comprises the NIS for the proposed development and is intended to provide An Bord Pleanála, as the competent authority in this case, with objective information to inform its Appropriate Assessment (AA) of the implications of the proposed development for Natura 2000 sites, pursuant to Article 6(3) of the Habitats Directive (92/43/EEC).

1.1 Background

As per the Cork County Development Plan 2022-2028, Passage West forms part of the County Metropolitan Cork Strategic Planning Area. The strategic aim for Passage West is to: -

- Increase the population and employment of this area so that it can compete effectively for Investment and jobs in line with the key enablers identified in the Regional Spatial and Economic Strategy (RSES) for the Southern Region and the Cork Metropolitan Area Strategic Plan (MASP),
- Consolidate employment at existing employment locations with improved supporting infrastructure, and public transport improvements including those identified in the Cork Metropolitan Area Transport Strategy (CMATS), and
- Consolidate critical population growth, service, and employment centres within the Cork Metropolitan Area, providing high levels of community facilities and amenities with infrastructure capacity high quality and integrated public transport connections should be the location of choice for most people especially those with an urban employment focus.

To that end, the proposed development seeks to improve the existing walking and cycling connectivity between Rochestown and Passage West, which involves the proposed widening of the existing greenway from 2.5m to up to 4m, in line with National Transport Authority (NTA) guidance for shared use (in some areas localised reductions from 4m will be adopted to protect trees). The proposed development follows directly on from

corresponding improvements to the existing greenway from the N40, through Rochestown, which is being progressed by Cork City Council¹.

The development is being proposed by Cork County Council, with funding being provided by NTA. All lands in question are under the ownership of Cork County Council.

¹ <https://www.corkcity.ie/corkcityco/en/council-services/news-room/public-notice/passag-railway-greenway-improvement-scheme-phase-ii-planning-and-development-act-2000-as-amended-planning-development-regulations-2001-as-amended-.html>



1.2 The Proposed Development

1.2.1 Shared Pedestrian and Cycle Facility

The purpose of this project is to widen the existing path of Cork Harbour Greenway between the Cork City/Cork County Boundary to the Passage West Playground. The intention is to increase the width from an average of 2.5m wide to an average of 4m wide (however, in some areas localised reductions from 4m will be adopted to protect trees).

Starting at the Cork City/Cork County Boundary, the width of the existing path will be increased from 2.8m to 3.7m for the first 220m. The works will primarily take place on both sides of the path, the existing exercise infrastructure will remain untouched. Once the path reaches the Cork Harbour Greenway Car Park, the existing path will be widened to 4m. There is no intrusive work within the Cork Harbour Greenway Car Park or to Roberts Bridge (RPS² 01474), but new landscaping (to include native species and other pollinator-friendly species) will be planted between the proposed path and the existing car parking area to supplement the existing landscaping in the area (refer to landscaping proposals which accompany this Application; CSR, 2024a). One existing tree on Roberts Bridge (RPS 01474) will be cut down because it will damage the bridge structure if it is allowed to mature (however, this intervention will be required irrespective of the proposed development in order to prevent damage to Roberts Bridge). Where any possible interaction with tree roots is anticipated, the following works will take place. Deep excavation is not proposed; the existing path surface will be planed off and replaced. Cell Web tree root protection will be used wherever the proposed path is extended close to existing and proposed trees, it is not proposed to dig down into the root zone, but to protect any roots encountered during construction. Furthermore, as noted the alignment of the path and its width will be amended locally to minimise damage to trees. There are new bollards proposed at access points to the existing path. Lighting is discussed in Section 1.2.1.1, below.

For approximately 800m, between the Cork Harbour Greenway (Robert's Bridge) Car Park and the start of the retaining wall approximately 80m east of Abbotts bridge (RPS 01476), the path will be widened from 3.0m to 4m on both the landward and seaward side. Due to space constraints, the existing benches located along this section will also be relocated to accommodate the widening on both sides of the path. The benches will be placed on a new reinforced concrete plinth suitable for the marine environment. It is not proposed to remove the line of oak trees growing along the seaward side of the pathway in this area.

Once the path reaches the existing retaining wall (for the decommissioned railway line), and where it passes over the bridge (un-named) (RPS 01475), the path widening will only be on the landside of the existing path. For the next 300m south-east the proposed path will vary between 3.7 to 4m in width, so the majority of the existing trees and native hedgerows will remain untouched. There are 4 no. trees that are proposed for removal in this location. These trees have been surveyed by an arborist to determine their retention quality, and a bat expert to confirm there are no bat roosts in the trees. For every tree that will be removed, there will be three new native Irish trees planted. There will also be new native Irish hedgerows planted to supplement the new and existing trees along this section of the path. (Full details of trees which would be impacted by the proposed development and where these are located is included in the accompanying Arborist's Report; CSR, 2024b).

As the path extends south-east towards the Wooden Bridge (not on the RPS list), a short section of the existing path will remain untouched so two existing trees can remain in place. Planting around the Wooden Bridge will be undertaken to introduce a shallow taper to the existing path. This low-level planting at the taper will provide pedestrians and cyclists with adequate sight distances to oncoming path users as they approach the Wooden Bridge.

² Record of Protected Structures (Cork County Development Plan 2022-2028).

The existing car park adjacent to the existing path located 170m east of the Wooden Bridge will be converted to parallel on-street parking. There is currently no segregation between path users and vehicles at this location. The proposed infrastructure changes will increase safety for vulnerable path users. This proposed on-street parking will be segregated from the pedestrian and cycle path by a proposed 1.8m wide foot path and a proposed low height stone wall (approximately 600mm). New benches and picnic tables are envisaged for this area, along with new native Irish hedgerows and trees.

There is a pinch point on the existing path located outside the Passage West Maritime Museum. There is a 90° bend between the Museum boundary wall and stone wall beside the boat slip for the Passage West Rowing Club. The path is approximately 2m wide at this pinch point. The preliminary design for this project proposes to chamfer the boundary wall of the Museum building, to provide a new path, with a 35° bend so that pedestrians and cyclists have sufficient sight distances from either direction as they approach this point. In addition to this, minor repairs to the dilapidated stairs down to the local beach will be made within the footprint of the existing structure in order to improve safety for pedestrians moving to and from the beach.

There are no plans to do any works on the foreshore. We are only repairing and making good the existing steps, at this location, that are in dis-repair.

1.2.1.1 Public Lighting

As noted this project entails proposed upgrades to an existing public pathway and its associated lighting scheme. As such it is not proposed to introduce public lighting to a presently unlit area. Improvements to the existing lighting scheme are, however, proposed in order to minimise their ecological footprint.

This route shall require minimal alterations and relocations of public lighting infrastructure (i.e. a small number of lighting stanchions will be relocated). It is proposed that the public lighting scheme along the pathway will be upgraded in order to comply with Bats and artificial lighting in *Guidance Note GN08/23 - Bats and Artificial Lighting at Night* (Institute of Lighting Professionals, 2023), in respect of mitigation strategies, to minimise the impact of outdoor lighting upon bat populations. We would encourage Cork City Council to also upgrade lighting along the Greenway within the City.

Light emitting diodes (LEDs) type lanterns, of the Warm white type, will be installed, with a Colour Temperature of 2,700 Kelvin (ILP, 2023), as 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. Lanterns on site will be reviewed, such that all lanterns will be mounted at 0° tilt and are fully cut off type with no light output above the horizontal plane. Lamp standards are currently 5m mounting height with c. 35m spacings between columns. The height of columns also mitigates against vandalism which can be an issue when placing luminaires in isolated locations.

Through the retention of trees along the seaward side of the pathway, along with the measures included above the objective is to minimise the spillage of light from the pathway onto the neighbouring shoreline.

As shown on the drawings submitted as part of this application, there are 55 no. existing lighting poles along the route. The treatment of these as part of the proposed development is as follows: -

- from Ch. 0 to Ch. 1150, 31 no. to be retained in their existing positions,
- from Ch. 1150 to 1650, 16 no. to be moved back slightly,
- from Ch. 1650 to 1750, 4 no. to be retained in their existing positions,



- from Ch. 1750 to 1800, 2 no. to be moved back slightly, and
- from Ch. 1800 to 1900, 2 no. to be retained in their existing positions.

Thus, 37 no. lighting poles (approximately two thirds of the total number) are to be retained in their existing positions, 18 no. (approximately one third of the total number) are to be moved back slightly, and none are to be added or taken away.

1.2.1.2 Invasive Plant Species

JKI Environmental Ltd. has been contracted to monitor and treat a number of Japanese Knotweed (*Reynoutria japonica*) sites within the scheme. Treatments consist of herbicide application using a Glyphosate based herbicide. Application methods vary from foliar spray application, or leaf wiping (in sensitive areas and/or to avoid non target species). Treatments consist of two applications between July and September. Monitoring of the sites and the scheme extents is conducted in May/June the following year to check for any regrowth or change in conditions to a given site that may affect future works. Treatments are undertaken by competent and qualified person(s) and records of herbicide usage logged in accordance with relevant legislation. This work is ongoing.

The ecology surveys also recorded Three-corner leek (garlic) (*Allium triquetrum*). The location of these plants is known and will be clearly marked on the ground in order to prevent incidental disturbance to those plants outside the works area. JKI Environmental Ltd. have been requested to prepare management proposals for any plants overlapping with the works area as well as those elsewhere along the Greenway. JKI Environmental Ltd. will also be treating the Three-corner leek (*Allium triquetrum*) located along the scheme.

With respect to species not listed on the 3rd Schedule of the Natural Habitats Regulations (SI 477 of 2011), such as winter heliotrope (*Petasites pyrenaicus*) the Contractor will be required to prevent spread of this species. It is not however proposed to remove heliotrope from along the pathway in areas where it is not dominant. This is for a number of reasons, including i) avoidance of excessive use of herbicides along the path and ii) avoidance of digging it out in areas where it co-occurs with Ivy Broomrape (*Orobanche hederaceae*) alongside the path. It is also noted that heliotrope flowers from November to March (over winter) and thus is an important plant, in particular for early emerging bumblebees. In a similar way the value of Butterfly-bush (*Buddleia* sp.) to pollinators is noted. In all cases the priority will be to prevent spread of any of these species within the site or off-site.

1.2.2 Pathway Construction Methods

The following detail of proposed construction works methods was prepared by Ryan Hanley on behalf of Cork County Council (Ryan Hanley, 2024). While it was initially intended to plane off the existing tarmac path surface, following consultation with the Council's ecology team, it is now intended to build up from the existing surface in order to minimise the potential for negative impacts to adjoining vegetation. In particular the technical note explains how the existing path will be widened to prevent impacting on trees adjacent to the path by using a Cellweb® confinement system. The Cellweb® system is a lightweight permeable system that allows free flow of water and gases through layers. Each cell can be filled with granular material or so and the cell design ensures loads can be evenly distributed across a path. This approach will be used where the area to be widened is close to existing tree roots.

The following construction details describe how the path is to be constructed near trees, so as to protect against any potential damage, to tree roots.



Plate 1-1 - Typical cellular soil confinement system.

1.2.2.1 Ground Preparation at Tree locations

- **Step 1a:** The existing tarmacadam layer is to be removed from site to a licenced waste management facility.
- **Step 1b:** In areas adjoining existing tarmacadam, excavate top soil and sub-soil and store the soil on site for reuse.
- **Step 2:** Set up temporary Heras fencing around trees to protect them during the adjacent path preparation works. Refer to Plate 1-4 and
- **Step 3:** Install wooden boards to define the edge of the path. Carefully insert stakes. Refer to Plate 1-2.



Plate 1-2 - Prepare the proposed pedestrian and cycle path for the cellular confinement system.

1.2.2.2 Installation

- **Step 4:** Where appropriate roll out geotextile Cellweb® confinement system to protect tree roots. Refer to Plate1-3.
- **Step 5:** Overlay the existing path & fill areas of Cellweb® confinement system with construction material, i.e., Type UGM A for the proposed pedestrian and cycle path. Refer to Plate 1-3.



Plate 1-3 - Fill cellular material confinement system to evenly distribute loads across the proposed pedestrian and cycle path.

- **Step 6:** Use excavated sub soil and top soil to create a slope from the path to existing ground level.



Plate1-4 - Reuse excavated soil to build slope off path.

1.2.2.3 Surfacing and Reinstating area

- **Step 7:** Run a roller/compactor over the path and add a layer of porous tarmacadam to seal the path. Reinstating the slope/filled in soil area with riparian grass. Refer to Plate 1-5.



Plate 1-5 - Finish path and reinstate area alongside.

1.2.3 Overview of Works

The proposed programme is for a 12-month contract.

While Section 1.2.2 outlines the approach to works where there is interaction near trees, the following outlines the sequence of associated construction related activities: -

1. Mobilisation and established of site compound. This is likely to be located in the public car park at Roberts Bridge, which will be closed to the public for the duration of works. The compound will host the site office (prefabricated building, if required), welfare facilities and staff car parking.
2. It may also be necessary to have a secondary site compound at Patrick Murphy Park at the Southern end of the scheme. The appointed contractor will make the final decision in this regard.
3. The site compound will also be used for storage of materials as they come on site. The site will be operated as an *On-Time Delivery* site in order to minimise the need for storage of excessive quantities of material on site.
4. The site compound will also allow for the sorting and temporary storage of waste packing prior to removal off site to an appropriately licenced recycling facility.
5. The welfare facilities will be a closed system, with wastes pumped out from any toilets and removed from site for disposal at an appropriately licenced facility. There will be no waste emissions from site permitted.
6. As part of the mobilisation, the appointed Contractor will be required to put a Traffic Management Plan in place. Particular attention will be paid to safe access / egress from the site compound.

7. Safety fencing will also be erected as will Signage outlining the nature of the proposed works and why the pathway is being temporarily closed.
8. Site Clearance. This is to be done in co-operation with an Arborist and appointed Environmental Clerk of Works in order to avoid negative impacts to trees and clearance of only those trees identified in the Design Drawings prepared by Ryan Hanley.
9. Construction of the pathway will proceed in short sections of ca. 200m. This is in order to keep the path open during the proposed works. [It is not permitted to clear vegetation in order to create a parallel path for pedestrians and cyclists alongside the works area.]
10. Works will include the relocation of a small number of lighting stanchions (see Section 1.2) and park benches.
11. No drainage works are required. All drainage will be over-the-edge drainage and natural infiltration, with the path surface also selected in order to be permeable.
12. No bridge replacement works are required.
13. Treatment of invasive plant species is addressed in Section 1.2.1.2 with respect to Japanese knotweed and in Section X.Y, with respect to species not listed on the 3rd Schedule of the Natural Habitats Regulations, SI 477 of 2011.
14. Completion of any path marking and placement of Signage as required.
15. Landscaping (as set out in Section 1.2.4).
16. De-mobilisation and restoration of any damage.

1.2.3.1 Materials and equipment

Materials for construction of the works will be imported and stockpiled within the proposed site compounds (i.e. Roberts Bridge & Patrick Murphy Park). The materials to be employed will principally consist of: -

- Geotextile membrane
- Granular sub-base material
- 6mm crushed limestone
- Dense bitumen macadam
- Hot rolled asphalt
- Topsoil / grass seed, landscaping including tree planting
- Signage and miscellaneous furniture

The following equipment will be used on site: -

- Dumpers or trucks
- Mini diggers



- Excavator
- Pedestrian roller
- Mini paving machine

Equipment to be used on site must be suitable for use within the footprint of the existing path. [It is not permitted to clear vegetation in order to create a parallel path for pedestrians and cyclists alongside the works area.]

1.2.3.2 Advanced Works

As part of Construction Projects, Accommodation works are often carried out by the contractor to mitigate the impacts that may be experienced by any landowner as a direct result of the construction and operation of the scheme. No such works are required for this scheme.

1.2.3.3 Main Works

Site clearance includes a range of vegetation clearing, topsoil stripping, and removal of existing infrastructure items which are obstacles to the proposed path. When possible, any materials removed as part of site clearing will be reused onsite during the works.

Temporary working areas (site compounds) will be erected during the construction period to accommodate workforce and vehicle movements, stockpiling of excavated material, and the erection and removal of temporary site compounds. As noted, it is proposed to form a compound (which will include stockpiling materials) at either end of the scheme, at Robert's Bridge Car Park to the North and the car park next to Patrick Murphy Park at the Southern end of the scheme. The appointed contractor will make the final decision in this regard.

Temporary haul roads will not be required to facilitate the extension of the proposed path, nor will a temporary path be constructed to facilitate pedestrians and cyclists during works.

The path composition will be in accordance with TII specification DN-GEO-030471³. There are four existing bridges along this route, these bridges will remain in place and will not be modified. New landscaping will include native Irish trees, hawthorn hedgerows and low-level planting (this is discussed in detail in the accompanying Ecological Impact Assessment). For surface water drainage, construction of the path will maintain existing slopes so that surface water can maintain its natural drainage path.

Energy efficient lighting will provide a suitable level of light for use by cyclists and pedestrians whilst creating minimal light spillage onto adjacent environmentally sensitive locations.

The proposed path will be segregated from the R610 Regional Road along the length of this route. The access points to the path include two car parks and 2-3m wide footpaths linking directly from the R610 Regional Road.

Ancillary and amenity elements are included as part of the proposed development which include fencing, signage, cycle track markings, information boards, bike racks, picnic tables and park benches.

The reinstatement of temporary working areas will be done following the completion of the construction phase of the scheme. Planting of new native Irish trees is proposed on the landside of the existing path. During the operational phase, general cleaning and upkeep of the new pathway is proposed. An electric sweeper will be used to maintain the path.

³ TII (2022) *Rural Cycleway Design (Offline & Greenway)*. DN-GEO-03047. August 2022. Transport Infrastructure Ireland, Dublin.
<https://www.tiipublications.ie/advanced-search/results/document/?id=3207>

It will be the responsibility of the contractor to appoint an Environmental Clerk of Works (ECoW) (with ecological experience) to monitor and advise on all environmental matters during the construction phase of the proposed upgrade works.

Installing Cellweb® tree root protection (TRP) directly onto the gravel path and build up the path on it. The system allows continued water permeation and gas exchange (see Plate 1-1). 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. It is not possible to use a permeable surfacing, as in order to minimise impacts existing tarmac surfaces are not to be planed off.

Sediment control measures are not required. Where possible materials will be reused on site. However, excess excavated material from excavations, will be removed off site by a licensed waste handler and disposed of in an appropriately licensed waste facility.

The preparation of a Construction Environmental Operating Plan, will be required. This will consider measures required to construct the project (including construction compounds, drainage measures required during construction, e.g. silt control, dust or noise control, etc) and outline design and mitigation measures identified during project development.

1.2.3.4 Defects Period

12 months defects period would normally apply to the pathway. However, due to the inclusion of landscaping along the scheme and invasive species monitoring a defects period of 24 months is allowed for.

1.2.4 Landscaping

A landscape design and planting mixes has been incorporated into Design Drawings prepared by Ryan Hanley on behalf of Cork County Council (included in full in the accompanying Ecological Impact Assessment). The design was informed by the findings of the ecology surveys, as well as the Tree Survey report prepared by Cunnane Stratton Reynolds on behalf of Cork County Council (CSR, 2024b).

The approach to landscaping has followed the mitigation hierarchy – i.e. avoid, minimise and restore. Works have been designed in the first instance to minimise the amount of semi-natural vegetation and the number of trees to be removed. Furthermore, excavation has been limited and Cellweb® tree root protection will be employed to minimise disturbance to tree roots. The location of where path is to be widened will also shift from side to side to minimise impacts on vegetation (with on-site guidance to be provided by an ecologist and arborist).

Mitigation in the form of landscape planting is then proposed for the scheme. Native plants have been prioritised, though in line with TII Guidance⁴ in the urban fringe close to Patrick Murphy Park non-native trees are proposed as are species appropriate for use in flower beds (the Park at this location in many respects resembles a garden space opposite a road side (R610) terrace of houses. It was further informed by the All-Ireland Pollinator Plan⁵.

1.2.5 Maintenance and Renewal

Details of likely maintenance and renewal during the operational phase of the project will be limited to landscaping, localised repairs to any damage to pathways, greenway markings, lighting and or signage. It is anticipated that the lifespan of surfacing works undertaken will be 20 years.

⁴ TII (n.a.). A Guide to Landscape Treatments for National Road Schemes in Ireland.

⁵ <https://pollinators.ie/>

2. Scope of Study

2.1 Legislative Context

2.1.1 Natura 2000

Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora (“the Habitats Directive”) is a legislative instrument of the European Union (EU) which provides legal protection for habitats and species of Community interest. Article 2 of the Directive requires the maintenance or restoration of such habitats and species at a favourable conservation status, while Articles 3 to 9, inclusive, provide for the establishment and conservation of an EU-wide network of special areas of conservation (SACs), known as Natura 2000, which also includes special protection areas (SPAs) designated under Article 4 of Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds (“the Birds Directive”). Both SACs and SPAs are commonly referred to as “European sites” or “Natura 2000 sites”.

SACs are selected for natural habitat types listed on Annex I to the Habitats Directive and the habitats of species listed on Annex II to the Habitats Directive. SPAs are selected for species listed on Annex I to the Birds Directive and other regularly occurring migratory species. The habitats and species for which a Natura 2000 site is selected are referred to as the “qualifying interests” of that site and each is assigned a “conservation objective” aimed at maintaining or restoring its “favourable conservation condition” at the site, which contributes to the maintenance or restoration of its “favourable conservation status” at national and European levels.

2.1.2 Appropriate Assessment

Article 6 of the Habitats Directive deals with the management and protection of Natura 2000 sites. Articles 6(3) and (4) set out the decision-making process, known as “Appropriate Assessment” (AA), for plans or projects in relation to Natura 2000 sites. Article 6(3) states: -

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

The first sentence of Article 6(3) provides a basis for determining which plans and projects require AA, i.e. those “not directly connected with or necessary to the management of [one or more Natura 2000 sites] but likely to have a significant effect thereon, either individually or in combination with other plans or projects”. In *Waddenzee* (C-127/02), the Court of Justice of the European Union (CJEU) ruled that significant effects must be considered “likely” if “it cannot be excluded, on the basis of objective information”, that they would occur. This clearly sets a low threshold, such that AA is required wherever there is a reasonable possibility of significant effects on a Natura 2000 site. In the same judgment, the CJEU established that the test of significance relates specifically to the conservation objectives of the site concerned, i.e. “significant effects” are those which, “in the light, inter alia, of the characteristics and specific environmental conditions of the site”, could undermine the site’s conservation objectives. In addition to the effects of the plan or project on its own, the combined effects arising from the plan or project under consideration and other plans and projects must also be assessed (see Section 8.1 below for more details).

The last part of the first sentence of Article 6(3) defines AA as an assessment of the “implications [of the plan or project] for the site in view of the site's conservation objectives”. In the second sentence, Article 6(3) requires

that, prior to agreeing to a plan or project, the competent authority must “ascertain” that “*it will not adversely affect the integrity of the site concerned*”. In *Sweetman v. An Bord Pleanála* (C-258/11), the CJEU ruled that a plan or project “*will adversely affect the integrity of that site if it is liable to prevent the lasting preservation of the constitutive characteristics of the site that are connected to the presence of a priority natural habitat whose conservation was the objective justifying the designation of the site in the list of sites*”. On that basis, EC (2018) described the “integrity of the site” as “*the coherent sum of the site’s ecological structure, function and ecological processes, across its whole area, which enables it to sustain the habitats, complex of habitats and/or populations of species for which the site is designated*”. As such, the “integrity” of a specific site is defined by its conservation objectives and is “adversely affected” when those objectives are undermined. In *Waddenzee*, the CJEU ruled that the absence of adverse effects can only be ascertained “*where no reasonable scientific doubt remains*”.

The “precautionary principle” applies to all of the legal tests in AA, i.e. in the absence of objective information to demonstrate otherwise, the worst-case scenario is assumed. Where the tests established by Article 6(3) cannot be satisfied, Article 6(4) applies (see explanation in Section 2.2 below).

2.1.3 Competent Authority

The requirements of Articles 6(3) and (4) are transposed into Irish law by, inter alia, Part 5 of the European Communities (Birds and Natura Habitats) Regulations, 2011 (as amended) (“the Habitats Regulations”) and Part XAB of the Planning and Development Act, 2000 (as amended) (“the Planning and Development Acts”). As per the second sentence of Article 6(3), it is the “competent national authorities” who are responsible for carrying out AA and, by extension, for determining which plans and projects require AA. The competent authority in each case is the authority responsible for consenting to or licensing a plan or project, e.g. local authorities, An Bord Pleanála, Transport Infrastructure Ireland (TII) or a Government Minister. In all cases, it is the competent authority who is ultimately responsible for determining whether or not a plan or project requires AA and for carrying out the AA, where required.

2.2 Appropriate Assessment Process

The AA process can be described as being made up of three distinct stages, as described below, the need to progress to each stage being determined by the outcome of the preceding stage.

Stage 1: Screening – This stage involves a determination by the competent authority as to whether or not a given plan or project required AA. As explained in Section 2.1, AA is required in respect of any plan or project not directly connected with or necessary to the management of a Natura 2000 site, but for which the possibility of likely significant effects on one or more Natura 2000 sites cannot be excluded. The CJEU’s Judgment on *Eco Advocacy v. An Bord Pleanála* (C-721/21) and the Opinion of Advocate General Kokott in the same case set out the principles for identifying any aspects of a plan or project which may constitute what the CJEU termed in *People Over Wind* (C-323/17) “*measures intended to avoid or minimise harmful effects on a Natura 2000 site*” and, as such, cannot be taken into account in making an AA Screening determination. Consideration of the potential for in-combination effects is also required at this stage.

Stage 2: Appropriate Assessment – This stage involves a detailed assessment of the implications of the plan or project, individually and in combination with other plans and projects, for the integrity of the Natura 2000 site(s) concerned. This stage also involves the development of appropriate mitigation to address any adverse effects and an assessment of the significance of any residual impacts following the inclusion of mitigation. In *Kelly v. An Bord Pleanála* (IEHC 400), the High Court ruled that a lawful AA must contain complete, precise and definitive findings based on examination and analysis, and conclusions and a final determination based on an evaluation of the findings. In the same judgment, the High Court stressed that, in order for the findings to be complete, precise and definitive, the AA must be carried out in light of best scientific knowledge in the field and cannot have gaps or lacunae. In *Holohan v. An Bord Pleanála* (C-461/17), the CJEU clarified that AA must “*catalogue the entirety of habitat types and species for which a site is protected*” (i.e. the qualifying interests of the site) and

assess the implications of the plan or project for the qualifying interests, both within and outside the site boundaries, and other, non-qualifying interest habitats and species, whether inside or outside the site boundaries, “*provided that those implications are liable to affect the conservation objectives of the site*”. The proposer of a plan or project requiring AA is furnishes the competent authority with the scientific evidence upon which to base its AA by way of a Natura Impact Statement (NIS) or Natura Impact Report (NIR). If it is not possible to ascertain that the plan or project will not adversely affect one or more Natura 2000 sites, authorisation can only be granted subject to Article 6(4).

Stage 3: Article 6(4) – If a plan or project does not pass the legal test at Stage 2, alternative solutions to achieve its aims must be considered and themselves subject to Article 6(3). If no feasible alternatives exist, authorisation can only be granted where it can be demonstrated that there are imperative reasons of overriding public interest (IROPI) justifying its implementation. Where this is the case, all compensatory measures must be taken to protect the overall coherence of Natura 2000.

The three stages described above are illustrated in Figure 2-1 below.

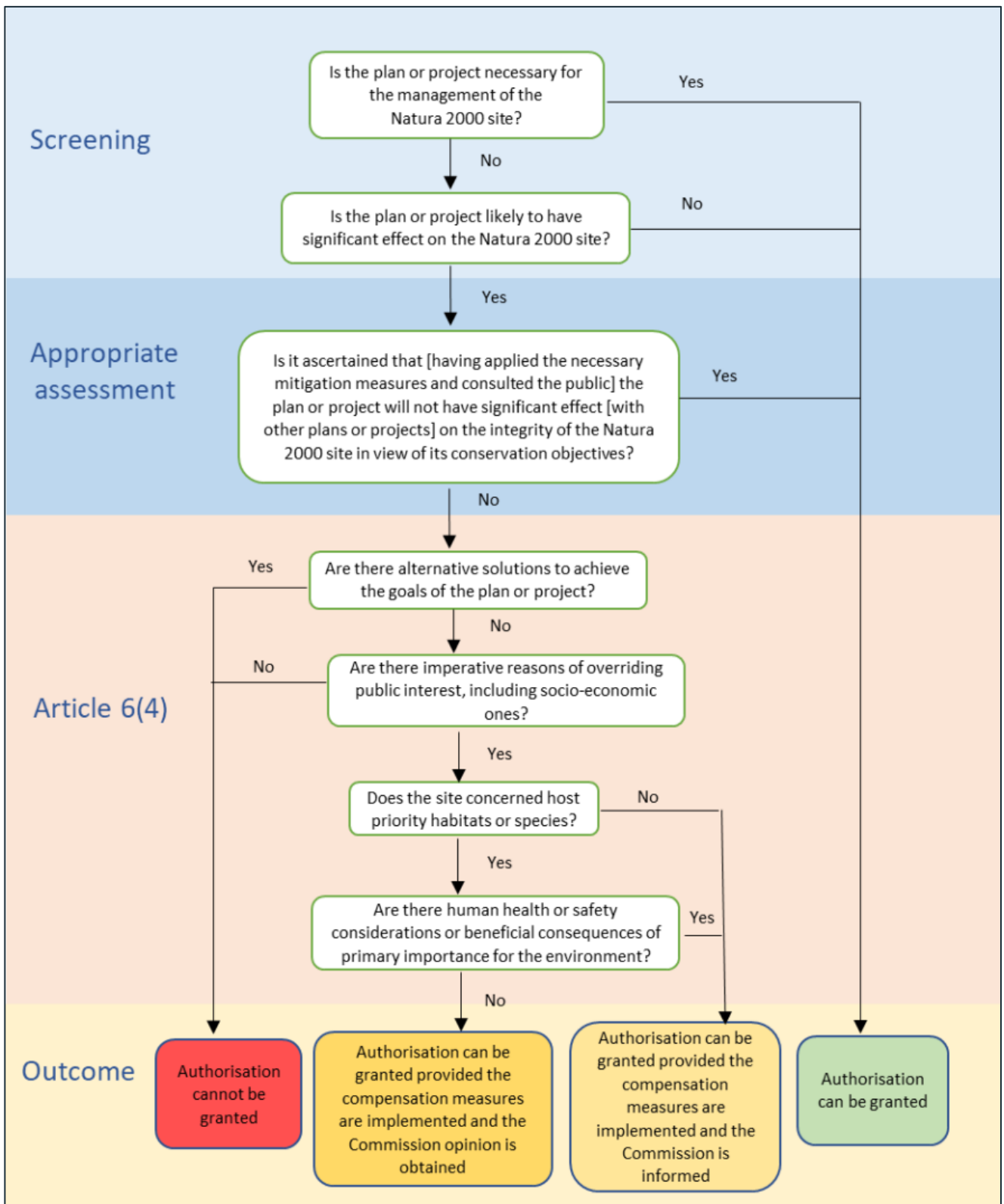


Figure 2-1 - Stages of the Appropriate Assessment process (EC, 2021a).

3. Methodology

3.1 Sources of Guidance

This report was prepared with due regard to the relevant European and Irish legislation, case law and guidance, including but not limited to: -

- Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild flora and fauna. *Official Journal of the European Communities* L 206/7-50.
- Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds. *Official Journal of the European Union* L 20/7-25.
- European Communities (Birds and Natural Habitats) Regulations, 2011. *S.I. No. 77/2011* (as amended) (“the Habitats Regulations”).
- Planning and Development Act, 2000. *No. 30 of 2000* (as amended) (“the Planning and Development Acts”).
- Planning and Development Regulations, 2001. *S.I. No. 600/2001* (as amended) (“the Planning Regulations”).
- EC (2019). *Managing Natura 2000 sites – The provisions of Article 6 of the Habitats Directive 92/43/EEC*. European Commission, Brussels. *Official Journal of the European Union* C 33/1-62.
- EC (2021a). *Assessment of plans and projects in relation to Natura 2000 sites: Methodological guidance on the provisions of Articles 6(3) and (4) of the Habitats Directive 92/43/EEC*. European Commission, Brussels. *Official Journal of the European Union* C 437/1-107.
- EC (2021b). *Guidance document on the strict protection of animal species of Community interest under the Habitats Directive*. *C(2021) 7301*. European Commission, Brussels.
- DG Env (2022a). *Guidance document on assessment of plans and projects in relation to Natura 2000 sites – A summary*. Directorate-General for Environment, European Commission, Brussels. Publications Office of the European Union, Luxembourg.
- DEHLG (2010a). *Appropriate Assessment of Plans and Projects in Ireland: Guidance for Planning Authorities*. Revised 11/02/2010. Department of the Environment, Heritage and Local Government, Dublin.
- DEHLG (2010b). *Circular NPW 1/10 & PSSP 2/10*. Dated 11/03/2010. Department of the Environment, Heritage and Local Government, Dublin.
- NPWS (2012). *Marine Natura Impact Statements in Irish Special Areas of Conservation. A Working Document*. April 2012. National Parks & Wildlife Service, Department of Arts, Heritage and the Gaeltacht, Dublin.
- NPWS (2021). *Guidance on the Strict Protection of Certain Animal and Plant Species under the Habitats Directive in Ireland*. *National Parks & Wildlife Service Guidance Series 1*, Department of Housing, Local Government and Heritage, Dublin.
- Mullen, E., Marnell, F. and Nelson, B. (2021). *Strict Protection of Animal Species – Guidance for Public authorities on the Application of Articles 12 and 16 of the EU Habitats Directive to development/works undertaken by or on behalf of a Public authority*. *National Parks & Wildlife Service Guidance Series 2*, Department of Housing, Local Government and Heritage, Dublin.
- OPR (2021). *Appropriate Assessment Screening for Development Management*. *OPR Practice Note PN01*. Office of the Planning Regulator, Dublin.



- Case law, including *Waddenzee* (C-127/02), *Sweetman v. An Bord Pleanála* (C-258/11), *Kelly v. An Bord Pleanála* (IEHC 400), *Commission v. Germany* (C-142/16), *People Over Wind* (C-323/17), *Holohan v. An Bord Pleanála* (C-461/17), *Eoin Kelly v. An Bord Pleanála* (IEHC 84), *Heather Hill* (IEHC 450) and *Eco Advocacy v. An Bord Pleanála* (C-721/21).
- Sundseth, K. and Roth, P. (2014). *Article 6 of the Habitats Directive – Rulings of the European Court of Justice*. Ecosystems LTD (N2K Group), Brussels.

3.2 Desk Study

Baseline data regarding the receiving environment, including Natura 2000 sites, was gathered through a thorough desk study.

The boundaries of Natura 2000 sites were downloaded from *NPWS: Maps and Data* (<https://www.npws.ie/maps-and-data>). Information on sites, including their overall structures and functions, qualifying interests, conservation objectives and threats/pressures and activities therein, was found in the Site Synopsis, Natura 2000 Standard Data Form, Conservation Objectives and supporting documents for each site. Spatial data for site-specific conservation objectives of Natura 2000 sites, and boundary data for other designated sites, such as Natural Heritage Areas, was also retrieved from *NPWS: Maps and Data*. Reporting under Article 17 of the Habitats Directive (NPWS, 2019a-c; *Article 17 web tool*) and Article 12 of the Birds Directive (NPWS, 2024c; *Article 12 web tool*) provided further information on the habitats and species concerned at the national level.

Information relating to recent and historical records of species was obtained from the National Biodiversity Data Centre (NBDC) *Biodiversity Maps* (<https://maps.biodiversityireland.ie/Map>), while data for other features of the natural environment, e.g. known occurrences of non-qualifying interest Annex I habitats, were viewed on the *Environmental Sensitivity Mapping (ESM) Webtool* (<https://airomaps.geohive.ie/ESM/>).

The Environmental Protection Agency (EPA) map viewer *EPA Maps (Water)* (<https://gis.epa.ie/EPAMaps/Water>) and spatial data for river, lake, canal, transitional and coastal waterbodies downloaded from the *EPA Geoportal* (<https://gis.epa.ie/GetData/Download>) was used to identify any hydrological connection between the proposed development and Natura 2000 sites or connected features. Satellite and aerial imagery from *Google Earth*, *Bing Maps* and Ordnance Survey Ireland (OSi) was reviewed to identify hedgerows, treelines and other potential ecological features.

In addition, reports from ecological surveys and site visits previously undertaken at the location of the proposed development were also reviewed, having due regard to the *Advice note on the lifespan of ecological reports and surveys* (CIEEM, 2019). In particular, these included survey reports provided to Cork County Council by Ryan Hanley in relation to the proposed development. These reports formed part of the desk study and helped to inform the scope of further desk study work and field surveys undertaken to inform this EclA.

In order to inform the assessment of potential in-combination effects, planning applications from the surrounding area were reviewed using the *National Planning Application Database* (<https://housinggovie.maps.arcgis.com/apps/webappviewer>), An Bord Pleanála's *Map Search* (<https://www.pleanala.ie/en-ie/map-search>) and the *EIA Portal* (<https://www.gov.ie/en/publication/9f9e7-eia-portal/>). In addition, aquaculture activities and designated shellfish areas were identified using *Ireland's Marine Atlas* (<https://atlas.marine.ie/>) and *EPA Maps (Water)*.

3.3 Site Visits

An initial site visit and walkover was carried out on 2nd April 2024 by AtkinsRéalis Associate Director (Ecology) Paul O'Donoghue and AtkinsRéalis Senior Ecologist Owen O'Keefe with a representative of Cork County Council. The purpose of this site visit was to become familiarised with the site and receiving environment and identify any features of concern which might require further specialist surveys.

An ecological walkover of the full extent of the proposed development was carried out by AtkinsRéalis Ecologists Owen O’Keefe and Caroline Downey on 1st May 2024. Habitats were classified according to *A Guide to Habitats in Ireland* (Fossitt, 2000) and mapped following *Best Practice Guidance for Habitat Survey and Mapping* (Smith et al., 2011). Habitats with potential links with types listed on Annex I to the Habitats Directive were evaluated against the *Interpretation Manual of European Union Habitats* (DG Env, 2013) and the relevant national monitoring guidelines for the habitats in question. This survey also included compilation of a botanical species list, searches for invasive alien plant species, e.g. Japanese Knotweed (*Fallopia japonica*), and recording of any incidental observations or evidence of presence of fauna, including an assessment of the suitability of trees and structures to support roosting bats. The site was surveyed for Common Toadflax (*Linaria vulgaris*) on the 27th June 2024. This included a survey of neighbouring areas of the Greenway from Harty’s Quay to beyond the Black Bridge where it has also been recorded in the past. The eastern part of the pathway was again visited in again with the Local Authority in 29th August 2024.

Surveys for waterbirds were undertaken from December 2023 to March 2024 by independent ecologist Tom Gittings PhD MCIEEM. These surveys covered Lough Mahon from the shore to the northern/eastern edge of the navigation channel from Hop Island to Marino Point (including bays/inlets/lagoons) and the full width of the West Passage from Marino Point to the Glenbrook ferry slipway, as well as the fields to the south of the proposed development at its western/northern end, as shown in Figure 3-1 below. The methodology and results of these surveys are detailed in the Waterbird Survey Report which is presented in Appendix C to this NIS.

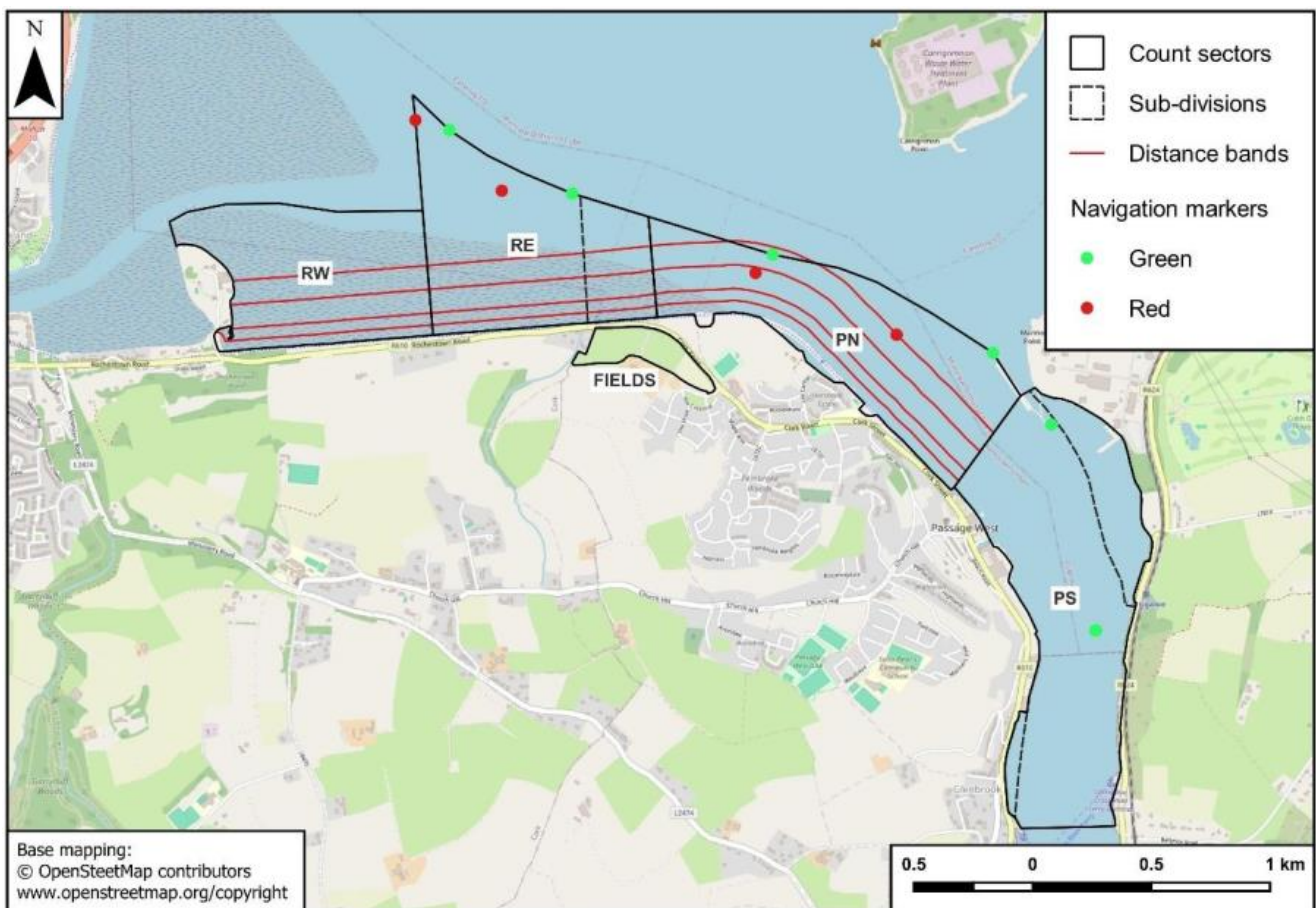


Figure 3-1 - Survey area and count sectors (taken from Map 2.1 in the Waterbird Survey Report which is presented in Appendix C to this NIS).

