



BusConnects Cork Sustainable Transport Corridors (STCs): Proposed Ground Investigation Works - STCs B-K Screening for Appropriate Assessment Report

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BusConnects Cork Sustainable Transport Corridors

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Contents

1.	Introduction	1
1.1	Background and overview	1
1.2	Purpose of this Report	2
1.3	Appropriate Assessment requirements.....	2
1.3.1	Introduction	2
1.3.2	Legislative Context.....	2
1.3.3	Case Law	4
1.3.4	Stages in Appropriate Assessment	4
1.4	Authors Qualifications and Expertise.....	5
2.	Assessment Methodology	6
2.1	Introduction	6
2.2	AA Guidance Documents.....	6
2.3	Screening Methodology.....	6
2.4	Baseline characterisation.....	11
2.4.1	Introduction	11
3.	Description of Proposed GI works and Site Characteristics	14
3.1	Overview	14
3.2	Description of the proposed GI works	14
3.2.1	Boreholes	14
3.2.2	Slit Trenches	15
3.2.3	Hand and/or mechanical trial pitting	15
3.2.4	Structural coring.....	16
3.2.5	Geophysical surveying	16
3.2.6	Staff Welfare units	16
3.2.9	Biosecurity measures.....	17
4.	Baseline Characterisation	18
4.1	Overview of the Baseline Environment.....	18
4.2	European Sites	18
4.3	Annex I Habitats	19
4.4	Species: wintering birds.....	19
4.5	Aquatic Environment.....	22
4.6	Invasive Species.....	23
5.	Identification of relevant European sites	24
5.1	Introduction	24
5.2	European Sites within the ZoI of the Proposed GI Works.....	24
6.	Assessment of Likely Significant Effects (LSEs)	30
6.1	Introduction	30

6.2	Screening Exercise.....	30
6.3	Determination of Likely Significant Effects	34
6.3.1	Alone assessment.....	34
6.3.2	In-combination assessment.....	34
7.	Screening Statement and Conclusion.....	35
8.	References	36

Appendix A. Photographs

Appendix B. Figures

1. Introduction

1.1 Background and overview

BusConnects is the National Transport Authority's (NTA) programme to greatly improve bus services in Cork and other cities. It is a key part of the Government's policies to improve public transport and address climate change and is included within the National Development Plan (2021-2030), the Cork Metropolitan Area Transport Strategy 2040 (NTA, 2020), the Climate Action Plan 2024 (Department of Environment, Climate and Communications (DoECC), 2023) and the National Planning Framework 2040 (Government of Ireland (GoI), 2024).

The aim of BusConnects Cork is to deliver an enhanced bus system that is better for Cork city, its people and the environment. BusConnects Cork is designed to provide a better, more reliable and more efficient bus service for everyone in addition to providing safe cycling and enhanced pedestrian facilities along key routes.

One of the key elements of BusConnects is investment in eleven Sustainable Transport Corridors (STCs) that will have continuous bus priority – generally, a continuous bus lane in each direction, but other arrangements maybe used in constricted locations. This will remove delays currently being experienced by the bus system and its users across Cork City as shown on Image 1.1.

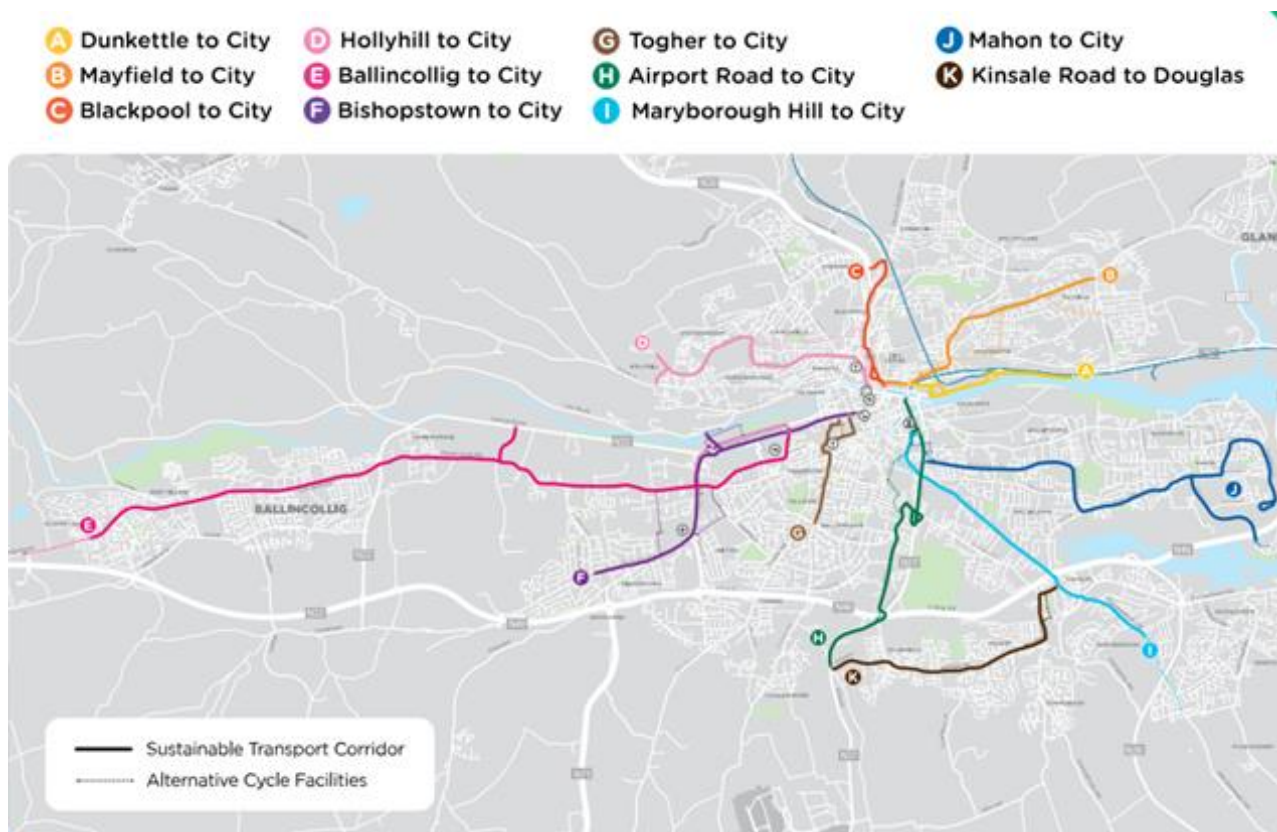


Image 1.1: Indicative Overview of BusConnects Cork Sustainable Transport Corridors (NTA, 2024).

To inform the design and assessment of the proposals for the BusConnects Cork STCs, ground investigation (GI) works are required. Note that this report covers the proposed GI works for STCs B to K. The GI proposals for STC A will be undertaken under a separate contract, at a later time and subject to a separate assessment as described in Section 1.2.

The locations of the proposed GI works are on main commuter routes into Cork City centre with high pedestrian, cyclist and vehicular flows, which are also along the proposed preferred routes for the BusConnects Cork STCs. The majority of proposed GI works are located on areas of hardstanding typically

roads, pavements, and carparks, with other land surfaces including amenity grassland and occasional areas of broadleaved woodland or scrub - refer to Appendix A for site photographs which show the general character of the area. The River Lee and Douglas River are in proximity to the proposed GI works.

The proposed GI works include boreholes utilising cable percussion, rotary coring, sonic resonance drilling, window sampling and dynamic probes, alongside trial pit works using hand and mechanical pitting, slit trenches, horizontal structural coring, geophysical surveying, and minor site clearance and de-vegetation where required to facilitate the GI works - refer to Appendix B, Figure B2 for the proposed GI works locations.

1.2 Purpose of this Report

In the context of Article 6(3) of the Habitats Directive and Section 177U(1) of Planning and Development Act 2000 (as amended) (see Section 1.3 for details), the NTA as the competent authority for this project, must carry out Screening for Appropriate Assessment (AA) of the proposed GI works. This will assess whether, on the basis of objective scientific information, the proposed GI works, individually or in-combination with other plans or projects, is likely to have a significant effect on the conservation objectives of any European sites.

This report presents the information required for the competent authority to undertake Screening for AA for the proposed GI works for ten of the 11 BusConnects Cork STCs – namely B to K as shown in Image 1.1 The proposed GI works for STC A, which will be delivered at a later time to the GI works for STC B to K, will be subject to a separate AA screening as these works are potentially subject to a foreshore licence application to the Maritime Area Regulatory Authority (MARA). The report provides an assessment of the potential for Likely Significant Effects (LSEs) on European sites within the zone of influence (ZoI), as defined by the source-pathway-receptor model (OPR, 2021), of the GI works proposed in STCs B to K.

1.3 Appropriate Assessment requirements

1.3.1 Introduction

The purpose of AA Screening is to identify whether activities associated with plans or projects, either acting individually or in-combination with other plans or projects, result in LSEs on any European sites. All potential effects between activities associated with the plans or projects and the ecological components of European sites must be considered. This includes potential effects on mobile species, notably birds, mammals, invertebrates, and migratory fish using functionally linked land outside the designated boundary of the European site.

Appropriate Assessment sits within a legislative context which is briefly set out below along with an overview of the stages with the AA process.

1.3.2 Legislative Context

Habitats and species of European importance are provided legal protection under Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora (hereafter referred to as the Habitats Directive) and Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds (hereafter referred to as the Birds Directive). The Habitats Directive protects habitats and species of community interest through the establishment and conservation of an EU-wide network of sites known as the Natura 2000 network (hereafter referred to as European sites, as the term Natura 2000 network was replaced by 'European site' under S.I. No. 473 of 2011 – European Union (Environmental Impact Assessment and Habitats) Regulations 2011). European sites comprise Special Areas of Conservation (SACs) and Special Protection Areas (SPAs).

The EU Habitats Directive (92/43/EEC) has been transposed into Irish law by the Planning and Development Act 2000 (as amended) and the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I.

477/2011). Articles 6(3) and 6(4) of the Habitats Directive set out the decision-making tests for plans and projects likely to affect European sites.

Article 6(3) establishes the requirement for AA:

"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."

Article 6(4) states:

"If, in spite of a negative assessment of the implications for the [Natura 2000] site and in the absence of alternative solutions, a plan or project must nevertheless be carried out for imperative reasons of overriding public interest, including those of a social or economic nature, Member States shall take all compensatory measures necessary to ensure that the overall coherence of Natura 2000 is protected. It shall inform the Commission of the compensatory measures adopted."

The Habitats Directive was transposed into Irish law from a planning perspective through Part XAB of the Planning and Development Act 2000 (as amended). The circumstances under which an AA is required, the stages of that assessment which must be undertaken and the responsibilities of the Competent Authority in considering whether or not to approve consent for proposed plans or projects are outlined in the Act.

Section 177U(1) states that:

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

Where likely significant effects upon a European site are predicted, or cannot be ruled out, it is the responsibility of the Competent Authority to undertake an AA under Article 6(3) of the Habitats Directive, informed through an Natura Impact Statement (NIS), to determine whether or not the proposed GI works in combination with any other plan or project would adversely affect the integrity of a European site in light of its Conservation Objectives.

Section 177T(1) states that:

"(a) A Natura impact report means a statement for the purposes of Article 6 of the Habitats Directive, of the implications of a Land use plan, on its own or in combination with other plans or projects, for one or more than one European site, in view of the conservation objectives of the site or sites."

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

Section 177T(2) states that:

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

1.3.3 Case Law

In addition to the above legislation, a number of cases have been brought to both the national and European courts in relation to the AA process. Therefore, relevant case law, European Court of Justice rulings and EC publications have also been considered in the preparation of this Screening for AA.

Relevant case law includes rulings from the European Court of Justice (ECJ) e.g. the Waddenzee Judgement (ECJ case C-127/02), which established that an LSE is one that cannot be ruled out on the basis of objective information. This is underpinned by the precautionary principle which is enshrined in law in the Habitats Directive, and the test of something as being “beyond reasonable scientific doubt”, as presented in the Waddenzee Judgement. The Sweetman case (ECJ case C-258/ 11) reinforced and further refined the Waddenzee Judgement ruling that “the question is simply whether the plan or project concerned is capable of having an effect. It is in that sense that the English ‘likely to’ should be understood”. The People Over Wind Judgement (ECJ case C-323/17) clarifies the stage in the AA process when mitigation measures can be taken into account when assessing impacts on a European site. The ruling is that: “...in order to determine whether it is necessary to carry out, subsequently, an appropriate assessment of the implications, for a site concerned, of a plan or project, it is not appropriate, at the screening stage, to take account of the measures intended to avoid or reduce the harmful effects of the plan or project on that site”.

1.3.4 Stages in Appropriate Assessment

As mentioned previously, the purpose of AA Screening is to identify whether activities associated with plans or projects, either acting individually or in-combination with other plans or projects, result in LSEs on any European sites.

If the prospect of LSEs occurring cannot be excluded on the basis of objective information, the plan or project is taken forward to the next stage of the process, Stage 2 AA. At Screening, the burden of evidence is to show, on the basis of objective information, and beyond reasonable scientific doubt, that the proposed plan or project will have no LSEs on a European site. If LSEs cannot be excluded, or it is uncertain, it would trigger the need for AA.

An overview of the AA process is outlined below:

Stage 1 Screening: Screening determines whether an AA is required by determining if the project or plan is likely to have a significant effect on any European site(s) either individually or in-combination with other plans or projects, in light of the site’s conservation objectives;

Stage 2 AA: If the screening has determined that AA is required, the Competent Authority then considers the effect of the project or plan on the integrity of the European site(s). Specifically, it must be determined if the project or plan will adversely affect the integrity of a European site(s) either individually or in-combination with other plans and projects in view of the conservation objectives of the site(s). Where potential adverse effects on site integrity are identified, mitigation measures are proposed to avoid adverse effects, as appropriate. For projects and plans, the AA process is documented within a Natura Impact Statement (NIS).

Following AA, including mitigation proposals, if adverse effects on site integrity remain, or uncertainty remains and the project/plan is to be progressed, an Assessment of Alternative Solutions is required under the provisions of Article 6(4) of the Habitats Directive. This process examines the alternative ways of achieving the objectives of the project or plan that avoid adverse impacts on the integrity of the European site. If no alternatives exist, or all alternatives would result in adverse effects on the integrity of a European site, then if the project/plan is to be progressed, the process moves to the next stage.

Where an Assessment of Alternative Solutions fails to identify any suitable alternatives, for a project or plan to be progressed it must demonstrate that there are Imperative Reasons for Overriding Public Interest (IROPI).

If, following an assessment of IROPI, it is deemed that the project or plan can proceed, compensatory measures must be secured to maintain the coherence of the European site network despite adverse effects to the integrity of the site(s).

1.4 Authors Qualifications and Expertise

This report has been prepared by Sophie King and reviewed by Russell Cryer, who have the necessary qualifications and experience in preparing AA Screening reports:

Sophie King is an Ecologist with six years' experience in the ecology and conservation industry, including more than three years' experience in ecological consultancy. Sophie holds an MSc degree in Conservation and Biodiversity from Lancaster University and a BSc degree in Conservation Biology and Ecology from the University of Exeter. Sophie has carried out extensive field surveys both protected species and habitats, as well as completing AA screenings and contributing to Environmental Impact Assessments (EIA).

Russell Cryer is a Chartered Environmentalist and has over 20 years of experience of supporting infrastructure projects in ecological assessment, specialising in Appropriate Assessment. Before this, he spent 18 years developing land management, team/project management and stakeholder engagement skills in the nature conservation field. Russell's experience has been in the voluntary, public and private sectors and has included infrastructure projects including new nuclear build, trunk roads, pipelines, electricity transmission and waste management facilities, as well as development of decision-making processes and strategic assessments in the government sector.

2. Assessment Methodology

2.1 Introduction

This section of the report outlines the assessment methodology which has been employed in this AA Screening report. There are a number of guidance documents which inform the preparation of the appropriate assessment and these are listed below.

2.2 AA Guidance Documents

This Screening for AA was undertaken taking cognisance of the following guidance:

- Appropriate Assessment of Plans and Projects in Ireland. Guidance for Planning Authorities (Department of Environment, Heritage and Local Government (DoEHLG), 2010).
- Assessment of Plans and Projects Significantly Affecting Natura 2000 Sites – Methodological Guidance on the Provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC (EC, 2001).
- Communication from the Commission on the Precautionary Principle (EC, 2000).
- Guidance Document on Article 6(4) of the 'Habitats Directive' 92/43/EEC. Clarification of the concepts of: Alternative Solutions, Imperative Reasons of Overriding Public Interest, Compensatory Measures, Overall Coherence, Opinion of the Commission (EC, 2007).
- Managing Natura 2000 sites: The provisions of Article 6 of the 'Habitats' Directive 92/43/EEC (EC, 2019).
- Guidance document on the strict protection of animal species of Community interest under the Habitats Directive (EC, 2021).
- Office of the Planning Regulator (2021). Appropriate Assessment Screening for Development Management. OPR Practice Note PN01.

2.3 Screening Methodology

2.3.1 Overview

The guidance documents outlined above set out the process for carrying out AA, the first stage of which is referred to as Screening. Steps required for screening include the following:

- Determination of whether a project or plan is directly connected with or necessary to the conservation management of any European sites.
- Description of the details of the project/ plan (including the site characteristics/plan area).
- Description of the characteristics of European sites that might be affected (i.e. identification of qualifying interests (QIs) and conservation objectives (COs) that could be affected as a result of progressing the project/plan.
- Assessment of LSEs on relevant European sites in view of the sites' conservation objectives, either individually or in-combination with other plans and projects.
- Presentation of a screening assessment which should determine if the project/plan individually or in-combination with other plans and projects could undermine the conservation objectives of the site(s) and give rise to LSEs. The assessment of LSEs must be undertaken in the absence of mitigation measures.

2.3.2 Potential pathways used in the assessment

When assessing the proposed GI works, the 'source-pathway-receptor' model is applied taking consideration of all potential impact pathways connecting elements of the proposed GI works to European sites in view of their conservation objectives.

The source-pathway-receptor conceptual model is a standard tool in environmental assessment to identify and assess potential impact pathways. In order for an effect to occur, all three elements of this mechanism must be in place. The absence or removal of one of the elements of the pathway means that there is no likelihood for the effect to occur (e.g. no potential for LSEs).

Potential impact pathways assessed are:

- Habitat loss;
- Habitat degradation – changes in water quality;
- Habitat degradation – changes in air quality;
- Habitat degradation – hydrological changes;
- Habitat degradation – hydrogeological changes;
- Habitat degradation – spread of invasive species;
- Disturbance of species; and
- Mortality.

The source-pathway-receptor model is focused solely on the QIs for which European sites are designated as per the latest conservation objectives from the National Parks and Wildlife Service (NPWS) website.

AA screening requires consideration of a range of potential effect pathways. The range of potential effect pathways to be considered for the BusConnects Cork STCs proposed GI works has been developed and is outlined in Table 2.1. The source / pathway / receptor model, the zones of influence (Zoi) and the extents of sensitivity of QIs for each potential impact pathway used in this assessment are also defined in Table 2.1.

