ATKINS

Member of the SNC-Lavalin Group

Cork City Social Housing

Clover Hill Court - Appropriate Assessment Screening Report

Cork City Council

October 2022

Notice

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Document history

Revision	Purpose description	Origin-ated	Checked	Reviewed	Author-ised	Date
Rev 1.0	Revision 1.0	EN, NS & POD	POD	POD	MF	15-07-22
Rev 1.1	Revision 1.1	EN, NS & POD	POD	POD	MF	28-10-22

Client signoff

Client	Cork City Council
Project	Cork City Social Housing
Job number	5205780
Client signature / date	

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1. Introduction

Atkins Ireland have been commissioned by Cork City Council to prepare a Screening for Appropriate Assessment report for the proposed project at Clover Hill Court in Cork City. Cork City Council aim to provide a social housing project in at Clover Hill Court. The latter shall be referred to as the 'proposed project' for the purposes of this report.

1.1. Project Context & Description

The social housing project will be situated at the Clover Hill Court site, located on Bessboro Road within the suburbs of Cork city in Mahon. The following description is largely taken from the *Engineering Planning Report* (Punch Consulting Engineers, 2022).

The site is a brownfield site that was previously home to Hormann Electronics from 1977 until 2008 when the firm closed. It is approximately 1.02 hectares in area. Hormann Electronics assembled and tested printed circuit boards when in operation. It is not considered likely that such processes would have led to any possible contamination of the site. More than 90% of the site area is made up of hardstanding, comprising of macadam access road, carparking facilities and the foundations of the old Hormann Electronics building.

It is intended that the existing foundation will be demolished as part of the development. Asbestos was found in the remaining floors on the site and needs to be safely removed as part of the demolition process for the floor slab. The existing foul, storm water, and watermain connections will be retained and utilized as part of the new development. The site is relatively flat and is bounded by the Bessboro Road to the east, Riverview Business Park to the south, Jacobs Engineering Consultancy to the northeast and the Clover Hill housing estate to the northwest.

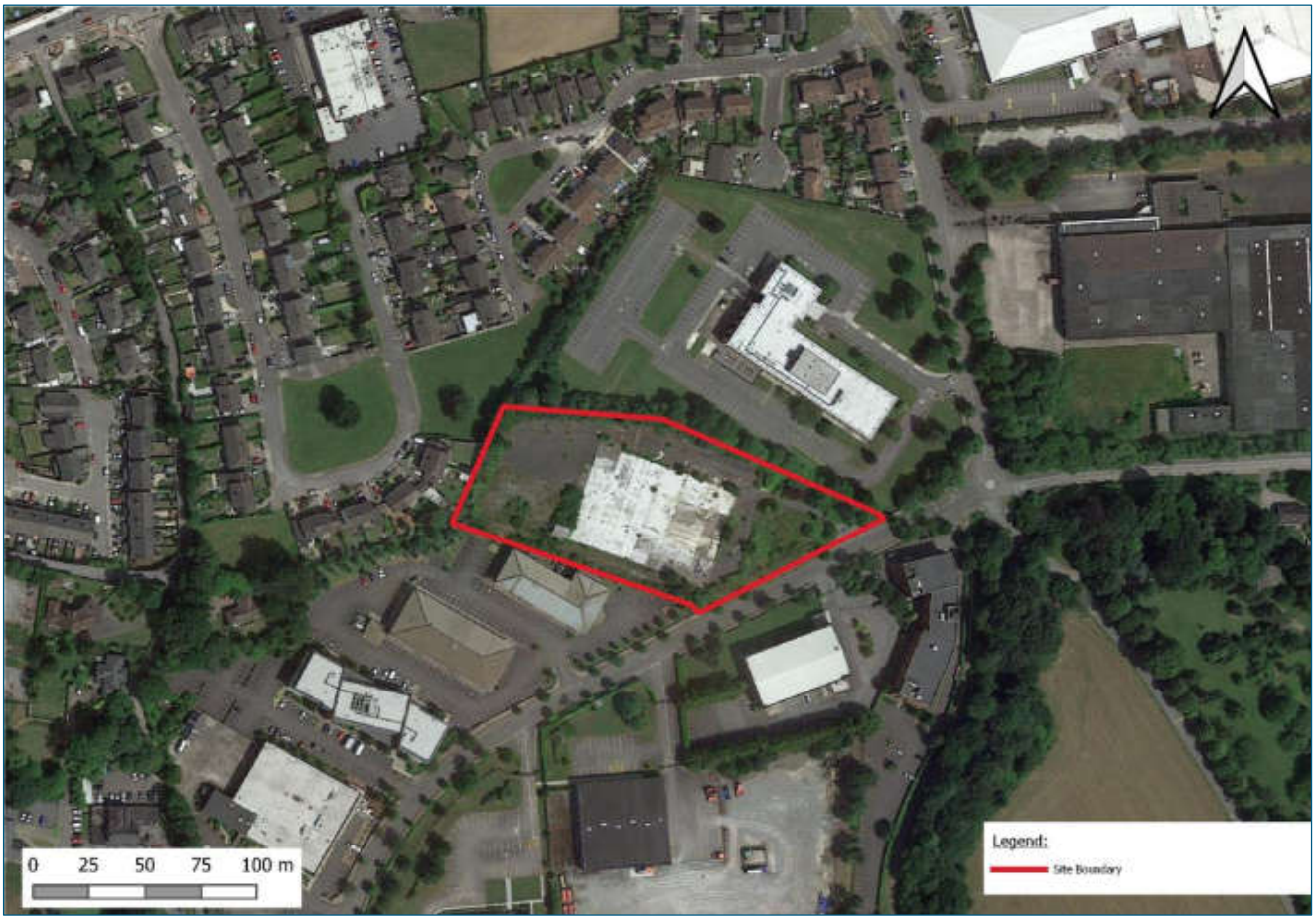


Figure 1.1 Site Location (from Punch Consulting Engineers, 2022).

1.2. Proposed Development

The proposed development will consist of removal of existing floor slab of former commercial building, relocation of existing substation, construction of 2 no. apartment buildings (1 no. 3-4 storey building and 1 no. 4-5 storey building), linked at ground floor, containing 84 no. apartments in total (28 no. 1-bed apartments and 56 no. 2-bed apartments), each with private balcony/wintergarden/terrace, as well as ground floor bin & bicycle stores and plant (including 1 no. relocated substation and 1 no. additional substation), 6 no. 2-storey 3-bed terraced houses, each with private garden, and all associated site development works, services provision, road infrastructure, landscaping/public realm works, 49 no. car parking spaces (43 no. on-street car parking spaces and 6 no. on-curtilage car parking spaces) and 188 no. bicycle parking spaces (94 no. bicycle parking spaces in apartment buildings, 52 no. bicycle parking spaces in freestanding external shelters and 42 no. bicycle parking spaces in open external racks).

Figure 1.2 Proposed Site Layout (O'Mahony Pike).

Anticipated excavation depths for the development are as follows: -

- Average excavation depth for the roads, driveways and car parking is in the order of 0.9m below ground level (this could increase if the CBR values are lower than 5%, which is what our typical detail allows for).

- Maximum excavation depth for underground services will most likely be in the region of 4.5m below ground level. This will be local to trenches at connection points to the existing public stormwater and foul water networks running through the site.

- Excavation depths for the foundations of the dwellings and apartment blocks would typically be 1m below ground level, but these are to be confirmed upon receipt and review of geotechnical ground investigation reports for the development.

Construction will take 8 months.

1.2.1. Stormwater Drainage Design

[Extracted from Punch Consulting Engineers, 2022]

Cork City Council record drawings indicate that there is an existing 1200mm gravity sewer traversing the site from the Clover Hill Estate to the Bessboro Road. The sewer is laid such as to allow storm water to flow in an easterly direction, with the sewer invert levels approximately 4m below existing ground levels which will allow for connection of proposed storm water infrastructure without a requirement for pumping.

A GPR survey conducted by Geodata confirmed the Cork City Council record drawings. The GPR survey confirmed the existence of 100mm and 150mm storm water sewers around the perimeter of the demolished structure which connect into the main stormwater line. These 100mm and 150mm sewer lines will be removed as part of the demolition works.

Please refer to Appendix A of the *Engineering Planning Report* (Punch Consulting Engineers, 2022) for Cork County Council Record Drawings illustrating the existing stormwater drainage arrangement. An extract is shown in Figure 1.3 below.

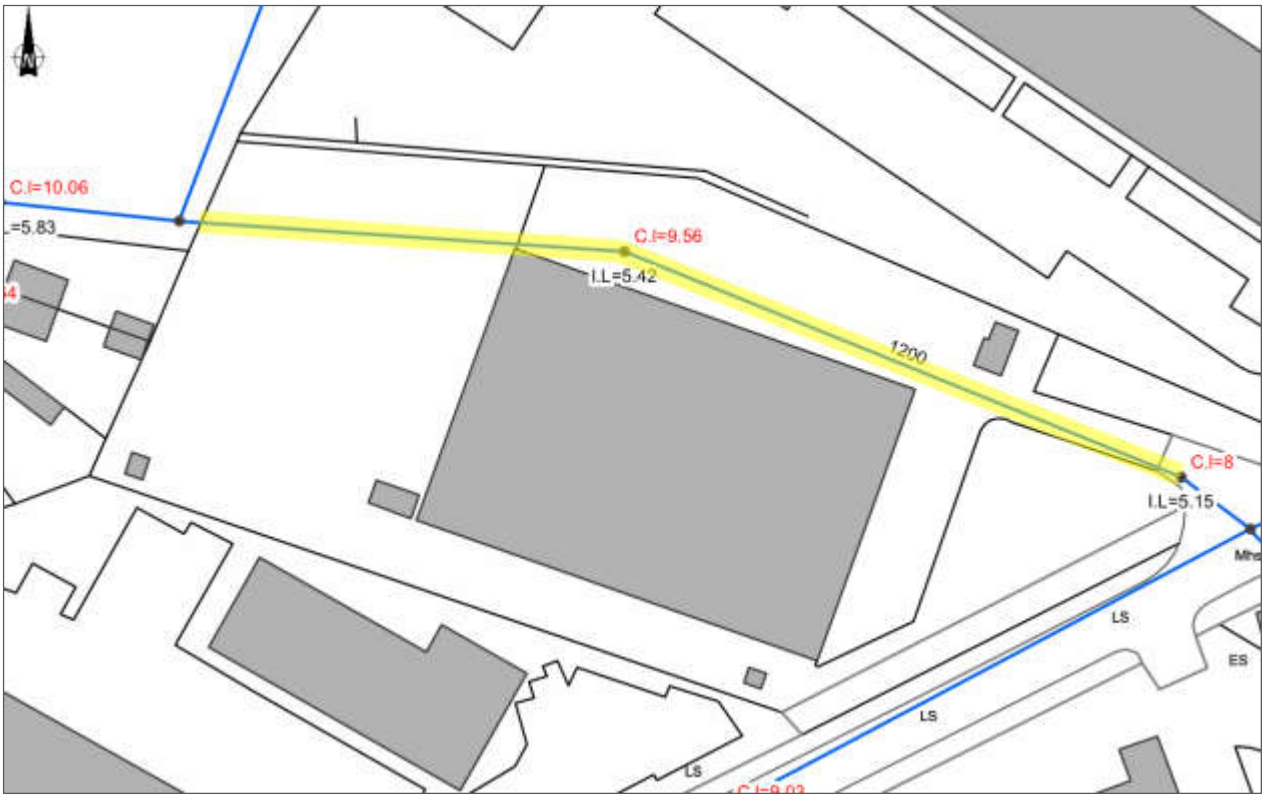


Figure 1.3 Existing stormwater drainage surrounding the site (extract from Council records) (from Punch Consulting Engineers, 2022).

1.2.2. Proposed Stormwater Drainage

[Extracted from Punch Consulting Engineers, 2022]

The proposed surface water drainage system has been designed using Causeway Flow software in accordance with the Department of Environment and Local Government's guidance document "*Recommendations for Site Development Works for Housing Areas*", with guidance taken from the "*Greater Dublin Strategic Drainage Study*" (GDSDS) and the Cork City Development Plan, 2015-2021.

A new surface water sewer network shall be provided for the proposed development which will be entirely separated from the foul water sewer network. All surface water run-off from roof areas and hardstanding areas are designed to be collected by a gravity pipe network and connected to the existing stormwater network running through the site at Manhole No. S1-8. (refer to drawing CLO-PUNCH- XX-XX-DR-C-0100 for details of connection location prepared by Punch Consulting Engineers; submitted as part of the planning pack).

Notwithstanding that this is a brownfield site, in line with best practice, the storm flows from the development will be restricted by means of a Hydrobrake to the equivalent peak greenfield runoff rate (Q-BAR), which has been calculated as 8.43 litres per second in accordance with the IH124 report published by the Institute of Hydrology (*Flood Estimation for Small Catchments*). As a consequence of this flow limitation, an attenuation tank will be required to store surface waters in extreme events.

Levels and drainage have been designed to ensure that no surface water generated by the development site outfalls to the Bessboro Road.

Proposed finished floor levels range between 9.850mAOD and 10.300mAOD. All floor levels are at least 500mm above maximum drainage water levels for a 100 year return period.