Surveys for Otter (*Lutra lutra*) were undertaken on 2nd and 3rd February 2024 by ecologist Ross Macklin BSc (Hons) MCIEEM of Triturus Environmental Ltd, following the ‘total corridor otter survey’ (TCOS) technique. This survey covered the shoreline and adjoining areas along the full length of the route, and further seaward sections

as far as the Glenbrook ferry slipway. The methodology and results of these surveys are detailed in the Otter Survey Report which is presented in Appendix D to this NIS.

A bat study was undertaken by O'Donnell Environmental. The study included desktop studies and field surveys. Daytime visual assessments were undertaken by Tom O'Donnell MSc CEnv MCIEEM and Claire McCarthy MSc QCIEEM on 4th and 15th May and 19th June 2023, following *Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd ed.)* (Collins (ed.), 2016).⁶ A passive bat detector was also deployed along the route for the 12 nights from 4th to 15th May 2023. Dusk activity transects were also undertaken in good conditions on 6th and 19th June 2023. The methodology and results of these surveys are detailed in the Bat Survey Report which is presented as a standalone report accompanying this application.

3.4 Statement of Authority

This NIS was prepared by Owen O'Keefe with peer review and support from Caroline Downey and Paul O'Donoghue.

Owen O'Keefe is a Senior Ecologist at Atkins. Owen holds a BSc (Hons) in Ecology from University College Cork (2015) and is a Full Member of the Chartered Institute of Ecology and Environmental Management (MCIEEM). He has 8 years' professional experience in ecological consultancy, specialising river ecosystems and Appropriate Assessment.

Caroline Downey is a Graduate Ecologist at Atkins holding a BSc (Hons) in Ecology and Environmental Biology from University College Cork. Caroline has worked in ecological consultancy since 2023, with a broad knowledge of Appropriate Assessment, Natura Impact Statements, Ecological Impact Statements and ecological theory and legislation, resultant of her BSc. A focus of Caroline's work to date has been assisting Appropriate Assessment Screenings and supporting the preparation of AA and NIS.

Paul O'Donoghue is an Associate Director at Atkins. Paul holds a BSc (Hons) in Zoology, an MSc in Behavioural Ecology and a PhD in Avian Ecology and Genetics. Paul is a Chartered member of the Society for the Environment (CEnv) and a Full Member of the Chartered Institute of Ecology and Environmental Management (MCIEEM). Paul has over 19 years' experience in ecology; including extensive experience in the preparation of Habitat Directive Assessments/Natura Impact Statements, i.e. Appropriate Assessment under Article 6(3) of the Habitats Directive.

⁶ These surveys were carried out prior to the 4th edition of these guidelines being published in September 2023.

4. Existing Environment

4.1 General Context

The proposed development is located along the existing Cork Harbour Greenway, which follows the route of the former Cork, Blackrock and Passage Railway in the townlands of Ardmore and Pembroke. The existing greenway is a shared cyclist and pedestrian facility with a tarmac surface, generally c. 3m wide with a rough grassy verge and trees/shrubs of varied ages. The route is along the shore of Lough Mahon and the West Passage maritime areas of Cork Harbour, where there is a relatively narrow intertidal band of soft sediments. Inland from the route is a mixture of mostly residential buildings and landscaped areas of a mature suburban setting, with the southern end in the Passage West village centre.

4.2 Designated Sites

Cork Harbour is listed as a Wetland of International Importance (site no. 837) under the Ramsar Convention⁷. Cork Harbour is also recognised as an Important Bird Area (site code: IE088) by BirdLife International. These designations are based on the significant examples of estuarine habitats occurring within and adjoining the harbour, particularly mudflats and saltmarshes, as well as the importance of the harbour for both wintering and breeding waterbirds, with numbers of wintering waterfowl regularly exceeding 20,000 individuals from 22 different species. There are no UNESCO⁸ World Heritage or UNESCO Biosphere Reserve sites, or sites designated under the OSPAR Convention⁹, in close proximity to the proposed development or its Zone of Influence.

There are two European sites (Natura 2000) sites designated within Cork Harbour. The Great Island Channel SAC (site code: 001058) is c. 0.9km from the proposed development (across Lough Mahon) and is designated for its mudflats and saltmarshes, while the Cork Harbour SPA (site code: 004030) is immediately adjacent to the proposed development and is designated for a range of waterbirds and their wetland habitats. These sites are described in more detail in Section 5.3 below.

There are no Natural Heritage Areas (NHA) designated in close proximity to the proposed development or its Zone of Influence. However, there is a large number of proposed Natural Heritage Areas (pNHA). The Douglas River Estuary pNHA is immediately adjacent to the proposed development and the Glanmire Wood pNHA, Dunkettle Shore pNHA, Rockfarm Quarry, Little Island pNHA, Great Island Channel pNHA, Monkstown Creek pNHA, Owenboy River pNHA, Lough Beg (Cork) pNHA, Whitegate Bay pNHA, and Rostellan Lough, Aghada Shore and Poul nabibe Inlet pNHA, are all within the wider Cork Harbour system, largely encompassed by the Cork Harbour SPA. Additional sites in the wider area include the Cork Lough pNHA, Cuskinny Marsh pNHA, Carrigshane Hill pNHA, and Loughs Aderry and Ballybutler pNHA.

Wildfowl Sanctuaries are areas that have been excluded from the Wildlife (Wild Birds) (Open Seasons) Order, 1979-2012 so that game birds can rest and feed undisturbed from shooting. One such area, namely the Douglas Estuary (site code: WFS-67), is immediately adjacent to the proposed development. Lough Aderry (WFS-10) and The Lough, Cork (WFS-12) are also within the wider Zone of Influence of the proposed development.

There are no statutory Nature Reserves or any National Parks designated in close proximity to the proposed development or within its Zone of Influence.

⁷ Convention on Wetlands of International Importance especially as Waterfowl Habitat (as amended).

⁸ United Nations Educational, Scientific and Cultural Organization.

⁹ Convention for the Protection of the Marine Environment of the North-East Atlantic.

4.3 Habitats and Species

4.3.1 Habitats

As detailed in Section 3.3, habitat surveys and mapping of the proposed development footprint were carried out in May 2024, following the Fossitt (2000) classification and Smith *et al.* (2011) guidelines. Correspondence to Annex I habitats was checked using *Interpretation Manual of European Union Habitats* (DG Env, 2013) and with reference to the relevant national habitat monitoring programmes. While this application is accompanied by an Ecological Impact Assessment, a summary of the key ecological features of the site and environs is included in the Natura Impact Statement for completeness. This is discussed in detail in the accompanying Ecological Impact Assessment.

4.3.1.1 Fossitt (2000) Classification


Habitats identified in the study area are listed in and described in Table 4-1 below and illustrated in the habitat maps presented in Appendix B.

Table 4-1 - Fossitt (2000) habitat types identified in the study area.

Habitat	Description
Linear Habitats	
BL1 - Stone walls and other stonework	A number of old stone walls are present immediately adjoining the proposed development. These are generally of limestone or sandstone masonry construction with lime mortar. These walls support a typical range of calcicolous and other plant species, including Thyme-leaved Sandwort (<i>Arenaria serpyllifolia</i>), Rustyback (<i>Asplenium ceterach</i>), Wall-rue (<i>Asplenium ruta-muraria</i>), Hart's-tongue (<i>Asplenium scolopendrium</i>), Maidenhair Spleenwort (<i>Asplenium trichomanes</i>), Red Valerian (<i>Centranthus ruber</i>), Ivy-leaved Toadflax (<i>Cymbalaria muralis</i>), Willowherbs (<i>Epilobium</i> spp.), Mexican Fleabane (<i>Erigeron karvinskianus</i>), Herb-Robert (<i>Geranium robertianum</i>), Ivy (<i>Hedera helix</i>), Pellitory-of-the-Wall (<i>Parietaria judaica</i>), Mouse-ear Hawkweed (<i>Pilosella officinarum</i>), Common Polypody (<i>Polypodium vulgare</i>), Navelwort (<i>Umbilicus rupestris</i>) and Cornsalad (<i>Valerianella</i> sp.).
CC1 - Sea walls, piers and jetties	This category includes vertical or near vertical coastal constructions adjacent to the proposed development. Given the age of the structures, they are generally of masonry construction. Their upper sections (above the splash zone) support species many of those listed for BL1, but also more coastal species such as Sea Radish (<i>Raphanus raphanistrum</i> subsp. <i>maritimus</i>), White Stonecrop (<i>Sedum album</i>) and Lesser Sea-spurrey (<i>Spergularia marina</i>). Lower sections of these structures show the typical zonation from splash zone to upper, middle and lower intertidal, with typical communities of these zones, i.e. from lichens to wracks and encrusting organisms.
FW4 - Drainage ditch	Given the nature of the area surrounding the proposed development, there are relatively few drainage ditches compared with more greenfield sites. One drainage ditch was noted dividing two areas of GA1 south of the Rochestown Road from the city end of the proposed development. This area could not be accessed, but is remote from the proposed development and unlikely to support habitats or species of conservation interest.
WL2 - Treelines	Treelines of varying length, height and composition occur throughout the survey area. Some are mapped discretely, while others occur as part of the *GW greenway mosaic described below. Tree species recorded included Field Maple (<i>Acer campestre</i>), Norway Maple (<i>A. platanoides</i>), Sycamore (<i>A. pseudoplatanus</i>), Sugar Maple (<i>A.</i>

Habitat	Description
	<p>saccharum), Beech (<i>Fagus sylvatica</i>), cypresses (Cupressaceae), Ash (<i>Fraxinus excelsior</i>), Bay Laurel (<i>Laurus nobilis</i>), pines (ornamental) (<i>Pinus</i>), Turkey Oak (<i>Quercus cerris</i>), Sessile Oak (<i>Q. petraea</i>), Pedunculate Oak (<i>Q. robur</i>), willows (<i>Salix</i> spp.), Small-leaved Lime (<i>Tilia cordata</i>) and Elm (<i>Ulmus</i> sp.). Lower-growing trees, shrubs and large herbs growing underneath or associated with treelines adjacent to the proposed development included Japanese Laurel (<i>Aucuba japonica</i>), Traveller's-joy (<i>Clematis vitalba</i>), Dogwoods (<i>Cornus</i> cultivars), Hawthorn (<i>Crataegus monogyna</i>), Holly (<i>Ilex aquifolium</i>), Japanese Knotweed (<i>Fallopia japonica</i>), Cherry Laurel (<i>Prunus laurocerasus</i>), Flowering Currant (<i>Ribes sanguineum</i>), Elder (<i>Sambucus nigra</i>), Alexanders (<i>Smyrnium olusatrum</i>) and Gorse (<i>Ulex europaeus</i>). Treelines adjacent to the proposed development are considerably fragmented.</p>

Non-linear Habitats

<p>*GW - Greenway corridor mosaic</p>	<p>This non-Fossitt category covers the existing greenway surface and adjoining areas on top of the old railway embankment, i.e. the existing greenway verges. It is characterised as a mosaic of a number of Fossitt classes generally occurring as parallel, narrow or linear habitats. Following Smith et al. (2011), these are mapped as a mosaic as the component habitats occur in areas or bands that are smaller/narrower than the mapping tolerance at this scale. The main constant feature is the existing greenway itself, classed as BL3 (described below). Immediately adjoining the greenway along most of its length is GA2 (described below). Smaller areas or elements of treelines (WL2), flower beds (BC4), recolonising bare ground (ED3), scrub (WS1) and non-native shrubs (WS3) also occur scattered throughout. A number of individual trees such as Chilean Myrtle (<i>Luma apiculata</i>), Apple (<i>Malus</i> sp.) and Chatham Island Tree Daisy (<i>Olearia traversiorum</i>) also occur in this corridor. Butterfly-bush (<i>Buddleja davidii</i>) is also frequent, while some long stands of Three-cornered Leek (<i>Allium triquetrum</i>) also occur, alongside Winter Heliotrope (<i>Petasites pyrenaicus</i>) and Bluebell (<i>Hyacinthoides non-scripta</i>). See typical cross-section below.</p> 
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Habitat	Description
BC4 - Flower beds and borders	A number of both public and private ornamental landscaped areas occur throughout the study area. Common planted species in these areas include Montbretia (<i>Crocsmia x crocosmiiflora</i>), Wallflower (<i>Erysimum</i> cultivar), Spurge (<i>Euphorbia</i> sp.), Strawberry (domestic) (<i>Fragaria x ananassa</i>), Coral Bells (<i>Heuchera</i>), Daffodil (ornamental) (<i>Narcissus</i> var.), African Daisy (<i>Osteospermum</i> likely 'Cannington Roy'), New Zealand Flax (<i>Phormium tenax</i>) and ornamental grasses. Shrubs planted in and bordering these areas include Japanese Laurel (<i>Aucuba japonica</i>), Dogwoods (<i>Cornus</i> cultivars), Kapuka (<i>Griselinia littoralis</i> cultivar), Hydrangea (<i>Hydrangea</i>), Rose of Sharon (<i>Hypericum calycinum</i>), Bay Laurel (<i>Laurus nobilis</i>), Himalayan Honeysuckle (<i>Leycesteria formosa</i>), Portuguese Laurel (<i>Prunus lusitanica</i> cultivar), Roses (<i>Rosa</i> spp., hybrids and cultivars) and Hebe 'Wiri Charm' (<i>Veronica speciosa</i> cultivar).
BL3 - Buildings and artificial surfaces	Buildings and other artificial surfaces, e.g. roads and walls of modern construction, generally support very little or no vegetation or other species. However, within the study area, gaps and cracks in such surfaces are quickly colonised by species such as Scarlet Pimpernel (<i>Anagallis arvensis</i>), Smooth Hawk's-beard (<i>Crepis capillaris</i>), Willowherbs (<i>Epilobium</i> spp.), Mexican Fleabane (<i>Erigeron karvinskianus</i>), Guernsey Fleabane (<i>E. sumatrensis</i>), Cleavers (<i>Galium aparine</i>), Ragwort (<i>Jacobaea vulgaris</i>), Black Medick (<i>Medicago lupulina</i>), Mints (<i>Mentha</i> spp.), Ribwort Plantain (<i>Plantago lanceolata</i>), Greater Plantain (<i>P. major</i>), Common Figwort (<i>Scrophularia nodosa</i>), Perennial Sowthistle (<i>Sonchus arvensis</i>), Smooth Sowthistle (<i>S. oleraceus</i>), Wood Sage (<i>Teucrium scorodonia</i>), Lesser Trefoil (<i>Trifolium dubium</i>) and Germander Speedwell (<i>Veronica chamaedrys</i>).
BL3/GA2 - Buildings and gardens	Buildings such as domestic dwellings and their associated landscaped areas or gardens are mapped as a mosaic of primarily BL3 and GA2. These also frequently contain areas of 'Ornamental/non-native shrub' (WS3), 'Horticultural land' (BC2), 'Flower beds and borders' (BC4) and 'Stone walls and other stonework' (BL1). Many species, particularly shrubs, from gardens and landscaping have escaped into the surrounding area and become established.
CC1 - Sea walls, piers and jetties	This category covers more gently sloped or flat areas than those described under CC1 (linear) above, e.g. the slipways and steps at the southern end of the proposed development and the rocky embankments along the northern section. The vegetation supported in these areas is largely similar to that described above, with the addition of species such as Thrift (<i>Armeria maritima</i>) and Sea Beet (<i>Beta vulgaris</i> subsp. <i>maritima</i>), particularly where there are crevices between rocks for larger plants to gain a foothold.
CW1 - Lagoons and saline lakes	There are two bodies of water on the landward side of the northern half of the existing greenway. The smaller and westernmost of these appears to be natural in origin, while the much larger and easternmost of these was created by it being cut off from the adjoining Lough Mahon transitional waterbody when the railway embankment was constructed. Both of these are tidal but their tidal range is significantly smaller than the adjoining estuary and they both retain water at low tide. These waterbodies likely provide nursery areas for fish and other aquatic fauna as well as foraging habitats for birds and bats.
GA1 - Improved agricultural grassland	There are two large fields of improved agricultural grassland to the south of the Rochestown Road along the northern section of the proposed development. These are of low biodiversity value and remote from the proposed development.

Habitat	Description
GA2 - Amenity grassland (improved)	Both public and private landscaped areas adjacent to the greenway are managed as amenity grassland. These are dominated by common, commercial grass species and support a range of herbs. In the shorter, more intensively managed areas, herbs present include Yarrow (<i>Achillea millefolium</i>), Common Mouse-ear (<i>Cerastium fontanum</i>), Danish Scurvy-grass (<i>Cochlearia danica</i>), Common Bird's-foot-trefoil (<i>Lotus corniculatus</i>), Black Medick (<i>Medicago lupulina</i>), Buck's-horn Plantain (<i>Plantago coronopus</i>), Ribwort Plantain (<i>P. lanceolata</i>), Greater Plantain (<i>P. major</i>), Common Sorrel (<i>Rumex acetosa</i>), Dandelion (<i>Taraxacum vulgaria</i> agg.), Lesser Trefoil (<i>Trifolium dubium</i>), Red Clover (<i>Trifolium pratense</i>), White Clover (<i>Trifolium repens</i>) and Common Field-speedwell (<i>Veronica persica</i>). In the longer, less frequently mowed areas, herbs present include Red Dead-nettle (<i>Lamium purpureum</i>), Meadow Buttercup (<i>Ranunculus acris</i>), Creeping Buttercup (<i>Ranunculus repens</i>), Woundworts (<i>Stachys</i> spp.), Hedge Woundwort (<i>Stachys sylvatica</i>), Common Chickweed (<i>Stellaria media</i>), Nettle (<i>Urtica dioica</i>) and Germander Speedwell (<i>Veronica chamaedrys</i>).
LS1 - Shingle and gravel shores	This category covers the areas of coarse, mobile sediments of the upper shore of Lough Mahon. The most prominent species noted in these areas during the surveys were Common Orache (<i>Atriplex patula</i>), Spear-leaved Orache (<i>A. prostrata</i>), Sea Beet (<i>Beta vulgaris</i> subsp. <i>maritima</i>) and Curled Dock (<i>Rumex crispus</i>). There was also a high volume of litter. As highlighted in the desk study, these areas also likely support Common Toadflax (<i>Linaria vulgaris</i>) and Sea-kale (<i>Crambe maritima</i>) (see Section 3.4.1 below).
MW4 - Estuaries	This category covers the open waters of Lough Mahon and the West Passage. The fish and other aquatic fauna of these waters are described in the desk study (Section 3.4.4 below).
SS3 - Infralittoral muds	This category covers the sandy and soft mud substrate of the intertidal zone of Lough Mahon. The nature of these sediments and their benthic invertebrate communities are described in the desk study (Section 3.4.4 below). These areas provide foraging habitat for a range of waterbird species.
WD1 - Mixed broadleaved woodland	South of the existing greenway between the Ardmore car park and the larger lagoon, there is a woodland whose canopy is dominated by a mixture of both native and non-native, predominantly broadleaved trees, including Sycamore (<i>A. pseudoplatanus</i>), Beech (<i>Fagus sylvatica</i>), Ash (<i>Fraxinus excelsior</i>), Sessile Oak (<i>Quercus petraea</i>), Pedunculate Oak (<i>Q. robur</i>) and Turkey Oak (<i>Q. cerris</i>). The shrub layer also has a mixture of native and non-native species, including Traveller's-joy (<i>Clematis vitalba</i>), Hawthorn (<i>Crataegus monogyna</i>), Holly (<i>Ilex aquifolium</i>), Cherry Laurel (<i>Prunus laurocerasus</i>) and Elder (<i>Sambucus nigra</i>).
WD2/WS1 - Mixed broadleaved/conifer woodland/Scrub	South of the Rochestown Road at the city end of the proposed development there is an area characterised as a mosaic of mixed broadleaved/conifer woodland and scrub. This area was not accessed during the surveys but is remote from the proposed development.
WS1 - Scrub	Scrub is present in a number of locations in the vicinity of the proposed development, mostly as part of the greenway mosaic (*GW) described above. Scrub in the study area occurs in various compositions and stages of maturity/succession, but as with many of the other habitats, there is a high number of non-native species, including the invasive Japanese Knotweed (<i>Fallopia japonica</i>), alongside typical native species such as Bramble (<i>Rubus fruticosus</i> agg.). Species such as bindweeds (Convolvulaceae) and Bittersweet (<i>Solanum dulcamara</i>) frequently grow through

Habitat	Description
	these areas. Other species frequently found at the edges of these areas include Ground-elder (<i>Aegopodium podagraria</i>), Cow Parsley (<i>Anthriscus sylvestris</i>), Common Knapweed (<i>Centaurea nigra</i>), Creeping Thistle (<i>Cirsium arvense</i>), Spear Thistle (<i>Cirsium vulgare</i>), Wild Strawberry (<i>Fragaria vesca</i>), Cleavers (<i>Galium aparine</i>), Cut-leaved Crane's-bill (<i>Geranium dissectum</i>), Dove's-foot Crane's-bill (<i>Geranium molle</i>), Herb-Robert (<i>Geranium robertianum</i>), St John's-worts (<i>Hypericum</i> spp.) and mints (<i>Mentha</i> spp.).
WS3 - Ornamental/non-native shrub	This category is used for areas dominated by ornamental or non-native shrubs, particularly where they occur in dense stands or formal settings, such as the large entrance to a private property opposite Robert's Bridge car park. This category also occurs as part of the greenway mosaic (*GW).

4.3.1.2 Habitats listed on Annex I of the EU Habitats Directive

Lough Mahon and the West Passage adjoining the proposed development (from the top of the shoreline to the middle of these waterbodies) correspond to the Annex I habitat type 'Estuaries' (1130), while the soft-sediment intertidal areas represent the Annex I habitat type 'Mudflats and sandflats not covered by seawater at low tide' (1140). These areas are of Natura 2000 interest as wetland habitat for waterbirds in the Cork Harbour SPA. Some of the vegetation of the LS1 shingle around the high-tide mark may also correspond to the Annex I type 'Annual vegetation of drift lines' (1210), which is not a qualifying interest of any of the Natura 2000 sites connected to the proposed development.

The two CW1 lagoons adjoining the proposed development may also show some affinity to the Annex I priority¹⁰ habitat type '*Coastal lagoons' (1150), which includes both natural and artificial lagoons, with or without vegetation. Lagoons are not a qualifying interest of any of the Natura 2000 sites connected to the proposed development. However, they remain to be of some value to biodiversity as nursery areas for fish and other aquatic fauna as well as foraging habitats for birds and bats.

None of the other habitats in the vicinity of the proposed development correspond to types listed on Annex I to the Habitats Directive.

The Annex I habitats 'Mudflats and sandflats not covered by seawater at low tide' (1140) and 'Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*)' (1330) are listed as qualifying interests of the Great Island Channel SAC. These specific areas are, however, remote from the proposed development. Atlantic salt meadows or other saltmarsh types do not occur in the vicinity of the proposed development.

4.3.1.3 Flora

The NBDC *Biodiversity Maps* shows records for a number of vascular plant taxa in the study area. Two notable species are Meadow Barley (*Hordeum secalinum*), which is protected under the Flora (Protection) Order, 2022 ("the FPO") and listed as Vulnerable in the Irish Red List, and Common Toadflax (*Linaria vulgaris*), which is listed as Near Threatened. The record for Meadow Barley dates from 1845 while that for Common Toadflax is from 2021 and is within or immediately adjacent to the proposed development. A number of invasive alien plant species are also included in these records, as detailed in Section 4.4 below.

¹⁰ Annex I habitat types marked with an asterisk (*) are "priority habitat types", i.e., natural habitat types in danger of disappearing and for the conservation of which the EU has a particular responsibility given the proportion of their natural ranges falling within the European territory of Member States.

Vascular plant taxa included in the NPWS records received included Pennyroyal (*Mentha pulegium*), which is protected under the FPO and listed as Endangered in the Irish Red List, Red Hemp-nettle (*Galeopsis angustifolia*) and Meadow Barley (*Hordeum secalinum*), which are protected under the FPO and listed as Vulnerable, Rough Poppy (*Papaver hybridum*), listed as Regionally Extinct, Broad-fruited Cornsalad (*Valerianella rimosa*), listed as Critically Endangered, Weasel's-snout/Lesser Snapdragon (*Misopates orontium*), listed as Endangered, and Sea-kale (*Crambe maritima*) and Yellow Horned-poppy (*Glaucium flavum*), both listed as Near Threatened. All of these records are over 120 years old.

Bryophytes recorded in the study area on the NBDC *Biodiversity Maps* include Glass-wort Feather-moss (*Scleropodium tourettii*), which is protected under the FPO and listed as Endangered on the Irish Red List, as well as Orobush-seed Liverwort (*Targionia hypophylla*), Oval-leaved Pottia (*Pterygoneurum ovatum*) and Wilson's Pottia (*Tortula wilsonii*), which are listed as Regionally Extinct, Lance-leaved Pottia (*Tortula lanceola*), which is Critically Endangered, Round-fruited Grimmia (*Grimmia orbicularis*), which is Vulnerable, and Red-neck Forklet-moss (*Dicranella cerviculata*) and Common Extinguisher-moss (*Encalypta vulgaris*), which are Near Threatened. However, the most recent record for any of these species is from 1880. There were no bryophytes reported in the study area in the NPWS records received.

Common Toadflax was located from a single location within the Greenway; it was found to be more abundant between Harty's Quay and just north of the Black Bridge. This is discussed further in the accompanying Ecological Impact Assessment.

None of the flora recorded during the field surveys (a total of 130 no. taxa, as presented in the accompanying Ecological Impact Assessment) are protected under the FPO or listed on the Irish Red List. It must be noted that the surveys were undertaken outside of the flowering period for Common Toadflax, which is considered likely to be present immediately adjacent to the proposed development.

4.3.1.4 Invasive Species

Invasive alien species are species which are caused to spread outside their natural range due to human activities and become problematic in their new habitats. Such species can have significant negative effects on biodiversity and related ecosystem services, human health and safety, and the economy. *Ireland's invasive and non-native species – trends in introductions* (O'Flynn *et al.*, 2014) presented a risk assessment of 377 recorded non-native species and 342 non-native potential invaders and categorised them as 'High-impact', 'Medium-impact' and 'Low-impact' species, according to their environmental, social and economic impacts.

Part 1 of the Third Schedule to the Habitats Regulations lists invasive alien plants requiring legal restrictions to prevent their spread. Regulation 49(2) and (3) of the Habitats Regulations make it an offence to cause or allow the spread of any of these species (or their hybrids, cultivars etc.), except where all reasonable steps have been taken and due diligence exercised to avoid committing the offence. As such, these species are of particular concern with regard to site development and construction works.

In addition, the EU Invasive Alien Species (IAS) Regulation (No. 1143/2014) (as amended) establishes rules to prevent, minimise and mitigate the negative effects of IAS within the EU. The species to which this Regulation applies are included in the official *List of Invasive Alien Species of Union concern* (DG Env, 2022b). Given the environmental, social and economic effects of these species and the legal restrictions on them at an EU level, they are also of concern for planning and development.

The NBDC *Biodiversity Maps* shows records for a large number of non-native species in the study area. During the surveys which informed this NIS, a total of 37 no. different non-native plant taxa were identified. Only 8 no. of these are species evaluated in O'Flynn (2014) or subject to legal restrictions, the remainder being naturalised species or common/widespread garden escapes. Notable non-native/invasive alien species observed during the surveys included: -

- Japanese Knotweed (*Fallopia japonica*), evaluated as High-impact in O'Flynn *et al.* (2014) and restricted under Regulation 49 of the Habitats Regulations,
- Three-cornered Leek (*Allium triquetrum*), evaluated as Medium-impact in O'Flynn *et al.* (2014) and restricted under Regulation 49 of the Habitats Regulations,
- Cherry Laurel (*Prunus laurocerasus*), evaluated as High-impact in O'Flynn *et al.* (2014), and
- Sycamore (*Acer pseudoplatanus*), Butterfly-bush (*Buddleja davidii*), Traveller's-joy (*Clematis vitalba*), Himalayan Honeysuckle (*Leycesteria formosa*) and Turkey Oak (*Quercus cerris*), all of which were evaluated as Medium-impact in O'Flynn *et al.* (2014).

4.3.2 Birds

4.3.2.1 Wintering Birds

During the waterbird surveys, Tom Gittings recorded 31 no. waterbird species within the survey area, including 16 no. species listed as qualifying interests of the Cork Harbour SPA. Dunlin (*Calidris alpina*) and Black-headed Gull (*Chroicocephalus ridibundus*) were the most abundant species. Numbers of Teal (*Anas crecca*), Black-tailed Godwit (*Limosa limosa*) and Herring Gull (*Larus argentatus*) were also high in a Cork Harbour context.

The proposed development is alongside the eastern part of the southern shore of Lough Mahon, where the mudflats narrow, and the northern part of the West Passage, where the intertidal zone is very narrow. These areas did not support significant numbers of any waterbirds during the surveys and the birds using these mudflats appeared to be habituated to disturbance from pedestrians and cyclists on the existing greenway.

Most of the waterbirds which feed in Lough Mahon are known to roost in the Douglas River Estuary at high tide. The only waterbird roosts recorded during the surveys was a Cormorant (*Phalacrocorax corax*) day roost on a platform south of Marino Point and a large Herring Gull night roost in the West Passage.

Detailed results of the waterbird surveys are presented in Appendix C.

4.3.2.2 Summer Birds

Breeding bird surveys were carried out by Ryan Hanley Ecologist, Breda Quinn in early April and late May 2023 (i.e. within the bird breeding season), following the Countryside Bird Survey (CBS) methodology. The surveyor recorded all birds seen and heard along a transect (i.e. the route of the proposed development) which was walked early in the morning on two occasions, one in early summer and one about a month later. The ecological walkover surveys carried out by AtkinsRéalis in May and June 2024 also recorded incidental observations of birds.

Bird species recorded during the breeding bird surveys carried out by Ryan Hanley in early summer 2023 included Magpie (*Pica pica*), Rook (*Corvus frugilegus*), Hooded Crow (*C. cornix*), Jackdaw (*Coloeus monedula*), Jay (*Garrulus glandarius*), Starling (*Sturnus vulgaris*), Blackbird (*Turdus merula*), Song Thrush (*Turdus philomelos*), Mistle Thrush (*T. viscivorus*), Robin (*Erithacus rubecula*), Wren (*Troglodytes troglodytes*), Woodpigeon (*Columba palumbus*), Collared Dove (*Streptopelia decaocto*), Dunnock (*Prunella modularis*), Goldfinch (*Carduelis carduelis*), Chaffinch (*Fringilla coelebs*), Bullfinch (*Pyrrhula pyrrhula*), House Sparrow (*Passer domesticus*), Blackcap (*Sylvia atricapilla*), Chiffchaff (*Phylloscopus collybita*), Willow Warbler (*Phylloscopus trochilus*), Grasshopper Warbler (*Locustella naevia*), Blue Tit (*Cyanistes caeruleus*), Great Tit (*Parus major*), Long-tailed Tit (*Aegithalus caudatus*), Grey Wagtail (*Motacilla cinerea*), House Martin (*Delichon urbicum*), Teal (*Anas crecca*), Turnstone (*Arenaria interpres*), Herring Gull (*Larus argentatus*), Cormorant (*Phalacrocorax carbo*) and Common Tern (*Sterna hirundo*).

The field and summary tables from Ryan Hanley's breeding bird surveys are included in Appendix F to the accompanying EclA.

During the ecological walkover on 1st May 2024, small numbers of Common Tern (*Sterna hirundo*) were observed feeding short distances offshore along the greenway route. Breeding Common Tern is a qualifying interest of Cork Harbour SPA. Historically, terns nested primarily on disused barges near Marino Point (Wilson et al., 2000). Following the barges' deterioration, terns nested at a number of locations in Cork Harbour, such as the port facilities at Ringaskiddy, the roof of the Martello Tower adjoining the Cork to Cobh railway line south of Fota Island, and a small island in the lagoon at Pfizer's Golf Course, Shanbally (RPS, 2014). In recent years a nesting platform/raft has been anchored on the eastern side of Little Island. There is no habitat in close proximity to the proposed development suitable for nesting by Common Tern.

While no suitable habitat for nesting by Kingfisher (*Alcedo atthis*), a species listed on Annex I of the EU Habitats Directive, was observed in close proximity to the proposed development, some branches overhanging the larger, partially-tidal lagoon/inlet adjoining the northern section of the greenway may provide suitable feeding perches for this species.

Bird species incidentally observed during the walkover survey included widespread and common species such as Barn Swallow (*Hirundo rustica*), Chiffchaff (*Phylloscopus collybita*), Blackbird (*Turdus merula*), Jackdaw (*Coloeus monedula*), Rook (*Corvus frugilegus*), Jay (*Garrulus glandarius*) and Woodpigeon (*Columba palumbus*), as well as small numbers of waterbirds including Turnstone (*Arenaria interpres*), Little Egret (*Egretta garzetta*), Whimbrel (*Numenius phaeopus*) and Common Tern (*Sterna hirundo*). Overall, bird activity during the survey was considered to be low, despite being during the breeding season and good weather conditions.

4.3.3 Mammals

4.3.3.1 Otter

Otter (*Lutra lutra*) is listed on Annex II to the Habitats Directive. However, it is not a qualifying interest of any of the SACs in the vicinity of the proposed development. Otter is also listed on Annex IV to the Habitats Directive, affording strict protection to otters and their breeding and resting places (whether inside or outside Natura 2000) under Article 12, as transposed into Irish law by Article 51 of the Habitats Regulations. Otter is also protected under the Wildlife Act, 1976 (as amended) ("the Wildlife Act"). An examination of the records for Otter on the National Biodiversity Data Centre's *Biodiversity Maps*, as well as data received from the NPWS, showed that this species or evidence of its presence have been recorded on numerous occasions around the shores of Cork Harbour, including adjacent to or in close proximity to the proposed development.

An otter survey was carried out by Ross Macklin, Triturus Environmental Ltd. and the full details of this survey are provided in the Otter Survey Report. This report is included in full in the accompanying Ecological Impact Assessment. This survey recorded a total of 14 no. otter signs, mostly spraint and jelly. A single couch identified in the otter survey was located >1km from the proposed development. A single holt in a boulder revetment was identified immediately adjacent to the proposed development (the precise location is redacted from the survey report as this is considered to be sensitive data). This holt was close to a source of fresh water and heavily marked with mixed-age spraint. This potential breeding holt was secluded from the existing walkway by dense scrub and was only accessible via the intertidal area, minimising disturbance from humans and dogs.

During the ecological walkover carried out by AtkinsRéalis on 1st May 2024, one adult otter was observed feeding c. 40m offshore from Patrick Murphy Park. No additional evidence of otters was observed during that survey.

There are a number of other Annex IV species present in Ireland and under the EC (Birds and Natural Habitats) Regulations 2011 – 2021 all are afforded the same level of protection. One such species is Otter. An otter holt was recorded outside, but close to the proposed works area. While there are no works on the shoreline, it is

proposed to apply to National Parks and Wildlife Service for a derogation licence¹¹. This application is being submitted to NPWS in parallel to this application.

4.3.3.2 Bats

All bat species present in Ireland are listed on Annex IV to the Habitats Directive, affording strict protection to bats and their roosts (whether inside or outside Natura 2000) under Article 12, as transposed into Irish law by Article 51 of the Habitats Regulations. Bats are also protected under the Wildlife Act. One species, namely Lesser Horseshoe Bat (*Rhinolophus hipposideros*) is listed on Annex II to the Habitats Directive, but is not a qualifying interest of any of the SACs in the vicinity of the proposed development.

Visual assessments by O'Donnell Environmental on behalf of Cork County Council (a full copy of the report accompanies this planning application) found that none of the 4 no. bridges, 1 no. set of stone pillars or 200 no. trees in the study area had more than Low suitability for roosting bats, and none of the trees or structures had potential to support a maternity roost. The passive detector recorded a total of 719 bat passes over the 12 nights. Soprano Pipistrelle accounted for 49.5% of passes, Common Pipistrelle for 31.7%, Leisler's Bat for 18.5%, and Daubenton's Bat accounted for 0.3%. These species are all common and widespread in Ireland and, apart from Daubenton's Bat, are relatively light-tolerant.

The activity transects recorded only Common Pipistrelle, Soprano Pipistrelle and Leisler's Bat, with the timing and behaviour of bats recorded indicating that roost locations were distant from the greenway. Overall, the levels of activity were low-moderate, likely due to high levels of artificial lighting and disturbance.

4.3.3.3 Marine Mammals

All marine mammals, including all whales, dolphins, porpoises and seals, are protected under the Wildlife Act. In addition, all cetaceans are listed on Annex IV to the Habitats Directive, affording them strict protection under Article 12, as transposed by Article 51 of the Habitats Regulations, while both Grey Seal (*Halichoerus grypus*) and Harbour Seal (*Phoca vitulina*) are listed on Annexes II and V to the Directive, though none of these species are qualifying interests of the Natura 2000 sites in Cork Harbour. Information on the presence of marine mammals in the study area was gathered through the NBDC Biodiversity Maps, the Irish Whale and Dolphin Group (IWDG) website <<https://www.iwdg.ie>> and literature available online.

Two pinniped species, namely Grey Seal and Harbour Seal are regularly observed in Cork Harbour, both seaward and inland from the proposed development. Records for both species have a similar distribution, with most records in the Lower Harbour and several in Cork City, but very few in Lough Mahon. It is likely that Lough Mahon does not provide the same feeding opportunities as these other parts of the Cork Harbour system. The levels of disturbance and nature of the habitats on the southern shore of Lough Mahon are also unsuitable for pinniped haul-out sites. As such, the habitats in the vicinity of the proposed development are not considered to be of importance for pinnipeds.

Three cetacean species, name Common Dolphin (*Delphinus delphis*), Harbour Porpoise (*Phocoena phocoena*) and Bottlenose Dolphin (*Tursiops truncatus*), are also regularly recorded in Cork Harbour. While records for Common Dolphin are distributed throughout Cork Harbour (including relatively frequent observations in Cork City), Harbour Porpoise and Bottlenose Dolphin are generally restricted to the Lower Harbour. However, it is considered likely that Harbour Porpoise and Bottlenose Dolphin may enter Lough Mahon at least occasionally. Another cetacean species which has previously been recorded in Cork Harbour is Orca (*Orcinus orca*). Three individuals were observed in Cork Harbour in August 1974, arriving and departing on the same day, while in June and July 2001, another three individuals spent six weeks in Cork Harbour, including entering Lough Mahon and spending a full day in Cork City centre (Wilson, 2001; Ryan & Wilson, 2003). One of those individuals died while

¹¹ As per NPWS Guidance set out at - <https://www.npws.ie/licensesandconsents/disturbance/application-for-derogation-licence>

in Cork Harbour. These events are considered to be exceptionally rare. Observations of other cetaceans such as Minke Whale (*Balaenoptera acutorostrata*) are limited to the mouth of the Harbour (around Roches Point) and further out to sea, i.e. remote from the proposed development.

No marine mammals were observed during the surveys which informed this NIS.



4.4 Invasive Alien Species

Invasive alien species are species which are caused to spread outside their natural range due to human activities and become problematic in their new habitats. Such species can have significant negative effects on biodiversity and related ecosystem services, human health and safety, and the economy. *Ireland's invasive and non-native species – trends in introductions* (O'Flynn *et al.*, 2014) presented a risk assessment of 377 recorded non-native species and 342 non-native potential invaders and categorised them as 'High-impact', 'Medium-impact' and 'Low-impact' species, according to their environmental, social and economic impacts.

Part 1 of the Third Schedule to the Habitats Regulations lists invasive alien plants requiring legal restrictions to prevent their spread. Regulation 49(2) and (3) of the Habitats Regulations make it an offence to cause or allow the spread of any of these species (or their hybrids, cultivars etc.), except where all reasonable steps have been taken and due diligence exercised to avoid committing the offence. As such, these species are of particular concern with regard to site development and construction works.

In addition, the EU Invasive Alien Species (IAS) Regulation (No. 1143/2014) (as amended) establishes rules to prevent, minimise and mitigate the negative effects of IAS within the EU. The species to which this Regulation applies are included in the official *List of Invasive Alien Species of Union concern* (DG Env, 2022b). Given the environmental, social and economic effects of these species and the legal restrictions on them at an EU level, they are also of concern for planning and development.

The NBDC *Biodiversity Maps* shows records for a large number of non-native species in the study area. These include the following records for plant species subject to legal restrictions (all of the following are restricted under Regulation 49 of the Habitats Regulations): -

- 2 no. plant species: -
 - Japanese Knotweed (*Fallopia japonica*), evaluated as High-impact in O'Flynn *et al.* (2014), and
 - Three-cornered Leek (*Allium triquetrum*), evaluated as Medium-impact in O'Flynn *et al.* (2014).

During the surveys which informed this NIS, a total of 37 no. different non-native plant taxa were identified. Only 8 no. of these are species evaluated in O'Flynn *et al.* (2014) or subject to legal restrictions, the remainder being naturalised species or common/widespread garden escapes. Notable non-native/invasive alien species observed during the surveys included:

- Japanese Knotweed (*Fallopia japonica*), evaluated as High-impact in O'Flynn *et al.* (2014) and restricted under Regulation 49 of the Habitats Regulations,
- Three-cornered Leek (*Allium triquetrum*), evaluated as Medium-impact in O'Flynn *et al.* (2014) and restricted under Regulation 49 of the Habitats Regulations,
- Cherry Laurel (*Prunus laurocerasus*), evaluated as High-impact in O'Flynn *et al.* (2014), and
- Sycamore (*Acer pseudoplatanus*), Butterfly-bush (*Buddleja davidii*), Traveller's-joy (*Clematis vitalba*), Himalayan Honeysuckle (*Leycesteria formosa*) and Turkey Oak (*Quercus cerris*), all of which were evaluated as Medium-impact in O'Flynn *et al.* (2014).

5. Connectivity to Natura 2000 Sites

5.1 Zone of Influence

The “*Zone of Influence*” of a plan or project is the area which may experience ecological effects as a result of its implementation, including any ancillary activities. The various impacts of a plan or project will each have their own characteristics, e.g. nature, extent, magnitude, duration etc. Accordingly, the area subject to each impact (“zone of impact”) will vary depending on characteristics of the impact and the presence of pathways for its propagation. Ecological features within or connected to one or more zones of impact could, depending on their sensitivities, be affected by the plan or project under consideration. The area containing such features may be regarded as the Zone of Influence. As such, in establishing the Zone of Influence for a plan or project, regard must be had to the characteristics of its potential impacts, potential pathways for impacts and the sensitivities of ecological features in the receiving environment.