Table 2.1 Potential effect pathways

Pathway name	Source / pathway / receptors model	Zone of Influence	Extent of sensitivity receptors
Habitat loss	<p>Where a project is providing new infrastructure or permanent change of habitat and could result in direct loss of QI habitat or supporting habitat for QI species in a European site, or functionally linked land associated with mobile QI species outside the boundaries of European sites.</p> <p>Construction activities including temporary works areas and access routes of the project could result in the temporary loss of habitats before reinstatement after construction is completed, potentially affecting QI habitat or supporting habitat for QI species in a European site, or functionally linked land associated with mobile QI species outside the boundaries of European sites.</p>	<p>The Zol assessed is within the footprint of the proposed GI works. Physical loss of habitat is only possible within the boundary of a European site, or within an area of functionally linked land habitat outside of the European site.</p>	<p>QI habitats are sensitive within the boundary of their designated site. Supporting habitats of QI species are sensitive within the boundary of their designated site. Functionally linked habitats of QI species are sensitive where suitable habitat is present within the range of the QI species from their designated site.</p>
Habitat degradation – changes in water quality	<p>Construction activities and changes in operational traffic / drainage can release oils, chemicals, heavy metals, silt etc. This can directly affect QI species or habitats or affect them indirectly through loss of aquatic prey species, or through changes in their habitats.</p>	<p>The Zol assessed is within the footprint of the proposed GI works or within hydrologically linked areas (to the point where effects would be imperceptible such as where a watercourse meets open sea). Pollutants can travel along hydrological linkages such as watercourses to a considerable distance from works.</p>	<p>QI habitats are sensitive within the boundary of their designated site. Supporting habitats of QI species are sensitive within the boundary of their designated site. Functionally linked habitats of QI species are sensitive where suitable habitat is present within the range of the QI species from their designated site.</p>

Table 2.1 Potential effect pathways

Pathway name	Source / pathway / receptors model	Zone of Influence	Extent of sensitivity receptors
Habitat degradation – changes in air quality	Construction plant and vehicles emit exhausts containing pollutants that can deposit on QI habitats, which can cause direct toxic effects on QI species and habitats or degradation of QI habitat.	The Zol assessed is within 200m of the footprint of the proposed GI works. Pollutant deposition from vehicles is thought to occur in insignificant amounts beyond 200m from the source.	QI habitats are sensitive within the boundary of their designated site. Supporting habitats of QI species are sensitive within the boundary of their designated site. Functionally linked habitats of QI species are sensitive where suitable habitat is present within the range of the QI species from their designated site.
Habitat degradation – hydrological changes	In-stream structures or changes to drainage from the project can cause changes in hydrology, which can alter water volumes and flows, which can in turn change the wetness of habitats or cause erosion or deposition of materials. Such changes can affect QI habitats or supporting and functionally linked habitats of QI species.	The Zol assessed is within surface water catchments that the footprint of the project lies within. Surface water changes can occur within catchments as changes in one location affect other locations via watercourses for example.	QI habitats are sensitive within the boundary of their designated site. Supporting habitats of QI species are sensitive within the boundary of their designated site. Functionally linked habitats of QI species are sensitive where suitable habitat is present within the range of the QI species from their designated site.

Table 2.1 Potential effect pathways

Pathway name	Source / pathway / receptors model	Zone of Influence	Extent of sensitivity receptors
Habitat degradation – hydrogeological changes	Construction activities such as groundworks, excavations and drainage and permanent changes to drainage and abstraction can cause changes to groundwater volumes and flows, which can change the hydrogeology of QI habitats and supporting or functionally linked habitats of QI species.	The Zol assessed is within groundwater catchments that the footprint of the project lies within. Groundwater changes can occur within catchments as changes in one location affect other locations.	QI habitats are sensitive within the boundary of their designated site. Supporting habitats of QI species are sensitive within the boundary of their designated site. Functionally linked habitats of QI species are sensitive where suitable habitat is present within the range of the QI species from their designated site.
Habitat degradation – spread of invasive species	Construction activities can cause the spread of invasive species already within the construction site (through transfer on plant or within materials moved during earthworks), or by importing materials from outside the construction site (on the wheels of plant or delivery vehicles, etc). This can cause the degradation of QI habitats or supporting and functionally linked habitats of QI species.	The Zol assessed is within the footprint of the proposed GI works. The spread or importing of invasive species can only occur within the construction site.	QI habitats are sensitive within the boundary of their designated site. Supporting habitats of QI species are sensitive within the boundary of their designated site. Functionally linked habitats of QI species are sensitive where suitable habitat is present within the range of the QI species from their designated site.
Disturbance of species	Construction activities could result in disturbance of QI species through changes in noise, vibration, movement (of people and/or vehicles) and lighting. Disturbance may lead to the abandonment of breeding, foraging or resting sites by QI species, potentially resulting in increased energy expenditure, reduced fitness and inability to complete lifecycle stages.	The Zol assessed is within the footprint of the proposed GI works or within 300m of the proposed GI works is considered to be an appropriate distance to assess disturbance as QI species are unlikely to be significantly disturbed beyond this distance.	QI species are sensitive within the boundary of their designated site (in supporting habitat) or within functionally linked habitats where suitable habitat is present within the range of the QI species from their designated site.
Mortality	Mortality of individuals of QI species could occur directly through killing of individuals by construction works or indirectly through death of individuals that have to cross roads because their existing commuting routes along watercourses have been severed or as a result of pollution entering the watercourse.	The Zol assessed is within the footprint of the proposed GI works, within 50m of watercourse crossings that will be subject to work. Direct mortality from construction activities can only occur within the construction footprint. Indirect mortality can occur near to works at watercourses that sever species commuting routes.	QI species are sensitive within the boundary of their designated site (in supporting habitat) or within functionally linked habitats where suitable habitat is present within the range of the QI species from their designated site.

2.4 Baseline characterisation

2.4.1 Introduction

The baseline characterisation of the existing environment in which the proposed GI works are situated was undertaken. This involved desk-based review of existing available information and undertaking a site visit and wintering bird surveys, which are described below. Only species records and surveys relevant to the QI of European sites identified to be within the ZoI of the proposed GI works are presented below (see Table 5.1 for the identification of relevant European sites).

2.4.2 Desk review

The following key resources were analysed to inform the baseline description of the sites and surrounding environment:

- Aerial imagery (Bing, Google Earth, ESRI).
- Environmental Protection Agency (EPA) rivers and water quality data Water Framework Directive (WFD) status online at <https://gis.epa.ie/EPAMaps/> (accessed January 2024).
- Mapping of European site boundaries available online at www.npws.ie (accessed January 2024).
- Protected species data from the National Biodiversity Data Centre online at <https://www.biodiversityireland.ie/> (accessed October 2023).
- National Parks and Wildlife Service (2019a). The Status of EU Protected Habitats and Species in Ireland. Volume 1: Summary Overview. Unpublished NPWS report. Edited by: Deirdre Lynn and Fionnuala O'Neill.
- National Parks and Wildlife Service (2019b). The Status of EU Protected Habitats and Species in Ireland. Volume 2: Habitat Assessments. Unpublished NPWS report. Edited by: Deirdre Lynn and Fionnuala O'Neill.
- National Parks and Wildlife Service (2019c). The Status of EU Protected Habitats and Species in Ireland. Volume 3: Species Assessments. Unpublished NPWS report. Edited by: Deirdre Lynn and Fionnuala O'Neill.
- Online data available on Natura 2000 sites as held by the NPWS from www.npws.ie including: the Natura 2000 network Data Form; Site Synopsis; Generic Conservation Objective data.
- Protected and invasive species data from the National Biodiversity Data Centre (NBDC) online at <https://www.biodiversityireland.ie/> (accessed January 2024).

2.4.3 Site visit

A site walkover of STCs B to K was undertaken by experienced ecologists from the subcontractor, MKO, during August and September 2023. At this time habitats within the site were assessed for their potential to support rare or protected species and/or qualifying interests (Annex I habitats or Annex II species) associated with European sites.

The site walkover and assessment of protected species and habitats and/or invasive species was undertaken in line with the following guidelines and informed this Screening for AA:

- A Guide to Habitats in Ireland. The Heritage Council (Fossitt, 2000).
- Article 17 reports (NPWS, 2019a, 2019b, and 2019c).
- CIEEM Good Practice Guidance for Habitats and Species (CIEEM, 2021).

- CIEEM Guidelines for Preliminary Ecological Appraisal. Second Edition (CIEEM, 2017).
- CIEEM Guidelines for Ecological Impact Assessment in the UK and Ireland (CIEEM, 2018).
- National Roads Authority (NRA) Guidelines on The Management of Noxious Weeds and Non-Native Invasive Plant Species on National Roads (NRA, 2010).
- Transport Infrastructure Ireland (TII) The Management of Invasive Alien Plant Species on National Roads, Standard (TII, 2020a).
- Transport Infrastructure Ireland (TII) The Management of Invasive Alien Plant Species on National Roads, Technical Guidance (TII, 2020b).

2.4.4 Wintering bird surveys

Monitoring surveys were undertaken with reference to the good practice guidance survey methodology: British Trust for Ornithology (BTO) Wintering Farmland Bird Survey methodology (Gillings *et al.*, 2008) and generic wintering bird monitoring methods detailed in Bird Monitoring Methods (Gilbert *et al.*, 1998).

Four survey visits have been undertaken between October 2023 and February 2024¹. Surveys were undertaken between dawn and dusk (approximately 8am and 5pm depending on daylight hours) and visits were planned so as to avoid adverse weather conditions such as heavy rain and strong wind, as this can reduce bird activity (Gilbert *et al.*, 1998). Surveys were carried out with visits alternating between high tide and low tide each month. The survey visits were undertaken by experienced MKO ornithologists.

The wintering bird surveys were designed to inform the proposals for STCs B to K relating to the BusConnects Cork programme, comprising sixteen vantage points and eight transects. The vantage points and transects were completed by two ornithologists over one day, surveying from predetermined points and predetermined transect routes at a slow walking pace.

Surveyors recorded all birds heard or seen with the aid of binoculars. Registrations, which are records of individual birds (identified either by call, song or visually), were recorded on field maps using the BTO codes. Care was taken to avoid double counting. Longer periods of observations were made in areas of high bird activity.

On each of the survey visits, the following details were recorded:

- Bird locations;
- Bird numbers, species; and
- Bird behaviour (e.g. in a flock or in flight).

2.4.5 Identifying Potential Functionally Linked Habitat

The baseline characterisation methodology includes the identification of any functionally linked land within the Zol of the proposed works. During the screening methodology, an assessment of LSEs on any identified functionally linked land is undertaken.

Functionally linked land is a term used to describe areas of land or sea occurring outside a designated site which is considered to be critical to, or necessary for, the ecological or behavioural functions in a relevant season of a qualifying feature for which a SAC, SPA or Ramsar site has been designated (Bowland Ecology, 2021). A desk study was undertaken to review the potential for functionally linked habitat for QI bird species in proximity of the proposed GI works. This included comparing the baseline ecological conditions for each

¹ One further survey will be undertaken in March 2024. The data collected is considered sufficient to inform this screening assessment. Further surveys will have no material influence on the conclusions of screening but will provide further detail for the Appropriate Assessment.

of the QI bird species (desk study and survey data) with the species numbers presented in the designated site citations, and identifying land used by QI bird species which met the population threshold for LSE described in section 2.4.6.

2.4.6 Population thresholds of QI species

Where there are areas outside of a designated site which support more than 1% of an individual SPA population of any QI species, this is considered to be a significant proportion of the population and therefore any potential impacts on them may cause LSEs.

During the baseline characterisation, a 1% population threshold was used to calculate LSEs on QI bird species which utilise habitats within the ZOI of the proposed GI works for foraging and roosting. The calculation was carried out using available population data for water bird species data taken from the Conservation Objectives Supporting Documents of SPAs, which are available through NPWS website. The water bird population data for the Cork Harbour SPA is derived from Irish Wetland Bird Surveys (I-WeBS) undertaken between the period 1994/95 to 2012/13, covering a total of 21 count subsites, and regularly monitoring approximately 2,961 ha of the SPA (NPWS, 2014a). The peak count data used for the 1% population threshold calculation is taken from the baseline data, the 5-year mean peak for the period 1995/96 – 1999/00 (from the aforementioned document), and the data collected from the wintering bird surveys carried out by MKO ecologists.

3. Description of Proposed GI works and Site Characteristics

3.1 Overview

This AA screening report has been undertaken in relation to the proposed GI works for STCs B-K, comprising a series of GI and geophysical survey works required in support of the BusConnects Cork programme. The proposed GI works will inform the geotechnical design and general baseline conditions.

Descriptions of the proposed GI works are outlined below, as is a description of the standard environmental management measures which are intrinsic to the proposed GI works. These standard environmental management measures are required for legal compliance irrespective of whether any European site may or may not be affected. As such, they are not considered 'mitigation measures' as defined under Section 1.3.3, Stages of Appropriate Assessment.

The specific locations of the proposed GI works, by type, are presented in Figure B2 (refer to Appendix B). The proposed GI works will include a series of:

Minor site clearance and de-vegetation where required to facilitate the proposed GI works;

- Boreholes utilising cable percussion drilling, rotary coring, sonic resonance drilling, window sampling and dynamic probes;
- Slit trenches;
- Trial pit works using hand and mechanical pitting;
- Horizontal structural coring;
- Geophysical surveying;

The proposed GI works are located in areas which are already disturbed by significant volumes of pedestrian, cyclist, vehicular and bus traffic. The proposed GI works are to be located on areas of hardstanding typically roads, pavements, and car parks, with other land surfaces including amenity grassland and occasional areas of broadleaved woodland or scrub. Works areas will be reinstated to their original state as far as practical, which will typically involve replacement of road surface. Notably the proposed GI works will be in proximity to the River Lee, and the Douglas River which flow into Lough Mahon, with several smaller watercourses also within proximity of the proposed GI works.

3.2 Description of the proposed GI works

The proposed GI works for STCs B to K are required to determine the condition and properties of the ground strata to inform the engineering design and environmental assessment for the BusConnects Cork STCs. The Investigation works will utilise a number of techniques to ascertain the required information and these techniques are described below. Information is also provided on the standard environmental management measures which will be implemented.

3.2.1 Boreholes

Cable percussion boreholes involve a variety of tools being raised and lowered, by a cable and winch, taking samples and carrying out tests in the borehole. The rig is typically in place for 0.5 to two days, depending on the depth of the sampling and the thickness of the soil.

Rotary drilling will normally be required as extensions to cable percussion boreholes. Where rotary core drilling is employed, this uses a drill, mounted on the back of a truck, or tracked rotary rig. A variety of steel bits can be used to drill the hole, which are lowered into the hole by a series of steel rods. These either form an open hole with no sample recovered or they recover a core of rock or soil for examination and laboratory testing. The rig may be in place for 3-5 days, depending on the thickness of the ground being examined. Coring is carried out in run lengths of 1 to 3 m. The extracted core will be removed from the core barrel and

within a standard core box. Samples are then labelled and stored. It is understood that pavement coring and structural investigation coring (horizontal coring) may also be employed.

Sonic drilling employs adjustable high-frequency vibrations of generally between 50 Hz and 150 Hz to advance drilling tools in soil and rock. The drill head contains an oscillator which generates resonant energy that is transferred down the drill string to the drill bit. Casing the hole as it advances is an integral part of the method. Each borehole sample taken will typically be in 1.5m lengths. Soil and rock samples can be removed from sampling tools using mechanical aids such as clamps, pipe wrenches and mole grips. The rig is typically in place for a few days per location, depending on the depth of the sampling and the thickness of the substrate.

Window/windowless sampling is proposed as an alternative to cable percussion boring, and is a technique used to bore through shallow soft soils to investigate substrate. It is carried out by a small lightweight rig on rubber tracks and extends no deeper than 5 m below ground level (BGL). Two techniques can be used, standard windowless sampling (WS) and windowless sampling using a dynamic probe. Due to its small size, it is particularly useful in areas with limited access or on embankments/steep terrain. It uses one-metre-long extension rods and is driven into the ground by a percussion method using a drop hammer.

Dynamic probes are normally required as a continuation of window sampling, whereby a solid cone is driven vertically into the ground using repeated blows of a hammer or fixed mass falling through a fixed distance. Energy is transmitted through rods to the cone. Rods are of a smaller diameter to the cone to negate friction. Rods shall not exceed 35 mm in diameter and their mass shall not exceed 6 kg/m. The rods, typically 1m in length, are normally marked in increments of 100 mm throughout their length. The number of blows taken per increment is recorded and used to determine the strength of soils.

Overall, there are 112 proposed boreholes, refer to Appendix B, Figure B2 for proposed locations. On completion, the boreholes are filled in with previously excavated materials, bentonite/grout or instrumentation may be installed – for example, to monitor water levels. Where an installation remains in place, the only thing visible is a small cover, level with the ground. Where boreholes are situated on vegetated ground that may be allowed to grow, standing covers may be utilised to ensure that installation can easily be identified.

3.2.2 Slit Trenches

A slit trench is a long narrow trench commonly used in urban environments and on roadways to determine the position of existing services. These are usually excavated by a combination of hand excavation and excavation using a small mechanical excavator equipped with a toothless bucket. There are three proposed slit trenches (see Appendix B, Figure B2 for locations). The slit trenches are proposed in built up areas where it is anticipated there will be a requirement to identify buried services prior to commencing borehole works. It is understood that when contractors are liaising with utilities providers, there may be a requirement for additional slit trenches as a method to mitigate against the risk of hitting a service in areas of proposed boreholes.

3.2.3 Hand and/or mechanical trial pitting

Trial pits are dug by hand or mechanical means using an excavator. These are dug to investigate soil conditions, conduct tests and in some cases expose existing foundations of structures. Where pits are hand dug, they are typically up to 1 m x 1 m in profile and excavated to a depth of 1.2 m. Where excavation is by mechanical means, typically, a 1 x 4 m pit is dug to a depth of 2-4 m. This enables observation of the profile of the ground from the surface and samples to be retrieved for testing. The contractor is required to leave every site as they found it, and this will involve replacement of minor quantities of topsoil only. There are 29 proposed trial pits (see Appendix B, Figure B2 for proposed locations).

3.2.4 Structural coring

Horizontal coring is required to investigate the geometry of existing structures and material composition including any concrete bedding. Coring equipment will likely consist of a handheld or surface mounted diamond drill capable of obtaining cores of up to 300mm in diameter. On completion, the sample will be taken off site for logging and testing and the voids created by the coring will be fully grouted. Structural coring is only proposed at one location, refer to C-CS-01 on Figure B2 sheet 11 of 12 (Appendix B).

3.2.5 Geophysical surveying

The following geophysical surveying techniques may be employed: Utilities Ground Penetrating Radar or Electromagnetic, Ground Conductivity techniques, Electrical Resistivity, Seismic Refraction or Reflection and Multi-channel Analysis of Surface Waves.

In Ground Penetrating Radar (GPR) surveys, electromagnetic waves at radar frequencies are transmitted into the ground. GPR surveys may be undertaken using a radar antenna that can be handheld, pulled across the ground or pushed on a kart (similar to a lawn mower).

In electromagnetic (EM) surveying, the electrical conductivity of the ground is measured which measures the amplitude and/or the decay time of an electromagnetic pulse induced by a transmitter (TDEM).

FDEM (frequency domain electromagnetic) instruments have both a transmitter and receiver coil, the transmitter coil radiates an electromagnetic field which induces electrical currents into the subsurface materials, this creates eddy currents within the materials, which the receiver coil detects.

TDEM (Time Domain electromagnetic) instruments operate by generating a pulsed primary magnetic field from a transmitter coil, which in turn induces eddy currents into the subsurface materials. Receiver coils measure the decay of the eddy currents over time.

Electrical resistivity involves inserting electrodes into the ground using different electrode configurations to measure the potential electrical gradient within the subsurface.

Seismic reflection and refraction images the interfaces between materials with contrasting acoustic/seismic velocities.

The Multi-channel Analysis of Surface Waves (MASW) technique operates by using an impulsive source and multiple receivers (multi-channel) along a survey line. An active source is used (typically a hammer blow) together with using the "background" seismic noise already present.

Non-intrusive, geophysical surveys are proposed at the following three locations on STC C (see Appendix B, Figure B2 for locations).

3.2.6 Staff Welfare units

Temporary staff welfare units may be required for the duration of the proposed GI works. The location and size of the welfare unit will be the Contractor's responsibility and will be selected by the appointed Contractor. The welfare units will be located on suitable land adjacent to the proposed GI works, of low ecological value to ensure no LSE are caused by their operation.

3.2.7 Programme and timing of works

It is understood that the proposed GI works are expected to commence in April/May 2024. There are no daylight hours working restrictions on the proposed GI works.

3.2.8 Standard environmental management measures

A suitably competent Ecologist shall be appointed as an Ecological Clerk of Works (ECoW) by the GI Contractor prior to the commencement of works to advise on ecological issues and ensure compliance with legislation and best practice guidance.

A Method Statement for Environmental Protection will be produced prior to the commencement of work. The statement will include measures relating to:

No stockpiling or soil management shall be permitted within 30 m of any waterbody.

No fuel, lubricants or other chemicals will be stored within 30 m of any waterbody.