1.2.2.1. SUDs Proposals

The proposed development has been assessed in relation to Sustainable Urban Drainage Systems (SuDS). A variety of SuDS measures may be adopted to comply with Council recommendations. All SuDS measures are to be implemented with reference to the UK Suds Manual and Cork City Council drainage requirements.

1.2.2.2. Attenuation Tank

The proposed attenuation tank is sized to reduce the peak runoff from the site to the peak greenfield discharge rate of 8.43 l/s. The proposed attenuation tank is 1.6m deep and has a plan area of 155m^2. The minimum free storage volume of the tank is 236 m^3. See Punch Consulting Engineers drawing CLO-PUNCH-XX-XX-DR-C-0100 for a layout of the attenuation tank.

1.2.2.3. Petrol Interceptor

It is proposed that all surface water run-off from car park areas will outfall via a Class 1 Kingspan Klargester NSBE010 or approved equivalent Bypass Separator, located upstream of the connection to the existing storm water drain on site. This device will remove hydrocarbons and fine sediment particles from the site runoff and lower the risk of downstream contamination following an oil spillage on site.

Please refer to Appendix C of the *Engineering Planning Report* (Punch Consulting Engineers, 2022) for calculations regarding the proposed Petrol Interceptor - Nominal size in accordance with EN 858-2.

Bypass separators fully treat all flows generated by rainfall rates of up to 6.5mm/hr. This covers over 99% of all rainfall events. Flows above this rate are allowed to bypass the separator. These separators are used when it is considered an acceptable risk not to provide full treatment for high flows, for example where the risk of a large spillage and heavy rainfall occurring at the same time is small.

Class 1 devices are designed to achieve a concentration of less than 5mg/l of oil under standard test conditions.

1.2.3. Foul Water Drainage Design

1.2.3.1. Existing Foul Water Drainage

Irish Water and Cork City Council record drawings indicate that there is an existing 375mm gravity sewer traversing the site from the Clover Hill Estate to the Bessboro Road. The gradient of the sewer is from west to east, with the sewer invert levels approximately 2.5m below cover levels which will allow for connection of future foul sewers without need for pumping.

A GPR survey conducted by Geodata found the existing foul sewer to be 500mm and confirmed the location foul sewer. Due to dense undergrowth, the foul sewer was not able to be surveyed near the entrance of the site. The GPR survey confirmed the existence of a 100mm and 150mm foul sewer line to the south and east of the site which connect into the main foul sewer line. These 100mm and 150mm foul sewer lines will be scrubbed and removed as part of the demolition works.

Please refer to Appendix A of the *Engineering Planning Report* (Punch Consulting Engineers, 2022) for Cork City Council drawings illustrating the existing foul water drainage arrangement. An extract is shown in Figure 1.4.

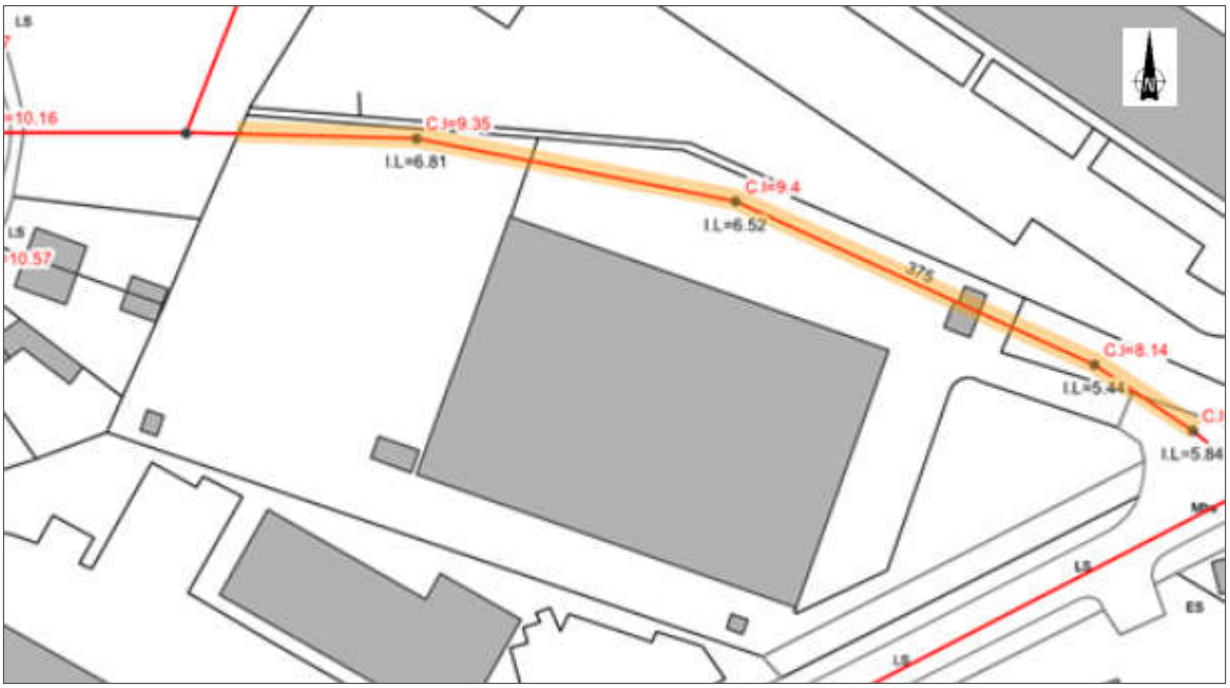


Figure 1.4 Existing foul drainage surrounding the site (Extract from Cork City Council records) (from Punch Consulting Engineers, 2022).

1.2.3.2. Proposed Foul Water Drainage

The proposed foul water sewers have been designed using Causeway Flow software in accordance with the DOE's "*Recommendations for Site Development Works for Housing Areas*". The foul loading has been calculated in accordance with "*Code of Practice for Wastewater Infrastructure*" (particularly clause 36, Appendix C and Appendix D) published by Irish Water.

It is proposed that the foul sewer will discharge by gravity to the existing foul sewer traversing the site at Manhole No. F1-9. Table 3-1 of the *Engineering Planning Report* (Punch Consulting Engineers, 2022) describes the foul water drainage design parameters used and detailed calculations are enclosed in Appendix D of same.

A Pre-Connection Enquiry Form has been issued to Irish Water in relation to the proposed development. Irish water has provided a response, advising that waste water connection is feasible without any infrastructure upgrade. Please refer to Appendix E the *Engineering Planning Report* (Punch Consulting Engineers, 2022) for the Confirmation of Feasibility from Irish Water.

1.2.4. Watermain Design

1.2.4.1. Existing Watermain

Irish Water record drawings indicate that there is an existing 300mm watermain running along Bessboro Road outside the site, and that there are 2 existing connections brought up to the site boundary from this watermain. There is also an existing watermain running through the Clover Hill Estate to the east of the site. A GPR survey conducted by Geodata confirmed the location of the watermain within the site and along Bessboro Road.

1.2.4.2. Proposed Watermain

It is generally accepted that the design loading for foul drainage can be used to evaluate an approximation of the water demand on the site. With reference to Irish Water's *Code of Practice for Water Infrastructure*, the average daily flow is calculated as the number of persons multiplied by the flow rate per person. The average day peak week flow is taken to be 1.25 x the average flow, and the peak demand is taken to be the average day peak week flow multiplied by a peaking factor of 5.

On the basis of calculations presented in the *Engineering Planning Report* (Punch Consulting Engineers, 2022), the development will have an increase in average water demand of 0.527 l/s and a peak water demand of 2.109 l/s.

It is proposed to construct a 100mm nominal diameter HDPE watermain to serve the proposed development based on the above calculated demand and hydrant requirements for the development. The proposed watermain will connect to the existing 300mm nominal diameter ductile iron watermain on Bessboro Road.

This feed will provide potable and firefighting water to the proposed development. A bulk water meter shall be provided at the site boundary at the location of the proposed connection to the existing watermain. The watermain layout has been designed in accordance with "Irish Water Code of Practice for Water Infrastructure". All watermains are to be constructed in accordance with Irish Water Code of Practice and the Local Authority's requirements. Fire coverage is to be reviewed and certified by the fire consultant.

To reduce the water demand on Local Authority water supplies and to reduce the foul discharge from the development, water conservation measures will be incorporated in the sanitary facilities throughout the development.

A Pre-Connection Enquiry Form has been issued to Irish Water in relation to the proposed development. Irish water has provided a response, advising that water servicing is feasible without any infrastructure upgrade. Please refer to Appendix E for the Confirmation of Feasibility from Irish Water.

1.2.5. Flooding

The site has been assessed in accordance with the "*The Planning System and Flood Risk Management*" Guidelines. As part of the sequential test, the OPW flood hazard maps have been consulted, as have the Catchment Flood Risk Assessment Maps produced by the OPW.

In all cases it was found that the development is at low risk of flooding and the development is deemed appropriate within the proposed site location.

1.2.6. Road and Access

1.2.6.1. Proposed Roads & Access

Access to the site will be via Bessboro Road. A 5m wide internal access road, and a 6m wide shared surface will be provided to access parking to the apartment blocks and the dwellings .

The proposed roads layout was designed in accordance with the Design Manual for Urban Roads and Streets (DMURS) and the Recommendations for Site Development Works. DMURS aims to aid the design of safer, more attractive and vibrant streets which will generate and sustain communities and neighbourhoods. As well as cars and other vehicles this encompasses pedestrians, cyclists and those using public transport. Research has shown that narrow carriageways are one of the most effective measures of traffic calming. This has been factored into the design of the development.

Sight lines at all junctions were designed in accordance with DMURS based on existing speed limits on Bessboro Road.

Auto track assessments were carried out on the proposed road network and demonstrate that a fire tender can safely negotiate the proposed road network and turning heads.

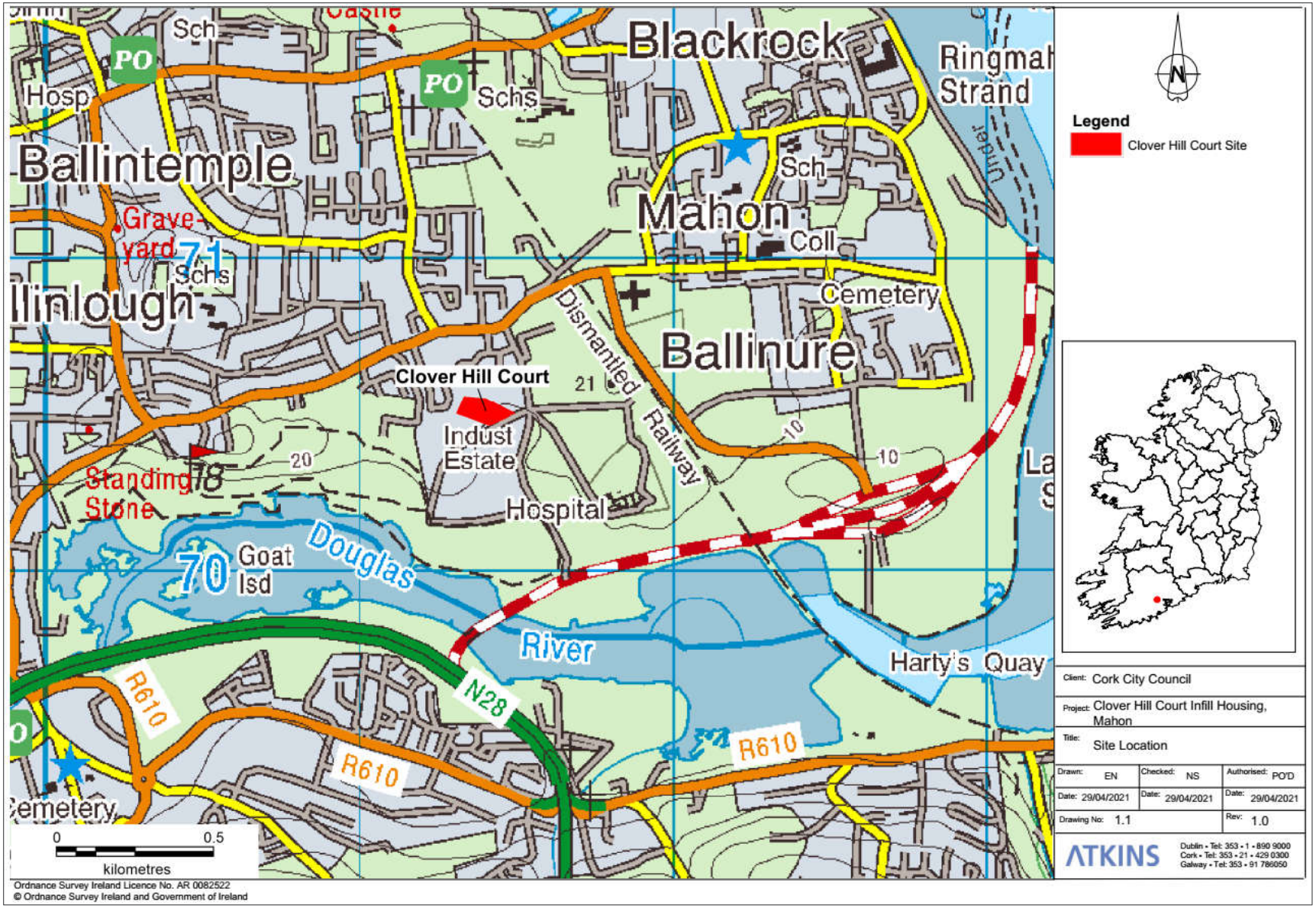


Figure 1.5 Site Location Map.