In its guidance on selecting Natura 2000 sites to include in AA, *Appropriate Assessment of Plans and Projects in Ireland: Guidance for Planning Authorities* (DEHLG, 2010a) recommends inclusion of sites in the following three categories: -

- Any Natura 2000 sites within or adjacent to the plan or project area,
- Any Natura 2000 sites within the Zone of Influence of the plan or project (generally within 15km for plans, to be established on a case-by-case basis for projects, having regard to the nature, scale and location of the project, the sensitivities of the ecological receptors and the potential for in-combination effects), and
- Following the precautionary principle, any other Natura 2000 sites for which the possibility of significant effects cannot be excluded, e.g. for a project with hydrological impacts, it may be necessary to check the full extent of the catchment for Natura 2000 sites with water-dependent qualifying interests.

In addition, EC (2021a) recommends consideration of Natura 2000 sites hosting fauna which could move to the plan or project area or its Zone of Influence, and the potential for severance of ecological connectivity within or between Natura 2000 sites. OPR (2021) emphasises the importance of employing the source-pathway-receptor model (rather than arbitrary distances such as 15km) when selecting Natura 2000 sites for inclusion in AA.

Based on the above considerations, the Zone of Influence for the proposed development was defined as the combination of the following zones of impact: -

- For direct impacts, all areas within and immediately adjoining the red-line boundary.
- For temporary disturbance to birds and other fauna, as well as effects associated with the spread of invasive alien species, all areas within a precautionary buffer of 500m from the red-line boundary.
- For water quality impacts, drains and inlets crossed by the proposed development, adjoining lagoons and the Lough Mahon transitional waterbody.
- For indirect effects, all other areas with potential ecological connectivity to the above zones of impact, i.e. the wider Cork Harbour system and adjoining lands.

Using QGIS3, spatial data for waterbodies and catchments from *EPA Geoportal* were viewed in conjunction with aerial imagery from *Google Earth* to identify pathways and zones of impact from the proposed development, and other potential ecological connections to the wider landscape. These were then mapped in relation to Natura 2000 sites using spatial data from *NPWS: Maps and Data* (see Figure 5-1).

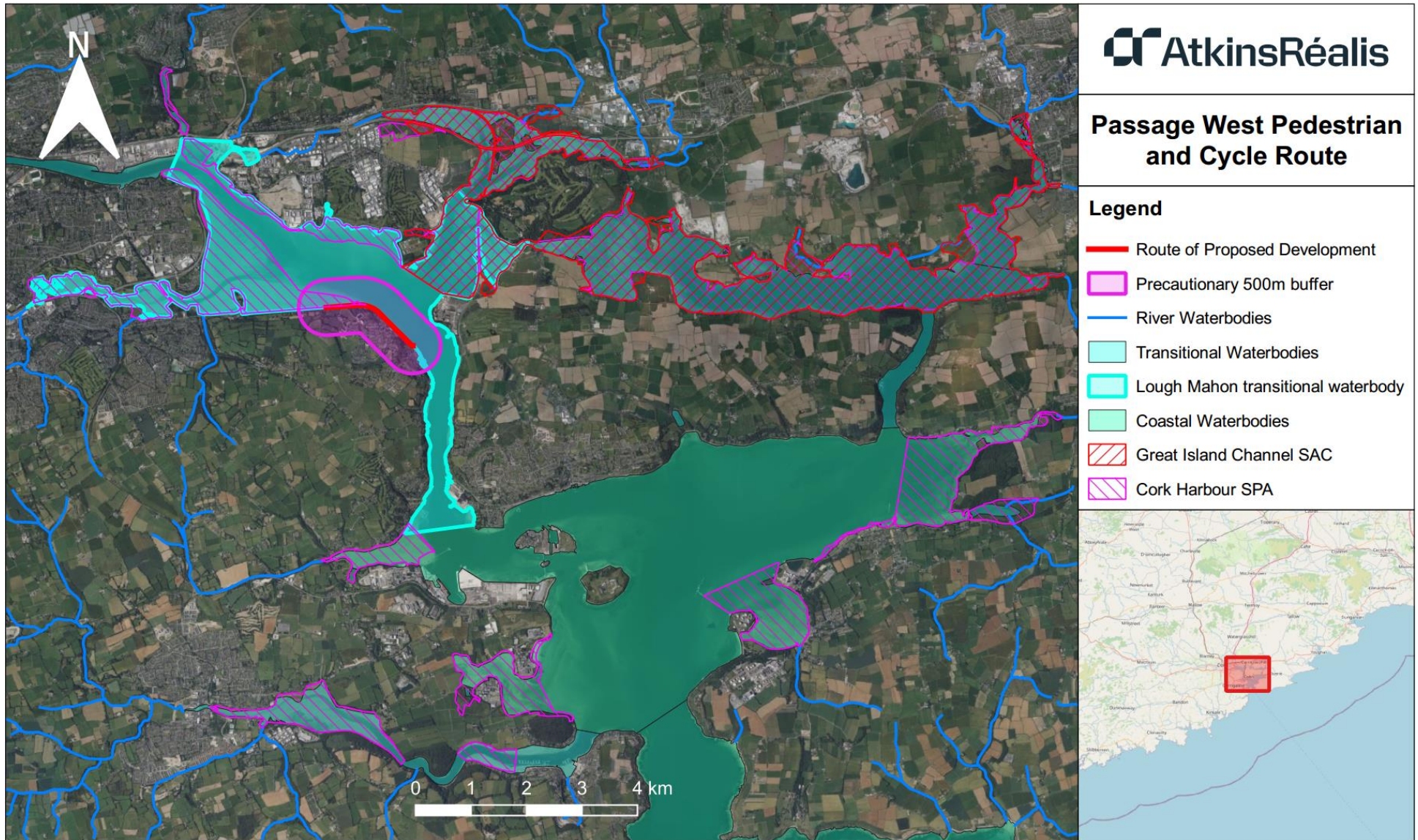


Figure 5-1 - The proposed development and its Zone of Influence in relation to Natura 2000 sites.

5.2 Identification of Sites

5.2.1 Direct Impacts

Direct impacts include those such as habitat loss and fragmentation which occur as a direct result of works. Such impacts are limited to the works footprint and the immediate vicinity. The proposed development is immediately adjacent to one Natura 2000 site, namely the Cork Harbour SPA (site code: 004030). Therefore, there is potential for direct impacts to this Natura 2000 site.

5.2.2 Disturbance and Invasive Alien Species

Disturbance impacts include noise, visual and other forms of disturbance to animal species. The extent of such impacts is highly dependent on their magnitude and the sensitivity of the receptors. In the case of the proposed development, a precautionary distance of 500m from the works was used. The proposed development is immediately adjacent to 1 no. Natura 2000 site, namely the Cork Harbour SPA, which is selected for a number of waterbirds which are sensitive to disturbance from human activities. Therefore, there is potential for disturbance impacts to this Natura 2000 site. There are no other Natura 2000 sites within the precautionary 500m buffer for such impacts.

Given the uncertainty and complexity of effects relating to the spread of invasive alien species, it is not possible to define a zone of impact. However, species such as Common Cord-grass (*Spartina anglica*) are considered to pose a threat to the integrity of mudflat and saltmarsh habitats in the Cork Harbour SPA, which is immediately adjacent to the proposed development, and the Great Island Channel SAC (site code: 001058), which is <1km from the proposed development across lower Lough Mahon. In the absence of appropriate controls, the proposed development could contribute to the spread of invasive alien species of concern in these Natura 2000 sites.

5.2.3 Water Quality Impacts

Water quality impacts include pollution of surface waters and groundwater by sediment, hydrocarbons (e.g. diesel, hydraulic oils and lubricating oils), concrete and other cementitious materials, and other deleterious matter arising during construction. In the case of the proposed development, these could include fine sediment from excavations and earthworks, fuels and other hydrocarbons from vehicles, plant and machinery, cementitious and bituminous materials required for construction of the path, and waste from on-site welfare facilities. The zone of impact covers the Lough Mahon transitional waterbody (as illustrated in Figure 5-1). Both the Great Island Channel SAC and Cork Harbour SPA occur within this zone of impact and are designated for wetland habitats sensitive to water quality impacts.

5.2.4 Indirect Effects

There are no additional Natura 2000 sites within or intersecting zone of impact for indirect impacts, i.e. the wider Cork Harbour system and adjoining lands.

5.2.5 Summary

Based on the above examination, the following Natura 2000 sites are selected for assessment: -

- Great Island Channel SAC (site code: 001058).
- Cork Harbour SPA (site code: 004030).

5.3 Site Descriptions

The descriptions of Natura 2000 sites presented in this section are based on the Site Synopsis, Conservation Objectives and Natura 2000 Standard Data Form documents for the sites concerned, augmented by information from the supporting documents available on the site-specific pages of the NPWS website.

Annex I habitat types marked with an asterisk (*) are “priority habitat types”, i.e., natural habitat types in danger of disappearing and for the conservation of which the EU has a particular responsibility given the proportion of their natural ranges falling within the European territory of Member States.

5.3.1 Great Island Channel SAC

5.3.1.1 Overview

The following description is taken from the Site Synopsis (NPWS, 2013) and Conservation Objectives Supporting Document (NPWS, 2014b) for Great Island Channel SAC.

‘The Great Island Channel stretches from Little Island to Midleton, with its southern boundary being formed by Great Island. It is an integral part of Cork Harbour which contains several other sites of conservation interest. Geologically, Cork Harbour consists of two large areas of open water in a limestone basin, separated from each other and the open sea by ridges of Old Red Sandstone. Within this system, Great Island Channel forms the eastern stretch of the river basin and compared to the rest of Cork Harbour, is relatively undisturbed. Within the site is the estuary of the Owennacurra and Dungourney Rivers. These rivers, which flow through Midleton, provide the main source of freshwater to the North Channel’

The Great Island Channel SAC is of ecological importance for its examples of intertidal mud and sand flats and Atlantic salt meadows of the estuarine type. Both habitats are fairly extensive in area and of moderate to good quality. The site has high ornithological importance, regularly supporting c. 50% of the wintering waterfowl of Cork Harbour (NPWS, 2013; 2014b). Significant proportions of the internationally important populations of Black-tailed Godwit and Redshank, which winter in Cork Harbour, utilise the site and it supports nationally important populations of a further 12 species, including Golden Plover and Bar-tailed Godwit, both listed on Annex I to the Birds Directive.

5.3.1.2 Qualifying Interests and Conservation Objectives

The Great Island Channel SAC was selected for the following qualifying interests: -

- Mudflats and sandflats not covered by seawater at low tide (1140)
- Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) (1330)

The Annex I habitat ‘Estuaries’ (1130) is also present within the site (NPWS, 2019d) but is not listed as a qualifying interest. NPWS (2014b) states that the swards of *Spartina* sp. within the site are not considered to qualify as the Annex I habitat ‘*Spartina* swards (*Spartinion maritimae*)’ (1320).

The conservation objectives of the Great Island Channel SAC are as follows:

- *To maintain the favourable conservation condition of Mudflats and sandflats not covered by seawater at low tide in Great Island Channel SAC*
- *To restore the favourable conservation condition of Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) in Great Island Channel SAC*

The Conservation Objectives document for the site (NPWS, 2014a) also states the following: “Please note that this SAC overlaps with Cork Harbour SPA (004030). [...] The conservation objectives for this site should be used in conjunction with those for the overlapping site as appropriate.”

5.3.1.3 Threats, Pressures and Activities

While the main land use within the Great Island Channel SAC is aquaculture (specifically, oyster farming), the greatest threats to its conservation significance come from road works, infilling, sewage outflows and possible marina developments.

Table 5-1 below lists the threats, pressures, and activities with negative impacts on the site, as per its Natura 2000 Standard Data Form (NPWS, 2019d).

Table 5-1 - Threats, pressures and activities with negative impacts on the Great Island Channel SAC.

Rank	Threat, pressure or activity (code)	Threat, pressure or activity (description)	Inside, outside or both
Medium	A04	grazing	inside
Medium	A08	Fertilisation	outside
High	D01.02	roads, motorways	inside
High	E01	Urbanised areas, human habitation	outside
High	F01	Marine and Freshwater Aquaculture	inside
Medium	I01	invasive non-native species	inside
High	J02.01.02	reclamation of land from sea, estuary or marsh	inside
Medium	K02.03	eutrophication (natural)	inside

NPWS (2019d) and Eionet (2022).

5.3.2 Cork Harbour SPA

5.3.2.1 Overview

The following description is taken from the Site Synopsis (NPWS, 2015) and Conservation Objectives Supporting Document (NPWS, 2014c) for Cork Harbour SPA.

‘Cork Harbour is a large, sheltered bay system, with several river estuaries, principally those of the Rivers Lee, Douglas, Owenboy and Owenacurra. The site comprises most of the main intertidal areas of Cork Harbour, including all of the Great Island Channel, the Douglas River Estuary, inner Lough Mahon, Monkstown Creek, Lough Beg, the Owenboy River Estuary, Whitegate Bay, Ringabella Creek and the Rostellan and Poul nabibe inlets.’

Owing to the sheltered conditions, the intertidal flats are often muddy in character. Salt marshes are scattered through the site, and these provide high tide roosts for the birds. Otherwise, birds roost on stony shorelines and in some areas fields adjacent to the shore. Some shallow bay water is included in the site. Cork Harbour is adjacent to a major urban centre and a major industrial centre.

Cork Harbour is an internationally important wetland site, regularly supporting in excess of 20,000 wintering waterfowl, for which it is amongst the top five sites in the country. It supports an internationally important population of Redshank (*Tringa totanus*). A further 15 species have populations of national importance, with particularly notable numbers of Shelduck (*Tadorna tadorna*) (9.6% of national total), Shoveler (*Anas clypeata*) (4.5% of total), Pintail (*Anas acuta*)

(4.2% of total) and Cormorant (*Phalacrocorax carbo*) (4.1% of total) occurring. It has regionally important populations of Golden Plover (*Pluvialis apricaria*) and Bar-tailed Godwit (*Limosa lapponica*). Passage waders are regular, including Ruff (*Philomachus pugnax*) and Spotted Redshank (*Tringa erythropus*). It is an important site for gulls in winter and autumn, especially Common Gull (*Larus canus*) and Lesser Black-backed Gull (*L. fuscus*). The SPA provides both feeding and roosting areas for the waterfowl species. The quality of most of the estuarine habitats is good. The wintering birds have been well-monitored since the 1970s. The site has a breeding colony of Common Tern (*Sterna hirundo*) which is of national importance.'

5.3.2.2 Qualifying Interests and Conservation Objectives

The Cork Harbour SPA was selected for the following qualifying interests: -

- Little Grebe (*Tachybaptus ruficollis*) (A004)
- Great Crested Grebe (*Podiceps cristatus*) (A005)
- Cormorant (*Phalacrocorax carbo*) (A017)
- Grey Heron (*Ardea cinerea*) (A028)
- Shelduck (*Tadorna tadorna*) (A048)
- Wigeon (*Anas penelope*) (A050)
- Teal (*Anas crecca*) (A052)
- Pintail (*Anas acuta*) (A054)
- Shoveler (*Anas clypeata*) (A056)
- Red-breasted Merganser (*Mergus serrator*) (A069)
- Oystercatcher (*Haematopus ostralegus*) (A130)
- Golden Plover (*Pluvialis apricaria*) (A140)
- Grey Plover (*Pluvialis squatarola*) (A141)
- Lapwing (*Vanellus vanellus*) (A142)
- Dunlin (*Calidris alpina alpina*) (A149)
- Black-tailed Godwit (*Limosa limosa*) (A156)
- Bar-tailed Godwit (*Limosa lapponica*) (A157)
- Curlew (*Numenius arquata*) (A160)
- Redshank (*Tringa totanus*) (A162)
- Black-headed Gull (*Chroicocephalus ridibundus*) (A179)
- Common Gull (*Larus canus*) (A182)
- Lesser Black-backed Gull (*Larus fuscus*) (A183)
- Common Tern (*Sterna hirundo*) (A193) [breeding]

- Wetlands (A999)

All of the qualifying interests listed above are assigned a conservation objective to “maintain” their favourable conservation status in the Cork Harbour SPA.

The Conservation Objectives document for the site (NPWS, 2014d) also states the following: “Please note that this SPA overlaps with Great Island Channel SAC (001058). [...] The conservation objectives for this site should be used in conjunction with those for the overlapping site as appropriate.”

5.3.2.3 Threats, Pressures and Activities

Table 5-2 below lists the threats, pressures, and activities with negative impacts on the Cork Harbour SPA, as per its Natura 2000 Standard Data Form (NPWS, 2020).

Table 5-2 - Threats, pressures and activities with negative impacts on the Cork Harbour SPA.

Rank	Threat, pressure or activity (code)	Threat, pressure or activity (description)	Inside, outside or both
Medium	A08	Fertilisation	outside
High	D01.02	roads, motorways	outside
High	D03.01	port areas	outside
Medium	D03.02	Shipping lanes	inside
High	E01	Urbanised areas, human habitation	outside
Low	E01.03	dispersed habitation	outside
High	E02	Industrial or commercial areas	outside
High	F01	Marine and Freshwater Aquaculture	inside
Medium	F02.03	Leisure fishing	inside
Medium	G01.01	nautical sports	inside
Medium	G01.02	walking, horse riding and non-motorised vehicles	inside

NPWS (2020) and Eionet (2022).

6. Assessment of Adverse Effects

6.1 Identification of Potential Impacts

This section identifies potential impacts on the qualifying interests of the Natura 2000 sites concerned following the source-pathway-receptor model, i.e. by identifying the impacts from the proposed development (sources) to which the qualifying interests (receptors) are sensitive and establishing whether there are pathways for those impacts.

6.1.1 Great Island Channel SAC

Table 6-1 - Identification of potential impacts on the Great Island Channel SAC.

Qualifying interest	Identification of potential impacts	Potential impact
Mudflats and sandflats not covered by seawater at low tide	<p>The nearest examples within the SAC are around Carrigrenan Point and Marino Point, both c. 0.9km from the proposed development. Further examples occur in the intertidal areas adjacent to the proposed development (outside of the SAC). This habitat depends on water quality to maintain the 'Mixed sediment to sandy mud with polychaetes and oligochaetes community complex' in a natural condition and there is hydrological connectivity with the proposed development. However, given the small magnitude and short duration of potential water quality impacts associated with the proposed development, and the very large dilution and dispersal capacity of Lough Mahon, any such impacts within this habitat have been evaluated as negligible.</p> <p>Therefore, adverse effects on the conservation objective for this qualifying interest can be ruled out at this stage.</p>	No
Atlantic salt meadows (<i>Glauco-Puccinellietalia maritima</i>)	<p>The nearest example within the SAC is around the Belvelly Martello Tower, c. 1.9km from the proposed development. The nearest potential examples outside the SAC are c. 1.5km to the west of the proposed development, adjoining the Hop Island causeway. These habitats are subject to periodic inundation (during spring tides), their vegetation structure and composition are sensitive to pollution of the estuarine waters of the SAC. As above, there is hydrological connectivity between the proposed development and this habitat. However, given the small magnitude and short duration of potential water quality impacts associated with the proposed development, and the very large dilution and dispersal capacity of Lough Mahon, any such impacts within this habitat have been evaluated as negligible.</p> <p>Therefore, adverse effects on the conservation objective for this qualifying interest can be ruled out at this stage.</p>	No

6.1.2 Cork Harbour SPA

Table 6-2 - Identification of potential impacts on the Cork Harbour SPA.

Qualifying interest	Identification of potential impacts	Potential impact
<p>Little Grebe, Great Crested Grebe, Cormorant, Grey Heron, Shelduck, Wigeon, Teal, Pintail, Shoveler, Red-breasted Merganser, Oystercatcher, Golden Plover, Grey Plover, Lapwing, Dunlin, Black-tailed Godwit, Bar-tailed Godwit, Curlew, Redshank, Black-headed Gull, Common Gull, Lesser Black-backed Gull and Common Tern</p>	<p>As noted a wintering bird survey was undertaken in the 2023/2024. This is included in full in Appendix C. Many of the bird species which are listed as qualifying interests of the Cork Harbour SPA occur in close proximity (<300m) to the proposed development. Some of these species are sensitive to noise and visual disturbance which may arise, particularly during construction. The objective of the field survey was to determine which species occur close to the existing pathway and in what numbers, as well as determining which of these species are qualifying interests of Cork Harbour SPA.</p> <p>Therefore, there is a complete source-pathway-receptor chain for impacts from the proposed development to some of these qualifying interests and, as such, adverse effects cannot be ruled out at this point, though it should be noted that pedestrians and cyclist are screened from the estuary by existing vegetation along much of the greenway. An exception is a single existing access points to the shore where walkers, often with dogs, can access the shoreline.</p> <p>The likelihood of adverse effects on these qualifying interests is assessed in more detail in Section 6.2 below.</p>	<p>Yes</p>
<p>Wetlands</p>	<p>Wetland habitat for waterbirds occurs immediately adjacent to the proposed development but not within the development footprint. Therefore, there will be no direct impacts through habitat loss. Wetland habitat is sensitive to changes in water quality with regard to foraging for waterbirds. However, given the magnitude, extent and duration of any potential water quality impacts associated with the proposed development, there is not considered to be any risk of significant impacts on water quality in wetland habitat for waterbirds in the Cork Harbour SPA.</p> <p>Therefore, adverse effects on the conservation objective for this qualifying interest can be ruled out at this stage.</p>	<p>No</p>

6.1.3 Summary

As detailed in Table 6-1, it has been possible at this stage to rule out impacts from the proposed development on the following qualifying interests: -

- Great Island Channel SAC
 - Mudflats and sandflats not covered by seawater at low tide
 - Atlantic salt meadows (*Glauco-Puccinellietalia maritima*)
- Cork Harbour SPA
 - Wetland and Waterbirds

As such, it can be concluded that the proposed development, individually, will not adversely affect the Great Island Channel SAC. Therefore, this site is not considered further until the assessment of effects in combination with other plans and projects.

The qualifying interests for which adverse effects could not be ruled out at this stage are as follows: -

- Cork Harbour SPA
 - Bird species listed as Qualifying Interests

The potential impacts on these qualifying interests are analysed and the significance of their effects evaluated in Section 6.2.

6.2 Analysis and Evaluation of Effects

This section analyses the potential impacts identified in Section 6.1 and evaluates the significance of their effects in view of the relevant conservation objectives, as defined by their specific attributes and targets.

6.2.1 Cork Harbour SPA

Table 6-3 - Evaluation of effects on the Cork Harbour SPA.

Qualifying interest	Description of effects	Adverse effect
<p>Little Grebe, Great Crested Grebe, Cormorant, Grey Heron, Shelduck, Wigeon, Teal, Pintail, Shoveler, Red-breasted Merganser, Oystercatcher, Golden Plover, Grey Plover, Lapwing, Dunlin, Black-tailed Godwit, Bar-tailed Godwit, Curlew, Redshank, Black-headed Gull, Common Gull, Lesser Black-backed Gull and Common Tern</p>	<p>The objective of the field survey was to determine which species occur close to the existing pathway and in what numbers, as well as determining which of these species are qualifying interests of Cork Harbour SPA. The survey work focused in particular on low tide distribution of birds foraging on intertidal mudflats adjoining the Greenway, with high tide counts focusing on the potential occurrence of roosting birds (supported by BirdWatch Ireland, Irish Wetland Bird Survey data which also focuses on high tide numbers and distribution of shorebirds).</p> <p>In assessing the potential for disturbance to shorebirds, the proximity of feeding or roosting birds to the pathway in combination with flight initiation distances (from disturbance) as well as the potential for some species to become habituated to consistent patterns of activity must be considered. It should be noted, however, that pedestrians and cyclist are screened from the estuary by existing vegetation along much of the greenway. An exception is a single existing access points to the shore where walkers, often with dogs, can access the shoreline. A small roost, usually of Oystercatcher, can occur on this small gravel point. However, overall, the foreshore adjoining the pathway does not support important roosting sites for intertidal waders. There are no night roosts for Cormorant along the southern side of Lough Mahon.</p> <p>As outlined in the accompanying report in order to include comprehensive coverage the study area used started along the City stretch of the Greenway at Hop Island (sections RW, RE). The proposed pathway is within section PN, while the surveys continued south from Passage West to Glenbrook (section PS).</p> <p>Over 300 m of intertidal habitat was exposed in most / all of the RW sector on each low tide count (Map 3.1 of Appendix C). The width of the intertidal habitat narrowed in the RE sector, with only around 200 m exposed during the January and March counts (Map 3.1 of Appendix C). The tideline reached the shoreline in the westernmost section of the PN sector (Map 3.1). In the remainder of the PN sector, there was minimal exposure of intertidal habitat. There was around 20-30 m exposed on the December and February counts, less than 10 m exposed on the March count, and no intertidal habitat exposed on the January count (except at the extreme southern end of this section).</p> <p>The waterbird surveys undertaken to inform this NIS recorded 16 no. of the 23 no. species listed as qualifying interests of the Cork Harbour SPA occurring in the survey area, with Dunlin and Black-headed Gull being the most abundant and numbers of Teal and Black-tailed Godwit also</p>	<p>No</p>

Qualifying interest	Description of effects	Adverse effect
	<p>high in a Cork Harbour context. However, in the areas adjacent to the proposed development, no significant numbers of any waterbird species did not occur (refer to Appendix C of Appendix C).</p> <p>Section Distribution</p> <p>The distribution of dabbling ducks between the sectors varied across the counts (Figure 3.1 of Appendix C). On the January and February low tide counts, the highest numbers occurred in the RE and/or RW sectors, which mainly involved Teal feeding along the tideline. In the February low tide count, relatively high numbers were also recorded in the PS sector: these were Teal feeding in the bay on the eastern shore to the south of Marino Point. Much lower numbers were recorded on the December and March low tide counts and on all the high tide counts. The highest numbers of diving waterbirds occurred in the PN sector, which partly reflected the fact that this sector had a very narrow intertidal zone. The main species involved were Cormorant and Shag. Note that Cormorants roosting at Marino Point are excluded from the totals in Figure 3.1 (see Section 3.5 of Appendix C). Very small numbers of herons and egrets (Grey Heron and Little Egret) were recorded, and they were widely distributed across the sectors (Figure 3.1 of Appendix C). The waders mainly occurred in the RE and RW sectors at low tide (Figure 3.1 of Appendix C). These were the only sectors with significant areas of intertidal habitat. The higher numbers on the January and February low tide counts were due to the presence of large Dunlin flocks. The numbers recorded at high tide in all the sectors were very small due to the absence of any high tide roosts. On the December low tide count, a mixed flock of 28 Oystercatchers, 45 Curlews and 153 Black-tailed Godwits were recorded in the FIELDS sector (i.e. farmland on opposite side of the R610, but there were no waders in this sector on any of the other counts. High numbers of gulls usually occurred in the PS sector and, on some counts, in the RE and/or RW sectors. The commonest species was Black-headed Gull, which was mainly recorded feeding on intertidal habitat in the RE and RW sectors, and in the bay to the south of Marino Point in the PS sector. In the PS sector, there was a high count of 231 Herring.</p> <p>Distance Band Distribution</p> <p>Figure 3.2 of Appendix C shows that, in the low tide counts of the RE and RW sectors, most waders and gulls were widely distributed across the distance bands, with no evidence of avoidance of the distance bands close to the greenway. Note that the 0-50 m and 50-100 m distance bands contained less intertidal habitat than the 100-200 m and 200-300 m distance bands, while the > 300 m distance bands contained variable amounts of intertidal habitat depending on the tideline alignment. The numbers of the other waterbird groups were generally too small, or too variable, for consistent patterns to emerge</p> <p>In analysis of the waterbird surveys that carried out for the Passage Railway Greenway project, Gittings (2021b), examined the distance band distribution of selected species in the RW sector (called the HIE sector in that report) on ebb/flood tides in relation to the availability of intertidal habitat. In most cases there was again no evidence of avoidance of</p>	

Qualifying interest	Description of effects	Adverse effect
	<p>areas close to the greenway, and, in fact, some species showed higher than expected numbers in the 0-50 m distance band.</p> <p>At low tide, the diving waterbirds mainly occurred in the > 300 m distance band, reflecting the distribution of subtidal habitat at low tide (Figure 3.2 of Appendix C). However, while at high tide, subtidal habitat occupied all the distance bands, the diving waterbirds still mainly occurred in the > 300 m distance band (Figure 3.3 of Appendix C). This reflects the pattern observed by Gittings (2023) in the waterbird surveys along the southern shore of Little Island, when the highest densities of Cormorants and Shags occurred in the > 300 m distance band.</p> <p>Areas adjoining the proposed Works (Section PN)</p> <p>The proposed upgrade on the Passage West Pedestrian and Cycle Route will run along the entire length of the PN sector and the eastern sub-division of the RE sector. The total numbers of waterbirds recorded in these sections are shown in Table 3.3 of Appendix C. Overall numbers were low with only the gull species regularly occurring in double figures.</p> <p>Roosts</p> <p>There are not any previously recorded regular high tide roosts along the southern shore of Lough Mahon east of Hop Island, and in the northern section of the West Passage Channel. None were recorded on any high tide roosts during the present survey. (As noted above small numbers of mainly Oystercatcher can roost on the gravel spit east of Roberts Bridge). No negative impacts to notable roosts within Cork Harbour SPA are anticipated.</p> <p>There are no night-time Cormorant roosts along the proposed study area (Section PN); with the nearest roost to the southeast on Section PS; on a concrete platform offshore from the old quay in the bay to the south of Marino Point (ca. 24-37 birds).</p> <p>There is a Great Crested Grebe night roost in the northern section of Lough Mahon (Gittings, 2017). However, this roost occurs to the north of the navigation channel and would not be impacted by walkers on the greenway on the other side of Lough Mahon.</p> <p>Potential Impacts</p> <p>There is no spatial overlap with Great Island Channel SAC or any of the habitats for which it has been designated.</p> <p>There are no areas of saltmarsh habitats (Atlantic salt meadows) along the greenway – the nearest such habitats are to the west at Hop Island.</p> <p>None of the areas of intertidal habitat (i.e. Mudflats and sandflats not covered by seawater at low tide) will be impacted by the proposed development.</p> <p>While construction is likely to be 12 months, it is not known at this time as to when works would be undertaken, so a precautionary approach has been take to assume potential overlap of works with the period when wintering waterbirds are present within Cork Harbour SPA.</p> <p>With respect to Cork Harbour SPA, walkers along the upper shore, especially with dogs, can be a significant source of disturbance to</p>	

Qualifying interest	Description of effects	Adverse effect
	<p>intertidal foraging waders (see e.g. BirdWatch Ireland¹², <i>Disturbance to Waterbirds – why it matters</i>). However, along the Passage Greenway walkers are confined to the Greenway apart from at one localised location where the gravel beach is accessible (east of Roberts Bridge). However, walkers tend not to walk along the foreshore on the southern side of Lough Mahon as access / egress from the path is limited or not available elsewhere between Hop Island and Passage West. Negative impacts from walkers accessing the shore are not therefore anticipated outside of this one location, access to which remains unchanged.</p> <p>As noted it is not proposed to remove vegetation along the seaward side of the pathway (e.g. the line of oaks east of Roberts Bridge will not be removed or cut back, and construction measures are proposed to minimise the risk of root damage). No change to the existing patterns of screening are therefore anticipated. Based on the species and number of birds noted, the shoreline adjoining the area of proposed works to Passage Greenway does not support substantial numbers of waders and waterfowl in the context of Cork Harbour SPA or the wider Cork Harbour (with e.g. larger areas of intertidal habitat and numbers in Section RW and RE, east of Roberts Bridge to Hop Island; outside the study area). Furthermore, along the works area numbers are dominated by species such as gulls, which readily habituate to consistent patterns of human activity, such as walkers and cyclists confined to within the pathway. Negative impacts through displacement are not therefore anticipated.</p> <p>The Passage Greenway is currently lit. Some localised changes to stanchion location are proposed (see Section 1.2.1.1). This report also includes recommendation to progressively improve lighting in order to improve light condition for foraging bats. Many intertidal waders will forage by night, especially when moonlight increases light levels for visual feeders. For example night-time lighting from an industrial complex increased illumination levels which benefited foraging Redshank (<i>Tringa totanus</i>) (Dwyer et al., 2013).</p> <p>The path itself does not adjoin any areas used by field (<i>ex-situ</i>) feeding species such as Curlew (<i>Numenius arquata</i>), Black-tailed Godwit (<i>Limosa limosa</i>) or Oystercatcher (<i>Haematopus ostralegus</i>). While Light-bellied brent geese (<i>Branta bernicla hrota</i>) do now occur in small number in Cork Harbour, they are not known from this part of the harbour.</p> <p>The fields opposite the car park at Roberts Bridge are known to support field feeding waders. On the December low tide count, a mixed flock of 28 Oystercatchers, 45 Curlews and 153 Black-tailed Godwits were recorded in the FIELDS sector, but there were no waders in this sector on any of the other counts (see Appendix C). These fields are separated from the car park and walk by the busy R610. Birds feeding in these fields do not appear to be disturbed by users of the car park or pathway (<i>pers. obs.</i>).</p> <p>Unlike the other qualifying interest of Cork Harbour SPA, Common Tern (<i>Sterna hirundo</i>) is designated within the harbour for its breeding</p>	

¹² <https://birdwatchireland.ie/our-work/surveys-research/research-surveys/irish-wetland-bird-survey/disturbance-to-waterbirds-why-it-matters/>



Qualifying interest	Description of effects	Adverse effect
	<p>population. Birds regularly feed along the shoreline in Passage, along the southern side of Lough Mahon and westwards up into Douglas Estuary. They also cross the path (even when busy) to feed in the small coastal lagoon at Woodenbridge (<i>pers obs</i>). Apart from some landscaping, no changes to the lagoon are proposed or to the tidal channel connecting it to the estuary. The nearest nesting site is on the roof of the Martello Tower at Belvelly, adjoining the railway line northeast of Marino Point (Ref. no. 20907592)¹³ - this site is just under 2km from the nearest works. Breedin Common tern will not be disturbed by the proposed construction activities or by walkers / cyclist along the Greenway.Conclusion</p> <p>Lough Mahon supports large populations of waterbirds that feed on the extensive areas of intertidal habitat that are exposed at low tide and mainly roost in the Douglas Estuary at high tide. These waterbirds use the mudflats on the southern shore of Lough Mahon east of Hop Island as part of the overall intertidal habitat complex in Lough Mahon. The birds using these mudflats appear to be habituated to disturbance from pedestrians and cyclists on the existing greenway that runs along the shoreline. The proposed upgrade to the Passage West Pedestrian and Cycle Route runs along the easternmost section of the southern shoreline of Lough Mahon, where the Lough Mahon mudflats narrow, and then along the confluence of Lough Mahon with the West Passage Channel where the intertidal zone is negligible. These areas did not support significant numbers of any waterbird species.</p> <p>Given the waterbird species and their numbers which occur adjacent to the proposed development and the nature and scale of the proposed development, there will be no significant impacts in terms of disturbance to these qualifying interests.</p> <p>In addition, given the magnitude, extent and duration of any potential water quality impacts associated with the proposed development, there is not considered to be any risk of significant impacts on water quality in wetland habitat for waterbirds in the Cork Harbour SPA or to any of the wetlands with the harbour.</p> <p>Therefore, adverse effects on the conservation objectives for these qualifying interests can be objectively excluded.</p>	

6.2.2 Summary

The possibility of adverse effects has been excluded for all qualifying interests of both the Great Island Channel SAC and Cork Harbour SPA.

¹³ <https://www.buildingsofireland.ie/buildings-search/building/20907592/marino-point-martello-tower-belvelly-cork>



7. Mitigation

7.1 Requirement and Approach

As demonstrated in Section 6 above, the proposed development individually will not adversely affect the integrity of any Natura 2000 site, in view of their conservation objectives. Notwithstanding that, this NIS prescribes mitigation measures to further control any impacts from the proposed development to minimise the potential for such effects in combination with other plans or projects.

The development of the mitigation measures prescribed in this section has followed the “mitigation hierarchy”, which prioritises avoidance over reduction, and actions at source over pathway over receptor, as follows: -

1. Eliminate the source of the impact,
2. Minimise or reduce the impact at its source,
3. Block or weaken the pathway for effects, and
4. Abate effects at the receptor.

This approach assists with more complete removal of the effects, minimises the risk of effects occurring by less obvious pathways, also protects non-target receptors, and minimises the risks of unintended harm associated with measures focussed at or near the receptors.

7.2 Mitigation Measures

7.2.1 Design Phase

A number of mitigation and enhancement measures have been incorporated into the proposed development design to minimise any losses of biodiversity and, where possible, deliver a biodiversity gain. These measures include the route alignment and Landscape Plan and Specification, as described below.

7.2.1.1 Route Alignment

While the general alignment of the proposed development is dictated by that of the existing greenway, the extent or distribution of widening on each side has been carefully considered on each stretch to minimise the negative impacts of habitat loss and fragmentation, particularly the removal of mature trees and scrub.

Similarly, while the typical design width of the greenway is dictated by TII and NTA standards, derogations have been utilised at particular “pinch-points” where derogations from the standards are justified to avoid negative impacts, e.g. the greenway narrows at existing bridges to avoid the need for structural works and the potential negative impacts associated with these.

7.2.1.2 Landscape Plan and Specification

A detailed Landscape Plan for the proposed development has been prepared by Ryan Hanley and the details of this plan are included on the design drawings presented in Appendix A to this NIS.

Reuse of topsoil and its associated seed bank is to be maximised where practical. However, depending upon site conditions when works commence, and the condition of soils, this may not be possible. In this case topsoil will be removed and disposed of off-site, with appropriate topsoil imported to site for finishing landscape works. This NIS has considered the risk associate with importation/export of materials from the site.



7.2.2 Construction Phase

This section details the mitigation measures which will be implemented by the Contractor during the construction phase. These measures shall be incorporated into the Contractor's method statement.

7.2.2.1 General Precautions

The following overarching measures shall apply to the construction phase: -

1. All works shall be undertaken within the agreed site boundary. No works shall be undertaken outside the site boundary.
2. As part of site induction, all persons entering the works area shall receive a 'tool-box talk' covering the environmental and ecological sensitivities of the site and the measures being implemented to avoid and minimise impacts on those sensitivities, as well as the responsibilities of persons on site in implementing those measures.
3. Working hours shall be restricted to between 08:00 and 18:00, to minimise the risk of disturbance to species such as Otter, foraging/commuting bats and roosting birds.

7.2.2.2 Ecological Supervision

The Contractor shall retain the services of a suitably qualified and experienced ecologist for the duration of the works.

The qualifications and experience of the Contractor's ecologist shall include, as a minimum: -

- BSc (Hons) or above in Ecology or a related environmental discipline,
- Full membership of the CIEEM or equivalent membership of a similar professional body,
- Demonstrable experience in providing ecological/environmental oversight on construction sites, including sites where waterbirds are present.

The main duties of the Contractor's ecologist shall include the following: -

1. Assist the Contractor in ensuring that the measures in this NIS, any conditions of consents/licences and relevant guidelines are fully and properly implemented during construction.
2. Undertake pre-construction surveys for legally restricted IAPS, any breeding or resting places of species listed on Annex IV to the Habitats Directive, and nesting birds.
3. Oversee the continued implementation of the IAPS Management Plan, as described below.
4. Advise the Contractor on any requirement for a derogation licence under Regulation 54 of the Habitats Regulations due to the presence of breeding or resting places of species listed on Annex IV to the Habitats Directive, as identified during the pre-construction surveys.¹⁴
5. Directly supervise key activities on site, particularly the set-up of water quality protection measures.
6. Carry out weekly inspections of the site and document the implementation of the measures in this NIS, any conditions of consents/licences and relevant guidelines. The Contractor's ecologist's inspection records shall be available to Cork County Council or Employer's Representative, An Bord Pleanála, the NPWS and IFI, on request.

¹⁴ The Contractor, with the assistance of the Contractor's ecologist, shall be responsible for applying for any such licence and observing its conditions.

7. Provide monthly updates to Cork County Council or Employer's Representative on the implementation of the mitigation measures detailed in this NIS and any ecological/environmental incidents on site.

7.2.2.3 Water Quality

The following measures shall apply to prevent water quality impacts generally: -

1. During all stages of construction, site management shall ensure that good housekeeping is maintained at all times and that all site personnel are made aware of the importance of the estuarine environments and the requirement to avoid pollution.
2. Safe handling of all potentially hazardous materials will be emphasised to all site personnel.
3. Tools and equipment shall not be cleaned in any waterbody and wash water shall not be discharged directly into any waterbody or drain without appropriate treatment.
4. Prior to commencement of works, the appointed Contractor, with the assistance of the Contractor's ecologist, shall elaborate detailed, project-specific Emergency Response Plan (ERP). The ERP shall be consistent with the mitigation measures in this NIS and the EclA, and approved by Cork County Council, and shall be adhered to in order to address any pollution incidents on site.
5. The Contractor shall make daily checks for elevated water levels in Lough Mahon and other waterbodies adjoining the construction site, as well as weather warnings or flood alerts from Met Éireann, Cork County Council and/or Cork City Council.
 - a. Should water levels in Lough Mahon or overland flows pose a risk of overwhelming water quality control measures, or a weather warning for extreme rainfall or a flood alert covering the construction site be in place,
 - i. All areas of exposed soil shall be securely covered with hessian matting,
 - ii. All stockpiles shall also be securely covered, and
 - iii. Works carrying the greatest risk of pollution, i.e. works within the flood zone, shall be suspended and all vehicles, plant, equipment, construction materials and personnel shall be removed from the flood zone.
 - b. Works may resume once any flood waters have receded and any warning/alert been lifted.

In addition, the measures in the following sub-sections shall apply to control the risk of water quality impacts from specific sources.

Surface Water Run-off

The following measures shall be implemented to minimise the quantity of surface water run-off from the works area¹⁵, and to minimise any potential contamination of such run-off by fine sediment or other deleterious matter: -

1. At the beginning of site set-up, silt fences shall be erected along both sides of the around the perimeter of the active works areas and the Contractor's compound.
 - a. The silt fences shall be formed using timber stakes and hessian fabric.

¹⁵ In this section, the "works area" includes the site compound, stockpiles and temporary settlement pond.