A designated refuelling area will be identified prior to the commencement of the proposed GI works, and refuelling of plant and vehicles will not take place within 50 m of any waterbody.

Storage areas, machinery depots and site offices shall be located within 50 m of waterbodies.

- Surface water runoff will be controlled by bunding, sheeting and/or sandbags, and by hay bales or other silt/filter fences as agreed.

Surface water shall not be discharged directly into any river, stream or any other waterbody.

- Only existing crossing points on rivers and watercourses may be used.
- Clearance of vegetation within 5 m of any watercourses will be undertaken by hand only.

In wet or soft ground appropriate matting will be required for access by vehicles and mechanical excavators. Matting may be rotated to reduce the total amount required.

Vehicles and plant shall be properly maintained. Any fuel or oil drips will be monitored on an ongoing basis and addressed immediately.

Spill kits, plant nappies, and oil/fuel soak up granules will be present onsite to deal with any incidents, and to stop a spill from reaching drains, watercourses, or sensitive areas. Contaminated materials from a spillage incident need to be disposed of as hazardous waste. Any spill incidents will be recorded by the site supervisor and ECoW.

3.2.9 Biosecurity measures

During the proposed GI works the GI Contractor will take all reasonable steps and exercise all due diligence to avoid allowing or causing the spread or dispersal of invasive non-native species (INNS). This will include appropriate construction, handling, treatment and disposal procedures to prevent the spread of INNS in line with recognised best practice. The GI Contractor shall document all positive steps or actions taken to avoid allowing or causing the spread or dispersal of INNS. The biosecurity measures are required for legal compliance irrespective of whether any European site may or may not be affected.

4. Baseline Characterisation

The results of the desk-based review and relevant field surveys are presented in the following sections.

4.1 Overview of the Baseline Environment

The general landscape across the proposed STCs B-K is dominated by buildings and artificial surfaces (BL3), with hedgerows (WL1) and treelines (WL2) running alongside private, public amenity grassland habitats (GA2), pedestrian walkways and car parks. Small areas of scattered trees and parkland (WD5) were also present adjacent to residential areas. Refer to Appendix A for site photographs which show the general character of the area.

Other habitats recorded included flower beds and borders (BC4), stone walls and other stonework (BL1), buildings and artificial surfaces (BL3), small areas of mixed broadleaved woodland (WD1), scrub (WS1), ornamental/non-native shrub (WS3), dry meadows and grassy verges (GS2), spoil and bare ground (ED2), recolonising bare ground (ED3) and improved agricultural grassland (GA1).

The proposed STCs also extend close to part of the following watercourses: River Lee, Douglas River, River Bride, River Moneygurney, Glasheen River and Curragheen River.

4.2 European Sites

European sites within proximity of the proposed GI works for STCs B to K are presented in Table 4.1 below. Refer to Appendix B, Figure B1 for location of the European site in relation to the BusConnects Cork STCs B to K.

Table 4.1 European sites within proximity of the proposed GI works for STCs B to K

European site	Distance from proposed GI works	Description
Cork Harbour SPA (NPWS, 2014a)	Located 150 m east of the proposed GI works at the closest point.	<p>Cork Harbour is a large, sheltered bay system, with several river estuaries, including the River Lee and Douglas River which are in proximity to the proposed GI works.</p> <p>The SPA is designated for supporting internationally important numbers of wintering waterfowl which can reach an excess of 20,000. It is noted that the site supports internationally important populations of:</p> <ul style="list-style-type: none"> • black-tailed godwit (<i>Limosa limosa</i>), and • redshank (<i>Tringa totanus</i>). <p>As well as nationally important populations of:</p> <ul style="list-style-type: none"> • little grebe (<i>Tachybaptus ruficollis</i>), • great crested grebe (<i>Podiceps cristatus</i>), • cormorant (<i>Phalacrocorax carbo</i>), • grey heron (<i>Ardea cinerea</i>), • shelduck (<i>Tadorna tadorna</i>), • widgeon (<i>Anas penelope</i>), • teal (<i>Anas crecca</i>), • mallard (<i>Anas platyrhynchos</i>), • pintail (<i>Anas acuta</i>), • shoveler (<i>Anas clypeata</i>), • red-breasted merganser (<i>Mergus serrator</i>), • oystercatcher (<i>Haematopus ostralegus</i>), • golden plover (<i>Pluvialis apricaria</i>), • grey plover (<i>Pluvialis squatarola</i>),

European site	Distance from proposed GI works	Description
		<ul style="list-style-type: none"> • lapwing (<i>Vanellus vanellus</i>), • dunlin (<i>Calidris alpina</i>), • bar-tailed godwit (<i>Limosa lapponica</i>), • curlew (<i>Numenius Arquata</i>), and • greenshank (<i>Tringa nebularia</i>). <p>In addition, the site supports the largest population of shelduck in Ireland.</p> <p>According to the citation, Cork Harbour is an important site for black-headed gull (<i>Chroicocephalus ridibundus</i>), common gull (<i>Larus canus</i>) and lesser black-backed gull (<i>Larus fuscus</i>) during the autumn and winter.</p> <p>During the breeding bird season, the SPA supports a nationally important breeding colony of common tern.</p>
The Great Island Channel SAC (NPWS, 2014b)	Located 3.75 km east of the proposed GI works at the closest point.	The Great Island Channel forms the eastern stretch of the Cork Harbour river basin, within which sit the estuaries of the Owenacurra and Dungourney Rivers. The main habitats of conservation interest in Great Island Channel SAC are the sheltered tidal sand and mudflats and the Atlantic salt meadows. The SAC is hydrologically linked downstream to the River Lee and Douglas River.

In addition to the Cork Harbour SPA and the Great Island Channel SAC, part of the Cork Harbour is designated as a Ramsar Site under the Convention on Wetlands (Ramsar, 2022). The Cork Harbour Ramsar site lies within the wider and extensive wetland system that is Cork Harbour and is focussed on four separate areas of intertidal habitat at Lough Mahon, Great Island Channel, Whitegate Bay and Lough Beg. These areas are an integral part of the larger Cork Harbour SPA, and part of the Ramsar site lies within the Great Island Channel SAC.

4.3 Annex I Habitats

No Annex I habitats listed have been identified on any of the STCs.

4.4 Species: wintering birds

A search of the National BioDiversity Data Centre (NBDC) identified a number of records of QI bird species of the Cork Harbour SPA within approximately 1 km of the proposed GI works as summarised in Table 4.1.

Table 4.2 QI Species returned from the NBDC database search (from January 2013-January 2024)

Species	Record count	Date of last record	Database
Little grebe	10	22/03/2020	Birds of Ireland
Great crested grebe	1	02/12/2017	Birds of Ireland
Cormorant	24	28/01/2023	Birds of Ireland
Grey heron	27	29/03/2022	Birds of Ireland
Shelduck	9	02/12/2017	Birds of Ireland
Wigeon	5	02/12/2017	Birds of Ireland
Teal	14	21/02/2023	Birds of Ireland
Shoveler	3	15/03/2020	Birds of Ireland
Red-breasted Merganser	1	02/12/2017	Birds of Ireland
Oystercatcher	13	28/01/2023	Birds of Ireland

Species	Record count	Date of last record	Database
Golden plover	2	26/02/2017	Birds of Ireland
Lapwing	6	02/12/2017	Birds of Ireland
Dunlin	4	02/12/2017	Birds of Ireland
Black-tailed godwit	8	28/01/2023	Birds of Ireland
Bar-tailed godwit	5	02/12/2017	Birds of Ireland
Curlew	12	28/01/2023	Birds of Ireland
Redshank	6	19/11/2016	Birds of Ireland
Black-headed gull	25	07/02/2021	Birds of Ireland
Common gull	10	06/03/2020	Birds of Ireland
Lesser black-backed gull	4	20/03/2020	Birds of Ireland
Common tern	1	23/06/2017	Birds of Ireland

Desk study records from the Cork Harbour SPA Conservation Objectives Supporting Document (NPWS, 2014a), were obtained from the NPWS. The Cork Harbour SPA was divided into subsites, with a water bird survey programme undertaken across the winter of 2010/2011. The following subsites are located within 300 m of the proposed GI works: Harty's Quay, Inner Douglas Estuary, Bloomfield and Ringmahon Point. The broad habitat types of these subsites comprise subtidal and intertidal. Species recorded at these subsites comprise ringed plover (*Charadrius hiaticula*), redshank, curlew, shelduck, lapwing, black-headed gull, cormorant, oystercatcher, black-tailed godwit, bar-tailed godwit, widgeon, grey plover, dunlin, lesser black-backed gull and teal.

Wintering bird surveys were conducted from October 2023 to February 2024 as part of the environmental assessments for the BusConnects Cork STCs which found a number of bird species nearby habitats in proximity to the proposed GI works. A summary of the results is presented in Table 4.2, comprising peak counts recorded during the wintering bird surveys. The peak counts are also presented as a percentage of the Cork Harbour SPA population (refer to Section 2.4.6 Population thresholds of QI species).

Table 4.2: Summary table of peak counts during the Wintering bird survey data collected between October 2023-February 2024

Species monthly peak counts	October	November	December	January	February	Peak Count	Cork Harbour SPA QI (Yes/No)	% of the SPA*
Black-headed gull	43	14	18	31	5	43	Yes	1.18%
Black-tailed godwit	-	-	-	5	10	10	Yes	0.52%
Cormorant	8	25	2	12	-	25	Yes	4.80%
Common gull	-	1	-	1	4	4	Yes	0.25%
Curlew	19	35	50	10	9	50	Yes	2.24%
Little egret (<i>Egretta garzetta</i>)	1	1	-	-	-	1	No	N/A
Greenshank	-	-	-	1	1	1	No	N/A
Goosander (<i>Mergus Merganser</i>)	-	-	-	1	2	2	No	N/A
Grey wagtail (<i>Motacilla cinerea</i>)	-	-	1	-	-	1	No	N/A
Grey heron	3	1	1	1	1	3	Yes	3.75%
Herring gull	4	1	10	3	20	20	No	N/A
Lapwing	-	-	-	93	-	93	Yes	1.23%
Lesser black-backed gull	1	-	4	3	9	9	Yes	1.15%
Mallard	-	-	5	-	3	5	Yes	0.97%
Mute swan (<i>Cygnus Olor</i>)	2	-	-	-	-	2	No	N/A
Oystercatcher	115	121	43	55	58	121	Yes	6.69%
Red-breasted merganser	-	-	-	-	-	1	Yes	0.82%
Redshank	1	-	1	2	-	2	Yes	0.09%
Redwing (<i>Turdus Iliacus</i>)	-	-	-	8	-	-	No	N/A
Whimbrel (<i>Numenius Phaeopus</i>)	-	-	-	2	-	-	No	N/A
Widgeon	-	-	2	-	-	2	Yes	0.11%

* The percent of the Cork Harbour SPA calculated using the population figures from the five-year mean peaks for the period 1995/96 to 1999/2000 (NPWS, 2014a).

A spatial review of the wintering bird survey data from October 2023-February 2024 was undertaken to identify where potentially significant numbers of birds were recorded. Peak counts which exceeded the 1% population threshold of the SPA were recorded at the following four discrete locations:

The sports pitches at Ringmahon, located between the South Ring Road and Ringmahon Road (refer to Appendix A, Photo 1). The closest proposed GI works are located 0.6 km south-east, along STC J (refer to Appendix B, Figure B1; J-BH-19, and J-BH-20). Peak counts of foraging and roosting oystercatcher and curlew were recorded here, comprising 6.69% and 2.24% of the Cork Harbour SPA population (NPWS, 2015) respectively. Other bird species recorded at this location include individual and small numbers of

black-headed gull, common gull, herring gull and whimbrel. Due to this site supporting over 1% of the SPA population of oystercatcher and curlew, and regularly supporting large numbers of these species across all months of the wintering bird surveys, this site will be considered functionally linked land during the assessment.

Adjacent to Horgan's Quay, on the River Lee close to Cork city centre (refer to Appendix A, Photo 2). The closest proposed GI works are located approximately 0.6 km west, along STC B (refer to Appendix B, Figure B1; B-BH-01, and B-WS-01 (Alt)). Significant numbers of black-headed gull, including a peak count calculated as 1.18% of the Cork Harbour SPA population were recorded. Other bird species recorded at this location include individual and small numbers of lesser black-backed gull, common gull, herring gull, cormorant and grey heron. Due to this site supporting over the threshold 1% of the SPA population of black-headed gull, this site will be considered functionally linked land during the assessment.

On the Douglas River estuary, near the Black Bridge (refer to Appendix A, Photo 3). The closest proposed GI works are located 0.25 km south-east, along STC J (refer to Appendix B, Figure B1; J-BH-22. Surveyed from a vantage point off Jacob's Island, peak counts of cormorant, lapwing, and grey heron, calculated as 4.8%, 1.23%, and 3.75% of the Cork Harbour SPA population respectively, were recorded. Other bird species recorded at this location include individual and small numbers of black-headed gull, redshank, grey heron, little egret, oystercatcher, and herring gull. This area is located within the Cork Harbour SPA.

Located within the Mahon Industrial Estate, a peak count of nine lesser black-backed gull were recorded during the February survey, comprising 1.15% of the SPA population. No other bird species, or lesser black-backed gull were recorded at this site during any other survey visits. As lesser black-backed gull has only been recorded roosting at this area once during winter bird surveys, with no other evidence from desk study and field surveys to suggest that this is a regular roosting area, the site is not deemed functionally linked land for lesser black-backed gull. The closest proposed GI works are located approximately 0.15 km south, along STC J (refer to Figure B1; J-BH-19, and J-BH-20).

No other notable numbers of bird species were recorded at other locations during the wintering bird surveys, with the remaining records comprising individual and small numbers of birds.

4.5 Aquatic Environment

The Water Framework Directive WFD (EPA, 2024) is an important mechanism for assessing and managing the water environment in the EU, through a six-yearly cycle of planning and implementing measures to protect and improve the water environment. It applies to all rivers, lakes, estuaries, coastal waters and groundwater. Good ecological status is the WFD default objective for all water bodies and is defined as a slight variation from undisturbed conditions. The WFD status may be determined by using monitoring, extrapolation or expert judgement techniques.

Waterbodies, including watercourses and transitional waterbodies, in the vicinity of the proposed GI works assessed using desk-based review, are presented in Table 4.3.

Table 4.3: Water Framework Directive Status of Watercourses within the study area (EPA, 2024)

Name	European Code	WFD status*	Status determination technique	Proximity to proposed GI works
Lee (Cork) Estuary Upper	IE_SW_060_0950	Moderate	Monitoring	Proposed GI works are located approximately 100m north of the watercourse at the closest point (refer to Figure B2; B-WS-01 (Alt), and B-BH-01).
Lee (Cork) 090	IE_SW_19L030800	Good	Monitoring	Proposed GI works are located approximately 180m south of the watercourse at the closest point (refer to Figure B2; F-BH-20, F-WS-21).
Moneygurney 10	IE_SW_19M300900	Good	Modelling	Proposed GI works are located within 10m of the watercourse (refer to Figure B2; H-BH-02, H-BH-03, H-BH-04, H-BH-05, H-WS-01)
Glasheen (Cork City) 010	IE_SW_19G040700	Poor	Modelling	Proposed GI works are located within 10m of the watercourse (refer to Figure B2; F-BH-20).
Curragheen (Cork City) 010	IE_SW_19C120740	Moderate	Expert judgement	Proposed GI works are located within 10m of the watercourse (refer to Figure B2; E-BH-21).
Bride (Cork City) 020	IE_SW_19B140300	Poor	Modelling	Proposed GI works are located within 10 m of the watercourse (refer to Figure B2; C-ST-01, C-ST-02, C-WS-03, C-WS-04, C-TPF-01, C-TPF-02, C-TPF-03, C-TPF-04, C-SC-01, C-BH-03, and C-BH04).

*WFD status assigned between 2016-2021

4.6 Invasive Species

The field survey identified the invasive species Japanese knotweed (*Reynoutria japonica*) within the survey area, which is listed on the Third Schedule of the European Communities (EC) (Birds and Natural Habitats) Regulations, 2011 (S.I. No.477/2011).

The field survey also identified cherry laurel (*Prunus laurocerasus*), and butterfly bush (*Buddleia davidii*) across the survey area, which are classed as invasive by the NBDC, but not listed in the Third Schedule of the European Communities (EC) (Birds and Natural Habitats) Regulations, 2011 (S.I. No.477/2011).

5. Identification of relevant European sites

5.1 Introduction

The proposed GI works were examined with reference to their location and proximity to European sites and taking account of the 'source-pathway-receptor' model and potential effects outlined in Table 2.1. Consideration was given to the potential for functionally linked land and hydrological connectivity via watercourses to be present within the zones of influence of impact pathways.

5.2 European Sites within the Zol of the Proposed GI Works

The proposed GI works are not directly connected with or essential for the management of any European site. The proposed GI works are not situated in or are directly adjacent to any European site.

Table 5.1 identifies all the potentially relevant European sites, within the vicinity of the proposed GI works, whose designated area or functionally linked land lies within one or more of the Zols. Table 5.1 determines whether these identified European sites should be taken forward for assessment of LSE.

Of the potentially relevant European sites listed in Table 5.1, ten were not considered relevant for screening due to the small scale of the proposed GI works and the absence of effect pathways, notably negligible hydrological connectivity and the absence of functionally linked land (refer to Table 5.1 for details).

Two European sites were identified within the Zols which are relevant for the screening assessment and are considered further in Section 6:

- Cork Harbour SPA (004030); and
- Great Island Channel SAC (001058).

Figure B1, Appendix B illustrates the European sites locations in relation to the BusConnects Cork STCs B-K and Figure B3, Appendix B, illustrates the proposed GI works within the Zol for physical disturbance of QI bird species of the Cork Harbour SPA.

Table 5.1: European Sites within the Zol of the Proposed GI Works

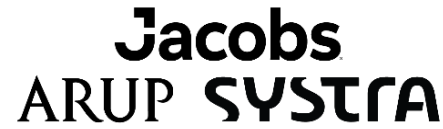
Potentially relevant European sites considered in the assessment	Zols that overlap the site or functionally linked land associated with it	Relevant European site requiring assessment of LSEs?	Qualifying Interest features	Conservation Objectives and Qualifying Interests
<p>Cork Harbour SPA (004030) (NPWS, 2014a). Located 150 m* east of the proposed GI works</p>	<p>Surface water catchment connectivity (Habitat degradation – changes in water quality and Habitat degradation – hydrogeological changes).</p> <p>Groundwater catchment connectivity (Habitat degradation – hydrological changes)</p> <p>Within 200 m from the proposed GI works (Habitat degradation – changes in air quality)</p> <p>Within 300 m from the proposed GI works (Disturbance of species)</p>	Yes	<p>Little grebe [A004] Great crested grebe [A005] Cormorant [A017] Grey heron [A028] Shelduck [A048] Wigeon [A050] Teal [A052] Pintail [A054] Shoveler [A056] Red-breasted Merganser [A069] Oystercatcher [A130] Golden plover [A140] Grey plover [A141] Lapwing [A142] Dunlin [A149] Black-tailed godwit [A156] Bar-tailed godwit [A157] Curlew [A160] Redshank [A162] Black-headed gull [A179] Common gull [A182] Lesser black-backed gull [A183] Common tern [A193] Wetland and water birds [A999]</p>	To maintain the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA.
<p>Great Island Channel SAC (001058) (NPWS, 2014b). Located 3.75 km* east of the proposed GI works.</p>	<p>Surface water catchment connectivity (Habitat degradation – changes in water quality and Habitat degradation – hydrogeological changes).</p> <p>Groundwater catchment connectivity (Habitat degradation – hydrological changes).</p>	Yes	<p>Mudflats and sandflats not covered by seawater at low tide [1140] Atlantic salt meadows (<i>Glauco-Puccinellietalia maritimae</i>) [1330]</p>	To maintain the favourable conservation condition of and to restore the favourable conservation condition of QI features of this SAC.

