Natura Impact Statement

prepared for ARUP

on behalf of Dun-Laoghaire-Rathdown County Council

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1 Introduction

1 This report has been prepared by Scott Cawley Ltd. for the applicant, Dun Laoghaire-Rathdown County Council who is seeking permission for rock face stabilisation to be undertaken at Coliemore Harbour, Coliemore Road, Dalkey, Co. Dublin (hereinafter referred to as the proposed development).

2 This NIS has been prepared in accordance with the provisions of Part XAB of the Planning and Development Act, 2000 (as amended) and in accordance with the requirements of Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora (the Habitats Directive).

3 It considers the implications of the proposed development, on its own and in combination with other plans or projects, for European sites[1] in view of the conservation objectives of those sites. It includes a scientific examination of evidence and data to identify and assess the implications of the proposed development for any European sites in view of the conservation objectives of those sites. It considers whether the proposed development, by itself and in combination with other plans or projects, would adversely affect the integrity of any European sites. In reaching a conclusion in this regard consideration is given to any mitigation measures necessary to avoid or reduce any potential negative impacts.

4 The purpose of this NIS is to provide an examination, analysis and evaluation of the potential impacts of the proposed development on European sites and to present findings and conclusions with respect to the proposed development in light of the best scientific knowledge in the field. This NIS will inform and assist the competent authority, An Bord Pleanála, in carrying out its Appropriate Assessment as to whether or not the proposed development will adversely affect the integrity of any European sites, either alone or in combination with other plans and projects, taking into account their conservation objectives.

5 The proposed development is neither connected with nor necessary to the management of any European sites.

2 Legislative Context

6 The Birds and Habitats Directives - Council Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds (the Birds Directive) and Council Directive 92 /43 /EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora (the Habitats Directive) – require Ireland to establish protected sites as part of a European wide network of sites (the Natura 2000 network which are known in Ireland as European sites) for habitats and species that are of international importance for conservation. In Ireland, European sites include Special Areas of Conservation (SACs) and Special Protection Areas (SPAs). SACs are selected for habitats listed on Annex I of the Habitats Directive (including priority Annex I habitat types which are in danger of disappearance) and species listed on Annex II. SPAs are selected for bird species (listed on Annex I of the Birds Directive), regularly-occurring populations of migratory bird species (such as ducks, geese and waders), and areas of international importance for migratory birds. The specified habitats and species for which each SAC and SPA is selected, correspond to the qualifying interests (in the case of SACs) or special conservation interest species (in the case of SPAs) for the sites, for which conservation objectives are prepared.

7 Article 6(3) of the Habitats Directive states that:

[1] The Natura 2000 network of sites are defined under the Habitats Directive (Article 3) as a European ecological network of special areas of conservation, composed of sites hosting the natural habitat types listed in Annex I and species listed in Annex II, and special protection areas classified pursuant to the Birds Directive (2009/147/EC). The aim of the network is to aid the long-term survival of Europe's most valuable and threatened species and habitats. In Ireland, these sites are designed as *European sites* – as defined under the Planning and Development Acts and/or Birds and Habitats Regulations as (a) a candidate site of Community importance, (b) a site of Community importance, (c) a candidate special area of conservation, (d) a special area of conservation, (e) a candidate special protection area, or (f) a special protection area. They are commonly referred to in Ireland as candidate Special Areas of Conservation (cSACs) and Special Protection Areas (SPAs).

'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.'

8 This provision is transposed into Irish law by Part XAB of the Planning and Development Acts 2000 as amended. Section 177U(4) of the said Acts provides for screening for Appropriate Assessment as follows:

'The competent authority shall determine that an appropriate assessment of [...] a proposed development [...] is required if it cannot be excluded, on the basis of objective information, that the [...] proposed development, individually or in combination with other plans or projects, will have a significant effect on a European site.'

9 Section 177U(5) provides as follows:

'The competent authority shall determine that an appropriate assessment of a […] proposed development, […], is not required if it can be excluded, on the basis of objective information, that the […] proposed development, individually or in combination with other plans or projects, will have a significant effect on a European site.'

10 Section 177T(1) and (2) provide that a NIS is '*a statement, for the purposes of Article 6 of the Habitats Directive, of the implications of a proposed development, on its own or in combination with other plans or projects, for one or more than one European site, in view of the conservation objectives of the site or sites' and specifies that it 'shall include a report of a scientific examination of evidence and data, carried out by competent persons to identify and classify any implications for one or more than one European site in view of the conservation objectives of the site or sites'*.

11 The Court of Justice of the European Union (CJEU) has made relevant rulings in relation to when an Appropriate Assessment, is required and its purpose[2] '*Any plan or project not directly connected with or necessary to the management of the site is to be subject to an appropriate assessment of its implications for the site in view of the site's conservation objectives if it cannot be excluded, on the basis of objective information, that it will have a significant effect on that site, either individually or in combination with other plans or projects*' and that the plan or project may only be authorised '*where no reasonable scientific doubt remains as to the absence of such effects*',

12 The CJEU has also made a relevant ruling on what should be contained within an Appropriate Assessment[3] *'[The Appropriate Assessment] cannot have lacunae and must contain complete, precise and definitive findings and conclusions capable of removing all reasonable scientific doubt as to the effects of the works proposed on the protected site concerned*'.

[2] *Any plan or project not directly connected with or necessary to the management of the site is to be subject to an appropriate assessment of its implications for the site in view of the site's conservation objectives if it cannot be excluded, on the basis of objective information, that it will have a significant effect on that site, either individually or in combination with other plans or projects*' and that the plan or project may only be authorised '*where no reasonable scientific doubt remains as to the absence of such effects - Case C-127/02 Landelijke Vereniging tot Behoud van de Waddenzee, Nederlandse vereniging tot Bescherming van Vogels v. Staatssecretaris van Landbouw, Naturbeheer en visserij (Waddenzee) [2004/ ECR I-7405*

[3] *'[The Appropriate Assessment] cannot have lacunae and must contain complete, precise and definitive findings and conclusions capable of removing all reasonable scientific doubt as to the effects of the works proposed on the protected site concerned*'. - Case C-258/11 Sweetman v An Bord Pleanala [2013] ECR I – 0000 (11 April 2013)

13 Consideration has been given in the preparation of this report, to the evolution in interpretation and application of directives and national legislation arising from jurisprudence of the European and Irish courts, in respect of Article 6 of the Habitats Directive.

3 Methodology

3.1 Scientific and Technical Competence Relied Upon

14 This NIS was authored by Polly Couldrick and reviewed by Niamh Burke, Laura Higgins and Ashling Cronin. The background and experience of the author and contributors to this report are set out below.

Polly Couldrick

15 Polly Couldrick has over 20 years of professional ecological consultancy and practical conservation experience. Polly is an associate member of the Chartered Institute of Ecology and Environmental Management (CIEEM) and holds an honours degree in Marine Biology from the University of Liverpool, a masters degree in Marine Environmental Protection from the University of Wales, Bangor and a PhD in ecology from the University of Bristol. Polly is a general ecologist and aquatic technical specialist and is an honorary research fellow at the University of Exeter studying the European eel (*Anguilla anguilla*). Polly has been the lead author for the preparation of numerous Screening for Appropriate Assessment Reports. She is an experienced project manager with a full working knowledge of EIA, the planning process and relevant environmental legislation. In addition to the above, Polly worked within a small team to create and develop the Marine Ecological Impact Assessment Guidelines for the Chartered Institute of Ecology and Environmental Management.

Laura Higgins

16 Laura Higgins is a Senior Ecologist with Scott Cawley Ltd. Laura holds a first class honours degree in Zoology from Trinity College Dublin. Laura has a range of fieldwork experience in Ireland including habitat, invasive species and protected species surveys. She has surveyed a wide range of mammal, bird and invertebrate species in terrestrial and aquatic habitats in Ireland. Laura has a great interest in ecology and is continually improving her professional skills through training courses and volunteer work. Since joining Scott Cawley, her work has included the collection of ecological data, data analysis and preparing Appropriate Assessment reports and Ecological Impact Assessments for residential and infrastructural projects across the country.

Niamh Burke

17 Niamh Burke is Principal Ecologist with Coiscéim Ecology. She holds a BSc (Hons) in Natural Sciences with Environmental Science and a PhD in salmonid ecology. She is a Chartered Environmentalist (CEnv) with the Society for the Environment (Soc Env) and a Full Member of the CIEEM. Niamh is a senior scientist with academic research and consulting experience in terrestrial ecology, aquatic ecology and fluvial geomorphology. She is an experienced project manager with a full working knowledge of EIA, the planning process and relevant environmental legislation, both national and European. With a specialism in aquatic habitats, she also has experience of terrestrial species' surveys and mitigation approaches. In her extensive consultancy roles she has acted as reviewer for all ecological reporting, ensuring consistency of standards and approach.

18 Ashling Cronin is a Technical Director with Scott Cawley. She holds a Masters in Ecological Assessment, an honours degree in Applied Ecology from University College Cork and an Advanced Diploma in Planning and Environmental Law in Kings Inns. She has over eleven years' experience in environmental management and environmental / ecological assessment across both the private and public sector. Ashling has a keen interest in both national and international environmental legislation and has extensive experience in the Appropriate Assessment (AA) process. She has been the lead ecologist for the preparation of a number of Natura Impact Statements for a range of development types and national level plans, as well Natura Impact Reports for a range of land use and non-land use plans. Ashling also provides technical review and due diligence of Appropriate Assessment documentation for public and local authorities to aid their decision-making process as well as peer review of AA documentation prior to lodgement of planning applications.

3.2 Guidance and Approach

19 This NIS has been prepared having regard to the following documents.

European Commission Guidance

- *Assessment of Plans and Projects Significantly Affecting Natura 2000 sites: Methodological Guidance on the Provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC* (European Commission, 2001)
- *Managing Natura 2000 Sites: The Provisions of Article 6 of the Habitat's Directive 92/43/EEC* (European Commission, 2019)
- *Communication from the Commission on the Precautionary Principle* (European Commission 2000)[4]
- *Nature and Biodiversity Cases – Ruling of the European Court of Justice* (European Commission 2006)
- *Article 6 of the Habitats Directive – Rulings of the European Court of Justice* (European Commission Final Draft September 2014)

Irish Guidance

- *Appropriate Assessment of Plans and Projects in Ireland – Guidance for Planning Authorities* (Department of Environment, Heritage and Local Government 2010 revision)
- Appropriate Assessment under Article 6 of the Habitats Directive: Guidance for Planning Authorities. *Circular NPW 1/10 & PSSP 2/10* (NPWS, 2010)
- *OPR Practice Note PN01. Appropriate Assessment Screening for Development Management* (Office of the Planning Regulator, 2021)

20 In addition, regard has been had to the following guidance in characterising impacts, including determining magnitude and significance of impacts, as relevant in the application to Appropriate Assessment and European sites:

- *Guidelines for Ecological Impact Assessment in the UK and Ireland* (Chartered Institute of Ecology and Environmental Assessment, 2018)

3.3 Assessment Methodology

21 The proposed development (including the proposed design, construction methodologies and operational effects) was analysed and assessed to identify the potential impacts associated with the proposed development that could affect the ecological environment.

[4] The precautionary principle is a guiding principle that derives from Article 191 of the Treaty on the Functioning of the European Union and has been developed in the case law of the European Court of Justice (e.g. ECJ case C-127/02 – Waddenzee, Netherlands).

This guidance document notes that the precautionary principle "*covers those specific circumstances where scientific evidence is insufficient, inconclusive or uncertain and there are indications through preliminary objective scientific evaluation that there are reasonable grounds for concern that the potentially dangerous effects on the environment, human, animal or plant health may be inconsistent with the chosen level of protection*".

Applying the precautionary principle in the context of screening for appropriate assessment requires that where there is uncertainty or doubt about the risk of significant effects on a European site(s), it should be assumed that significant effects are likely and AA must be carried out.

22 From this, the zone of influence of the proposed development was defined. Based on the identified impacts, and their zone of influence, the European sites potentially at risk of any direct or indirect impacts were identified.

23 In establishing which European sites are potentially at risk (in the absence of mitigation) from the proposed development, a source-pathway-receptor approach was applied. In order for an impact to occur, there must be a risk enabled by having a source (e.g. water abstraction or construction works), a receptor (e.g. a European site or its Qualifying Interest(s) (QIs) or Special Conservation Interest(s) (SCIs) species), and a pathway between the source and the receptor (e.g. pathway by air for air borne pollution, or a pathway by a watercourse for mobilisation of pollution). For an impact to occur, all three elements must exist; the absence or removal of one of the elements means there is no possibility for the impact to occur.

24 The identification of source-pathway-receptor connection(s) between the proposed development and European sites essentially is the process of identifying which European sites are within the zone of influence of the proposed development, and therefore potentially at risk of significant effects. The zone of influence is defined as the area within which the proposed development could affect the receiving environment such that it could potentially have significant effects on the QI habitats or QI/SCI species of a European site, or on the achievement of their conservation objectives (as defined in CIEEM, 2018).

25 The identification of a source-pathway-receptor risk does not automatically mean that significant effects will arise. The likelihood of significant effects will depend upon the characteristics of the source (e.g. extent and duration of construction works), the characteristics of the pathway (e.g. direction and strength of prevailing winds for air borne pollution) and the characteristics of the receptor (e.g. the sensitivities of the European site and its QIs/SCIs). However, identification of the risk does mean that there is a possibility of ecological or environmental damage occurring, with the significance of the effect depending upon the nature and exposure to the risk and the characteristics of the receptor. In this case, where there is uncertainty, the precautionary principle has been applied.

26 This assessment has been undertaken in consideration of all potential impact sources and pathways connecting the proposed development to European sites, in view of the conservation objectives supporting the conservation condition of the sites' QIs/SCIs.

27 The conservation objectives relating to each European site and its QIs/SCIs are expressed generally for SACs as "to maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the cSAC has been selected", and for SPAs "to maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA".

28 Following on from this, and as defined in the Habitats Directive, favourable conservation status (or condition, at a site level) of a habitat is achieved when:

- its natural range, and area it covers within that range, are stable or increasing, and
- 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

29 The favourable conservation status (or condition, at a site level) 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, and
- 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

30 Where site-specific conservation objectives have been prepared for a given European site, these include a series of specific attributes and targets against which effects on conservation condition, or integrity, can

be measured, i.e. an impact which affects the achievement of favourable conservation condition, as measured by the attributes and targets, is an impact on site integrity.

31 In the case of some QIs/SCIs in certain European sites, the conservation objective is to restore rather than maintain conservation condition and this distinction is taken into account in the assessment; as is any legacy damage to European sites that has occurred since their designation, insofar as possible.

3.4 Desktop Study

32 The desktop data sources used to inform the assessment presented in this report are as follows (accessed on the 17th February 2022):

- Online data available on European sites and protected habitats/species as held by the National Parks and Wildlife Service (NPWS) from www.npws.ie[5], including conservation objectives documents
- Online data available on protected species as held by the National Biodiversity Data Centre (NBDC) from www.biodiversityireland.ie
- Information on the surface water network and surface water quality in the area available from www.epa.ie
- Information on groundwater resources and groundwater quality in the area available from www.epa.ie and www.gsi.ie
- Ordnance Survey of Ireland mapping and aerial photography available from www.osi.ie
- Dun Laoghaire Rathdown (2016) *Dun Laoghaire Rathdown County Development Plan 2016-2022*
- ARUP (2021) *Construction Environmental Management Plan for Coliemore Harbour Permanent Remedial Works*

3.4.1 Consultation

33 In collating ecological data for Coliemore Harbour, Arup engaged with a number of organisations to ensure all available data was accounted for. These organisations included the National Parks and Wildlife Service (NPWS), the Irish Whale and Dolphin Group (IWDG) and Dun Laoghaire Rathdown County Council (DLRCC). Responses which are relevant to Appropriate Assessment are detailed below.

34 The IWDG previously surveyed the surrounding area and have confirmed records of harbour porpoises near the entrance of Coliemore Harbour but no records of harbour porpoises inside the harbour. The IWDG advised that it is highly likely that seals enter the harbour considering the nearby designated sites providing the perfect habitats. The IWDG advised to assume occasional usage of the harbour by both seals and harbour porpoises.

35 The DLRCC advised that data from a recently conducted survey indicated that there are otter holts located along the coastline from Harbour Road approximately 1-1.5km North of Coliemore Harbour. Although the otter holts are not located within Coliemore Harbour itself, the harbour is likely to be within the otter foraging range.

4 Description of the Proposed Development

36 On 13th August 2020, a localised collapse of the granite stone bedrock supporting the footpath leading to the southern jetty in Coliemore Harbour occurred. A large section of granite bedrock beneath the footpath

[5] The following SAC and SPA GIS boundary datasets are the most recently available at the time of writing: SAC_ITM_2022_02.shp and SPA_ITM_2021_10.shp.

sheared off and fell into the harbour. This led to the closure of access to the southern jetty and restricted access to the harbour due to concerns around the integrity of the bedrock. A temporary gangway was installed to allow public access to the Coliemore jetty for the 2021 summer season.

37 The proposed development involves permanent works to reinstate public access to Coliemore Harbour, with a design aim for minimum intrusion. This includes the grouting and infill works, rock anchoring dentition of the voids utilising up to 16 rock anchors and reinstatement of the walkway as per original.

Timing of Works

38 The proposed works will be carried out in the autumn/winter season of 2022. The duration of the works is anticipated to be eight weeks. The core construction working hours for the proposed development will be 8am to 6pm from Monday to Friday, and 8am to 2pm on Saturdays, with drilling works carried out within these periods as required, dependent on the suitability of the tides. All rock breaking/fracturing activities and pile driving will be undertaken during daytime hours. The removal of waste material off site by road and regular deliveries to site will be confined to daytime hours, from 10am to 4pm outside of peak traffic hours, where feasible.

Site preparation

39 The temporary walkway will be removed, prior to works commencing. Two granite bollards will be removed from the viewing platform for accessibility. A single land traffic closure will be required for approximately four hours during this period. The laydown and works area will be secured.

Pointing

40 This initial step seals the stone masonry wall as much as possible, with the aim of limiting grout or water leaking from the masonry wall during the compensation grouting. A crane will be setup in a lifting position.

41 The crane will be set up on the adjacent platform and will lift the man basket into position above the rock face, directed by a banksman via 2-way radio communication. After cleaning, the operative will apply lime mortar to the small joints in the masonry wall using a trowel.

Compensation Grouting

42 This secondary step fills the voids behind the rock face prior to rock anchor installation.

43 Grout injection will be carried out from the existing tarmac walkway via vertical holes drilled using a mini piling rig (Technodrill TD 308).

44 Grouting will be carried out in a bottom-up sequence as follows:

- Stage 1 grouting will be carried out in two rows along the walkway at 2m centres on either side of the walkway and to depth not exceeding 2m.
- Stage 2 grouting will be carried out in similar fashion but a 1 m centres and to depth not exceeding 6m.

45 Where larger voids are found sand filler will be used within the grout and the drill string will be removed and replaced with a 35mm grout lance. Measures will be taken to ensure that grout losses will be curtailed as far as possible to ensure minimal grout can enter the harbour.

Boring to depth

46 The drilling rig is set up over the pin position by positioning the drilling head directly above setup position.

47 The required depth is achieved by means of rotary percussive driving of the drilling head fitted with rock bit (approximately 85 - 110mm). The “returns” are flushed out from the hole via swivel through the drilling head. This process uses air flushing to target depth to avoid spoil contaminating the surrounding environment / harbour water.

48 The pre-prepared hollow stem rods of the correct length and size are inserted into the bore holes. The additional lengths will be added in sections. The final depth will be checked by means of checking rod lengths.

Grouting of pile

49 Grout is pumped through a hollow stem rod when drilling is completed, injecting grout at the bottom of the hole to displace any water and to ensure that the tendon is completely encased with grout. The grout is mixed in a Putzmeister SP11 mixer and pumped by the pumping operative. Any cement bags will be disposed of in a site skip. The grout pump will be bunded with heavy duty polythene to maintain onsite housekeeping.

50 The volume of injected grout per borehole will be recorded and noted on the daily report sheet.

51 If grout is detected to be rising to the top of the borehole, the drill rig operator will immediately direct the grout pump operator to stop pumping, to minimise liquid grout discharged to the surrounding area.

52 The bottom of walkway will be bunded to catch any flowing grout which escapes the top of the bores. Any escaped grout will be scraped up once it sets at the bund and will be disposed of offsite.

53 During compensation grouting, the operative will be in a man basket at the rock face, monitoring the rock joints for escaping grout. If grout leakage is detected, the operative will signal for the pumping to cease immediately, and the joint will be re-sealed.

54 Rods will be withdrawn from position at each location. On completion of all positions, the rock anchor installation can commence.

Installation of Rock Anchors

55 The purpose of this step is to install tie-back anchors which keep the rock mass in place for the design life duration. The access arrangements to the rock face will be via crane and man basket.

56 The contractor will core a hole within the granite rock face to enable the headplate and rock anchor to be recessed flush to the rock face.

57 A cradle-mounted drill will be used to install the inclined anchors. The objective is to bore to depth by means of a rotary percussive drilling head using a compressed air as a flush for the bored materials and then to fill the resultant hole with grout and reinforcement.

58 The pile diameter is envisaged to be 85-110mm nominal diameter R51N DYWI type hollow stem pile founded with embedment into existing rock.

59 Boring to depth will be carried out as above, except the drill rod will be driven by a cradle-mounted unit rather than drill rig.

60 Grouting of rock anchors will be via standard procedure using natural hydraulic lime mortar mix or a 'prompt' mix which is a fast-setting mix to ensure the works set before high waters. Alternatively, a dry grout/resin capsule bored in with drill rod which is activated during drilling, will be used. The capsule, if used, would further reduce the risk of liquid grout leaking or spilling to the seawater. It will be determined by detailed design if this option can be used. It is likely the standard procedure will be used and is considered the worst-case option in terms of potential for grout leak/spill.

61 Once the headplate is installed, a grey olive metal ring will be welded to the top of the bar.

5 Overview of the Receiving Environment

5.1 European Sites

62 The proposed development does not overlap with any European sites. The nearest European site to the proposed development is Dalkey Islands SPA, c. 93m east. The next nearest European site to the proposed development is Rockabill to Dalkey Island SAC located *c.* 183m east. The proposed development is also hydrologically connected to European sites in Dublin Bay, including South Dublin Bay SAC, North Dublin Bay SAC, South Dublin Bay and River Tolka Estuary SPA, North Bull Island SPA, Howth Head Coast SPA, Baldoyle SPA and Ireland's Eye SPA. There is potential that populations of SCI and/or QI species of other European

sites use Dublin Bay and its habitats for foraging, commuting and/or roosting, including Malahide Estuary SPA, The Murrough SPA, Lambay Island SAC, Lambay Island SPA and Rogerstown Estuary SPA.

63 Howth Head SAC and Bray Head SAC are both present in the vicinity of the proposed development, however, the QI habitats for which these sites have been designated are terrestrial habitats above the high tide line. Therefore, these European sites have been excluded from consideration going forward.

64 The European sites present in the vicinity of the proposed development are listed in Table 1, along with their qualifying interests and proximity to the proposed development, and shown on Figure 1.