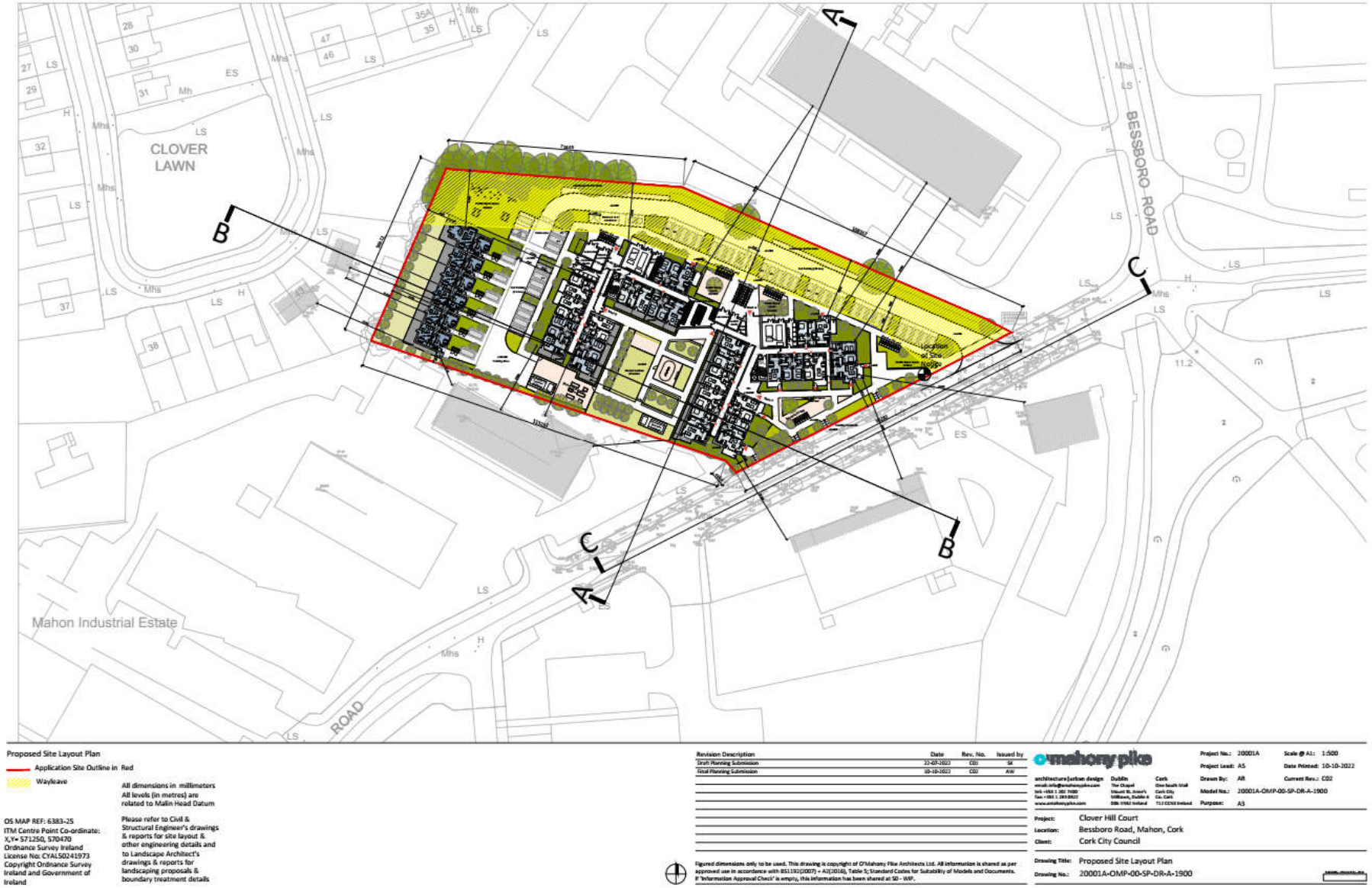


Figure 1.6 Site Layout.

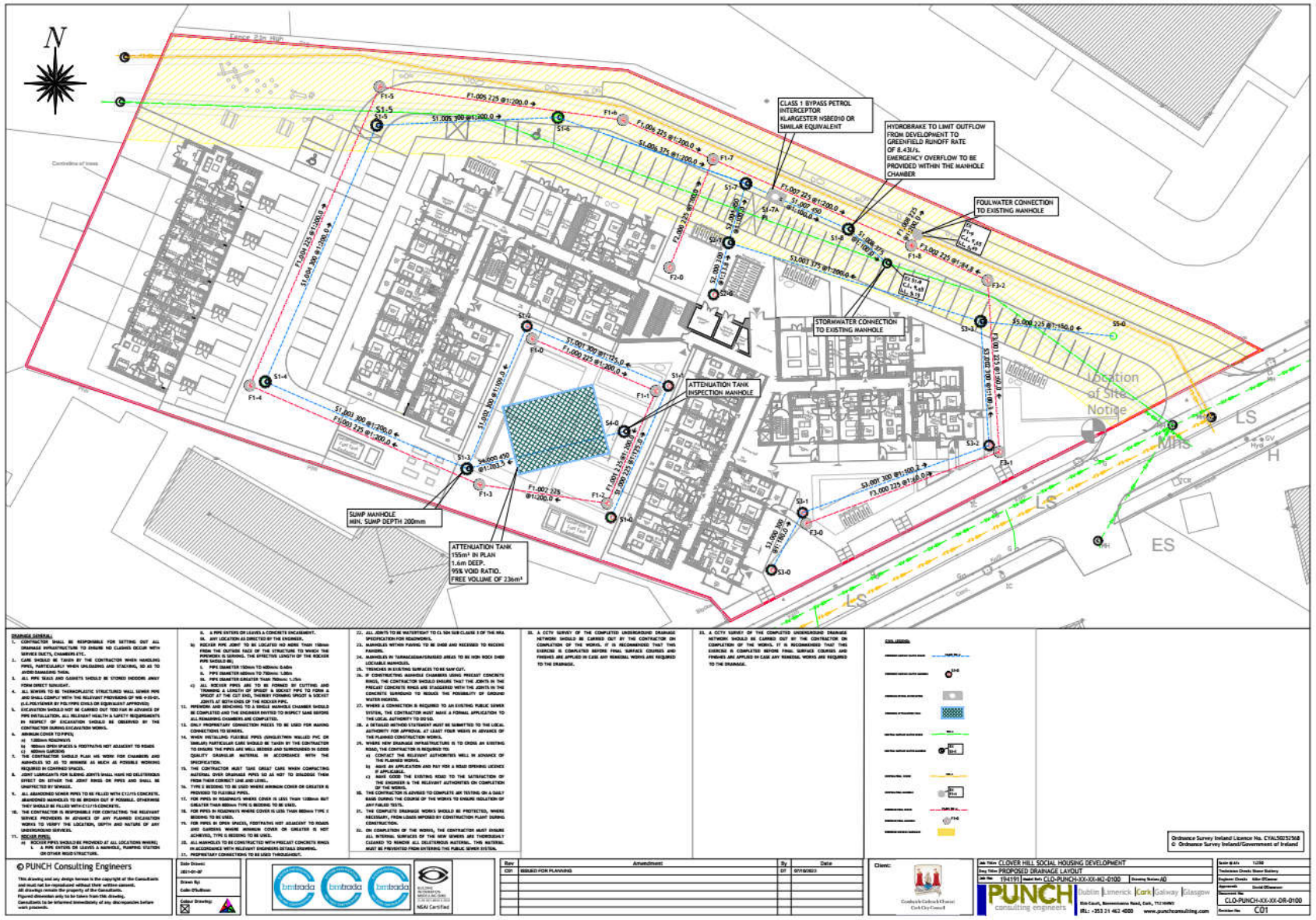


Figure 1.7 Proposed Drainage Layout.

Figure 1.8 Proposed Landscape Plan.

2. Scope of Study

The aim of this report is to provide supporting information to assist the competent authority to carry out an Appropriate Assessment determination with respect to the proposed project.

2.1. Legislative Context

Directive 92/43/EEC on the Conservation of Natural Habitats and Wild Fauna and Flora, known as the 'Habitats Directive' provides legal protection for habitats and species of European importance. Article 2 of the Directive requires the maintenance or restoration of habitats and species of European Community interest, at a favourable conservation status. Articles 3 – 9 provide the legislative means to protect habitats and species of Community interest through the establishment and conservations of an EU-wide network of sites known as European sites. European sites are Special Areas of Conservation (SACs) designated under the Habitats Directive and Special Protection Areas (SPAs) designated under the Conservation of Wild Birds Directive (79/409/EEC).

Articles 6(3) and 6(4) of the Habitats Directive set out the decision-making tests for plans or projects that could potentially affect European sites. Article 6(3) establishes the requirement for Appropriate Assessment: -

> *"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) deals with the steps that should be taken when it is determined, as a result of Appropriate Assessment, that a plan or project will adversely affect a European site. Alternative solutions, imperative reasons of overriding public interest (IROPI) and compensatory measures need to be addressed in this case. Article 6(4) states: -

> *"If, in spite of a negative assessment of the implications for the 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, the Member State 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.*
>
> *Where the site concerned hosts a priority natural habitat type and/or a priority species, the only considerations which may be raised are those relating to human health or public safety, to beneficial consequences of primary importance for the environment or, further to an opinion from the Commission, to other imperative reasons of overriding public interest."*

2.2. Appropriate Assessment Process

Guidance on the AA process was produced by the European Commission (EC, 2001; 2018), which was subsequently used to develop guidance for Ireland by the Department of Environment, Heritage and Local Government in 2009 (DEHLG, 2009), National Parks and Wildlife Service in 2018[1] (NPWS 2018) and the Office of the Planning Regulator (2021). These guidance documents set out a staged approach to complete the AA process and outline the issues and tests at each stage. The stages outlined below are taken from the guidance document Appropriate Assessment of Plans and Projects in Ireland – Guidance for Planning Authorities (DEHLG, 2009).

[1] https://www.npws.ie/development-consultations

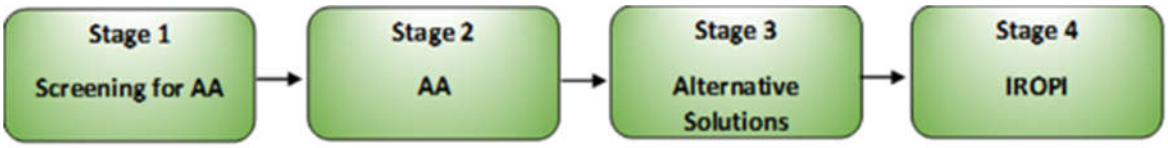


Figure 2-1 - Appropriate Assessment Process (Source: DEHLG, 2009)

2.2.1. Screening for Appropriate Assessment

Screening is the process that addresses and records the reasoning and conclusions in relation to the first two tests of Article 6(3): -

i. Whether a plan or project is directly connected to or necessary for the management of the site; and
ii. Whether a plan or project, alone or in combination with other plans and projects, is likely to have significant effects on a European site in view of its conservation objectives.

If the effects are deemed to be significant, potentially significant, or uncertain, then the process must proceed to Appropriate Assessment.

2.2.2. Appropriate Assessment

Appropriate Assessment considers whether the plan or project, alone or in combination with other projects or plans, will have adverse effects on the integrity of a European site, and includes any necessary mitigation measures.

The competent authority can only agree to the plan or project after having ascertained that it will not adversely affect the integrity of the site(s) concerned. If this cannot be determined, and where sufficient mitigation cannot be achieved, the alternative solutions need to be considered and the process proceeds to the consideration of alternative solutions.

2.2.3. Alternative Solutions

This examines any alternative solutions or options that could enable the plan or project to proceed without adverse effects on the integrity of a European site. The process must return to AA as alternatives will require assessment in order to proceed. Demonstrating that all reasonable alternatives have been considered and assessed, and that the least damaging option has been selected, it is necessary to examine whether there are imperative reasons of overriding interest (IROPI).

2.2.4. IROPI

This examines whether there are imperative reasons of overriding public interest for allowing a plan or project that will have adverse effects on the integrity of a European site to proceed in cases where it has been established that no less damaging alternative solution exists. Compensatory measures must be proposed and assessed, of which the Commission must be informed.

The AA process only progresses through the full process for certain plans and projects. For example, for a project not connected with the management of a European site and where no likely significant effects on a European site in view of its conservation objectives are identified, the process stops at Screening for AA. Throughout the process the precautionary principle must be applied, which requires that the conservation objectives of Natura 2000 should prevail where there is uncertainty (EC, 2001; 2018).