Potentially relevant European sites considered in the assessment	Zols that overlap the site or functionally linked land associated with it	Relevant European site requiring assessment of LSEs?	Qualifying Interest features	Conservation Objectives and Qualifying Interests
Blackwater River (Cork/Waterford) SAC (002170) (NPWS, 2012) located 13 km north of the proposed GI works.	The Blackwater River SAC is outside of the Zol of the proposed GI works, located in a different catchment, and is not hydrologically connected to the proposed GI works.	No	Estuaries [1130] Mudflats and sandflats not covered by seawater at low tide [1140] Perennial vegetation of stony banks [1220] Salicornia and other annuals colonising mud and sand [1310] Atlantic salt meadows (<i>Glauco-Puccinellietalia maritima</i>) [1330] Mediterranean salt meadows (<i>Juncetalia maritimi</i>) [1410] Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation [3260] Old sessile oak woods with Ilex and Blechnum in the British Isles [91A0] Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (<i>Alno-Padion</i> , <i>Alnion incanae</i> , <i>Salicion albae</i>) [91E0] Freshwater pearl mussel (<i>Margaritifera margaritifera</i>) [1029] White-clawed crayfish (<i>Austropotamobius pallipes</i>) [1092] Sea lamprey (<i>Petromyzon marinus</i>) [1095] Brook lamprey (<i>Lampetra planeri</i>) [1096] River lamprey (<i>Lampetra fluviatilis</i>) [1099] Twaite shad (<i>Alosa fallax fallax</i>) [1103] Salmon (<i>Salmo salar</i>) [1106] Otter (<i>Lutra lutra</i>) [1355] Killarney fern (<i>Trichomanes speciosum</i>) [1421]	
Sovereign Islands SPA (004124) (NPWS, 2022a) located 20 km south of the proposed GI works.	This site is not within hydrological connectivity of the proposed GI works and is beyond other Zols.	No	Cormorant [A017]	To maintain or restore the favourable conservation condition of the bird species listed as QI for this SPA.
The Gearagh SAC (000108) (NPWS, 2016) located 21 km west of the proposed GI works.	The site is hydrologically connected to the River Lee, however it is considered to be outside of the Zol.	No	Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation [3260] Rivers with muddy banks with <i>Chenopodium rubri</i> p.p. and <i>Bidention</i> p.p. vegetation [3270]	To maintain or restore the favourable conservation condition of habitats and species listed as QI for this SAC.

Potentially relevant European sites considered in the assessment	Zols that overlap the site or functionally linked land associated with it	Relevant European site requiring assessment of LSEs?	Qualifying Interest features	Conservation Objectives and Qualifying Interests
			Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles [91A0] Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (Alno-Padion, Alnion incanae, Salicion albae) [91E0] Otter [1355]	
The Gearagh SPA (004109) (NPWS, 2022b), located 23 km west of the proposed GI works.	The site is hydrologically connected to the River Lee, however it is considered to be outside of the Zol.	No	Wigeon [A050] Teal [A052] Mallard [A053] Coot (<i>Fulica atra</i>) [A125] Wetland and water birds [A999]	To maintain or restore the favourable conservation condition of the bird species listed as QI for this SPA.
Mullaghanish to Musheramore Mountains SPA (004162) (NPWS, 2022c), located 25 km west of the proposed GI works.	There were no effect pathways to the designated site identified, and the site is outside of the Zol of the proposed GI works.	No	Hen Harrier (<i>Circus cyaneus</i>) [A082]	To maintain or restore the favourable conservation condition of the bird species listed as QI for this SPA.
Ballycotton Bay SPA (004022) (NPWS, 2014c) located 26 km east of the proposed GI works.	This site is not within hydrological connectivity of the proposed GI works and is beyond other Zols.	No	Teal [A052] Ringed plover [A137] Golden plover [A140] Grey plover [A141] Lapwing [A142] Black-tailed godwit [A156] Bar-tailed godwit [A157] Curlew [A160] Turnstone (<i>Arenaria interpres</i>) [A169] Common gull [A182] Lesser black-backed gull [A183] Wetland and water birds [A999]	To maintain or restore the favourable conservation condition of the bird species listed as QI for this SPA.
Courtmacsherry Estuary SAC (001230) (NPWS, 2014d),	This site is not within hydrological connectivity of the proposed GI works and is beyond other Zols.	No	Estuaries [1130] Mudflats and sandflats not covered by seawater at low tide [1140]	To maintain or restore the favourable conservation condition

Potentially relevant European sites considered in the assessment	Zols that overlap the site or functionally linked land associated with it	Relevant European site requiring assessment of LSEs?	Qualifying Interest features	Conservation Objectives and Qualifying Interests
located 25 km south of the proposed GI works.			Annual vegetation of drift lines [1210] Perennial vegetation of stony banks [1220] Salicornia and other annuals colonising mud and sand [1310] Atlantic salt meadows (<i>Glauco-Puccinellietalia maritima</i>) [1330] Mediterranean salt meadows (<i>Juncetalia maritimi</i>) [1410] Embryonic shifting dunes [2110] Shifting dunes along the shoreline with <i>Ammophila arenaria</i> (white dunes) [2120] Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130]	of habitats and species listed as QI for this SAC.
Courtmacsherry Bay SPA (004219) (NPSW, 2014e) located 27 km south of the proposed GI works.	This site is not within hydrological connectivity of the proposed GI works and is beyond other Zols.	No	Great northern diver (<i>Gavia immer</i>) [A003] Shelduck [A048] Wigeon [A050] Red-breasted merganser [A069] Golden plover [A140] Lapwing [A142] Dunlin [A149] Black-tailed godwit [A156] Bar-tailed Godwit [A157] Curlew [A160] Black-headed gull [A179] Common gull [A182] Wetland and waterbirds [A999]	To maintain or restore the favourable conservation condition of the bird species listed as QI for this SPA.
Old Head of Kinsale SPA (004021) (NPWS, 2022d) located 27 km south of the proposed GI works.	This site is not within hydrological connectivity of the proposed GI works and is beyond other Zols.	No	Kittiwake (<i>Rissa tridactyla</i>) [A188] Guillemot (<i>Uria aalge</i>) [A199]	To maintain or restore the favourable conservation condition of the bird species listed as QI for this SPA.
Blackwater Callows SPA (004094) (NPWS, 2022e) located 28 km	This site is not within hydrological connectivity of the proposed GI works and is beyond other Zols.	No	Whooper Swan (<i>Cygnus cygnus</i>) [A038] Wigeon [A050] Teal [A052]	To maintain or restore the favourable conservation condition

BusConnects Cork Sustainable Transport Corridors (STCs)
 Proposed Ground Investigation Works - STCs B-K
 Screening for AA report



Potentially relevant European sites considered in the assessment	Zols that overlap the site or functionally linked land associated with it	Relevant European site requiring assessment of LSEs?	Qualifying Interest features	Conservation Objectives and Qualifying Interests
north of the proposed GI works.			Black-tailed godwit [A156] Wetland and water birds [A999]	of the bird species listed as QI for this SPA.

**Distance measured from the closest proposed GI works to the European site.*

6. Assessment of Likely Significant Effects (LSEs)

6.1 Introduction

This section presents the screening exercise and the result of the impact assessment that was undertaken.

6.2 Screening Exercise

A screening exercise is presented in Table 6.1 which examines the potential effects of the proposed GI works on European sites and the QI (Annex I habitats and Annex II species) for which they are designated. The results of this exercise and the rationale for 'screening in or screening out' European sites within the ZOI (and therefore, of potential relevance to the AA) are also detailed in Table 6.1.

Consideration of LSE due to the proposed GI works was given to the European sites located within the ZOI identified in Table 5.1.

Table 6.1: European Sites with the Potential for LSEs from the proposed GI works

European site (and connectivity)	Conservation Objectives and Qualifying Interests (*=priority habitat).	Potential pathway	Assessment of LSE Alone	LSE from the proposed GI works alone
<p>Cork Harbour SPA (004030) (NPWS, 2014a). Located 150 m* east of the proposed GI works. No direct hydrological connectivity, however, groundwater runoff provides indirect hydrological connectivity.</p>	<p>To maintain the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA: Little grebe [A004] Great crested grebe [A005] Cormorant [A017] Grey heron [A028] Shelduck [A048] Wigeon [A050] Teal [A052] Pintail [A054] Shoveler [A056] Red-breasted merganser [A069] Oystercatcher [A130] Golden plover [A140] Grey plover [A141] Lapwing [A142] Dunlin [A149] Black-tailed godwit [A156] Bar-tailed godwit [A157] Curlew [A160] Redshank [A162] Black-headed gull [A179]</p>	Habitat loss - permanent	The European site is outside of the proposed GI works boundary and so outside of the ZoI of habitat loss and therefore there is no pathway to an effect.	No LSE at all
		Habitat loss - temporary	The European site is outside of the proposed GI works boundary and so outside of the ZoI of habitat loss and therefore there is no pathway to an effect.	No LSE at all
		Habitat degradation – changes in water quality	The European site is outside of the proposed GI works boundary. The European site is hydrologically linked. All proposed GI works are small scale and of short duration. No extensive or deep earth works will be required, and ground will be reinstated post works. The proposed GI works will follow standard best practice pollution prevention measures. Any surface water will be captured by the urban drainage system. Overall, it is highly unlikely that pollutants or sediments could enter a watercourse in quantities to significantly degrade or pollute the SPA and therefore there is no pathway to an effect.	No LSE at all
		Habitat degradation – changes in air quality	The European site is outside of the proposed GI works boundary. Some of the proposed GI works are within 200m of the Cork Harbour SPA, and so the ZoI for habitat degradation through changes in air quality, however the proposed GI works will not result in significant changes in air quality and therefore there is no pathway to an effect.	No LSE at all
		Habitat degradation – hydrological changes	The European site is hydrologically linked, but at a distance where effects would be imperceptible due to the small scale of the proposed GI works and limited risk of pollution. All proposed GI works are small scale and of short duration. No extensive or deep earth works will be required, and ground will be reinstated post works. Any surface water will be captured by the urban drainage system, so there will be no change to flows and volumes of water in the environment and therefore there is no pathway to an effect.	No LSE at all
		Habitat degradation – hydrogeological changes	The European site is outside of the proposed GI works boundary. The European site may be within the groundwater catchment of the proposed GI works. All proposed GI works are small scale and of short duration. No extensive or deep earth works will be required, and ground will be reinstated post works. Any surface water will be captured by the urban drainage system. The proposed GI works would not cause changes to groundwater volumes and flows, which in turn might change the hydrogeology of QI habitats and supporting or functionally linked habitats of QI species. As such, there is no pathway to an effect.	No LSE at all
		Habitat degradation – spread of invasive species	The European site is outside of the proposed GI works boundary and so outside of the ZoI of the spread of invasive species and therefore there is no pathway to an effect.	No LSE at all
		Disturbance of species	All proposed GI which are works located more than 300m from the SPA present no pathway to an effect for disturbance impacts upon QI bird species through increased noise and vibration disturbance, as they are outside of the ZoI.	No LSE at all

European site (and connectivity)	Conservation Objectives and Qualifying Interests (*=priority habitat).	Potential pathway	Assessment of LSE Alone	LSE from the proposed GI works alone
	Common gull [A182] Lesser black-backed gull [A183] Common tern [A193] Wetland and water birds [A999]		No proposed GI works are located within 300m of the site or the functionally linked land at Ringmahon Park or Horgan's Quay, identified from the wintering bird surveys as supporting more than the 1% threshold population of curlew, oystercatcher and black-headed gull (refer to Section 4.4). Of the proposed GI works, window sampling is proposed at three locations (I-WS-01, I-WS-02, and J-WS-18) and boreholes are proposed at four locations (J-BH-19, J-BH-20, J-BH-21, J-BH-22), within 300m of the Cork Harbour SPA (refer to Appendix B, Figure B3). Specifically, the Douglas River Estuary, which was identified as supporting more than the 1% threshold population of cormorant, grey heron and lapwing. The window sampling is proposed at two locations near Reeves Wood off Douglas Road, 150m west of the SPA, and in the carpark of the Mahon Retail Park, 290m north of the SPA. Of the proposed boreholes, two are located next to the Mahon Retail Park and two are adjacent to the Mahon Interchange Bridge, the closest being 190m north-east of the SPA. A review of aerial imagery identified major barriers between the proposed GI works and the SPA, including the South Ring Road, Mahon Retail Park and residential housing which will provide screening for noise and visual disturbance. It is noted that given the mobility of these species and the range of alternative feeding sites around the Cork Harbour SPA, any temporary displacement, would be unlikely to be significant. In addition, the works are short term and the vibration and associated disturbance from the proposed GI works will be highly localised. Overall, disturbance resulting from noise and vibration will be imperceptible at the receptor sites, therefore there is no pathway to an effect.	
		Mortality	The European site is outside of the proposed GI works boundary and outside of the ZoI of mortality and therefore there is no pathway to an effect.	no LSE at all
Great Island Channel SAC (001058) (NPWS, 2014b) Located 3.75 km* east of the proposed GI works. No direct hydrological connectivity, however, groundwater runoff provides indirect hydrological connectivity.	To maintain or restore the favourable conservation condition of the Annex I habitats and Annex II species for which the SAC has been selected. Mudflats and sandflats not covered by seawater at low tide [1140] Atlantic salt meadows [1330]	Habitat loss - permanent	The European site is outside of the proposed GI works boundary and so outside of the ZoI of habitat loss and therefore there is no pathway to an effect.	No LSE at all
		Habitat loss - temporary	The European site is outside of the proposed GI works boundary and so outside of the ZoI of habitat loss and therefore there is no pathway to an effect.	No LSE at all
		Habitat degradation – changes in water quality	The European site is outside of the proposed GI works boundary. The European site is hydrologically linked, but at a distance where effects would be imperceptible due to the small scale of the proposed GI works and limited risk of pollution.	No LSE at all
		Habitat degradation – changes in air quality	The European site is outside of the proposed GI works boundary and so outside of the ZoI of habitat degradation through changes in air quality. In addition, the proposed GI works will not result in significant changes in air quality and therefore there is no pathway to an effect.	No LSE at all
		Habitat degradation – hydrological changes	The European site is outside of the proposed GI works boundary. The European site is hydrologically linked, but at a distance where effects would be imperceptible due to the small scale of the proposed GI works and limited risk of pollution.	No LSE at all
		Habitat degradation – hydrogeological changes	The European site is outside of the proposed GI works boundary. The European site may be within the groundwater catchment of the proposed GI works.	No LSE at all

European site (and connectivity)	Conservation Objectives and Qualifying Interests (*=priority habitat).	Potential pathway	Assessment of LSE Alone	LSE from the proposed GI works alone
			All proposed GI works are small scale and of short duration. No extensive or deep earth works will be required, and ground will be reinstated post works. Any surface water will be captured by the urban drainage system. It is not feasible that the works could lead to changes in flows and volumes of water and therefore there is no pathway to an effect.	
		Habitat degradation - spread of invasive species	The European site is outside of the proposed GI works boundary and so outside of the ZoI of habitat loss and therefore there is no pathway to an effect.	No LSE at all
		Disturbance of species	N/A	N/A
		Mortality	N/A	N/A

*Distance measured from the closest proposed GI works to the European site.

**Refer to Appendix B, Figure B2

6.3 Determination of Likely Significant Effects

6.3.1 Alone assessment

An examination of European Sites and their QI features within the Zol of the proposed GI works is presented in Table 5.3. Potential pathways have been identified between the proposed GI works and European sites as outlined in Table 6.1. From this assessment, it can be concluded that all LSEs can be excluded on the basis of objective information and so Stage 2 AA is not required. No European Sites were identified for further examination.

6.3.2 In-combination assessment

As all LSEs have been excluded on the basis that there is no pathway to an effect and therefore no effect at all. The in-combination assessment therefore does not need to consider other plans and projects as, if there is no effect at all from the proposed GI works, then the proposed GI works cannot contribute to combined effects with other plans and projects irrespective of how many plans and projects there might be that may have in-combination effects.

7. Screening Statement and Conclusion

The proposed GI works are not connected with, or necessary to, the management of any European site(s).

This AA Screening Report presents the objective scientific information required to inform a robust and complete examination of the potential impacts of the proposed GI works on European sites.

The conclusion of the Screening for AA is that, in the absence of mitigation measures, there are no Likely Significant Effects either alone or in-combination to undermine the conservation objectives of any European sites, and therefore Stage 2 AA of the proposed GI works is not required.

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Appendix A. Photographs



Photo 1. Ringmahon Park from Ringmahon Road



Photo 2. River Lee from Horgan's Quay



Photo 3. Jacob's Island Wintering Bird Vantage Point, looking across to The Black Bridge



Photo 4. Broadleaved woodland located off Middle Glanmire Road, STC B Mayfield to City



Photo 5. Amenity grassland located off Leycesters Lane, STC B Mayfield to City

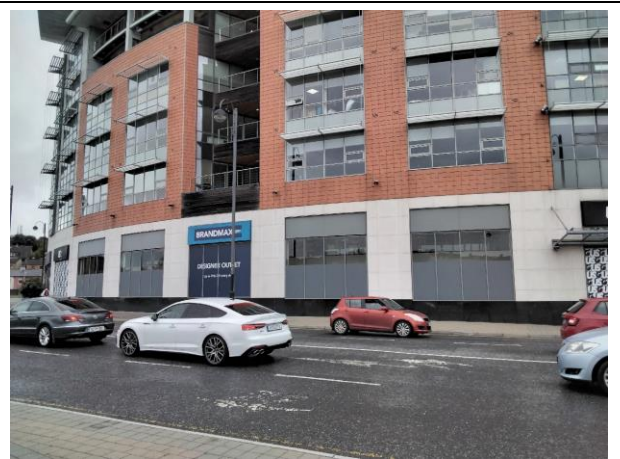


Photo 6. Brothers Delaney Road, STC C Blackpool to City



Photo 7. Cathedral Road, STC D Hollyhill to City



Photo 8. Main Street, STC E Ballincollig to City



Photo 9. A field located off Model Farm Road, STC E Ballincollig to City



Photo 10. A sports pitch located in Cork City, off Western Road STC F Bishopstown to City



Photo 11. Amenity grassland and scattered trees located off Glasheen Road STC F Bishopstown to City



Photo 12. South Gate Bridge from French's Quay STC G Togher to City



Photo 13. Residential area off Kinsale Road STC H Airport Road to Cork City



Photo 14. Scattered trees and parkland off Douglas Road, STC I Maryborough Hill to City