Table 1 European sites in the vicinity of the proposed development

European Site Name [Code] and its Qualifying interest(s) / Special Conservation Interest(s) (*Priority Annex I Habitats)	**Location Relative to the Proposed Development Site**
Special Area of Conservation (SAC)	
Rockabill to Dalkey Island SAC [003000] 1170 Reefs 1351 Harbour porpoise *Phocoena phocaena* *S.I. No. 94/2019 - European Union Habitats (Rockabill To Dalkey Island Special Area Of Conservation 003000) Regulations 2019* NPWS (2013) *Conservation Objectives: Rockabill to Dalkey Island SAC 003000.* Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.	Approximately 183m east of the proposed development
South Dublin Bay SAC [000210] 1140 Mudflats and sandflats not covered by seawater at low tide 1210 Annual vegetation of drift lines 1310 *Salicornia* and other annuals colonising mud and sand 2110 Embryonic shifting dunes *S.I. No. 525/2019 - European Union Habitats (South Dublin Bay Special Area of Conservation 000210) Regulations 2019* NPWS (2013) *Conservation Objectives: South Dublin Bay SAC 000210.* Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.	Approximately 4.6km northwest of the proposed development
North Dublin Bay SAC [000206] 1140 Mudflats and sandflats not covered by seawater at low tide 1210 Annual vegetation of drift lines 1310 *Salicornia* and other annuals colonising mud and sand 1330 Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) 1395 Petalwort *Petalophyllum ralfsii* 1410 Mediterranean salt meadows (*Juncetalia maritimi*) 2110 Embryonic shifting dunes 2120 Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes) 2130 Fixed coastal dunes with herbaceous vegetation (grey dunes) 2190 Humid dune slacks	Approximately 8.7km north of the proposed development

S.I. No. 524/2019 - European Union Habitats (North Dublin Bay Special Area of Conservation 000206) Regulations 2019 NPWS (2013) *Conservation Objectives: North Dublin Bay SAC 000206.* Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.	
Bray Head SAC [000714] 1230 Vegetated sea cliffs of the Atlantic and Baltic coasts 4030 European dry heaths *S.I. No. 620/2017 - European Union Habitats (Bray Head Special Area of Conservation 000714) Regulations 2017* NPWS (2017) *Conservation Objectives: Bray Head SAC 000714.* Version 1. National Parks and Wildlife Service, Department of Culture, Heritage and the Gaeltacht.	Approximately 8.7km south of the proposed development
Ballyman Glen SAC [000713] 7220 Petrifying springs with tufa formation (Cratoneurion)* 7230 Alkaline fens *S.I. No. 92/2019 - European Union Habitats (Ballyman Glen Special Area Of Conservation 000713) Regulations 2019* NPWS (2019) *Conservation Objectives: Ballyman Glen SAC 000713.* Version 1. National Parks and Wildlife Service, Department of Culture, Heritage and the Gaeltacht.	Approximately 8.7km southwest of the proposed development
Howth Head SAC [000202] 1230 Vegetated sea cliffs of the Atlantic and Baltic coasts 4030 European dry heaths *S.I. No. 524/2021 - European Union Habitats (Howth Head Special Area of Conservation 000202) Regulations 2021* NPWS (2016) *Conservation Objectives: Howth Head SAC 000202.* Version 1. National Parks and Wildlife Service, Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs.	Approximately 9.5km north of the proposed development
Knocksink Wood SAC [000725] 7220 Petrifying springs with tufa formation (Cratoneurion)* 91A0 Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles 91E0 Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (Alno-Padion, Alnion incanae, Salicion albae)* *S.I. No. 93/2019 - European Union Habitats (Knocksink Wood Special Area Of Conservation 000725) Regulations 2019* NPWS (2021) *Conservation objectives for Knocksink Wood SAC [000725].* Generic Version 8.0. Department of Housing, Local Government and Heritage.	Approximately 9.9km southwest of the proposed development
Wicklow Mountains SAC [002122] 3110 Oligotrophic waters containing very few minerals of sandy plains (*Littorelletalia uniflorae*) 3160 Natural dystrophic lakes and ponds 4010 Northern Atlantic wet heaths with *Erica tetralix* 4030 European dry heaths	Approximately 12km southwest of the proposed development

4060 Alpine and Boreal heaths 6130 *Calaminarian* grasslands of the *Violetalia calaminariae* 6230 Species-rich Nardus grasslands, on siliceous substrates in mountain areas (and submountain areas, in Continental Europe) 7130 Blanket bogs (* if active bog) 8110 Siliceous scree of the montane to snow levels (*Androsacetalia alpinae* and *Galeopsietalia ladani*) 8210 Calcareous rocky slopes with chasmophytic vegetation 8220 Siliceous rocky slopes with chasmophytic vegetation 91A0 Old sessile oak woods with *Ilex* and Blechnum in the British Isles 1355 *Lutra lutra* (Otter) NPWS (2017) *Conservation Objectives: Wicklow Mountains SAC 002122.* Version 1. National Parks and Wildlife Service, Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs.	
Baldoyle Bay SAC [000199] 1140 Mudflats and sandflats not covered by seawater at low tide 1310 Salicornia and other annuals colonizing mud and sand 1330 Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) 1410 Mediterranean salt meadows (*Juncetalia maritimi*) *S.I. No. 472/2021 - European Union Habitats (Baldoyle Bay Special Area of Conservation 000199) Regulations 2021* NPWS (2012) *Conservation Objectives: Baldoyle Bay SAC 000199.* Version 1.0. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht	Approximately 12.8km north of the proposed development
Ireland's Eye SAC [002193] 1220 Perennial vegetation of stony banks 1230 Vegetated sea cliffs of the Atlantic and Baltic coasts *S.I. No. 501/2017 - European Union Habitats (Ireland's Eye Special Area of Conservation 002193) Regulations 2017* NPWS (2017) *Conservation Objectives: Ireland's Eye SAC 002193.* Version 1. National Parks and Wildlife Service, Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs.	Approximately 14km north of the proposed development
Glen of the Downs SAC [000719] 91A0 Old sessile oak woods with Ilex and Blechnum in the British Isles *S.I. No. 526/2019 - European Union Habitats (Glen of the Downs Special Area of Conservation 000719) Regulations 2019* NPWS (2020) *Conservation Objectives: Glen of the Downs SAC 000719*. Version 1. National Parks and Wildlife Service, Department of Housing, Local Government and Heritage.	Approximately 14.7km southwest of the proposed development

Lambay Island SAC [000204] 1170 Reefs 1230 Vegetated sea cliffs of the Atlantic and Baltic coasts 1364 Grey seal *Halichoerus grypus* 1365 Harbour seal *Phoca vitulina* S.I. No. 294/2019 - European Union Habitats (Lambay Island Special Area Of Conservation 000204) Regulations 2019 NPWS (2013) Conservation Objectives: Lambay Island SAC 000204. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht	Approximately 23.4km north of the proposed development
Special Protection Area (SPA)	
Dalkey Islands SPA [004172] A192 Roseate Tern *Sterna dougallii* A193 Common Tern *Sterna hirundo* A194 Arctic Tern *Sterna paradisaea* *S.I. No. 238/2010 - European Communities (Conservation of Wild Birds (Dalkey Islands Special Protection Area 004172)) Regulations 2010.* NPWS (2022) *Conservation objectives for Dalkey Islands SPA [004172].* Generic Version 9.0. Department of Housing, Local Government and Heritage.	Approximately 93m east of the proposed development
South Dublin Bay and River Tolka Estuary SPA [004024] A046 Light-bellied Brent Goose *Branta bernicla hrota* A130 Oystercatcher *Haematopus ostralegus* A137 Ringed Plover *Charadrius hiaticula* A141 Grey Plover *Pluvialis squatarola* A143 Knot *Calidris canutus* A144 Sanderling *Calidris alba* A149 Dunlin *Calidris alpina* A157 Bar-tailed Godwit *Limosa lapponica* A162 Redshank *Tringa totanus* A179 Black-headed Gull *Chroicocephalus ridibundus* A192 Roseate Tern *Sterna dougallii* A193 Common Tern *Sterna hirundo* A194 Arctic Tern *Sterna paradisaea* A999 Wetland and Waterbirds *S.I. No. 212/2010 - European Communities (Conservation of Wild Birds (South Dublin Bay and River Tolka Estuary Special Protection Area 004024)) Regulations 2010.* NPWS (2015) *Conservation Objectives: South Dublin Bay and River Tolka Estuary SPA 004024*. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.	Approximately 4.0km northwest of the proposed development
North Bull Island SPA [004006] A046 Light-bellied Brent Goose *Branta bernicla hrota* A048 Shelduck *Tadorna tadorna* A052 Teal *Anas crecca*	Approximately 8.6km north of the proposed development

A054 Pintail *Anas acuta* A056 Shoveler *Anas clypeata* A130 Oystercatcher *Haematopus ostralegus* A140 Golden Plover *Pluvialis apricaria* A141 Grey Plover *Pluvialis squatarola* A143 Knot *Calidris canutus* A144 Sanderling *Calidris alba* A149 Dunlin *Calidris alpina* A156 Black-tailed Godwit *Limosa limosa* A157 Bar-tailed Godwit *Limosa lapponica* A160 Curlew *Numenius arquata* A162 Redshank *Tringa totanus* A169 Turnstone *Arenaria interpres* A179 Black-headed Gull *Chroicocephalus ridibundus* A999 Wetlands & Waterbirds *S.I. No. 211/2010 - European Communities (Conservation of Wild Birds (North Bull Island Special Protection Area 004006)) Regulations 2010.* NPWS (2015) *Conservation Objectives: North Bull Island SPA 004006.* Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.	
Howth Head Coast SPA [004113] A188 Kittiwake *Rissa tridactyla* *S.I. No. 185/2012 - European Communities (Conservation of Wild Birds (Howth Head Coast Special Protection Area 004113)) Regulations 2012.* NPWS (2022) *Conservation objectives for Howth Head Coast SPA [004113].* Generic Version9.0. Department of Housing, Local Government and Heritage.	Approximately 9.8km northeast of the proposed development
Wicklow Mountains SPA [004040] A098 Merlin *Falco columbarius* A103 Peregrine *Falco peregrinus* *S.I. No. 586/2012 - European Communities (Conservation of Wild Birds (Wicklow Mountains Special Protection Area 004040)) Regulations 2012.* NPWS (2022) *Conservation objectives for Wicklow Mountains SPA [004040].* Generic Version 9.0. Department of Housing, Local Government and Heritage.	Approximately 12.0km southwest of the proposed development
Baldoyle Bay SPA [004016] A046 Light-bellied Brent Goose *Branta bernicla hrota* A048 Shelduck *Tadorna tadorna* A137 Ringed Plover *Charadrius hiaticula* A140 Golden Plover *Pluvialis apricaria* A141 Grey Plover *Pluvialis squatarola* A157 Bar-tailed Godwit *Limosa lapponica* A999 Wetland and Waterbirds	Approximately 13.0km north of the proposed development

S.I. No. 275/2010 - European Communities (Conservation of Wild Birds (Baldoyle Bay Special Protection Area 004016)) Regulations 2010. NPWS (2013) *Conservation Objectives: Baldoyle Bay SPA 004016. Version 1.* National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.	
Ireland's Eye SPA [004117] A017 Cormorant *Phalacrocorax carbo* A184 Herring Gull *Larus argentatus* A188 Kittiwake *Rissa tridactyla* A199 Guillemot *Uria aalge* A200 Razorbill *Alca torda* *S.I. No. 240/2010 - European Communities (Conservation of Wild Birds (Ireland's Eye Special Protection Area 004117)) Regulations 2010.* NPWS (2022) *Conservation objectives for Ireland's Eye SPA [004117].* Generic Version 9.0. Department of Housing, Local Government and Heritage.	Approximately 13.6km north of the proposed development
Malahide Estuary SPA [004025] A005 Great Crested Grebe *Podiceps cristatus* A046 Light-bellied Brent Goose *Branta bernicla hrota* A048 Shelduck *Tadorna tadorna* A054 Pintail *Anas acuta* A067 Goldeneye *Bucephala clangula* A069 Red-breasted Merganser *Mergus serrator* A130 Oystercatcher *Haematopus ostralegus* A140 Golden Plover *Pluvialis apricaria* A141 Grey Plover *Pluvialis squatarola* A143 Knot *Calidris canutus* A149 Dunlin *Calidris alpina* A156 Black-tailed Godwit *Limosa limosa* A157 Bar-tailed Godwit *Limosa lapponica* A162 Redshank *Tringa totanus* A999 Wetland and Waterbirds *S.I. No. 285/2011 - European Communities (Conservation of Wild Birds (Malahide Estuary Special Protection Area 004025)) Regulations 2011.* NPWS (2013) *Conservation Objectives: Malahide Estuary SPA 004025. Version 1.* National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.	Approximately 18.5km north of the proposed development
The Murrough SPA [004186] A001 Red-throated Diver *Gavia stellata* A043 Greylag Goose *Anser anser* A046 Light-bellied Brent Goose *Branta bernicla hrota* A050 Wigeon *Anas penelope* A052 Teal *Anas crecca* A179 Black-headed Gull *Chroicocephalus ridibundus* A184 Herring Gull *Larus argentatus* A195 Little Tern *Sterna albifrons*	Approximately 19km south of the proposed development

A999 Wetland and Waterbirds *S.I. No. 298/2011 - European Communities (Conservation of Wild Birds (The Murrough Special Protection Area 004186)) Regulations 2011.* NPWS (2022) *Conservation objectives for The Murrough SPA [004186].* Generic Version 9.0. Department of Housing, Local Government and Heritage.	
Lambay Island SPA [004069] A009 Fulmar *Fulmarus glacialis* A017 Cormorant *Phalacrocorax carbo* A018 Shag *Phalacrocorax aristotelis* A043 Greylag Goose *Anser anser* A183 Lesser Black-backed Gull *Larus fuscus* A184 Herring Gull *Larus argentatus* A188 Kittiwake *Rissa tridactyla* A199 Guillemot *Uria aalge* *S.I. No. 242/2010 - European Communities (Conservation of Wild Birds (Lambay Island Special Protection Area 004069)) Regulations 2010.* NPWS (2022) *Conservation objectives for Lambay Island SPA [004069].* Generic Version 9.0. Department of Housing, Local Government and Heritage.	Approximately 23.2km north of the proposed development
Rogerstown Estuary SPA [004015] A043 Greylag Goose Anser anser A046 Brent Goose Branta bernicla hrota A048 Shelduck Tadorna tadorna A056 Shoveler Anas clypeata A130 Oystercatcher Haematopus ostralegus A137 Ringed Plover Charadrius hiaticula A141 Grey Plover Pluvialis squatarola A143 Knot Calidris canutus A149 Dunlin Calidris alpina alpina A156 Black-tailed Godwit Limosa limosa A162 Redshank Tringa totanus A999 Wetlands *S.I. No. 271/2010 - European Communities (Conservation of Wild Birds (Rogerstown Estuary Special Protection Area 004015)) Regulations 2010.* NPWS (2013) *Conservation Objectives: Rogerstown Estuary SPA 004015. Version 1*. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.	Approximately 23.8km north of the proposed development

Figure 1 European sites within the vicinity of the proposed development site

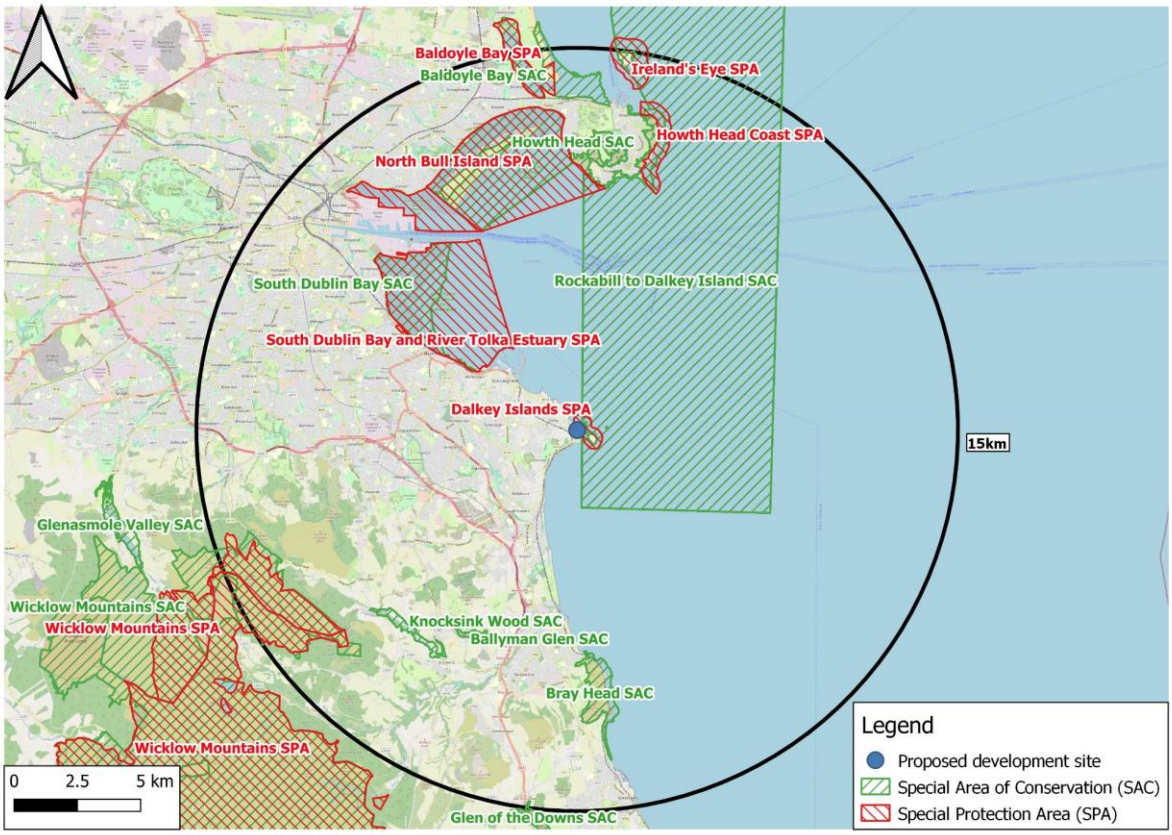


Figure 2 European sites in close proximity to the proposed development

5.1.1 Habitats

65 The proposed development site is located in a coastal setting in Coliemore Harbour, with urban residential areas to the north, west and south, and the Irish Sea to the east. The proposed development involves the permanent rock face stabilisation of the existing harbour wall which is of 'Sea walls, piers and jetties (CC1)'habitat. Terrestrial and intertidal habitat surveys were carried out to inform the Ecological Impact Assessment prepared for this development[6]. None of the habitats recorded within the proposed development site boundary, or Coliemore Harbour itself correspond to any Annex I habitat type.

5.1.2 Flora and Fauna Species

66 The desktop study did not find records for any Annex II flora in the vicinity of the proposed development site. The field survey undertaken to inform the Ecological Impact Assessment in 2022 at the proposed development site did not record any Annex II flora within Coliemore Harbour.

67 With regards to records for non-native invasive species within *c.* 2km of the proposed development, the NBDC database search returned records for the following non-native invasive species which are listed on the Third Schedule of the *European Communities (Birds and Natural Habitats) Regulations, 2011* (as amended).:

- Three cornered garlic *Allium triquetrum,*
- Hottentot fig *Carpobrotus edulis,*
- Giant hogweed *Heracleum mantegazzianum,*
- Japanese wireweed *Sargassum muticum*,

68 No non-native invasive flora listed on the Third Schedule of the *European Communities (Birds and Natural Habitats) Regulations, 2011 (as amended)* were recorded within the proposed development site during the survey in 2022.

69 The desktop study found the following records for the following Annex I and Annex II species for which European sites illustrated in Figure 1, and listed in Table 1 are designated within c.100m of the development site:

- Common Porpoise (*Phocoena phocoena*)
- Arctic Tern (*Sterna paradisaea*)
- Common Tern (*Sterna hirundo*)
- Sandwich Tern (*Thalasseus sandvicensis*)
- Roseate Tern (*Sterna dougallii*)

70 The desktop study returned records of the following species for which European sites illustrated in Figure 1, and listed in Table 1 are designated within c. 2km of the development site:

- Harbour Porpoise (*Phocoena phocoena*)
- Bottle-nosed dolphin (*Tursops truncates*)
- Harbour/Common seal (*Phoca vitulina*)
- Grey seal (*Halichoerus grypus*)

[6] Scott Cawley Ltd. (2022). *Ecological Impact Assessment. Coliemore Harbour Remedial Works.*

- Otter (*Lutra lutra*)
- Peregrine Falcon (*Falco peregrinus*)
- Arctic Tern (*Sterna paradisaea*)
- Common Tern (*Sterna hirundo*)
- Dunlin (*Calidris aplina*)
- Red Throated Diver (*Gavia stellata*)
- Sandwich Tern (*Thalasseus sandvicensis*)
- Roseate Tern (*Sterna dougallii*)
- Light-bellied brent goose (*Branta bernicla subsp. hrota*)
- Black-headed gull (*Larus ridibundus)*
- Guillemot (*Uria aalge*)
- Redshank (*Tringa totanus*)
- Shelduck (*Tadorna tadorna*)
- Cormorant (*Phalacrocorax carbo*)
- Curlew (*Numenius arquata*)
- Oystercatcher (*Haematopus ostralegus*)
- Shag (*Phalacrocorax aristotelis*)
- Herring gull (*Larus argentatus*)
- Razorbill (*Alca torda*)
- Turnstone (*Arenaria interpres*)

Marine mammals

71 The desktop study returned records for four Annex II marine mammal species within c. 2km of the proposed development site: bottle-nosed dolphin (*Tursops truncates*), harbour porpoise (*Phocoena phocoena*), harbour seal (*Phoca vitulina*) and grey seal (*Halichoerus grypus*). As part of the consultation process for the proposed development Arup consulted with the Irish Whale and Dolphin Group (IWDG). The IWDG have previously surveyed the area surrounding Coliemore Harbour and have confirmed records of harbour porpoise near the entrance of the harbour but not within it. The nearest European site designated for harbour porpoise is Rockabill to Dalkey Island SAC, located *c.* 183m east at its closest point, and the nearest European sites designated for the seal species is Lambay Island SAC, located *c*. 23.5km north. Given the nearby sites designated for marine mammals, and the habitats in the vicinity of Coliemore Harbour, the IWDG have advised to assume the occasional usage of the harbour by both seal species and harbour porpoise. All European sites designated for bottle-nosed dolphin in Ireland are located on the west coast. Therefore, it is not considered that bottle-nosed dolphins present in the vicinity of the proposed development site are associated with any European site, and they have been excluded from consideration going forward.

Otter

72 The desktop study returned records of otter (*Lutra lutra*), an Annex II and IV species within c. 2km of the proposed development site. DLRCC have advised that there are recent records of otter holts along the coastline, approximately 1-1.5km north of Coliemore Harbour. Although the otter holts are not located within the harbour itself, Coliemore Harbour is likely to be within the foraging range of these otter. The nearest European site designated for otter is Wicklow Mountains SAC, located *c.* 12km from the proposed

development site (as the crow flies). The Wicklow Mountains SAC is hydrologically connected to Dublin Bay and the Irish Sea via a network of rivers. The closest river with hydrological connectivity to the Wicklow Mountains SAC is the Glencullen River which flows into Bray Harbour via the River Dargle The outfall of the River Dargle in Bray Harbour is located approximately *c.* 12.7km downstream of the Wicklow Mountains SAC (measured along the length of the river), and Bray Harbour is located *c.* 8.2km south of Coliemore Harbour (measured along the coastline). Therefore, the Wicklow Mountains SAC is located *c.* 20.9km from the proposed development site, via habitats suitable to support otter.

SCI bird species

73 Records of several SCI bird species within c. 2km of the proposed development site were returned from the desk study (see above). The waters in and around Coliemore Harbour are considered to be suitable to support feeding and loafing SCI waterbirds. Additionally, rocky shorelines in the vicinity of Coliemore Harbour are suitable to support SCI waders.

74 Aquatic and shoreline habitats present in the vicinity of Coliemore Harbour are likely to support a range of SCI wintering waterbird species for which European sites in the vicinity are designated, including gulls, waders, waterfowl and divers. SCI wintering waterbirds for which European sites are designated are generally present between September and March, with peak numbers present in the middle of this season. SCI birds associated with the populations of the following European sites could utilise habitats in the vicinity of the proposed development site: River Tolka Estuary SPA, North Bull Island SPA, Howth Head Coast SPA, Baldoyle SPA, Malahide Estuary SPA, The Murrough SPA, Lambay Island SPA, Rogerstown Estuary SPA and Ireland's Eye SPA.

75 There were records of peregrine (*Falco peregrinus*) returned from the desk study. The habitats in the proposed development site offer no suitable nesting sites for peregrine, and limited hunting opportunities due to the small size of the harbour. The nearest SPA designated for this species is Wicklow Mountains SPA, which is located *c.* 12km south-west of the proposed development site.

76 Dalkey Islands SPA, located c. 93m to the east of the site, is designated for roseate tern *Sterna dougallii*, common tern *Sterna hirundo* and Arctic tern *Sterna paradisaaa.* The Dalkey Islands are important for breeding and staging terns, and there is a well-established colony of common tern and smaller numbers of Arctic tern present. Roseate tern have bred on Dalkey Island in the past (in 2003 and 2004). Dalkey Islands SPA is used by the three tern species as a post-breeding/pre-migration autumn roost area. Nesting tern colonies in Ireland are largely confined to offshore islands where predator populations (such as rats) are actively managed. There is no suitable shingle habitat for nesting terns within Coliemore Harbour or the surrounding area on the mainland. However, the open marine environment adjacent to Coliemore Harbour is likely to support foraging terns during their breeding and pre-migration seasons (May-September).

5.1.3 Hydrology

77 The nearest watercourse to the proposed development site is the Kill-O-The-Grange Stream, which outfalls to Killiney Bay, *c.* 3.3km south of the proposed development site. Coliemore Harbour is not hydrologically connected to this river waterbody. Under the Water Framework Directive (WFD) (2000/60/EC) the Kill-O-The-Grange Stream (Kill of the Grange Stream_010) has a status of 'poor' and is considered 'at risk'. According to the EPA Map Viewer, the most recent surface water quality information for the Kill of the Grange Stream downstream of the proposed development site at monitoring point RS10K020200 indicated a Q-value score of 3 indicating 'poor' water quality status.

78 The proposed development site is located within coastal waters that connect the proposed development site to Dublin Bay and the Irish Sea. The Water Framework Directive (WFD) (2000/60/EC) status 2013-2018 of Dublin Bay (HA10) is considered to be 'Good' and is 'Not at Risk' of not meeting the WFD objectives. Water Quality data from 2010-2012 indicate that the coastal waterbody is 'Unpolluted'.

5.1.4 Hydrogeology

79 Geological Survey of Ireland (GSI) data indicates that the site is underlain by a "poor aquifer", which is described as "bedrock which is generally unproductive except for local zones".

80 The Groundwater Body (GWB) underlying the site is the 'Kilcullen' groundwater body, which is currently classified by the EPA (2013-2018) as having "Good" groundwater status and "Not at Risk" of achieving good status under the Water Framework Directive. The vulnerability rating for the groundwater beneath site is "E" – extreme vulnerability of potential contaminants passing through the bedrock and into the groundwater.

81 Geological Survey of Ireland (GSI) data indicates that the bedrock formation on site is 'Type 2p microcline porphyritic (Northern and Upper Liffey Valley Plutons), comprised of Granite with microcline phenocrysts.

6 Potential Impacts, Zone of Influence and Identifying European Sites at Risk of Effects

82 Based on the baseline and receiving ecological environment and the nature and characteristics of the proposed development the following potential impacts have been identified:

- Habitat loss and fragmentation
- Habitat degradation as a result of hydrological impacts
- Disturbance and displacement impacts

6.1 Habitat loss and fragmentation

83 The proposed development does not overlap with the boundary of any European site. Therefore, there are no European sites at risk of direct habitat loss impacts.

84 QI/SCI fauna species such as marine mammals and waterbirds may be transiently present in Coliemore Harbour. As the proposed development involves permanent rock stabilisation, the proposed development will result in the temporary fragmentation and loss of habitat suitable to support the QI/SCI populations of the European sites, and machinery associated with the construction phase of the proposed development may result in temporary loss of suitable high tide loafing/foraging habitat for QI/SCI populations.

85 As the proposed development will result in temporary habitat loss and fragmentation outside the European sites, but impacting on species associated with the European sites, there is the potential for in combination effects to occur, however, these are considered to be low impact and temporary in nature.

6.2 Habitat degradation as a result of hydrological impacts

86 Surface water run-off and discharges from the proposed development will drain to the coastal waters in Coliemore Harbour which flow into Dublin Bay and the Irish Sea. Therefore, the Zone of Influence (ZoI) of potential effects on water quality from the proposed development could extend to Dublin Bay and the Irish Sea.