3. Methods

3.1. Legislation & Guidance Documents

The Screening for Appropriate Assessment was prepared with reference and due consideration to the following documents and case law, including but not limited to: -

- Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild flora and fauna. *Official Journal of the European Communities* L 206/7-50.
- Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds. *Official Journal of the European Union* L 20/7-25.
- European Communities (Birds and Natural Habitats) Regulations, 2011. *S.I. No. 77/2011* (as amended) ("the Habitats Regulations").
- Planning and Development Act, 2000. *No. 30 of 2000* (as amended) ("the Planning and Development Acts").
- EC (2018) *Managing Natura 2000 sites: The provisions of Article 6 of the 'Habitats' Directive 92/43/EEC.* European Commission, Brussels.
- EC (2021) *Assessment of plans and projects in relation to Natura 2000 sites: Methodological guidance on the provisions of Articles 6(3) and (4) of the Habitats Directive 92/43/EEC.* European Commission, Brussels.
- DEHLG (2010a) *Appropriate Assessment of Plans and Projects in Ireland: Guidance for Planning Authorities. Revised 11/02/2010.* Department of the Environment, Heritage and Local Government, Dublin.
- DEHLG (2010b) *Circular NPW 1/10 & PSSP 2/10. Dated 11/03/2010.* Department of the Environment, Heritage and Local Government, Dublin.
- NPWS (2012) *Marine Natura Impact Statements in Irish Special Areas of Conservation. A Working Document. April 2012.* National Parks & Wildlife Service, Department of Arts, Heritage and the Gaeltacht, Dublin.
- OPR (2021) *Appropriate Assessment Screening for Development Management. OPR Practice Note PN01.* Office of the Planning Regulator, Dublin.
- Case law, including *Waddenzee* (C-127/02), *Sweetman v. An Bord Pleanála* (C-258/11), *Kelly v. An Bord Pleanála* (IEHC 400), *Commission v. Germany* (C-142/16), *People Over Wind* (C-323/17), *Holohan v. An Bord Pleanála* (C-461/17), *Eoin Kelly v. An Bord Pleanála* (IEHC 84) and *Heather Hill* (IEHC 450).

3.2. Desk Study

A desk study was carried out to collate information available on European sites in the vicinity of the proposed project. These areas were viewed using Google Earth, Google maps[2] and Bing maps[3] (last accessed on (14/-07/22).

The National Parks and Wildlife Service (NPWS) online databases were reviewed concerning European sites and their features of interest in the vicinity of the proposed project. The Environmental Protection Agency (EPA) mapping[4] system was used to identify any hydrological connection between the proposed project and European sites, this information was supported by site walkover surveys.

[2] https://www.google.ie/maps
[3] http://www.bing.com/maps/
[4] https://gis.epa.ie/EPAMaps/

Locations and boundaries of all European sites within the potential zone of influence of the proposed project were identified and reviewed using the NPWS online map viewer. Boundary shapefiles were also downloaded from this site to facilitate the preparation of project graphics.

Desktop information on relevant European sites was reviewed on the NPWS website, including the site synopsis for each SAC/SPA, the conservation objectives, the site boundaries as shown on the NPWS online map viewer, the standard European Data Form for the SAC/SPA which details conditions and threats of the sites, and published information and unpublished reports on the relevant European sites.

Relevant planning information for the surrounding area was reviewed using the planning enquiry systems of Cork County Council. Search criteria were implemented to determine whether such projects or plans would be relevant to this study and this information was used to determine potential cumulative impacts from other plans / projects with the proposed project.

3.3. Site Visit

Ecological survey methods were in general accordance with those outlined in the following documents:

- A Guide to Habitats in Ireland (Fossitt, 2000);
- Best Practice Guidance for Habitat Survey and Mapping (Smith *et al*., 2011);
- Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes (NRA, 2009).

As detailed in Section 5.1, the zone of influence will vary for different ecological features depending on their sensitivity to an environmental change (CIEEM, 2018). The survey area included the lands within the red line boundary. The lands adjoining to the red line boundary of the proposed project are commercial business units.

Surveys were undertaken on 26/04/2021 by an Atkins ecologist. While on site, semi-natural habitats present were recorded using the Fossitt (2000) classification system and their constituent species noted. Potential sensitive ecological receptors present within the survey area were recorded, including the presence of protected species and habitats or habitats that would support protected species, in addition to noting connectivity to European sites. The presence of non-native invasive species was also recorded. All features of interest were recorded using a handheld Garmin Map 62 device.

3.4. Statement of Authority

The Screening for Appropriate Assessment report was prepared by Niamh Sweeney. Peer review was undertaken by Paul O'Donoghue.

Niamh Sweeney (BSc, MSc (Res)) is a freshwater ecologist with over 10 years' experience in ecological consultancy, with specialisms in macroinvertebrate and diatom taxonomy. Niamh has worked on numerous Screenings for Appropriate Assessment, Natura Impact Statements and Ecological Impact Assessments for private architect firms, waste companies, numerous County Councils, the OPW and Inland Fisheries Ireland.

Emma Nickelsen has a BSc (Hons) in Environmental Biology and an MSc in Marine Biology. Emma has worked in ecological and environmental consultancy since 2017, working on a wide range of projects including bridge works, road construction, local amenity development and renewable energy. A focus of Emma's work to date has been on conducting Appropriate Assessment screenings, ecological appraisals and supporting the preparation of Natura Impact Statements and Ecological Impact Statements.

Paul O'Donoghue has a BSc (Zoology), MSc (Behavioural Ecology) and a PhD in avian ecology and genetics. His is a chartered member of the Society for the Environment (CEnv) and a full member of the Chartered Institute of Ecology and Environmental Management (MCIEEM). Paul has over 20 years' experience in ecology; including extensive experience in the preparation of Habitat Directive Assessments / Natura Impact Statements (i.e. Appropriate Assessment under Article 6(3) of the EU Habitats Directive).

4. Existing Environment

4.1. Desktop review

The proposed project is situated in the suburbs of Cork City, located on Bessboro Road in Mahon. Lands immediately adjacent to and bordering the proposed project include open green spaces, residential housing estates, and business offices and units within Mahon Industrial Estate. Mahon Golf Course and the lands of the Bessborough Centre are located to the south and south-east respectively of Mahon Industrial Estate.

All surface hydrological features within the vicinity of the proposed development follow topography and flow in an easterly direction towards the coast. The proposed project is located within the Lee, Cork Harbour and Youghal Bay catchment area and the Glasheen [Corkcity]_SC_010 sub catchment area. (EPA, 2022).

The proposed development is underlain by a regionally important aquifer - Karstfied (GSI 2021). Groundwater vulnerability beneath the development has been classified as 'high' (GSI 2021).

The bedrock beneath the proposed development is underlain by a Massive and crinoidal fine limestone by the little island formation (GSI, 2022). There is a fault line running to the north of the site (GSI, 2022).

There is no evidence of any karst features being present within the vicinity of the proposed development. The closest karst landform is a cave (GSI Reference: 1707SWK0100) located 1.2km north west (GSI, 2022).

There are no Geological Heritage Areas within the proposed site. The closest Geological Heritage Areas is Blackrock Diamond Quarry (IGH 6) which is located ca. 2km north west and described as '*Amethyst; tarmac over - coal yard'* (GSI, 2021). There is no hydrogeological connection between Diamond Quarry Geological Heritage Area and the proposed site (GSI, 2021).

To the south of Mahon Industrial Estate and Mahon Golf Course lies the estuary of the Douglas River. The Douglas estuary discharges into Cork Harbour in the vicinity of Rochestown and Jacob's Island. Douglas estuary and Cork Harbour are categorised by the EPA as Lough Mahon transitional waterbody. Lough Mahon has been assigned 'Moderate' status under the Water Framework Directive and is 'At Risk' of not attaining 'Good' status. Douglas estuary is designated as a Special Protection Area; Cork Harbour SPA (004030).

4.2. Site Visit

The proposed site is a brownfield site dominated by artificial surfaces (BL3). The internal road within the site is tarmac. The centre of the site comprises a large concrete slab that is covered by linoleum and tiles. The linoleum and tile covering is broken with the concrete slab exposed in places.

The northern and western boundary of the site is a treeline (WL1) comprised mainly of cherry laurel (*Prunus laurocerasus*), ash (*Fraxinus excelsior*), sycamore (*Acer pseudoplatanus*), hawthorn (*Crataegus monogyna*) and bramble (*Rubus fructicosus*).

As the site has not been actively occupied recently, the site is transitioning in areas. Scattered throughout the site are sapling trees such as sycamore, willow (*Salix* sp.), alder (*Alnus glutinosa*) and butter-fly bush (*Buddleia davidii*) fringing the concrete slab area. The south-west area of the site is recolonising bare ground (ED3) with typical colonisers such as dandelion (*Taraxacum* spp.), plantains (*Plantago* sp.), pineappleweed (*Matricaria discoidea*), and grasses.

The site is open with very little cover to support protected species. The treeline has the potential to support nesting passerine birds. The site does not offer supporting habitat to foraging or roosting waterbirds. There was no evidence of animal activity on site and the nature of site (i.e. predominantly artificial surfaces) does not provide suitable resting or breeding places for animals.

Plate 4.1 Site Entrance.

Plate 4.2 Bessboro Road (site visible to right).

Plate 4.3 **Tarmac internal road within the site and adjoining vegetation.**

Plate 4.4 **Tarmac internal road within the site and adjoining vegetation.**

Plate 4.5 **View from within the site to site entrance / Bessboro Road.**

Plate 4.6 **Transition between marginal habitat, grassland and scrub, with young trees becoming established.**

Plate 4.7 Plants recolonising tarmacadam areas.

Plate 4.8 Transitioning habitat at the margins of the site.

Plate 4.9 **Concrete slab within the site.**

Plate 4.10 **Old corrugated shed on site.** [Note: site of substation; to be relocated within proposed building].

5. Appropriate Assessment Screening

5.1. Connectivity to European Sites

The 'zone of influence' (ZoI) for a project is the area over which ecological features may be subject to significant effects as a result of the proposed project and associated activities. This is likely to extend beyond the project site, for example where there are ecological or hydrological links beyond the site boundaries. The zone of influence will vary for different ecological features depending on their sensitivity to an environmental change (CIEEM, 2018).

A distance of 15km is recommended in the case of plans, as a potential zone of influence and this distance is derived from UK guidance (Scott Wilson *et al*., 2006). However, for projects the distance could be much less, and in some cases less than 100m. National Parks and Wildlife Service and Office of the Planning Regulator guidance[5] advises that this must be evaluated on a case-by-case basis with reference to the nature, size and location of the project, the sensitivities of the ecological receptors, and the potential for in-combination effects.

Thus, given the nature, scale and extent of the proposed project, the potential zone of influence will consider European sites with regard to the location of a European site, the QIs of the site and their potential mobility outside that European site, the Cause-Pathway-Effect model and potential environment effects of the proposed project.

There are two European designated sites within the potential zone of influence of the proposed project; Great Island Channel SAC (001058) and Cork Harbour SPA (004030).

Cork Island Channel SAC is situated in the inner area of Cork Harbour, north of Cobh Island and on the eastern side of Cork Harbour, i.e. the opposite side of the Harbour to Douglas estuary and the proposed project. Cork Island Channel is located ca. 5.3km to the east of the proposed project. The SAC is designated for intertidal mudflats and sandflats and Atlantic salt meadows (Table 5.1). It must be assumed that surface water drainage from the environs of the site ultimately reaches the harbour; either by direct outfall or via infiltration to groundwater.

Cork Harbour SPA is comprised of a number of discrete elements distributed throughout the harbour. The nearest element is Douglas Estuary, which is located ca 410m to the south of the proposed project. Mahon industrial estate and Mahon Golf Course lie between the proposed project and the SPA. However, given that the SPA is situated within 500m of the proposed project, it is deemed to be within the zone of influence of the proposed project and is considered further in this assessment.

[5] DoEHLG (2009*). Appropriate Assessment of Plans and Projects in Ireland. Guidance for Planning Authorities*. Department of Environment, Heritage and Local Government, Dublin, Ireland.
OPR (2021) Appropriate Assessment Screening for Development Management. OPR Practice Note PN01. Office of the Planning Regulator. Dublin, Ireland.

Table 5.1 SACs within ZoI of the proposed project.

Site Name	Site Code	Approximate distance	Features of Interest	Within ZoI
Great Island Channel SAC[6]	0010058	ca. 5.3km by land (straight line distance)	• Mudflats and sandflats not covered by seawater at low tide [1140] • Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) [1330]	Yes There is no overlap or direct connectivity from the proposed project to the SAC. The SAC is situated within the inner area of Cork Harbour at a distance from the proposed development, which is >410m from the shore, and thus, there is at most weak and remote hydrological connectivity between the proposed project and the SAC.