Photo 15. Grassland located off Mahon Link Road, STC J Mahon to City



Photo 16. A park located off Skehard Road, STC J Mahon to City



Photo 17. Bare ground in Mahon Industrial Park, STC J Mahon to City



Photo 18. River Lee looking east from Western Road



Photo 19. River Lee looking west from Clontarf Bridge



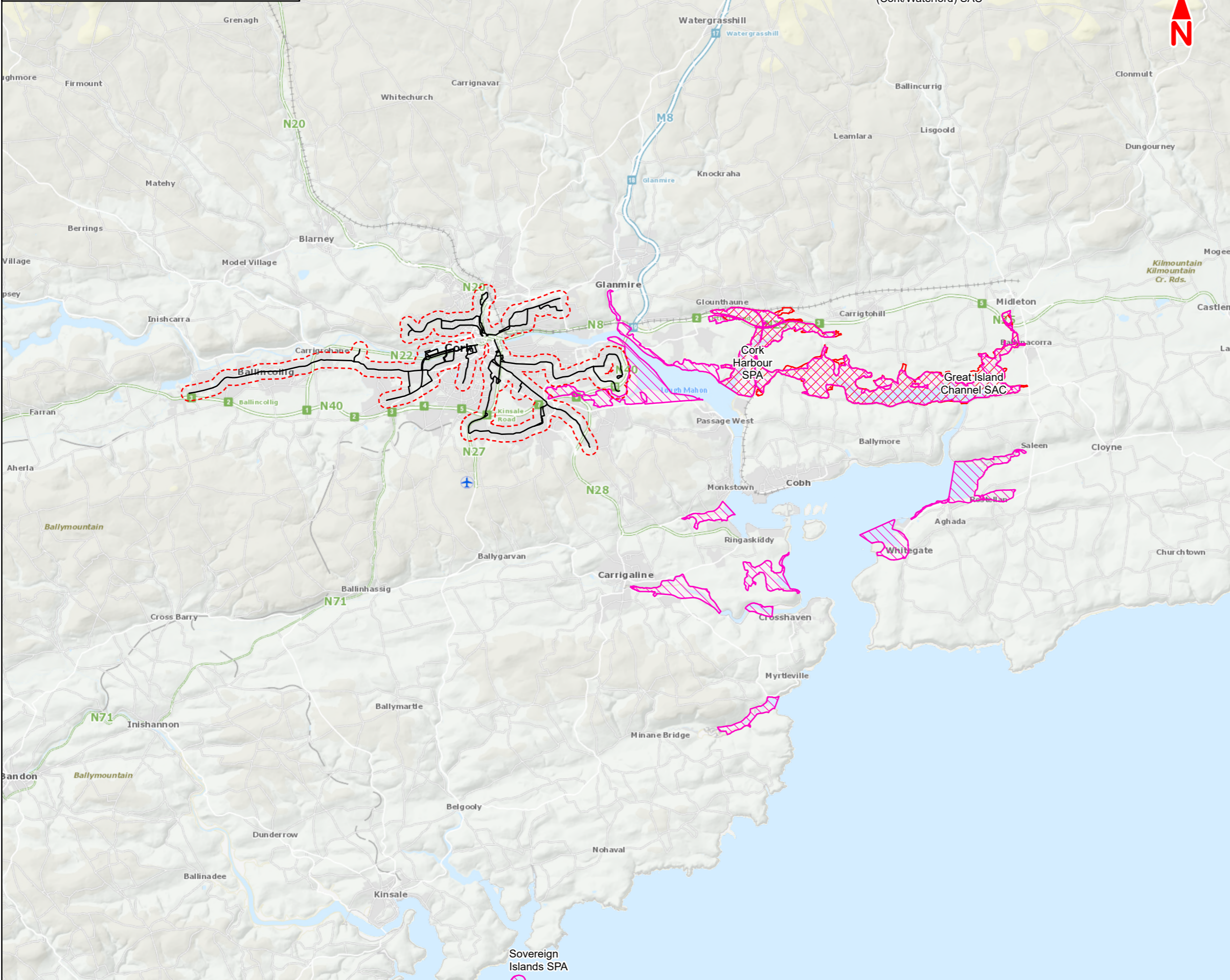
Photo 20. River Lee looking east from Clontarf Bridge

Appendix B. Figures

Figure B1 Location of European Sites in relation to BusConnects STCs B-K

Figure B2 Locations of the Proposed GI Works

Figure B3 Proposed GI Works within 300 m of Cork Harbour SPA



- Legend:**
- Sustainable Transport Corridors
 - 300m Study Area
 - NPWS EU Designated Sites**
 - Special Protection Areas
 - Special Area of Conservation

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P05	Mar 2024	EK	SK	SF	Final

Client
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Údarás Náisiúnta Iompair
National Transport Authority

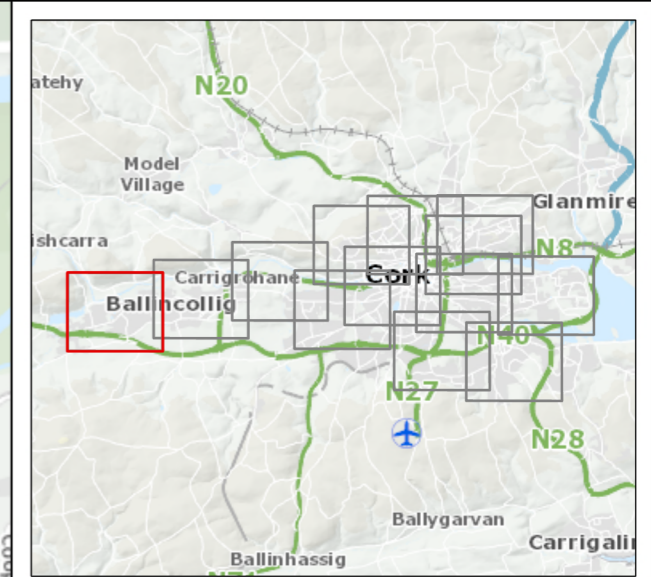
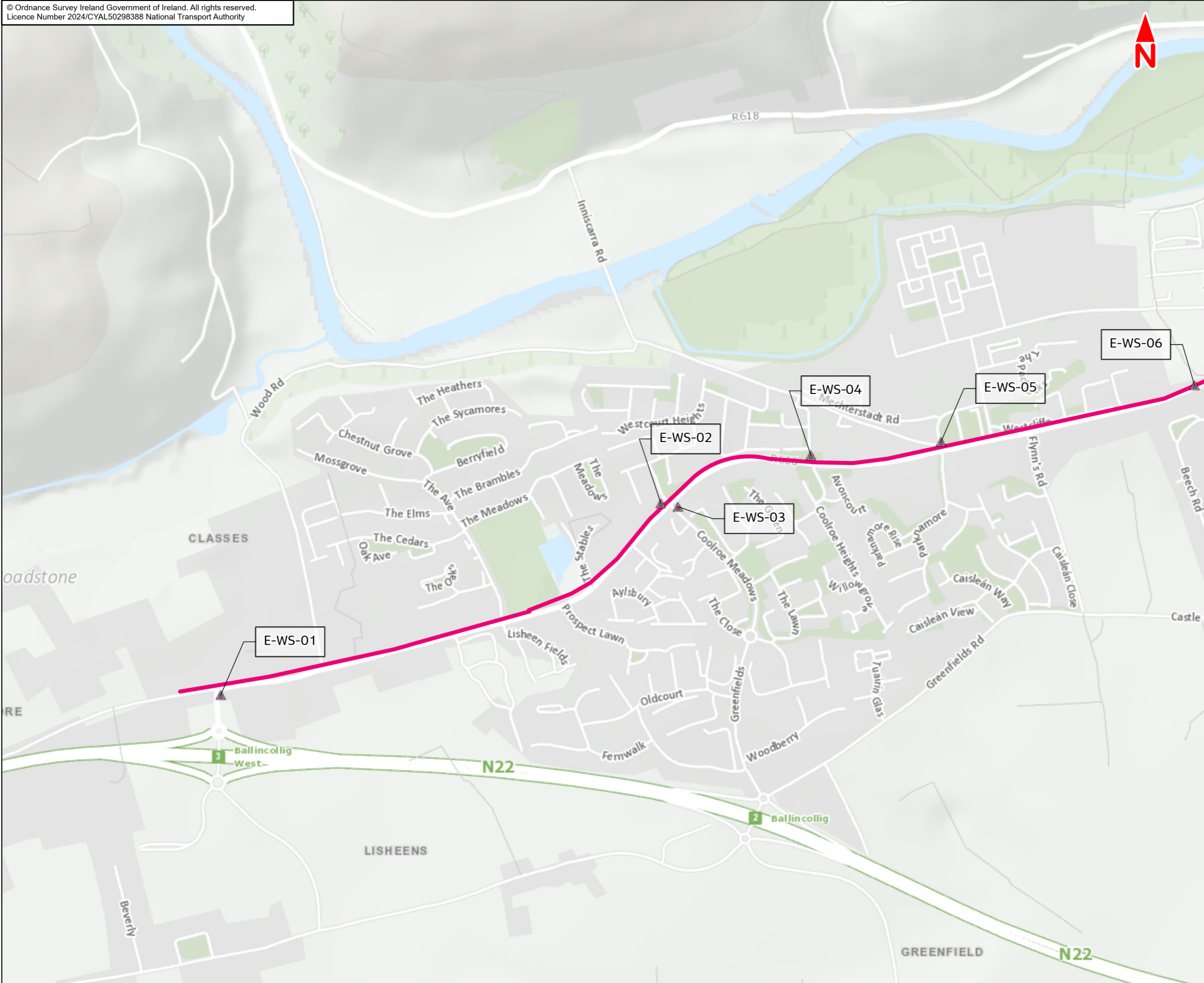
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Scale @ A3: 1:150,000
Project Code: BCCE
Originator Code: JAS

Consultant
JACOBS ARUP SYSTRA

Drawn: EK
Checked: SK
Approved: SF

QMS Code

Programme Title BusConnects Cork Sustainable Transport Corridors			
Drawing Title Figure B1 Location of European Sites in relation to BusConnects STCs B-K			
Drawing File Name BCCE-3-JAS-X-ENV-DR-G-5501	Sheet Number 1 of 1	Status 01	Rev P05



Legend:

Proposed GI Locations

- ▲ Window Sampler

Sustainable Transport Corridor

- Ballincollig to City

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P05	Mar 2024	EK	SK	SF	Final

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National Transport Authority

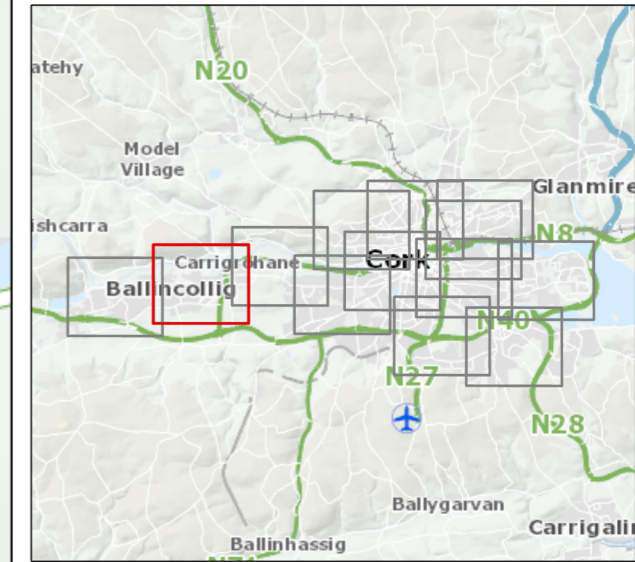
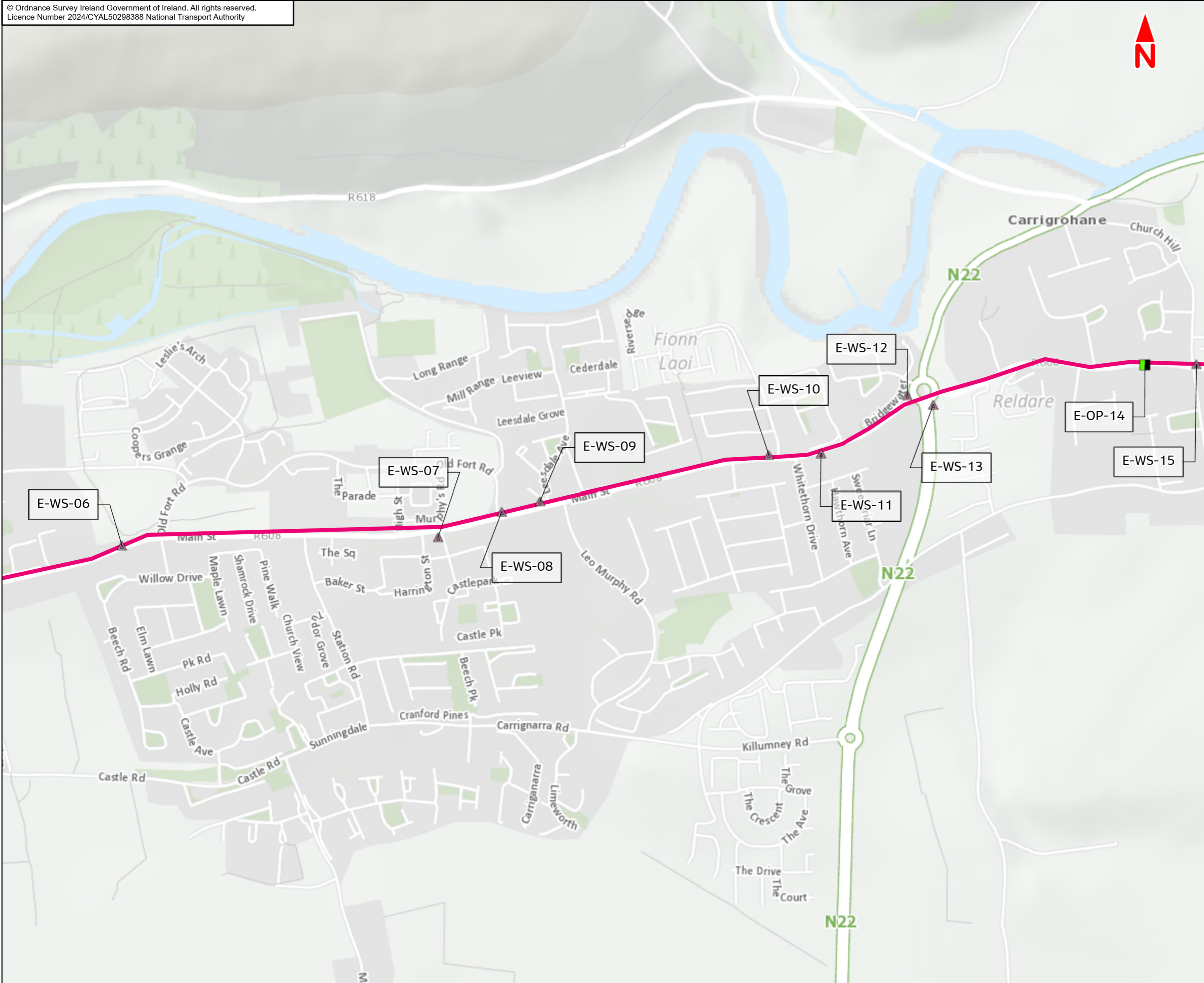
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Scale @ A3: 1:10000
Project Code: BCCE
Originator Code: JAS

Consultant
JACOBS ARUP SYSTRA

Drawn: EK
Checked: SK
Approved: SF

GMS Code

Programme Title BusConnects Cork Sustainable Transport Corridors			
Drawing Title Figure B2 Locations of Proposed GI Works			
Drawing File Name BCCE-3-JAS-X-GI-DR-G-0101	Sheet Number 1 of 12	Status 01	Rev P05

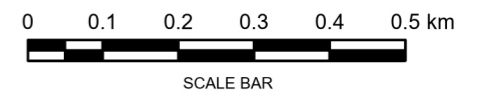


Legend:

- Proposed GI Locations**
- Trial Pit
 - ▲ Window Sampler

- Sustainable Transport Corridor**
- Ballincollig to City

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P05	Mar 2024	EK	SK	SF	Final

Client: **NTA**
Údarás Náisiúnta Iompair
National Transport Authority

Consultant: **JACOBS ARUP SYSTRA**

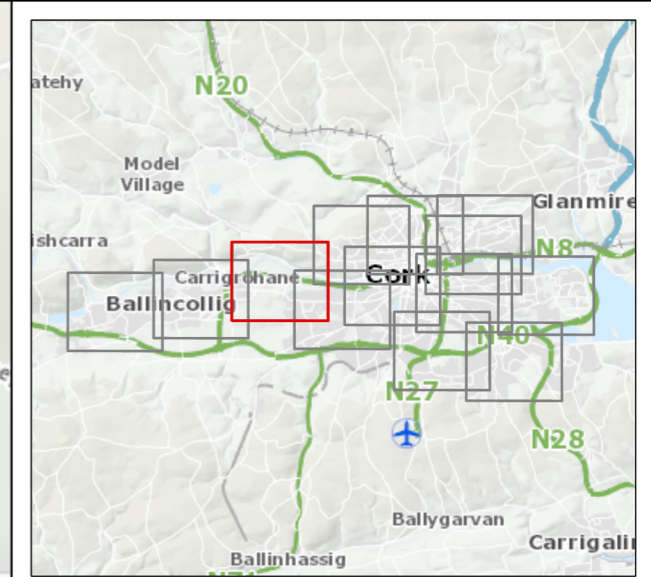
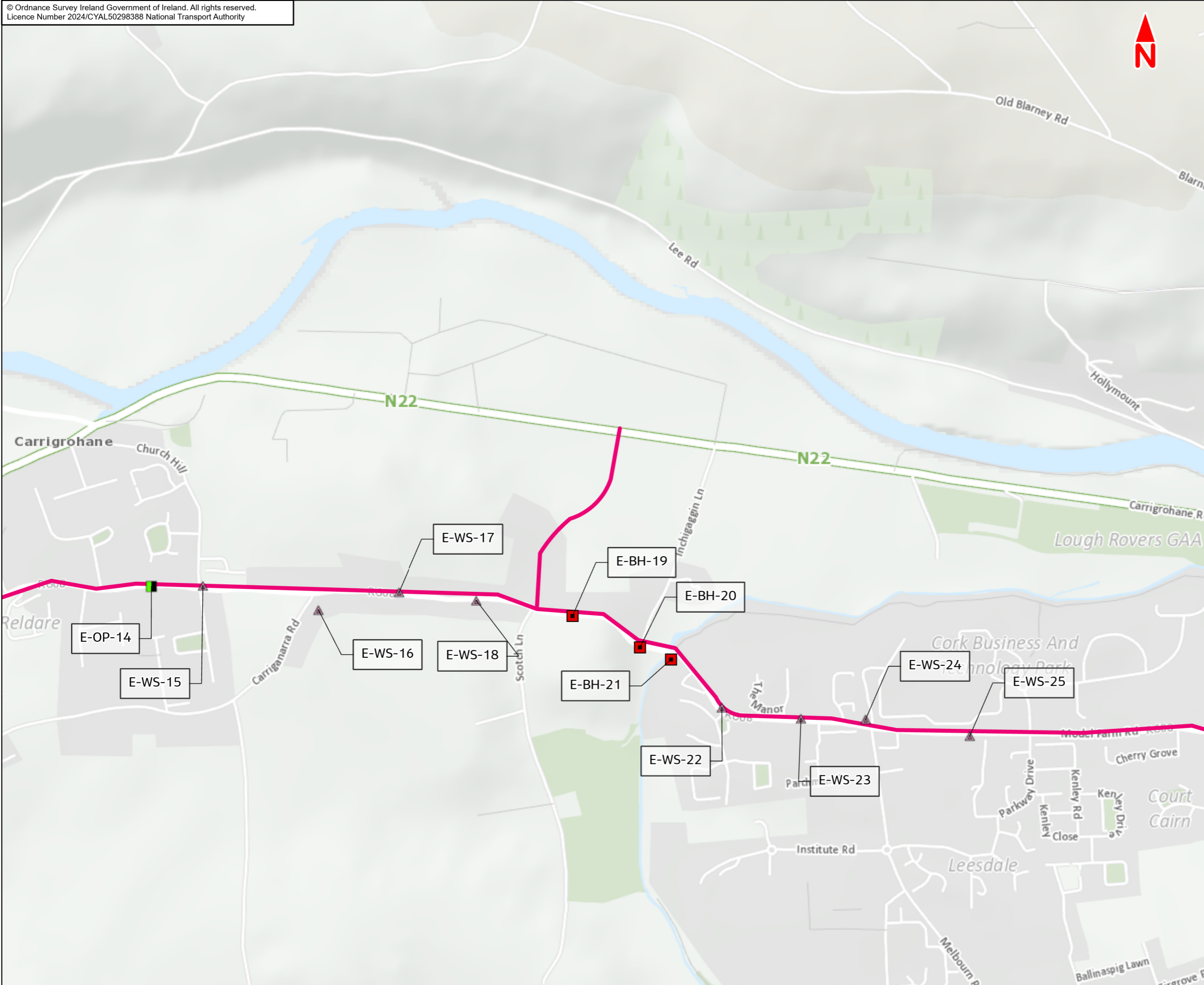
Date: 28/03/2024 | Scale @ A3: 1:10000

Project Code: BCCE | Originator Code: JAS

Drawn: EK | Checked: SK | Approved: SF

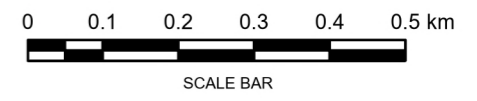
QMS Code: _____

Programme Title: BusConnects Cork Sustainable Transport Corridors			
Drawing Title: Figure B2 Locations of Proposed GI Works			
Drawing File Name: BCCE-3-JAS-X-GI-DR-G-0102	Sheet Number: 2 of 12	Status: 01	Rev: P05



- Legend:**
- Proposed Borehole
 - Trial Pit
 - ▲ Window Sampler
- Sustainable Transport Corridor**
- Ballincollig to City