Construction phase

87 An accidental pollution event during construction, has the potential to affect water quality in Dublin Bay. A pollution event, of a sufficient magnitude, has the potential to affect the receiving aquatic and marine environments (either alone or in combination with other pressures on water quality) to an extent that undermines the conservation objectives of the European sites closest to, or hydrologically connected to the site, i.e., Dalkey Islands SPA, Rockabill to Dalkey Island SAC, South Dublin Bay SAC and North Dublin Bay SAC, and the special conservation interests/qualifying interests of South Dublin Bay and River Tolka Estuary SPA, North Bull Island SPA, Howth Head Coast SPA, Baldoyle SPA, Malahide Estuary SPA, The Murrough SPA, Lambay Island SAC, Lambay Island SPA, Rogerstown Estuary SPA , and Ireland's Eye SPA.

Operational phase

88 The proposed development involves rock face stabilisation work at Coliemore Harbour. Once in place and operational it is not considered likely that this proposed development would result in any effects on surface water quality within the harbour and surrounding marine environment.

89 Therefore, there is no possibility of the proposed development undermining the conservation objectives of any of the qualifying interests or special conservation interests of the European sites in, or associated with, Dublin Bay as a result of surface water run-off or discharges during the operational phase.

6.3 Habitat degradation as a result of hydrogeological impacts

90 The proposed development lies within the Kilcullen Groundwater Body (Kilcullen GWB). The only European site within the Kilcullen GWB that is designated for groundwater dependant habitats and/or species is the Glenasmole Valley SAC. Of the qualifying interests of the Glenasmole Valley SAC, the priority Annex I habitat Petrifying springs with tufa formation is dependent upon the existing condition and functioning of the groundwater regime. Based on information published by Geological Survey Ireland (GSI) on the Kilcullen GWB[1], 'The general groundwater flow direction in this aquifer is 'towards numerous small springs and streams that discharge flow towards the coast'. As the proposed development will not interact directly with the underlying groundwater body, and lies down gradient of the Glenasmole Valley SAC, it cannot influence groundwater conditions in the European site.

91 Therefore, there is no possibility of the proposed development undermining the conservation objectives of any of the qualifying interests or special conservation interests of any European sites, either alone or in combination with any other pans or projects, as a result of hydrogeological effects.

6.4 Disturbance and displacement impacts

Construction phase

92 Construction-related disturbance and displacement of fauna species could potentially occur within the vicinity of the proposed development for the eight week duration of the project. For mammal species such as otter, disturbance effects would not be expected to extend beyond 150m[7]. For birds, disturbance effects would not be expected to extend beyond a distance of c.300m, for general construction activities as noise levels would attenuate to close to background levels at that distance[8].

93 Noisy activities associated with the proposed development include the use of equipment such as a grout mixer and pump, mobile telescopic crane, hand-held pneumatic rock drill, and hand-held pneumatic breaker (see full details of noisy equipment in Appendix III- Construction Noise Calculation). The noisiest piece of equipment that will be used during the proposed works is the hand-held pneumatic rock breaker, which will generate a sound pressure level of up to 95dBA at 10m. Noise modelling was carried out on the four noisiest pieces of equipment (95dBA, 90dBA, 86dBA and 84dBA). There is no potential for more than one of any of these four noisiest pieces of equipment to be in operation at the same time. Simultaneous operation of equipment sums to a total equivalent sound pressure of 97dBA at 10m from construction activity. At 100m, the sound pressure will be 77dBA, and at 300m, the sound pressure will be 68dBA. The highest possible noise levels modelled will only occur for relatively short periods of time, i.e. up to 30 minutes at a time. This is likely to cause brief disturbance effects[7] to shorebirds in the vicinity of the proposed development[8].

[7] The duration of effects has been described based on information within 'Guidelines on the Information to be Contained in Environmental Impact Assessment Reports' (EPA, 2017)

[8] Current understanding of construction related noise disturbance to shorebirds is based on the research presented in Cutts et al. (2013) and Wright et al. (2010). In terms of construction noise, levels below 50dB would not be expected to result in any response from foraging or roosting birds. Noise levels between 50dB and 70dB would provoke a moderate effect/level of response from birds, i.e. birds becoming alert and some behavioural changes (e.g. reduced feeding activity), but birds would be expected to habituate to noise levels within this range. Noise levels above 70dB would likely result in birds moving out of the affected zone, or leaving the site altogether. At c. 300m, typical noise levels associated with construction activity (BS 5228) are generally below 60dB or, in most cases, are approaching the 50dB threshold.

Cutts, N., Hemingway, K. and Spencer, J. (2013). Waterbird Disturbance Mitigation Toolkit Informing Estuarine Planning & Construction Projects. Version 3.2. Institute of Estuarine & Coastal Studies (IECS) University of Hull.

94 The closest area of suitable habitat for nesting tern species is Lamb Island, which is located approximately 300m from the proposed works. In a worst-case scenario, noise levels of up to 68dBA may be experienced at Lamb Island which is likely to result in moderate levels of disturbance to birds for short periods of time. This is below the 70dB threshold, above which would likely result in birds moving out of the affected zone. Therefore, given that in a worst-case scenario noise levels will not reach this threshold, and that works will be completed within eight weeks, it is not considered that the proposed works will result in significant effects on nesting tern species associated with the Dalkey Islands SPA. Additionally, it is proposed that works will be carried out in the autumn/winter season of 2022. Therefore, the majority of the disturbance works will be carried out outside of the breeding and pre-migration season for tern species (May-September).

95 A range of SCI waterbird species were returned from the desk study, the majority of which are wintering waterbirds associated with nearby European sites, in Dublin Bay and the Irish Sea. The waters in and around Coliemore Harbour are considered to be suitable to support feeding and loafing SCI waterbirds. Additionally, rocky shorelines in the vicinity of Coliemore Harbour are suitable to support SCI waders. Works are proposed to be carried out in the autumn/winter season of 2022. Therefore, there is potential that temporary noise and vibration associated with the construction of the proposed development could result in disturbance and displacement of SCI wintering waterbird species. However, noise produced as a result of the proposed development will not result in effects on breeding SCI or wintering waterbird species that would affect the population size or distribution due to the brief nature of the works which will only be undertaken over the course of a single wintering bird season (as outlined in detail above). Given that there are extensive areas of suitable alternative foraging and loafing habitat for waterbirds in Dublin Bay and the Irish Sea, no population level effects on SCI waterbirds associated with European sites (including River Tolka Estuary SPA, North Bull Island SPA, Howth Head Coast SPA, Baldoyle SPA, Malahide Estuary SPA, The Murrough SPA, Lambay Island SPA, Rogerstown Estuary SPA and Ireland's Eye SPA) will occur as a result of disturbance and displacement arising from the construction stage of the proposed development.

96 There are two European sites within the disturbance ZoI (i.e. Dalkey Islands SPA and Rockabill to Dalkey Island SAC) where there is the potential for qualifying/special conservation interests to be disturbed and displaced from foraging within the site for the duration of construction and/or operation. These qualifying species include the roseate tern, common tern, Arctic tern and harbour porpoise.

97 Records of grey seal and harbour seal have been returned in the vicinity of the proposed development site. Therefore, there is potential that noise and vibration associated with the construction phase of the proposed development could result in temporary disturbance and displacement effects on marine mammals associated with European sites (i.e. Lambay Island SAC). However, given the brief nature of the proposed works (as outlined in detail above), and the extent of suitable alternative foraging habitat and haul out sites within Dublin Bay and the Irish Sea, disturbance and displacement impacts associated with the construction of the proposed development have no potential to result in any population level effects on seal species.

98 Records of otter have been returned in the vicinity of the proposed development site. The nearest SAC to the proposed development site for which otter has been designated is Wicklow Mountains SAC. Research carried out by Ó Néill *et al.* (2008)[11] on ranging behaviours of otter on river systems in Ireland found that female otter ranges averaged 7.5km while male otter home ranges varied between 7-19km. The proposed development site is located c.20.9km from the Wicklow Mountains SAC when measured along the coastline and river network. Therefore, the proposed development site is located outside of the normal foraging range of otter associated with the SAC population associated with Wicklow Mountains SAC. Additionally, otter are a largely nocturnal species and the proposed works will be carried out during daylight hours, and

Wright, M., Goodman, P., Cameron, T. (2010). Exploring behavioural responses of shorebirds to impulsive noise. Institute of Integrative and Comparative Biology, University of Leeds

there are no confirmed holts within the disturbance ZoI. Therefore the proposed development has no potential to result in significant effects on QI otter populations.

99 As the proposed development has the potential to result in the disturbance/displacement of the qualifying/special conservation interest species of any European site, there is the potential for in combination effects to occur.

Operational phase

100 The proposed development involves the permanent reinstatement of public access to the southern jetty at Coliemore Harbour. As Coliemore Harbour is an existing public amenity, reinstating public access to the southern jetty as a result of this proposed development would not result in any disturbance/displacement effects during the operational stage that would have an effect on breeding or wintering SCI bird populations.

6.5 Summary

101 The potential impacts associated with the proposed development have the potential to affect the receiving environment and, as a result, the conservation objectives supporting the qualifying interest/special conservation interests of the following European sites: Dalkey Islands SPA, Rockabill to Dalkey Island SAC, South Dublin Bay SAC and North Dublin Bay SAC, South Dublin Bay and River Tolka Estuary SPA, North Bull Island SPA, Howth Head Coast SPA, Baldoyle SPA, Malahide Estuary SPA, The Murrough SPA, Lambay Island SAC, Lambay Island SPA, Rogerstown Estuary SPA and Ireland's Eye SPA

102 The potential impacts of the proposed development on the receiving environment, their zone of influence, and the European sites at risk of likely significant effects are summarised in Table 2 below.

Table 2 Summary of the potential impacts of the proposed development on the receiving environment, their potential zone of influence, and the European sites within the zone of influence

Potential Direct or Indirect Impacts and zone of influence of the Potential Effects	Are there any European sites within the zone of influence?
Habitat loss Habitat loss will be confined to the lands within the proposed development boundary.	Yes There are no European sites within the proposed development boundary. As the proposed development works involves permanent rock stabilisation, the proposed development will result in the temporary loss of habitat suitable to support the QI/SCI populations of Dalkey Islands SPA, Rockabill to Dalkey Island SPA, South Dublin Bay and River Tolka Estuary SPA, North Bull Island SPA, Howth Head Coast SPA, Baldoyle SPA, Malahide Estuary SPA, The Murrough SPA, Lambay Island SAC, Lambay Island SPA, Rogerstown Estuary SPA and Ireland's Eye SPA.
Habitat degradation as a result of hydrological impacts Habitats and species downstream of the proposed development site and the associated surface water drainage discharge points, and downstream of the Leixlip MWWTP.	Yes The European sites at risk of hydrological effects associated with the proposed development

	are Dalkey Islands SPA, Rockabill to Dalkey Island SAC, South Dublin Bay SAC and North Dublin Bay SAC and the special conservation interests/qualifying interests of South Dublin Bay and River Tolka Estuary SPA, North Bull Island SPA, Howth Head Coast SPA, Baldoyle SPA, Malahide Estuary SPA, The Murrough SPA, Lambay Island SAC, Lambay Island SPA, Rogerstown Estuary SPA and Ireland's Eye SPA
Habitat degradation as a result of hydrogeological impacts Groundwater dependant habitats, and the species those habitats support, in the local area that lie downgradient of the proposed development site.	No There are no European sites at risk of hydrogeological effects associated with the proposed development
Habitat degradation as a result of introducing/spreading non-native invasive species Habitat areas within, adjacent to, and potentially downstream of the proposed development site.	No There are no European sites at risk of degradation as a result of non-native invasive species spread.
Disturbance and displacement impacts Potentially up to several hundred metres from the proposed development boundary, dependent upon the predicted levels of noise, vibration and visual disturbance associated with the proposed development, in conjunction with the sensitivity of the qualifying interest species to disturbance effects	Yes There are no SCI/QI populations of European sites at risk of disturbance and displacement from their breeding sites. Noise produced as a result of the construction of the proposed development will not result in significant effects on breeding SCI or wintering waterbird species. Foraging QI/SCI populations associated with Dalkey Islands SPA and Rockabill to Dalkey Island SAC are within the potential zone of influence of disturbance effects associated with the construction of the proposed development.

7 Assessment of Effects on European Sites

103 This section of the NIS assesses the direct and indirect impacts of the proposed development on the European sites which fall within its zone of influence. For each of these European sites, the assessment below sets out the relevant ecological baseline information, the analysis of the potential impacts, the qualifying interests/special conservation interests at risk of these potential impacts, in view of the sites'

conservation objectives, and the mitigation measures (if required) to avoid/reduce the effects of any potential impacts.

104 The assessment of the proposed development in combination with any other plans or projects on European sites is presented in Section 8.

7.1 Dalkey Islands SPA [004172]

7.1.1 Ecological Baseline Description for Dalkey Islands SPA

105 The Natura 2000 Standard Data Form[28] lists the site as an important site for both breeding and staging terns. There is a well-established colony of common terns *Sterna hirundo* and smaller numbers of Arctic tern *Sterna paradisaea* and roseate terns *Sterna dougallii*. The site along with other parts of south Dublin Bay is used by the three tern species as a major post-breeding/pre-migration autumn roost area. The site also has breeding great black-backed gull *Larus marinus*, shelduck and oystercatcher *Haematopus ostralegus*. The site is known to be frequented in winter by significant numbers of turnstone *Arenaria interpres*, purple sandpiper *Calidris maritima* and light-bellied brent goose *Branta bernicla hrota*. Threats to the site include urbanisation and human habitation, human intrusions and disturbances, and agriculture.

7.1.2 Qualifying Interests and Conservation Objectives of Dalkey Islands SPA

106 The Special Conservation Interests of Dalkey Islands SPA, and the overall conservation objective, are listed below in Table 3.

Table 3 Special Conservation Interests and Conservation Objectives of Dalkey Islands SPA

Special Conservation Interest(s)	Conservation Objective(s)
[A192] Roseate tern *Sterna dougallii* [A193] Common tern *Sterna hirundo* [A194] Arctic tern *Sterna paradisaea* *S.I. No. 238/2010 - European Communities (Conservation of Wild Birds (Dalkey Islands Special Protection Area 004172)) Regulations 2010.* NPWS (2022) *Conservation objectives for Dalkey Islands SPA [004172].* Generic Version 9.0. Department of Housing, Local Government and Heritage.	To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA

107 In the absence of a site-specific conservation objectives document for the Dalkey Islands SPA, to inform this assessment a set of site-specific conservation objectives has been compiled for the special conservation interests of the SPA, based on site-specific conservation objectives documents available for other European sites with equivalent qualifying interests.

108 This document sets out the attributes, measures and targets that define the favourable conservation condition of the qualifying interests within the European site. Affecting the conservation condition of the qualifying interests/special conservation interests is deemed to constitute an adverse effect on the integrity of a European site. The specific attributes and targets used to define the conservation objectives of the qualifying interests of Dalkey Islands SPA are presented in Section 7.1.7, Table 4.

7.1.3 Examination and Analysis of Potential Direct and Indirect Impacts

109 The direct and/or indirect impacts by which the proposed development could (in the absence of mitigation measures) potentially affect the conservation objective attributes and targets supporting the conservation condition of the qualifying interests of Dalkey Islands SPA, are:

- Habitat loss and fragmentation
- Habitat degradation as a result of hydrological impacts

- Disturbance and displacement impacts

7.1.4 Habitat loss and fragmentation

110 Internationally important numbers of breeding and pre-migrating/post-breeding Roseate, Common and Arctic Terns use intertidal and marine habitats in Dublin Bay for feeding and roosting. These species would be vulnerable to habitat loss and fragmentation. However, the loss of intertidal rocky shore habitat is negligible in size and the loss will be temporary until the rocky shore communities re-establish in 2-10 years[9].

111 Machinery associated with the construction phase of the proposed development may result in temporary loss of suitable high tide loafing habitat for SCI tern species associated with the Dalkey Islands SPA. However, the loss of this habitat is negligible in size and the loss will be temporary until the works are complete. The duration of works is estimated to be eight weeks.

7.1.5 Habitat degradation as a result of hydrological impacts

112 Contaminated surface water run-off or an accidental pollution event, of a sufficient magnitude during the construction operational phase of the proposed development has the potential to affect water quality in immediate vicinity of the proposed development site and the Dublin Bay as the proposed development site ultimately drains to the coastal waterbody.

113 Internationally important numbers of breeding and pre-migrating/post-breeding Roseate, Common and Arctic Terns use intertidal and marine habitats in Dublin Bay for feeding and roosting. These species would be vulnerable to changes in water quality as a result of contaminated surface water run-off, silt or an accidental pollution incident either directly *e.g.* through direct contact with oil or other polluting chemicals, or indirectly by affecting the habitats and food supply on which they rely for feeding.

114 Affecting the water quality of the immediate vicinity of the proposed development site and Southwestern Irish Sea – Dublin Bay due to contaminated surface water run-off, silt or an accidental pollution incident has the potential to undermine the conservation objectives of Dalkey Islands SPA by affecting the quality of intertidal and marine habitats in the immediate vicinity of the proposed development site and Dublin Bay and/or through direct contact with SCI species causing harm or mortality.

7.1.6 Disturbance and displacement impacts

115 Construction-related disturbance and displacement of fauna species could potentially occur within the vicinity of the proposed development. For birds, disturbance effects would not be expected to extend beyond a distance of c.300m for general construction activities, as noise levels would attenuate to close to background levels at that distance[8].

Noisy activities associated with the proposed development include the use of equipment such as a grout mixer and pump, mobile telescopic crane, hand-held pneumatic rock drill, and hand-held pneumatic breaker (see full details of noisy equipment in Appendix III- Construction Noise Calculation). The noisiest piece of equipment that will be used during the proposed works is the hand-held pneumatic rock breaker, which will generate a sound pressure level of up to 95dBA at 10m. Noise modelling was carried out on the four noisiest pieces of equipment (95dBA, 90dBA, 86dBA and 84dBA). There is no potential for more than one of any of these four pieces of equipment to be in operation at the same time. Simultaneous operation of equipment sums to a total equivalent sound pressure of 97dBA at 10m from construction activity. At 100m, the sound pressure will be 77dBA, and at 300m, the sound pressure will be 68dBA. The highest possible noise levels modelled will only occur for relatively short periods of time, i.e. up to 30 minutes at a

[9] MarLIN - The Marine Life Information Network - Fucus vesiculosus on full salinity moderately exposed to sheltered mid eulittoral rock.

time. This is likely to cause brief disturbance effects[10] to shorebirds in the vicinity of the proposed development[11]. In a worst-case scenario, noise levels of up to 68dBA may be experienced at 300m from the proposed works. This is below the 70dB threshold which would result in birds moving out of the affected zone. Therefore, given that in a worst-case scenario noise levels will not reach this threshold, works will be completed within eight weeks, and that the extent of suitable alternative foraging habitat within Dalkey Islands SPA (See Figure 3) the proposed works have no potential to result in any population level effects on foraging SCI tern species. Additionally, it is proposed that works will be carried out in the autumn/winter season of 2022. Therefore, the majority of the disturbance works will be carried out outside of the breeding and pre-migration season for tern species (May-September).

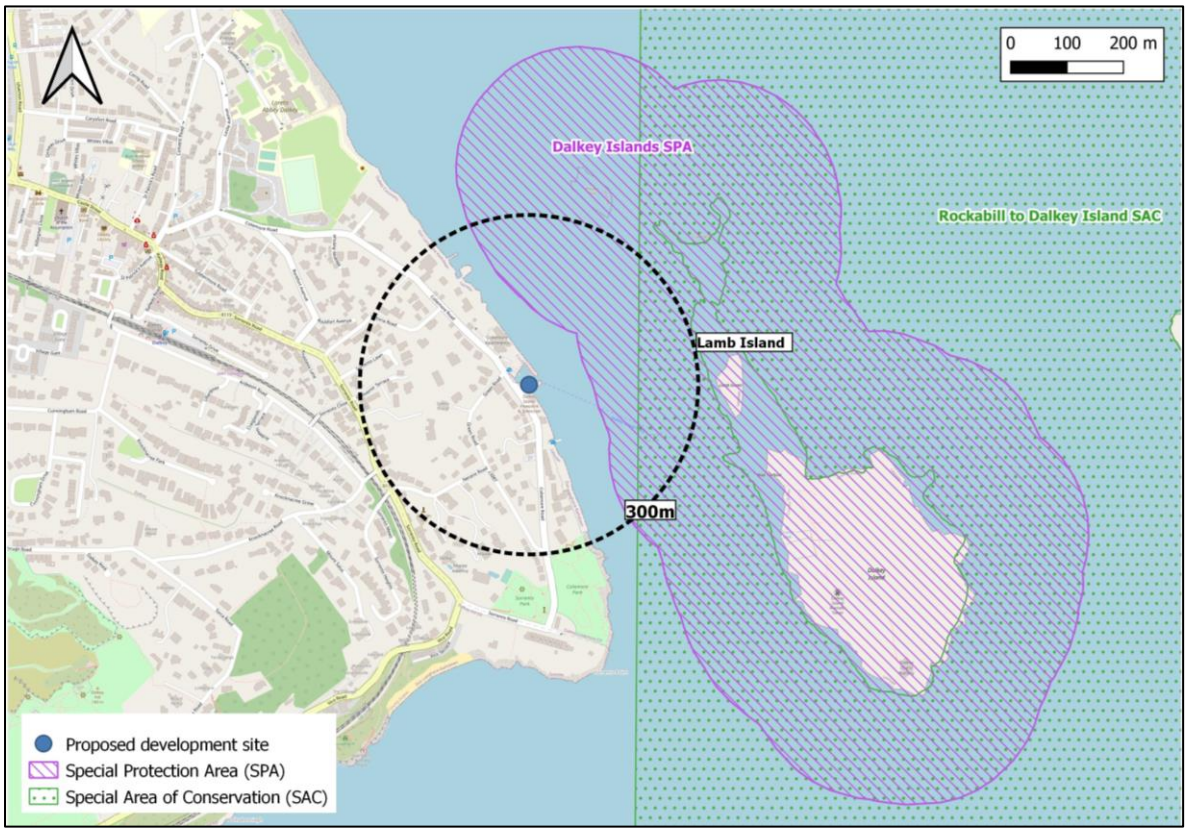
[10] The duration of effects has been described based on information within *'Guidelines on the Information to be Contained in Environmental Impact Assessment Reports'* (EPA, 2017)

[11] Current understanding of construction related noise disturbance to shorebirds is based on the research presented in Cutts et al. (2013) and Wright et al. (2010). In terms of construction noise, levels below 50dB would not be expected to result in any response from foraging or roosting birds. Noise levels between 50dB and 70dB would provoke a moderate effect/level of response from birds, i.e. birds becoming alert and some behavioural changes (e.g. reduced feeding activity), but birds would be expected to habituate to noise levels within this range. Noise levels above 70dB would likely result in birds moving out of the affected zone, or leaving the site altogether. At c. 300m, typical noise levels associated with construction activity (BS 5228) are generally below 60dB or, in most cases, are approaching the 50dB threshold.

Cutts, N., Hemingway, K. and Spencer, J. (2013). *Waterbird Disturbance Mitigation Toolkit Informing Estuarine Planning & Construction Projects. Version 3.2.* Institute of Estuarine & Coastal Studies (IECS) University of Hull.

Wright, M., Goodman, P., Cameron, T. (2010). *Exploring behavioural responses of shorebirds to impulsive noise*. Institute of Integrative and Comparative Biology, University of Leeds

Figure 3 Disturbance zone of the proposed works in relation to Dalkey Islands SPA and Rockabill to Dalkey Island SAC



116 As the proposed development has the potential to result in the disturbance/displacement of the qualifying/special conservation interest species, there is the potential for in combination effects to occur.

7.1.7 Summary

117 Table 4 below presents a summary of the potential impacts of the proposed development on the qualifying interests of Dalkey Islands SPA, and how these impacts relate to affecting the site's conservation objectives.