- b. All silt fences shall be inspected by the Contractor and their ecologist on set-up and, thereafter, on a daily basis by the Contractor and weekly by their ecologist. Silt fences shall be maintained in good condition and any defects shall be rectified as soon as they are identified.
 - c. Records shall be kept of the installation, checks, maintenance and removal of all silt fences.
- 2. Run-off from the site compound and material stockpiles will be collected by a shallow toe drain or other means of collection, which will discharge to a shallow settlement pond.
 - a. The collection system and settlement pond shall be installed before the site compound and stockpiles.
 - b. A silt fence (as described above) shall be installed around the settlement pond. These silt fences shall also be subject to regular checks and maintenance, as described above.
 - c. Settlement ponds from the compound and stockpiling shall be checked on a daily basis by the Contractor and weekly by the Contractor's ecologist.
 - d. Sediment build-up shall be removed from the settlement pond at regular intervals and removed off-site.
 - e. Records shall be kept of checks and sediment removal from settlement ponds.
- 3. Stockpiles shall be located as far as possible from any waterbody and any stockpiles left overnight shall be covered.

Hydrocarbons

The following measures shall be implemented to control the risk of pollution from hydrocarbons, including fuels, hydraulic oils etc. on site: -

- 1. Storage of any fuels, oils and other hydrocarbons on site shall be in secure tanks/containers banded to 110% capacity.
- 2. Refuelling shall not be permitted within 50m of any waterbody.
- 3. All vehicles, plant, equipment etc. shall: -
 - a. Be free of any mechanical defects, and be well maintained so as to prevent fuel or oil leaks,
 - b. Be mechanically sound and checked before arriving on site,
 - c. Not be left idling when not in use, and
 - d. Be parked/stored on drip trays overnight.
- 4. Driving on site and shall be kept to a minimum.
- 5. All site personnel shall be familiar with their responsibilities under the ERP. In particular: -
 - a. All construction personnel shall be trained in the use of the spill containment/pollution control kits which will be kept on site.
 - b. Any spillage of fuels, lubricants or hydraulic oils shall be immediately contained and a pollution control kit used. The contaminated soil shall be removed off site and properly disposed of.
 - c. Any spillage of fuels, lubricants or hydraulic oils, shall be reported immediately to the Contractor and Contractor's ecologist.
- 6. Additional drip trays and spill kits shall be accessible from the storage container.



7.2.2.4 Invasive Alien Species

The following relates to the preparation and implementation of an IAPS Management Plan for the construction phase and shall be put into effect prior to mobilisation and before any works commence on site: -

1. The Contractor's ecologist shall carry out a detailed survey to map the distribution and extents of all IAPS within and adjoining the red-line boundary.
2. Any IAPS identified during the pre-construction survey shall be clearly demarcated. The areas of infestation and appropriate buffer zones shall be isolated with fencing or warning tape and 'Biosecure Zone' signs.
3. The Contractor's ecologist shall update the IAPS Management Plan, as appropriate, taking into account:
 - a. The specific IAPS present and the scale and extent of infestation,
 - b. The sensitivity of the local environment, particularly Cork Harbour,
 - c. The growth stage/season of the plants, and
 - d. The construction sequence/programme.
4. The IAPS Management Plan shall be prepared in agreement with the Contractor and Cork County Council or Employer's Representative and in accordance with the following: -
 - TII (2006) *A Guide to Landscape Treatments for National Road Schemes in Ireland*. GE-ENV-01102. February 2006. Transport Infrastructure Ireland, Dublin.
 - TII (2012) *Guidelines on the Implementation of Landscape Treatment on National Road Schemes in Ireland*. GE-ENV-01103. July 2012. Transport Infrastructure Ireland, Dublin.
 - TII (2017) *The Management of Waste from National Road Construction Projects*. GE-ENV-01101. December 2017. Transport Infrastructure Ireland, Dublin.
 - TII (2020a) *The Management of Invasive Alien Plant Species on National Roads – Standard*. GE-ENV-01104. December 2020. Transport Infrastructure Ireland, Dublin.
 - TII (2020b) *The Management of Invasive Alien Plant Species on National Roads – Technical Guidance*. GE-ENV-01105. December 2020. Transport Infrastructure Ireland, Dublin.
5. The following measures form the basis of the IAPS Management Plan.

The following shall be implemented during the construction stage (including advance works): -

6. The IAPS Management Plan shall be implemented by the Contractor with the advice and assistance of the Contractor's ecologist.
7. The 'toolbox talk' for all persons entering the site shall include an overview of the IAPS present on site, their identification, the importance of controlling them/preventing their spread, and the responsibilities of site staff in avoiding any spread of IAPS.
8. The Contractor shall ensure that all vehicles, plant, equipment and PPE intended for use on site are dry, clean and free from debris and plant material prior to being brought to site.
9. A dedicated and clearly marked cleaning facility/wash-down area shall be strategically placed in a contained area on site for use by staff, vehicles and machinery.



- a. All vehicles and equipment that have been used in a contaminated zone shall be thoroughly pressure-washed in the wash-down area each time they leave site and once work in that zone is complete. This includes footwear, personal protective equipment (PPE), tools, and other light equipment.
 - b. This facility shall be located as far as possible from any waterbody and shall be appropriately bunded to prevent run-off.
 - c. Material gathered in this facility shall be appropriately stockpiled and treated along with other contaminated material.
10. Soil management during the works shall be in accordance with Section 5.5 of TII (2006).
11. Any imported materials (e.g. fill and topsoil) shall be sourced from licensed suppliers who shall certify that in advance of delivery that any such materials are free from IAPS material, especially propagules such as seeds or rhizome fragments.
12. The Contractor shall implement appropriate controls on the movement of machinery and materials in IAPS-contaminated zones.
- a. Where it is necessary to work in contaminated zones, every effort shall be made not to use vehicles with caterpillar tracks.
 - b. Vehicles leaving contaminated zones shall be confined to marked haulage routes protected by root barrier membranes or be pressure-washed before leaving the zone.
13. Any further measures required in relation to any additional species which may be identified on site during the Contractor's ecologist's pre-construction survey shall be included in the IAPS Management Plan.
14. Any Ash trees or fallen Ash branches or leaf litter to be removed shall be assumed to be infected with *Hymenoscyphus fraxineus*, the causal agent of 'Ash dieback disease'. Any Ash material arising that is suspected to have ash-dieback disease shall be dealt with in line with published best practice – such as e.g. Scottish Environmental Protection Agency (SEPA) advice on *Disposal of trees and plants infected with specific plant diseases*.¹⁶
15. The removal of IAPS shall not be undertaken without the water quality protection measures described above being fully in place.
16. In relation to stockpiling of IAPS-contaminated material: -
- a. Any such material shall be stockpiled separately from other material and clearly marked as contaminated.
 - b. The length of time for which such material is stored on site shall be kept to a minimum.
 - c. Measures shall be implemented to prevent any run-off from stockpiles of contaminated material which could convey IAPS propagules to watercourses.
17. Only vehicles that are deemed to be biosecure (i.e. sealed so that no soil can escape) shall be used to transport IAPS-contaminated material and be thoroughly pressure-washed in the wash-down area before leaving site.
18. Following completion of works in a given area of the site, bare soil shall be planted (as per the Landscape Plan and Specification) at the earliest opportunity, i.e. vegetation shall be established as quickly as possible to stabilise the soil and minimise opportunities for re-colonisation by IAPS.

¹⁶ https://www.sepa.org.uk/media/154389/wst-q-037-disposal_of_trees_plants_with_specific_diseases.pdf

19. The Contractor's ecologist shall oversee and record the implementation of the IAPS Management Plan and all works relating to IAPS, as per TII (2020a,b). In particular, the Contractor's ecologist shall: -
 - a. Inspect the demarcation and signage of contaminated zones, the cleaning/wash-down facility and IAPS material stockpiling area prior to their use,
 - b. Directly supervise and document all IAPS removal works,
 - c. Carry out weekly inspections of the site for compliance with the biosecurity measures detailed in the IAPS Management Plan, and
 - d. Provide monthly updates to Cork County Council or the Employer's Representative regarding the implementation of the IAPS Management Plan.

The following shall be implemented after completion of construction and during the establishment of new planting as per the Landscape Plan and Specification.

20. The works area shall be monitored for regrowth of IAPS over a minimum of 2 years. Any regrowth of treated IAPS on site shall be accurately mapped and reported to Cork County Council. The removal of IAPS may be considered successful after two consecutive growing seasons with no sign of regrowth from the removed stands.

7.2.2.5 Terrestrial Habitat Loss/Fragmentation

The following measures shall be implemented to address loss and fragmentation of terrestrial habitats associated with both the proposed development: -

1. The extent of cutting/felling of trees or clearance of vegetation shall be limited to that absolutely necessary to facilitate construction of the proposed development, as indicated in the design drawings in Appendix A. All vegetation, including hedgerows/treelines and other semi-natural habitats, not required to be cleared shall be fenced off as part of site preparations and protected/managed as per the landscape specification during construction.
1. Every effort shall be made to avoid cutting/felling trees or clearing vegetation during the main bird nesting period, i.e. between 1st March and 31st August, as per Section 40 of the Wildlife Act. Where tree felling or vegetation clearance during this period is deemed necessary, the Contractor's ecologist will inspect the trees/vegetation and identify any active bird nests present. Any active nests will be protected and surrounding cover not cleared until such time as the nest is no longer active, as advised by the ecologist.
2. As part of the pre-construction survey, the Contractor's ecologist shall identify any breeding or resting places of species listed on Annex IV to the Habitats Directive, e.g. otter holts, and assist the Contractor in applying any derogation licence under Regulation 54 of the Habitats Regulations which might be required. Where any such licence is granted, the works to which it relates shall be carried out in strict accordance with its conditions and the Contractor's ecologist shall assist the Contractor in this regard.
3. Following completion of works in a given area of the site, the appropriate landscape treatment as per the Landscape Plan and Specification shall be applied.

7.2.3 Operational Phase

During the period of establishment of the new landscaping, the area will be regularly monitored for any regeneration or new infestation of invasive alien plant species. Any such regeneration/infestation shall be treated in accordance with the following guidance: -

- TII (2020a) *The Management of Invasive Alien Plant Species on National Roads – Standard. GE-ENV-01104. December 2020*. Transport Infrastructure Ireland, Dublin.



- TII (2020b) *The Management of Invasive Alien Plant Species on National Roads – Technical Guidance*. GE-ENV-01105. December 2020. Transport Infrastructure Ireland, Dublin.

7.3 Assessment of Residual Effects

Given the full and proper implementation of the mitigation prescribed in this section, the probability, likely magnitude and likely maximum extent of any water quality impacts from the proposed development do not present any risk of adverse risks to water quality and will not result in adverse effects on the integrity of the Great Island Channel SAC or Cork Harbour SPA. Similarly, the effects associated with disturbance to fauna and spread of invasive alien species are under effective control and will not result in adverse effects on the integrity of the Great Island Channel SAC or Cork Harbour SPA.



8. Potential In-combination Effects

8.1 Requirement for Assessment

The requirement for AA arising out of Article 6(3) of the Habitats Directive covers plans and projects that, “*either individually or in combination with other plans or projects*”, are likely to have a significant effect on one or more Natura 2000 sites. This means that AA is required for any plan or project that, in combination with other plans or projects, would have a significant effect on one or more Natura 2000 sites, irrespective of the presence or absence of such effects from that plan or project on its own. Therefore, regardless of the significance of the effects of the plan or project individually, the potential for significant effects in combination with other plans and projects must be considered in all cases.

8.2 Approach and Methodology

The objective of this requirement is to capture significant effects potentially arising from the cumulation or other interaction of non-significant effects from multiple plans and projects. Consequently, the assessment of potential in-combination effects is not a pair-wise assessment, rather, it considers the totality of the effects arising from all plans and projects affecting the Natura 2000 site(s) in question. In identifying the plans and projects to be included in this assessment, it is important to define an appropriate geographical scope and timescale over which potential in-combination effects are to be considered and the sources of information to be consulted, as described below. It is also important to consider the nature of the interactions between effects, which may be additive, antagonistic, synergistic or complex.

For practical reasons, the effects from the proposed development which are considered in the assessment of potential in-combination effects are the residual effects described in Section 7.3 above, rather than the potential effects in the absence of any mitigation. For this reason, this assessment is documented following the description of the mitigation measures and residual effects.

8.2.1 Geographical Scope

In defining the geographical scope for identifying potential in-combination effects, it is important to remember that effects are evaluated in view of the conservation objectives of the Natura 2000 site(s) concerned. As such, two or more effects relating to the same conservation objective for a given Natura 2000 site would combine even if their geographical extents did not overlap. For example, the loss of a small area of an Annex I habitat type listed as a qualifying interest of a Natura 2000 site would combine with the loss of an entirely unconnected area of the same habitat type from a remote part of the same site to produce an in-combination effect, the significance of which would need to be evaluated in view of the relevant conservation objective. On that basis, the scope of the assessment of in-combination effects extends to all plans and projects affecting the same conservation objectives as the plan or project under consideration, irrespective of whether those effects are significant or not.

However, given the scale of the proposed development and localised extents of its residual impacts, it was deemed sufficient to include only areas in close proximity (c. 150m) to the proposed development and their zones of impact in the geographical scope for identifying potential in-combination effects.

8.2.2 Timescale

Given that the proposed development has an intended lifespan of c. 20 years, the timescale for identification of other plans and projects with potential for in-combination effects cover plans and projects approved in the last 5 years (i.e. since 1st January 2019), plans and project currently under consideration (principally those which have been applied for) and any other reasonably foreseeable future plans and projects.



8.2.3 Sources of Information

The following sources of information were consulted to gather information on other plans and projects: -

- *Cork County Development Plan 2022-2028*. Cork County Council, Cork.
- *Cork City Development Plan 2022-2028*. Cork City Council, Cork.
- *National Planning Application Database (NPAD)* (<https://housinggov.ie/maps.arcgis.com/apps/webappviewer/index.%20html?id=9cf2a09799d74d8e9316a3d3a4d3a8de>) [accessed via an ArcGIS Feature Service in QGIS3 on 16/05/2024].
- *EIA Portal* (<https://www.gov.ie/en/publication/9f9e7-eia-portal/>) [accessed via an ArcGIS Feature Service in QGIS3 on 16/05/2024].
- *An Bord Pleanála Map Search* (<https://www.pleanala.ie/en-ie/map-search>) [accessed 16/05/2024].
- *EPA Maps (Water)* (<https://gis.epa.ie/EPAMaps/Water>) [accessed 02/05/2024].
- *Ireland's Marine Atlas* (<https://atlas.marine.ie/>) [accessed 02/05/2023].

The threats, pressures and activities with negative impacts on the Natura 2000 sites selected for inclusion in this assessment (see Section 5.3 of this NIS) were used to identify plans and projects which, by their nature, are likely to give rise to potential impacts on the sites concerned.

8.3 Assessment

8.3.1 Plans

The current Cork City Development Plan and Cork County Development Plan set out the policies and objectives of Cork City Council and Cork County Council, respectively, with regard to the proper planning and sustainable development within their respective functional areas. Both plans cover the period from 2022 to 2028.

Both the Cork City Development Plan and the Cork County Development Plan were subject to AA, including the preparation of Natura Impacts Reports (NIRs). These NIRs assessed at a strategic level, the implications of the plans for Natura 2000 sites, including the Great Island Channel SAC and the Cork Harbour SPA. Where potential adverse effects were identified, the plans were amended to mitigate those effects. Following these amendments, the adopted plans now contain specific text in relation to the protection of these and other Natura 2000 sites. This includes restrictions on development within the vicinity of these sites, requirement for assessment under Article 6 of the Habitats Directive for development likely to have a significant effect on these sites, use of sustainable urban drainage systems (SUDS), and commitments to develop green infrastructure to support Natura 2000 sites and biodiversity generally, in line with Article 10 of the Habitats Directive and Article 3 of the Birds Directive.

The policies and objectives in these local authority development plans contribute to mitigating the negative effects of development on the Great Island Channel SAC, Cork Harbour SPA and other Natura 2000 sites and provide for the enhanced resilience of these sites through the development of green infrastructure/ecological networks. Therefore, there will be no adverse effects from the proposed development in combination with these development plans and these plans will also mitigate any in-combination effects arising from other projects.

8.3.2 Projects

8.3.2.1 Large-scale Projects

Larger-scale projects within and in the vicinity of the three Natura 2000 sites concerned, as identified through the *EIA Portal* and *An Bord Pleanála Map Search*, were as follows:

- Glashaboy River (Glanmire/Sallybrook) Drainage Scheme¹⁷ - Construction of direct flood defences and conveyance improvement measures along the Glashaboy River and its tributaries. The direct defences proposed include flood walls and embankments with the conveyance improvements consisting of localised channel widening and deepening and the introduction of or replacement of culverts. This project is currently under construction.
- Cork County Council planning ref. 19/6783 - Belvelly Marino Development Company DAC - Belvelly Port Facility, Marino Point - Demolition, site infrastructure improvements, and utility upgrade works to stabilise the existing site and to provide capacity for future industrial development proposals at the Belvelly Port Facility.
- Cork County Council planning ref. 20/6955 - Goulding Chemicals Ltd and Belvelly Marino Development Company - Belvelly Port Facility, Marino Point - Construction of a new agricultural fertiliser facility for use by Goulding Chemicals Ltd; and additional port operational use of the jetty to facilitate cargo vessels.

The Glashaboy River Drainage Scheme is c. 4.5km north-west of the proposed development and involves significant in-stream and bankside works upstream of Lough Mahon. The two projects at Belvelly Port are c. 600m from the proposed development, directly across the West Passage Channel. Given the implementation of the mitigation measures prescribed for these projects, as secured through the conditions attached to their planning consents, and the nature and extents of impacts from the proposed Passage West Greenway developed, there will be no adverse effects from all of these projects in combination.

8.3.2.2 Small-scale Projects

As identified through the *National Planning Application Database (NPAD)*, within 150m of the zones of impact of the proposed development, there are 160 no. planning applications to Cork County Council and Cork City Council which have been granted permission (143 no.) or are awaiting a decision (17 no.). These projects include small residential developments, extensions to existing dwellings, modifications of pedestrian and vehicular accesses to properties, changes of use, changes to existing commercial premises such as fuel stations and hospitality as well as to industrial facilities, and installations of photovoltaic panels, electric vehicle charging points etc. to dwellings.

One application of note which is currently awaiting a decision is for the construction of rock armour revetment protection and reclamation of the foreshore on lands adjacent to the Cork Harbour Marina, Strand Road, Monkstown, to provide the following:

- a) Construction of a two-storey marina building to include a public restaurant/café, public and private offices, convenience store, chandlery, lounge/training area, and ancillary spaces including service and changing areas and storage spaces,
- b) Construction of a single-storey gym and rowing facility building including changing rooms, ancillary support spaces and public toilet,
- c) Construction of single-storey bird hide, 3 no. flagpoles and associated signage,

¹⁷ <https://www.floodinfo.ie/frs/en/qlashaboy/home/>

- d) Provision of 1 no. floating electrical vessel recharging facility and 1 no. floating vessel refuelling facility and associated gangways,
- e) All ancillary associated works including demolition of sections of the existing seawall to provide for a new vehicular entrance from the R610-113 strand road and 4 no. pedestrian/bicycle entrances from the adjacent public footpath/permitted greenway, public and private car parking, campervan and bicycle parking, internal road network, pedestrian footpaths and public seating areas, landscaping and associated site services.

This marina project is adjacent to the Monkstown Creek sector of the Cork Harbour SPA, c. 3km south of the proposed development. The NIS for this project (prepared by EirEco) prescribes mitigation to prevent adverse effects on the Cork Harbour SPA. Given the scale of this project, its location relative to the areas of importance to the SAC and the proposed Passage West Greenway development, and the mitigation measures prescribed, it will not give rise to adverse effects in combination with the proposed development.

8.3.2.3 Licensed Activities

A review of licensed activities through *EPA Maps* found that there is upwards of 40 no. Integrated Pollution Control (IPC), Industrial Emissions (IE) and Waste licences in the vicinity of the Great Island Channel SAC and Cork Harbour SPA and connected waterbodies. Some of the above licences are currently pending approval, while others may no longer be in use. Based on the nature and scale of these activities, a risk of significant in-combination effects on Natura 2000 sites via water quality impacts must be considered. However, given the conditions attached to the IPC and IE licences and enforcement of the same by the EPA, this risk is considered to be controlled such that there will not be any adverse effects in combination with the proposed development.

Wastewater Treatment Plants

Upper Cork Harbour

The Cork City WwTP provides tertiary phosphorus removal for 296,425 p.e. (as of 2023). The plant capacity is 413,200 p.e., leaving significant headroom for future development and population growth, and it passed its WFD compliance test in 2021. This WwTP is located at Carrigrenan, Little Island and discharges to the Lough Mahon transitional waterbody, which overlaps with the Great Island Channel SAC and Cork Harbour SPA, and is connected to the Glashaboy Estuary and Lee (Cork) Estuary Lower.

The Carrigtwohill Wastewater Treatment Plant (WwTP) discharges treated effluent to the Lough Mahon (Harper's Island) transitional waterbody, within the Great Island Channel SAC and a short distance upstream of the Cork Harbour SPA. The Carrigtwohill WwTP can provide tertiary treatment (including nitrogen and phosphorus removal) for a population equivalent (p.e.) of up to 30,000. The current load is 9,480 p.e. (as of 2023) and the WwTP passed its Water Framework Directive (WFD) compliance test in 2021.

The Midleton WwTP can provide tertiary treatment (including nitrogen removal) for 15,000 p.e. but is currently overloaded, with an agglomeration p.e. of 17,042 (as of 2023). Nevertheless, it passed its WFD compliance test in 2021. This plant discharges to the Owenacurra Estuary transitional waterbody, which is connected to the North Channel Great Island transitional waterbody. In addition, on 13th February 2023, Cork County Council granted planning permission for the Midleton North Wastewater Pumping Station and Network (Planning Ref. 22/05032), which will provide for the diversion of loads of c. 4,100 p.e. from the Midleton wastewater network to Carrigtwohill, which, as demonstrated above, currently has treatment headroom of > 20,000 p.e. This will bring the effective loading to the Midleton WwTP within its design capacity without significantly reducing the capacity of the Carrigtwohill WwTP to accommodate expected loading from future development.

The current WFD ecological status or potential and risk of not achieving WFD objectives by 2027 for each of the transitional waterbodies to which the three WwTPs concerned discharge are provided in Table 8-1 below. While these are identified as being at risk in many cases, Uisce Éireann's planned upgrades to the wastewater networks and

treatment plants discharging to Cork Harbour and connected waterbodies should significantly assist in the aim to achieve good water quality status in these waterbodies.

Table 8-1 - WFD Status and Risk for transitional waterbodies covering the Great Island Channel SAC and inner sectors of the Cork Harbour SPA and to which the Carrigtwohill, Midleton and Cork City WwTPs are connected.

Transitional Waterbody	WFD Status 2016-2021	Risk (re 2027)
Slatty Bridge, Fota Island	Unassigned	Review
Lough Mahon (Harper's Island)	Good	At risk
Lough Mahon	Moderate	At risk
Glashaboy Estuary	Bad	At risk
Lee (Cork) Estuary Lower	Moderate	At risk
Owenacurra Estuary	Moderate	At risk
North Channel Great Island	Moderate	At risk

Lower Cork Harbour

Large WwTPs in discharging to the outer sectors of the Cork Harbour SPA and connected waterbodies include Ringaskiddy, Cobh North and Cloyne. The Ringaskiddy WwTP at Shanbally provides secondary treatment for 47,193 p.e. from Ringaskiddy Village, Ringaskiddy-Crosshaven-Carrigaline, Passage-Monkstown and Cobh Town, the plant capacity is 65,000 p.e. but it failed its WFD compliance test in 2021 due to discharges of industrial effluent downstream of the WwTP. The Cobh North provides secondary treatment for 1,182 p.e. and the plant capacity is 2,000 p.e. The Cloyne WwTP provides secondary treatment for 2,125 p.e., the plant capacity is 1,400 p.e. but it passed its WFD compliance test in 2021. There is no treatment provided for wastewater from Whitegate-Aghada (2,423 p.e.). As noted, the WFD status of transitional and coastal waterbodies to which these networks discharge and are connected are all 'Moderate' and 'At risk'.

Overall, the discharge from these wastewater networks is not considered to be significantly affecting the Great Island Channel SAC and Cork Harbour SPA and, given the absence of effects from the proposed development individually or in combination with the Carrigtwohill, Midleton and Cork City WwTPs, it can be concluded that there will be no such effects in combination with these other wastewater networks.

Aquaculture

EPA Maps shows 4 No. areas designated under the Shellfish Waters Directive (2006/113/EC), as transposed into Irish law by European Communities (Quality of Shellfish Waters) Regulations, 2006 (as amended), in Cork Harbour. The largest of these is "Cork Great Island North Channel", which occupies approximately the middle third of the Great Island Channel and so overlaps with both the Great Island Channel SAC and Cork Harbour SPA. In addition, the "Rostellan North", "Rostellan South" and "Rostellan West" shellfish areas overlap the north-eastern sector the Cork Harbour SPA in the Lower Harbour. Under the Shellfish Waters Directive, the quality of these waters must be protected from pollution and meet specific targets for physical, chemical and microbiological parameters in order to support bivalve and gastropod molluscs.

A review of *Ireland's Marine Atlas* found 4 No. licensed aquaculture sites in Cork Harbour. These include a small area to the west of Brick Island, where Fota Oyster Farm Ltd is licensed to produce Pacific Oyster and Brown Seaweeds, a larger area to the east of Brick Island, where Atlantic Shellfish Ltd is licensed to produce Pacific Oyster, and a large area comprising two sites the north-eastern part of the Lower Harbour, where Atlantic Shellfish Ltd is licensed to produce Blue Mussel. The two sites near Brick Island are both within the Great Island Channel SAC and Cork Harbour SPA, while the large Blue Mussel site overlaps the Cork Harbour SPA only.

In its AA of aquaculture activities in Cork Harbour (October 2022), the Department of Agriculture, Food and the Marine found that, given the types of aquaculture practised, as well as the scale and location of activities, such activities do not pose a threat to the Great Island Channel SAC or Cork Harbour SPA. On the basis of that assessment and given the nature, scale and location of the proposed Passage West greenway development, no significant effects will arise from the proposed development in combination with aquaculture.

8.3.2.4 Other Activities

Cork Harbour is a busy port, with large volumes of activities including shipping, passenger ferries, commercial fishing and angling, manufacturing and other industry, tourism and both water- and shore-based recreation. There are also numerous urban settlements around the harbour, with associated transport and other infrastructure. The nature and magnitude of development and activities around the harbour clearly represents a cumulative pressure on the Natura 2000 sites located therein. However, given the nature, scale and location of the proposed Passage West Greenway development, it will not give rise to any perceptible increase in this pressure. As such, there is no potential for adverse in-combination effects on the Great Island Channel SAC or Cork Harbour SPA.

8.4 Conclusion

As detailed in the preceding sections, it can be concluded that, based on the small scale of the proposed development and the nature, scale and duration of its impacts, it will not give rise to adverse effects on any of the Natura 2000 sites concerned, in combination with other plans or projects.

9. Conclusion

This NIS has examined the details of the proposed Passage West Pedestrian and Cycle Route in Co. Cork and the Natura 2000 sites in its Zone of Influence. It has analysed the potential impacts of the proposed development on the receiving natural environment and evaluated their effects, both individually and in combination with other plans and projects, in view of the conservation objectives of the relevant Natura 2000 sites. This report has been prepared in line with the Habitats Directive, as transposed into Irish law by the Habitats Regulations, relevant case law and guidance from the European Commission, the Department of the Environment, Heritage and Local Government and the Office of the Planning Regulator, on the basis of objective information and adhering to the precautionary principle.

Given the prescription of the mitigation measures detailed in Section 7 of this NIS, it can be concluded beyond reasonable scientific doubt that the proposed development will not, either individually or in combination with other plans or projects, give rise to any impacts which would constitute adverse effects on the Great Island Channel SAC, Cork Harbour SPA or any other Natura 2000 site, in view of their conservation objectives. Therefore, it is the recommendation of the authors of this report that An Bord Pleanála, as the competent authority in this case, may determine that the proposed development, either individually or in combination with other plans or projects, will not adversely affect the integrity of any Natura 2000 site, provided that the mitigation prescribed in this NIS is fully and properly implemented.



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APPENDICES

Appendix A. Otter Report

Otter Survey for the Passage West Pedestrian and Cycle Route Scheme, Co. Cork



Prepared by Triturus Environmental Ltd. for Atkins

March 2024

Please cite as:

Triturus (2024). Otter survey for the Passage West Pedestrian and Cycle Route Scheme, Co. Cork. Report prepared by Triturus Environmental Ltd. for Atkins. March 2023

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1. Introduction

1.1 Background

In light of proposals for the Passage West Pedestrian and Cycle Route scheme between Glenbrook and the Cork Harbour Greenway, Passage West, Co. Cork an otter survey was required to inform the species utilisation of the adjoining intertidal and saline lagoon habitats bordering the study area. In particular the current report would identify areas used for breeding and resting (holts and couches respectively), given these areas of otter habitat are protected under the Wildlife Acts 1976-2021 and are included in a system of Strict Protection pursuant to the requirements of Articles 12, 13 and 16 of the Habitats Directive (92/43/EEC) (NPWS, 2021). The findings of the survey would also inform mitigation to protect otter populations in the vicinity of the study area in light of Cork Harbour being an important habitat for the species (Dalton et al. 2021).

The proposed pedestrian and cycle scheme commences at Mariner's Quay, Passage West and finishes at Glenbrook Ferry Terminal (approximately 1.5km). It also includes a public realm interface for Passage West. After exiting Passage West tunnel at Glenbrook wharf, the proposed pedestrian and cycle route will follow the eastern footpath, next to the water, to Glenbrook Ferry Terminal. This scheme will join to a proposed scheme at Mariner's Quay and link to another at Glenbrook Ferry Terminal. It will form a vital part in connecting Passage West, Monkstown, Carrigaline and Crosshaven with Rochestown in Cork City, through pedestrian and cycling infrastructure.

1.2 Otter legislative protection

The Eurasian otter (*Lutra lutra*) is a species of conservation concern and high priority having suffered major declines in its range and population throughout Europe since the 1950s. It is classified as 'near threatened' by the IUCN Red List with a decreasing population trend and, as such, is listed in Appendix I of CITES, Appendix II of the Bern Convention (Council of Europe, 1979) and Annexes II and IV of the EU Habitats Directive (92/43/EEC).

Otters, along with their breeding and resting places, are also protected under provisions of the Irish Wildlife Acts 1976-2021. Otters have additional protection because of their inclusion in Annex II and Annex IV of the Habitats Directive 92/43/EEC, which is transposed into Irish law by the European Union (Birds and Natural Habitats) Regulations 2011-2021.

The protection of otters is outlined in Article 51(1) and (2):

Protection of fauna referred to in the First Schedule;

51.(1) *The Minister shall take the requisite measures to establish a system of strict protection for the fauna consisting of the species referred to in Part 1 of the First Schedule.*

51.(2) *Notwithstanding any consent, statutory or otherwise, given to a person by a public authority or held by a person, except in accordance with a license granted by the Minister under Regulation 54, a person who in respect of the species referred to in Part 1 of the First Schedule (listed below). Items (b) and (d) may be considered most relevant to developments.*

(a) *deliberately captures or kills any specimen of these species in the wild,*

- (b) deliberately disturbs these species particularly during the period of breeding, rearing, hibernation and migration,*
- (c) deliberately takes or destroys eggs of those species from the wild,*
- (d) damages or destroys a breeding site or resting place of such an animal, or*
- (e) keeps, transports, sells, exchanges, offers for sale or offers for exchange any specimen of these species taken in the wild, other than those taken legally as referred to in Article 12(2) of the Habitats Directive, shall be guilty of an offence.*

In an Irish context, according to the most recent Article 17 reporting (NPWS, 2019), otter conservation status has improved, with the species now evaluated as being of 'Favourable' conservation status. Otters were considered to be previously 'Near Threatened' (Marnell, 2009) based on a 20-25% decline between 1980 and 2005 (Bailey & Rochford, 2006). However, the current conservation status is now of 'Least Concern' (Marnell et al., 2019).

1.3 Statement of authority

Ross Macklin PhD (candidate), B.Sc. (Hons) MCIEEM., MIFM, HDip GIS, PDip IPM Ross is an aquatic, fisheries and mammalian ecologist with 18 years' professional experience in Ireland. He is director of Triturus Environmental Ltd. Ross has a BSc in Applied Ecology and diplomas in integrated Pest Management and GIS. He is currently completing his PhD in fisheries ecology. He has considerable experience in a wide range of ecological and environmental projects including EIAR, EclA, CEMP and AA/NIS reporting, as well as biodiversity, water quality monitoring, invasive species, mammalian surveys and fisheries management. He also has expert identification skills in fisheries, macrophytes, freshwater invertebrates, protected species and habitats. His diverse project experience includes work on renewable energy developments, flood relief schemes, road schemes, waste management, blueways/greenways, biodiversity projects, non-volant mammal monitoring, fisheries management projects and catchment wide water quality management. He has worked extensively within the catchment of Cork Harbour on mammal monitoring projects for Pfizer, Irving Oil, Cork LNG and Transport Infrastructure Ireland and is an expert in his field. He recently completed and was lead author of numerous catchment wide otter surveys including the Lower Lee FRS Otter Survey, Dublin City Otter Survey, Dún Laoghaire Rathdown Otter Survey and Tullamore Otter Survey which are among the largest urban otter surveys conducted in Ireland. He also recently completed an otter management plan for Grand Canal Harbour in Dublin and is currently developing a standard detail for artificial holt construction in conjunction with Dublin City Council for otter habitat enhancement projects. Further otter work currently being undertaken by Ross are two city wide otter population genetic studies using DNA extracted from spraint in Cork and Dublin in conjunction with Bio-ID.

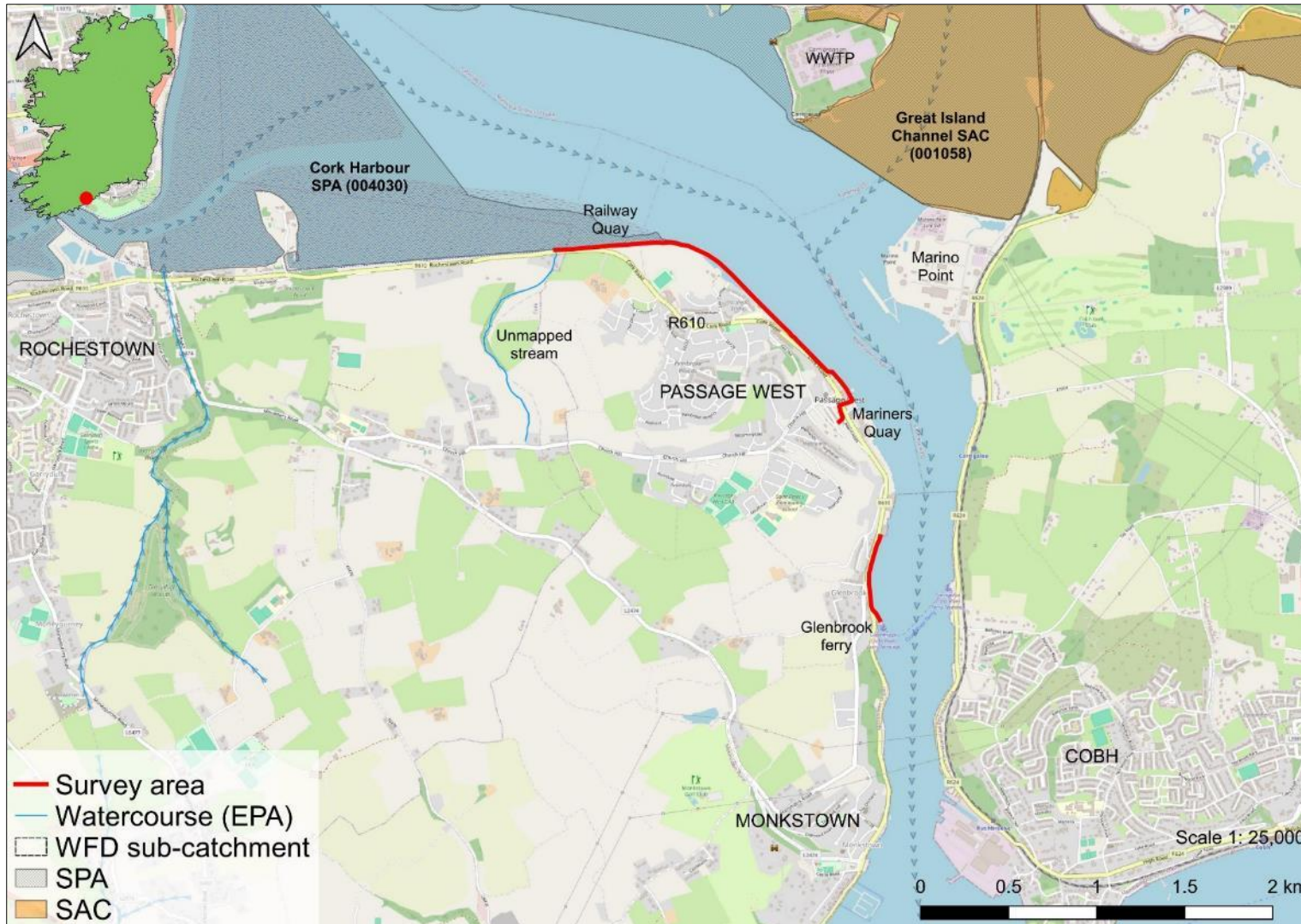


Figure 1.1 Otter survey study area location between Glenbrook and Railway Quay, Passage West, Cork

2. Methodology

2.1 Otter sign surveys

A walkover otter survey of the study area was conducted on the 2nd and 3rd February 2024. The survey was completed between Glenbrook and the Cork Harbour Greenway car park, Co. Cork (**Figure 1.1**).

The survey was completed during dry, mild, bright and settled conditions which ensured that a good representation of habitat marked by otter could be recorded in the field, including territorial marking or marking of feeding areas. The survey also deliberately coincided with prolonged dry periods to not minimise rain washout of otter signs (spraint, smears etc.).

Each otter sign was logged by type, location (handheld GPS), condition and approximate age for later interpretation to distinguish differences in habitat use and activity. Spraints were subjectively assessed as either fresh (very recent), mixed-age (recent and older spraints typically indicative of a regular sprainting site) or old (spraint breaking down and not recently deposited). Furthermore, indicative counts of spraint (i.e. number of individual spraints) and the number of sprainting sites (often separate clusters in one area) were noted. This helped indicate the frequency of otter marking that would support preferential use of habitat temporally by otter and often demarcates important territory where marking frequency is high. This technique was first utilised in the Dublin City Otter Survey (Macklin et al. 2019) and has been applied in other largescale otter surveys (Brazier & Macklin, 2020).

2.2 Total corridor otter survey (TCOS) methodology

The survey broadly followed the best practice survey methodology for otter as recommended by Lenton et al. (1980), Chanin (2003) and Bailey & Rochford (2006). However, methodology differed in that the entire waterline was surveyed rather than the standard 500-600m sections from accessible points (e.g. bridges). The novel survey technique, known as a total corridor otter survey (TCOS) (Macklin et al., 2019), encompassed the full intertidal zone adjoining the study area inclusive of connecting tidal lagoons and freshwater stream confluences with the intertidal.

Total corridor survey methodology typically involves the one or two surveyors working independently (in tandem) along the full corridor of the study area. This also facilitates one to work from a more elevated position (e.g. bank top) with one surveying (with appropriate PPE such as a dry suit or chest waders) from within the channel or along mean high tide mark to increase the likelihood of otter sign detection. This is especially true of more cryptic signs such as holts, which can be located in undercut banks, under tree root systems etc. out of the view of traditional surveys. Surveyors can alternate between waterside locations and banks depending on surveyor knowledge and experience of preferential areas of habitat likely to be used by otter.

3. Results

3.1 Study Area

The survey area between Glenbrook, Mariner’s Quay and Railway Quay at Passage West, Co. Cork covered a mosaic of intertidal and bordering terrestrial habitats (**Figure 3.1**). These comprised areas of intertidal mixed sediment/ rocky intertidal habitat, costal boulder revetments, scrub, treelines, mixed broadleaved woodland plantation, upper saltmarsh, tidal lagoons and streams that bordered the study area between Glenbrook and the Cork Harbour Greenway area at Passage West. The fringes of semi-natural habitats, despite a high degree of disturbance and impingement from developed lands and or existing walkways, contained areas of lower disturbance with vegetation cover and poorer access to people that benefitted otter.

3.2 Otter records



A total of $n=16$ otter signs were recorded within the survey area during the survey conducted during February 2024. This equated to a density of 4.9 otter signs per linear kilometre of habitat over the 3.25km habitat survey area including tidal lagoons. The signs recorded comprised fourteen spraint sites, a single couch and a single holt site (**Table 3.1; Figure 3.1**). The potential breeding area (i.e. holt)  and couch site (resting area)  are shown on **Figure 3.1**. A photographic audit of the survey area inclusive of the identified holt and couch area are presented in **Plates 3.1-3.12** below.