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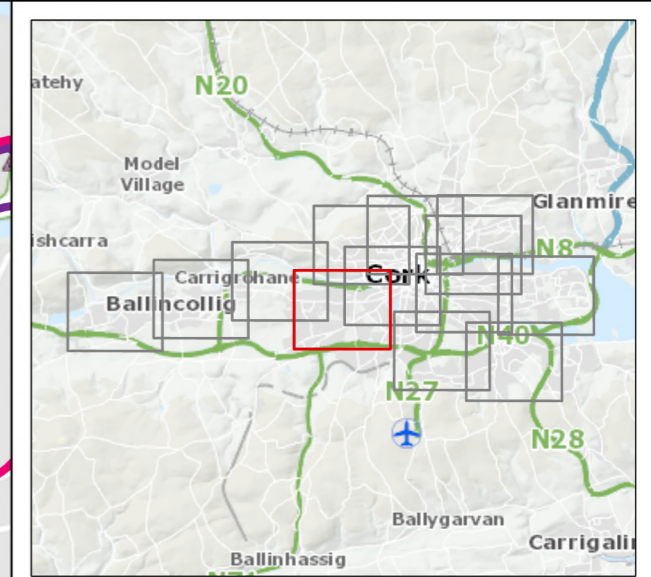
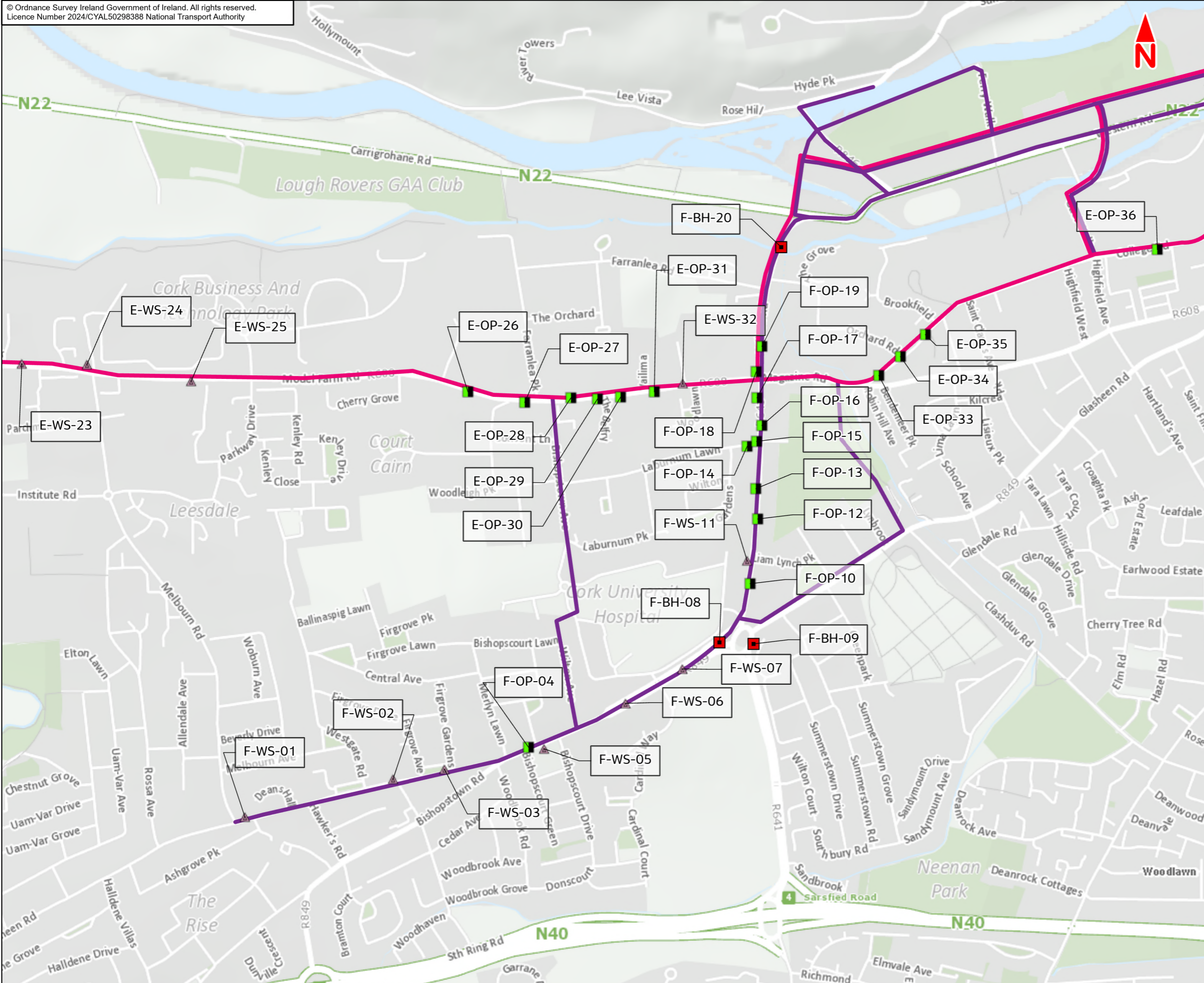
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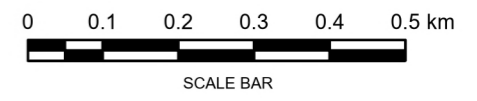
Client		Consultant	
 Údarás Náisiúnta Iompair National Transport Authority			
Date	Scale @ A3	Drawn	Checked
28/03/2024	1:10000	EK	SK
Project Code	Originator Code	QMS Code	
BCCE	JAS		

Programme Title		Drawing Title	
BusConnects Cork Sustainable Transport Corridors		Figure B2 Locations of Proposed GI Works	
Drawing File Name	Sheet Number	Status	Rev
BCCE-3-JAS-X-GI-DR-G-0103	3 of 12	01	P05



- Legend:**
- Proposed GI Locations**
 - Proposed Borehole (Red square)
 - Trial Pit (Green square)
 - Window Sampler (Black triangle)
 - Sustainable Transport Corridor**
 - Ballincollig to City (Pink line)
 - Bishopstown to City (Purple line)

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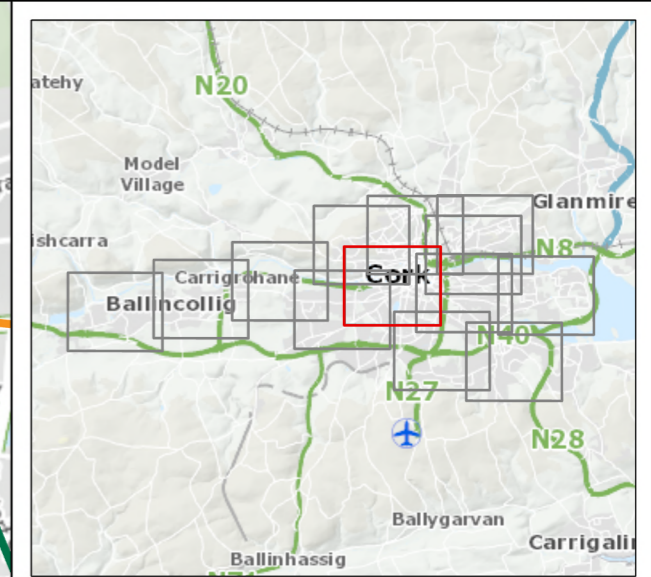
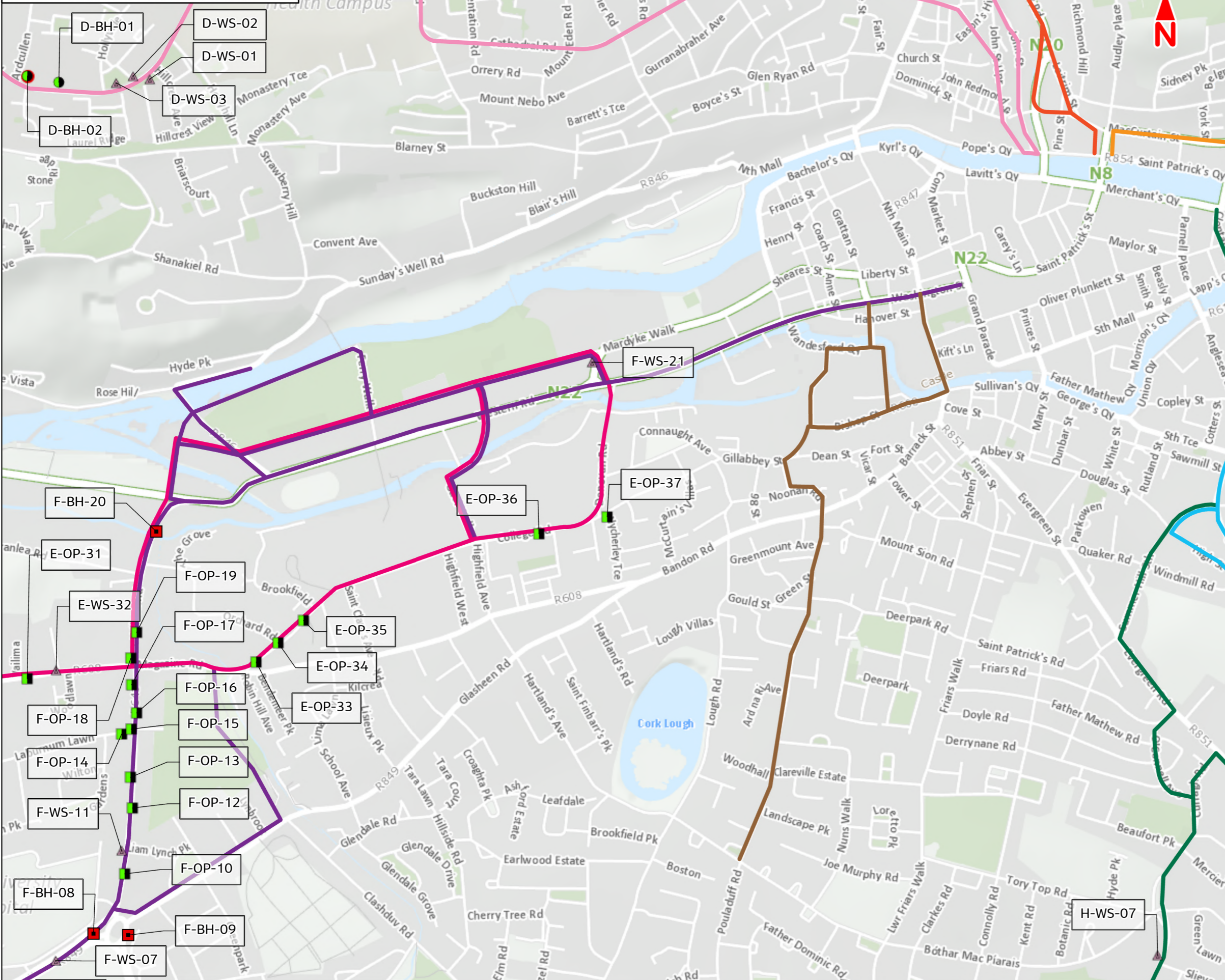
Client
NTA
 Údarás Náisiúnta Iompair
 National Transport Authority

Date: 28/03/2024
 Scale @ A3: 1:10000
 Project Code: BCCE
 Originator Code: JAS

Consultant
JACOBS ARUP SYSTRA

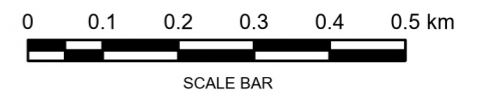
Drawn: EK
 Checked: SK
 Approved: SF

Programme Title BusConnects Cork Sustainable Transport Corridors			
Drawing Title Figure B2 Locations of Proposed GI Works			
Drawing File Name BCCE-3-JAS-X-GI-DR-G-0104	Sheet Number 4 of 12	Status 01	Rev P05



- Legend:**
- Proposed GI Locations**
- Cable Percussive Borehole
 - Cable Percussive With Rotary Follow-On
 - Proposed Borehole
 - Trial Pit
 - Window Sampler
- Sustainable Transport Corridor**
- Mayfield to City
 - Blackpool to City
 - Hollyhill to City
 - Ballincollig to City
 - Bishopstown to City
 - Togher to City
 - Airport Road to City
 - Maryborough Hill to City

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National Transport Authority

Consultant: **JACOBS ARUP SYSTRA**

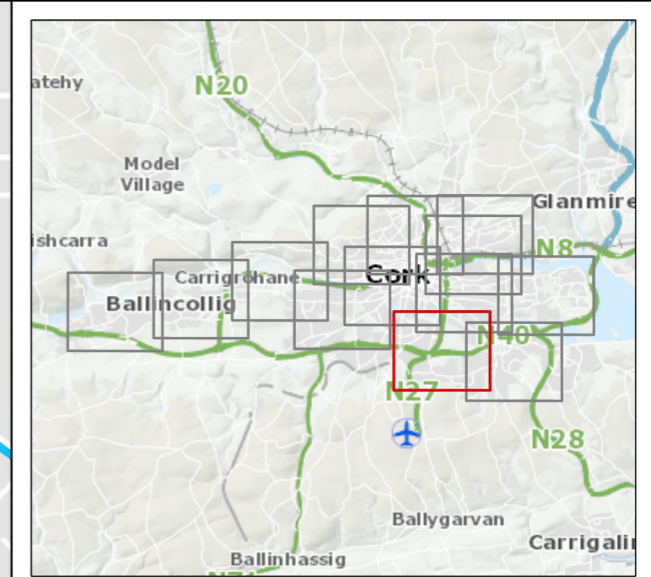
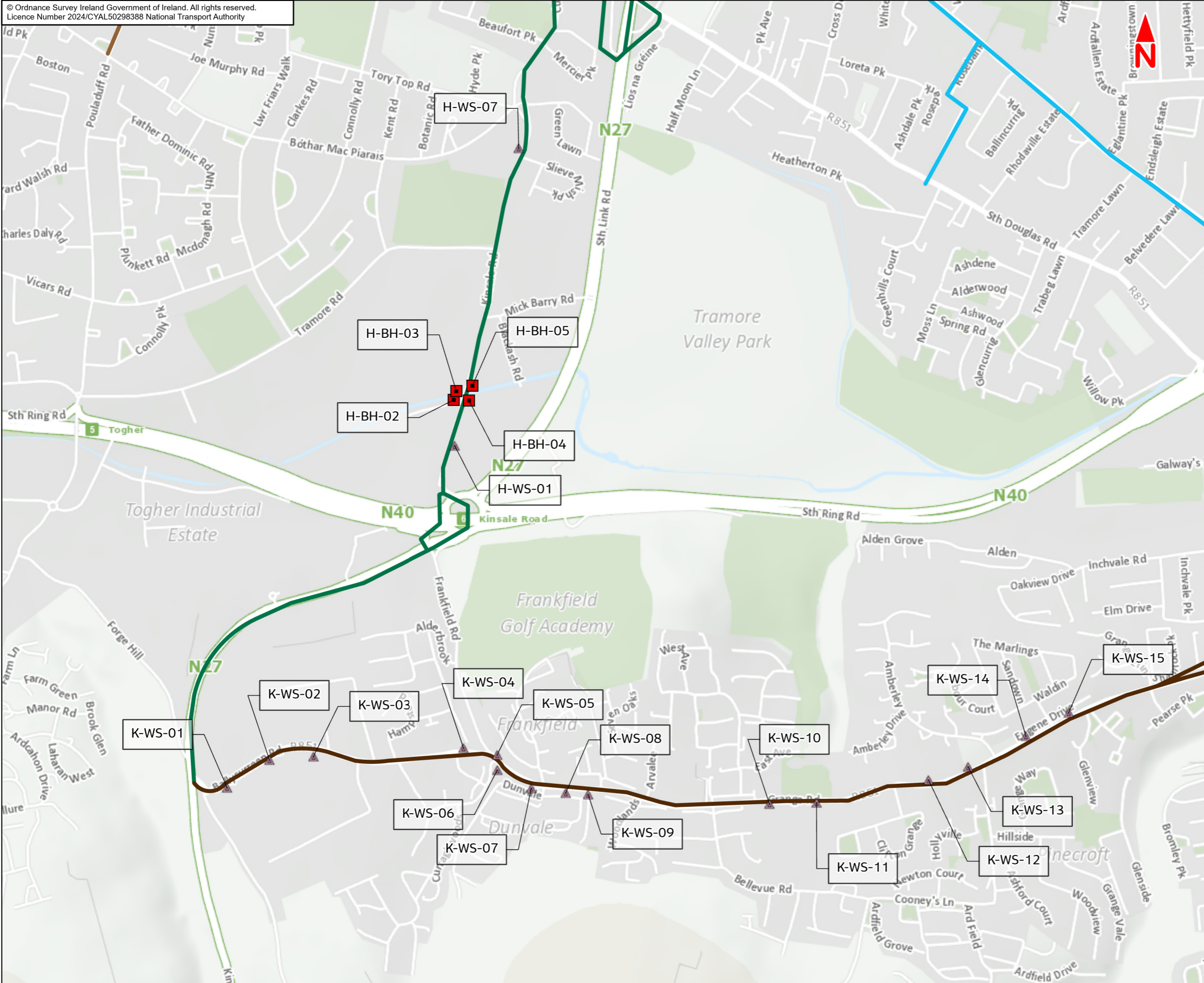
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Project Code: BCCE | Originator Code: JAS

Drawn: EK | Checked: SK | Approved: SF

QMS Code: _____

Programme Title: BusConnects Cork Sustainable Transport Corridors			
Drawing Title: Figure B2 Locations of Proposed GI Works			
Drawing File Name: BCCE-3-JAS-X-GI-DR-G-0105	Sheet Number: 5 of 12	Status: 01	Rev: P05



Legend:

Proposed GI Locations

- Proposed Borehole
- ▲ Window Sampler

Sustainable Transport Corridor

- Togher to City
- Airport Road to City
- Maryborough Hill to City
- Kinsale Road to Douglas