Table 4 Potential Impacts/Effects on the Conservation Objectives of Dalkey Isalnds SPA

Conservation Objectives **Attribute/Measure/Target**	**Potential Impacts Requiring Mitigation?**	**Are mitigation measures required?**	**Residual Impacts?**
Roseate Tern (*Sterna dougallii*) [A192] There is no site-specific conservation objectives document available for this SPA. Therefore, the attributes, measures and targets below have been developed based on the specific conservation objectives available for roseate tern in the South Dublin Bay and River Tolka Estuary SPA [004024].:			
Passage population: individuals / Number / No significant decline	Yes Loss of feeding/foraging habitat will be temporary and low impact. Contaminated surface water run-off, or an accidental pollution incident of a sufficient magnitude, either alone or cumulatively with other pollution sources, could affect feeding resources of SCI species, or result in mortality of SCI species.	Yes The mitigation measures described in Section 7.1.8 are required. No mitigation is required for the temporary loss of habitat during the construction phase of the proposed works.	No
Distribution: roosting areas / Number; location; area (hectares) / No significant decline			
Prey biomass available / Kilogrammes / No significant decline			
Barriers to connectivity / Number; location; shape; area (hectares) / No significant increase			
Disturbance at roosting site / Level of impact / Human activities should occur at levels that do not adversely affect the numbers of roseate tern among the post-breeding aggregation of terns			
Common Tern (*Sterna hirundo*) [A193] There is no site-specific conservation objectives document available for this SPA. Therefore, the attributes, measures and targets below have been developed based on the specific conservation objectives available for common tern in the South Dublin Bay and River Tolka Estuary SPA [004024].:			
Breeding population abundance: apparently occupied nests (AONs) / Number / No significant decline	Yes Loss of feeding/foraging habitat will be temporary and low impact. Contaminated surface water run-off, or an accidental pollution incident of a sufficient magnitude, either alone or cumulatively with other pollution sources, could affect feeding resources of SCI species, or result in mortality of SCI species.	Yes The mitigation measures described in Section 7.1.8 are required. No mitigation is required for the temporary loss of habitat during the construction phase of the proposed works.	No
Productivity rate: fledged young per breeding pair / Mean number / No significant decline			
Passage population: individuals / Number / No significant decline			
Distribution: breeding colonies / Number; location; area (Hectares) / No significant decline			
Distribution: roosting areas / Number; location; area (Hectares) / No significant decline			

Prey biomass available / Kilogrammes / No significant decline			
Barriers to connectivity / Number; location; shape; area (hectares) / No significant increase			
Disturbance at breeding site / Level of impact / Human activities should occur at levels that do not adversely affect the breeding common tern population			
Disturbance at roosting site / Level of impact / Human activities should occur at levels that do not adversely affect the numbers of common tern among the post-breeding aggregation of terns			
Arctic Tern (*Sterna paradisaea*) [A194] There is no site-specific conservation objectives document available for this SPA. Therefore, the attributes, measures and targets below have been developed based on the specific conservation objectives available for arctic tern in the South Dublin Bay and River Tolka Estuary SPA [004024].:			
Passage population / Number of individuals / No significant decline	Yes Loss of feeding/foraging habitat will be temporary and low impact. Contaminated surface water run-off, or an accidental pollution incident of a sufficient magnitude, either alone or cumulatively with other pollution sources, could affect feeding resources of SCI species, or result in mortality of SCI species.	Yes The mitigation measures described in Section 7.1.8 are required. No mitigation is required for the temporary loss of habitat during the construction phase of the proposed works.	No
Distribution: roosting areas / Number; location; area (hectares) / No significant decline			
Prey biomass available / Kilogrammes / No significant decline			
Barriers to connectivity / Number; location; shape; area (hectares) / No significant increase			
Disturbance at roosting site / Level of impact / Human activities should occur at levels that do not adversely affect the numbers of Arctic tern among the post-breeding aggregation of terns			

7.1.8 Mitigation Measures

118 This section presents the mitigation measures that will be implemented during construction and operation to avoid or reduce the potential impacts of the proposed development on Dalkey Islands SPA. All of the mitigation measures will be implemented in full and are best practice, and tried and tested, effective control measures to protect the receiving environment.

Measures to Protect Surface Water Quality during Construction

Environmental Manager

119 An environmental manager will be appointed by the Contractor to ensure that the CEMP is implemented effectively. The environmental manager will be a suitably qualified, competent and experienced professional who will perform the necessary tasks, review environmental procedures and consult with the members of the construction team and stakeholders as required. The environmental manager will be required to have a detailed level of knowledge on all aspects of environmental information associated with the proposed development. The environmental manager will be responsible for:

- Reviewing, updating, maintaining and implementing the CEMP;
- Establishing, implementing, and maintaining the EMS in line with ISO 14001 requirements;
- Ensuring that construction is undertaken in accordance with the relevant environmental requirements and that such compliance is adequately recorded and documented;
- Completing a site inspection and compiling an environmental compliance report on a monthly basis;
- Attending site and stakeholder meetings as required;
- Keeping up to date with relevant environmental best practice and legislative changes;
- Liaising with the relevant staff to prepare method statements and relevant plans for all activities where there is a risk of environmental damage;
- Delivering general environmental awareness training and toolbox talks and provide specific environmental briefings prior to all activities
- Ensuring all personnel have undertaken adequate environmental inductions, and awareness briefings and training (including subcontractors);
- Dealing with environmental complaints; and
- Managing and responding to environmental incidents and ensuring that all incidents are recorded and reported in an appropriate manner.

Training

120 PJ Edwards & Co. Ltd. construction staff and their subcontractors are required to hold the relevant qualifications and experience to construct the project. The Contractor will employ construction staff with the skills, qualifications and experience appropriate to the needs of the works to be carried out.

121 The Contractor will provide a site induction to all construction staff before they commence work on site. The Contractor will identify specific training needs for the construction workforce and will ensure that appropriate training requirements are fulfilled.

122 The Contractor will establish an Environmental Training and Awareness Programme and ensure that all personnel receive adequate training prior to the commencement of construction activities. A baseline level of environmental awareness will be established through the site induction programme. Key environmental considerations and objectives will be incorporated into this induction. Specifically, site inductions will cover the following as a minimum:

- Introduction to the environmental manager;
- Description of the CEMP requirements and consequences of non-compliance;
- The requirement of due diligence and duty of care;
- Overview of the conditions attached to the consents, permits and licences;
- Requirements associated with community engagement and stakeholder liaison;
- Identification of environmental constraints and notable features within the site; and
- Procedures associated with incident notification and reporting, including procedures for dealing with damage to the environment.

123 Nobody will work on site without first receiving the environmental induction. Signed records of environmental training received will be established, maintained and made available to the employer's representative.

124 Site briefings and toolbox talks will be carried out on a regular basis to ensure that construction staff have an adequate level of knowledge of the relevant environmental issues and community relations requirements and can effectively follow the environmental control procedures throughout construction period.

Monitoring and corrective actions

125 Monitoring will be carried out to ensure that construction activities are undertaken correctly. The results of all environmental monitoring activities will be reviewed by the environmental manager on an ongoing basis to enable trends or exceedance of criteria to be identified and corrective actions to be implemented as necessary. The Contractor will be required to inform the employer's representative of any continuous exceedances of criteria.

126 Corrective actions are measures to be implemented to rectify any non-conformances (i.e., exceedance of criteria or targets) identified during monitoring. In the first instance, an investigation will be undertaken by the environmental manager to identify the cause of any non-conformances. Appropriate remedial measures will be identified and implemented as soon as practicable to prevent further exceedances. If necessary, the appropriate statutory authority and stakeholders will be notified. Where new or amended measures are proposed, the CEMP will be updated accordingly by the environmental manager and the employer's representative will be informed at the earliest opportunity.

127 A corrective actions' report will be prepared on foot of any non-conformances identified during environmental monitoring. The corrective actions report will describe in detail the cause and effect of a non-conformance on site and describe the recommended corrective action that is required to remedy it.

128 An appropriate timeline for closing out the corrective actions will be identified by the contractor in the updated CEMP, as well as arrangements for the environmental manager to verify the corrective actions' report and, if appropriate, inform the appropriate authorities and stakeholders in a timely manner.

Environmental Compliance Report

129 The Contractor will be required to submit a monthly environmental compliance report to the employer's representative for review and approval. The report shall address the following as a minimum:

- Summary of compliance with the CEMP including identification of any non-conformances;
- Interpretation of the results of ongoing monitoring;
- Detailed description of any issues and/or non-conformances identified during inspections;
- Record of incidents and corrective actions, including corrective actions reports as appropriate;
- Synopsis of environmental complaints received / queries raised by stakeholders; and
- Records of environmental training undertaken as appropriate.

Grout Management- General

130 Grouting works will be undertaken from a suspended man basket via crane located on the viewing platform. This will facilitate operatives to manually carry out the works on the seaward side. The grouting works will be carefully planned to minimise spillage into the harbour.

131 As the bedrock and harbour wall is exposed during low waters this work can be programmed within suitable tide times. Grouting of rock anchors will be via standard procedure using natural hydraulic lime mortar mix or a 'prompt' mix which is a fast-setting mix to ensure the works set before high waters. It is likely the standard procedure will be used and is considered the worst-case option in terms of potential for grout leak/spill.

132 Alternatively, a dry grout/resin capsule bored in with drill rod which is activated during drilling, will be used. The capsule, if used, would further reduce the risk of liquid grout leaking or spilling to the seawater. It will be determined by detailed design if this option can be used.

133 The volume of injected grout per borehole will be recorded and noted on the daily report sheet. Immediately when grout is detected to be rising to top of borehole, the drill rig operator will direct the grout pump operator to stop pumping, to minimise the liquid grout discharged to the surrounding area. The bottom of the walkway will be bunded to catch any flowing grout which escapes to the top of the bores. Any escaped grout will be scraped from the bund once it sets and will be disposed of offsite to a permitted facility by a licenced contractor.

Grout Management- Pointing

134 During the initial pointing step, as much work as possible will be carried out with manually applied lime mortar mix. This pointing will seal any open joints in the stone masonry wall above the rock.

135 The mortar mix will be mixed on viewing platform and carried in a bucket into works man basket by operative. The mixing area will be bunded with heavy duty polythene to maintain housekeeping.

136 Prior to pointing, vegetation will be removed and the jointed raked out and cleaned. Missing stones in the wall face will be replaced where possible to limit the amount of lime mortar required.

Grout Management – Compensation Grouting

137 The grout mix will be mixed on viewing platform. The mixing area will be bunded with heavy duty polythene to maintain housekeeping.

138 During compensation grouting, operative will be in man basket at rock face, monitoring the rock joints for escaping grout. If grout leakage is detected, operative will direct pump to cease immediately and the joint will be re-sealed.

139 Care will be taken to make sure grout egressing from top of the borehole locations is collected and not allowed to enter the harbour. This will be achieved by bunding bottom of walkway to prevent escape of surface runoff grout into harbour. The bunded grout will be allowed to set, then scraped up once in solid form and disposed of offsite by a licenced contractor.

140 If grout is detected to be rising to the top of the borehole, the drill rig operator will immediately direct the grout pump operator to stop pumping, to minimise liquid grout discharged to the surrounding area.

Grout Management – Grouting of Installed Rock Anchors

141 During this step, the contractor will use a natural hydraulic lime mortar mix which will be fast-setting (or potentially grout/resin capsules) to minimise quantity and duration of liquid grouting and risk of escaped liquid. The specific grouting solution will be confirmed in detail design.

Grout Management – Additional Measures to Protect European Sites

142 The following additional procedures will be implemented to protect European sites:

- Fast-setting grout or mortar will be used.

- Bunds will be installed where practical, at bottom of walkway site to contain surface runoff to the seawater.
- A licenced waste collector will remove the accumulated wastewater off site and this will be confirmed by the Contractor to DLRCC with appropriate documentation retained.
- Measures will be put in place on the site compound, such as drip trays, spillkits and lined wastewater skips.

Pollution Control and Spill Protection

143 Fuel/oil spillages can only occur on viewing platform or walkway, based on envisaged logistics. The Contractor will ensure that the following procedures are in place to control and/or prevent spills:

- Emergency response awareness training for all project personnel on-site works.
- Grout machine, pressure washer and any fuel/oils on viewing platform laydown area will be stored in drip trays
- Appropriate and sufficient spill control materials will be installed onsite. Spills kits for immediate use will be kept on viewing platform.
- Spill kits will include suitable spill control materials to deal with the type of spillage that may occur and where it may occur. Typical contents of an on-site spill kit will include the following as a minimum;
    - Absorbent granules;
    - Absorbent booms; and
    - Absorbent mats/cushions.
- Potentially contaminated run off from plant and machinery on walkway will be contained by bunded area at end of walkway catching surface runoff. This will be disposed of offsite.
- Bunds will be installed where practical, at bottom of walkway site to contain surface runoff to the seawater.
- Damaged or leaking containers will be removed from use and replaced immediately.
- Wastewater will be generated from washing out of pumps each evening after grouting. This will be collected in lined skip onsite and a licenced waste collector will remove the accumulated wastewater off site and this will be confirmed by the Contractor to DLRCC with appropriate documentation retained.
- Any empty cement bags will be generated as waste and these will be disposed of in a separate skip which shall be disposed of offsite by licensed waste haulier.

Incident management

144 Should an environmental incident occur on-site PJE will record the event on an Environmental Incident Record. These records will include the following:

- Any malfunction of any environmental protection system,
- Any occurrence with the potential for environmental pollution,
- Any emergency.

145 The Environmental Incident Record will include relevant details associated with the incident and recommend measures which will prevent a similar incident occurring in the future. The effectiveness of the amendments to the procedures and plans will be verified by the environmental site manager. A list of contact details for relevant personnel e.g. DLRCC, the local fire station etc. will be maintained in the site office. Access to the emergency phone list will be made available to all member of staff. The Contractor's staff will be informed of the emergency phone list at the tool box talks.

Good Housekeeping

146 The Contractor will ensure "good housekeeping" at all times. This will include, but not necessarily be limited to, the following:

- General maintenance of working areas and cleanliness of welfare facilities and storage areas;
- Provision of site layout map showing key areas such as first aid posts, spill kits, material and waste storage and welfare facilities;
- Maintaining all plant, material and equipment required to complete the construction work in good order, clean, and tidy;
- Keeping construction compounds, access routes and designated parking areas free and clear of excess dirt, rubbish piles, scrap wood, etc. at all times;
- Provision of signs giving details of site management contact numbers, including out of hours, and public information at the boundaries of the working areas;
- Provision of adequate welfare facilities for site personnel;
- Installation of appropriate security, lighting, fencing and hoarding at each working area;
- Effective prevention of oil, grease or other objectionable matter being discharged from any working area;
- Provision of appropriate waste management at each working area and regular collections to be arranged;
- Prevention of infestation from pests or vermin including arrangements for regular disposal of food and material attractive to pests. If infestation occurs the contractor will take appropriate action to eliminate and prevent further occurrence;
- Maintenance of wheel washing facilities and other contaminant measures as required in each working area;
- No discharge of site runoff or water discharge without agreement of the relevant authorities;
- Prohibition of open fires at all times;
- Use of less intrusive noise alarms, which meet the safety requirements, such as broadband reversing warnings, or proximity sensors to reduce the requirement for traditional reversing alarms;
- Maintenance of public rights of way, diversions and entry/ exit areas around working areas for pedestrians and cyclists where practicable;
- All loading and unloading of vehicles will take place off the public highway wherever this is practicable; and
- Material handling will be appropriately located to minimise exposure to wind. Water misting or sprays shall be used as required if particularly dusty activities are necessary during dry or windy periods.
- Any cement bags to be disposed of in site skip and grout pump will be bunded with heavy duty polythene to maintain onsite housekeeping.

7.1.9 Residual Impacts

147 The proposed development poses no risk of affecting the conservation objectives, or the favourable conservation condition, of the qualifying interest habitats of Dalkey Islands SPA, and there are therefore,

no residual direct or indirect impacts associated with the proposed development that could adversely affect the integrity of Dalkey Islands SPA.

7.1.10 Conclusion of Assessment for Dalkey Islands SPA

148 Following an examination, analysis and evaluation in light of best scientific knowledge, of all relevant information in respect of the qualifying interests of Dalkey Islands SPA, the potential impacts, and whether or not the predicted impacts would affect the conservation objectives that support the conservation condition of the qualifying interests, it has been concluded that the proposed development does not pose a risk of adversely affecting (either directly or indirectly) the integrity of Dalkey Islands SPA.

7.2 Rockabill to Dalkey Island SAC [003000]

7.2.1 Ecological Baseline Description for Rockabill to Dalkey Island SAC

149 This SAC is a marine site which is a rectangle shaped area extending from Rockabill south to Dalkey Island in south Dublin. The SAC has been selected for the Annex I Habitats Directive habitat: [1170] Reefs.

150 The only species listed as a qualifying interest for the Rockabill to Dalkey Island SAC is the Harbour porpoise *Phocoena phocoena* [1351]. Surveys of the site estimated that there are 211±47 Harbour porpoises in the northern part of the site and 138±33 in the southern part (Berrow *et al*., 2010)12. Calves and juveniles have been recorded across the SAC, which suggests the site has value in the reproductive cycle of the species.

7.2.2 Qualifying Interests and Conservation Objectives of Rockabill to Dalkey Island SAC

151 The Qualifying Interests of the Rockabill to Dalkey Island SAC, and the overall conservation objective, are listed below in Table 5.

Table 5 Qualifying Interests and Conservation Objectives of Rockabill to Dalkey Island SAC

Qualifying Interest(s)	Conservation Objective(s)
[1170] Reefs [1351] Harbour porpoise *Phocoena phocoena* *S.I. No. 94/2019 - European Union Habitats (Rockabill To Dalkey Island Special Area Of Conservation 003000) Regulations 2019* NPWS (2013) *Conservation Objectives: Rockabill to Dalkey Island SAC 003000.* Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.	To maintain the favourable conservation condition of the Annex I habitat and the Annex II species for which the SAC has been selected.

152 In conjunction with considering the generic conservation objective for SACs "To maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the SAC has been selected", the available site-specific conservation objectives document for Rockabill to Dalkey Island SAC also informed this assessment.

153 This document sets out the attributes, measures and targets that define the favourable conservation condition of the qualifying interests within the European site. Affecting the conservation condition of the qualifying interests is deemed to constitute an adverse effect on the integrity of a European site. The specific attributes and targets used to define the conservation objectives of the qualifying interests of Rockabill to Dalkey Island SAC are presented in Table 6.

12 Berrow, S.D., Whooley, P., O'Connell, M. and Wall, D. (2010). Irish Cetacean Review (2000-2009). Irish Whale and Dolphin Group, 60pp.

7.2.3 Examination and Analysis of Potential Direct and Indirect Impacts

154 The direct and/or indirect impacts by which the proposed development could (in the absence of mitigation measures) potentially affect the conservation objective attributes and targets supporting the conservation condition of the qualifying interests of Rockabill to Dalkey Island SAC, are:

- Habitat loss and fragmentation
- Habitat degradation as a result of hydrological impacts
- Disturbance and displacement impacts

7.2.4 Habitat loss and fragmentation

155 According to the IWDG, harbour porpoise associated with Rockabill to Dalkey Island SAC may occasionally use Coliemore Harbour. Machinery associated with the construction phase of the proposed development may result in temporary loss of suitable aquatic habitat for harbour porpoise. However, the loss of any habitat is negligible in size and the loss will be temporary until the works are complete. The duration of works is estimated to be eight weeks.

7.2.5 Habitat degradation as a result of hydrological impacts

156 Contaminated surface water run-off or an accidental pollution event, of a sufficient magnitude during the construction phase of the proposed development has the potential to affect water quality in Dublin Bay as the proposed development site ultimately drains to the coastal waterbody. Affecting the water quality of Dublin Bay due to changes in water quality as a result of contaminated surface water run-off or an accidental pollution incident has the potential to undermine the conservation objectives of Rockabill to Dalkey Island SAC by affecting the quality of Annex I habitat [1170] Reefs, and the habitat of Harbour porpoise [1351] for which the site is designated. Harbour porpoise would be vulnerable to an accidental pollution incident either directly e.g. through direct contact with polluting chemicals, or indirectly by affecting the habitats and food supply on which they rely. Reef habitat would be susceptible to sedimentation and changes in water quality also.

7.2.6 Disturbance and displacement impacts

157 Records of harbour porpoise have been returned in the vicinity of the proposed development site. Therefore, there is potential that noise and vibration associated with the construction phase of the proposed development could result in temporary disturbance and displacement effects on marine mammals associated with Rockabill to Dalkey Island SAC which is located *c*. 183m from the proposed development site at its closest point.

158 Noisy activities associated with the proposed development include the use of equipment such as a grout mixer and pump, mobile telescopic crane, hand-held pneumatic rock drill, and hand-held pneumatic breaker (see full details of noisy equipment in Appendix III- Construction Noise Calculation). The noisiest piece of equipment that will be used during the proposed works is the hand-held pneumatic rock breaker, which will generate a sound pressure level of up to 95dBA at 10m. Noise modelling was carried out on the four noisiest pieces of equipment (95dBA, 90dBA, 86dBA and 84dBA). There is no potential for more than one of any of these four pieces of equipment to be in operation at the same time. Simultaneous operation of equipment sums to a total equivalent sound pressure of 97dBA at 10m from construction activity. At 100m, the sound pressure will be 77dBA, and at 300m, the sound pressure will be 68dBA. According to the behavioural response criteria proposed by Southall *et al.* (2008)[13] this level will not elicit a behavioural response, temporary threshold shift (TTS) or permanent threshold shift (PTS) in marine mammals in the

[13] Southall, B.; Bowles, A.; Ellison, W.; Finneran, J.; Gentry, R.; Greene, C. Jr.; Kastak, D.; Ketten, D.; Miller, J.; Nachtigall, P.; Richardson, W.; Thomas, J.; Tyack, P. (2008). *Marine Mammal Noise Exposure Criteria: Initial Scientific Recommendations.* Aquatic Mammals, *33(4), 273-275.*

vicinity of the proposed works. Southall *et al.* (2007) proposed sound pressure level criteria of 230 dB re 1 µPa (peak broadband level) for injury in cetaceans and 218 dB re 1 µPa for pinnipeds. They also recommended behavioural changes can occur at 224 dB re 1 µPa (peak broadband level) for cetaceans and 212 dB re 1 µPa for pinnipeds.

159 Given the above, as well as the fact that works will be complete within eight weeks, and the extent of suitable alternative foraging habitat within Rockabill to Dalkey Island SAC, Dublin Bay and the Irish Sea, the proposed works have no potential to result in any population level effects on foraging QI marine mammal species.

160 Given the brief nature of the proposed works, and the extent of suitable alternative foraging habitat within Rockabill to Dalkey Island SAC, disturbance and displacement impacts associated with the construction of the proposed development have no potential to result in any population level effects on marine mammal species.

161 As the proposed development has the potential to result in the disturbance/displacement of the qualifying/special conservation interest species, there is the potential for in combination effects to occur.

7.2.7 Summary

162 Table 4 below presents a summary of the potential impacts of the proposed development on the qualifying interests of Rockabill to Dalkey Island SAC, and how these impacts relate to affecting the site's conservation objectives.

Table 6: Potential Impacts on the Conservation Objectives of the Rockabill to Dalkey Island SAC

Conservation Objectives Attribute/Measure/Target	**Potential Impacts Requiring Mitigation?**	**Are mitigation measures required?**	**Residual Impacts?**
Reefs [1170] Maintain the favourable conservation condition			
Habitat area / Hectares / The permanent habitat area is stable or increasing, subject to natural processes	Yes Contaminated surface water run-off or an accidental pollution incident of a sufficient magnitude, either alone or cumulatively with other pollution sources, could affect the quality of the reef habitat for which this site is designated.	Yes The mitigation measures described in Section 7.1.8, to protect water quality are required	No
Habitat distribution / Occurrence / Distribution is stable or increasing, subject to natural processes.			
Community structure / Biological composition / Conserve the following community types in a natural condition: Intertidal reef community complex; and Subtidal reef community complex.			
Harbour porpoise [1351] Maintain the favourable conservation condition			
Access to suitable habitat / Number of artificial barriers / Species range within the site should not be restricted by artificial barriers to site use	Yes Contaminated surface water run-off or an accidental pollution incident of a sufficient magnitude, either alone or cumulatively with other pollution sources, could affect feeding resources of QI species, or result in mortality of QI species.	Yes The mitigation measures described in Section 7.1.8, to protect water quality are required	No
Disturbance / Level of impact / Human activities should occur at levels that do not adversely affect the Harbour porpoise community at the site			

7.2.8 Mitigation Measures

163 This section presents the mitigation measures that will be implemented during construction and operation to avoid or reduce the potential impacts of the proposed development on Rockabill to Dalkey Island SAC. All of the mitigation measures will be implemented in full and are best practice, and tried and tested, effective control measures to protect the receiving environment.

164 See the sections listed below which provide mitigation measures to protect the water quality in Dublin Bay during construction and operation of the proposed development:

165 The mitigation measures presented above in Section 7.1.8 will protect surface water quality during construction and operation of the Proposed development.

7.2.9 Residual Impacts

166 Following the implementation of mitigation measures, the proposed development poses no risk of affecting the conservation objectives, or the favourable conservation condition, of the qualifying interest habitats or species of Rockabill to Dalkey Island SAC, and there are therefore, no residual direct or indirect impacts associated with the proposed development that could adversely affect the integrity of the Rockabill to Dalkey Island SAC.

7.2.10 Conclusion of Assessment for Rockabill to Dalkey Island SAC

167 Following an examination, analysis and evaluation in light of best scientific knowledge, of all relevant information in respect of the qualifying interests of Rockabill to Dalkey Island SAC, the potential impacts, and whether or not the predicted effects would affect the conservation objectives that support the conservation condition of the qualifying interests, it has been concluded that the proposed development does not pose a risk of adversely affecting (either directly or indirectly) the integrity of the Rockabill to Dalkey Island SAC.

7.3 South Dublin Bay SAC, South Dublin Bay and River Tolka Estuary SPA, North Dublin Bay SAC, North Bull Island SPA, Howth Head Coast SPA, Baldoyle Bay SPA, Ireland's Eye SPA, Malahide Estuary SPA, The Murrough SPA, Lambay Island SAC, Lambay Island SPA and Rogerstown Estuary SPA

168 The European sites in Dublin Bay and its immediate vicinity are examined and assessed here together, as the proposed development has a potential impact pathway common to all (direct discharge of surface water to Dublin Bay), these European sites are all dependent upon the condition of the coastal, estuarine and intertidal environments to support the conservation objectives and the conservation condition of their qualifying interests/special conservation interests.

7.3.1 Ecological Baseline Description

169 North Dublin Bay SAC overs the inner part of north Dublin Bay, the seaward boundary extending from the Bull Wall lighthouse across to the Martello Tower at Howth Head. The North Bull Island is the focal point of this site. South Dublin Bay SAC lies south of the River Liffey in Co. Dublin and extends from the South Wall to the west pier at Dun Laoghaire. It is an intertidal site with extensive areas of sand and mudflats. Both European sites are designated for a range of coastal, estuarine and intertidal habitats that support a diverse range of flora and fauna species.

170 North Bull Island SPA covers all of the inner part of north Dublin Bay, with the seaward boundary extending from the Bull Wall lighthouse across to Drumleck Point at Howth Head. Saltmarsh extends along the length of the landward side of the island and provides the main roost site for wintering birds in Dublin Bay. The island shelters two intertidal lagoons which are divided by a solid causeway. These lagoons provide the main feeding grounds for the wintering waterfowl. The site is designated for a range of over-wintering waterbirds.

171 The South Dublin Bay and River Tolka Estuary SPA comprises a substantial part of Dublin Bay. It includes the intertidal area between the River Liffey and Dun Laoghaire, and the estuary of the River Tolka to the north of the River Liffey, as well as Booterstown Marsh. A portion of the shallow marine waters of the bay is also included. In addition to the over-wintering water birds for which the site is designated, it also supports a nationally important colony of breeding Common Tern and is an internationally important passage/staging site for Common Tern, Arctic Tern and Roseate Tern.