Table 5.2 SPAs within ZoI of the proposed project

Site Name	Site Code	Approximate distance	Features of Interest	Within ZoI
Cork Harbour SPA[7]	004030	Ca. 410m by land (straight line distance)	• Little Grebe (*Tachybaptus ruficollis*) [A004] • Great Crested Grebe (*Podiceps cristatus*) [A005] • Cormorant (*Phalacrocorax carbo*) [A017] • Grey Heron (*Ardea cinerea*) [A028] • Shelduck (*Tadorna tadorna*) [A048] • Wigeon (*Anas penelope*) [A050] • Teal (*Anas crecca*) [A052] • Pintail (*Anas acuta*) [A054] • Shoveler (*Anas clypeata*) [A056] • Red-breasted Merganser (*Mergus serrator*) [A069] • Oystercatcher (*Haematopus ostralegus*) [A130] • Golden Plover (*Pluvialis apricaria*) [A140] • Grey Plover (*Pluvialis squatarola*) [A141] • Lapwing (*Vanellus vanellus*) [A142] • Dunlin (*Calidris alpina*) [A149] • Black-tailed Godwit (*Limosa limosa*) [A156] • Bar-tailed Godwit (*Limosa lapponica*) [A157]	Yes. The proposed project is located ca. 410m from the SPA and thus, is within the potential zone of influence of the proposed project.

[6] NPWS (2014). *Conservation Objectives: Great Island Channel SAC 001058. Version 1.* National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht

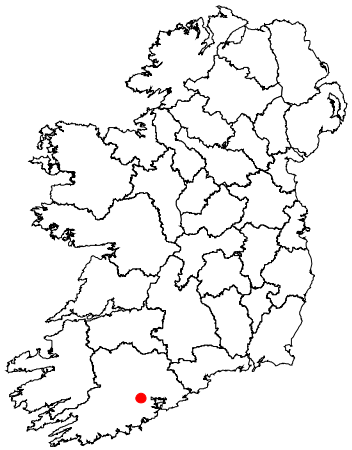
[7] NPWS (2014). *Conservation Objectives: Cork Harbour SPA 004030. Version 1.* National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

Site Name	Site Code	Approximate distance	Features of Interest	Within ZoI
			• Curlew (*Numenius arquata*) [A160] • Redshank (*Tringa totanus*) [A162] • Black-headed Gull (*Chroicocephalus ridibundus*) [A179] • Common Gull (*Larus canus*) [A182] • Lesser Black-backed Gull (*Larus fuscus*) [A183] • Common Tern (*Sterna hirundo*) [A193] • Wetland and Waterbirds [A999]	

N

Legend

- Clover Hill Court
- Great Island SAC



Client:	Cork City Council
Project:	Clover Hill Court Infill Housing, Mahon
Title:	Special Areas of Conservation

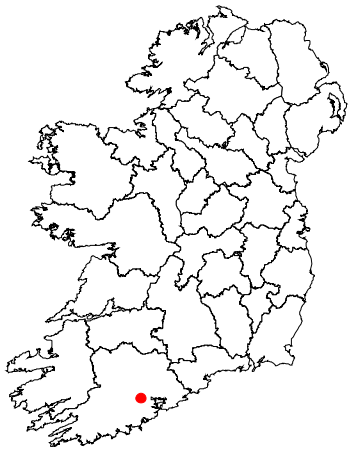
Drawn: EN	Checked: NS	Authorised: PO'D
Date: 29/04/2021	Date: 29/04/2021	Date: 29/04/2021
Drawing No: 5.1		Rev: 1.0

ATKINS
Dublin - Tel: 353 - 1 - 890 9000
Cork - Tel: 353 - 21 - 429 0300
Galway - Tel: 353 - 91 786050

N

Legend

- Clover Hill Court
- Cork Harbour SPA



Client:	Cork City Council
Project:	Clover Hill Court Infill Housing, Mahon
Title:	Special Protection Areas

Drawn: EN	Checked: NS	Authorised: PO'D
Date: 29/04/2021	Date: 29/04/2021	Date: 29/04/2021
Drawing No: 5.2		Rev: 1.0

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5.2. Great Island Channel SAC

5.2.1. Description of Great Island Channel SAC

Great Island Channel SAC is described as follows in the NPWS site synopsis (NPWS, 2013a; a full copy of the site synopsis is included in Appendix A): -

> *"The Great Island Channel stretches from Little Island to Midleton, with its southern boundary being formed by Great Island. It is an integral part of Cork Harbour which contains several other sites of conservation interest. Geologically, Cork Harbour consists of two large areas of open water in a limestone basin, separated from each other and the open sea by ridges of Old Red Sandstone. Within this system, Great Island Channel forms the eastern stretch of the river basin and, compared to the rest of Cork Harbour, is relatively undisturbed. Within the site is the estuary of the Owenacurra and Dungourney Rivers. These rivers, which flow through Midleton, provide the main source of freshwater to the North Channel.*
>
> *The main habitats of conservation interest in Great Island Channel SAC are the sheltered tidal sand and mudflats and the Atlantic salt meadows. Owing to the sheltered conditions, the intertidal flats are composed mainly of soft muds. These muds support a range of macro-invertebrates, notably* Macoma balthica*,* Scrobicularia plana*,* Hydrobia ulvae*,* Nepthys hombergi*,* Nereis diversicolor *and* Corophium volutator*. Green algal species occur on the flats, especially* Ulva lactuca *and* Enteromorpha *spp. Cordgrass (*Spartina *spp.) has colonised the intertidal flats in places, especially at Rossleague and Belvelly. The saltmarshes are scattered through the site and are all of the estuarine type on mud substrate. Species present include Sea Purslane (*Halimione portulacoides*), Sea Aster (*Aster tripolium*), Thrift (*Armeria maritima*), Common Saltmarsh-grass (*Puccinellia maritima*), Sea Plantain (*Plantago maritima*), Greater Sea-spurrey (*Spergularia media*), Lax-flowered Sea-lavender (*Limonium humile*), Sea Arrowgrass (*Triglochin maritimum*), Sea Mayweed (*Matricaria maritima*) and Red Fescue (*Festuca rubra*)."*

5.2.2. Conservation Objectives

The Habitats Directive defines when the conservation status of the listed habitats and species is considered as favourable. The definitions it uses for this are specific to the Directive. In summary, they require that the range and areas of the listed habitats, and the range and population of the listed species, should be at least maintained at their status at the time of designation. Site-specific conservation objectives aim to define favourable conservation conditions for a particular habitat or species at that site.

Article (1) of the Habitats Directive (92/43/EEC) describes favourable conservation status for habitats and species as follows.

Favourable conservation status of a habitat is achieved when:

- Its natural range, and area it covers within that range, are stable or increasing;
- The specific structure and functions which are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future; and
- The conservation status of its typical species is favourable.

The favourable conservation status of a species is achieved when:

- Population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats;
- The natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future; and

- There is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.

The conservation objectives for Great Island Channel SAC, to maintain or restore the favourable conservation condition for each of the qualifying interests of the site, were published by NPWS (2014a) and are as follows: -

- To maintain the favourable conservation condition of Mudflats and sandflats not covered by seawater at low tide in Great Island Channel SAC;

- To restore the favourable conservation condition of Atlantic salt meadows in Great Island Channel SAC.

When considering the potential for impacts on annexed habitats in Great Island Channel SAC consideration must be given to each of the Attributes for *Habitat 1140* (Table 5.3) and *1330* (Table 5.4) as set out in the Conservation Objective Supporting documentation (NPWS, 2014a).

Table 5.3 Attributes of 1140 Mudflats and sandflats not covered by seawater at low tide (from NPWS, 2014a).

1140	Mudflats and sandflats not covered by seawater at low tide		
To maintain the favourable conservation condition of Mudflats and sandflats not covered by seawater at low tide in Great Island Channel SAC, which is defined by the following list of attributes and targets:			
Attribute	Measure	Target	Notes
Habitat area	Hectares	The permanent habitat area is stable or increasing, subject to natural processes. See Map 3 of NPWS, 2014a.	Habitat area was estimated using as 723ha using OSi data
Community distribution	Hectares	Conserve the following community type in a natural condition: Mixed sediment to sandy mud with polychaetes and oligochaetes community complex. See Map 4 of NPWS, 2014a.	Based on intertidal and subtidal surveys undertaken in 2006 (Aquafact, 2007) and 2011 (EcoServe, 2012; MERC, 2012). See marine supporting document for further information.

Table 5.4 Attributes of 1330 Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) (from NPWS, 2014a).

1330	Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*)		
To restore the favourable conservation condition of Atlantic salt meadows (*GlaucoPuccinellietalia maritimae*) in Great Island Channel SAC, which is defined by the following list of attributes and targets:			
Habitat area	Hectares	Area stable or increasing, subject to natural processes, including erosion and succession. For sub-sites mapped: Bawnard - 0.29ha; Carrigtwohill - 1.01ha. See Map 5 of NPWS, 2014a.	Based on data from Saltmarsh Monitoring Project (SMP) (McCorry and Ryle, 2009). Two sub-sites that supported Atlantic salt meadow (ASM) were mapped (1.30ha) and additional areas of potential saltmarsh (17.60ha) were identified from an examination of aerial photographs, giving a total estimated area of 18.90ha. Saltmarsh habitat has also been recorded at two other sub-sites within the SAC (Curtis and Sheehy Skeffington, 1998). NB further unsurveyed areas maybe present within the SAC. See coastal habitats supporting document for further details.
Habitat distribution	Occurrence	No decline or change in habitat distribution, subject to natural processes. See Map 5 of NPWS, 2014a.	Based on data from McCorry and Ryle (2009). Within the sites surveyed by the SMP, estuary type saltmarsh over a mud substrate is most common and ASM is the dominant saltmarsh habitat. NB further unsurveyed areas maybe present within the SAC. See coastal habitats supporting document for further details.
Physical structure: sediment supply	Presence/ absence of physical barriers	Maintain/restore natural circulation of sediments and organic matter, without any physical obstructions	Based on data from McCorry and Ryle (2009). At Bawnard there is a seawall that was constructed in the 18th-19th centuries. At Carrigtwohill the northern and eastern shorelines have been significantly modified by road construction. Part of the saltmarsh has also been infilled. See coastal habitats supporting document for further details
Physical structure: creeks and pans	Occurrence	Maintain/restore creek and pan structure, subject to natural processes, including erosion and succession	Based on data from McCorry and Ryle (2009). The ASM at Carrigtwohill is poorly developed, though some of the larger sections contain salt pans. The smaller sections, however, tend to be quite uniform in topography. The saltmarsh topography at Bawnard is poorly developed with few typical saltmarsh features. See coastal habitats supporting document for further details
Physical structure: flooding regime	Hectares flooded; frequency	Maintain natural tidal regime	Based on data from McCorry and Ryle (2009). At Bawnard, the entire bay empties at low tide to expose soft intertidal mudflats. See coastal habitats supporting document for further details
Vegetation structure: zonation	Occurrence	Maintain range of coastal habitats including transitional zones, subject to natural processes including erosion and succession	Based on data from McCorry and Ryle (2009). Zonations to Salicornia flats and intertidal mudflats occurs at Carrigtwohill. At Bawnard, there is succession from saltmarsh to brackish saltmarsh and wet grassland as well as zonation to intertidal mudflats at the lower saltmarsh boundary. See coastal habitats supporting document for further details

1330	Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*)		
To restore the favourable conservation condition of Atlantic salt meadows (*GlaucoPuccinellietalia maritimae*) in Great Island Channel SAC, which is defined by the following list of attributes and targets:			
Vegetation structure: vegetation height	Centimetres	Maintain structural variation within sward	Based on data from McCorry and Ryle (2009). At Carrigtwohill, the sward height is quite tall due to lack of grazing. At Bawnard only part of the site is grazed. See coastal habitats supporting document for further details
Vegetation structure: vegetation cover	Percentage cover at a representative number of monitoring stops	Maintain more than 90% area outside creeks vegetated	Based on data from McCorry and Ryle (2009). Some poaching was noted in places at Bawnard. See coastal habitats supporting document for further details
Vegetation composition: typical species and subcommunities	Percentage cover at a representative number of monitoring stops	Maintain range of subcommunities with typical species listed in SMP (McCorry and Ryle, 2009)	See coastal habitats supporting document for further details
Vegetation structure: negative indicator species - *Spartina anglica*	Hectares	No significant expansion of common cordgrass (*Spartina anglica*), with an annual spread of less than 1% where it is known to occur	Based on data from McCorry and Ryle (2009). Spartina occurs at both sub-sites in this SAC. See coastal habitats supporting document for further details

5.2.3. Potential Threats

The site synopsis for the Great Island Channel SAC describes the land use and threats to the SAC as follows; *'While the main land use within the site is aquaculture (oyster farming), the greatest threats to its conservation significance come from road works, infilling, sewage outflows and possible marina developments.'*

The threats, pressures and activities with impacts on the SAC (NPWS, 2019) are itemised in Table 5.5.

Table 5.5 Threats, pressures and activities with impacts on the SAC.