Table 3.1 Summary of the otter signs recorded in the study area at Passage West

Otter sign	Total no.
Spraint site	14
Holt	1
Couch (with jelly)	1
Total	16
Density signs per linear km	4.9



Plate 3.1 Otter couch (resting area) under eroded tidal wall with otter jelly on rocks with freshwater bathing area [REDACTED], bathing areas are extremely important for coastal otter to wash salt off their coats



Plate 3.2 Open boulder revetment at Glenbrook with high human disturbance that did not have any otter signs, these open disturbed areas are not typically marked by otters



Plate 3.3 Open mixed sediment and shingle intertidal between Passage and Glenbrook facing south from Granary Wharf



Plate 3.4 The old quay wall at Granary Wharf, Passage West

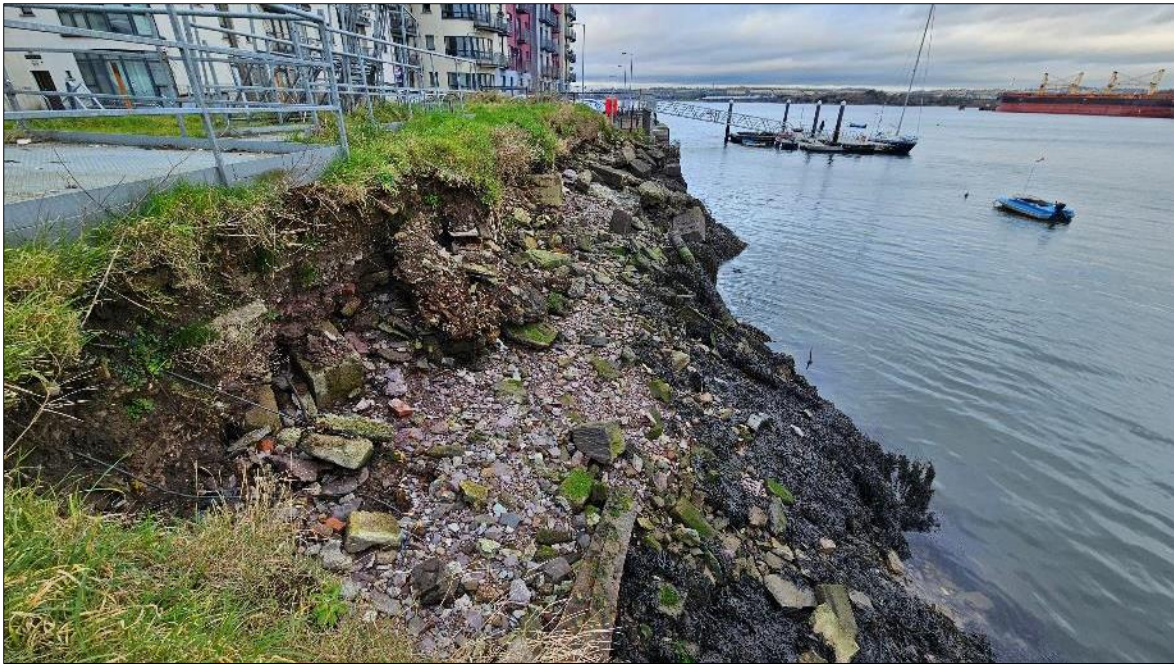


Plate 3.5 Eroded bank at Mariner's Quay, Passage West

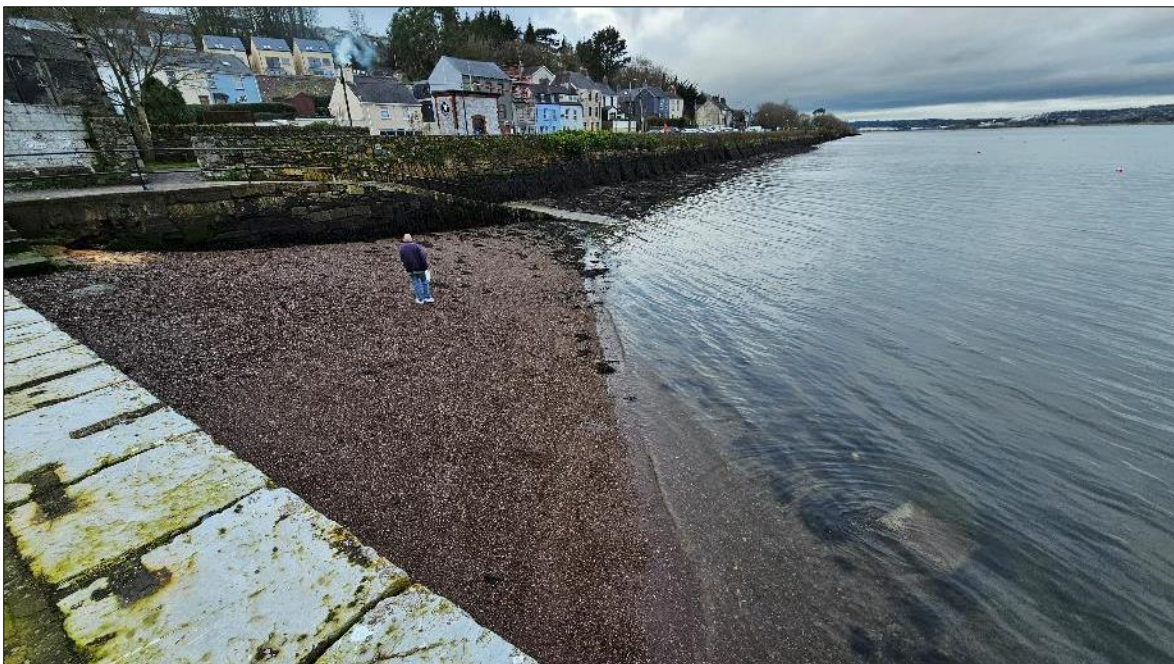


Plate 3.6 The old quay wall facing northwest from the Passage West Maritime Museum



Plate 3.7 Tidal lagoon at Horsehead, Passage West showing undercut banks that supported no otter signs despite have some suitability as potential couch areas



Plate 3.8 Large crevice under sycamore root system but no otter scent spraint or signs of use, therefore not a holt site (many of these crevices existed at Railway Quay and were examined thoroughly)



Plate 3.9 Spraint site at Railway Quay, Passage on the high tide mark on historical collapsed pier below quay wall



Plate 3.10 Example of the typical habitat along Railway Quay with scrub bordering walkway, boulder revetment and mixed sediment intertidal grading into open estuarine mudflat



Plate 3.11



Plate 3.12 Boulder revetments and freshwater stream with regular spraint site at Railway Quay, supporting the known importance of freshwater sources for coastal otters

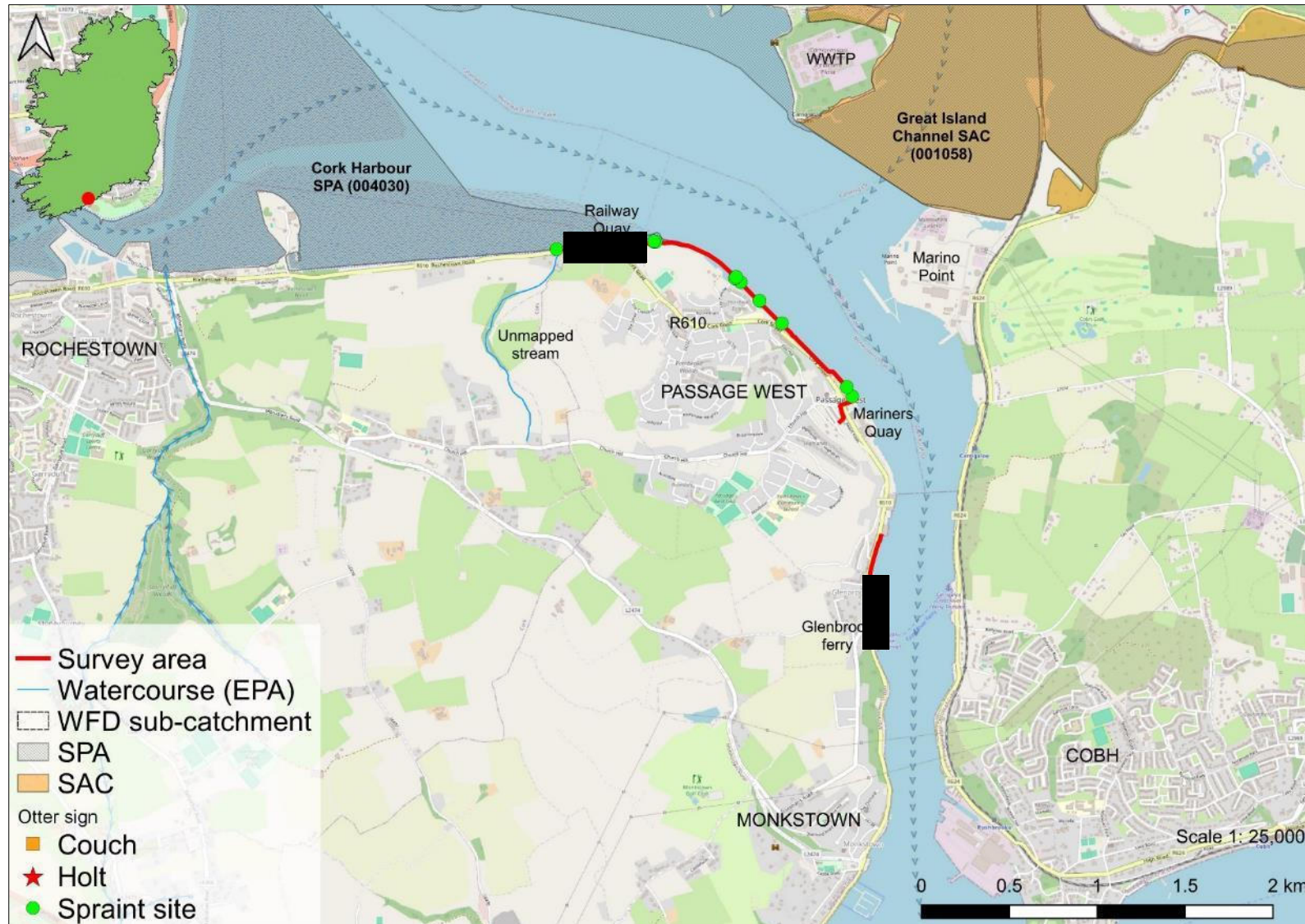


Figure 3.1 Otter sign distribution map showing otter signs inclusive of couch and holt sites in the study area



Figure 3.2 Otter sign distribution map showing the location of the active holt in the boulder revetment [redacted] with 150m buffer

4. Discussion

This survey recorded a total of $n=14$ otter signs, the majority of which were associated with the faecal depositions of otter (i.e. spraint and jelly sites). Important depositional spraint areas were clearly associated with freshwater sources representative of territorial marking of these important bathing areas.

Legally protected breeding ($n=1$ holt site) and resting areas ($n=1$ couch site) were also recorded in the study area. A single couch area [REDACTED] was evidently used as a frequent resting and bathing area. This small enclave [REDACTED] was secluded from human disturbance and had a small stream of freshwater spilling over intertidal boulders that acted as an ideal bathing and resting area (**Plate 3.1 & Figure 3.1**). No other clearly definitive couch areas were identified in the study area.

A single holt [REDACTED] was also identified (**Plate 3.11 & Figure 3.2**) This holt as with the couch area [REDACTED], was close to a regularly used freshwater stream source. The holt was heavily marked with mixed age spraint and was associated with a tunnel system under the boulders into the adjoining embankment indicating it as a definitive holt site. This potential breeding holt area was secluded from the existing walkway by dense bramble scrub and limited access from the walkway to the intertidal area.

Otter breeding areas (holts) are widely accepted as being especially sensitive to direct human disturbance (Mason & Macdonald, 2009; Macklin et al. 2019), with otter reproductive success known to be higher in less disturbed habitat; hence their preferential fidelity for low disturbance areas of habitat (Brazier & Macklin, 2020; Macklin et al. 2019; Scorpio et al., 2016; Ruiz-Olmo et al., 2011; Loy et al., 2009; Kruuk, 2006). The location of the identified holt in a more poorly accessible boulder revetment helped minimise disturbance to otter by people and dog walkers. It is very important to maintain the observed low disturbance levels during greenway construction works given continued fragmentation of otter habitats in Cork Harbour with increased suburbanisation pressures. Furthermore, the existing scrub vegetation provides extra separation between dog walkers and the intertidal which should be preserved where practical. This separation also benefits waterbirds that feed on the exposed mudflats.

Otters, along with their breeding and resting places, are protected under provisions of the Irish Wildlife Acts 1976-2021 and also pursuant to the requirements of Articles 12, 13 and 16 of the Habitats Directive (92/43/EEC) as an Annex V species. The identified holt and couch areas are in close proximity (contiguous) with to the proposed development area. Despite the study area being an active thoroughfare for patrons of Cork City, construction activity and or increased activity once the greenway becomes operational may directly or indirectly disturb otter breeding/resting areas. Consequentially a derogation licence will be required from the National Parks and Wildlife Service (NPWS) in advance of any works in these areas. Recent guidance on the derogation process for otter is summarised in the NPWS document, *'Guidance on the Strict Protection of Certain Animal and Plant Species under the Habitats Directive in Ireland'* (NPWS, 2021) and should be adhered to in the derogation application. It is recommended that acoustic barriers be used during construction in the vicinity of breeding and resting areas. In addition trail camera monitoring that is a standard component of mitigation as part of derogation requirements, should be implemented during the construction period to establish

patterns of otter utilisation and potential disturbance related impacts in order to apply corrective action. Additional landscape planting with trees and scrub should also be considered adjoining the intertidal to screen the holt and couch areas. The local ranger of the NPWS should also be contacted to agree on the final appropriate schedule of mitigation in accordance with the conditions of the derogation licence.

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6. Appendix A – otter signs database

Table 6.1 Summary of the $n=16$ otter signs recorded in the study area during February 2024 (breeding and resting areas marked in bold)

Sign no.	Type	No. spraint sites & total no. spraints in parenthesis	Age	Description	ITM x	ITM y
PG01	*Couch & spraint	2(5)	Fresh	Mixed age spraint on boulders at top of intertidal zone under ivy hedgerow [REDACTED]. The couch area is likely freshwater bathing area given freshwater feed flowing from wall near boulders increasing importance.	[REDACTED]	[REDACTED]
PG02	Spraint	3(7)	Mixed age	Mixed age spraint on boulders at top of intertidal zone under Grisilinea hedgerow near Glenbrook Ferry Terminal.	577113	567510
PG03	Spraint	1(5)	Mixed age	Mixed age spraint at top of quayside steps at Mariners Quay.	576968	568841
PG04	Spraint	1(1)	Old	Old spraint at top of quayside steps at Mariners Quay.	576937	568894
PG05	Spraint	1(2)	Fresh	Fresh spraint on old slipway near Haven Marine Boatyard.	576568	569257
PG06	Spraint	1(1)	Fresh	Very fresh spraint on old quayside wall below high tide mark at Railway Quay.	576440	569385
PG07	Spraint	1(7)	Mixed age	Mixed age spraint on corner of boulder revetment south of lagoon outfall.	576333	569491
PG08	Spraint	2(5)	Mixed age	Mixed age spraint on concrete retaining wall inside tidal lagoon (near outfall).	576299	569513
PG09	Spraint	1(1)	Old	Old spraint on boulders at outfall from large tidal lagoon.	576307	569521
PG10	Spraint	1(3)	Fresh	Fresh spraint site on boulder east of outfall from tidal lagoon at Railway Quay.	575839	569721
PG11	Spraint	3(6)	Mixed age	Regular spraint sites on boulders east of outfall from tidal lagoon at Railway Quay.	575850	569721
PG12	Spraint	1(1)	Old	Single old spraint on boulder east of outfall from tidal lagoon at Railway Quay.	575838	569724

Sign no.	Type	No. spraint sites & total no. spraints in parenthesis	Age	Description	ITM x	ITM y
PG13	Spraint	3(8)	Mixed age	Regular spraint site on boulders near outfall at carpark (Robert's Bridge) area at Railway Quay.	575546	569713
PG14	Spraint	1(1)	Fresh	Spraint under boulders at Railway Quay.	575456	569695
PG15	*Holt & spraint	3(14)	Mixed age	Holt in boulder revetment above high tide mark with very regular spraint site [REDACTED]. Tunnel under boulders.	[REDACTED]	[REDACTED]
PG16	Spraint	2(6)	Mixed age	Regular spraint site west of unnamed freshwater stream on boulders at Railway Quay.	575285	569679

* **Conservation value:** Otters, along with their breeding and resting places (i.e. holts and couches respectively), are protected under provisions of the Irish Wildlife Act 1976-2021. Otters are also listed under Annex II and IV of the Habitats Directive [92/42/EEC].



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Appendix B. Winter Bird Report



**PASSAGE WEST PEDESTRIAN AND
CYCLE ROUTE: WATERBIRD SURVEY,
WINTER 2023/24**

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**REPORT NUMBER: 2319-F1
STATUS OF REPORT: Revision 1
DATE OF REPORT: 25 March 2024**

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SUMMARY

This report presents the results of a waterbird survey of a section of the southern shore of the Lough Mahon, and the northern section of the West Passage Channel, in Cork Harbour between December 2023 and March 2024. The objective of the survey was to contribute towards the environmental assessment of the proposed upgrade of the Passage West Pedestrian and Cycle Route.

Four low tide and two high tide counts were carried out between December 2023 and March 2024. Waterbirds were counted in four count sectors as well as in 0-300 m distance bands from the shoreline.

The survey recorded 31 waterbird species, including 16 Qualifying Interest species of the Cork Harbour SPA.

Lough Mahon supports large populations of waterbirds that feed on the extensive areas of intertidal habitat that are exposed at low tide and mainly roost in the Douglas Estuary at high tide. These waterbirds use the mudflats on the southern shore of Lough Mahon east of Hop Island as part of the overall intertidal habitat complex in Lough Mahon. The birds using these mudflats appear to be habituated to disturbance from pedestrians and cyclists on the existing greenway that runs along the shoreline.

The proposed upgrade to the Passage West Pedestrian and Cycle Route runs along the easternmost section of the southern shoreline of Lough Mahon, where the Lough Mahon mudflats narrow, and then along the confluence of Lough Mahon with the West Passage Channel where the intertidal zone is negligible. These areas did not support significant numbers of any waterbird species.

Glenbrook Bay is a small bay on the western side of the West Passage Channel just to the north of the Glenbrook Ferry Port. This area did not support significant numbers of any waterbird species.

There are no known high tide roosts in this section of Cork Harbour and no high tide roosts were recorded in these surveys. A Cormorant day roost was recorded on a concrete platform offshore from an old quay to the south of Marino Point. A large Herring Gull night roost was recorded in the West Passage Channel on one count which coincided with dusk.

1. INTRODUCTION

1.1. SCOPE OF REPORT

This report presents the results of a waterbird survey of a section of the southern shore of the Lough Mahon, and the northern section of the West Passage Channel, in Cork Harbour between December 2023 and March 2024.

The survey was commissioned by Atkins to contribute towards the environmental assessment of the proposed upgrade of the Passage West Pedestrian and Cycle Route.

1.2. SURVEY DATA

The full survey data is included in the database that accompanies this report. Details of this database are provided in Appendix 1.

1.3. STATEMENT OF COMPETENCE

All the survey work, data analysis and assessment presented in this report was carried out by Tom Gittings.

Tom Gittings is an ecologist with 28 years' experience in professional consultancy work and research. Tom specialises in ecological surveying, monitoring and evaluation, ecological impact assessment, habitat management, and avian, invertebrate, wetland and woodland ecology. He is currently working as an independent ecological consultant. His previous experience includes working for the RPS Group (a multi-disciplinary environmental consultancy) and carrying out research into forest and wetland biodiversity in the Department of Zoology, Ecology and Plant Science at University College Cork. He has a BSc (Hons) and a PhD in Ecology and is a member of the Chartered Institute of Ecology and Environmental Management and has extensive professional experience in project management and ecological assessment. His recent consultancy work includes assessments for planning applications (including Appropriate Assessments, Environmental Impact Statements, and expert witness work at oral hearings), large-scale habitat surveys, preparation of management plans, contributions to multi-disciplinary conservation plans, and specialist ecological survey and research.

2. METHODOLOGY

2.1. SURVEY AREA AND COUNT SECTORS

I defined a survey area that covered the section of Lough Mahon and the West Passage Channel adjacent to the Passage West Pedestrian and Cycle Route, as well as the section of Lough Mahon to the west of the western end of the route and the section of the West Passage Channel to the south of the southern end of the route (Map 2.1). This survey area included all the intertidal habitat on the southern shore of Lough Mahon and in the West Passage Channel between Hop Island and Glenbrook. In Lough Mahon, the survey area extended out to the navigation channel.

I divided the survey area into four count sectors (Map 2.1). Two of the sectors comprised the tidal habitat on the southern side of Lough Mahon east of Hop Island (RW and RE). The other two sectors comprised the tidal habitat in the northern half of the West Passage Channel (PN and PS). The RE sector was divided into eastern and western sections (Map 2.1) with the eastern section representing the part of the sector that is adjacent to the proposed upgrade of the Passage West Pedestrian and Cycle Route.

I used navigation buoys to define the outer limits of the RW, RE and PN (western section) sectors, and a bearing line to a navigation buoy to define the boundary between the RW and RE sectors of these sectors. The boundary between the RE and PN sector was defined by the eastern edge of the car park on the Rochestown Road. The boundary between the PN and PS sector was defined by the start of the quay behind Passage West library. The southern boundary of the PS sector was defined by the ramp at the Glenbrook Ferry Port. The PN sector included the impounded tidal pools on the southern / western side of the greenway.

In addition to the above four tidal sectors, I also covered a section of fields on the southern side of the Rochestown Road where it turns inland (Map 2.1; FIELDS).

The RW and RE sectors were also covered in my waterbird surveys for the Passage Railway Greenway project, where they were called the HIE and PA sectors (Gittings, 2021b), while the PN sector was also covered in my waterbird surveys for the Carrigaline to Glenbrook / Ringaskiddy Greenway project (Gittings, 2021a). The outer boundaries of the RE and PN sectors were designed to match those of sectors that I have previously surveyed on the northern side of Lough Mahon (Gittings, 2022, 2023b).

The sectors also show a broad correspondence to those used for the NPWS Waterbird Survey Programme Cork Harbour counts (Cummins and Crowe, 2011). The differences between the respective boundaries were due to divisions of subsites that I used to provide count sectors relevant to the present survey, definitions of the sectors that followed the morphology of the tidal habitat, and/or use of clearly defined features to demarcate the boundaries (Table 2.1).

Table 2.1. Correspondence between the count sectors used in this survey, and the subsites used for the NPWS Waterbird Survey Programme Cork Harbour counts.

WSP subsite	Count sectors from this survey	Notes
0L537	RW and RE	The western boundary of the RW sector extended around 150 m west of 0L537 boundary to the shoreline of Hop Island. The eastern boundary of the RE sector was defined by the edge of the car park. The outer boundary of the 0L537 subsite is poorly defined. The outer boundaries of the RW and RE were defined by the Douglas Estuary tidal channel and the navigation channel.
0L510 (south)	PM	The 0L510 subsite extends to the northern shoreline of Lough Mahon. The PS sector covered the section of this subsite to the south of the navigation channel.
0L532 (north)	PS	The 0L532 subsite covers the full length of the West Passage Channel. The PS sector covered the northern half of this subsite.

2.2. SURVEY DATES AND TIMINGS

I carried out monthly low tide counts between December 2023 and March 2024, and high tide counts in January and February 2024 (Table 2.2). Each count was carried out during the three-hour periods centred on high tide or low tide, as appropriate (Table 2.2).

Table 2.2. Survey dates and timings.

Month	Date	Tide	Start time	Finish time	HT/LT time
Dec	13/12/2023	LT	10:47	13:03	11:53
Jan	24/01/2024	LT	10:15	12:36	11:16
Jan	24/01/2024	HT	15:23	17:00	16:50
Feb	12/02/2024	LT	12:29	14:47	13:38
Feb	19/02/2024	HT	12:09	13:53	13:29
Mar	22/03/2024	LT	09:22	11:21	10:44

Tide times are the predicted times for Cork City from the UKHO tide tables.

2.3. SURVEY METHODS

I carried out the counts of the RW, RE and PN sectors by cycling along the greenway and stopping as required to count. I counted the PS sector from vantage points on the eastern shore at the northern and southern ends of the sector. I counted the FIELDS sector from the adjacent section of the greenway.

I counted birds separately in each sector. I also classified birds by the tidal zone in which they occurred (subtidal, intertidal, supratidal, or terrestrial; see Lewis and Tierney, 2014) and behaviour (Table 2.3). In the RW, RE and PN sectors, I counted birds separately in the following distance bands from the shoreline: 0-50 m, 50-100 m, 100-200 m, 200-300 m and > 300 m. On the high tide surveys, I also counted birds separately at each high tide roost location. In the RE sector, I counted birds separately in the eastern and western sub-divisions. In the PS sector, I counted birds separately in the two discrete areas of intertidal habitat: the bay on the eastern shore south of Marino Point, and the bay on the western shore at Glenbrook (Map 2.1).

I mapped the locations of significant flocks.

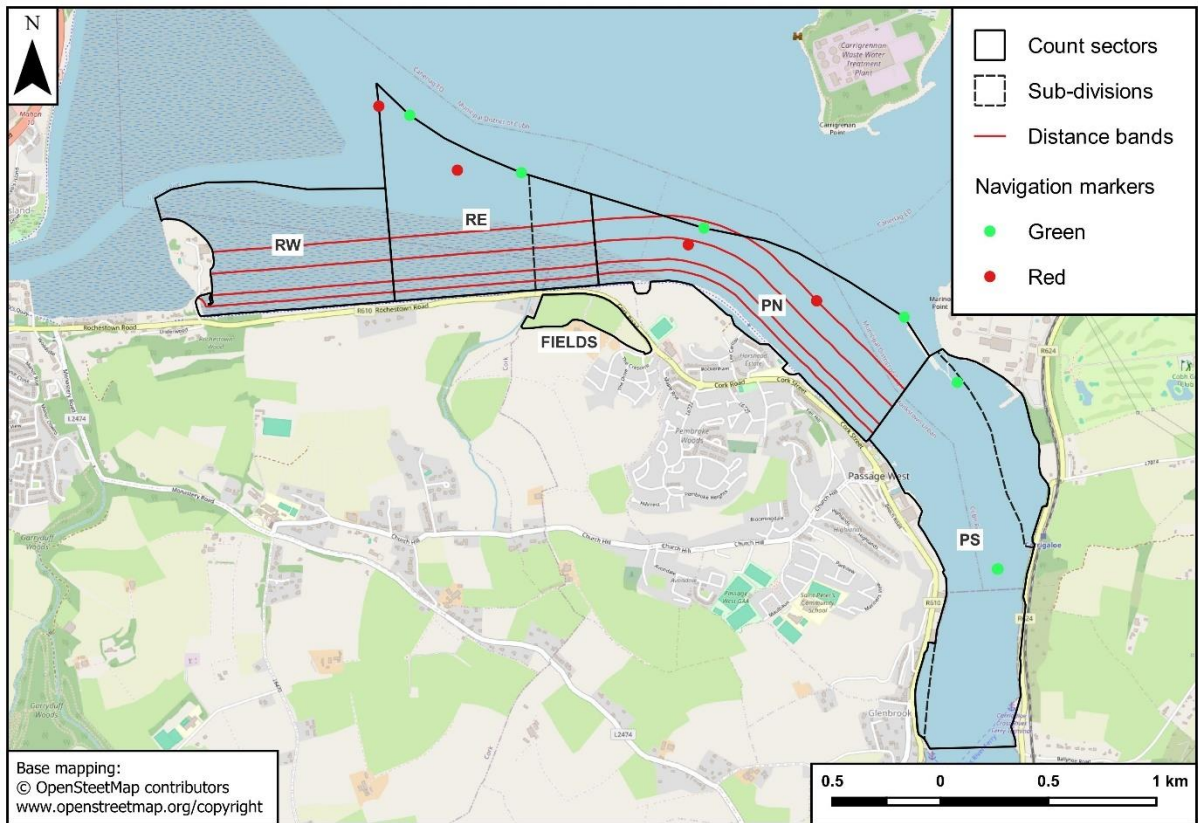
On the low tide counts, I mapped the extent of exposure of intertidal habitat in each sector.

I used a laser rangefinder (Leupold RX-1300i TBR) to measure distances, for the purposes of distance band classification and mapping tidal exposure.

I recorded potentially disturbing activities and impacts using the disturbance recording protocol from Lewis and Tierney (2014). I did not record pedestrian or cyclist activity on the greenway, or pedestrians and traffic on the roads along the edges of the PS sector. These activities occurred on every count and did not produce observable disturbance responses.

Table 2.3. Behavioural categories used for the waterbird survey.

Category	Behaviour
F	Feeding
R	Non-feeding behaviour, excluding Y1, Y2 and H categories
Y1	Flying bird that is using the sector: e.g., a bird that was present in the site, but flew off before its behaviour could be categorised
Y2	Flying bird that is not using the sector: e.g., a bird commuting across the sector
H	Bird flushed by the observer before its behaviour was categorised



Map 2.1. Survey area and count sectors.

3. SURVEY RESULTS

3.1. TIDAL EXPOSURE

Over 300 m of intertidal habitat was exposed in most / all of the RW sector on each low tide count (Map 3.1). The width of the intertidal habitat narrowed in the RE sector, with only around 200 m exposed during the January and March counts (Map 3.1).

The tideline reached the shoreline in the westernmost section of the PN sector (Map 3.1). In the remainder of the PN sector, there was minimal exposure of intertidal habitat. There was around 20-30 m exposed on the December and February counts, less than 10 m exposed on the March count, and no intertidal habitat exposed on the January count (except at the extreme southern end).

In the PS sector, the only significant exposure of soft sediment intertidal habitat was in the bay to the south of Marino Point (Marino Point Bay; Map 3.2) and in the bay on the western shore at Glenbrook (Glenbrook Bay; Map 3.2). During the low tide counts, the width of the intertidal habitat exposed in Marino Point Bay varied from around 60 – 120 m, while the width of intertidal habitat exposed in Glenbrook Bay varied from around 40 – 60 m. To the south of Marino Point Bay, a strip of littoral rock intertidal habitat around 30 m wide was exposed on the eastern shore during the low tide counts.

3.2. OVERALL WATERBIRD NUMBERS

I recorded 16 Qualifying Interest species and another 15 non-Qualifying Interest waterbird species (Table 3.1 and Table 3.2). The most abundant species were Dunlin and Black-headed Gull while Teal, Black-tailed Godwit and Herring Gull numbers were also high in a Cork Harbour context.

3.3. SECTOR DISTRIBUTION

The distribution of dabbling ducks between the sectors varied across the counts (Figure 3.1). On the January and February low tide counts, the highest numbers occurred in the RE and/or RW sectors, which mainly involved Teal feeding along the tideline. In the February low tide count, relatively high numbers were also recorded in the PS sector: these were Teal feeding in the bay on the eastern shore to the south of Marino Point. Much lower numbers were recorded on the December and March low tide counts and on all the high tide counts.

The highest numbers of diving waterbirds occurred in the PN sector, which partly reflected the fact that this sector had a very narrow intertidal zone. The main species involved were Cormorant and Shag. Note that Cormorants roosting at Marino Point are excluded from the totals in Figure 3.1 (see Section 3.5).

Very small numbers of herons and egrets (Grey Heron and Little Egret) were recorded, and they were widely distributed across the sectors (Figure 3.1).

The waders mainly occurred in the RE and RW sectors at low tide (Figure 3.1). These were the only sectors with significant areas of intertidal habitat. The higher numbers on the January and February low tide counts were due to the presence of large Dunlin flocks. The numbers recorded at high tide in all the sectors were very small due to the absence of any high tide roosts. On the December low tide count, a mixed flock of 28 Oystercatchers, 45 Curlews and 153 Black-tailed Godwits were recorded in the FIELDS sector, but there were no waders in this sector on any of the other counts.

High numbers of gulls usually occurred in the PS sector and, on some counts, in the RE and/or RW sectors. The commonest species was Black-headed Gull, which was mainly recorded feeding on intertidal habitat in the RE and RW sectors, and in the bay to the south of Marino Point in the PS sector. In the PS sector, there was a high count of 231 Herring Gulls on the December high tide count, which represented a nocturnal roost (see Section 3.5).

3.4. DISTANCE BAND DISTRIBUTION

Figure 3.2 shows that, in the low tide counts of the RE and RW sectors, most waders and gulls were widely distributed across the distance bands, with no evidence of avoidance of the distance bands close to the greenway. Note that the 0-50 m and 50-100 m distance bands contained less intertidal habitat than the 100-200 m and 200-300 m distance bands, while the > 300 m distance bands contained variable amounts of intertidal habitat depending on the tideline alignment. The numbers of the other waterbird groups were generally too small, or too variable, for consistent patterns to emerge (but see below).

In my analysis of the waterbird surveys that I carried out for the Passage Railway Greenway project (Gittings, 2021b), I examined the distance band distribution of selected species in the RW sector (called the HIE sector in that report) on ebb/flood tides in relation to the availability of intertidal habitat. In most cases there was again no evidence of avoidance of areas close to the greenway, and, in fact, some species showed higher than expected numbers in the 0-50 m distance band.

At low tide, the diving waterbirds mainly occurred in the > 300 m distance band, reflecting the distribution of subtidal habitat at low tide (Figure 3.2). However, while at high tide, subtidal habitat occupied all the distance bands, the diving waterbirds still mainly occurred in the > 300 m distance band (Figure 3.3). This reflects the pattern that I observed in the waterbird surveys along the southern shore of Little Island, when the highest densities of Cormorants and Shags occurred in the > 300 m distance band (Gittings, 2023b).

3.5. PASSAGE WEST PEDESTRIAN AND CYCLE ROUTE

The proposed upgrade on the Passage West Pedestrian and Cycle Route will run along the entire length of the PN sector and the eastern sub-division of the RE sector. The total numbers of waterbirds recorded in these sections are shown in Table 3.3. Overall numbers were low with only the gull species regularly occurring in double figures.

3.6. GLENBROOK BAY

Glenbrook Bay is a small bay on the eastern shore at the southern end of the PS sector (Map 3.2). Cork County Council requested specific information on waterbird numbers in this bay. The total numbers of waterbirds recorded in these sections are shown in Table 3.4. This bay usually held small flocks of roosting gulls, which occurred both on the intertidal and on boats moored just below the tideline. Apart from gulls, very few waterbirds occurred in this bay.

3.7. ROOSTS

There are not any previously recorded regular high tide roosts along the southern shore of Lough Mahon east of Hop Island, and in the northern section of the West Passage Channel. So, it was not surprising that I did not record any high tide roosts during the present survey.

There was a regular Cormorant day roost on a concrete platform offshore from the old quay in the bay to the south of Marino Point (Map 3.2). I recorded Cormorant roosting here on most counts with numbers varying from 24 – 37 birds. I did not record any Cormorant here on the January high tide count, but this was carried out in the late afternoon when the birds had probably departed for their night roost. I also recorded single Cormorant roosting on the Marino Point jetty on two counts; I have previously recorded large Cormorant roosts on this jetty.

On the January high tide count, I recorded a total of 217 Herring Gull in the PS sector, which is a high count for Cork Harbour; the most recent mean annual peak I-WeBS count for this species in Cork Harbour was 165 birds (Gittings, 2023a). These birds appeared to be assembling in a night roost, with birds roosting in subtidal habitat in the middle of the channel and flying around above the channel. This gull roost does not appear to have been previously recorded. The main gull roost in Cork Harbour is along the western shore of Lough Mahon, but that roost is mainly used by Black-headed Gulls and Lesser Black-backed Gulls.

There is a Great Crested Grebe night roost in the northern section of Lough Mahon (Gittings, 2017). However, this roost occurs to the north of the navigation channel. I did not record any evidence of roosting Great Crested Grebes in the sectors that I covered during the present survey, and, in fact, overall numbers of Great Crested Grebes were low.

Table 3.1. Total counts of Qualifying Interest waterbird species.

Species	Tide	Dec	Jan	Feb	Mar
Shelduck	HT	-	13	0	-
	LT	11	35	21	25
Wigeon	HT	-	5	11	-
	LT	2	2	4	2
Teal	HT	-	0	14	-
	LT	19	56	111	5
Red-breasted Merganser	HT	-	4	0	-
	LT	0	5	0	0
Cormorant	HT	-	4	47	-
	LT	28	34	31	23
Grey Heron	HT	-	1	3	-
	LT	0	6	6	1
Great Crested Grebe	HT	-	1	0	-
	LT	2	3	0	0
Oystercatcher	HT	-	2	1	-
	LT	50	49	46	18
Curlew	HT	-	3	4	-
	LT	109	51	73	1
Black-tailed Godwit	HT	-	0	0	-
	LT	161	11	83	304
Bar-tailed Godwit	HT	-	0	0	-
	LT	0	42	3	0
Dunlin	HT	-	0	0	-
	LT	2	903	1317	0
Redshank	HT	-	9	2	-
	LT	16	15	24	16
Black-headed Gull	HT	-	352	42	-
	LT	239	494	604	45
Common Gull	HT	-	18	54	-
	LT	31	80	63	10
Lesser Black-backed Gull	HT	-	52	4	-
	LT	17	33	85	22

High tide counts were not carried out in December or March.

Table 3.2. Total counts of other waterbird species.

Species	Tide	Dec	Jan	Feb	Mar
Mallard	HT	-	0	0	-
	LT	0	6	2	0
Shag	HT	-	0	1	-
	LT	6	0	4	3
Little Egret	HT	-	0	2	-
	LT	1	3	1	3
Turnstone	HT	-	4	8	-
	LT	0	2	40	3
Herring Gull	HT	-	231	15	-
	LT	38	51	69	112
Great Black-backed Gull	HT	-	4	5	-
	LT	9	7	5	7

High tide counts were not carried out in December or March. Additional species: Mute Swan (2 records), Long-tailed Duck (1 record), Great Northern Diver (2 records), Moorhen (1 record), Greenshank (1 record), Black Guillemot (2 records), Mediterranean Gull (2 records), Yellow-legged Gull (2 records), and Iceland Gull (1 record).

Table 3.3. Waterbird counts in the sections of the survey area corresponding to the proposed upgrade of the Passage West Pedestrian and Cycle Route.

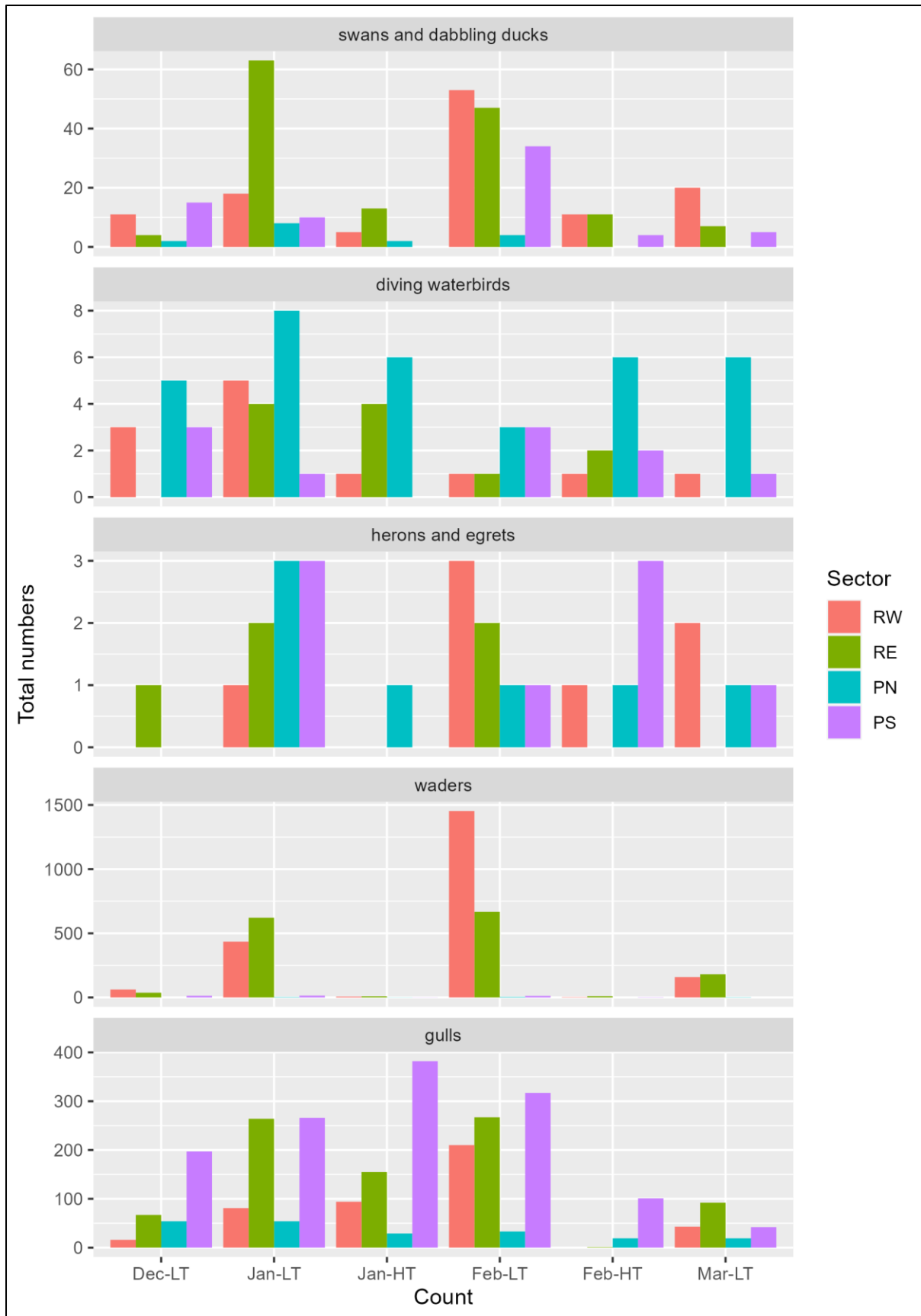
Species	Dec LT	Jan HT	Jan LT	Feb HT	Feb LT	Mar LT
Mute Swan	0	2	0	0	0	0
Wigeon	2	0	2	0	4	2
Mallard	0	0	6	0	0	0
Red-breasted Merganser	0	4	2	0	0	0
Great Northern Diver	0	0	1	0	0	0
Cormorant	1	3	6	7	2	3
Shag	5	0	0	0	2	3
Little Egret	0	0	2	1	0	1
Grey Heron	0	1	1	0	1	0
Great Crested Grebe	0	0	1	0	0	0
Moorhen	0	0	0	0	0	1
Oystercatcher	0	0	1	0	1	0
Curlew	1	0	3	0	3	0
Black-tailed Godwit	0	0	0	0	0	12
Turnstone	0	4	2	8	1	3
Redshank	1	0	2	0	1	0
Black Guillemot	0	1	1	0	0	0
Black-headed Gull	59	21	26	11	13	14
Mediterranean Gull	0	1	0	0	0	0
Common Gull	0	4	15	0	6	7
Lesser Black-backed Gull	2	0	11	1	28	0
Herring Gull	9	12	17	5	21	11
Great Black-backed Gull	0	2	0	2	1	0

The area covered by the counts included in this table were the PN sector and the eastern sub-division of the RE sector.

Table 3.4. Waterbird counts in Glenbrook Bay.

Species	Dec LT	Jan HT	Jan LT	Feb HT	Feb LT	Mar LT
Shag	0	0	0	1	0	0
Oystercatcher	1	0	0	0	0	0
Curlew	0	0	0	0	1	0
Redshank	0	0	0	1	1	0
Black-headed Gull	46	0	24	17	20	0
Common Gull	28	0	33	7	17	0
Lesser Black-backed Gull	1	0	0	0	1	0
Herring Gull	0	0	4	6	5	1
Yellow-legged Gull	0	0	0	1	0	0

The area covered by the counts included in this table were the intertidal zone in Glenbrook Bay and the subtidal zone extending out to around 150 m from the shoreline.



The diving waterbirds totals do not include Cormorant roosting on the Marino Point jetty and quay in the PS sector (see text).

Figure 3.1. Distribution between sectors of the total numbers of waterbird groups recorded on each count.