172 The remainder of the sites lie further afield but are nonetheless considered here due to their hydrological link to the proposed development site. These European sites are either designated for their habitats which also support the breeding, foraging and/or roosting of SCI and QI species, or for their wintering and/or breeding populations of SCI and QI species. There is potential that population of SCI and/or QI species of these European sites use Dublin Bay and its habitats for foraging, commuting and/or roosting, and are therefore susceptible to potential surface water quality impacts from the proposed development.

7.3.2 Qualifying Interests and Conservation Objectives

173 The qualifying interests (in the case of SACs) and the special conservation interests (in the case of SPAs) of South Dublin Bay SAC, South Dublin Bay and River Tolka Estuary SPA, North Dublin Bay SAC, North Bull Island SPA, Howth Head Coast SPA, Baldoyle Bay SPA, Ireland's Eye SPA, Malahide Estuary SPA, The Murrough SPA, Lambay Island SAC, Lambay Island SPA and Rogerstown Estuary SPA., and the overall conservation objective for each, are listed below in Table 7.

Table 7. Qualifying Interests and Conservation Objectives of South Dublin Bay SAC, South Dublin Bay and River Tolka Estuary SPA, North Dublin Bay SAC, North Bull Island SPA, Howth Head Coast SPA, Baldoyle Bay SPA, Ireland's Eye SPA, Malahide Estuary SPA, The Murrough SPA, Lambay Island SAC, Lambay Island SPA and Rogerstown Estuary SPA

Qualifying Interest(s)	**Conservation Objective(s)**
Special Area of Conservation (SAC)	
South Dublin Bay SAC [000210]	
1140 Mudflats and sandflats not covered by seawater at low tide 1210 Annual vegetation of drift lines 1310 *Salicornia* and other annuals colonising mud and sand 2110 Embryonic shifting dunes *S.I. No. 525/2019 - European Union Habitats (South Dublin Bay Special Area of Conservation 000210) Regulations 2019* NPWS (2013) *Conservation Objectives: South Dublin Bay SAC 000210.* Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.	To maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the SAC has been selected
North Dublin Bay SAC [000206]	
1140 Mudflats and sandflats not covered by seawater at low tide 1210 Annual vegetation of drift lines 1310 *Salicornia* and other annuals colonising mud and sand 1330 Atlantic salt meadows (Glauco-Puccinellietalia maritimae) 1395 Petalwort *Petalophyllum ralfsii* 1410 Mediterranean salt meadows (Juncetalia maritimi) 2110 Embryonic shifting dunes 2120 Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes) 2130 Fixed coastal dunes with herbaceous vegetation (grey dunes)* 2190 Humid dune slacks *S.I. No. 524/2019 - European Union Habitats (North Dublin Bay Special Area of Conservation 000206) Regulations 2019* NPWS (2013) *Conservation Objectives: North Dublin Bay SAC 000206.* Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht..	To maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the SAC has been selected
Lambay Island SAC [000204]	
1170 Reefs 1230 Vegetated sea cliffs of the Atlantic and Baltic coasts 1364 Grey seal *Halichoerus grypus* 1365 Harbour seal *Phoca vitulina* S.I. No. 294/2019 - European Union Habitats (Lambay Island Special Area Of Conservation 000204) Regulations 2019 NPWS (2013) Conservation Objectives: Lambay Island SAC 000204. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht	To maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the SAC has been selected

Special Protection Area (SPA)	
South Dublin Bay and River Tolka Estuary SPA [004024]	
A046 Light-bellied Brent goose *Branta bernicla hrota* A130 Oystercatcher *Haematopus ostralegus* A137 Ringed glover *Charadrius hiaticula* A141 Grey glover *Pluvialis squatarola* A143 Knot *Calidris canutus* A144 Sanderling *Calidris alba* A149 Dunlin *Calidris alpina* A157 Bar-tailed godwit *Limosa lapponica* A162 Redshank *Tringa totanus* A179 Black-headed gull *Chroicocephalus ridibundus* A192 Roseate tern *Sterna dougallii* A193 Common tern *Sterna hirundo* A194 Arctic tern *Sterna paradisaea* A999 Wetlands and waterbirds *S.I. No. 212/2010 - European Communities (Conservation of Wild Birds (South Dublin Bay and River Tolka Estuary Special Protection Area 004024)) Regulations 2010.* NPWS (2015) *Conservation Objectives: South Dublin Bay and River Tolka Estuary SPA 004024*. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.	To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA
North Bull Island SPA [004006]	
A046 Light-bellied Brent goose *Branta bernicla hrota* A048 Shelduck *Tadorna tadorna* A052 Teal *Anas crecca* A054 Pintail *Anas acuta* A056 Shoveler *Anas clypeata* A130 Oystercatcher *Haematopus ostralegus* A140 Golden plover *Pluvialis apricaria* A141 Grey plover *Pluvialis squatarola* A143 Knot *Calidris canutus* A144 Sanderling *Calidris alba* A149 Dunlin *Calidris alpina* A156 Black-tailed godwit *Limosa limosa* A157 Bar-tailed godwit *Limosa lapponica* A160 Curlew *Numenius arquata* A162 Redshank *Tringa totanus* A169 Turnstone *Arenaria interpres* A179 Black-headed gull *Chroicocephalus ridibundus* A999 Wetlands and waterbirds *S.I. No. 211/2010 - European Communities (Conservation of Wild Birds (North Bull Island Special Protection Area 004006)) Regulations 2010.*	To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA

NPWS (2015) *Conservation Objectives: North Bull Island SPA 004006.* Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.	
Howth Head Coast SPA [004113]	
A188 Kittiwake *Rissa tridactyla* *S.I. No. 185/2012 - European Communities (Conservation of Wild Birds (Howth Head Coast Special Protection Area 004113)) Regulations 2012.* NPWS (2021) *Conservation objectives for Howth Head Coast SPA [004113]. Generic Version 8.0.* Department of Housing, Local Government and Heritage.	To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA
Baldoyle Bay SPA [004016]	
A046 Light-bellied Brent goose *Branta bernicla hrota* A048 Shelduck *Tadorna tadorna* A137 Ringed plover *Charadrius hiaticula* A140 Golden plover *Pluvialis apricaria* A141 Grey plover *Pluvialis squatarola* A157 Bar-tailed godwit *Limosa lapponica* A999 Wetlands and waterbirds *S.I. No. 275/2010 - European Communities (Conservation of Wild Birds (Baldoyle Bay Special Protection Area 004016)) Regulations 2010.* NPWS (2013) *Conservation Objectives: Baldoyle Bay SPA 004016. Version 1*. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.	To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA
Ireland's Eye SPA [004117]	
A017 Cormorant *Phalacrocorax carbo* A184 Herring Gull *Larus argentatus* A188 Kittiwake *Rissa tridactyla* A199 Guillemot *Uria aalge* A200 Razorbill *Alca torda* *S.I. No. 240/2010 - European Communities (Conservation of Wild Birds (Ireland's Eye Special Protection Area 004117)) Regulations 2010.* NPWS (2022) *Conservation objectives for Ireland's Eye SPA [004117].* Generic Version 9.0. Department of Housing, Local Government and Heritage.	To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA
Malahide Estuary SPA [004025]	
A005 Great Crested Grebe *Podiceps cristatus* A046 Light-bellied Brent Goose *Branta bernicla hrota* A048 Shelduck *Tadorna tadorna* A054 Pintail *Anas acuta* A067 Goldeneye *Bucephala clangula* A069 Red-breasted Merganser *Mergus serrator* A130 Oystercatcher *Haematopus ostralegus* A140 Golden Plover *Pluvialis apricaria* A141 Grey Plover *Pluvialis squatarola*	To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA

A143 Knot *Calidris canutus* A149 Dunlin *Calidris alpina* A156 Black-tailed Godwit *Limosa limosa* A157 Bar-tailed Godwit *Limosa lapponica* A162 Redshank *Tringa totanus* A999 Wetland and Waterbirds *S.I. No. 285/2011 - European Communities (Conservation of Wild Birds (Malahide Estuary Special Protection Area 004025)) Regulations 2011.* NPWS (2013) *Conservation Objectives: Malahide Estuary SPA 004025. Version 1.* National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.	
The Murrough SPA [004186]	
A001 Red-throated Diver *Gavia stellata* A043 Greylag Goose *Anser anser* A046 Light-bellied Brent Goose *Branta bernicla hrota* A050 Wigeon *Anas penelope* A052 Teal *Anas crecca* A179 Black-headed Gull *Chroicocephalus ridibundus* A184 Herring Gull *Larus argentatus* A195 Little Tern *Sterna albifrons* A999 Wetland and Waterbirds *S.I. No. 298/2011 - European Communities (Conservation of Wild Birds (The Murrough Special Protection Area 004186)) Regulations 2011.* NPWS (2022) *Conservation objectives for The Murrough SPA [004186].* Generic Version 9.0. Department of Housing, Local Government and Heritage.	To maintain or restore the favourable conservation condition of the wetland habitat at The Murrough SPA as a resource for the regularly-occurring migratory waterbirds that utilise it.
Lambay Island SPA [004069]	
A009 Fulmar *Fulmarus glacialis* A017 Cormorant *Phalacrocorax carbo* A018 Shag *Phalacrocorax aristotelis* A043 Greylag Goose *Anser anser* A183 Lesser Black-backed Gull *Larus fuscus* A184 Herring Gull *Larus argentatus* A188 Kittiwake *Rissa tridactyla* A199 Guillemot *Uria aalge* *S.I. No. 242/2010 - European Communities (Conservation of Wild Birds (Lambay Island Special Protection Area 004069)) Regulations 2010.* NPWS (2022) *Conservation objectives for Lambay Island SPA [004069].* Generic Version 9.0. Department of Housing, Local Government and Heritage.	To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA
Rogerstown Estuary SPA	
A043 Greylag Goose *Anser anser* A046 Brent Goose *Branta bernicla hrota* A048 Shelduck *Tadorna tadorna* A056 Shoveler *Anas clypeata*	To maintain or restore the favourable conservation condition of the bird species listed

A130 Oystercatcher *Haematopus ostralegus* A137 Ringed Plover *Charadrius hiaticula* A141 Grey Plover *Pluvialis squatarola* A143 Knot *Calidris canutus* A149 Dunlin *Calidris alpina alpina* A156 Black-tailed Godwit *Limosa limosa* A162 Redshank *Tringa totanus* A999 Wetlands *S.I. No. 271/2010 - European Communities (Conservation of Wild Birds (Rogerstown Estuary Special Protection Area 004015)) Regulations 2010.* NPWS (2013) *Conservation Objectives: Rogerstown Estuary SPA 004015. Version 1*. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.	as Special Conservation Interests for this SPA

174 In conjunction with considering the generic conservation objective for SACs "To maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the SAC has been selected", and for SPAs "To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA", the available site specific conservation objectives documents for South Dublin Bay SAC, South Dublin Bay and River Tolka Estuary SPA, North Dublin Bay SAC, North Bull Island SPA, Howth Head Coast SPA, Baldoyle Bay SPA, Ireland's Eye SPA, Malahide Estuary SPA, The Murrough SPA, Lambay Island SAC, Lambay Island SPA and Rogerstown Estuary SPA also informed this assessment.

175 These documents set out the attributes, measures and targets that define the favourable conservation condition of the qualifying interests/special conservation interests within the European site(s). Affecting the conservation condition of the qualifying interests/special conservation interests is deemed to constitute an adverse effect on the integrity of a European site. The specific attributes and targets used to define the conservation objectives of the qualifying interests/special conservation interests of South Dublin Bay SAC, South Dublin Bay and River Tolka Estuary SPA, North Dublin Bay SAC, North Bull Island SPA, Howth Head Coast SPA, Baldoyle Bay SPA, Ireland's Eye SPA, Malahide Estuary SPA, The Murrough SPA, Lambay Island SAC, Lambay Island SPA and Rogerstown Estuary SPA are presented in Section 7.3.3, Table 8.

7.3.3 Examination and Analysis of Potential Direct and Indirect Impacts

176 The direct and/or indirect impact by which the proposed development could (in the absence of mitigation measures) potentially affect the conservation objective attributes and targets supporting the conservation condition of the qualifying interests/special conservation interests of South Dublin Bay SAC, South Dublin Bay and River Tolka Estuary SPA, North Dublin Bay SAC, North Bull Island SPA, Howth Head Coast SPA, Baldoyle Bay SPA, Ireland's Eye SPA, Malahide Estuary SPA, The Murrough SPA, Lambay Island SAC, Lambay Island SPA and Rogerstown Estuary SPA is:

- Habitat loss and fragmentation
- Habitat degradation as a result of hydrological impacts

7.3.4 Habitat loss and fragmentation

177 Records of a rage of SCI breeding and wintering bird species and QI marine mammal species were returned from the desk study in the vicinity of the proposed development. These species would be vulnerable to habitat loss and fragmentation. However, the loss of intertidal rocky shore habitat is negligible in size and the loss will be temporary until the rocky shore communities re-establish in 2-10 years. Machinery associated with the construction phase of the proposed development may result in temporary loss of suitable high tide loafing habitat for SCI species associated with nearby European sites. However, given

that there are extensive areas of suitable alternative foraging and loafing habitats in the vicinity of the proposed development, the loss of this habitat is negligible in size and the loss will be temporary until the works are complete. The duration of works is estimated to be eight weeks. Therefore, habitat loss as a result of the proposed development has no potential to result in any population level effects on the QI/SCI species of any European site.

7.3.5 Habitat degradation as a result of hydrological impacts

178 An accidental pollution event during construction, or operation, has the potential to affect water quality in Dublin Bay as the proposed development site is located in Coliemore Harbour and the surface waters will drain directly into the harbour basin. Therefore, an accidental pollution event of a sufficient magnitude, either alone or cumulatively with other pollution sources, could potentially affect the water quality in Dublin Bay. A reduction in water quality in Dublin Bay has the potential to affect the coastal, estuarine and intertidal environments and natural conditions that support the conservation objectives of the qualifying interests/special conservation interests of European (see Table 8 for more details).

7.3.6 Summary

Table 8 below presents a summary of the potential impacts of the proposed development on the qualifying interests of South Dublin Bay SAC, South Dublin Bay and River Tolka Estuary SPA, North Dublin Bay SAC, North Bull Island SPA, Howth Head SAC, Howth Head Coast SPA, Baldoyle Bay SAC, Baldoyle Bay SPA, Ireland's Eye SAC, Ireland's Eye SPA, Malahide Estuary SPA, The Murrough SPA, Lambay Island SAC, Lambay Island SPA and, Rogerstown Estuary SPA and Bray Head SAC, and how these impacts relate to affecting the site's conservation objectives.

Table 8. Potential Impacts on the Conservation Objectives of South Dublin Bay SAC, South Dublin Bay and River Tolka Estuary SPA, North Dublin Bay SAC, North Bull Island SPA, Howth Head Coast SPA, Baldoyle Bay SAC, Baldoyle Bay SPA, Ireland's Eye SAC, Ireland's Eye SPA, Malahide Estuary SPA, The Murrough SPA, Lambay Island SAC, Lambay Island SPA and Rogerstown Estuary SPA

Conservation Objectives **Attribute/Measure/Target**	**Potential Impacts Requiring Mitigation?**	**Are mitigation measures required?**	**Residual Impacts?**
South Dublin Bay SAC			
Mudflats and sandflats not covered by water at low tide [1140] To maintain the favourable conservation condition of the habitat in the SAC, which is defined as follows:			
Habitat area / Hectares / The permanent habitat area is stable or increasing, subject to natural processes	Yes An accidental pollution event during construction could affect surface water downstream in Dublin Bay. An accidental pollution event of a sufficient magnitude, either along or cumulatively with other pollution sources, could affect the quality of the intertidal habitats and the fauna communities they support	Yes The mitigation measures described in Section 7.1.8 to protect water quality in the receiving environment will ensure that surface water quality in Dublin Bay is protected during construction of the proposed development	No
Community extent / Hectares / Maintain the extent of the *Zostera* dominated community, subject to natural processes			
Community structure: *Mytilus edulis* density / Individuals/m^2 / Conserve the high quality of the *Zostera* dominated community, subject to natural processes			
Community distribution / Hectares / Conserve the following community type in a natural condition: Fine sands with *Angulus tenuis* community complex			
Annual Vegetation of drift lines [1210] To restore the favourable conservation condition of the habitat in the SAC, which is defined as follows:			
Habitat area / Hectares / Area increasing, subject to natural processes, including erosion and succession	Yes An accidental pollution event during construction could affect surface water downstream in Dublin Bay. An accidental	Yes The mitigation measures described in Section 7.1.8 to protect water quality in the receiving environment will ensure that surface water	No
Habitat distribution / Occurrence / No decline, or change in habitat distribution, subject to natural processes			

Physical structure: functionality and sediment supply / Presence/ absence of physical barriers / Maintain the natural circulation of sediment and organic matter, without any physical obstructions	pollution event of a sufficient magnitude, either along or cumulatively with other pollution sources, could potentially affect the quality (vegetation structure and composition) and area/distribution of intertidal/coastal habitats.	quality in Dublin Bay is protected during construction and operation of the proposed development	
Vegetation structure: zonation / Occurrence / Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession			
Vegetation composition: typical species and sub-communities / Percentage cover at a representative number of monitoring stops / Maintain the presence of species-poor communities with typical species: sea rocket (*Cakile maritima*), sea sandwort (*Honckenya peploides*), prickly saltwort (*Salsola kali*) and oraches (*Atriplex* spp.)			
Vegetation composition: negative indicator species / Percentage cover / Negative indicator species (including non-natives) to represent less than 5% cover			
***Salicornia* and other annuals colonising mud and sand [1310]** To restore the favourable conservation condition of the habitat in the SAC, which is defined as follows:			
Habitat area / Hectares / Area stable or increasing, subject to natural processes, including erosion and succession	Yes An accidental pollution event during construction or operation could affect surface water downstream in Dublin Bay. An accidental pollution event of a sufficient magnitude, either along or cumulatively with other pollution sources, could potentially affect the quality (vegetation structure and composition) and area/distribution of intertidal/coastal habitats	Yes The mitigation measures described in Section 7.1.8 to protect water quality in the receiving environment will ensure that surface water quality in Dublin Bay is protected during construction and operation of the proposed development	No
Habitat distribution / Occurrence / No decline, or change in habitat distribution, subject to natural processes			
Physical structure: sediment supply / Presence/ absence of physical barriers. Maintain, or where necessary restore, natural circulation of sediments and organic matter, without any physical obstructions			
Physical structure: creeks and pans / Occurrence / Maintain creek and pan structure, subject to natural processes, including erosion and succession			

Physical structure: flooding regime / Hectares flooded; frequency / Maintain natural tidal regime			
Vegetation structure: zonation / Occurrence / Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession			
Vegetation structure: vegetation height / Centimetres / Maintain structural variation within sward			
Vegetation structure: vegetation cover / Percentage cover at a representative number of monitoring stops / Maintain more than 90% of area outside creeks vegetated			
Vegetation composition: typical species and subcommunities / Percentage cover / Maintain the presence of species-poor communities listed in SMP (McCorry and Ryle, 2009)			
Vegetation structure: negative indicator species - *Spartina anglica* / Hectares / No significant expansion of common cordgrass (*Spartina anglica*), with an annual spread of less than 1%			
Embryonic shifting dunes [2110] To restore the favourable conservation condition of the habitat in the SAC, which is defined as follows:			
Habitat area / Hectares / Area stable or increasing, subject to natural processes, including erosion and succession.	No Terrestrial habitats above the high tide line are not at risk of effects from water pollution in Dublin Bay.	No	No
Habitat distribution / Occurrence / No decline, or change in habitat distribution, subject to natural processes.			
Physical structure: functionality sediment supply / Presence/ absence of physical barriers / Maintain natural circulation of sediments and organic matter, without any physical obstructions			

Vegetation structure: zonation / Occurrence / Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession			
Vegetation composition: plant health of foredune grasses / Percentage cover / More than 95% of sand couch (*Elytrigia juncea*) and/or lyme-grass (*Leymus arenarius*) should be healthy (i.e. green plant parts above ground and flowering heads present)			
Vegetation composition: typical species and sub-communities / Percentage cover at a representative number of monitoring stops / Maintain the presence of species-poor communities with typical species: sand couch (*Elytrigia juncea*) and/or lyme-grass (*Leymus arenarius*)			
Vegetation composition: negative indicator species / Percentage cover / Negative indicator species (including non-native species) to represent less than 5% cover			
North Dublin Bay SAC			
Mudflats and sandflats not covered by water at low tide [1140] To maintain the favourable conservation condition of the habitat in the SAC, which is defined as follows:			
Habitat area / Hectares / The permanent habitat area is stable or increasing, subject to natural processes	Yes An accidental pollution event during construction or operation could affect surface water downstream in Dublin Bay. An accidental pollution event of a sufficient magnitude, either alone or cumulatively with other pollution sources, could affect the quality of the	Yes The mitigation measures described in Section 7.1.8 to protect water quality in the receiving environment will ensure that surface water quality in Dublin Bay is protected during construction and operation of the proposed development	No
Community extent / Hectares / Maintain the extent of the *Mytilus edulis*-dominated community, subject to natural processes			
Community structure: *Mytilus edulis* density / Individuals/m^2 / Conserve the high quality of the *Mytilus edulis* dominated community, subject to natural processes			

Community distribution / Hectares / Conserve the following community types in a natural condition: Fine sand to sandy mud with *Pygospio elegans* and *Crangon crangon* community complex; Fine sand with *Spio martinensis* community complex	intertidal habitats and the fauna communities they support		
Annual Vegetation of drift lines [1210] To restore the favourable conservation condition of the habitat in the SAC, which is defined as follows:			
Habitat area / Hectares / Area increasing, subject to natural processes, including erosion and succession	Yes An accidental pollution event during construction or operation could affect surface water downstream in Dublin Bay. An accidental pollution event of a sufficient magnitude, either along or cumulatively with other pollution sources, could potentially affect the quality (vegetation structure and composition) and area/distribution of intertidal/coastal habitats	Yes The mitigation measures described in Section 7.1.8 to protect water quality in the receiving environment will ensure that surface water quality in Dublin Bay is protected during construction and operation of the proposed development	No
Habitat distribution / Occurrence / No decline, or change in habitat distribution, subject to natural processes			
Physical structure: functionality and sediment supply / Presence/ absence of physical barriers / Maintain the natural circulation of sediment and organic matter, without any physical obstructions			
Vegetation structure: zonation / Occurrence / Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession			
Vegetation composition: typical species and sub-communities / Percentage cover at a representative number of monitoring stops / Maintain the presence of species-poor communities with typical species: sea rocket (*Cakile maritima*), sea sandwort (*Honckenya peploides*), prickly saltwort (*Salsola kali*) and oraches (*Atriplex* spp.)			
Vegetation composition: negative indicator species / Percentage cover / Negative indicator species (including non-natives) to represent less than 5% cover			
***Salicornia* and other annuals colonising mud and sand [1310]**			

To restore the favourable conservation condition of the habitat in the SAC, which is defined as follows:			
Habitat area / Hectares / Area stable or increasing, subject to natural processes, including erosion and succession	Yes An accidental pollution event during construction could affect surface water downstream in Dublin Bay. An accidental pollution event of a sufficient magnitude, either along or cumulatively with other pollution sources, could potentially affect the quality (vegetation structure and composition) and area/distribution of intertidal/coastal habitats	Yes The mitigation measures described in Section 7.1.8 to protect water quality in the receiving environment will ensure that surface water quality in Dublin Bay is protected during construction of the proposed development	No
Habitat distribution / Occurrence / No decline, or change in habitat distribution, subject to natural processes			
Physical structure: sediment supply / Presence/ absence of physical barriers Maintain, or where necessary restore, natural circulation of sediments and organic matter, without any physical obstructions			
Physical structure: creeks and pans / Occurrence / Maintain creek and pan structure, subject to natural processes, including erosion and succession			
Physical structure: flooding regime / Hectares flooded; frequency / Maintain natural tidal regime			
Vegetation structure: zonation / Occurrence / Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession			
Vegetation structure: vegetation height / Centimetres / Maintain structural variation within sward			
Vegetation structure: vegetation cover / Percentage cover at a representative number of monitoring stops / Maintain more than 90% of area outside creeks vegetated			
Vegetation composition: typical species and subcommunities / Percentage cover / Maintain the presence of species-poor communities listed in SMP (McCorry and Ryle, 2009)			

Vegetation structure: negative indicator species - *Spartina anglica* / Hectares / No significant expansion of common cordgrass (*Spartina anglica*), with an annual spread of less than 1%			
Atlantic salt meadows (Glauco-Puccinellietalia maritimae) [1330] To maintain the favourable conservation condition of the habitat in the SAC, which is defined as follows:			
Habitat area / Hectares / Area stable or increasing, subject to natural processes, including erosion and succession	Yes An accidental pollution event during construction could affect surface water downstream in Dublin Bay. An accidental pollution event of a sufficient magnitude, either along or cumulatively with other pollution sources, could potentially affect the quality (vegetation structure and composition) and area/distribution of intertidal/coastal habitats	Yes The mitigation measures described in Section 7.1.8 to protect water quality in the receiving environment will ensure that surface water quality in Dublin Bay is protected during construction of the proposed development	No
Habitat distribution / Occurrence / No decline, or change in habitat distribution, subject to natural processes			
Physical structure: sediment supplyPresence/ absence of physical barriers / Maintain natural circulation of sediments and organic matter, without any physical obstructions			
Physical structure: creeks and pans / Occurrence / Maintain creek and pan structure, subject to natural processes, including erosion and succession			
Physical structure: flooding regime / Hectares flooded; frequency / Maintain natural tidal regime			
Vegetation structure: zonation / Occurrence / Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession			
Vegetation structure: vegetation height / Centimetres / Maintain structural variation within sward			
Vegetation structure: vegetation cover / Percentage cover at a representative number of monitoring stops / Maintain more than 90% of area outside creeks vegetated			