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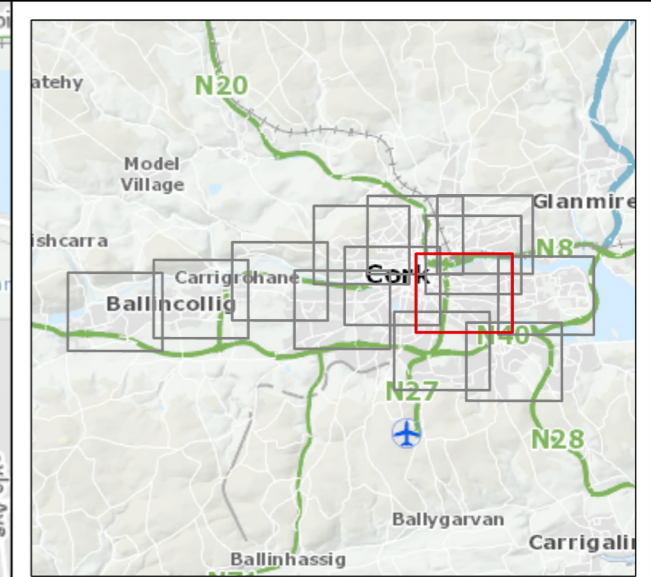
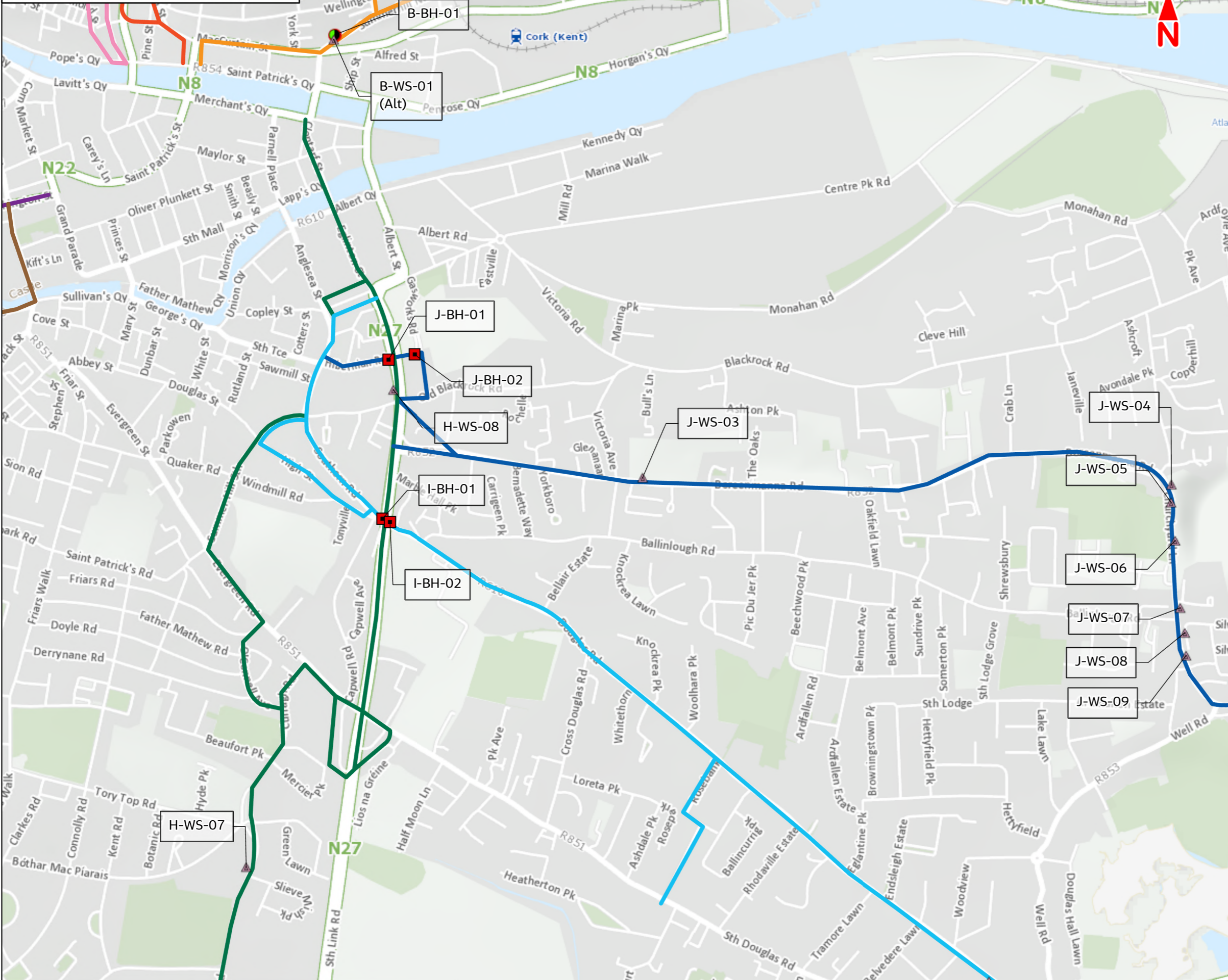
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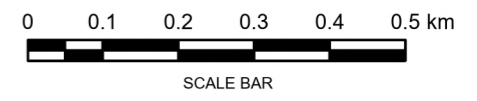
Client NTA Údarás Náisiúnta Iompair National Transport Authority		Consultant JACOBS ARUP SYSTRA		
Date 28/03/2024	Scale @ A3 1:10000	Drawn EK	Checked SK	Approved SF
Project Code BCCE	Originator Code JAS	QMS Code		

Programme Title BusConnects Cork Sustainable Transport Corridors				
Drawing Title Figure B2 Locations of Proposed GI Works				
Drawing File Name BCCE-3-JAS-X-GI-DR-G-0106	Sheet Number 6 of 12	Status 01	Rev P05	



- Legend:**
- Proposed GI Locations**
- Cable Percussive With Rotary Follow-On
 - Proposed Borehole
 - Window Sampler
- Sustainable Transport Corridor**
- Mayfield to City
 - Blackpool to City
 - Hollyhill to City
 - Bishopstown to City
 - Togher to City
 - Airport Road to City
 - Maryborough Hill to City
 - Mahon to City

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National Transport Authority

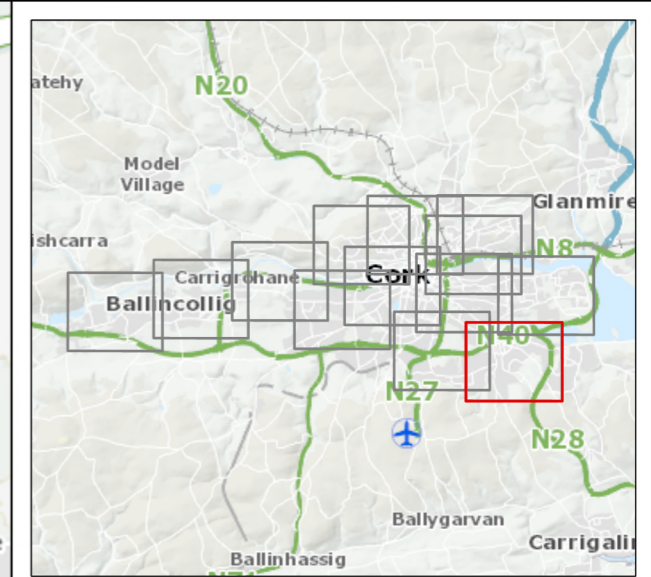
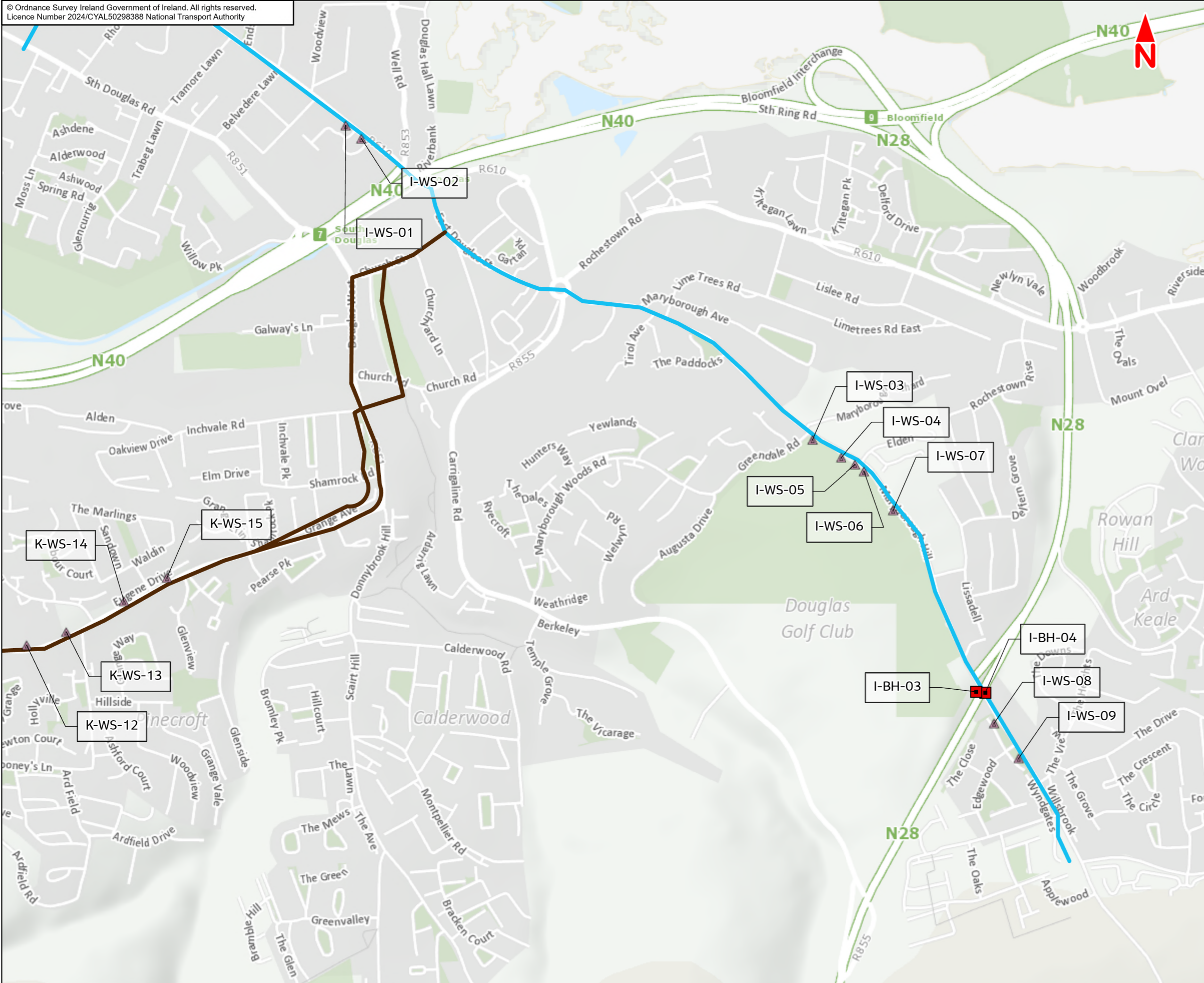
Consultant: **Jacobs ARUP SYSTRA**

Date: 28/03/2024
Scale: A3 1:10000

Project Code: BCCE
Originator Code: JAS

Drawn: EK
Checked: SK
Approved: SF

Programme Title: BusConnects Cork Sustainable Transport Corridors				
Drawing Title: Figure B2 Locations of Proposed GI Works				
Drawing File Name: BCCE-3-JAS-X-GI-DR-G-0107	Sheet Number: 7 of 12	Status: 01	Rev: P05	



Legend:

Proposed GI Locations

- Proposed Borehole
- ▲ Window Sampler

Sustainable Transport Corridor

- Maryborough Hill to City
- Kinsale Road to Douglas

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Rev	Date	Drn	Chk'd	App'd	Description
P05	Mar 2024	EK	SK	SF	Final

Client
NTA
Údarás Náisiúnta Iompair
National Transport Authority

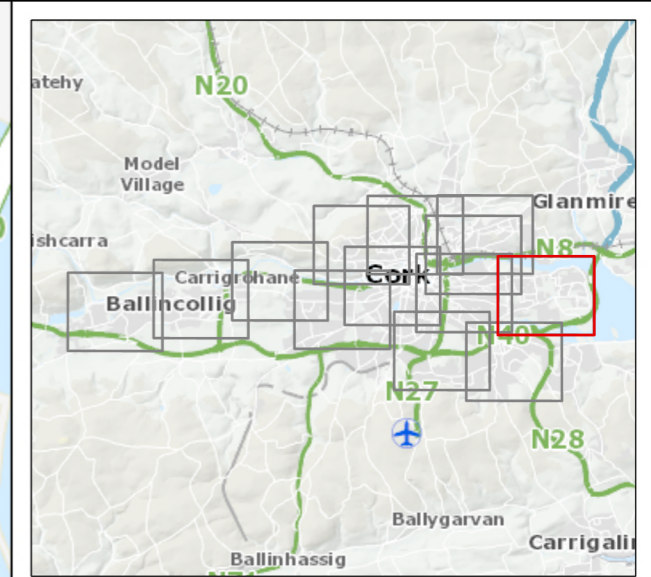
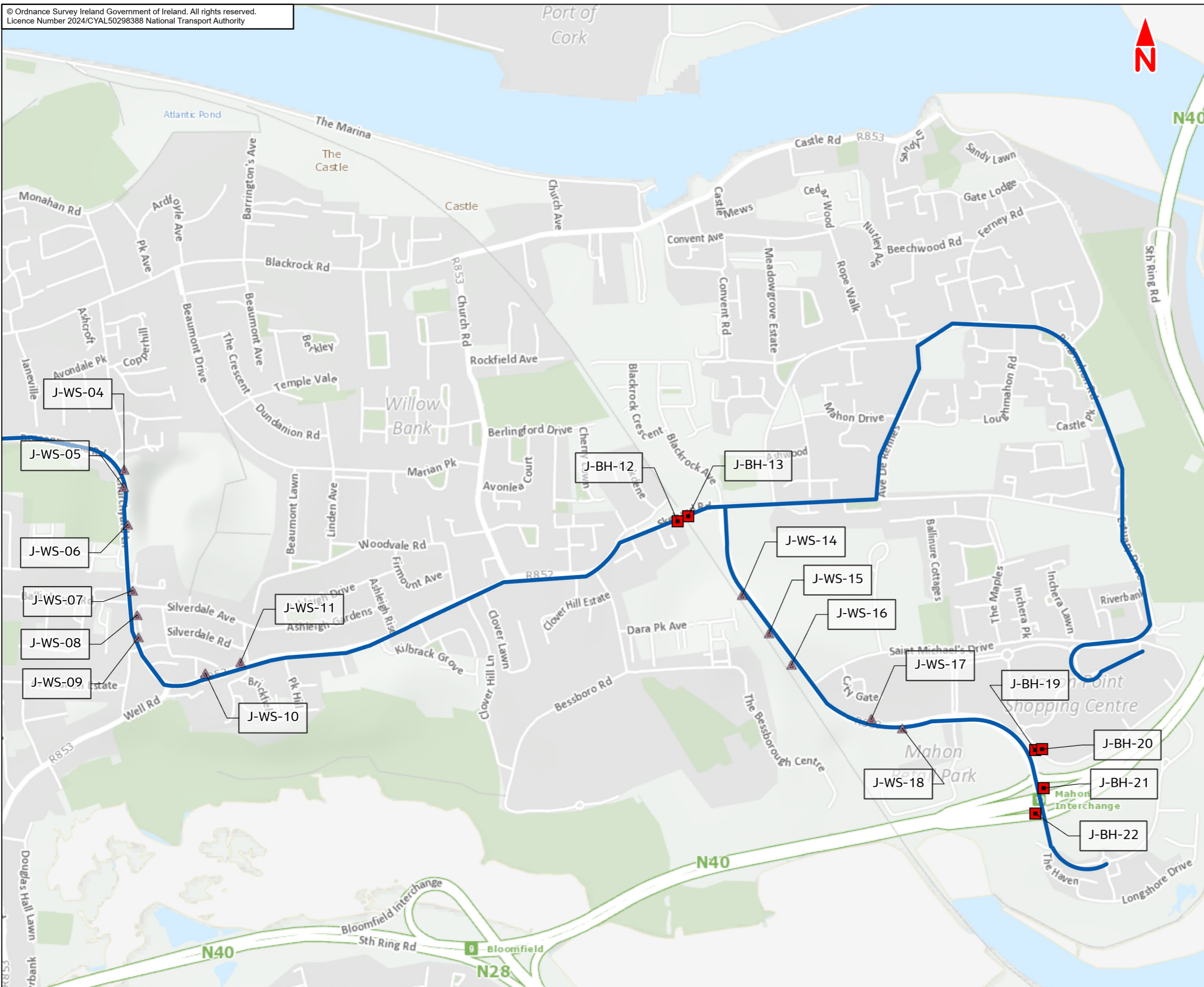
Date: 28/03/2024
Scale @ A3: 1:10000
Project Code: BCCE
Originator Code: JAS

Consultant
Jacobs ARUP SYSTRA

Drawn: EK
Checked: SK
Approved: SF

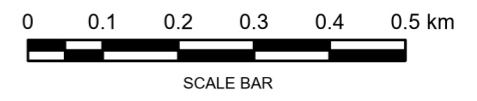
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Programme Title BusConnects Cork Sustainable Transport Corridors			
Drawing Title Figure B2 Locations of Proposed GI Works			
Drawing File Name BCCE-3-JAS-X-GI-DR-G-0108	Sheet Number 8 of 12	Status 01	Rev P05



- Legend:**
- Proposed Borehole
 - ▲ Window Sampler
 - Sustainable Transport Corridor
 - Mahon to City

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P05	Mar 2024	EK	SK	SF	Final

Client
NTA
Údarás Náisiúnta Iompair
National Transport Authority

Consultant
Jacobs
ARUP SYSTRA

Date: 28/03/2024
Scale @ A3: 1:10000

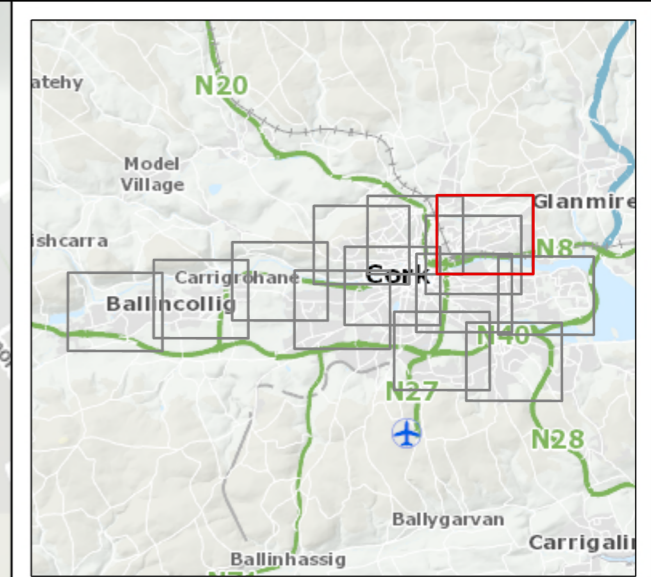
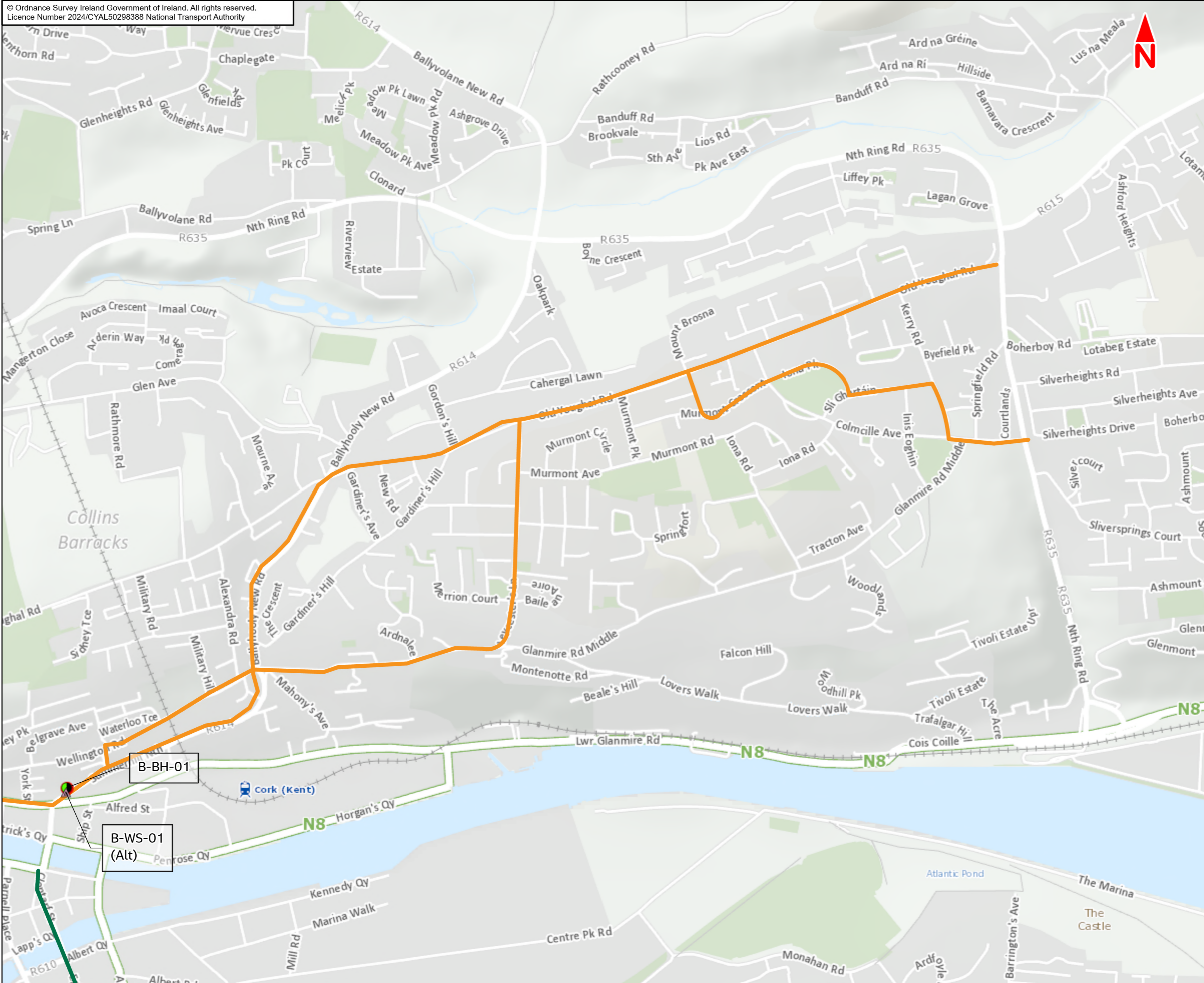
Project Code: BCCE
Originator Code: JAS