Rank	Threats and pressures (code)	Threats and pressure (type)	Inside/outside/both (i/o/b)
M	A08	Fertilisation	o
H	F01	Marine and freshwater aquaculture	i
H	J02.01.02	Suppression of natural fires	i
H	D01.02	Roads and motorways	i
H	E01	Urbanised areas and human habitation	o
M	I01	Invasive non-native species	i
M	A04	Grazing	i
M	K02.03	Eutrophication (natural)	i

5.3. Brief Description of Cork Harbour SPA

Cork Harbour SPA is described as follows in the NPWS site synopsis[8]:

> *"Cork Harbour is a large, sheltered bay system, with several river estuaries - principally those of the Rivers Lee, Douglas, Owenboy and Owennacurra. The SPA site comprises most of the main intertidal areas of Cork Harbour, including all of the North Channel, the Douglas River Estuary, inner Lough Mahon, Monkstown Creek, Lough Beg, the Owenboy River Estuary, Whitegate Bay, Ringabella Creek and the Rostellan and Poulnabibe inlets.*
>
> *Owing to the sheltered conditions, the intertidal flats are often muddy in character. These muds support a range of macro-invertebrates, notably* Macoma balthica, Scrobicularia plana, Hydrobia ulvae, Nepthys hombergi, Nereis diversicolor *and* Corophium volutator. *Green algae species occur on the flats, especially* Ulva *spp. Cordgrass (*Spartina *spp.) has colonised the intertidal flats in places, especially where good shelter exists, such as at Rossleague and Belvelly in the North Channel. Salt marshes are scattered through the site and these provide high tide roosts for the birds. Some shallow bay water is included in the site. Rostellan Lake is a small brackish lake that is used by swans throughout the winter. The site also includes some marginal wet grassland areas used by feeding and roosting birds.*
>
> *Cork Harbour is of major ornithological significance, being of international importance both for the total numbers of wintering birds (i.e. > 20,000) and also for its populations of Black-tailed Godwit and Redshank. In addition, it supports nationally important wintering populations of 22 species, as well as a nationally important breeding colony of Common Tern. Several of the species which occur regularly are listed on Annex I of the E.U. Birds Directive, i.e. Whooper Swan, Little Egret, Golden Plover, Bar-tailed Godwit, Ruff, Mediterranean Gull and Common Tern. The site provides both feeding and roosting sites for the various bird species that use it. Cork Harbour is also a Ramsar Convention site and part of Cork Harbour SPA is a Wildfowl Sanctuary."*

5.3.1. Conservation Objectives of Cork Harbour SPA

The Conservation Objectives for Cork Harbour SPA are to maintain the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA[9].(last accessed 16/12/2020).

The favourable conservation status of a species is achieved when:

- population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats;
- the natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future; and
- there is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.

The conservation objective for non-breeding birds Special Conservation Interests of Cork Harbour SPA[10] are summarised in Table 5.6.

[8] https://www.npws.ie/sites/default/files/protected-sites/synopsis/SY004030.pdf
[9] https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004030.pdf
[10] https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004030.pdf

Table 5.6 Conservation Objectives of Cork Harbour SPA.

Objective 1: To maintain the favourable conservation condition of the waterbird Special Conservation Interest species listed for Cork Harbour SPA, which is defined by the following list of attributes and targets:			
Parameter	**Attribute**	**Measure**	**Target**
Population	Population Trend	Percentage change as per population trend assessment using waterbird count data collected through the Irish Wetland Bird Survey and other surveys	The long term population trend should be stable or increasing
Range	Distribution	Range, timing or intensity of use of areas used by waterbirds, as determined by regular low tide and other waterbird surveys	There should be no significant decrease in the range, timing or intensity of use of areas by the waterbird species of Special Conservation Interest other than that occurring from natural patterns of variation.
Area	Wetland habitat	Area (Ha)	The permanent area occupied by the wetland habitat should be stable and not significantly less than the area of 2,587 Ha, other than that occurring from natural patterns of variation.

5.3.2. Potential Threats

The threats, pressures and activities[11] with impact on Cork Harbour SPA are itemised in Table 5.7.

Table 5.7 Threats, pressures and activities with impacts on the SPA.

Rank	Threats and pressures (code)	Threats and pressures (type)	Inside/outside/both (i/o/b)
M	F02.03	Leisure fishing	i
H	E02	Industrial or commercial areas	o
M	G01.01	Nautical sports	i
M	D03.02	Shipping lanes	i
M	G01.02	Walking, horse riding and non-motorised vehicles	i
H	D01.02	Roads, motorways	o
H	E01	Urbanised areas, human habitation	o
L	E01.03	Dispersed habitation	o
H	F01	Marine and Freshwater Aquaculture	i
M	G01.06	Skiing, off-piste	i
M	A08	Fertilisation	o
H	D03.01	Port areas	o

[11] https://www.npws.ie/sites/default/files/protected-sites/natura2000/NF004030.pdf

5.4. Likelihood of Significant Effects on European sites

The available information on European sites was reviewed to establish whether or not the proposed project is likely to have a significant effect on the conservation objectives of the designated sites. The likelihood of impacts on the qualifying interests of the European sites identified in this report is based on information collated from the desk study, site visit, site plans, design information and reports and other available existing information.

The likelihood of impacts occurring are established in light of the type and scale of the proposed works, the location of the proposed works with respect to European sites and the features of interest and conservation objectives of the European sites.

This screening report is prepared following the Cause – Pathway – Effect model. The potential impacts are summarised into the following categories for screening purposes.

- Direct impacts refer to habitat loss or fragmentation arising from land-take requirements for development or agricultural purposes. Direct impacts can be as a result of a change in land use or management, such as the removal of agricultural practices that prevent scrub encroachment.

- Indirect impacts refer to those which can arise through remote connectivity, for example by means of a watercourse, via groundwater, via air (e.g. dust) or via other emissions from a project site (e.g. noise and light). Indirect and secondary impacts do not have a straight-line route between cause and effect. It is potentially more challenging to ensure that all the possible indirect impacts of the project – in combination with other plans and projects - have been established. These can arise, for example, when a development alters the hydrology of a catchment area, which in turn affects the movement of groundwater to a site and the qualifying interests that rely on the maintenance of water levels. Deterioration in water quality can occur as an indirect consequence of development, which in turn changes the aquatic environment and reduces its capacity to support certain plants and animals. The introduction of invasive species can also be defined as an indirect impact. Disturbance to fauna can arise directly through the loss of habitat (e.g. displacement of roosting bats) or indirectly through noise, vibration and increased activity associated with construction and operation.

5.4.1. Identification of Potential Impacts

5.4.1.1. Indirect impacts via surface water run-off during construction and operational phase

Construction

The proposed works area is not located within a European site (neither SAC nor SPA). The proposed development site on Bessboro Road is ca. 5.3km along watercourses / Cork Harbour to Great Island Channel SAC and ca. 410m north of Douglas Estuary / Cork Harbour SPA.

There is no watercourse within or immediately adjoining the proposed development site.

The only connection to European sites is potentially via a remote hydrological linkage through the existing surface water drainage system from the site and environs to Cork Harbour. There is, accordingly, a potential hydrological link between the proposed development site and European sites in Cork Harbour. However, it should be noted that this link is weak and via a very large body of water which offers substantial dilution of surface waters.

The existing surface water network at the site is described in Section 1.2.1; as noted an existing 1200mm gravity sewer traverses the site from the Clover Hill Estate to the Bessboro Road. This will be protected during the course of construction works. Where any other drains are identified on site, these will be isolated from construction works for the duration of any tasks that might result in silt laden waters entering such drains.

During the construction phase of the project a construction compound will be established within the site boundary; this will not be located in proximity to any drains or surface water features through which sediment or other pollutants such as hydrocarbons could be discharged to Cork Harbour.

When considering *1140 - Mudflats and sandflats not covered by seawater at low tide* – it is not anticipated that the proposed development at Clover Hill would affect either of the listed Attributes for this habitat – i.e. either *Habitat Area* or *Distribution* of this habitat within the SAC; nor would they affect any of the Attributes listed for

1330 Atlantic salt meadows (see Table 5.3 and 5.4). Even in a worst case scenario where silt laden waters might enter the local surface water drainage network and reach Cork Harbour during construction on the Clover Hill site, the dilution offered by the adjoining harbour, together with the character of the qualifying interests, is such that negative impacts to Great Island Channel SAC are not anticipated; nor to the Wetlands for which Cork Harbour SPA is also designated.

Apart from a steel shed, the proposed scheme does not include the demolition of the existing building onsite. The shed is the existing substation that is to be relocated within proposed building. The main building has already been demolished; removal of floor slab only is required. Excavation of the proposed site will also involve the removal of the existing hardstanding material. Excavated material will be temporarily stored at suitable locations only and then removed from site to appropriately licenced waste facilities. No negative impacts to European sites are anticipated from these activities.

Cork Harbour SPA is designated for several wintering waterbirds. As noted, there is no overlap with the SPA. While several species for which the SPA has been designated do feed in fields outside of the SPA (e.g. Curlew, Oystercatcher, and Black-tailed Godwit) the proposed works area at Clover Hill does not support suitable habitat for these species (see Plate 4.1-4.10). The proposed works are sufficiently remote from the SPA that waterbirds within the SPA will not be impacted / disturbed by proposed works. The SPA is also designated for Wetland and Waterbirds [A999]; however, as noted above for Great Island Channel SAC no impact to wetland habitats within the SPA are anticipated.

Operation

During the operation phase, the surface water drainage will flow into an underground attenuation tank/cube. The proposed development has been assessed in relation to Sustainable Urban Drainage Systems (SuDS). A variety of SuDS measures may be adopted to comply with Council recommendations. All SuDS measures are to be implemented with reference to the UK SuDS Manual and Cork City Council drainage requirements (Section 1.2.2.1).

A proposed attenuation tank is also to be used as part of the surface water management system (Section 1.2.2.2); this will be sized to reduce the peak runoff from the site to the peak greenfield discharge rate of 8.43 l/s. The proposed attenuation tank is 1.6m deep and has a plan area of 155m^2. The minimum free storage volume of the tank is 236 m^3 (see Punch Consulting Engineers drawing CLO-PUNCH-XX-XX-DR-C-0100 for a layout of the attenuation tank).

As noted above (Section 1.2.2.3(, it is also proposed that all surface water run-off from car park areas will outfall via a Class 1 Kingspan Klargester NSBE010 or approved equivalent Bypass Separator, located upstream of the connection to the existing storm water drain on site. This device will remove hydrocarbons and fine sediment particles from the site runoff and lower the risk of downstream contamination following an oil spillage on site.

As a result, no negative impacts to European sites are therefore anticipated from surface water drainage of the proposed development during operation of the site.

As noted above, no operational impacts on wintering waterbirds for which Cork Harbour SPA has been designated are anticipated.

In summary, due to the nature of proposed works, the absence of a watercourse on the site, as well as the distance between Clover Hill and Great Island Channel SAC / Cork Harbour SPA, as well as the extent and duration of the proposed works; no negative impacts to European sites, notably Great Island Channel SAC / Cork Harbour SPA through surface waters or via disturbance are anticipated during construction or operation of this scheme.

5.4.1.2. Potential Indirect Impacts during construction and operational phase via groundwater (hydrogeological pathway)

The proposed development is underlain by a regionally important aquifer - Karstfied (GSI 2021). Groundwater vulnerability beneath the development has been classified as ‘high’ (GSI 2021).

The proposed project will mainly involve excavations to an anticipated of between 0.9m and 4.5m. GSI (2022) have reported a ‘*high’* groundwater vulnerability rating for site, indicating that the groundwater beneath this portion of the proposed development may be vulnerable to contamination. Excavation works on site can interact

with groundwater and have the potential to expose groundwater to contamination by concrete, hydrocarbons and other chemicals used in construction. Shallow groundwater will likely be encountered during construction work. In the event of a water strike dewatering may be required.

There is no evidence of any karst features being present within the vicinity of the proposed development. The closest karst landform is a cave (GSI Reference: 1707SWK0100) located 1.2km north west (GSI, 2022).

However, any localised / temporary alteration of ground water levels on-site is expected to be minor and of short duration, and will not have a significant impact on groundwater levels (i.e. locally or within the Lough Mahon Transitional Water Body), during site operation. Following completion of works, in landscaped areas of the site surface water will naturally infiltrate to soils and ultimately groundwater; all other waters will be intercepted by the surface water management system as discussed above. Risk to groundwater quality will be of limited duration; occurring during excavations and removal of the septic tank. As noted the site is a significant distance from the Lough Mahon Transitional Water Body in Cork Harbour.

It is therefore considered that the proposed development will not negatively impact on groundwater quality within Great Island Channel SAC; nor will it impact, directly or indirectly, any of the habitats or species listed as features of interest for Great Island Channel SAC.

5.4.1.3. Potential Indirect impact / damage through discharge of treated foul effluent.

As noted, it is proposed that the foul sewer will discharge by gravity to the existing foul sewer traversing the site at Manhole No. F1-9. Table 3-1 of the *Engineering Planning Report* (Punch Consulting Engineers, 2022) describes the foul water drainage design parameters used and detailed calculations are enclosed in Appendix D of same. The *Engineering Planning Report* also details the Pre-Connection Enquiry Form that was issued to Irish Water in relation to the proposed development. Irish Water has provided a response, advising that waste water connection is feasible without any infrastructure upgrade. The existing Irish Water infrastructure upgrade has been subject to stand alone Appropriate Assessment. Negative impacts to Great Island Channel SAC arising from treatment of foul effluent within this existing infrastructure are not anticipated; nor to the Wetlands for which Cork Harbour SPA is also designated.

Therefore, it is not anticipated that operational discharge of foul to the existing network would result in any adverse effects on the Great Island SAC or Cork Harbour SPA.