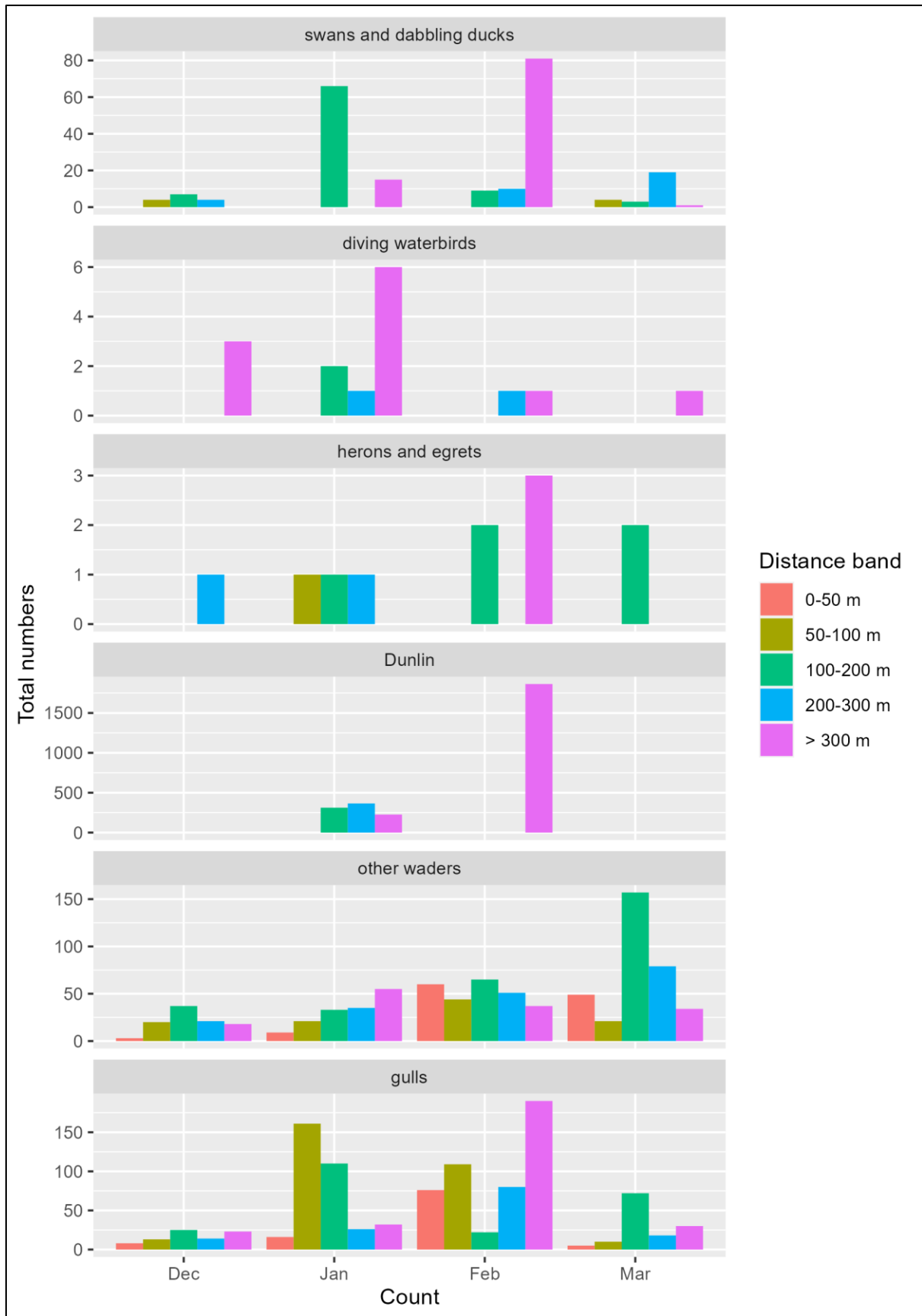


Figure 3.2. Distance band distribution on the low tide counts in the RE and RW sectors.

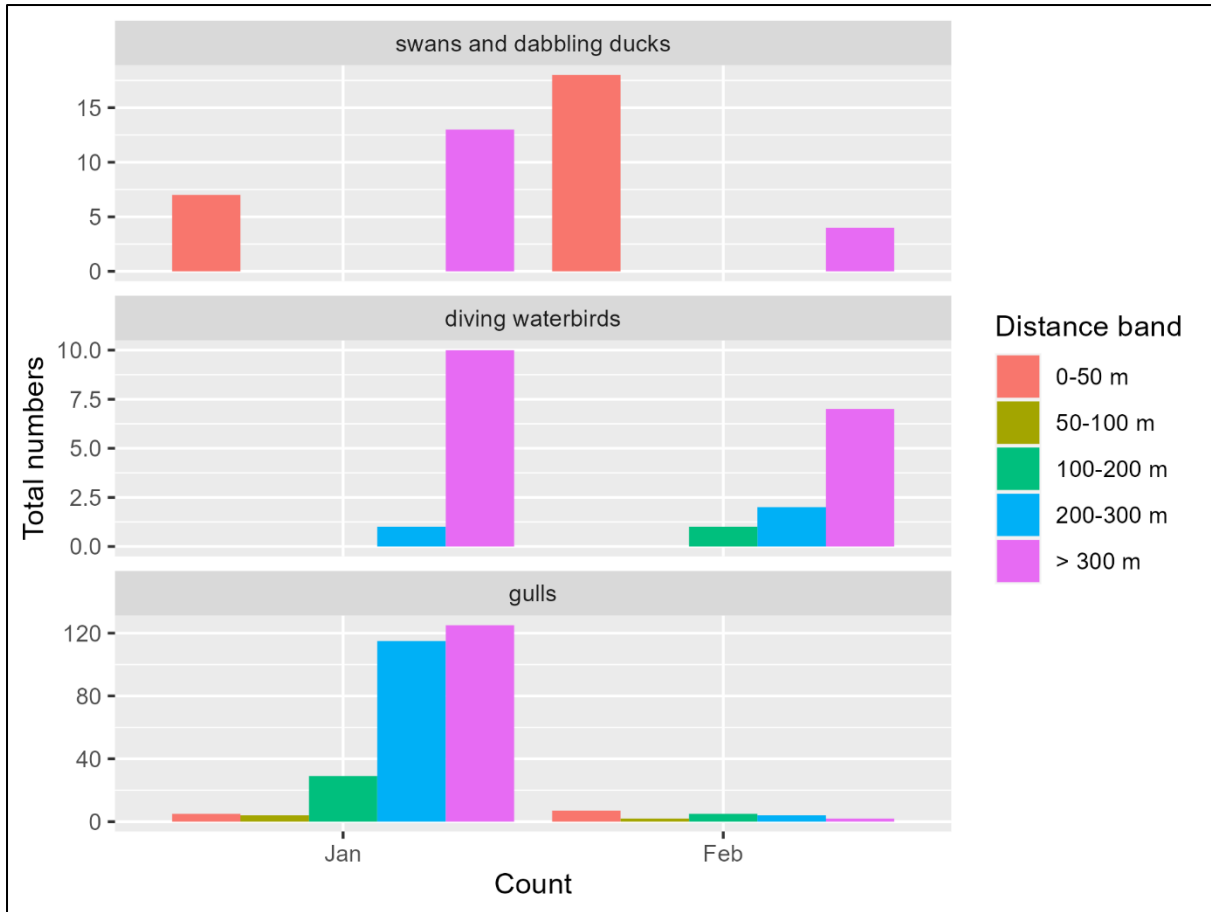
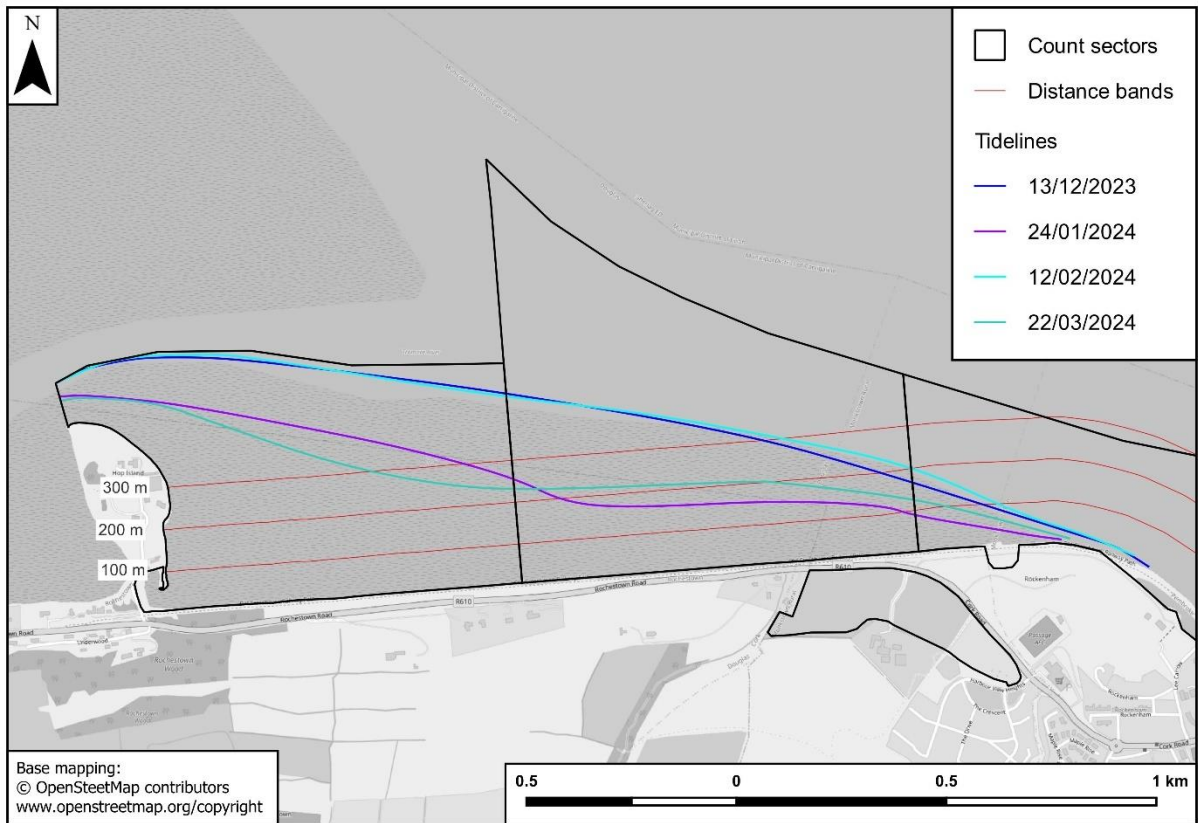
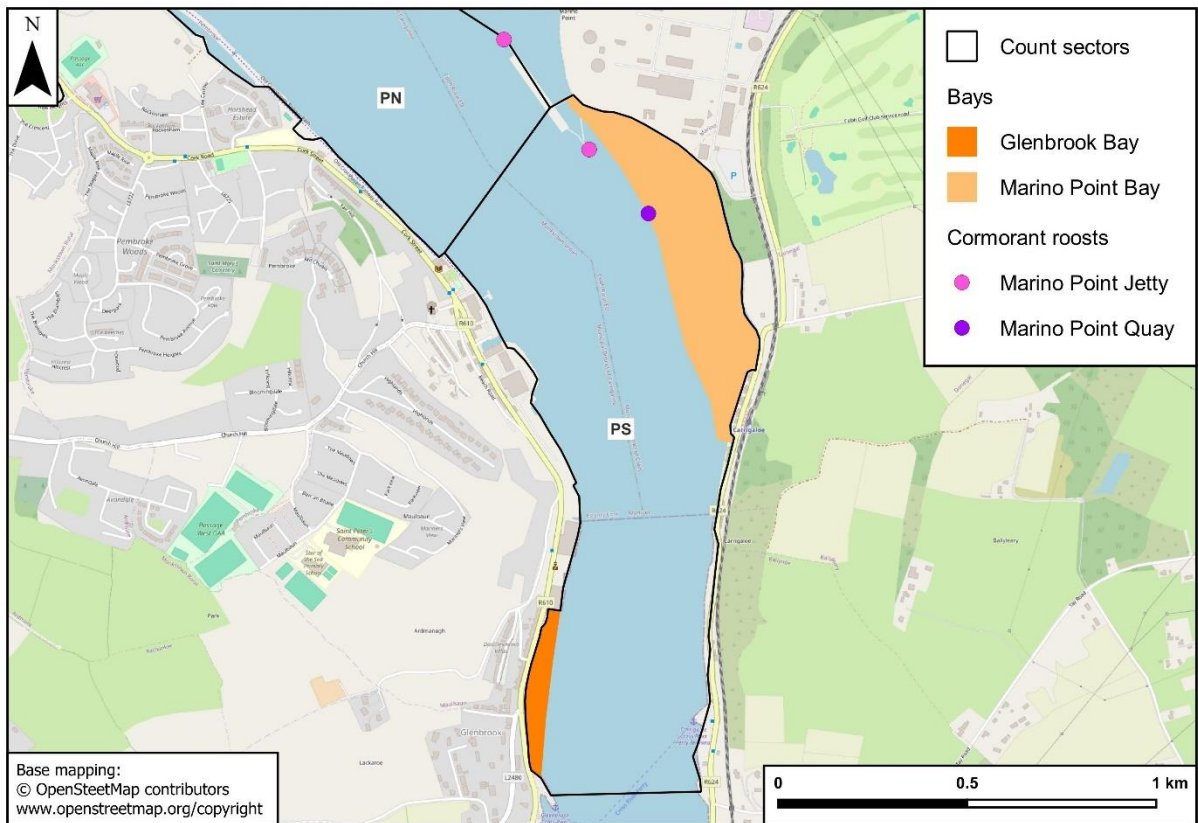


Figure 3.3. Distance band distribution on the high tide counts in the RE, RW and PN sectors.



Map 3.1. Tidelines in the RW, RE and PN (western end) count sectors during the low tide counts.



Map 3.2. Locations of Glenbrook and Marino Point Bays, and the Cormorant roosts.

4. CONCLUSIONS

Lough Mahon supports large populations of waterbirds that feed on the extensive areas of intertidal habitat that are exposed at low tide and mainly roost in the Douglas Estuary at high tide. These waterbirds use the mudflats on the southern shore of Lough Mahon east of Hop Island as part of the overall intertidal habitat complex in Lough Mahon. The birds using these mudflats appear to be habituated to disturbance from pedestrians and cyclists on the existing greenway that runs along the shoreline.

The proposed upgrade to the Passage West Pedestrian and Cycle Route runs along the easternmost section of the southern shoreline of Lough Mahon, where the Lough Mahon mudflats narrow, and then along the confluence of Lough Mahon with the West Passage Channel where the intertidal zone is negligible. These areas did not support significant numbers of any waterbird species.

Glenbrook Bay is a small bay on the western side of the West Passage Channel just to the north of the Glenbrook Ferry Port. This area did not support significant numbers of any waterbird species.

There are no known high tide roosts in this section of Cork Harbour and no high tide roosts were recorded in these surveys. A Cormorant day roost was recorded on a concrete platform offshore from an old quay to the south of Marino Point. A large Herring Gull night roost was recorded in the West Passage Channel on one count which coincided with dusk.

REFERENCES

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Appendix 1 Waterbird survey datasets

WATERBIRD SURVEY DATA TABLES ACCOMPANYING THIS REPORT

Filename: PWPCR_2023_24_count_data.csv		
Contents: Waterbird count data		
Field	Data type	Details
Date	Date	Count date
Tide	Text	HT = high tide LT = low tide
Sector	Text	Count sector
Division	Text	Sub-divisions of the RE and PS sectors E = eastern sub-division of RE sector W = western sub-division of RE sector GL = Glenbrook Bay in the PS sector MPB = Marino Point Bay in the PS sector
Distance	Text	Distance band from the shoreline: 0 = 0-50 m 50 = 50-100 m 100 = 100-200 m 200 = 200-300 m 300 = > 300 m X = not assessed Note: distance bands were not recorded for the PS sector or for birds with behaviour classified as Y2
Zone	Text	INT = intertidal SUB = subtidal SUP = supratidal TERR = terrestrial AQU = terrestrial (aquatic) See Lewis and Tierney (2014) for definitions
Roost	Text	Code identifying Cormorant roost locations: MPQ = Marino Point quay MPJ = Marino Point jetty
Species	Text	BTO species code Mammals: OTTE = Otter
Number	Integer	Species count
Behaviour	Text	F = feeding R = roosting H = flushed Y1 = flying (included in count totals) Y2 = flying (not included in count totals)
Quality	Text	Count quality: OK or LOW
DC_count	Text	Overall count double-count: YES or NO
DC_sector	Text	Sector double count: YES or NO
DC_distance	Text	Distance band double-count: YES or NO
Ref	Integer	Identifier for cross-referencing to flock maps
Notes	Text	Free-form field for any additional notes: e.g., location details, movements, behaviour, etc.

Filename: PWPCR_2023_24_count_details.csv		
Contents: Waterbird count timings and conditions		
Field	Data type	Details
Date	Date	Count date
Tide	Text	HT = high tide LT = low tide
Sector	Text	Count sector
Time_start	Time	Start time of sector count
Time_finish	Time	End time of sector count
Cloud	Integer	Cloud cover during count: 1 = 0-33% 2 = 34-66% 3 = 67-100%
Rain	Integer	Rainfall during count: 1 = no rain 2 = light showers/drizzle 3 = heavy shows/rain 4 = heavy rain
Wind_direction	Text	Compass bearing
Wind_speed	Integer	Beaufort scale
Visibility	Integer	Visibility during count: 1 = good 2 = moderate 3 = poor 4 = very poor
Waterbirds	Text	YES = waterbirds recorded NO = no waterbirds recorded
Notes	Text	Free-form field for any relevant additional details: e.g., further details when reduced visibility was recorded

WATERBIRD SURVEY GIS DATASETS ACCOMPANYING THIS REPORT

Filename: PWPCR_2023_24_count_sectors_polygon.shp		
Contents: Count sector boundaries		
Field	Data type	Details
Code	Text	Count sector code
Sector	Text	Count sector name

Filename: PWPCR_2023_24_count_sector_divisions_polygon.shp		
Contents: Count sector boundaries		
Field	Data type	Details
Code	Text	Count sector code
Sector	Text	Count sector name
Division	Text	Sub-division used in counts

Filename: PWPCR_2023_24_distance_bands_polyline.shp		
Contents: Distance bands from the shoreline		
Field	Data type	Details
Distance_m	Integer	Distance from the shoreline (m)

Filename: PWPCR_2023_24_tidelines_polyline.shp		
Contents: Low tide tidelines		
Field	Data type	Details
Date	Date	Count date

Filename: PWPCR_2023_24_flocks_polygon.shp		
Contents: Low tide tidelines		
Field	Data type	Details
Date	Date	Count date
Ref	Integer	Identifier for cross-referencing to count data

REFERENCE

Lewis, L.J. & Tierney, T.D. (2014). Low Tide Waterbird Surveys: Survey Methods and Guidance Notes. Irish Wildlife Manuals, No. 80. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht, Ireland.

Appendix C. Summer Birds



Appendix 1

Breeding Bird survey data

Table 1. Breeding bird survey April visit (Early Visit)

Transect Number	Bird Species	BTO Code	0-25m	25-100m	>100m	Flying (F)	Number in total
1	Magpie	MG	1				1
	Wren	WR		1			1
	Cormorant	CA	1			1	1
	Blackbird	B.	1				1
	Wren	WR		1			1
	Rook	RO	1				1
	Cormorant	CA			1	1	1
	Robin	R.		1			1
	Wren	WR		2			2
	Rook	RO			20		20
	Woodpigeon	WP		1			1
	Wren	WR		1			1
	Jay	J.			1		1
	Goldfinch	GO	1				1
	Rook	RO	1				1
	Blackbird	B.	1			1	1
	Robin	R.		1			1
	Blackcap	BC		1			1
Wren	WR		1			1	
2	Rook	RO	1				1
	Wren	WR	1				1
	Dunnock	D.	1				1
	Woodpigeon	WP	1				1
	Chiffchaff	CC	1				1
	Jay	J.		1			1
	Blackcap	BC		1			1
	Robin	R.	1				1
	Chiffchaff	CC		2			2
	Jay	J.			1		1
	Robin	R.		1			1
	Wren	WR		1			1
	Rook	RO			5		5
	Chiffchaff	CC		1			1
	Woodpigeon	WP			1		1
	Blackbird	B.		1			1
	Blackcap	BC		1			1
	Turnstone	TT	1				1
	Robin	R.	2			2	2
	Wren	WR		1			1
Robin	R.			1		1	
3	Woodpigeon	WP	2				2
	Dunnock	D.		1			1
	Robin	R.		1			1

	Rook	RO			1		1
	Wren	WR		1			1
	Chiffchaff	CC	1				1
	Robin	R.		1			1
	Chiffchaff	CC			1		1
	Blackbird	B.	2				2
	Woodpigeon	WP	1				1
	Rook	RO	2			2	2
	Chiffchaff	CC	1				1
	Herring gull	HG			4	4	4
	Woodpigeon	WP			1		1
	Dunnock	D.		1			1
	Chiffchaff	CC		1			1
	Blackcap	BC		1			1
	Robin	R.		1			1
	Dunnock	D.		1			1
	Chiffchaff	CC			1		1
	Rook	RO			1		1
	Woodpigeon	WP	1				1
	Dunnock	D.		1			1
	Robin	R.		1			1
	Woodpigeon	WP			1		1
4	Chiffchaff	CC	1				1
	Blackcap	BC	1				1
	Dunnock	D.		1			1
	Woodpigeon	WP		2			2
	Robin	R.	1				1
	Wren	WR	1				1
	Chiffchaff	CC		1			1
	Wren	WR		1			1
	Rook	RO			1		1
	Chiffchaff	CC	1				1
	Blackcap	BC		1			1
	Robin	R.	1				1
	Chiffchaff	CC			1		1
	Wren	WR		1			1
	Chaffinch	CH	1				1
	Jackdaw	JD			1		1
	Chaffinch	CH		1			1
	Robin	R.		1			1
	Blackcap	BC	1				1
	Chiffchaff	CC		1			1
	Woodpigeon	WP			2		2
	Wren	WR		1			1
	Dunnock	D.		1			1
	Robin	R.	1				1

	Chaffinch	CH		1		1
	Robin	R.		1		1
	Woodpigeon	WP			1	1
	Woodpigeon	WP	1			1
	Wren	WR		1		1
	Blackcap	BC		1		1
5	Wren	WR		1		1
	Dunnock	D.		1		1
	Robin	R.		1		1
	Woodpigeon	WP			1	1
	Blackcap	BC		1		1
	Chiffchaff	CC			1	1
	Wren	WR		1		1
	Blackcap	BC		1		1
	Wren	WR			1	1
	Woodpigeon	WP	1			1
	Song thrush	ST			1	1
	Robin	R.	1			1
	Blackcap	BC		1		1
	Blue tit	BT		1		1
	Chaffinch	CH		1		1
	Song thrush	ST		1		1
	Chiffchaff	CC		1		1
	Willow warbler	WW		1		1
	Goldfinch	GO			1	1
	Robin	R.		1		1
	Robin	R.			1	1
	Song thrush	ST			1	1
	Robin	R.	1			1
	Dunnock	D.		1		1
Chiffchaff	CC		1		1	
House sparrow	HS			1	1	
6	Chiffchaff	CC		1		1
	Robin	R.	1			1
	Dunnock	D.		1		1
	Wren	WR		1		1
	Jackdaw	JD			1	1
	Herring gull	HG	2			2
	Blue tit	BT		1		1
	Robin	R.	1			1
	Wren	WR		1		1
	Jackdaw	JD			2	2
	Goldfinch	GO			1	1
	Grasshopper warbler	GH		1		1
	Blue tit	BT		1		1
	Robin	R.	1			1

	Goldfinch	GO			1		1
	Goldfinch	GO		1			1
	Jackdaw	JD			1		1
	Robin	R.	1				1
	Song thrush	ST		1			1
	Grasshopper warbler	GH			1		1
	Great tit	GT	1				1
	Goldfinch	GO		1			1
	Blue tit	BT	1				1
	Great tit	GT	1				1
	Great tit	GT		1			1
	Woodpigeon	WP	1				1
	Robin	R.		1			1
	Robin	R.	1				1
	Grasshopper warbler	GH		1			1
	Robin	R.	2			2	2
	Chaffinch	CH		1			1
	Rook	RO		1		1	1
	Chiffchaff	CC			1		1
7	Chiffchaff	CC	1				1
	Wren	WR	1				1
	Chiffchaff	CC		1			1
	Wren	WR	1				1
	Goldfinch	GO		1			1
	Teal	T.	2				2
	Wren	WR		1			1
	Woodpigeon	WP			1		1
	Jackdaw	JD		1			1
	Wren	WR	1				1
	Woodpigeon	WP			1		1
	House sparrow	HS		4			4
	Robin	R.	1				1
	Goldfinch	GO			1		1
	Collared dove	CD			1		1
	Chiffchaff	CC		1			1
	Jackdaw	JD			1	1	1
	Wren	WR		2			2
	Wren	WR		1			1
	Jackdaw	JD	1			1	1
	Robin	R.		1			1
	Chiffchaff	CC			1		1
8	Wren	WR		1			1
	Jackdaw	JD			1		1
	House sparrow	HS		1			1
	Hooded crow	HC			1		1
	House sparrow	HS	4			4	4

	Starling	SG		5		5	5
	House sparrow	HS		10			10
	Woodpigeon	WP		1			1
	Wren	WR	1				1
	Robin	R.		1			1
	Starling	SG		1			1
	Blackcap	BC		2			2
	House sparrow	HS		4			4
	Wren	WR		1			1
	Starling	SG		1			1
	Wren	WR	1				1
	House sparrow	HS	1				1
9	House sparrow	HS		1			1
	Wren	WR	1				1
	Starling	SG		1			1
	Robin	R.	1				1
	Robin	R.		1			1
	Robin	R.	1				1
	Jackdaw	JD		1			1
10	Chiffchaff	CC		1			1
	Wren	WR		1			1
	Chiffchaff	CC		1			1
	Robin	R.	1				1
	Jackdaw	JD				1	1
	Chiffchaff	CC				1	1

Table 2 - Breeding bird survey May visit (Late visit)

Transect Number	Bird Species	BTO Code	0-25m	25-100m	>100m	Flying (F)	Number in total
1	Cormorant	CA	1				1
	Wren	WR		1			1
	Blue tit	BT	1				1
	Magpie	MG		1			1
	Jackdaw	JD			1		1
	Robin	R.	1				1
	Rook	RO		1		1	1
	Blackcap	BC		1			1
	Rook	RO			8		8
	Blackbird	B.	1				1
	Mistle thrush	M.		1			1
	Blackbird	B.		1			1
	Wren	WR		1			1
	Hooded crow	HC	2				2
	Magpie	MG	1			1	1
Chiffchaff	CC		1			1	

	Magpie	MG	1				1
	Grey wagtail	GL	1				1
	Blackcap	BC		1			1
	Wren	WR		1			1
	Hooded crow	HC	1				1
	Goldfinch	GO	1				1
	Hooded crow	HC	5			5	5
	Blackbird	B.	1				1
	Cormorant	CA		1			1
	Goldfinch	GO	1				1
	Wren	WR		1			1
	Hooded crow	HC		1			1
	Woodpigeon	WP	2			2	2
	Chiffchaff	CC			1		1
2	Woodpigeon	WP		1			1
	Hooded crow	HC		1			1
	Blackbird	B.		1			1
	Magpie	MG			1		1
	Blue tit	BT	1				1
	Chiffchaff	CC		1			1
	Woodpigeon	WP			1		1
	Goldcrest	GC		1			1
	Jackdaw	JD			1		1
	Wren	WR		1			1
	Woodpigeon	WP	1				1
	Wren	WR		1			1
	Robin	R.		1			1
	Woodpigeon	WP			2		2
	Robin	R.	1				1
	Woodpigeon	WP		2		2	2
	Blackbird	B.	1				1
	Wren	WR		1			1
	Long-tailed tit	LT		1			1
	Herring gull	HG			1	1	1
	Wren	WR		1			1
3	Woodpigeon	WP			1		1
	Wren	WR		1			1
	Teal	T.	1				1
	Dunnock	D.		1			1
	Woodpigeon	WP			1	1	1
	Long-tailed tit	LT		1			1
	Woodpigeon	WP	1			1	1
	Blackbird	B.		1			1
	Woodpigeon	WP			1		1
	Woodpigeon	WP			1		1
	Woodpigeon	WP		1			1

	Wren	WR		1			1
	Woodpigeon	WP			1		1
	Long-tailed tit	LT		1			1
	Magpie	MG			1	1	1
	Cormorant	CA			1	1	1
	Robin	R.		1			1
	Bullfinch	BF		1			1
	Dunnock	D.		1			1
	House sparrow	HS		3			3
	Hooded crow	HC			1	1	1
4	House sparrow	HS		1			1
	Bullfinch	BF		1			1
	Chaffinch	CH		1			1
	Dunnock	D.		1			1
	Hooded crow	HC	1			1	1
	Blackbird	B.			1		1
	Chaffinch	CH		1			1
	Woodpigeon	WP	1			1	1
	Jackdaw	JD			1		1
	Woodpigeon	WP			1		1
	Woodpigeon	WP	1			1	1
	Common Tern	CN		1		1	1
	Chaffinch	CH	1				1
	Woodpigeon	WP	1				1
	Wren	WR		1			1
	Robin	R.		1			1
	Blackbird	B.			1		1
5	Woodpigeon	WP	1				1
	Robin	R.		1			1
	Jackdaw	JD			1		1
	Woodpigeon	WP	1				1
	Wren	WR		1			1
	Hooded crow	HC			1	1	1
	Chaffinch	CH	1				1
	Wren	WR		1			1
	Robin	R.		1			1
	House sparrow	HS	1				1
	Chaffinch	CH	1				1
	Robin	R.	1				1
	Wren	WR		1			1
	Rook	RO		1			1
	Herring gull	HG			1	1	1
	Wren	WR		1			1
6	Chaffinch	CH		1			1

	Wren	WR		1			1
	Blackbird	B.	1				1
	House sparrow	HS	1				1
	Chaffinch	CH	3			3	3
	Teal	T.	2			2	2
	House sparrow	HS		1			1
	House sparrow	HS	1				1
	House sparrow	HS		5			5
	Wren	WR		1			1
	Chaffinch	CH	1				1
	House sparrow	HS		1			1
	Hooded crow	HC		1		1	1
	Woodpigeon	WP	2			2	2
7	Woodpigeon	WP		1			1
	House sparrow	HS		1			1
	Wren	WR		1			1
	Jackdaw	JD		1			1
	Woodpigeon	WP			2	2	2
	House sparrow	HS			1		1
	Woodpigeon	WP	1				1
	Woodpigeon	WP	1			1	1
	Woodpigeon	WP			1		1
	Hooded crow	HC		1			1
	Blackbird	B.		1			1
	Cormorant	CA			1		1
	Robin	R.		1			1
	Woodpigeon	WP			1		1
	House sparrow	HS		1			1
	Chaffinch	CH	1				1
	Jackdaw	JD	1			1	1
8	Woodpigeon	WP			1		1
	Jackdaw	JD		1			1
	Rook	RO			1		1
	Chaffinch	CH		1			1
	House sparrow	HS		1			1
	Woodpigeon	WP			1		1
	Wren	WR		1			1
	Robin	R.		1			1
	Chaffinch	CH		1			1

	Blackbird	B.	1				1
	Woodpigeon	WP	1				1
	Woodpigeon	WP	1			1	1
	Jackdaw	JD		1		1	1
9	Chaffinch	CH	4				4
	Woodpigeon	WP			1		1
	Woodpigeon	WP	1			1	1
	Jackdaw	JD		1		1	1
	House sparrow	HS	1				1
	Jackdaw	JD	1			1	1
	Chaffinch	CH	1				1
	Wren	WR		1			1
	House sparrow	HS		1			1
	Chaffinch	CH	1				1
10	Jackdaw	JD	1			1	1
	Wren	WR		1			1
	Chiffchaff	CC		1			1
	Woodpigeon	WP			1	1	1
	Chaffinch	CH	1				1
	Blackbird	B.		1			1
	Jackdaw	JD		1			1
	House martin	HM		2		2	2
Woodpigeon	WP			1		1	

Dunnoek	0	0	2	1	0	0	0	0	0	0	3
Chiffchaff	2	1	0	0	0	0	0	0	0	1	4
Herring gull	0	1	0	0	1	0	0	0	0	0	2
Chaffinch	0	0	0	3	2	5	1	2	6	1	20
Jackdaw	1	1	0	1	1	0	2	2	2	2	12
Blue tit	1	1	0	0	0	0	0	0	0	0	2
House sparrow	0	0	3	1	2	9	3	1	2	0	21
Teal	0	0	1	0	0	2	0	0	0	0	3
Hooded crow	9	1	1	1	1	1	1	0	0	0	15
Mistle thrush	1	0	0	0	0	0	0	0	0	0	1
Grey wagtail	1	0	0	0	0	0	0	0	0	0	1
Goldcrest	0	1	0	0	0	0	0	0	0	0	1
Long-tailed tit	0	1	2	0	0	0	0	0	0	0	3
Bullfinch	0	0	1	1	0	0	0	0	0	0	2
Common Tern	0	0	0	1	0	0	0	0	0	0	1
House martin	0	0	0	0	0	0	0	0	0	2	2

Table 5 – Summary table including Early and Late Breeding bird survey data & conservation status.

Common Name	Scientific name	Total n. in April	Breeding Status recorded in April	Total n. in May	Breeding Status recorded in May	Conservation status – Green, Amber & Red listed species
Magpie	<i>Pica pica</i>	1	S	5	S,F	Green
Wren	<i>Troglodytes troglodytes</i>	33	S	21	S	Green
Cormorant	<i>Phalacrocorax carbo</i>	2	F	4	F	Amber
Blackbird	<i>Turdus merula</i>	5	S,F	12	S,FL	Green
Rook	<i>Corvus frugilegus</i>	34	S,H,F	11	H,F	Green
Robin	<i>Erithacus rubecula</i>	35	S,H,F	10	H,S	Green
Woodpigeon	<i>Columba palumbus</i>	21	S,H	39	H,S,F	Green
Jay	<i>Garrulus glandarius</i>	3	S	0	-	Green
Goldfinch	<i>Carduelis carduelis</i>	8	S,H	2	S	Green
Blackcap	<i>Sylvia atricapilla</i>	12	H,S	2	H	Green
Dunnoek	<i>Prunella modularis</i>	10	S,H	3	S	Green
Chiffchaff	<i>Phylloscopus collybita</i>	26	H	4	H	Green

Turnstone	<i>Arenaria interpres</i>	1	Fo.	0	-	Green
Herring gull	<i>Larus argentatus</i>	6	F	2	F	Amber
Chaffinch	<i>Fringilla coelebs</i>	5	H,S	20	S,FL	Green
Jackdaw	<i>Corvus monedula</i>	11	F,S	12	H,F	Green
Song thrush	<i>Turdus philomelos</i>	4	S	0	-	Green
Blue tit	<i>Cyanistes caeruleus</i>	4	S,H	2	S,H	Green
Willow warbler	<i>Phylloscopus trochilus</i>	1	S	0	-	Green
House sparrow	<i>Passer domesticus</i>	26	S,F	21	H,S	Amber
Grasshopper warbler	<i>Locustella naevia</i>	3	S	0	-	Amber
Great tit	<i>Parus major</i>	3	S,H	0	-	Green
Teal	<i>Anas crecca</i>	2	Fo.*	3	Fo.	Amber
Collared dove	<i>Streptopelia decaocto</i>	1	S	0	-	Green
Hooded crow	<i>Corvus cornix</i>	1	H	15	H,F	Green
Starling	<i>Sturnus vulgaris</i>	8	S,F	0		Amber
Mistle thrush	<i>Turdus viscivorus</i>	0	-	1	S	Green
Grey wagtail	<i>Motacilla cinerea</i>	0	-	1	H	Red
Goldcrest	<i>Regulus regulus</i>	0	-	1	S	Green
Long-tailed tit	<i>Aegithalus caudatus</i>	0	-	3	H	Green
Bullfinch	<i>Pyrrhula pyrrhula</i>	0	-	2	S	Green
Common Tern	<i>Sterna hirundo</i>	0	-	1	F	Amber
House martin	<i>Delichon urbicum</i>	0	-	2	F	Amber

*Fo. – Foraging

Transect 1- This transect is located at the most western section of the proposed works route. It is surrounded by treelines and grassy verges to the south and grassy verges and the estuary habitat to the north. Birds exhibiting breeding activity, primarily singing males or the presence of species in suitable nesting habitat, within this transect included a range of common passerine and corvids species including magpie, jay, wren, blackbird, rook, robin, blackcap, mistle thrush, goldfinch and chiffchaff. The proposed works footprint along transect 1 and its immediate environs do not provide suitable breeding habitat for waterbird species.

Transect 2- This transect is located following on from Transect 1, with the Passage West Greenway carpark to the south, followed by treelines and broadleaved woodland. Treelines, grassy verges and estuarine habitat is to the north of this transect. Birds exhibiting breeding activity, primarily singing males or the presence of species in suitable nesting habitat, within this transect included similar species to Transect 1, woodpigeon, hooded crow, blackbird, magpie, blue tit, chiffchaff, goldcrest,

jackdaw, jay, wren, robin and long-tailed tit. The proposed works footprint along transect 2 and its immediate environs do not provide suitable breeding habitat for waterbird species.

Transect 3- This transect is located following on from Transect 2, with broadleaved woodland habitat to the south and treelines, broadleaved woodland, grassy verges and estuarine habitat to the north. Birds exhibiting breeding activity, primarily singing males or the presence of species in suitable nesting habitat, within this transect included similar species to Transect 1 & 2, woodpigeon, dunnock, robin, wren, chiffchaff, blackbird, blackcap, rook, long-tailed tit and bullfinch. The proposed works footprint along Transect 3 and its immediate environs do not provide suitable breeding habitat for waterbird species.

Transect 4- This transect is located following on from Transect 3, with broadleaved woodland habitat to the south and treelines and estuarine habitats to the north. Birds exhibiting breeding activity, primarily singing males or the presence of species in suitable nesting habitat, within this transect included chiffchaff, blackcap, dunnock, woodpigeon, robin, wren, rook, jackdaw, bullfinch and chaffinch. The common tern was recorded flying on the estuary side of the transect. The proposed works footprint along Transect 4 and its immediate environs do not provide suitable breeding habitat for waterbird species, but common terns can be found nesting/breeding on the other side of the estuary.

Transect 5- This transect is located following on from Transect 4, with treeline, grassy verges and sea inlets and bays habitat to the south and grassy verges, treelines and estuarine habitats to the north. Birds exhibiting breeding activity, primarily singing males or the presence of species in suitable nesting habitat, within this transect included wren, dunnock, robin, woodpigeon, blackcap, song thrush, blue tit, chaffinch, willow warbler, goldfinch, house sparrow, jackdaw and rook.

Transect 6- This transect is located following on from Transect 5, with treeline, grassy verges and sea inlets and bays habitat to the south and grassy verges, treelines and estuarine habitats to the north. Birds exhibiting breeding activity, primarily singing males or the presence of species in suitable nesting habitat, within this transect included chiffchaff, robin, dunnock, wren, jackdaw, blue tit, goldfinch, song thrush, grasshopper warbler, great tit, woodpigeon, blackbird, house sparrow, and chaffinch. Teal was recorded foraging within the sea inlet and bays habitat.

Transect 7- This transect is located following on from Transect 6, with treeline, grassy verges and sea inlets and bays habitat to the south and estuarine habitat to the north. Birds exhibiting breeding activity, primarily singing males or the presence of species in suitable nesting habitat, within this transect included chiffchaff, wren, goldfinch, woodpigeon, jackdaw, house sparrow, robin, blackbird, collared dove and hooded crow. Teal was again recorded foraging within the sea inlet and bays habitat, further east. Cormorant was recorded foraging within the estuarine habitat. The proposed works footprint along Transect 7 and its immediate environs do not provide suitable breeding habitat for waterbird species. Most breeding waterbird species breed further west, outside the proposed works route or on the opposite site of the estuary.

Transect 8- This transect is located following Transect 7, with grassy verges, treelines and parkland/amenity grassland to the south and estuarine habitat to the north. Birds exhibiting breeding activity, primarily singing males or the presence of species in suitable nesting habitat, within this transect included wren, jackdaw, house sparrow, hooded crow, woodpigeon, robin, starling, blackcap, rook, chaffinch, and blackbird. Transect 8 and its immediate environs do not provide suitable breeding habitat for waterbird species.

Transect 9- This transect follows on from Transect 8, with amenity grassland, parkland, treelines and built land (car park) to the south and estuarine habitat to the north. Birds exhibiting breeding activity, primarily singing males or the presence of species in suitable nesting habitat, within this transect included house sparrow, wren, starling, robin, jackdaw, chaffinch and woodpigeon. Transect 9 and its immediate environs do not provide suitable breeding habitat for waterbird species.

Transect 10- This transect follows on from Transect 9, with amenity grassland, parkland, treelines and built land (carpark, café and buildings) to the south and estuarine habitat and built land (pier) to the south. Birds exhibiting breeding activity, primarily singing males or the presence of species in suitable nesting habitat, within this transect included chiffchaff, wren, robin, jackdaw, woodpigeon and blackbird. House martins were recorded flying overhead in this transect, it is assumed they may be nesting/breeding within the surrounding built land. Transect 10 and its immediate environs do not provide suitable breeding habitat for waterbird species.

Breeding Status Codes

Non-breeding	
F	Flying over
M	Species observed but suspected to be still on M igration
U	Species observed but suspected to be sU 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 F Ledged 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 seen) 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

Figure 1. Breeding bird Status Codes.