Drawn: EK
Checked: SK
Approved: SF

QMS Code



Programme Title BusConnects Cork Sustainable Transport Corridors			
Drawing Title Figure B2 Locations of Proposed GI Works			
Drawing File Name BCCE-3-JAS-X-GI-DR-G-0109	Sheet Number 9 of 12	Status 01	Rev P05







Legend:

Proposed GI Locations

-  Cable Percussive With Rotary Follow-On
-  Window Sampler

Sustainable Transport Corridor

-  Mayfield to City
-  Airport Road to City

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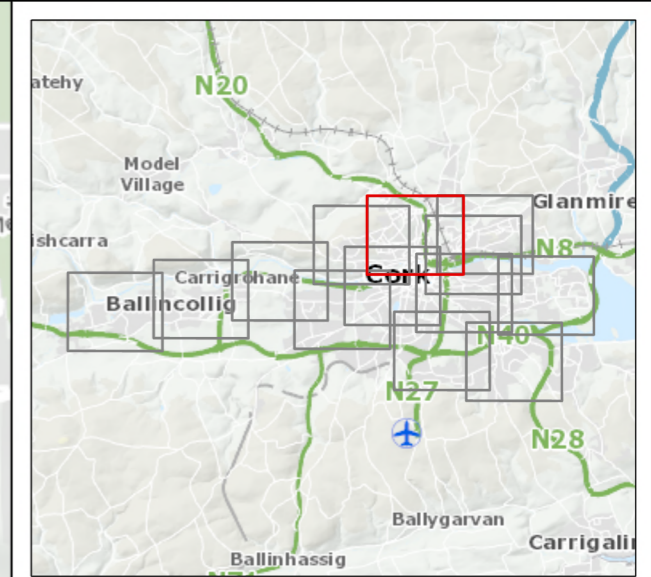
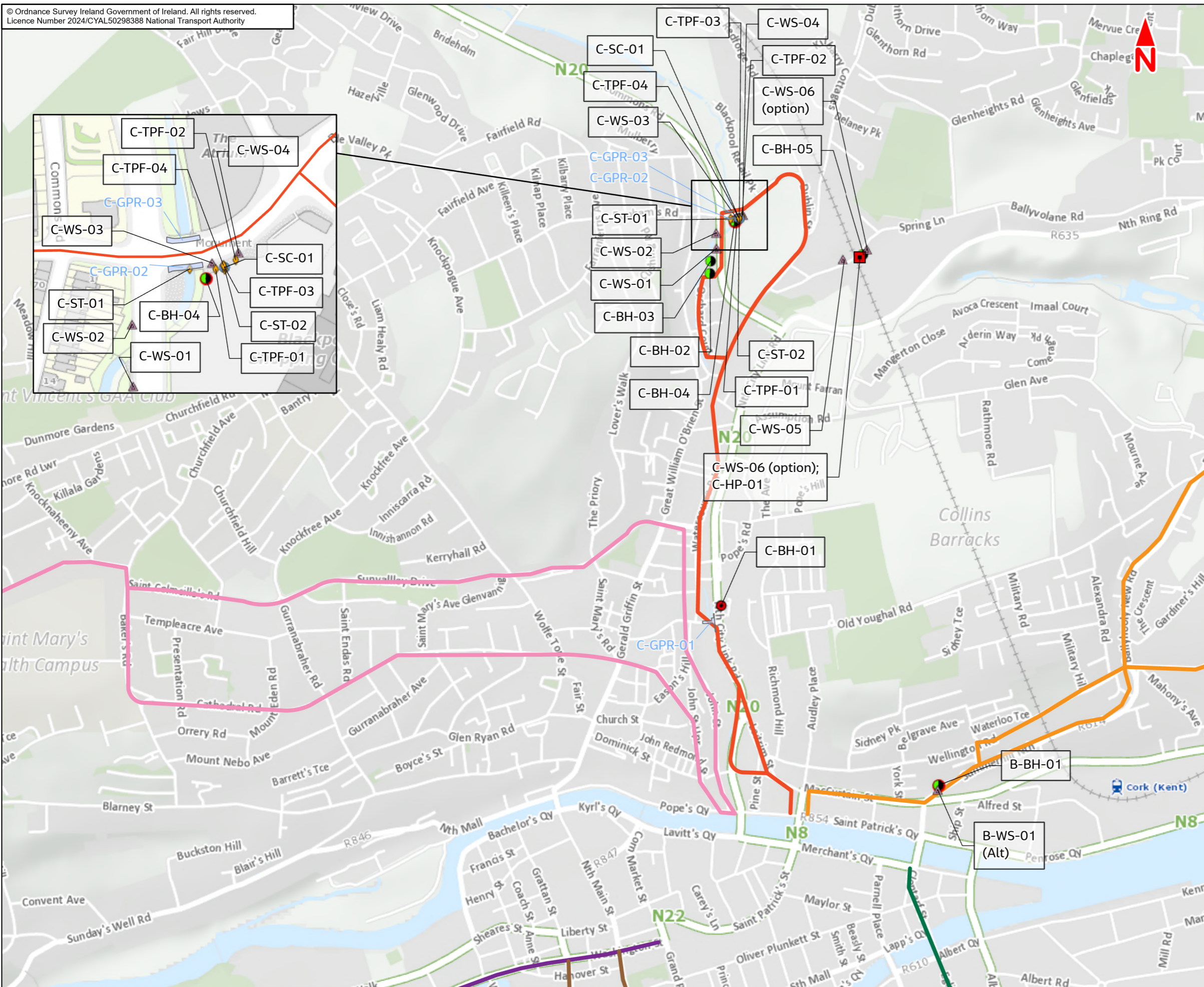
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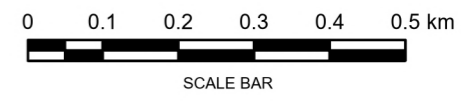
Client NTA Údarás Náisiúnta Iompair National Transport Authority		Consultant JACOBS ARUP SYSTRA		
Date 28/03/2024	Scale @ A3 1:10000	Drawn EK	Checked SK	Approved SF
Project Code BCCE	Originator Code JAS	QMS Code		

Programme Title BusConnects Cork				
Drawing Title Sustainable Transport Corridors				
Figure B2 Locations of Proposed GI Works				
Drawing File Name BCCE-3-JAS-X-GI-DR-G-0110	Sheet Number 10 of 12	Status 01	Rev P05	



- Legend:**
- Proposed Geophysics Survey Area
 - Proposed GI Locations**
 - Cable Percussive Borehole
 - Cable Percussive With Rotary Follow-On
 - Pavement Core
 - Proposed Borehole
 - Rotary Borehole
 - Slit Trench
 - Window Sampler
 - Sustainable Transport Corridor**
 - Mayfield to City
 - Blackpool to City
 - Hollyhill to City
 - Bishopstown to City
 - Togher to City
 - Airport Road to City

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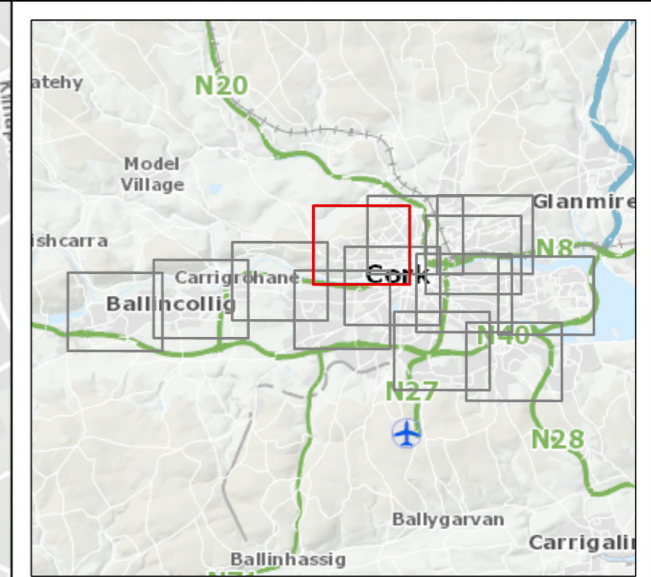
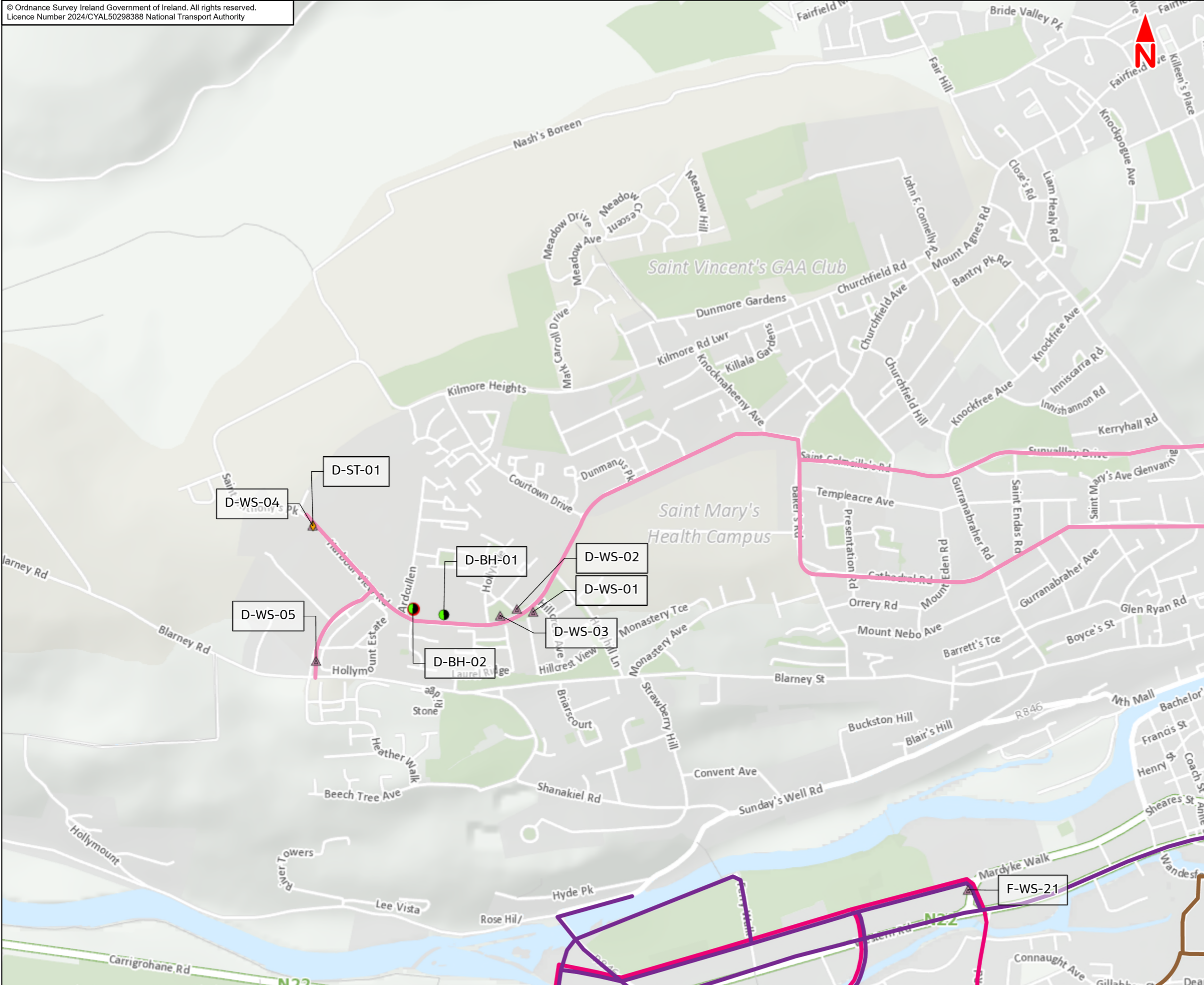
Client: **NTA**
Údarás Náisiúnta Iompair
National Transport Authority

Consultant: **Jacobs ARUP SYSTRA**

Date: 28/03/2024 Scale @ A3: 1:10000
Project Code: BCCE Originator Code: JAS

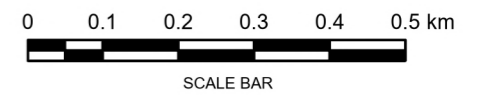
Drawn: EK Checked: SK Approved: SF

Programme Title: BusConnects Cork Sustainable Transport Corridors			
Drawing Title: Figure B2 Locations of Proposed GI Works			
Drawing File Name: BCCE-3-JAS-X-GI-DR-G-0111	Sheet Number: 11 of 12	Status: 01	Rev: P05



- Legend:**
- Proposed GI Locations**
- Cable Percussive Borehole
 - Cable Percussive With Rotary Follow-On
 - Slit Trench
 - Window Sampler
- Sustainable Transport Corridor**
- Hollyhill to City
 - Ballincollig to City
 - Bishopstown to City
 - Togher to City

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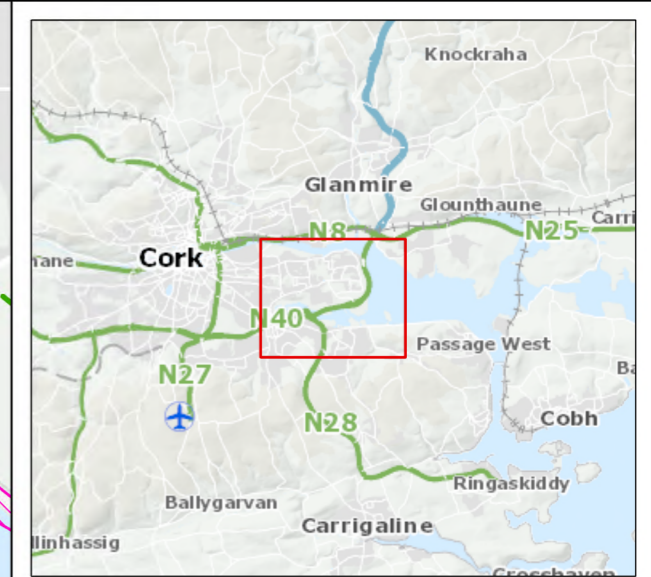
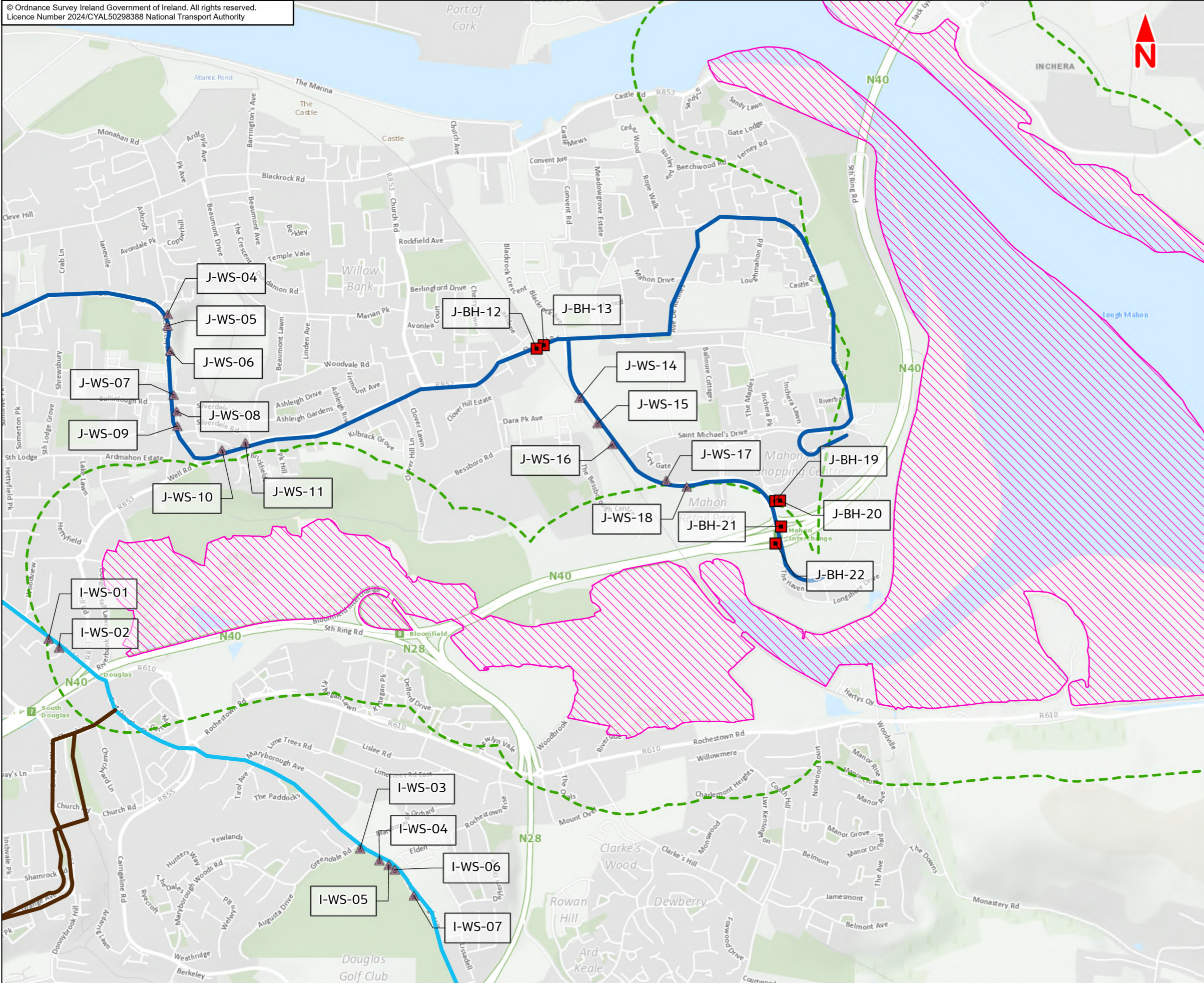
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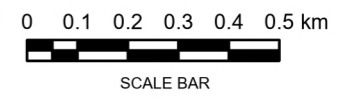
Client		Consultant	
NTA Údarás Náisiúnta Iompair National Transport Authority		Jacobs ARUP SYSTRA	
Date	Scale @ A3	Drawn	Checked
28/03/2024	1:10000	EK	SK
Project Code	Originator Code	QMS Code	
BCCE	JAS		

Programme Title		Drawing Title	
BusConnects Cork Sustainable Transport Corridors		Figure B2 Locations of Proposed GI Works	
Drawing File Name	Sheet Number	Status	Rev
BCCE-3-JAS-X-GI-DR-G-0112	12 of 12	01	P05



- Legend:**
- Proposed GI Locations**
 - Proposed Borehole
 - Window Sampler
 - Sustainable Transport Corridor**
 - Maryborough Hill to City
 - Mahon to City
 - Kinsale Road to Douglas
 - NPWS EU Designated Sites**
 - Cork Harbour Special Protection Area (SPA)
 - Cork Harbour SPA 300m

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Client NTA Údarás Náisiúnta Iompair National Transport Authority		Consultant Jacobs ARUP SYSTRA	
Date 28/03/2024	Scale @ A3 1:15000	Drawn EK	Checked SK
Project Code BCCE	Originator Code JAS	Approved SF	

Programme Title BusConnects Cork Sustainable Transport Corridors			
Drawing Title Figure B3 Proposed GI Works within 300m of Cork Harbour SPA			
Drawing File Name BCCE-3-JAS-X-GI-DR-G-0201	Sheet Number 1 of 1	Status 01	Rev P05