Vegetation composition: typical species and sub-communities / Percentage cover at a representative number of monitoring stops / Maintain the presence of species-poor communities listed in SMP (McCorry and Ryle, 2009)			
Vegetation structure: negative indicator species - *Spartina anglica* / Hectares / No significant expansion of common cordgrass (*Spartina anglica*), with an annual spread of less than 1%			
Mediterranean salt meadows (Juncetalia maritimi) [1410] To maintain the favourable conservation condition of the habitat in the SAC, which is defined as follows:			
Habitat area / Hectares / Area stable or increasing, subject to natural processes, including erosion and succession	Yes An accidental pollution event during construction could affect surface water downstream in Dublin Bay. An accidental pollution event of a sufficient magnitude, either along or cumulatively with other pollution sources, could potentially affect the quality (vegetation structure and composition) and area/distribution of intertidal/coastal habitats	Yes The mitigation measures described in Section 7.1.8 to protect water quality in the receiving environment will ensure that surface water quality in Dublin Bay is protected during construction of the proposed development	No
Habitat distribution / Occurrence / No decline, or change in habitat distribution, subject to natural processes			
Physical structure: sediment supply / Presence/ absence of physical barriers / Maintain natural circulation of sediments and organic matter, without any physical obstructions			
Physical structure: creeks and pans / Occurrence / Maintain creek and pan structure, subject to natural processes, including erosion and succession			
Physical structure: flooding regime / Hectares flooded; frequency / Maintain natural tidal regime			
Vegetation structure: zonation / Occurrence / Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession			

Vegetation structure: vegetation height / Centimetres / Maintain structural variation within sward			
Vegetation structure: vegetation cover / Percentage cover at a representative number of monitoring stops / Maintain more than 90% of area outside creeks vegetated			
Vegetation composition: typical species and sub-communities / Percentage cover at a representative number of monitoring stops / Maintain the presence of species-poor communities listed in SMP (McCorry and Ryle, 2009)			
Vegetation structure: negative indicator species - *Spartina anglica* / Hectares / No significant expansion of common cordgrass (*Spartina anglica*), with an annual spread of less than 1%			
Embryonic shifting dunes [2110] To restore the favourable conservation condition of the habitat in the SAC, which is defined as follows:			
Habitat area / Hectares / Area stable or increasing, subject to natural processes, including erosion and succession.	No Terrestrial habitats above the high tide line are not at risk of effects from water pollution in Dublin Bay	No	No
Habitat distribution / Occurrence / No decline, or change in habitat distribution, subject to natural processes.			
Physical structure: functionality sediment supply / Presence/ absence of physical barriers / Maintain natural circulation of sediments and organic matter, without any physical obstructions			
Vegetation structure: zonation / Occurrence / Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession			

Vegetation composition: plant health of foredune grasses / Percentage cover / More than 95% of sand couch (*Elytrigia juncea*) and/or lyme-grass (*Leymus arenarius*) should be healthy (i.e. green plant parts above ground and flowering heads present)			
Vegetation composition: typical species and sub-communities / Percentage cover at a representative number of monitoring stops / Maintain the presence of species-poor communities with typical species: sand couch (*Elytrigia juncea*) and/or lyme-grass (*Leymus arenarius*)			
Vegetation composition: negative indicator species / Percentage cover / Negative indicator species (including non-native species) to represent less than 5% cover			
Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes) [2120] To restore the favourable conservation condition of the habitat in the SAC, which is defined as follows:			
Habitat area / Hectares / Area stable or increasing, subject to natural processes, including erosion and succession	No Terrestrial habitats above the high tide line are not at risk of effects from water pollution in Dublin Bay	No	No
Habitat distribution / Occurrence / No decline, or change in habitat distribution, subject to natural processes			
Physical structure: functionality sediment supply / Presence/ absence of physical barriers / Maintain natural circulation of sediments and organic matter, without any physical obstructions			
Vegetation structure: zonation / Occurrence / Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession			
Vegetation composition: plant health of dune grasses / Percentage cover / 95% of marram grass (*Ammophila arenaria*) and/or lyme-			

grass (*Leymus arenarius*) should be healthy (i.e. green plant parts above ground and flowering heads present)			
Vegetation composition: typical species and sub-communities / Percentage cover at a representative number of monitoring stops / Maintain the presence of species-poor communities dominated by marram grass (*Ammophila arenaria*) and/or lyme-grass (*Leymus arenarius*)			
Vegetation composition: negative indicator species / Percentage cover / Negative indicator species (including non-native species) to represent less than 5% cover			
Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130] * To restore the favourable conservation condition of the habitat in the SAC, which is defined as follows:			
Habitat area / Hectares / Area stable or increasing, subject to natural processes, including erosion and succession	No Terrestrial habitats above the high tide line are not at risk of effects from water pollution in Dublin Bay	No	No
Habitat distribution / Occurrence / No decline, or change in habitat distribution, subject to natural processes			
Physical structure: functionality sediment supply / Presence/ absence of physical barriers / Maintain natural circulation of sediments and organic matter, without any physical obstructions			
Vegetation structure: zonation / Occurrence / Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession			
Vegetation structure: bare ground / Percentage cover / Bare ground should not exceed 10% of fixed dune habitat, subject to natural processes			

Vegetation structure: sward height / Centimetres / Maintain structural variation in the sward			
Vegetation composition: typical species and sub-communities / Percentage cover at a representative number of monitoring stops / Maintain range of sub-communities with typical species listed in Delaney *et al.* (2013)			
Vegetation composition: negative indicator species (including *Hippophae rhamnoides*) / Percentage cover / Negative indicator species (including non-native species) to represent less than 5% cover			
Vegetation composition: scrub/trees / Percentage cover / No more than 5% cover or under control			
Humid dune slacks [2190] To restore the favourable conservation condition of the habitat in the SAC, which is defined as follows:			
Habitat area / Hectares / Area increasing, subject to natural processes, including erosion and succession	No Terrestrial habitats above the high tide line are not at risk of effects from water pollution in Dublin Bay	No	No
Habitat distribution / Occurrence / No decline, or change in habitat distribution, subject to natural processes			
Physical structure: functionality sediment supply / Presence/ absence of physical barriers / Maintain natural circulation of sediments and organic matter, without any physical obstructions			
Physical structure: hydrological and flooding regime / Water table levels; groundwater fluctuations (metres) / Maintain natural hydrological regime			

Vegetation structure: zonation / Occurrence / Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession			
Vegetation structure: bare ground / Percentage cover / Bare ground should not exceed 5% of dune slack habitat, with the exception of pioneer slacks which can have up to 20% bare ground			
Vegetation structure: vegetation height / Centimetres / Maintain structural variation within the sward			
Vegetation composition: typical species and sub-communities / Percentage cover at a representative number of monitoring stops / Maintain range of sub-communities with typical species listed in Delaney *et al*. (2013)			
Vegetation composition: cover of Salix repens / Percentage cover; centimetres / Maintain less than 40% cover of creeping willow (*Salix repens*)			
Vegetation composition: negative indicator species / Percentage cover / Negative indicator species (including non-native species) to represent less than 5% cover			
Vegetation composition: scrub/trees / Percentage cover / No more than 5% cover or under control			
Petalwort *Petalophyllum ralfsii* [1395] To maintain the favourable conservation condition of the species in the SAC, which is defined as follows:			
Distribution of populations / Number and geographical spread of populations / No decline	No As a terrestrial flora species of damp calcareous dune slacks, found above the	No	No
Population size / Number of individuals / No decline			

Area of suitable habitat / Hectares / No decline	high tide line, it is not at risk of effects from water pollution in Dublin Bay		
Hydrological conditions: soil moisture / Occurrence / Maintain hydrological conditions so that substrate is kept moist and damp throughout the year, but not subject to prolonged inundation by flooding in winter			
Vegetation structure: height and cover / Centimetres and percentage / Maintain open, low vegetation with a high percentage of bryophytes (small acrocarps and liverwort turf) and bare ground			
Reefs [1170] To maintain the favourable conservation condition of the habitat in the SAC, which is defined as follows:			
Habitat area / Hectares / The permanent area is stable or increasing, subject to natural processes	No A pollution event associated with the proposed development could not affect the quality of marine habitats associated with Lambay Island SAC due to dilution and mixing in Dublin Bay and the Irish Sea. Lambay Island SAC is located a significant distance from the proposed development site, on the far side of the Howth peninsula.	No	No
Distribution /Occurrence / The distribution of reefs is stable or increasing, subject to natural processes			
Community structure / Biological composition / Conserve the following community types in a natural condition: Intertidal reef community complex; *Laminaria*-dominated community complex			
Vegetated sea cliffs of the Atlantic and Baltic coasts [1230] To maintain the favourable conservation condition of the habitat in the SAC, which is defined as follows:			
Habitat length / Kilometres/ Area stable, subject to natural processes, including erosion. Total length of cliff section mapped: 7.27km	No	No	No

Habitat distribution / Occurrence / No decline, subject to natural processes.	Terrestrial habitats above the high tide line are not at risk of effects from water pollution.		
Physical structure: functionality and hydrological regime / Occurrence of artificial barriers / No alteration to natural functioning of geomorphological and hydrological processes due to artificial structures			
Vegetation structure: zonation / Occurrence / Maintain range of sea cliff habitat zonations including transitional zones, subject to natural processes including erosion and succession			
Vegetation structure: vegetation height / Centimetres / Maintain structural variation within sward			
Vegetation composition: typical species and subcommunities / Percentage cover at a representative sample of monitoring stops / Maintain range of subcommunities with typical species listed in the Irish Sea Cliff Survey (Barron *et al.,* 2011)			
Vegetation composition: negative indicator species / Percentage / Negative indicator species (including non-natives) to represent less than 5% cover			
Vegetation composition: bracken and woody species / Percentage / Cover of bracken (Pteridium aquilinum) on grassland and/or heath less than 10%. Cover of woody species on grassland and/or heath less than 20%			
Grey seal *Halichoerus grypus* [1364] To maintain the favourable conservation condition of the species in the SAC, which is defined as follows:			

Access to suitable habitat / Number of artificial barriers / Species range within the site should not be restricted by artificial barriers to site use	Yes Contaminated surface water run-off, silt or an accidental pollution incident of a sufficient magnitude, either alone or cumulatively with other pollution sources, could affect feeding resources of QI species, or result in mortality of QI species.	Yes The mitigation measures described in Section 7.1.8, to protect water quality are required	No
Breeding behaviour / Breeding sites / The breeding sites should be maintained in a natural condition			
Moulting behaviour / Moult haul-out sites / The moult haul-out sites should be maintained in a natural condition			
Resting behaviour / Resting haul-out sites / The resting haul-out sites should be maintained in a natural condition			
Disturbance / Level of impact / Human activities should occur at levels that do not adversely affect the grey seal population at the site			
Harbour seal *Phoca vitulina* [1365] To maintain the favourable conservation condition of the species in the SAC, which is defined as follows:			
Access to suitable habitat / Number of artificial barriers / Species range within the site should not be restricted by artificial barriers to site use	Yes Contaminated surface water run-off, silt or an accidental pollution incident of a sufficient magnitude, either alone or cumulatively with other pollution sources, could affect feeding resources of QI species, or result in mortality of QI species.	Yes The mitigation measures described in Section 7.1.8, to protect water quality are required	No
Breeding behaviour / Breeding sites / The breeding sites should be maintained in a natural condition.			
Moulting behaviour / Moult haul-out sites / The moult haul-out sites should be maintained in a natural condition.			
Resting behaviour / Resting haul-out sites / The resting haul-out sites should be maintained in a natural condition			

Disturbance / Level of impact / Human activities should occur at levels that do not adversely affect the harbour seal population at the site			
Special Protection Area (SPA)			
South Dublin Bay and River Tolka Estuary SPA			
Light-bellied Brent Goose (*Branta bernicla hrota*) [A046], Oystercatcher (*Haematopus ostralegus*) [A130], Ringed Plover (*Charadrius hiaticula*) [A137], Knot (*Calidris canutus*) [A143], Sanderling (*Calidris alba*) [A144], Dunlin (*Calidris alpina alpina*) [A149], Bar-tailed Godwit (*Limosa lapponica*) [A157], Redshank (*Tringa totanus*) [A162], Black-headed Gull (*Chroicocephalus ridibundus*) [A179] **Note: Grey Plover (*Pluvialis squatarola*) [A141] is proposed for removal from the list of SCIs for the site so no site-specific conservation objective is included for the species** To maintain the favourable conservation condition of the special conservation interests of the SPA, which is defined as follows:			
Population trend / Percentage change / Long term population trend stable or increasing	Yes An accidental pollution event during construction or operation could affect surface water downstream in Dublin Bay. An accidental pollution event of a sufficient magnitude, either along or cumulatively with other pollution sources, could potentially affect the quality the of intertidal/coastal habitats that support the special conservation interest bird species of the SPA. This could potentially affect the use of habitat areas by birds and have long-term effects on the SPA populations	Yes The mitigation measures described in Section 7.1.8 to protect water quality in the receiving environment will ensure that surface water quality in Dublin Bay is protected during construction and operation of the proposed development	No
Distribution / Range, timing and intensity of use of areas / No significant decrease in the range, timing and intensity of use of areas by all of the above-named species, other than that occurring from natural patterns of variation			
Roseate Tern (*Sterna dougallii*) [A192] To maintain the favourable conservation condition of the special conservation interests of the SPA, which is defined as follows:			

Passage population: individuals / Number / No significant decline	Yes An accidental pollution event during construction or operation could affect surface water downstream in Dublin Bay. An accidental pollution event of a sufficient magnitude, either along or cumulatively with other pollution sources, could potentially affect the abundance of prey fish species and the quality and suitability of roosting sites within the SPA	Yes The mitigation measures described in Section 7.1.8 to protect water quality in the receiving environment will ensure that surface water quality in Dublin Bay is protected during construction and operation of the proposed development	No
Distribution: roosting areas / Number; location; area (hectares) / No significant decline			
Prey biomass available / Kilogrammes / No significant decline			
Barriers to connectivity / Number; location; shape; area (hectares) / No significant increase	No	No	No
Disturbance at roosting site / Level of impact / Human activities should occur at levels that do not adversely affect the numbers of roseate tern among the post-breeding aggregation of terns	No	No	No
Common Tern (*Sterna hirundo*) [A193] To maintain the favourable conservation condition of the special conservation interests of the SPA, which is defined as follows:			
Breeding population abundance: apparently occupied nests (AONs) / Number / No significant decline	Yes An accidental pollution event during construction or operation could affect surface water downstream in Dublin Bay. An accidental pollution event of a sufficient magnitude, either along or cumulatively with other pollution sources, could potentially affect the	Yes The mitigation measures described in Section 7.1.8 to protect water quality in the receiving environment will ensure that surface water quality in Dublin Bay is protected during construction and operation of the proposed development	No
Productivity rate: fledged young per breeding pair / Mean number / No significant decline			
Passage population: individuals / Number / No significant decline			
Distribution: breeding colonies / Number; location; area (Hectares) / No significant decline			

Distribution: roosting areas / Number; location; area (Hectares) / No significant decline	abundance of prey fish species and the quality and suitability of nesting and roosting sites within the SPA. This could potentially have long-term effects on the SPA's breeding population		
Prey biomass available / Kilogrammes / No significant decline			
Barriers to connectivity / Number; location; shape; area (hectares) / No significant increase	No	No	No
Disturbance at breeding site / Level of impact / Human activities should occur at levels that do not adversely affect the breeding common tern population	No	No	No
Disturbance at roosting site / Level of impact / Human activities should occur at levels that do not adversely affect the numbers of common tern among the post-breeding aggregation of terns	No	No	No
Arctic Tern (*Sterna paradisaea*) [A194] To maintain the favourable conservation condition of the special conservation interests of the SPA, which is defined as follows:			
Passage population / Number of individuals / No significant decline	Yes An accidental pollution event during construction or operation could affect surface water downstream in Dublin Bay. An accidental pollution event of a sufficient magnitude, either along or cumulatively with other pollution sources, could potentially affect the abundance of prey fish species and the quality and suitability of roosting sites within the SPA.	Yes The mitigation measures described in Section 7.1.8 to protect water quality in the receiving environment will ensure that surface water quality in Dublin Bay is protected during construction and operation of the proposed development	No
Distribution: roosting areas / Number; location; area (hectares) / No significant decline			
Prey biomass available / Kilogrammes / No significant decline			

Barriers to connectivity / Number; location; shape; area (hectares) / No significant increase	No	No	No
Disturbance at roosting site / Level of impact / Human activities should occur at levels that do not adversely affect the numbers of Arctic tern among the post-breeding aggregation of terns	No	No	No
Wetlands [A999] To maintain the favourable conservation condition of wetland habitats within the SPA, which is defined as follows:			
Habitat area / Hectares / The permanent area occupied by the wetland habitat should be stable and not significantly less than the area of 2192ha, other than that occurring from natural patterns of variation	Yes An accidental pollution event during construction or operation could affect surface water downstream in Dublin Bay. An accidental pollution event of a sufficient magnitude, either along or cumulatively with other pollution sources, could potentially affect the quality the of intertidal/coastal habitats that support the special conservation interest bird species of the SPA. This could potentially affect the use of habitat areas by birds and have long-term effects on the SPA populations	Yes The mitigation measures described in Section 7.1.8 to protect water quality in the receiving environment will ensure that surface water quality in Dublin Bay is protected during construction and operation of the proposed development	No
North Bull Island SPA			
Light-bellied Brent Goose (*Branta bernicla hrota*) [A046], Shelduck (*Tadorna tadorna*) [A048], Teal (*Anas crecca*) [A052], Pintail (*Anas acuta*) [A054], Shoveler (*Anas clypeata*) [A056], Oystercatcher (*Haematopus ostralegus*) [A130], Golden Plover (*Pluvialis apricaria*) [A140], Grey Plover (*Pluvialis squatarola*) [A141], Knot (*Calidris canutus*) [A143], Sanderling (*Calidris alba*) [A144], Dunlin (*Calidris alpina alpina*) [A149], Black-tailed Godwit (*Limosa limosa*) [A156], Bar-tailed Godwit (*Limosa lapponica*) [A157], Curlew (*Numenius arquata*) [A160], Redshank (*Tringa totanus*) [A162], Turnstone (*Arenaria interpres*) [A169], Black-headed Gull (*Chroicocephalus ridibundus*) [A179]			

To maintain the favourable conservation condition of the special conservation interests of the SPA, which is defined as follows:			
Population trend / Percentage change / Long term population trend stable or increasing	Yes An accidental pollution event during construction or operation could affect surface water downstream in Dublin Bay. An accidental pollution event of a sufficient magnitude, either along or cumulatively with other pollution sources, could potentially affect the quality the of intertidal/coastal habitats that support the special conservation interest bird species of the SPA. This could potentially affect the use of habitat areas by birds and have long-term effects on the SPA populations	Yes The mitigation measures described in Section 7.1.8 to protect water quality in the receiving environment will ensure that surface water quality in Dublin Bay is protected during construction and operation of the proposed development	No
Distribution / Range, timing and intensity of use of areas / No significant decrease in the range, timing and intensity of use of areas by all of the above-named species, other than that occurring from natural patterns of variation			
Wetlands [A999] To maintain the favourable conservation condition of wetland habitats within the SPA, which is defined as follows:			
Habitat area / Hectares / The permanent area occupied by the wetland habitat should be stable and not significantly less than the area of 1713ha, other than that occurring from natural patterns of variation	Yes An accidental pollution event during construction or operation could affect surface water downstream in Dublin Bay. An accidental pollution event of a sufficient magnitude, either along or cumulatively with other pollution sources, could potentially affect the quality the of intertidal/coastal habitats that support the special conservation interest bird species of the SPA. This could potentially affect the use of habitat	Yes The mitigation measures described in Section 7.1.8 to protect water quality in the receiving environment will ensure that surface water quality in Dublin Bay is protected during construction and operation of the proposed development	No

	areas by birds and have long-term effects on the SPA populations		
Howth Head Coast SPA			
Kittiwake (*Rissa tridactyla*) [A188] To maintain the favourable conservation condition of the special conservation interests of the SPA, which is defined as follows:			
Breeding population abundance: apparently occupied nests (AONs)/ Number/ No significant decline	Yes An accidental pollution event during construction or operation could affect surface water downstream in Dublin Bay. An accidental pollution event of a sufficient magnitude, either along or cumulatively with other pollution sources, could potentially affect the abundance of prey fish species and the quality and suitability of roosting sites within the SPA.	Yes The mitigation measures described in Section 7.1.8 to protect water quality in the receiving environment will ensure that surface water quality in Dublin Bay is protected during construction and operation of the proposed development	No
Productivity rate/ Mean number/ No significant decline			
Distribution: breeding colonies/ Number; location; area (hectares)/ No significant decline			
Prey biomass available/ Kilogrammes/ No significant decline			
Barriers to connectivity/ Number; location; shape; area (hectares)/ No significant increase	No	No	No
Disturbance at the breeding site/ Level of impact/ No significant increase	No	No	No
Baldoyle Bay SPA			
Light-bellied Brent Goose (*Branta bernicla hrota*) [A046], Shelduck (*Tadorna tadorna*) [A048], Ringed Plover (Charadrius hiaticula) [A137], Golden Plover (*Pluvialis apricaria*) [A140], Grey Plover (*Pluvialis squatarola*) [A141], Bar-tailed Godwit (*Limosa lapponica*) [A157] To maintain the favourable conservation condition of the special conservation interests of the SPA, which is defined as follows:			

Population trend / Percentage change / Long term population trend stable or increasing	Yes An accidental pollution event during construction or operation could affect surface water downstream in Dublin Bay. An accidental pollution event of a sufficient magnitude, either along or cumulatively with other pollution sources, could potentially affect the quality the of intertidal/coastal habitats that support the special conservation interest bird species of the SPA. This could potentially affect the use of habitat areas by birds and have long-term effects on the SPA populations	Yes The mitigation measures described in Section 7.1.8 to protect water quality in the receiving environment will ensure that surface water quality in Dublin Bay is protected during construction and operation of the proposed development	No
Distribution / Range, timing and intensity of use of areas / No significant decrease in the range, timing and intensity of use of areas by all of the above-named species, other than that occurring from natural patterns of variation			
Wetlands [A999] To maintain the favourable conservation condition of wetland habitats within the SPA, which is defined as follows:			
Habitat area / Hectares / The permanent area occupied by the wetland habitat should be stable and not significantly less than the area of 263ha, other than that occurring from natural patterns of variation	No A pollution event associated with the proposed development could not affect the quality of marine habitats associated with Baldoyle Bay SPA due to dilution and mixing in Dublin Bay and the Irish Sea. Baldoyle Bay SPA is located a significant distance from the proposed development site, on the far side of the Howth peninsula.	No	No
Ireland's Eye SPA			

Cormorant (*Phalacrocorax carbo*) [A017], Herring Gull [*Larus argentatus*] [A184], Kittiwake (*Rissa tridactyla*) [A188], Guillemot (*Uria aalge*) [A199], Razorbill (*Alca torda*) [A200] There is no site-specific conservation objectives document available for this SPA. Therefore, the attributes, measures and targets below have been developed based on the specific conservation objectives available for Rogerstown Estuary SPA [004015]			
Breeding population abundance: apparently occupied nests (AONs)/ Number/ No significant decline	Yes An accidental pollution event during construction or operation could affect surface water downstream in Dublin Bay. An accidental pollution event of a sufficient magnitude, either along or cumulatively with other pollution sources, could potentially affect the abundance of prey fish species and the quality and suitability of roosting sites within the SPA.	Yes The mitigation measures described in Section 7.1.8 to protect water quality in the receiving environment will ensure that surface water quality in Dublin Bay is protected during construction and operation of the proposed development	No
Productivity rate/ Mean number/ No significant decline			
Distribution: breeding colonies/ Number; location; area (hectares)/ No significant decline			
Prey biomass available/ Kilogrammes/ No significant decline			
Barriers to connectivity/ Number; location; shape; area (hectares)/ No significant increase	No	No	No
Disturbance at the breeding site/ Level of impact/ No significant increase	No	No	No
Malahide Estuary SPA			
Great Crested Grebe (*Podiceps cristatus*) [A005], Light-bellied Brent Goose (*Branta bernicla hrota*) [A046], Shelduck (*Tadorna tadorna*) [A048], Pintail (*Anas acuta*) [A054], Goldeneye (*Bucephala clangula*) [A067], Red-breasted Merganser (*Mergus serrator*) [A069], Oystercatcher (*Haematopus ostralegus*) [A130], Golden Plover (*Pluvialis apricaria*) [A140], Grey Plover (*Pluvialis squatarola*) [A141], Knot (*Calidris canutus*) [A143], Dunlin (*Calidris alpina alpina*) [A149], Black-tailed Godwit (*Limosa limosa*) [A156], Bar-tailed Godwit (*Limosa lapponica*) [A157], Redshank (*Tringa totanus*) [A162] To maintain the favourable conservation condition of the special conservation interests of the SPA, which is defined as follows:			

Population trend / Percentage change / Long term population trend stable or increasing	Yes An accidental pollution event during construction or operation could affect surface water downstream in Dublin Bay. An accidental pollution event of a sufficient magnitude, either along or cumulatively with other pollution sources, could potentially affect the quality the of intertidal/coastal habitats that support the special conservation interest bird species of the SPA. This could potentially affect the use of habitat areas by birds and have long-term effects on the SPA populations	Yes The mitigation measures described in Section 7.1.8 to protect water quality in the receiving environment will ensure that surface water quality in Dublin Bay is protected during construction and operation of the proposed development	No
Distribution / Range, timing and intensity of use of areas / No significant decrease in the range, timing and intensity of use of areas by all of the above-named species, other than that occurring from natural patterns of variation			
Wetlands [A999] To maintain the favourable conservation condition of wetland habitats within the SPA, which is defined as follows:			
Habitat area / Hectares / The permanent area occupied by the wetland habitat should be stable and not significantly less than the area of 765ha, other than that occurring from natural patterns of variation	No A pollution event associated with the proposed development could not affect the quality of marine habitats associated with Malahide Estuary SPA due to dilution and mixing in Dublin Bay and the Irish Sea. Malahide Estuary SPA is located a significant distance from the proposed development site, on the far side of the Howth peninsula.	No	No
The Murrough SPA			
Red-throated Diver [A001]			