5.4.1.4. Proposed Indirect habitat/species loss/damage via spread of invasive species (if present at the study site).

The introduction and spread of invasive species can also result in negative impacts within a designated site. As noted, no species listed on the 3rd Schedule of the EC (Bird and Natural Habitats) Regulations, 2011 (S.I. 477/ 2011), have been recorded on site. No 3rd Schedule species were recorded within the site boundaries as illustrated on Figure 1.1.

No invasive species listed on the 3rd Schedule of the EC (Bird and Natural Habitats) Regulations, 2011 have been identified on site. As a result, no adverse effects shall occur on the Great Island Channel SAC or Cork Harbour SPA as a result of the potential spread of invasive species. However, as is good practice strict biosecurity measures will be implemented on site.

5.5. In-Combination Impacts

In-combination impacts with the following plans and projects were considered during the preparation of this report. The search of Cork City Council's planning database was map-based.

The Cork City Development Plan 2022 - 2028[12] categorises the area of the proposed project as 'Business and Technology', with adjacent areas of 'Residential, Local Services and Institutional Uses'.

Cork City Council has started the preparation of a new Cork City Development Plan 2022-2028. This is a 2-year process, which evolves through various stages in line with Planning and Development Legislation. It can be viewed at: - https://www.corkcity.ie/en/proposed-cork-city-development-plan-2022-2028/.

A draft Natura Impact Report was prepared in support of the Appropriate Assessment of the draft Development Plan; this assessed the Plan and its potential to adversely affect the integrity of European sites. The findings of the NIS were integrated into the Plan, ensuring that potential impacts were avoided, reduced or offset. Thus, an AA determination was made by the Council that the Plan will not adversely affect the integrity of European sites due to the incorporation of mitigation measures into the Plan as a result of the AA process.

A search of Cork City Council Planning Applications has been undertaken for applications submitted within the last 5 years in the vicinity of the proposed development (last reviewed 12/07/2022). Some of the granted applications have already been completed and of those which are not completed, most are generally of small scale in nature (i.e. residential extension works, or property improvement works). Completed or granted applications of such small scale (such as residential improvements) have not been considered further in terms of potential for cumulative impacts.

6 no. projects are committed developments, which have not yet been built or are currently under construction. These developments have been further evaluated for the potential of cumulative impacts and are presented in Table 5.8. It is considered unlikely that the granted projects occurring within any sites surrounding the airport lands will act in combination with the proposed project to give rise to significant cumulative impacts on the receiving environment.

Given the nature, extent and scale of the proposed project, it is not anticipated that it will act in-combination with the plans or projects outlined above, or other plans or projects, to give rise to cumulative impacts on European sites, including Great Island Channel SAC and / or Cork Harbour SPA.

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[12] https://www.corkcity.ie/en/proposed-cork-city-development-plan-2022-2028/. Please note the 2022-2028 is currently at public consultation phase.

Table 5.8 Committed Development in the vicinity of the proposed residential development.

Planning Ref	Decision Date	App. Name	Location	Description	Assessment
2140453	17/01/2022	First Step Homes Ireland Ltd.	Bessboro, Mahon, Cork	Permission to alter and extend the previously granted Creche building granted under planning reference No. 18/37820 and An Bord Pleanála ABP-302784-18 to incorporate a larger ground floor Creche/Community facility and bin store. The application is also to include for the permission of 10. no. first and second floors apartments to consist of the following: 5 no. first floor apartments: 2 no. 1 bed and 3 no. 2 bed with communal storage and 5 no. second floor apartments: 2 no. 1 bed and 3 no. 2 bed with communal storage and all associated site works	This development is located ca. 220m south of the proposed site. Based on the location, scale and nature of this project, cumulative impacts associated with the proposed residential development on the receiving environment are unlikely.
1938649	22/10/2019	SR Technics Airfoil Services Ltd.	Mahon Industrial Estate, Bessboro Road, Blackrock, Cork City	Permission to construct a single storey extension to the West Side of the existing SR Technics Airfoil Services Ltd factory building	This development is located ca. 220m south of the proposed site. Based on the location, scale and nature of this project, cumulative impacts associated with the proposed residential development on the receiving environment are unlikely.
1837820	26/09/2018	Bessboro Warehouse Holdings Ltd.	Bessboro Road, Mahon, Cork	Permission for the demolition and removal of the existing warehouse/distribution building and associated structures and the construction of 135 no. residential units comprising 24 no. dwelling houses, 64 no. duplex apartments and a three storey apartment block (comprising 20 no. apartments) and a four storey apartment block (comprising 27 no. apartments). 1 no. crèche, provision for the relocation of 2 no. utility buildings (gas and electricity) and all associated ancillary site development works including vehicular access, parking, footpaths, landscaping, drainage and amenity areas.	This development is located ca. 220m south of the proposed site. Based on the location, scale and nature of this project, cumulative impacts associated with the proposed residential development on the receiving environment are unlikely.
1737565	13/03/2018	Denis O' Brien Developments (Cork) Ltd.	Bessboro Road, Ballinure, Mahon, Cork	Permission for the construction of 66 no. residential units and all associated ancillary development works including vehicular access (including 2 no. entrances on to Bessboro Road), parking, footpaths, landscaping, drainage and amenity areas	This development is located 320m east of the proposed site. Based on the location, scale and nature of this project, cumulative impacts associated with the proposed residential development on the receiving environment are unlikely.

Planning Ref	Decision Date	App. Name	Location	Description	Assessment
1938875	11/03/2020	O'Flynn Construction Co. Unlimited Company	Blackrock Business Park, Bessboro Road, Mahon, Cork	Permission for the construction of 12,004 sq. metres (gross) of office floorspace comprising of a 4-storey office building with an option for internal sub-division to provide up to 16 no. office units, 174 no. surface car parking spaces and 66 no. undercroft / semi-basement car parking spaces and all associated ancillary development works including landscaping, drainage, plant and solar panels (provided at roof level), 1 no. smoking shelter, motorbike and bicycle parking and 1 no. switch room, electrical substation and bin stores.	This development is located 460m north east of the proposed site. Based on the location, scale and nature of this project, cumulative impacts associated with the proposed residential development on the receiving environment are unlikely.
1737286	11/04/2017	O'Flynn Construction Cork	Mahon Business Park, Former Motorola Site, Bessboro Road, Mahon, Cork	Permission is sought for the construction of a new entrance canopy and minor works to existing façade including modifications and replacement of existing door and windows and all necessary ancillary development works to the existing office building	This development is located 410m north east of the proposed site. Based on the location, scale and nature of this project, cumulative impacts associated with the proposed residential development on the receiving environment are unlikely.

5.6. Likelihood of Significant Effects on Natura 2000 Sites

Due to the location, scale and nature of the proposed project, it is considered that the proposed project, either alone or in combination with other plans or projects, will not result in likely significantly effects on Great Island Channel SAC or Cork Harbour SPA, or any other European site, in view of their conservation objectives.

5.7. Consideration of Findings

This Screening for Appropriate Assessment report is based on the best available scientific information. It is concluded by the authors of this report that, on the basis of objective information, the proposed project, individually or in-combination with other plants and projects, will not have likely significant effects on Great Island Channel SAC or Cork Harbour SPA in view of their conservation objectives. Thus, it is concluded that the proposed project does not need to proceed to Appropriate Assessment.

Should the scope or nature of the proposed project change, a new Screening for Appropriate Assessment report shall be required.

6. Appropriate Assessment Screening Matrix

Presented below is a summary screening matrix for the proposed project at Clover Hill, Bessboro Road, Mahon in Cork City. As discussed above, this summarises the assessment of potential impacts on the Great Island Channel SAC and Cork Harbour SPA, or any other European site.

1. Description of the project or plan	
Location	Clover Hill, Bessboro Road, Mahon Cork City
Distance from designated site	Great Island Channel SAC (001058) Cork Harbour SPA (004030)
Brief Description of the project or plan	The proposed development will consist of removal of existing floor slab of former commercial building, relocation of existing substation, construction of 2 no. apartment buildings (1 no. 3-4 storey building and 1 no. 4-5 storey building), linked at ground floor, containing 84 no. apartments in total (28 no. 1-bed apartments and 56 no. 2-bed apartments), each with private balcony/wintergarden/terrace, as well as ground floor bin & bicycle stores and plant (including 1 no. relocated substation and 1 no. additional substation), 6 no. 2-storey 3-bed terraced houses, each with private garden, and all associated site development works, services provision, road infrastructure, landscaping/public realm works, 49 no. car parking spaces (43 no. on-street car parking spaces and 6 no. on-curtilage car parking spaces) and 188 no. bicycle parking spaces (94 no. bicycle parking spaces in apartment buildings, 52 no. bicycle parking spaces in freestanding external shelters and 42 no. bicycle parking spaces in open external racks). See Chapter 1.0.
Is the plan directly connected with or necessary to the site management for nature conservation?	No

2. Brief Description of the Natura 2000 site(s)	
Name	Great Island Channel SAC (001058) Cork Harbour SPA (004030)
Site designation status	SAC / SPA
Qualifying interests	Refer to Table 5.1 & 5.2
Unit size	Great island Channel SAC Area 1437.549976ha; of which 86.95% is marine Cork Harbour SPA Area: 2660.3 ha; of which marine: 90.792%

3. Assessment Criteria	
Other plans or projects which may have a cumulative impact	A search of Cork City Council Planning Applications has been undertaken for applications submitted within the last 5 years in the vicinity of the proposed development (last reviewed 12/07/2022). Some of the granted applications have already been completed and of those which are not completed, most are generally of small scale in nature (i.e. residential extension works, or property improvement works). Completed or granted applications of such small scale (such as residential improvements) have not been considered further in terms of potential for cumulative impacts.

3. Assessment Criteria	
	6 no. projects are committed developments, which have not yet been built or are currently under construction. These developments have been further evaluated for the potential of cumulative impacts and are presented in Table 5.8. It is considered unlikely that the granted projects occurring within any sites surrounding the airport lands will act in combination with the proposed project to give rise to significant cumulative impacts on the receiving environment.
Describe the individual elements of the project (either alone or in combination with other plans or projects) likely to give rise to impacts on the Natura 2000 sites.	See Chapter 1.0 & Tables 5.1 – 5.2.
Describe any likely direct, indirect or secondary impacts of the project (either alone or in combination with other plans or projects) on the Natura 2000 site by virtue of: - *Size and scale* - *Land-take* - *Distance from Natura 2000 site or key features of the site* - *Resource requirements* - *Emissions* - *Excavation requirements* - *Transportation requirements* - *Duration of construction, operation etc.* - *Others*	There are no likely changes to the European sites as a result of the proposed works. All works are at a significant distance from European sites. No land-take of the SAC or SPA is required for the proposed project. No habitats for which Great Island Channel SAC / Cork Harbour SPA have been designated are located within the works areas. There are no water abstraction requirements for the proposed project and there shall be no emissions during the operational phase of the project. No instream works are proposed. The potential for polluting material to enter the watercourse is low. It is estimated that works would be undertaken over a 8 month period.
Describe any likely changes to the site arising as a result of: - *Reduction of habitat area* - *Disturbance of key species* - *Habitat or species fragmentation* - *Reduction in species density* - *Changes in key indicators of conservation value* - *Climate change*	There are no likely changes to the sites as a result of the proposed works. There shall be no reduction of habitat area as a result of the proposed project. There shall be no habitat or species fragmentation or reduction in species density as a result of the works. Given the nature, scale and location of works negative impacts are not anticipated.
Describe any likely impacts on the Natura 2000 site as a whole in terms of: - *Interference with the key relationships that define the structure of the site* *Interference with key relationships that define the function of the site.*	There are no likely changes to the sites as a result of the proposed works with respect to the key relationships that define the structure or function of Great Island Channel SAC / Cork Harbour SPA.
Provide indicators of significance as a result of the identification of effects set out above in terms of: - *Loss* - *Fragmentation* - *Disruption* - *Disturbance* - *Change to key elements of the site*	There are no likely changes to the sites as a result of the proposed works. There shall be no reduction of habitat area as a result of the proposed project. There shall be no habitat or species fragmentation or reduction in species density as a result of the works. Given the nature, scale and location of works negative impacts are not anticipated.
Describe from the above those elements of the project or plan, or combination of	There are no likely changes to the sites as a result of the proposed works.

3. Assessment Criteria	
elements, where the above impacts are likely to be significant or where the scale of magnitude of impacts is not known.	