Appendix D. Habitat Map





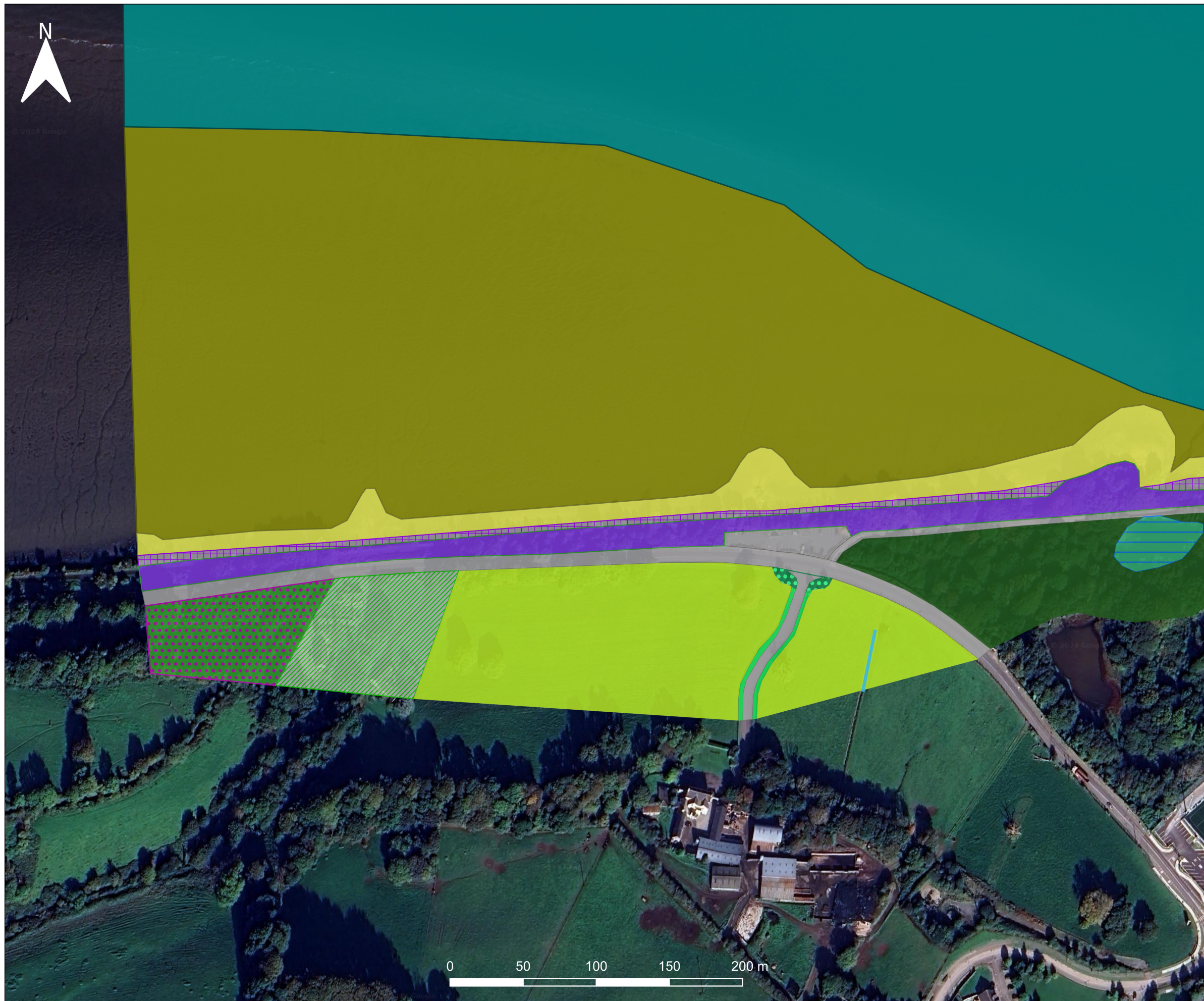
Habitat Map

Legend

Linear Habitats	
FW4	GA2
	LS1
Non-linear Habitats	MW4
*GW	SS3
BL3	WD1
BL3/GA2	WD2/WS1
CC1	WS3
CW1	
GA1	

1. Habitat classifications follow 'A Guide to Habitats In Ireland' (Fossitt, 2000), except where marked by an asterisk (*).









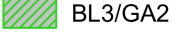

2. Site-specific descriptions of habitats are provided in the Ecological Impact Assessment (AtkinsRéalis doc. ref. 0085669DG0004).





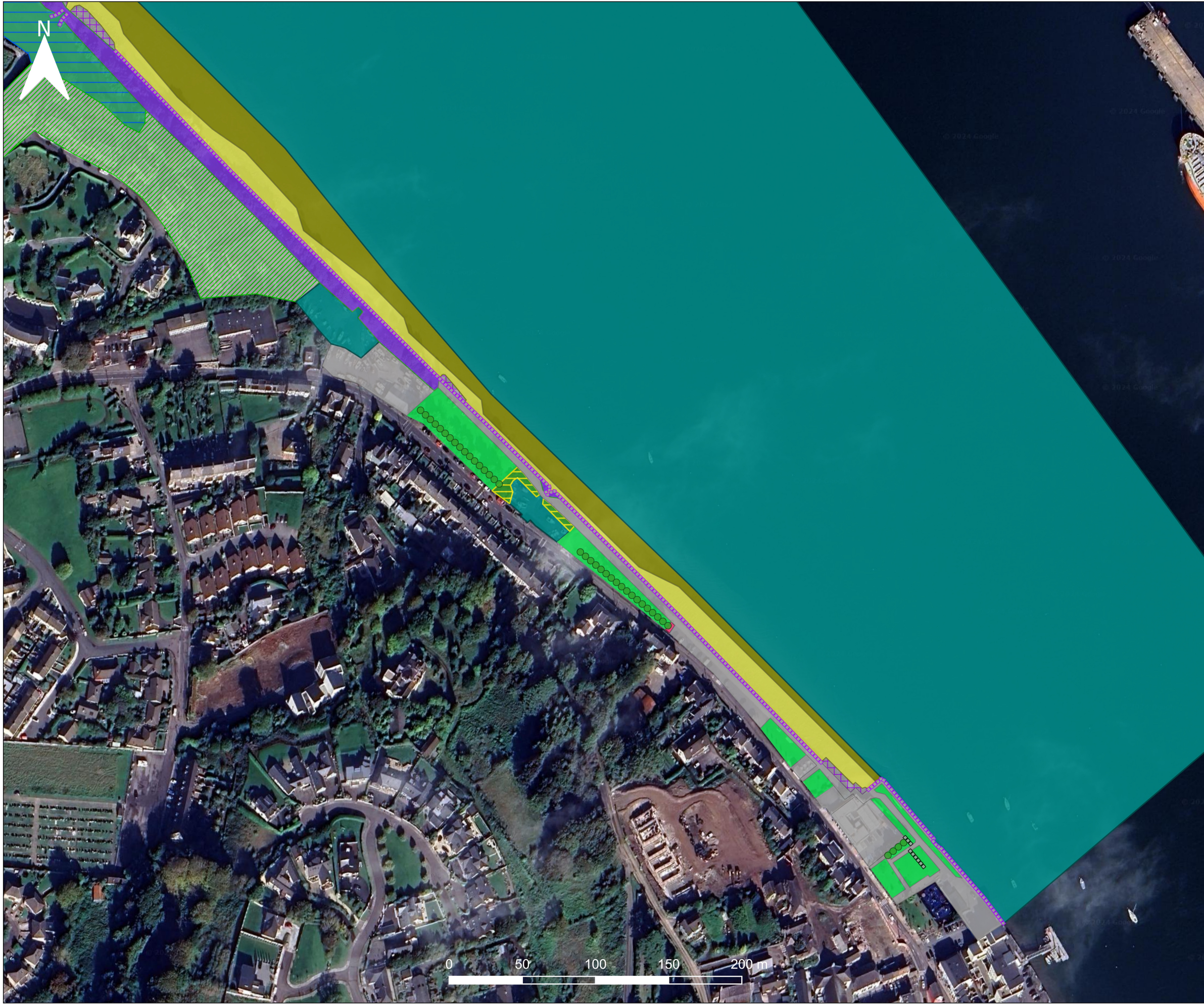
Habitat Map

Legend

Linear Habitats	 CW1
 CC1	 LS1
Non-linear Habitats	 MW4
 *GW	 SS3
 BL3	 WD1
 BL3/GA2	
 CC1	

1. Habitat classifications follow 'A Guide to Habitats In Ireland' (Fossitt, 2000), except where marked by an asterisk (*).
2. Site-specific descriptions of habitats are provided in the Ecological Impact Assessment (AtkinsRéalis doc. ref. 0085669DG0004).





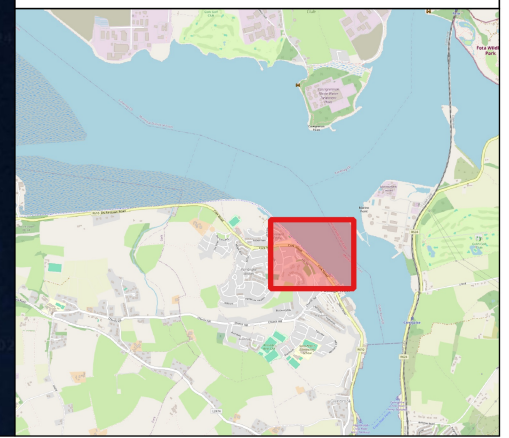
Habitat Map

Legend

Linear Habitats	
BL1	CC1
CC1	CW1
WL2	GA2
	LS1
Non-linear Habitats	
*GW	MW4
BC4	SS3
BL3	WS1
BL3/GA2	

1. Habitat classifications follow 'A Guide to Habitats In Ireland' (Fossitt, 2000), except where marked by an asterisk (*).

2. Site-specific descriptions of habitats are provided in the Ecological Impact Assessment (AtkinsRéalis doc. ref. 0085669DG0004).



Appendix E. Design Drawings

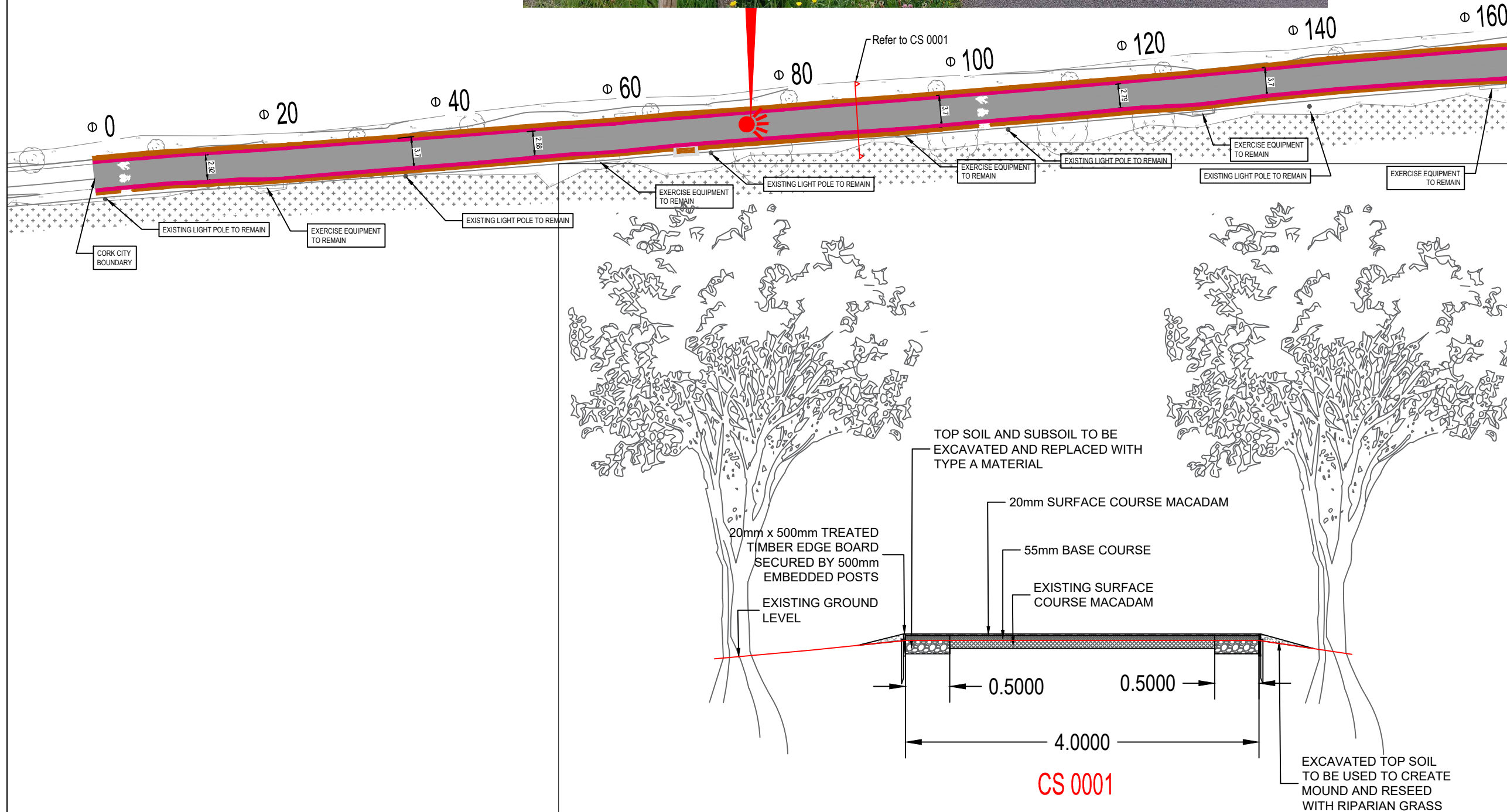




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Legend

Proposed Shared Surface	
Existing Shared Surface	
Excavated top soil to create mound	
Proposed Planter Mix	
Proposed Concrete Footpath	
Proposed Paving	
Existing Paving	
Existing Grass to Remain	
Existing Road to be Resurfaced	
Existing Paving to Remain	
Proposed Tree	
Existing tree to remain	
Existing tree to be removed	
Proposed Native Hedgerow	
Existing Lamp Post	
Proposed Lamp Post	
Proposed Slip Form Kerb	
Proposed Block and Stone Wall	
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Proposed Bench	
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Proposed Location of Level Change	
Proposed Low Shrub Plants	
Proposed Grass	
Repropagate Riparian Grass	



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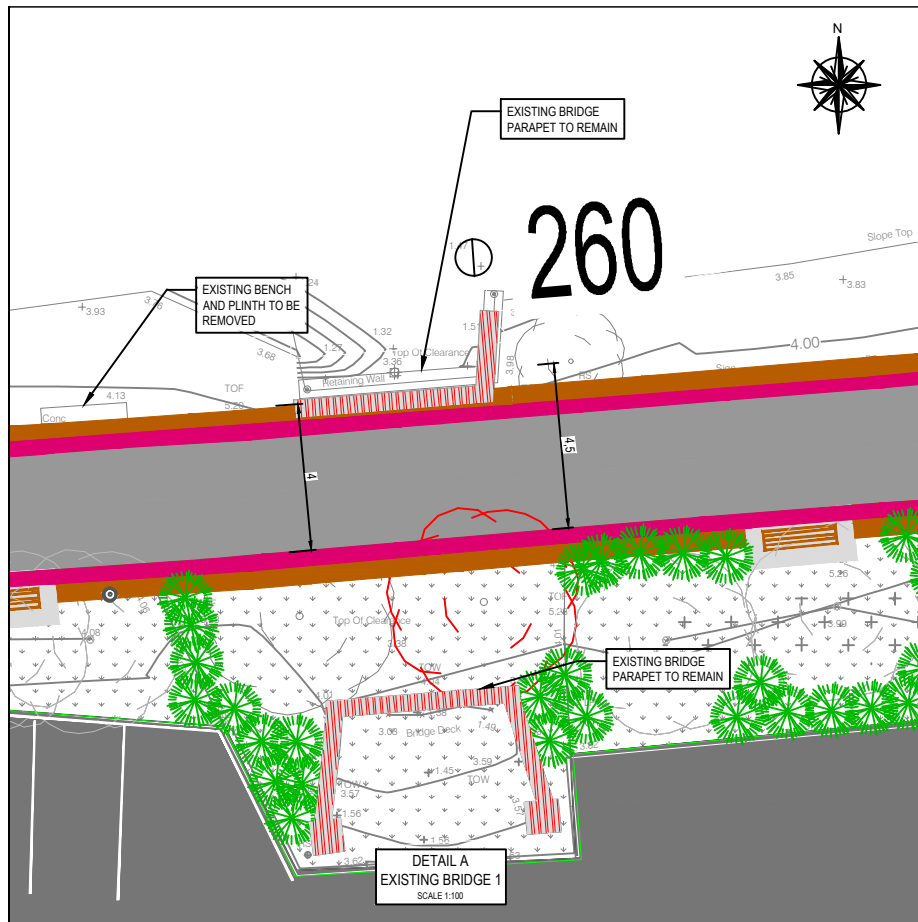
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Comhairle Contae Chorcaí

PROJECT
Passage West
Pedestrian and Cycle Route

TITLE
General Arrangement

Sheet 1 of 12

SCALE @ A1	DATE	DRAWN	CHECKED	APPROVED
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EUONYMUS EUROPAEUS (SPINDLE)
(NATIVE HEDGEROW)



CORYLUS AVELLANA (HAZEL)
(NATIVE HEDGEROW)



WILLOW
(NATIVE HEDGEROW)

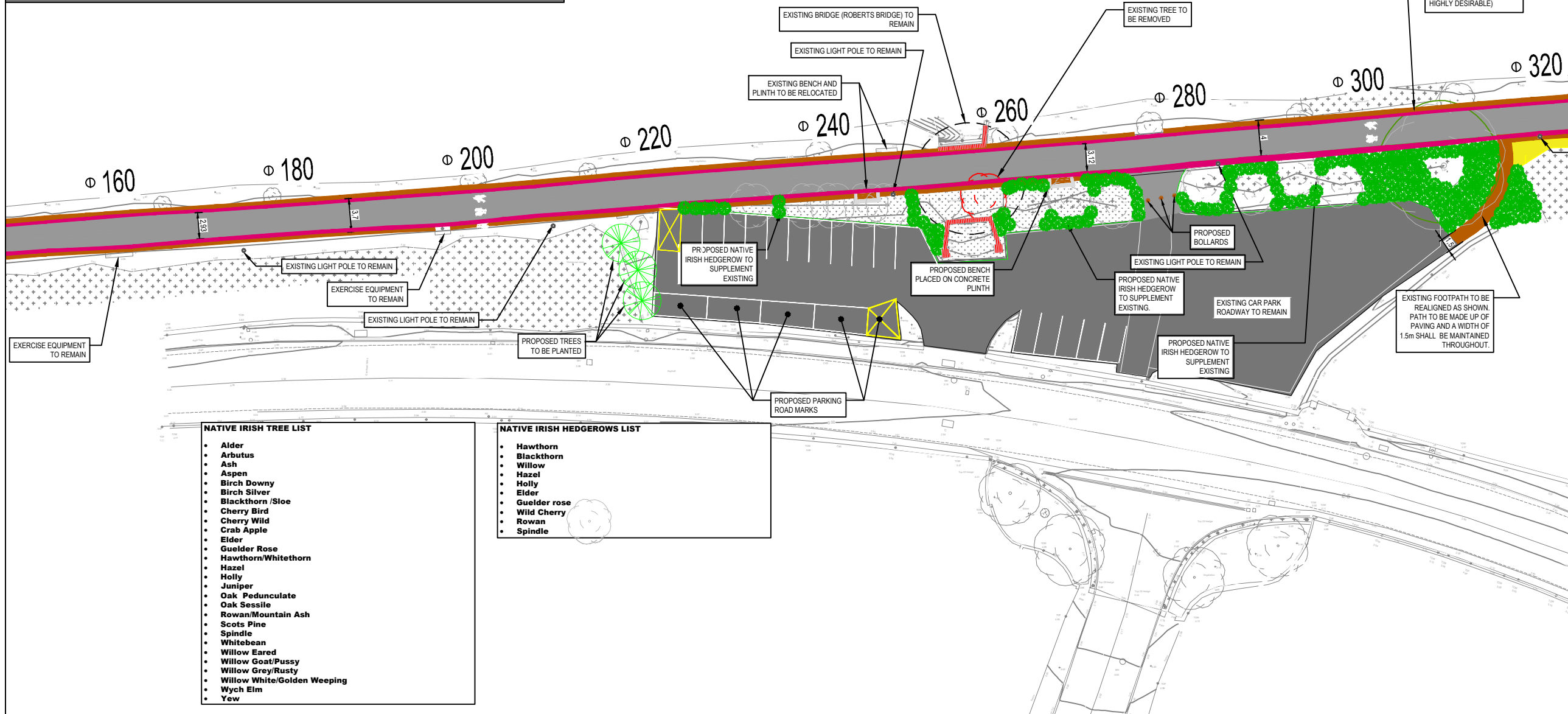


HAWTHORN
(NATIVE HEDGEROW)



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 - Proposed Low Shrub Plants
 - Proposed Grass
 - Repropagate Riparian Grass



- NATIVE IRISH TREE LIST**
- Alder
 - Arbutus
 - Ash
 - Aspen
 - Birch Downy
 - Birch Silver
 - Blackthorn /Sloe
 - Cherry Bird
 - Cherry Wild
 - Crab Apple
 - Elder
 - Guelder Rose
 - Hawthorn/Whitethorn
 - Hazel
 - Holly
 - Juniper
 - Oak Pedunculate
 - Oak Sessile
 - Rowan/Mountain Ash
 - Scots Pine
 - Spindle
 - Whitebean
 - Willow Eared
 - Willow Goat/Pussy
 - Willow Grey/Rusty
 - Willow White/Golden Weeping
 - Wych Elm
 - Yew

- NATIVE IRISH HEDGEROWS LIST**
- Hawthorn
 - Blackthorn
 - Willow
 - Hazel
 - Holly
 - Elder
 - Guelder rose
 - Wild Cherry
 - Rowan
 - Spindle

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Pedestrian and Cycle Route

TITLE
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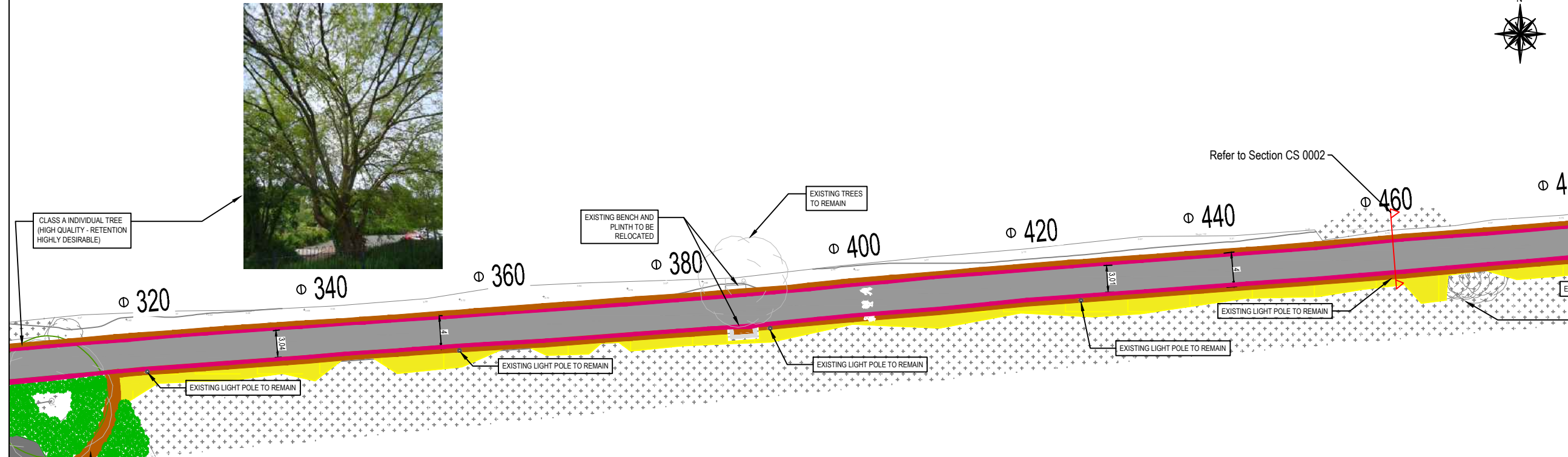
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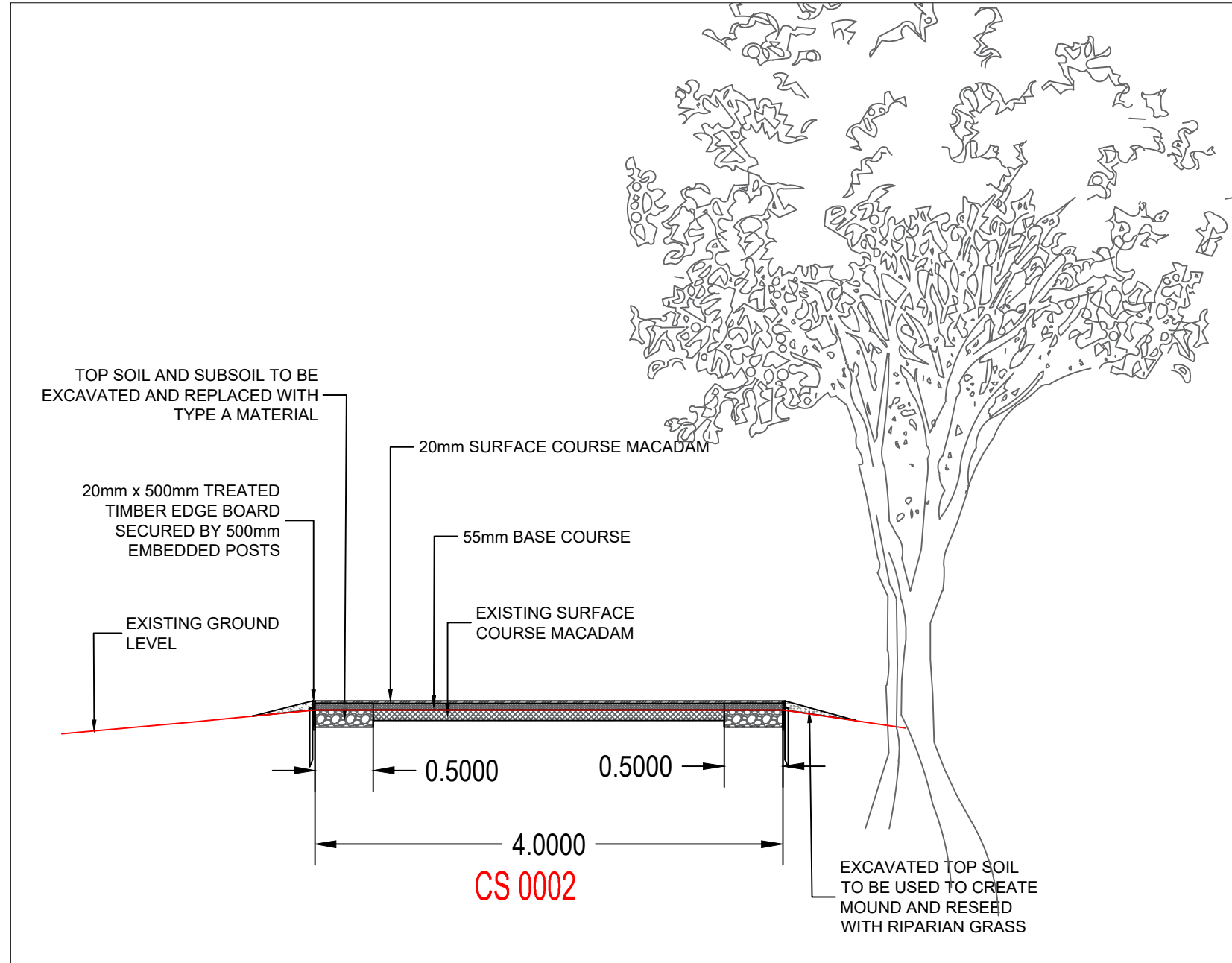
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Proposed Road Marks	
Existing Roadway to remain	
Proposed Solareye Light	
Proposed Location of Level Change	
Proposed Low Shrub Plants	
Proposed Grass	
Repropagate Riparian Grass	



EXISTING FOOTPATH TO BE REALIGNED AS SHOWN. PATH TO BE MADE UP OF PAVING AND A WIDTH OF 1.5m SHALL BE MAINTAINED THROUGHOUT.



- NATIVE IRISH HEDGEROWS LIST**
- Hawthorn
 - Blackthorn
 - Willow
 - Hazel
 - Holly
 - Elder
 - Guelder rose
 - Wild Cherry
 - Rowan
 - Spindle

- NATIVE IRISH TREE LIST**
- Alder
 - Arbutus
 - Ash
 - Aspen
 - Birch Downy
 - Birch Silver
 - Blackthorn /Sloe
 - Cherry Bird
 - Cherry Wild
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 - Juniper
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 - Spindle
 - Whitebean
 - Willow Eared
 - Willow Goat/Pussy
 - Willow Grey/Rusty
 - Willow White/Golden Weeping
 - Wych Elm
 - Yew

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NATIVE IRISH TREE LIST

- Alder
- Arbutus
- Ash
- Aspen
- Birch Downy
- Birch Silver
- Blackthorn /Sloe
- Cherry Bird
- Cherry Wild
- Crab Apple
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- Willow White/Golden Weeping
- Wych Elm
- Yew

NATIVE IRISH HEDGEROWS LIST

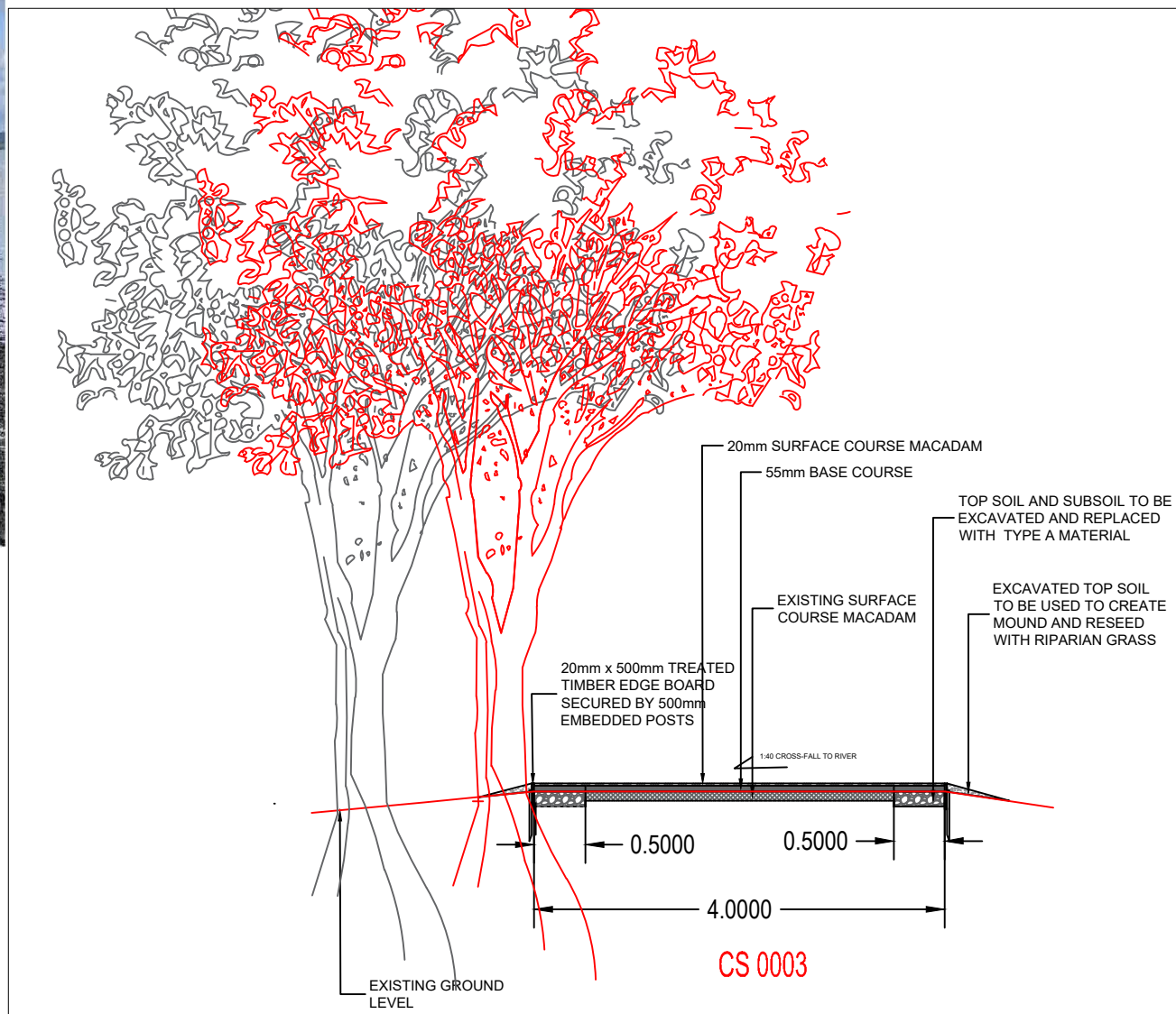
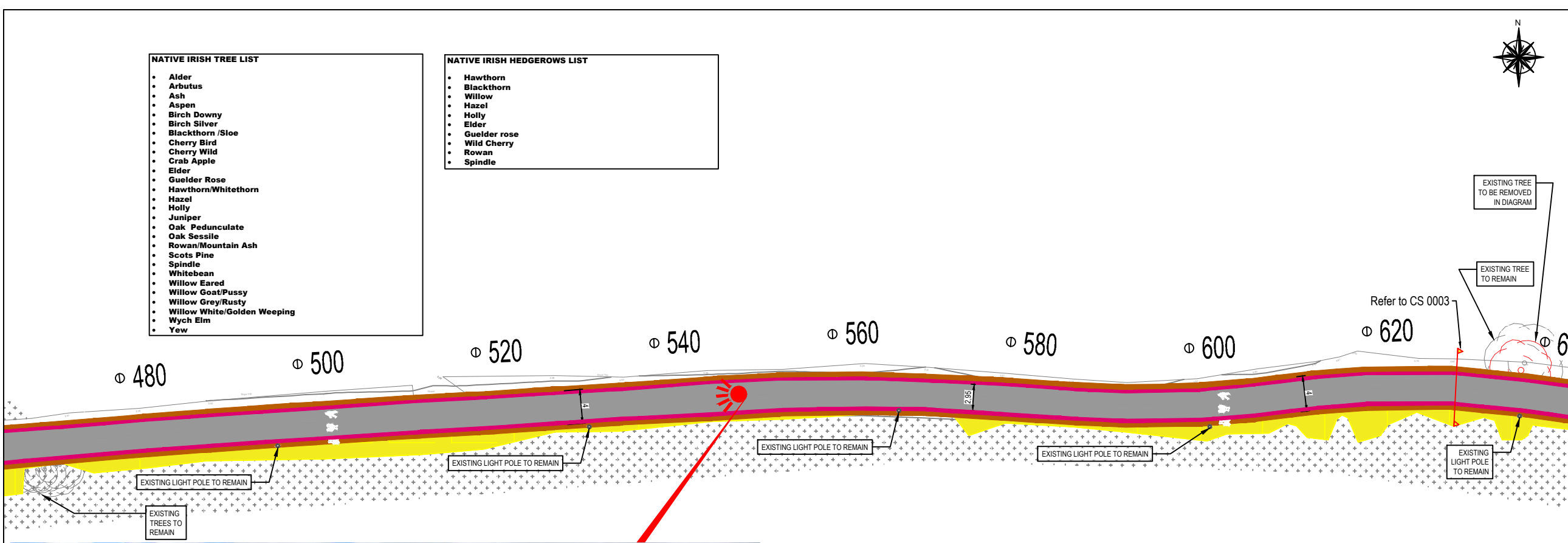
- Hawthorn
- Blackthorn
- Willow
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- Elder
- Guelder rose
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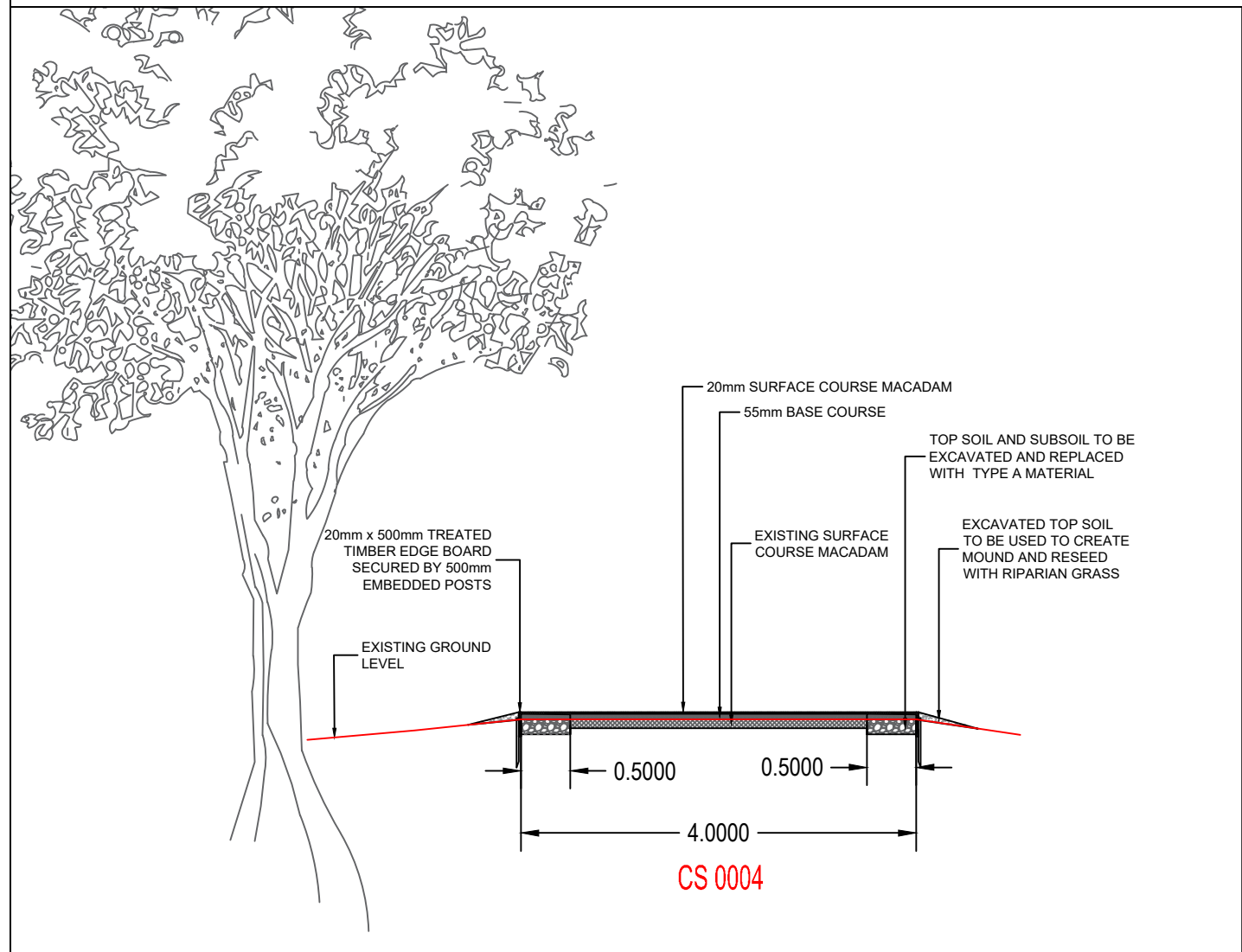
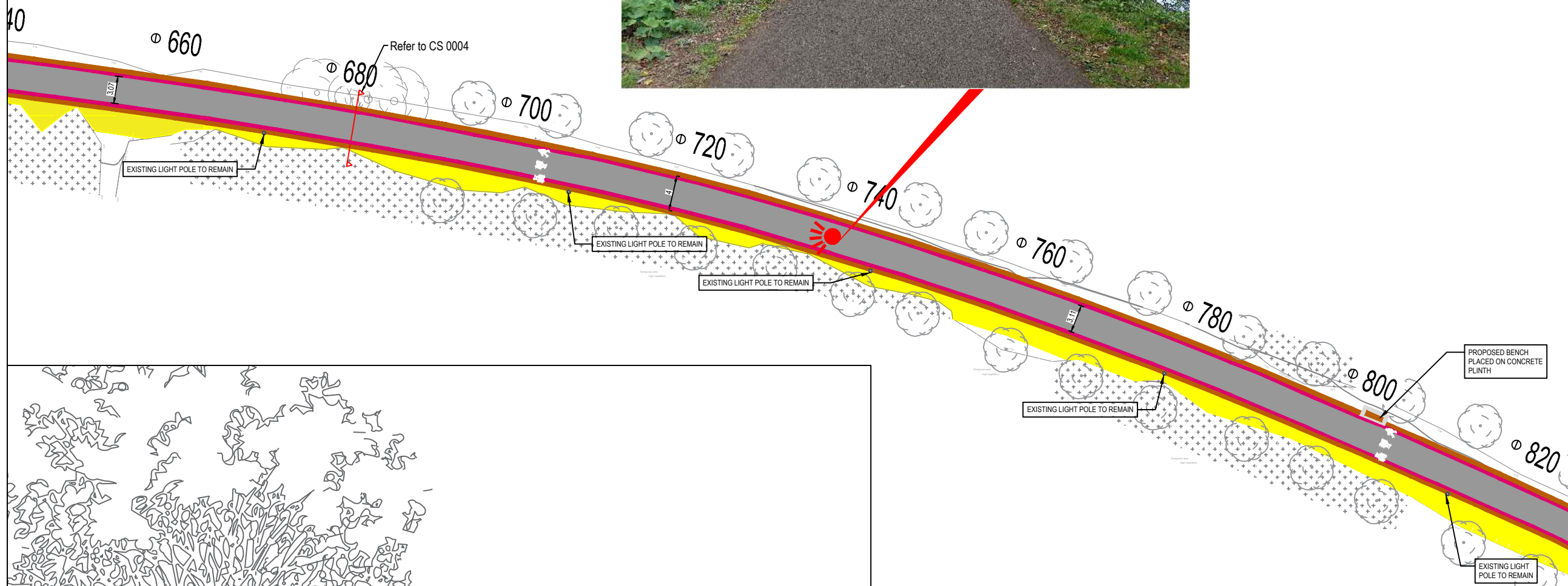
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PROJECT
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Sheet 4 of 12