There is no site-specific conservation objectives document available for this SPA. Therefore, the attributes, measures and targets below have been developed based on the specific conservation objectives available for red-throated diver in The Raven SPA [004019] (NPWS, 2012a)			
Population trend / % change / Long term population trend stable or increasing Distribution / Number and range of areas used by waterbirds / There should be no significant decrease in the numbers or range of areas used by waterbird species, other than that occurring from natural patterns of variation	No There is no potential for impacts to occur on this SCI bird species population at The Murrough SPA, in light of its conservation objectives.	No	No
Greylag Goose [A043] There is no site-specific conservation objectives document available for this SPA. Therefore, the attributes, measures and targets below have been developed based on the specific conservation objectives available for Greylag Goose in Rogerstown Estuary SPA [004015] (NPWS, 2013)			
Population trend / Percentage change / Long term population trend stable or increasing Distribution / Range, timing and intensity of use of areas / No significant decrease in the range, timing and intensity of use of areas by all of the above-named species, other than that occurring from natural patterns of variation	No There is no potential for impacts to occur on this SCI bird species population at The Murrough SPA, in light of its conservation objectives.	No	No
Light-Bellied Brent Goose [A046] There is no site-specific conservation objectives document available for this SPA. Therefore, the attributes, measures and targets below have been developed based on the specific conservation objectives available for Light-bellied Brent Goose in South Dublin Bay and River Tolka Estuary SPA [004024] (NPWS, 2015)			
Population trend / Percentage change / Long term population trend stable or increasing Distribution / Range, timing and intensity of use of areas / No significant decrease in the range, timing and intensity of use of areas by all of the above-named species, other than that occurring from natural patterns of variation	Yes An accidental pollution event during construction or operation could affect surface water downstream in Dublin Bay. An accidental pollution event of a sufficient magnitude, either along or cumulatively with other pollution	Yes The mitigation measures described in Section 7.1.8 to protect water quality in the receiving environment will ensure that surface water quality in Dublin Bay is protected during	No

	sources, could potentially affect the quality the of intertidal/coastal habitats that support the special conservation interest bird species of the SPA. This could potentially affect the use of habitat areas by birds and have long-term effects on the SPA populations	construction and operation of the proposed development	
Wigeon [A050] There is no site-specific conservation objectives document available for this SPA. Therefore, the attributes, measures and targets below have been developed based on the specific conservation objectives available for Wigeon in Wexford Harbour and Slobs SPA [004076] (NPWS, 2012b)			
Population trend / Percentage change / Long term population trend stable or increasing	No There is no potential for impacts to occur on this SCI bird species population at The Murrough SPA, in light of its conservation objectives.	No	No
Distribution / Range, timing and intensity of use of areas / No significant decrease in the range, timing and intensity of use of areas by all of the above-named species, other than that occurring from natural patterns of variation			
Teal [A052] There is no site-specific conservation objectives document available for this SPA. Therefore, the attributes, measures and targets below have been developed based on the specific conservation objectives available for Teal in North Bull Island SPA [004006] (NPWS, 2015)			
Population trend / Percentage change / Long term population trend stable or increasing	No There is no potential for impacts to occur on this SCI bird species population at The Murrough SPA, in light of its conservation objectives.	No	No
Distribution / Range, timing and intensity of use of areas / No significant decrease in the range, timing and intensity of use of areas by all of the above-named species, other than that occurring from natural patterns of variation			
Black-Headed Gull [179]			

There is no site-specific conservation objectives document available for this SPA. Therefore, the attributes, measures and targets below have been developed based on the specific conservation objectives available for Black-headed Gull in South Dublin Bay and River Tolka Estuary SPA [004024] (NPWS, 2015)			
Population trend / Percentage change / Long term population trend stable or increasing	Yes An accidental pollution event during construction or operation could affect surface water downstream in Dublin Bay. An accidental pollution event of a sufficient magnitude, either along or cumulatively with other pollution sources, could potentially affect the quality the of intertidal/coastal habitats that support the special conservation interest bird species of the SPA. This could potentially affect the use of habitat areas by birds and have long-term effects on the SPA populations	Yes The mitigation measures described in Section 7.1.8 to protect water quality in the receiving environment will ensure that surface water quality in Dublin Bay is protected during construction and operation of the proposed development	No
Distribution / Range, timing and intensity of use of areas / No significant decrease in the range, timing and intensity of use of areas by all of the above-named species, other than that occurring from natural patterns of variation			
Herring Gull [184] There is no site-specific conservation objectives document available for this SPA. Therefore, the attributes, measures and targets below have been developed based on the specific conservation objectives available for Herring Gull in River Nanny Estuary and Shore SPA [004158] (NPWS, 2012c)			
Population trend / Percentage change / Long term population trend stable or increasing	Yes An accidental pollution event during construction or operation could affect surface water downstream in Dublin Bay. An accidental pollution event of a sufficient magnitude, either along or cumulatively with other pollution sources, could potentially affect the quality the of intertidal/coastal habitats that support the special conservation	Yes The mitigation measures described in Section 7.1.8 to protect water quality in the receiving environment will ensure that surface water quality in Dublin Bay is protected during construction and operation of the proposed development	No
Distribution / Range, timing and intensity of use of areas / No significant decrease in the range, timing and intensity of use of areas by all of the above-named species, other than that occurring from natural patterns of variation			

	interest bird species of the SPA. This could potentially affect the use of habitat areas by birds and have long-term effects on the SPA populations		
Little Tern [195] There is no site-specific conservation objectives document available for this SPA. Therefore, the attributes, measures and targets below have been developed based on the specific conservation objectives available for Little Tern in Boyne Estuary SPA [004080] (NPWS, 2013b)			
Breeding population abundance: apparently occupied nests (AONs) / Number / No significant decline	No There is no potential for impacts to occur on this SCI bird species population at The Murrough SPA, in light of its conservation objectives.	No	No
Productivity rate: fledged young per breeding pair / Mean number / No significant decline			
Distribution: breeding colonies / Number; location; area (ha) / No significant decline			
Prey biomass available / Kg's / No significant decline			
Barriers to connectivity / Number; location; shape; area (ha) / No significant decline			
Disturbance at the breeding site / Level of impact / Human activities should occur at levels that do not adversely affect the breeding little tern population			
Wetland and Waterbirds [A999 There is no site-specific conservation objectives document available for this SPA. Therefore, the attributes, measures and targets below have been developed based on the specific conservation objectives available for wetlands and waterbirds in the South Dublin Bay and River Tolka Estuary SPA [004024].:			
Habitat area / Hectares / The permanent area occupied by the wetland habitat should be stable, other than that occurring from natural patterns of variation	No A pollution event associated with the proposed development could not affect	No	No

	the quality of marine habitats associated with The Murrough SPA due to dilution and mixing in Dublin Bay and the Irish Sea. The Murrough SPA is located a significant distance from the proposed development site, on the far side of Bray Head.		
Lambay Island SPA			
Fulmar (*Fulmarus glacialis*) [A009], Cormorant (*Phalacrocorax carbo*) [A017], Shag (*Phalacrocorax aristotelis*) [A018], Greylag Goose (*Anser anser*) [A043], Lesser Black-backed Gull (*Larus fuscus*) [A183], Herring Gull (*Larus argentatus*) [A184], Kittiwake (*Rissa tridactyla*) [A188], Guillemot (*Uria aalge*) [A199], Razorbill (*Alca torda*) [A200], Puffin (*Fratercula arctica*) [A204] TThere is no site-specific conservation objectives document available for this SPA. Therefore, the attributes, measures and targets below have been developed based on the specific conservation objectives available for Rogerstown Estuary SPA [004015]			
Population trend / Percentage change / Long term population trend stable or increasing	Yes An accidental pollution event during construction or operation could affect surface water downstream in Dublin Bay. An accidental pollution event of a sufficient magnitude, either along or cumulatively with other pollution sources, could potentially affect the abundance of prey fish species and the quality and suitability of roosting sites within the SPA.	Yes The mitigation measures described in Section 7.1.8 to protect water quality in the receiving environment will ensure that surface water quality in Dublin Bay is protected during construction and operation of the proposed development	No
Distribution / Range, timing and intensity of use of areas / No significant decrease in the range, timing and intensity of use of areas by all of the above-named species, other than that occurring from natural patterns of variation			
Rogerstown Estuary SPA			
Greylag Goose (*Anser anser*) [A043], Light-bellied Brent Goose (*Branta bernicla hrota*) [A046], Shelduck (*Tadorna tadorna*) [A048], Shoveler (*Anas clypeata*) [A056], Oystercatcher (*Haematopus ostralegus*) [A130], Ringed Plover (*Charadrius hiaticula*) [A137], Golden Plover (*Pluvialis apricaria*) [A140], Grey Plover (*Pluvialis squatarola*) [A141], Knot (*Calidris canutus*) [A143], Dunlin (*Calidris alpina alpina*) [A149], Black-tailed Godwit (*Limosa limosa*) [A156], Redshank (*Tringa totanus*) [A162]			

To maintain the favourable conservation condition of the special conservation interests of the SPA, which is defined as follows:			
Population trend / Percentage change / Long term population trend stable or increasing Distribution / Range, timing and intensity of use of areas / No significant decrease in the range, timing and intensity of use of areas by all of the above-named species, other than that occurring from natural patterns of variation	Yes An accidental pollution event during construction or operation could affect surface water downstream in Dublin Bay. An accidental pollution event of a sufficient magnitude, either along or cumulatively with other pollution sources, could potentially affect the quality the of intertidal/coastal habitats that support the special conservation interest bird species of the SPA. This could potentially affect the use of habitat areas by birds and have long-term effects on the SPA populations	Yes The mitigation measures described in Section 7.1.8 to protect water quality in the receiving environment will ensure that surface water quality in Dublin Bay is protected during construction and operation of the proposed development	No
Wetland and Waterbirds [A999 To maintain the favourable conservation condition of wetland habitats within the SPA, which is defined as follows:			
Habitat area / Hectares / The permanent area occupied by the wetland habitat should be stable and not significantly less than the area of 646ha, other than that occurring from natural patterns of variation	No A pollution event associated with the proposed development could not affect the quality of marine habitats associated with Rogerstown Estuary SPA due to dilution and mixing in Dublin Bay and the Irish Sea. Rogerstown Estuary SPA is located a significant distance from the proposed development site, on the far side of the Howth peninsula.	No	No

7.3.7 Mitigation Measures

179 This section presents the mitigation measures that will be implemented during construction and operation to avoid or reduce the potential impacts of the proposed development on South Dublin Bay SAC, South Dublin Bay and River Tolka Estuary SPA, North Dublin Bay SAC, North Bull Island SPA, Howth Head Coast SPA, Baldoyle Bay SPA, Ireland's Eye SPA, Malahide Estuary SPA, The Murrough SPA, Lambay Island SAC, Lambay Island SPA and Rogerstown Estuary SPA. All of the mitigation measures will be implemented in full and are best practice, and tried and tested, effective control measures to protect the receiving environment.

180 See the sections listed below which provide mitigation measures to protect the water quality in Dublin Bay during construction and operation of the proposed development:

181 The mitigation measures presented above in Section 7.1.8 will protect surface water quality during construction a of the proposed development.

7.3.8 Residual Impacts

182 Following the implementation of mitigation measures, the proposed development poses no risk of affecting the conservation objectives, or the favourable conservation condition, of the qualifying interests/special conservation interests of South Dublin Bay SAC, South Dublin Bay and River Tolka Estuary SPA, North Dublin Bay SAC, North Bull Island SPA, Howth Head Coast SPA, Baldoyle Bay SPA, Ireland's Eye SPA, Malahide Estuary SPA, The Murrough SPA, Lambay Island SAC, Lambay Island SPA and Rogerstown Estuary SPA7, and there are therefore, no residual direct or indirect impacts associated with the proposed development that could adversely affect the integrity of these European sites.

7.3.9 Conclusion of Assessment for South Dublin Bay SAC, South Dublin Bay and River Tolka Estuary SPA, North Dublin Bay SAC, North Bull Island SPA, Howth Head Coast SPA, Baldoyle Bay SPA, Ireland's Eye SPA, Malahide Estuary SPA, The Murrough SPA, Lambay Island SAC, Lambay Island SPA and Rogerstown Estuary SPA.

183 Following an examination, analysis and evaluation in light of best scientific knowledge, of all relevant information in respect of the qualifying interests of South Dublin Bay SAC, South Dublin Bay and River Tolka Estuary SPA, North Dublin Bay SAC, North Bull Island SPA, Howth Head Coast SPA, Baldoyle Bay SPA, Ireland's Eye SPA, Malahide Estuary SPA, The Murrough SPA, Lambay Island SAC, Lambay Island SPA and Rogerstown Estuary SPA, the potential impacts, and whether or not the predicted effects would affect the conservation objectives that support the conservation condition of the qualifying interests, it has been concluded that the proposed development does not pose a risk of adversely affecting (either directly or indirectly) the integrity of these European sites.

8 In Combination Assessment

8.1 Analysis of Potential In Combination Effects

184 This section of the report presents the assessment carried out to examine whether any other plans or projects have the potential to act in combination with the proposed development to adversely affect the integrity of European sites in Dublin Bay, and all other European sites indicated in Section 5.1. All other European sites fall beyond the zone of influence of the proposed development. Therefore, there is no potential for any other plans or projects to act in combination with the proposed development to adversely affect the integrity of any other European sites.

185 As assessed in Section 7, none of the potential impacts associated with the proposed development will result in any perceptible residual effect on the receiving environment or on the qualifying interests/special conservation interests of European sites in Dublin Bay, and all European sites indicated in Section 5.1. Therefore, there will not be any residual impacts associated with the proposed development that will adversely affect the conservation objectives supporting the conservation condition of the qualifying interests/special conservation interests of those European sites, and the proposed development in isolation will not adversely affect the integrity of those European site.

186 Cumulative effects can result from individually insignificant but collectively significant actions taking place over a period of time or concentrated in a location. The following development types are included in considering cumulative effects:

- Existing projects (under construction or operational)
- Projects which have been granted consent but not yet started
- Projects for which consent has been applied for which are awaiting a decision, including those under appeal
- Projects proposed at a plan level, if relevant (e.g. future strategic infrastructure such as roads or greenways)

187 There is the potential for other pollution sources within the Liffey and Dublin Bay WFD catchment and any other catchments that also drain to Dublin Bay to cumulatively affect water quality in the receiving estuarine and marine environments.

188 The potential for in combination effects to arise from any existing or proposed land use plans or developments is regulated and controlled by the environmental protective policies and objectives of the *Dublin City Council Development Plan 2016-2022,* the *Dun Laoghaire-Rathdown County Development Plan 2016-2012* and the *Fingal County Council Development Plan 2011-2017* in the immediate Dublin Bay catchment. Protective policies in the wider River Liffey and Dublin Bay catchment also apply and include the *Kildare County Development Plan 2017-2023*, and the *Wicklow County Development Plan 2016-2022*. Any existing/proposed plan or project that could potentially affect European sites in Dublin Bay, in combination with the proposed development, must adhere to these overarching environmental protective policies and objectives. These policies and objectives will ensure the protection of the European sites within the zone of influence of the proposed development, and include the requirement for any future plans or projects to undergo Screening for Appropriate Assessment and/or Appropriate Assessment to examine and assess their effects on European sites, alone and in combination with other plans and projects. The relevant policies and objectives in those plans for the protection of European sites and water quality are included in Appendix II. There are a number of small scale local planning applications in proximity to the proposed development. These include permissions for retention of buildings, demolition and construction of single dwellings, and single dwelling extensions. Due to the nature and small scale of these developments, none of them pose any risk of effects to the receiving environment. Therefore there is no potential for in combination effects to arise either collectively or cumulatively with the proposed development.

8.2 Conclusion of In Combination Assessment

189 As the proposed development itself will not have any effects on the conservation objectives of any European sites, and considering the protective environmental policies and objectives under the relevant development plans (See Appendix II), there is no potential for any other plan or project to adversely affect the integrity of any European site in combination with the proposed development.

9 NIS Conclusion

190 This NIS has examined and analysed, in light of the best scientific knowledge, with respect to those European sites within the zone of influence of the proposed development, the potential impact sources and pathways, how these could impact on the sites' special conservation interest species and whether the predicted impacts would adversely affect the integrity of Dalkey Islands SPA, Rockabill to Dalkey Island SAC, South Dublin Bay SAC and North Dublin Bay SAC, South Dublin Bay and River Tolka Estuary SPA, North Bull Island SPA, Howth Head Coast SPA, Baldoyle SPA, Malahide Estuary SPA, The Murrough SPA, Lambay Island SAC, Lambay Island SPA, Rogerstown Estuary SPA , and Ireland's Eye SPA. There are no other European sites at risk of effects from the proposed development.

191 It has been objectively concluded by Scott Cawley Ltd., following an examination, analysis and evaluation of the relevant information, including in particular the nature of the predicted impacts from the proposed development, that the proposed development will not adversely affect (either directly or indirectly) the integrity of any European site, either alone or in combination with other plans or projects.

Appendix I

Construction Environmental Management Plan

Dún Laoghaire Rathdown County Council

Coliemore Harbour Permanent Remedial Works

Construction Environmental Management Plan

Issue | 29 April 2022

Job number 277645-00

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Document verification

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Job title		Coliemore Harbour Permanent Remedial Works			**Job number** 277645-00
Document title		Construction Environmental Management Plan			**File reference**
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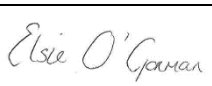
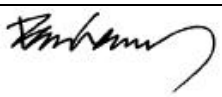
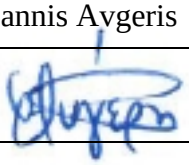
Revision	**Date**	**Filename**	Coliemore Harbour CEMP Issue.docx		
Issue	29 Apr 2022	**Description**	Issue for Planning		
			Prepared by	Checked by	Approved by
		Name	Elsie O'Gorman	Daniel Garvey	Ioannis Avgeris
		Signature			
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Contents

1 Introduction

1.1 Introduction

This Construction Environmental Management Plan (CEMP) has been prepared by Arup to support the Dún Laoghaire Rathdown County Council (DLRCC) application for consent for the proposed Coliemore Harbour permanent remedial works, hereinafter referred to as the 'proposed development'.

The proposed development will comprise:

- Mobilisation and site set-up, including access to viewing platform and obstruction removal (bollards etc);
- Removal of temporary walkway to allow access for grouting;
- Pointing works to the harbour wall followed by compensation grouting behind the rock face to improve stability;
- Installation of up to 16 rock anchors from the suspended platform via a crane located on the viewing platform;
- Grouting of the rock anchors;
- Headplate installation, with grey olive metal rings welded to the top of the bars; and
- Resurfacing and reinstatement of the existing walkway.

DLRCC, as the developer, has appointed PJ Edwards & Co. Ltd. as the competent party (the 'Contractor') to oversee all aspects of the construction phase of the proposed development.

An outline design for the permanent remedial works has been carried out by Arup. The works will be carried out on a design and build basis. The PJ Edwards & Co. Ltd. proposal will largely follow the Arup scheme. PJ Edwards & Co. Ltd will subcontract the pre-condition survey and permanent designs to Byrne Looby Partners.

1.2 Overview of CEMP

This CEMP summarises the overall environmental management strategy that will be implemented during the construction of the proposed development.

Construction is considered to include all site preparation, enabling works, materials delivery, materials and waste removal, construction activities and associated engineering works.

This CEMP sets out the duties and responsibilities in relation to the environmental management of the project which will be imposed on the contractor in the construction contract.

DLRCC will ensure compliance with the mitigation measures set out in the Environmental Impact Assessment (EIA) Screening Report and Natura Impact Statement (NIS), prepared to support the application for approval of the proposed development, and will be responsible for ensuring that the contractor complies with all requirements of this CEMP.

This CEMP must be read in conjunction with the details of the proposed development and the mitigation measures described in the EIA Screening Report and NIS.

1.2.1 Purpose of the CEMP

The purpose of this CEMP is to provide a framework that describes how the mitigation measures described in the EIA Screening and NIS will be implemented in order to minimise the negative environmental effects of the construction of the proposed development. This CEMP has been produced, as part of the application for approval, to ensure compliance with the mitigation measures specified in the EIA Screening and NIS.

This CEMP identifies the minimum requirements with regard to the appropriate mitigation, monitoring, inspection and reporting mechanisms that need to be implemented throughout the construction phase. Compliance with this CEMP will not absolve DLRCC, and the Contractor (PJ Edwards & Co. Ltd.) from compliance with all legislation and bylaws relating to the construction activities.

1.2.2 Preparation of the CEMP

The CEMP has been prepared having regard to industry best practice guidance including:

- National Roads Authority; *Guidelines for the Creation, Implementation and Maintenance of an Environmental Operating Plan*; and
- CIRIA C741 *Environmental Good Practice on Site Guide* (4th Edition, 2015).

The CEMP has been prepared in conjunction with the EIA Screening Report and NIS.

1.2.3 Updating the CEMP

The CEMP is a working document. Prior to commencing the works on site, the CEMP will be further developed by the Contractor as follows:

- **Section 4,** which addresses Roles and Responsibilities, will be adjusted to reflect the contractor's construction team structure and will be populated with the names of the personnel filling the roles.
- The contractor's detailed method statements will be appended.
- If planning approval is granted for the proposed development, the planning decision, and the conditions attached to the decision, will be included.

- The Contractor's Environmental Management System (EMS) for the proposed scheme, which will align with ISO 14001:2015 – Environmental Management Systems, will be appended.

The CEMP will be complemented by the contractor's general procedures, work procedures and operations instructions. These documents will be in place in the site administration offices and at appropriate site locations during the works.

The CEMP is a dynamic document and the contractor will ensure that it remains up to date for the duration of the construction period. The CEMP will be updated during the construction period to include such matters as monitoring results, legislative changes and outcomes of third-party consultations. All of the requirements of the CEMP will be delivered in full by the contractor. The updating of the CEMP by the contractor will not affect the robustness and adequacy of the information presented here and relied upon in the NIS.

The contract documents will require the Contractor to submit the updated CEMP to DLRCC no more than 28 days after receiving notice of the Commencement of Works and at defined intervals thereafter.

1.3 Structure of the CEMP

This CEMP has been structured as follows:

- **Section 1** introduces the proposed development and explains the purpose of the CEMP;
- **Section 2** describes the proposed development;
- **Section 3** lists reference documents used in the preparation of the CEMP
- **Section 4** sets outs the roles and responsibilities of the personnel tasked with managing the environmental requirements;
- **Section 5** outlines the procedures to be employed during construction to manage environmental aspects;
- **Section 6** describes the emergency response measures to be implemented to minimise likely significant negative effects, as far as practicable, during the construction of the proposed development.
- **Section 7** presents the community liaison plan
- **Section 8** presents the spill management measures
- **Section 9** describes the general environmental management measures on the construction site
- **Section 10** presents the mitigation measures for each environmental factor.

2 Description of the Proposed Development and Construction Activities

2.1 Overview

The proposed development will comprise the permanent remedial works for Coliemore Harbour, with a design aim for minimum intrusion. This includes the grouting and infill works, rock anchoring dentition of the voids utilising up to 16 rock anchors and reinstatement of the walkway and parapet as per original. An overview of the proposed development is shown in **Figure 2.1.**

It is recognised that Coliemore Harbour is of major historic importance as it is a Protected Structure. There is also a number of recorded monuments in close proximity to the harbour. Dalkey where the harbour is situated is considered an Architectural Conservation Area (ACA), therefore, it is considered a sensitive landscape which must be accounted for prior to any works in the harbour. The proposed development will provide a permanent solution to safeguard the integrity of the wall while ensuring minimum intrusion of the protected structure.

The proposed development will provide:

- Grouting and rock anchoring dentition of the voids by installing rock anchors from suspended platform via crane located on viewing platform, to ensure the integrity of the structure;
- The resurfacing and reinstatement of the existing walkway to its original condition, for safe use.

Figure 2.1: Overview of the Proposed Development | not to scale

2.2 Construction Activities

The construction program will be carried out over a period of 8 weeks, with specific construction activities outlined below.

2.2.1 Site Preparation

The temporary walkway will be removed, prior to works commencing. Two granite bollards will be removed from the viewing platform for accessibility. A single land traffic closure will be required for approximately four hours during this period. The laydown and works area will be secured.

2.2.2 Pointing

This initial step seals the stone masonry wall as much as possible, with the aim of limiting grout or water leaking from the masonry wall during the compensation grouting. A crane will be setup in a lifting position as shown below in **Figure 2.2**.

The crane will be set up on the adjacent platform and will lift the man basket into position above the rock face, directed by a banksman via 2-way radio communication. After cleaning, the operative will apply lime mortar to the small joints in the masonry wall using a trowel.