Data collected to carry out the assessment			
Who carried out the assessment	*Sources of data*	*Level of assessment completed*	*Where can the full results of the assessments be accessed and viewed?*
Atkins Unit 2B 2200 Cork Airport Business Park, Cork	Desktop data derived from the NPWS – Natura 2000 form, site synopsis, SAC reports etc. National Biodiversity Date Centre online data. EPA Envision Mapping system; Google maps; Bing Maps etc. Cork City Council Planning Enquiry System	Screening for Appropriate Assessment	Atkins, Unit 2B 2200 Cork Airport Business Park, Cork

6.1. Finding of No Significant Effects

Finding of No Significant Effects	
Name and location of Natura site(s)	Great Island Channel SAC (001058) Cork Harbour SPA (004030)
Brief description of the project or plan	See Section 1.
Is the project or plan directly connected with or necessary to the site management for nature conservation?	No
Are there other projects or plans that together with the project or plan being assessed could affect the site?	See Section 5.5.o

Assessment of significance of effects	
Describe how the project (either alone or in combination with other plans or projects) is likely to affect the Natura 2000 site.	There are no likely changes to the European sites as a result of the proposed works. All works are at a significant distance from European sites. No land-take of the SAC or SPA is required for the proposed project. No habitats for which Great Island Channel SAC / Cork Harbour SPA have been designated are located within the works areas. There are no water abstraction requirements for the proposed project and there shall be no emissions during the operational phase of the project. No instream works are proposed. The potential for polluting material to enter the watercourse is low. It is estimated that works would be undertaken over a 8 month period.
Explain why the effects are not considered significant	Refer to Chapter 5.0 and explanations presented above.
List the Agencies consulted	Formal consultation with NPWS via the Development Applications Unit has not been under taken at this time.

Assessment of significance of effects	
Response to Consultation	N/A

References

Birds Directive (2009/47/EC) – http://ec.europa.eu/environment/nature /legislation/birdsdirective /index _en.htm

CIEEM (2018; 2019 reprint). *Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine*. Chartered Institute of Ecology and Environmental Management, Winchester.

Cork City Council (2015). Cork County Development Plan 2015-2021 and all associated Environmental Documentation.

Cork City Council (2021). Cork County Development Plan 2022-2028 and all associated Environmental Documentation.

Cork City Council (2021). Cork City Natura Impact Report in support of the Appropriate Assessment. Part of the draft Cork City Development Plan 2022-2028.

Department of the Environment, Heritage and Local Government (2009). Appropriate Assessment of Plans and Projects in Ireland. Guidance for Planning Authorities.

Environmental Protection Agency (EPA), 2022. *Revised Guidelines on the Information to be contained in Environmental Impact Assessment Reports*.

EPA website: http://www.epa.ie

European Commission (2000). Managing Natura 2000 sites: the provisions of Article 6 of the 'Habitats' Directive 92/43/EEC.

European Commission (2021). Assessment of plans and projects significantly affecting Natura 2000 sites: Methodological guidance on the provisions of Articles 6(3) and (4) of the Habitats Directive 92/43/EEC.

European Commission (2007). Guidance document on Article 6(4) of the 'Habitats Directive' 92/49/EEC; clarification of the concepts of: Alternative solutions, Imperative reasons of overriding public interest, Compensatory Measures, Overall Coherence, Opinion of the Commission.

Fossitt, J. (2000). *A Guide to Habitats in Ireland*. The Heritage Council.

Gilbert, G., Stanbury, A. and Lewis, L. (2021). Birds of Conservation Concern in Ireland. 4. 2020-2026. *Irish Birds* 43: 1–22 (2021).

Geological Survey of Ireland (GSI) (2022). https://www.gsi.ie/en-ie/Pages/default.aspx. Consulted July 2022.

Inland Fisheries Ireland (IFI) (2016). *Guidelines on Protection of Fisheries during Construction Works in and Adjacent to Waters*. Inland Fisheries Ireland, Dublin.

IFI (2021). Planning for Watercourses in the Urban Environment. A Guide to the Protection of Watercourses through the use of Buffer Zones, Sustainable Drainage Systems, Instream Rehabilitation, Climate / Flood Risk and Recreational Planning. A Guideline Developed by Inland Fisheries Ireland.

Masters-Williams *et al.* (2001). Control of water pollution from construction sites. Guidance for consultants and contractors (C532). CIRIA.

Murnane *et al*. (2002). Control of Water Pollution from Construction Sites - Guide to Good Practice. SP156.

Murphy, D. (2004). *Requirements for the Protection of Fisheries Habitat during Construction and Development Works at River Sites*. Eastern Regional Fisheries Board, Dublin.

NPWS Protected Areas Site Synopses and maps available on - http://www.npws.ie/en/ProtectedSites/

NPWS (2008). *The Status of EU Protected Habitats and Species in Ireland. Conservation Status in Ireland of Habitats and Species listed in the European Council Directive on the Conservation of Habitats, Flora and Fauna 92/43/EEC.*

NPWS (2013). *Great Island Channel SAC 001058. Site Synopsis*. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht. [001058_Rev13.Doc; Version date: 24.09.2013].

NPWS (2014a). *Conservation Objectives: Cork Harbour SPA 004030. Version 1*. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

NPWS (2014b). *Cork Harbour SPA 004030. Conservation Objectives Supporting Documentation*. *Version 1.0*. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

NPWS (2014c). *Conservation Objectives: Great Island Channel SAC 001058. Version 1.* National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

NPWS (2015). *Cork Harbour SPA 004030. Site Synopsis*. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

NPWS (2018). Notifiable Actions [ONLINE] Available at: https://www.npws.ie/farmers-and-landowners/notifiable-actions.

NRA (2009). *National Roads Authority Guidelines for Assessment of Ecological Impacts of National Road Schemes.*

http://www.tii.ie/technicalservices/environment/planning/Guidelines-for-Assessment-of-Ecological-Impacts-ofNationalRoad-Schemes.pdf.

Office of Planning Regulation (2021). *Appropriate Assessment Screening for Development Management*. OPR Practice Note PN01.

Punch Consulting Engineers (2022). *Cork City Council Modular Housing – Clover Hill West. Engineering Planning Report.* Report prepared for Cork City Council.

Scott Wilson and Levett-Therivel, (2006). A*ppropriate Assessment of Plans*. Scott Wilson, Levett-Therivel Sustainability Consultants, Treweek Environmental Consultants and Land Use Consultants.

Smith, G., O'Donoghue, P., O'Hora, K. & Delaney, E. (2011). *Best Practice Guidance for Habitat Survey and Mapping*. The Heritage Council, Church Lane, Kilkenny, Ireland.

Appendices

Appendix A. Site Synopses

SITE SYNOPSIS

Site Name: Great Island Channel SAC

Site Code: 001058

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

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

[1140] Tidal Mudflats and Sandflats
[1330] Atlantic Salt Meadows

The main habitats of conservation interest in Great Island Channel SAC are the sheltered tidal sand and mudflats and the Atlantic salt meadows. Owing to the sheltered conditions, the intertidal flats are composed mainly of soft muds. These muds support a range of macro-invertebrates, notably *Macoma balthica*, *Scrobicularia plana*, *Hydrobia ulvae*, *Nepthys hombergi, Nereis diversicolor* and *Corophium volutator*. Green algal species occur on the flats, especially *Ulva lactua* and *Enteromorpha* spp. Cordgrass (*Spartina* spp.) has colonised the intertidal flats in places, especially at Rossleague and Belvelly.

The saltmarshes are scattered through the site and are all of the estuarine type on mud substrate. Species present include Sea Purslane (*Halimione portulacoides*), Sea Aster (*Aster tripolium*), Thrift (*Armeria maritima*), Common Saltmarsh-grass (*Puccinellia maritima*), Sea Plantain (*Plantago maritima*), Greater Sea-spurrey (*Spergularia media*), Lax-flowered Sea-lavender (*Limonium humile*), Sea Arrowgrass (*Triglochin maritimum*), Sea Mayweed (*Matricaria maritima*) and Red Fescue (*Festuca rubra*).

The site is extremely important for wintering waterfowl and is considered to contain three of the top five areas within Cork Harbour, namely North Channel, Harper's Island and Belvelly-Marino Point. Shelduck is the most frequent duck species with 800-1,000 birds centred on the Fota/Marino Point area. There are also large flocks of Teal and Wigeon, especially at the eastern end. Waders occur in the greatest density

north of Rosslare, with Dunlin, Godwit, Curlew and Golden Plover the commonest species. A population of about 80 Grey Plover is a notable feature of the area. All the mudflats support feeding birds; the main roost sites are at Weir Island and Brown Island, and to the north of Fota at Killacloyne and Harper's Island. Ahanesk supports a roost also but is subject to disturbance. The numbers of Grey Plover and Shelduck, as given above, are of national importance.

The site is an integral part of Cork Harbour which is a wetland of international importance for the birds it supports. Overall, Cork Harbour regularly holds over 20,000 waterfowl and contains internationally important numbers of Black-tailed Godwit (1,181) and Redshank (1,896), along with nationally important numbers of nineteen other species. Furthermore, it contains large Dunlin (12,019) and Lapwing (12,528) flocks. All counts are average peaks, 1994/95 – 1996/97. Much of the site falls within Cork Harbour Special Protection Area, an important bird area designated under the E.U. Birds Directive.

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

The site is of major importance for the two habitats listed on Annex I of the E.U. Habitats Directive, as well as for its important numbers of wintering waders and wildfowl. It also supports a good invertebrate fauna.

SITE SYNOPSIS

SITE NAME: CORK HARBOUR SPA

SITE CODE: 004030

Cork Harbour is a large, sheltered bay system, with several river estuaries - principally those of the Rivers Lee, Douglas, Owenboy and Owennacurra. The SPA site comprises most of the main intertidal areas of Cork Harbour, including all of the North Channel, the Douglas River Estuary, inner Lough Mahon, Monkstown Creek, Lough Beg, the Owenboy River Estuary, Whitegate Bay, Ringabella Creek and the Rostellan and Poulnabibe inlets.

Owing to the sheltered conditions, the intertidal flats are often muddy in character. These muds support a range of macro-invertebrates, notably *Macoma balthica*, *Scrobicularia plana*, *Hydrobia ulvae*, *Nepthys hombergi*, *Nereis diversicolor* and *Corophium volutator*. Green algae species occur on the flats, especially *Ulva* spp. Cordgrass (*Spartina* spp.) has colonised the intertidal flats in places, especially where good shelter exists, such as at Rossleague and Belvelly in the North Channel. Salt marshes are scattered through the site and these provide high tide roosts for the birds. Some shallow bay water is included in the site. Rostellan Lake is a small brackish lake that is used by swans throughout the winter. The site also includes some marginal wet grassland areas used by feeding and roosting birds.

The site is a Special Protection Area (SPA) under the E.U. Birds Directive, of special conservation interest for the following species: Little Grebe, Great Crested Grebe, Cormorant, Grey Heron, Shelduck, Wigeon, Teal, Mallard, Pintail, Shoveler, Red-breasted Merganser, Oystercatcher, Golden Plover, Grey Plover, Lapwing, Dunlin, Black-tailed Godwit, Bar-tailed Godwit, Curlew, Redshank, Greenshank, Black-headed Gull, Common Gull, Lesser Black-backed Gull and Common Tern. The site is also of special conservation interest for holding an assemblage of over 20,000 wintering waterbirds. The E.U. Birds Directive pays particular attention to wetlands and, as these form part of this SPA, the site and its associated waterbirds are of special conservation interest for Wetland & Waterbirds.

Cork Harbour is an internationally important wetland site, regularly supporting in excess of 20,000 wintering waterfowl. Of particular note is that the site supports internationally important populations of Black-tailed Godwit (1,896) and Redshank (2,149) - all figures given are five year mean peaks for the period 1995/96 to 1999/2000. Nationally important populations of the following 19 species occur: Little Grebe (57), Great Crested Grebe (253), Cormorant (521), Grey Heron (80), Shelduck (2,009), Wigeon (1,791), Teal (1,065), Mallard (513), Pintail (57), Shoveler (103), Red-breasted Merganser (121), Oystercatcher (1,809), Golden Plover (3,342), Grey Plover (95), Lapwing (7,569), Dunlin (9,621), Bar-tailed Godwit (233), Curlew (2,237) and Greenshank (46). The Shelduck population is the largest in the country (over 10% of national total). Other species using the site include Mute Swan (38), Whooper Swan (5), Pochard (72), Gadwall

(6), Tufted Duck (64), Goldeneye (21), Coot (53), Ringed Plover (73), Knot (26) and Turnstone (113). Cork Harbour is an important site for gulls in winter and autumn, especially Black-headed Gull (3,640), Common Gull (1,562) and Lesser Black-backed Gull (783), all of which occur in numbers of national importance. Little Egret and Mediterranean Gull, two species which have recently colonised Ireland, also occur at this site.

A range of passage waders occurs regularly in autumn, including such species as Ruff (5-10), Spotted Redshank (1-5) and Green Sandpiper (1-5). Numbers vary between years and usually a few of each of these species over-winter.

Cork Harbour has a nationally important breeding colony of Common Tern (102 pairs in 1995). The birds have nested in Cork Harbour since about 1970, and since 1983 on various artificial structures, notably derelict steel barges and the roof of a Martello Tower. The birds are monitored annually and the chicks are ringed.

Cork Harbour is of major ornithological significance, being of international importance both for the total numbers of wintering birds (i.e. > 20,000) and also for its populations of Black-tailed Godwit and Redshank. In addition, it supports nationally important wintering populations of 22 species, as well as a nationally important breeding colony of Common Tern. Several of the species which occur regularly are listed on Annex I of the E.U. Birds Directive, i.e. Whooper Swan, Little Egret, Golden Plover, Bar-tailed Godwit, Ruff, Mediterranean Gull and Common Tern. The site provides both feeding and roosting sites for the various bird species that use it. Cork Harbour is also a Ramsar Convention site and part of Cork Harbour SPA is a Wildfowl Sanctuary.

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