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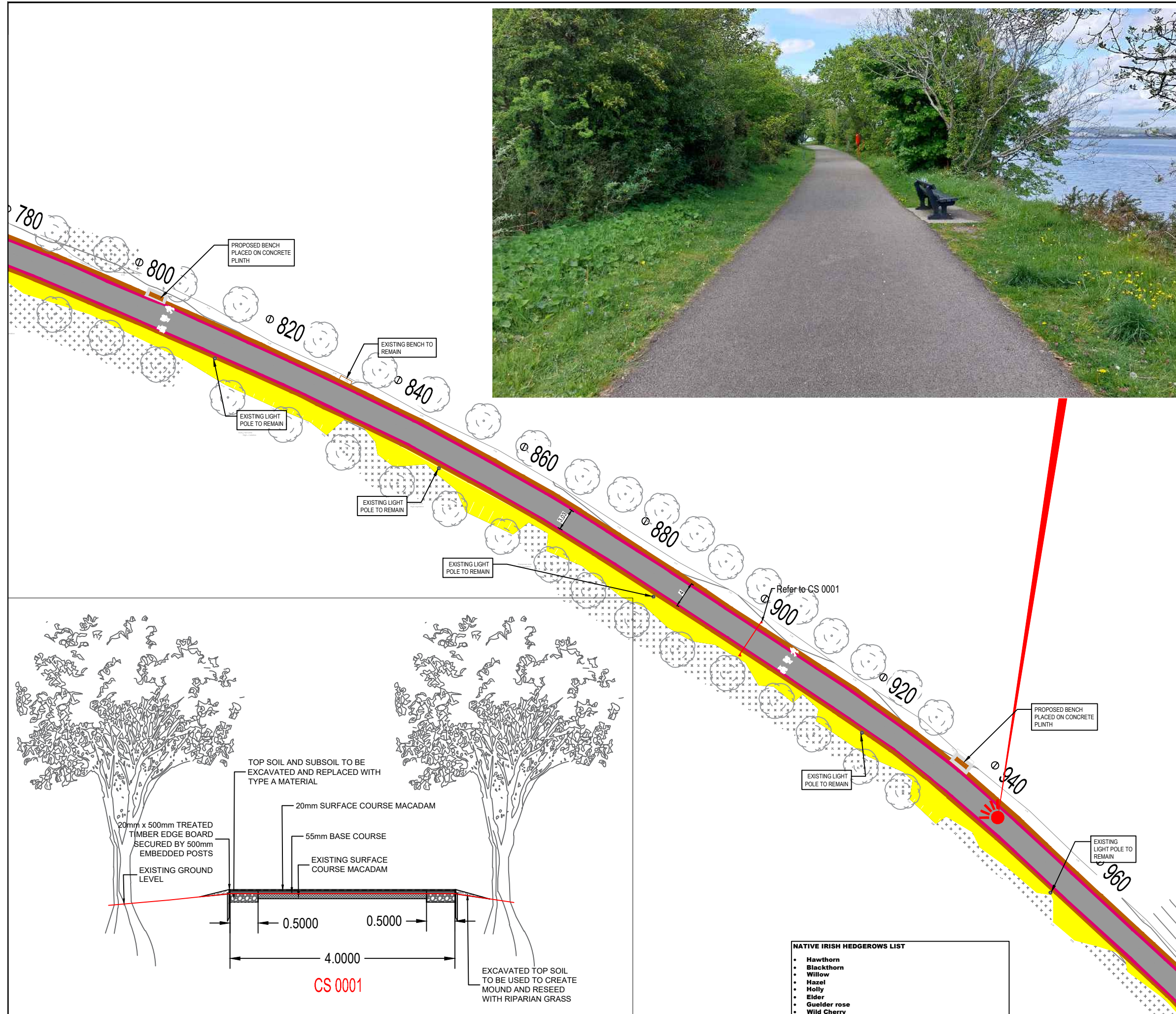
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PROJECT
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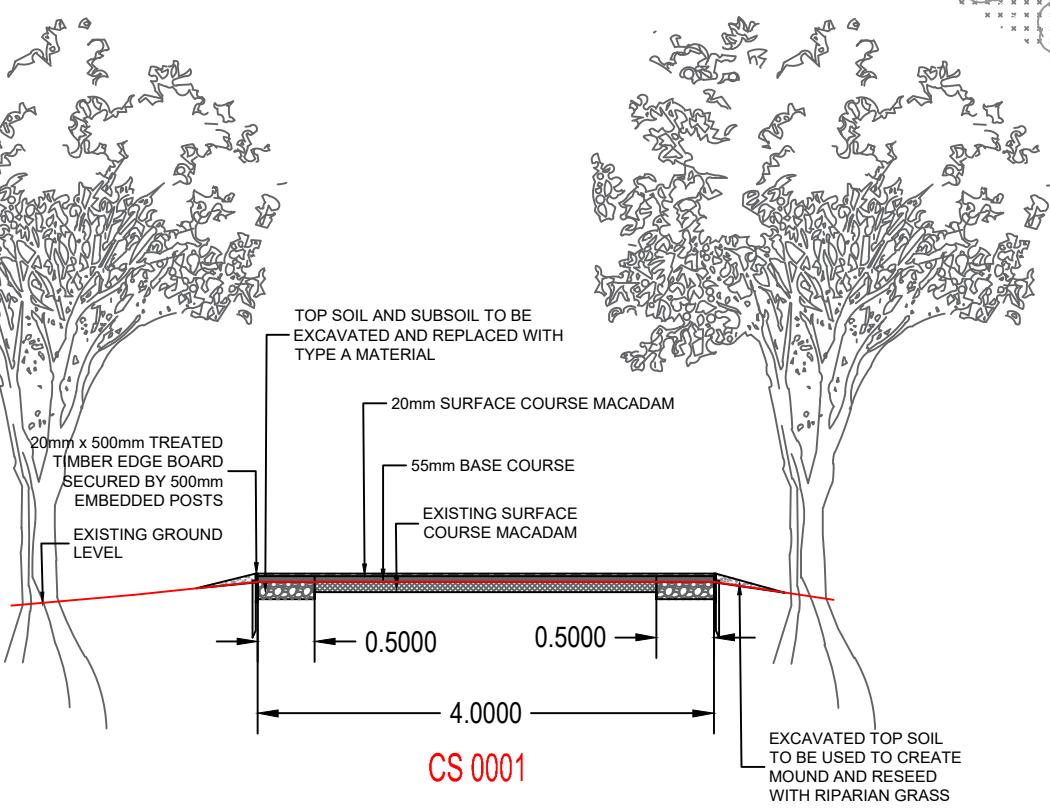


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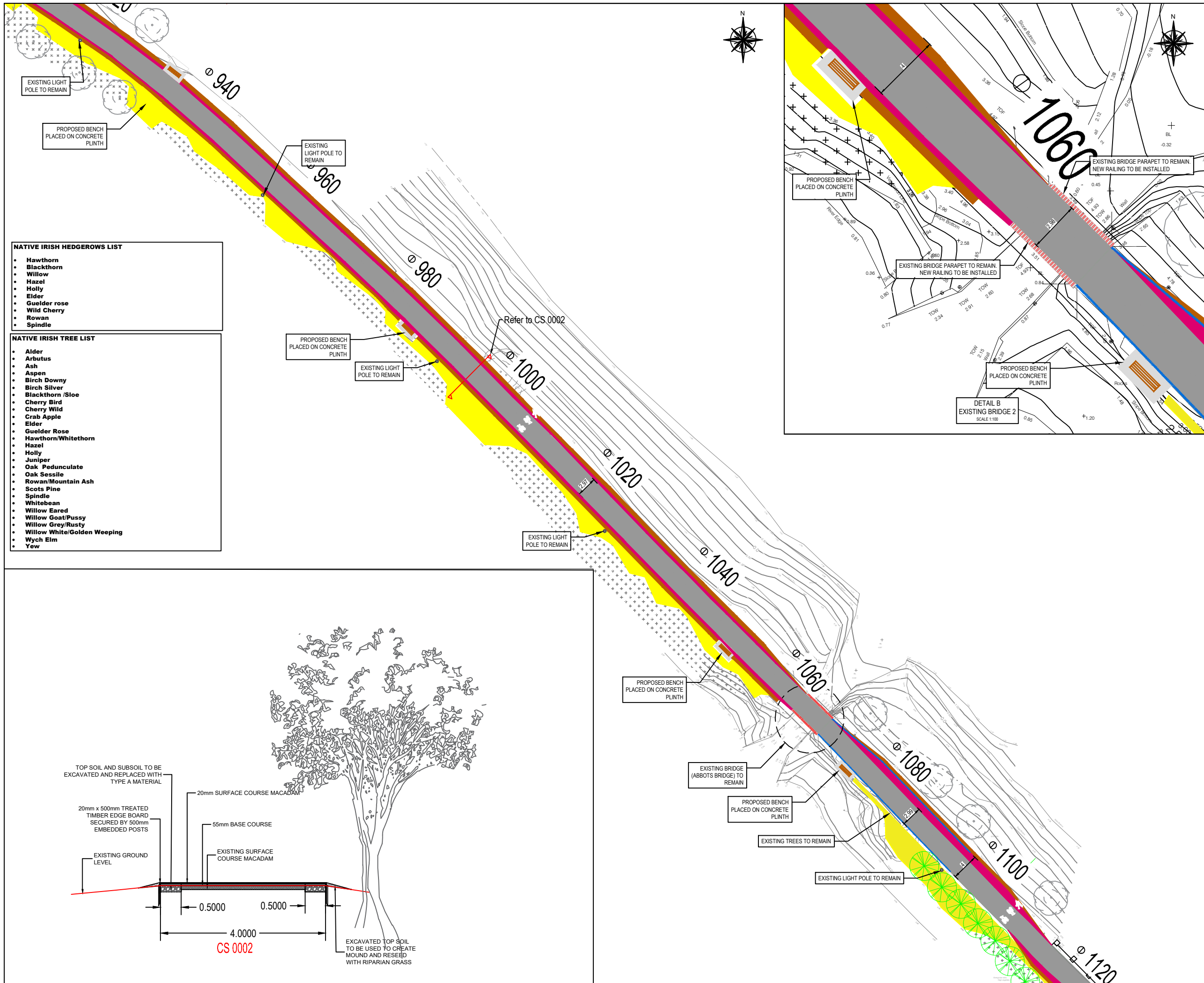
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2576	2576/DRG01	GA0006	0		



- NATIVE IRISH HEDGEROWS LIST**
- Hawthorn
 - Blackthorn
 - Willow
 - Hazel
 - Holly
 - Elder
 - Guelder rose
 - Wild Cherry



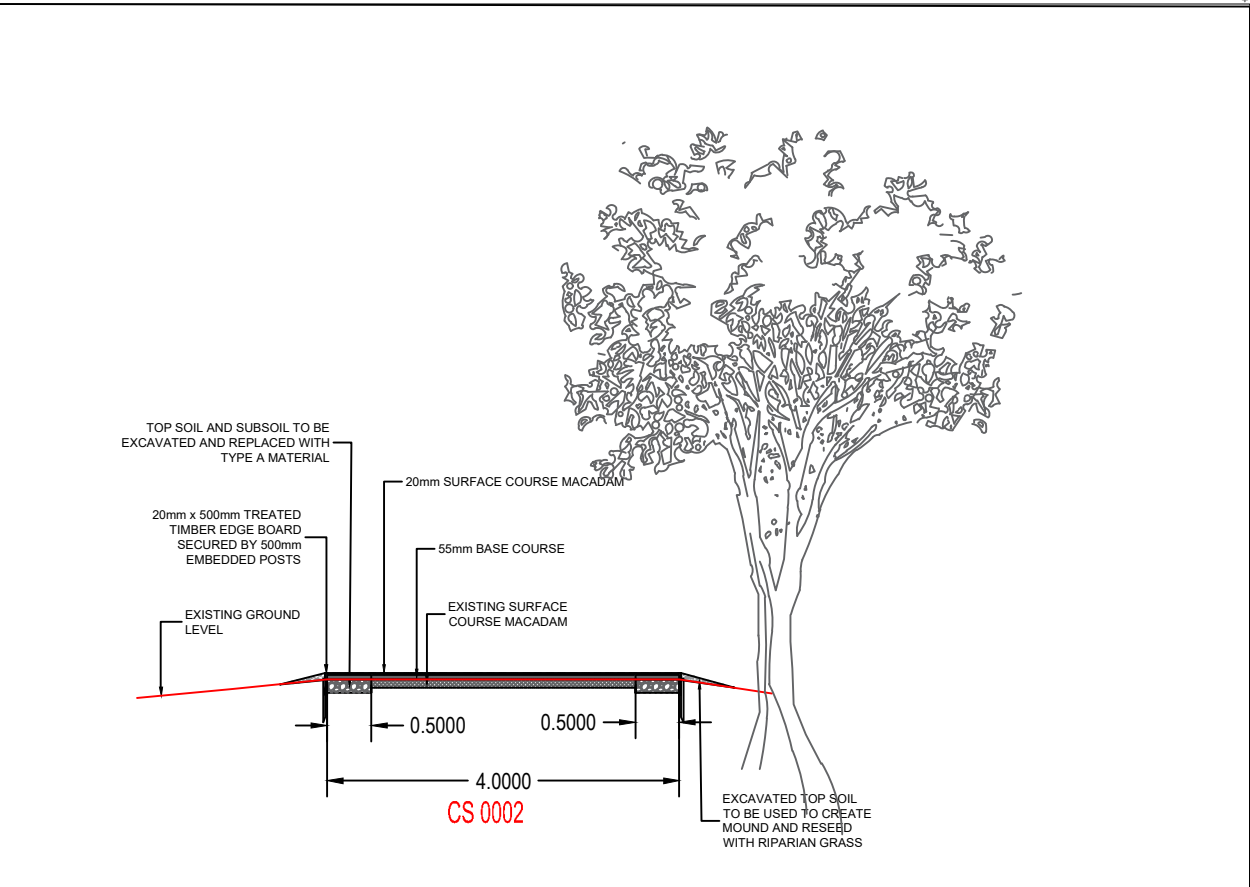
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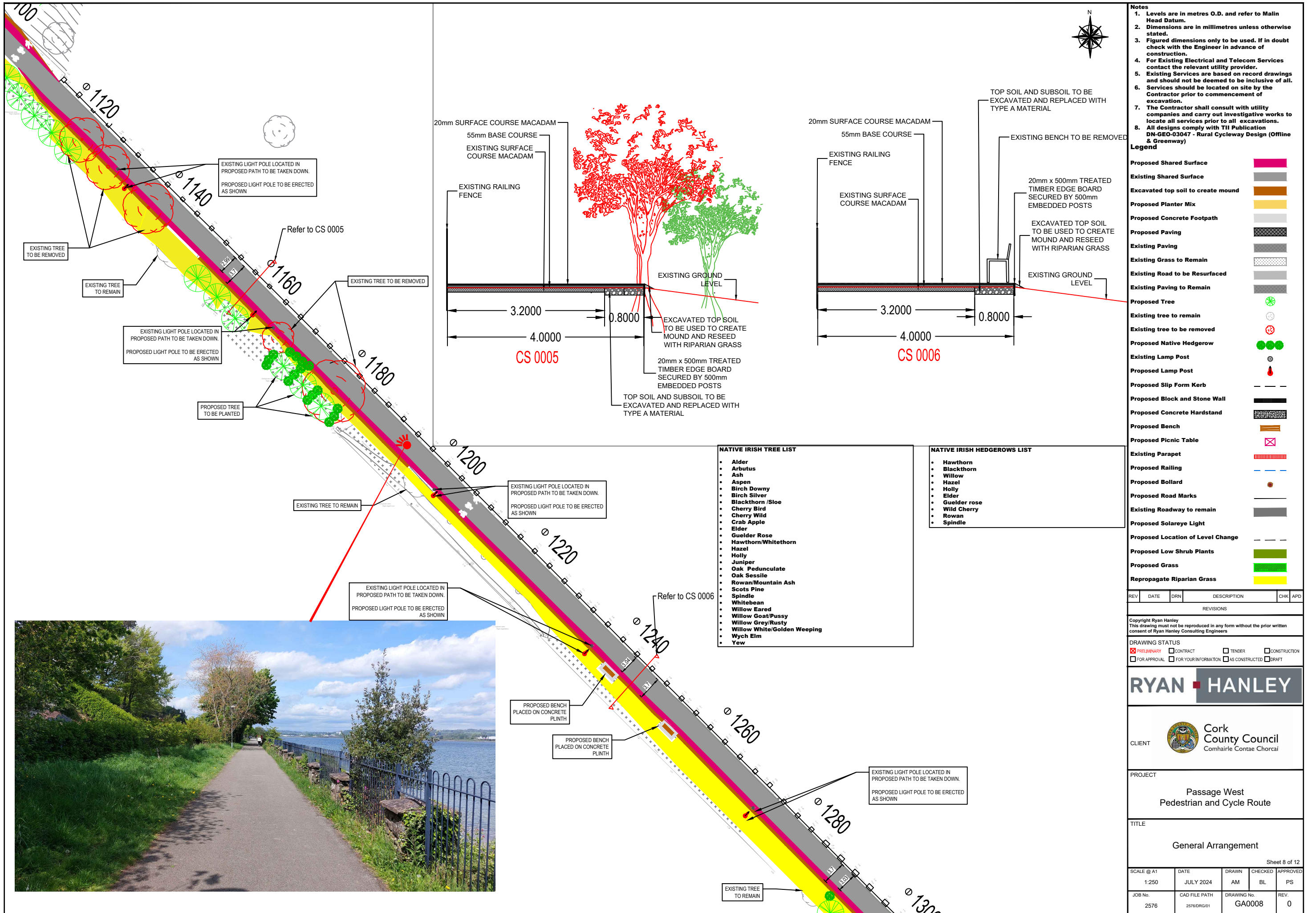
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Sheet 7 of 12

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 - Elder
 - Guelder rose
 - Wild Cherry
 - Rowan
 - Spindle

REV	DATE	DRN	DESCRIPTION	CHK	APD
REVISIONS					

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DRAWING STATUS

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<input type="checkbox"/> FOR APPROVAL	<input type="checkbox"/> FOR YOUR INFORMATION	<input type="checkbox"/> AS CONSTRUCTED	<input type="checkbox"/> DRAFT



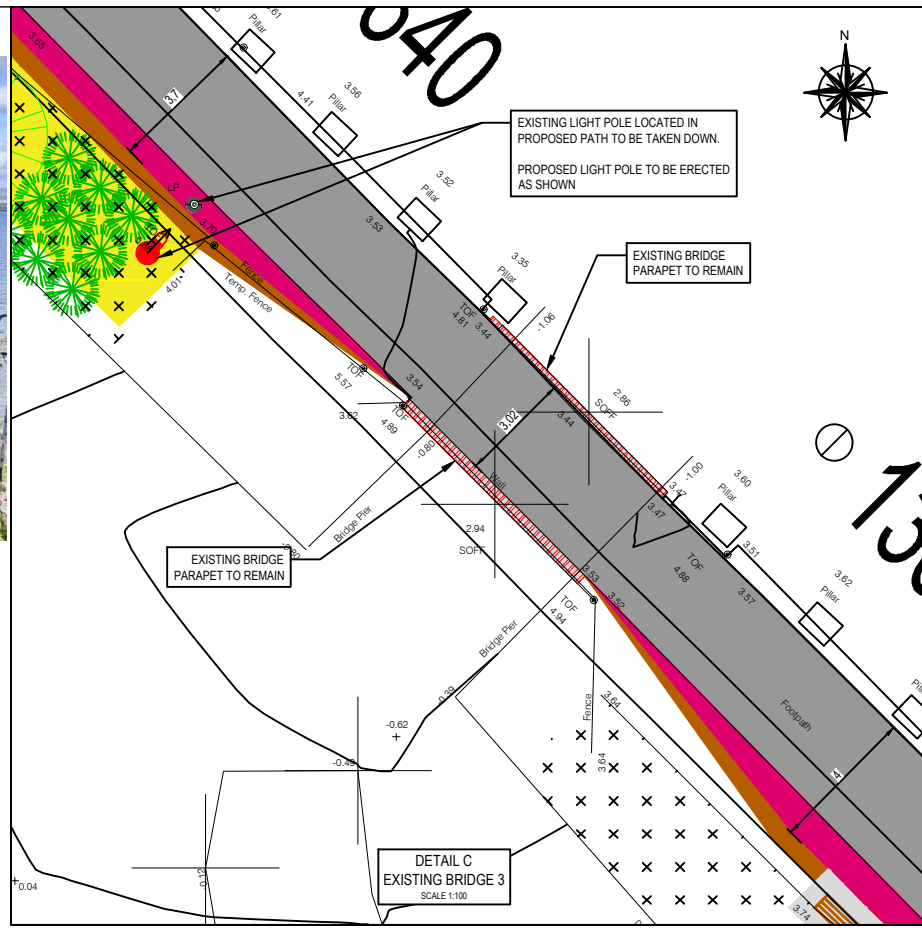
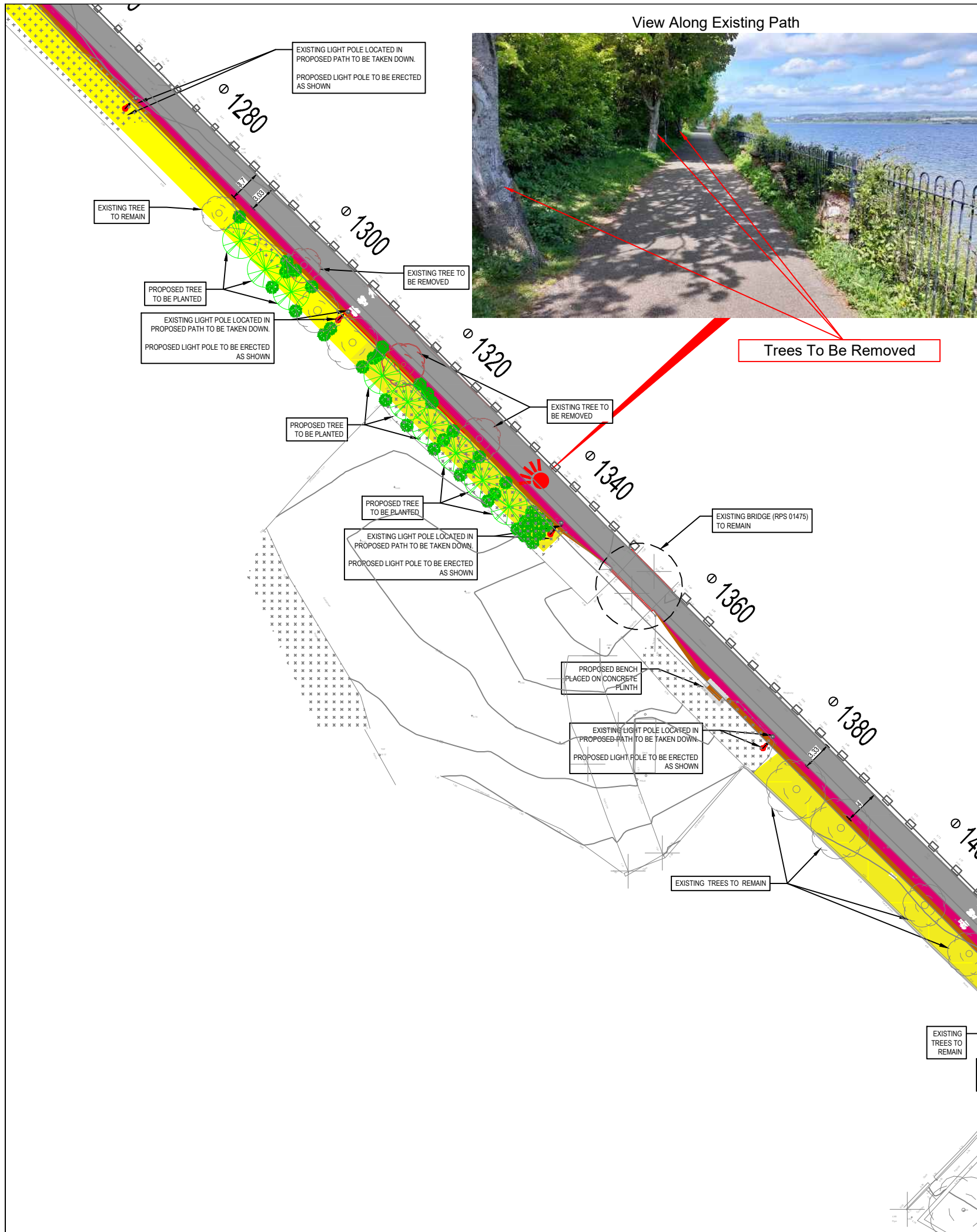
CLIENT
 Cork County Council
 Comhairle Contae Chorcaí

PROJECT
 Passage West
 Pedestrian and Cycle Route

TITLE
 General Arrangement

Sheet 8 of 12

SCALE @ A1	DATE	DRAWN	CHECKED	APPROVED
1:250	JULY 2024	AM	BL	PS
JOB No.	CAD FILE PATH	DRAWING No.	REV.	
2576	2576DRG01	GA0008	0	



- NATIVE IRISH HEDGEROWS LIST**
- Hawthorn
 - Blackthorn
 - Willow
 - Hazel
 - Holly
 - Elder
 - Guelder rose
 - Wild Cherry
 - Rowan
 - Spindle

- NATIVE IRISH TREE LIST**
- Alder
 - Arbutus
 - Ash
 - Aspen
 - Birch Downy
 - Birch Silver
 - Blackthorn /Sloe
 - Cherry Bird
 - Cherry Wild
 - Crab Apple
 - Elder
 - Guelder Rose
 - Hawthorn/Whitethorn
 - Hazel
 - Holly
 - Juniper
 - Oak Pedunculate
 - Oak Sessile
 - Rowan/Mountain Ash
 - Scots Pine
 - Spindle
 - Whitebean
 - Willow Eared
 - Willow Goat/Pussy
 - Willow Grey/Rusty
 - Willow White/Golden Weeping
 - Wych Elm
 - Yew

- Notes**
1. Levels are in metres O.D. and refer to Malin Head Datum.
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 6. The Contractor shall consult with utility companies and carry out investigative works to locate all services prior to all excavations.
 7. All designs comply with TII Publication DN-GEO-03047 - Rural Cycleway Design (Off-line & Greenway)

Legend

- Proposed Shared Surface
- Existing Shared Surface
- Excavated top soil to create mound
- Proposed Planter Mix
- Proposed Concrete Footpath
- Proposed Paving
- Existing Paving
- Existing Grass to Remain
- Existing Road to be Resurfaced
- Existing Paving to Remain
- Proposed Tree
- Existing tree to remain
- Existing tree to be removed
- Proposed Native Hedgerow
- Existing Lamp Post
- Proposed Lamp Post
- Proposed Slip Form Kerb
- Proposed Block and Stone Wall
- Proposed Concrete Hardstand
- Proposed Bench
- Proposed Picnic Table
- Existing Parapet
- Proposed Railing
- Proposed Bollard
- Proposed Road Marks
- Existing Roadway to remain
- Proposed Solareye Light
- Proposed Location of Level Change
- Proposed Low Shrub Plants
- Proposed Grass
- Repropagate Riparian Grass

REV	DATE	DRN	DESCRIPTION	CHK	APD
REVISIONS					

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DRAWING STATUS

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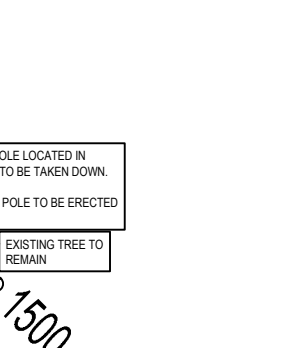
CLIENT Comhairle Contae Chorcaí
Cork County Council

PROJECT
Passage West
Pedestrian and Cycle Route

TITLE
General Arrangement

Sheet 9 of 12

SCALE @ A1	DATE	DRAWN	CHECKED	APPROVED
1:250	JULY 2024	AM	BL	PS
JOB No.	CAD FILE PATH	DRAWING No.	REV.	
2576	2576DRG01	GA0009	0	



- NATIVE IRISH HEDGEROWS LIST**
- Hawthorn
 - Blackthorn
 - Willow
 - Hazel
 - Holly
 - Elder
 - Guelder rose
 - Wild Cherry
 - Rowan
 - Spindle

- NATIVE IRISH TREE LIST**
- Alder
 - Arbutus
 - Ash
 - Aspen
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 - Spindle
 - Whitebean
 - Willow Eared
 - Willow Goat/Pussy
 - Willow Grey/Rusty
 - Willow White/Golden Weeping
 - Wych Elm
 - Yew

- Notes**
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Legend

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- Existing Paving to Remain
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- Existing tree to be removed
- Proposed Native Hedgerow
- Existing Lamp Post
- Proposed Lamp Post
- Proposed Slip Form Kerb
- Proposed Block and Stone Wall
- Proposed Concrete Hardstand
- Proposed Bench
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- Existing Parapet
- Proposed Railing
- Proposed Bollard
- Proposed Road Marks
- Existing Roadway to remain
- Proposed Solareye Light
- Proposed Location of Level Change
- Proposed Low Shrub Plants
- Proposed Grass
- Repropagate Riparian Grass

REV	DATE	DRN	DESCRIPTION	CHK	APD
REVISIONS					

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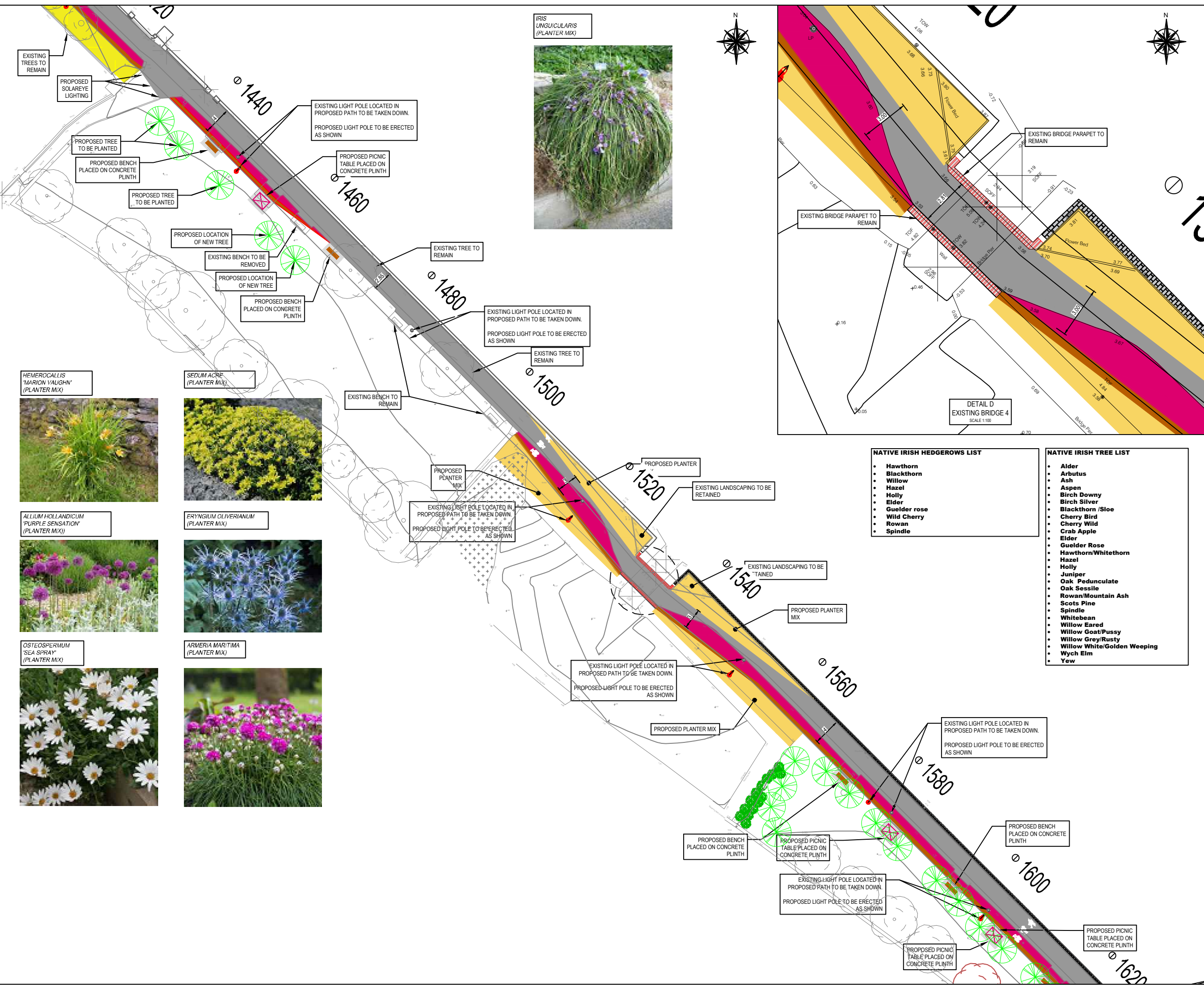
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 Cork County Council

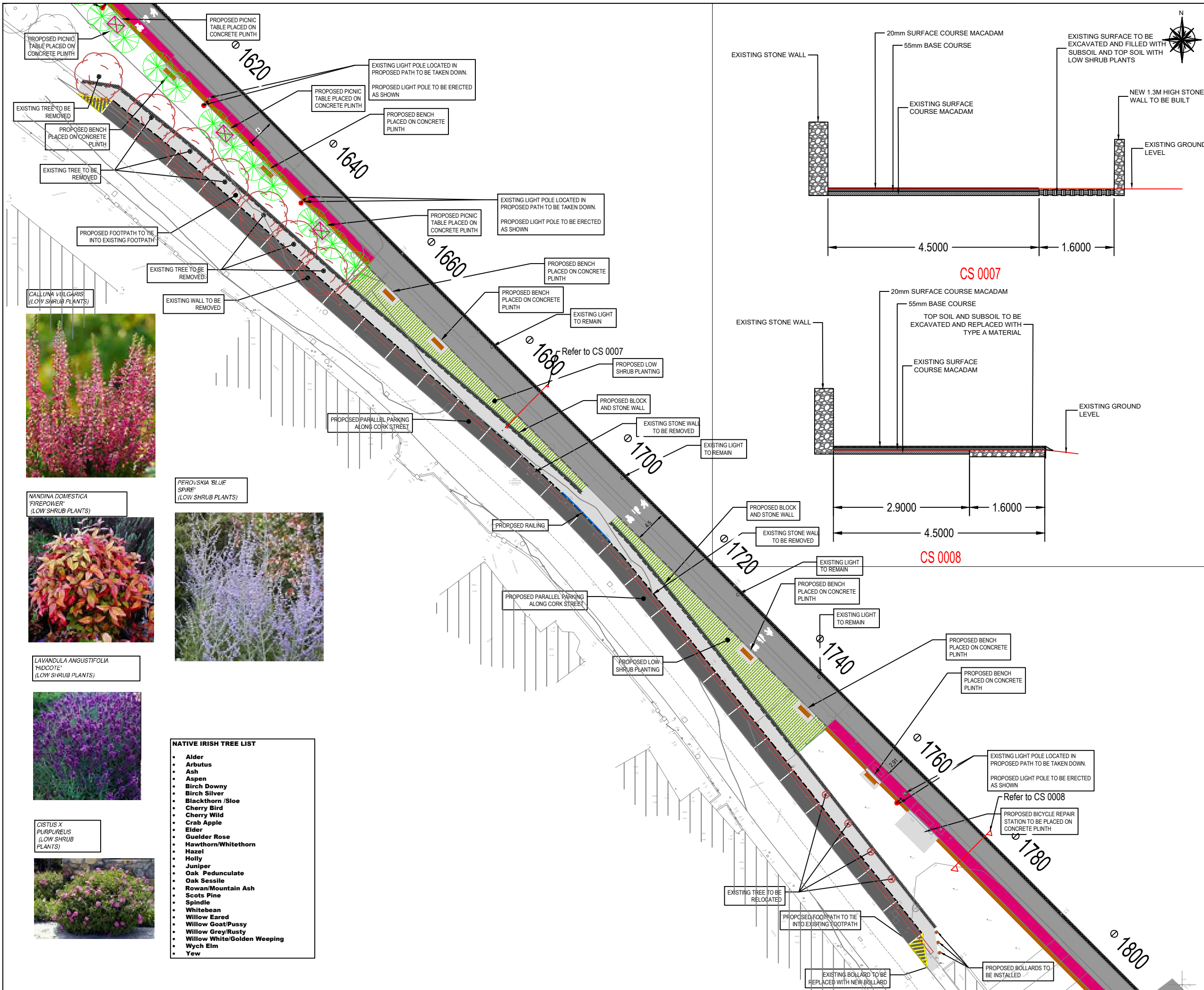
PROJECT
 Passage West
 Pedestrian and Cycle Route

TITLE
 General Arrangement

Sheet 10 of 12

SCALE @ A1	DATE	DRAWN	CHECKED	APPROVED
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JOB No.	CAD FILE PATH	DRAWING No.	REV.	
2576	2576DRG01	GA0010	0	





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Cork County Council

PROJECT

Passage West
Pedestrian and Cycle Route

TITLE

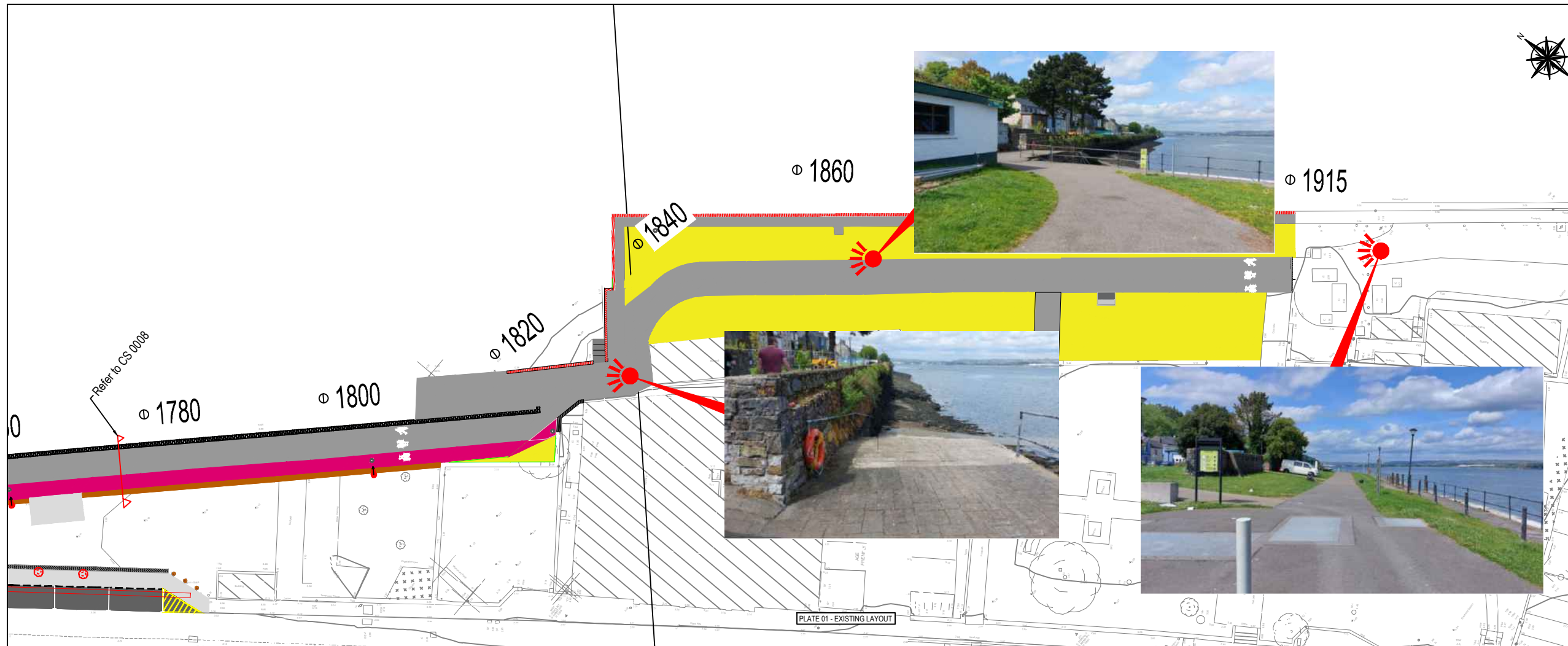
General Arrangement

Sheet 11 of 12

SCALE @ A1	DATE	DRAWN	CHECKED	APPROVED
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JOB No.	CAD FILE PATH	DRAWING No.	REV.	
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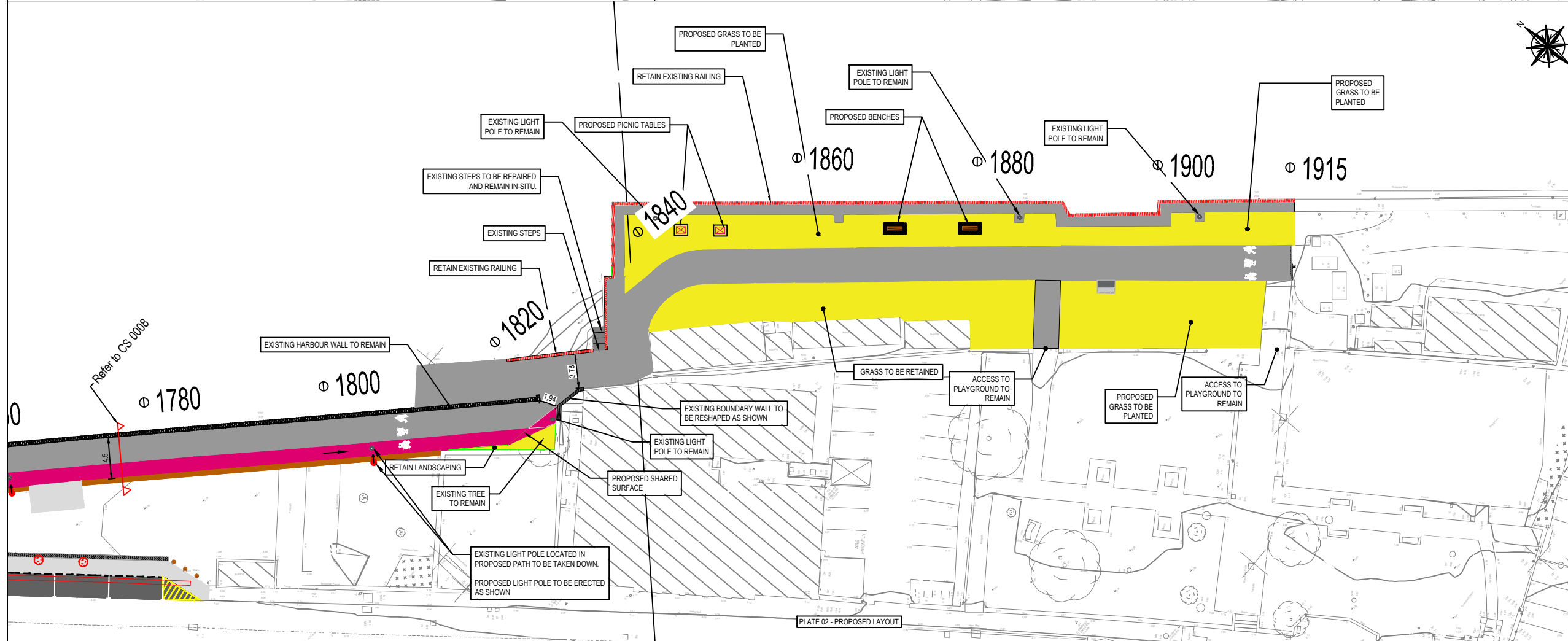
- NATIVE IRISH TREE LIST**
- Alder
 - Arbutus
 - Ash
 - Aspen
 - Birch Downy
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 - Blackthorn /Sloe
 - Cherry Bird
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 - Willow Grey/Rusty
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REV	DATE	DRN	DESCRIPTION	CHK	APD
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Comhairle Contae Chorcaí
 Cork County Council

PROJECT

Passage West
 Pedestrian and Cycle Route

TITLE

General Arrangement

Sheet 12 of 12				
SCALE @ A1	DATE	DRAWN	CHECKED	APPROVED
1:250	JULY 2024	AM	BL	PS
JOB No.	CAD FILE PATH	DRAWING No.	REV.	
2576	2576/DWG/01	GA0012	0	

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