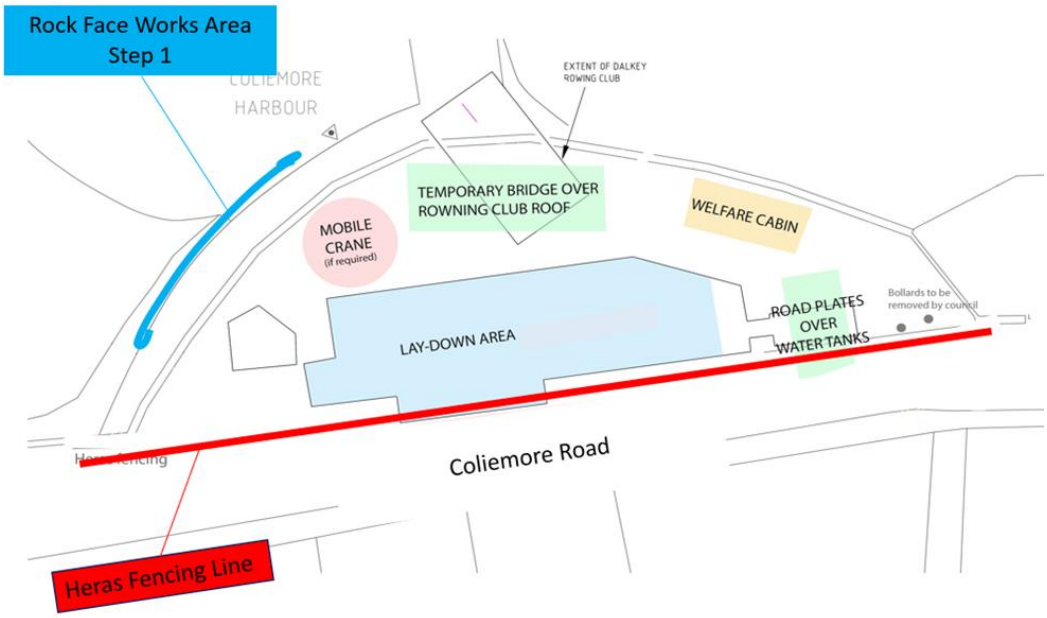

Figure 2.2: Site Set-up

2.2.3 Compensation Grouting

This secondary step fills the voids behind the rock face prior to rock anchor installation.

Grout injection will be carried out from the existing tarmac walkway via vertical holes drilled using a mini piling rig (Technodrill TD 308).

Grouting will be carried out in a bottom-up sequence as follows:

- Stage 1 grouting will be carried out in two rows along the walkway at 2m centres on either side of the walkway and to depth not exceeding 2m.
- Stage 2 grouting will be carried out in similar fashion but a 1 m centres and to depth not exceeding 6m.

Where larger voids are found sand filler will be used within the grout and the drill string will be removed and replaced with a 35mm grout lance. Measures will be taken to ensure that grout losses will be curtailed as far as possible to ensure minimal grout can enter the harbour.

2.2.4 Boring to Depth

The drilling rig is set up over the pin position by positioning the drilling head directly above setup position.

The required depth is achieved by means of rotary percussive driving of the drilling head fitted with rock bit (approximately 85 - 110mm). The “returns” are flushed out from the hole via swivel through the drilling head. This process uses air flushing to target depth to avoid spoil contaminating the surrounding environment / harbour water.

The pre-prepared hollow stem rods of the correct length and size are inserted into the bore holes. The additional lengths will be added in sections. The final depth will be checked by means of checking rod lengths.

2.2.5 Grouting of Pile

Grout is pumped through a hollow stem rod when drilling is completed, injecting grout at the bottom of the hole to displace any water and to ensure that the tendon is completely encased with grout. The grout is mixed in a Putzmeister SP11 mixer and pumped by the pumping operative. The grout pump will be bunded with heavy duty polythene to maintain onsite housekeeping.

The volume of injected grout per borehole will be recorded and noted on the daily report sheet.

If grout is detected to be rising to the top of the borehole, the drill rig operator will immediately direct the grout pump operator to stop pumping, to minimise liquid grout discharged to the surrounding area.

The bottom of walkway will be bunded to catch any flowing grout which escapes the top of the bores. Any escaped grout will be scraped up once it sets at the bund and will be disposed of offsite.

During compensation grouting, the operative will be in a man basket at the rock face, monitoring the rock joints for escaping grout. If grout leakage is detected, the operative will signal for the pumping to cease immediately, and the joint will be re-sealed.

Rods will be withdrawn from position at each location. On completion of all positions, the rock anchor installation can commence.

2.2.6 Installation of Rock Anchors

The purpose of this step is to install tie-back anchors which keep the rock mass in place for the design life duration. The access arrangements to the rock face will be via crane and man basket as outlined in **Section 2.2.1**.

The contractor will core a hole within the granite rock face to enable the headplate and rock anchor to be recessed flush to the rock face.

A cradle-mounted drill will be used to install the inclined anchors. The objective is to bore to depth by means of a rotary percussive drilling head using a compressed air as a flush for the bored materials and then to fill the resultant hole with grout and reinforcement.

The pile diameter is envisaged to be 85-110mm nominal diameter R51N DYWI type hollow stem pile founded with embedment into existing rock.

Boring to depth will be carried out as per **Section 2.2.3**, except the drill rod will be driven by a cradle-mounted unit rather than drill rig.

Grouting of rock anchors will be via standard procedure using natural hydraulic lime mortar mix or a ‘prompt’ mix which is a fast-setting mix to ensure the works set before high waters. Alternatively, a dry grout/resin capsule bored in with drill rod which is activated during drilling, will be used. It is likely the standard procedure will be used and is considered the worst-case option in terms of potential for grout leak/spill.

Once the headplate is installed, a grey olive metal ring will be welded to the top of the bar.

An indicative sketch of the proposed solution is presented on **Figure 2.3.**

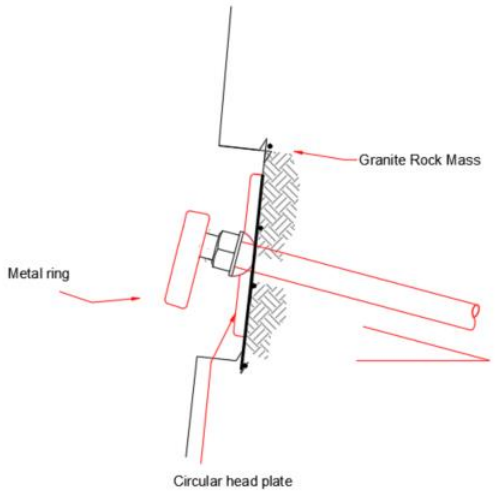

Figure 2.3: Indicative rock anchor sketch | not to scale

2.2.7 Reinstatement

The existing walkway will be resurfaced and reinstated to its original condition, for safe use, post completion of the works.

3 Reference Documents

This section provides a list of the reference documents which are relevant to the environmental management of the construction of the proposed scheme. The documents are divided into two categories, project specific reference documents and general reference and guidance documents.

3.1 Project Specific Reference Documents

The project specific reference documents are:

- Coliemore Harbour Permanent Remedial Works Natura Impact Statement, Scott Cawley (2022)
- Coliemore Harbour Permanent Remedial Works, Environmental Impact Screening (EIA) Screening Report, Arup (2022)

Other project specific reference documents will be included in this section when the contractor further develops the CEMP prior to the commencement of construction. These will include the construction contract documents, grant of planning permission and the conditions attached, the Health and Safety Plan, the Quality Plan and any other relevant project specific reference documentation.

3.2 General Reference and Guidance Documents

The general reference and guidance documents, listed below, indicate the best practice approach to addressing potential significant environmental impacts during construction. The list is non-exhaustive and will be updated by the contractor as some of the standards and documents may be revised or new guidance published prior to or during construction.

- British Standard Institute BS 5228 – 1: 2009 +A1 2014: Code of Practice for Noise and Vibration Control on Construction and Open Sites – Noise.UK Environment Agency PPGs including PPG1, PPG2, PPG5, PPG6 and PPG21 (2009, 2014)
- British Standard Institute BS5837:2012, Trees in relation to design, demolition and construction. Recommendations.
- British Standards Institution PAS 2080:2016 Carbon Management in Infrastructure (2016)
- British Standard Institute BS 4428:1989 Code of practice for general landscape operations (1989)
- Construction Industry, Task Force B4 Report - Recycling of Construction and Demolition Waste (2001)
- CIRIA SP156 Control of water pollution from construction sites – guide to good practice (2002)
- CIRIA C532 Control of Water Pollution from Construction Sites. Guidance for consultants and Contractors (2001)

- CIRIA C584: Coastal and Marine Environmental Site Guide (2003)
- CIRIA C624 Development and Flood Risk – guidance for the construction industry (2004);
- CIRIA C648 Control of Water Pollution from Linear Construction Projects - Site Guide (2006)
- CIRIA C649 Control of water pollution from linear construction projects - Technical guidance (2006)
- CIRIA C741 Environmental good practice on site guide (4th edition) (2015)
- CIRIA C744 Coastal and marine environmental site guide (2nd edition) (2015)
- CIRIA C750 Groundwater control – design and practice (2016)
- CIRIA C762 Environmental Good Practice on Site pocket book (fourth edition) (2015)
- CIRIA X263 Brownfield development sites: ground-related risks for buildings (2002)
- Department of the Environment Heritage and Local Government Best Practice Guidelines for the Preparation of Waste Management Plans for Construction and Demolition Projects (2006)
- Department of Transport, Tourism and Sport Guidelines for Managing Openings in Public Roads (April 2017).
- Department of Transport, Tourism and Sport Traffic Signs Manual – Chapter 8 Temporary Traffic Measures and Signs for Roadworks (August 2019)
- EPA Guidance on Soil and Stone By-products in the context of article 27 of the European Communities (Waste Directive) Regulations 2011 (Version 3; June 2019).
- Inland Fisheries Ireland Guidance on Protection of Fisheries during Construction Works in and adjacent to waters (2016)
- ISO 14001:2015 Environmental management systems -- Requirements with guidance for use (2015)
- Kelleher, C. & Marnell, F Bat Mitigation Guidelines for Ireland: Irish Wildlife Manuals, No. 2' (2006).
- Local Government Management Services Board and Department of Transport Guidance for the Control and Management of Traffic at Roadworks – Second Edition (2010)
- National Roads Authority Guidelines for the Crossing of Watercourses during the Construction of National Road Schemes (2008)
- National Roads Authority Guidelines on the Management of Noxious Weeds and Non-Native Invasive Plant Species on National Road Schemes, Revision 1 (2010)
- National Roads Authority Guidelines on the Management of Waste from National Road Construction Projects, Revision 1 (2014)

- National Roads Authority Guidelines for the Protection and Preservation of Trees, Hedgerows and Scrub Prior to, During and Post Construction of National Road Schemes (2005)
- National Roads Authority Guidelines for the Treatment of Badgers Prior to the Construction of a National Road Schemes (2006a)
- National Roads Authority Guidelines for the Treatment of Bats during to the Construction of National Road Schemes (2008)
- National Roads Authority Guidelines for the Treatment of Otters prior to the Construction of National Road Schemes (2006b)
- Transport Infrastructure Ireland CC-SPW-00600 Specification for Road Works Series 600 -Earthworks (including Erratum No 1, dated June 2013) (2013)
- Transport Infrastructure Ireland GE-ENV-01104 The Management of Invasive Alien Plant Species on National Roads - Standard (2020)
- Transport Infrastructure Ireland GE-ENV-01105 The Management of Invasive Alien Plant Species on National Roads - Technical Guidance (2020)

4 Environmental Management Roles and Responsibilities

4.1 Overview

PJ Edwards & Co. Ltd will include a requirement for the contractor to comply with relevant documents including the NIS and EIA Screening Report, the conditions of the planning permission and other statutory consents, this CEMP and any updates to the CEMP.

As part of the environmental management framework in the construction contract, the contractor will have to comply with all relevant environmental legislation and take account of published standards, accepted industry practice, national guidelines and codes of practice appropriate to the proposed development. Due regard will be given to the guidance and advice given by ISO14001 and Construction Industry Research and Information Association (CIRIA) guidance, listed in **Section 3** above.

PJ Edwards & Co. Ltd will be required to develop and implement an Environmental Management System (EMS) that follows the principles of ISO14001. The EMS will include an environmental policy, and operational, and monitoring procedures to ensure compliance with all environmental requirements and to monitor compliance with environmental legislation and the environmental management provisions outlined in the relevant documents.

4.2 Responsibilities

The environmental management responsibilities assigned to the key roles in the construction phase are described below. It should be noted that these roles will have other responsibilities on the construction project in relation to, for example, health and safety and compliance with quality standards. The Contractor's personnel will include other staff with specific roles such as the site safety officer.

4.2.1 Employer

DLRCC will ensure that competent parties are appointed to undertake construction and that sufficient resources are made available to facilitate the appropriate management of the risks to the environment.

4.2.2 Employer's Representative

Arup are the Employer's Representative (ER) for the project and have the following responsibilities:

- Monitoring compliance with the CEMP;
- Review and approve any updates to the CEMP proposed by the Contractor;

- Inspect the CEMP implementation measures put in place during the weekly site visits to ensure that construction impacts and nuisance on the environment are minimised.
- Supervise the construction of the scheme including monitoring the contractors' performance;
- Oversee the Contractor's liaison with key environmental agencies, the project stakeholders and the public during construction;
- Ensure that the construction is delivered as per the planning drawings and the Contractor's Detailed Design drawings (to be approved) and that the delivery of the proposed development meets the required design and H&S standards, and
- Undertake a final inspection of all reinstated areas at the end of the works following completion of reinstatement.

4.2.3 The Contractor

PJ Edwards & Co. Ltd. (the 'Contractor') will be responsible for the organisation, direction and execution of the construction activities during the construction of the proposed development. The Contractor will be required to undertake all activities in accordance with the relevant environmental requirements including the consent application documents and other regulatory and contractual obligations. The roles and responsibilities of the Contractor's staff in implementing the CEMP are summarised below.

4.2.3.1 Site Manager

A site manager will be appointed by the Contractor to oversee the day-to-day management of the working areas on site and ensure that construction activities are effective, safe, planned and delivered to the highest standards. The site manager will be a suitably qualified, competent and experienced professional who will oversee site logistics, communicate regularly with construction staff, accommodate project-specific inductions for staff on site and ensure that all work is compliant with the relevant design standards and health and safety legislation.

4.2.3.2 Environmental Manager

An environmental manager will be appointed by the Contractor to ensure that the CEMP is implemented effectively. The environmental manager will be a suitably qualified, competent and experienced professional who will perform the necessary tasks, review environmental procedures and consult with the members of the construction team and stakeholders as required. The environmental manager will be required to have a detailed level of knowledge on all aspects of environmental information associated with the proposed development. The environmental manager will be responsible for:

- Reviewing, updating, maintaining and implementing the CEMP;

- Establishing, implementing, and maintaining the EMS in line with ISO 14001 requirements;
- Ensuring that construction is undertaken in accordance with the relevant environmental requirements and that such compliance is adequately recorded and documented;
- Completing a site inspection and compiling an environmental compliance report on a monthly basis;
- Attending site and stakeholder meetings as required;
- Keeping up to date with relevant environmental best practice and legislative changes;
- Liaising with the relevant staff to prepare method statements and relevant plans for all activities where there is a risk of environmental damage;
- Delivering general environmental awareness training and toolbox talks and provide specific environmental briefings prior to all activities
- Ensuring all personnel have undertaken adequate environmental inductions, and awareness briefings and training (including subcontractors);
- Dealing with environmental complaints; and
- Managing and responding to environmental incidents and ensuring that all incidents are recorded and reported in an appropriate manner.

4.2.3.3 Contractor's Employees

The contractor's employees will have the following responsibilities with regard to environmental management on site:

- Complying with the relevant provisions of the CEMP;
- Complying with the directions and requirements given in the site induction;
- Proactively approaching environmental issues whilst on site;
- Reporting any environmental incidents/near misses immediately to the environmental manager;
- Carrying out all activities in line with the environmental procedures and requirements detailed in the CEMP.

4.2.3.4 General Subcontractors

The general sub-contractors will have the following responsibilities with regard to environmental management on site:

- Complying with the relevant provisions of the CEMP;
- Complying with the directions and requirements given in the site induction;
- Following control procedures as instructed;

- Carrying out all activities in line with the environmental procedures and requirements detailed in the CEMP;
- Reporting any environmental incidents/near misses immediately to the environmental manager.

4.2.3.5 Environmental Specialists Engaged by the Contractor

To fulfil its obligations under the CEMP and to support the environmental manager, the contractor will be required to engage suitably qualified and experienced professionals including the following competent experts:

- Archaeology and architectural heritage specialist; and
- Ecologist.

These specialist subcontractors will have the following responsibilities with regard to environmental management on site:

- Complying with the relevant provisions of the CEMP;
- Complying with the directions and requirements given in the site induction;
- Carrying out all activities in line with the environmental procedures and requirements detailed in the CEMP;
- Reporting any environmental incidents/near misses immediately to the environmental manager.

4.3 Contact Details

When the roles listed above have been assigned, contact details for the relevant personnel will be included in the CEMP. The contact details are required primarily in order to ensure a rapid response to, and the efficient reporting of, environmental incidents. The contact details will be maintained up to date. There will be three categories of contact details, (i) contractor's personnel, (ii) DLRCC contacts and (iii) statutory and third-party contacts. The contact details will include the organisation, job title, name, mobile phone number and email address of the relevant person.

5 Environmental Management Procedures

5.1 Training, Awareness and Competence

PJ Edwards & Co. Ltd. construction staff and their subcontractors are required to hold the relevant qualifications and experience to construct the project. The Contractor will be required to employ construction staff with the skills, qualifications and experience appropriate to the needs of the works to be carried out.

The Contractor will be required to provide a site induction to all construction staff before they commence work on site. The Contractor will identify specific training needs for the construction workforce and will ensure that appropriate training requirements are fulfilled.

The Contractor will be required to establish an Environmental Training and Awareness Programme and ensure that all personnel receive adequate training prior to the commencement of construction activities. A baseline level of environmental awareness will be established through the site induction programme. Key environmental considerations and objectives will be incorporated into this induction. Specifically, site inductions will cover the following as a minimum:

- Introduction to the environmental manager;
- Description of the CEMP requirements and consequences of non-compliance;
- The requirement of due diligence and duty of care;
- Overview of the conditions attached to the consents, permits and licences;
- Requirements associated with community engagement and stakeholder liaison;
- Identification of environmental constraints and notable features within the site; and
- Procedures associated with incident notification and reporting, including procedures for dealing with damage to the environment.

Nobody will work on site without first receiving the environmental induction. Signed records of environmental training received will be established, maintained and made available to the employer's representative.

Site briefings and toolbox talks will be carried out on a regular basis to ensure that construction staff have an adequate level of knowledge of the relevant environmental issues and community relations requirements and can effectively follow the environmental control procedures throughout construction period.

5.2 Meetings

The environmental manager will be responsible for arranging and holding meetings and site walkovers. The environmental manager will prepare minutes of the meetings and distribute them appropriately.

5.3 Monitoring

5.3.1 Monitoring

Mitigation and monitoring will be carried out in accordance with the requirements of the NIS and EIA Screening so that construction activities are undertaken in a manner that does not give rise to significant negative effects. Prior to construction monitoring proposed in the NIS and EIA Screening and in **Section 9** below will be modified as required to incorporate conditions attached to the planning permission and will be documented in the CEMP.

The results of all environmental monitoring activities will be reviewed by the environmental manager on an ongoing basis to enable trends or exceedance of criteria to be identified and corrective actions to be implemented as necessary. The Contractor will be required to inform the employer's representative of any continuous exceedances of criteria.

5.3.2 Corrective Actions

5.3.2.1 Overview

Corrective actions are measures to be implemented to rectify any non-conformances (i.e., exceedance of criteria or targets) identified during monitoring.

In the first instance, an investigation will be undertaken by the environmental manager to identify the cause of any non-conformances. Appropriate remedial measures will be identified and implemented as soon as practicable to prevent further exceedances. If necessary, the appropriate statutory authority and stakeholders will be notified.

Where new or amended measures are proposed, the CEMP will be updated accordingly by the environmental manager and the employer's representative will be informed at the earliest opportunity.

5.3.2.2 Corrective Actions' Reports

A corrective actions' report will be prepared on foot of any non-conformances identified during environmental monitoring. The corrective actions report will describe in detail the cause and effect of a non-conformance on site and describe the recommended corrective action that is required to remedy it.

An appropriate timeline for closing out the corrective actions will be identified by the contractor in the updated CEMP, as well as arrangements for the environmental manager to verify the corrective actions' report and, if appropriate, inform the appropriate authorities and stakeholders in a timely manner.

5.4 Environmental Compliance Report

The Contractor will be required to submit a monthly environmental compliance report to the employer's representative for review and approval. The report shall address the following as a minimum:

- Summary of compliance with the CEMP including identification of any non-conformances;
- Interpretation of the results of ongoing monitoring;
- Detailed description of any issues and/or non-conformances identified during inspections;
- Record of incidents and corrective actions, including corrective actions reports as appropriate;
- Synopsis of environmental complaints received / queries raised by stakeholders; and
- Records of environmental training undertaken as appropriate.

5.5 Environmental Records

The Contractor will maintain records of all environmental documents including monitoring, test results, method statements and plans. All records will be kept up to date and be made available for inspections and periodical reporting. The contractor will maintain the following environmental records, as a minimum, which will be made available for inspection to the employer's representative and the relevant authorities, if required:

- Management plans;
- Records of environmental incidents;
- Monthly environmental reports;
- Records of environmental training;
- Register of environmental complaints;
- Corrective actions' reports;
- Environmental inspections;
- All monitoring data;
- Waste and chemical inventories; and
- Health and safety records.

6 Emergency Response Plan

6.1 Overview

Emergency incidents are those occurrences that give rise to significant negative environmental effects including but not limited to the following:

- Any malfunction of a mitigation measure and/or environmental protection system;
- Any emission that does not comply with the requirements of the contract and relevant licences;
- Any circumstance with the potential for environmental pollution; or
- Any emergency that may give rise to environmental effects (e.g., significant spillages or fire outbreak).

Sections 6.2 and **6.6** below describes the mitigation measures which will be in place to minimise the risk of emergency incidents.

6.2 Emergency Response Plan

A set of standardised emergency response procedures will govern the management of emergency incidents. The contractor will be required to provide further detail of emergency response procedures in the updated CEMP, prior to construction, and to develop further this Emergency Response Plan.

The further detail, to be provided by the contractor, will include emergency phone numbers and the method of notifying local authorities, statutory authorities and stakeholders. Contact numbers for key site personnel will also be included. The contractor will be required to ensure that all personnel on site are familiar with the emergency arrangements.

In the case of work required in an emergency, or which if not completed would be result in a situation which would be unsafe or harmful to workers, the public or the local environment, DLRCC will be informed as soon as reasonably practicable of the reasons and likely duration. Examples of such a situation include where the ground needs stabilising if unexpected ground conditions are encountered, or where the grouting activities take longer than anticipated due to delayed deliveries or equipment failure.

In the event of an emergency incident occurring, the contractor will be required to investigate and provide a report including the following, as a minimum:

- A description of the incident, including location, the type and quantity of contaminant and the likely receptor(s);
- Contributory causes;
- Adverse effects;
- Measures implemented to mitigate the adverse effects; and

- Any recommendations to reduce the risk of similar incidents occurring.

The contractor will consult with the relevant statutory authorities and stakeholders such as the Health and Safety Authority, the DLRCC Fire Services, the HSE Ambulance Service, the EPA, and utility companies as required when preparing and developing response measures. If any sensitive environmental receptor is impacted, the appropriate environmental statutory authorities will be informed and consulted.

The response measures will be incorporated into the updated Emergency Response Plan that will be disseminated to construction staff and the employer's representative.

6.3 Emergency Access

The contractor will be required to maintain access routes for the emergency services in all work areas for the duration of the construction phase and to identify the emergency site access points to each work area.

These will be developed in consultation with the emergency services and documented by the contractor, as part of the updated CEMP prior to construction commencing, as well as being identified in the update Emergency Response Plan.

6.4 Extreme Weather Events and Flood Risk

The contractor will consider the impacts of extreme weather events, flood risk and related conditions during construction. The contractor will be required to use the short to medium range weather forecasting service from Met Eireann, or other approved meteorological data and weather forecast provider, to inform short to medium term scheduling of the works, environmental controls and mitigation measures.

The updated CEMP will include appropriate contingency measures to manage extreme weather events. The measures will include training of personnel and prevention and monitoring arrangements.

6.5 Fire and Explosion Risk

Even though the fire and explosion risk during construction are very low, the updated CEMP will include appropriate contingency measures to manage such risks. The measures will include training of personnel in fire and explosion risk awareness, prevention and monitoring. Portable fire extinguishers will be available for use at each of the working areas. Potentially flammable or hazardous substances will be stored appropriately and quantities stored will be limited to the minimum volume required to meet the immediate requirements.

Appropriate site personnel will be trained as first aiders and fire marshals. Monitoring of site activities to minimise fire and explosion risk will be a key part of the duties of the site safety officer and fire marshals.

6.6 Incident Investigation Reports

The contractor will inform the employer's representative of all emergency incidents immediately and prepare an initial report within 24 hours setting out the details of the incident and cause(s) if known. The contractor will be required to complete an environmental incident report and any further documentation requested by the employer's representative in relation to the incident within seven days of the incident occurring. The contractor will respond to all comments made by the employer's representative on any incident.

The environmental incident report will contain details of the incident including the location, known and suspected causes and weather conditions. It will define the scale and effects (short, medium, long term, temporary/permanent) as well as required corrective actions and mitigation/ remediation/compensation measures (as appropriate).

7 Community Liaison Plan

7.1 Community Liaison Plan

DLRCC recognises the importance of effective community liaison in order to ensure public safety and welfare during the works, to reduce nuisance to residents and the local community, and to help ensure the smooth running of construction activities. To this end, this Community Liaison Plan has been prepared. The purpose of this plan is to ensure good relations with the neighbouring community. Key aims of the Plan are to:

- Provide frequent and timely information to the public during the construction phase, (particularly to nearby residents and building occupants);
- Appointment of a Liaison Officer as a single point of contact to engage with the local community and respond to concerns;
- Keeping local residents and businesses informed of progress and timing of particular construction activities that may impact on them;
- Provide the correct points of contact and be responsive to queries and complaints; and
- Ensure good housekeeping in all aspects of the operations on site to minimise nuisance.

The contractor will take all reasonable steps to engage with stakeholders in the local community, focusing on those who may be affected by the construction works including nearby residents, businesses, community resources and specific vulnerable groups.

Communication with the local community, and other relevant stakeholders will be undertaken at an appropriate level and frequency throughout construction. The Community Liaison Plan will be updated by the contractor prior to construction and will specify obligations in relation to community and stakeholder engagement that the contractor must adhere to. Where communications are related to environmental issues, the environmental manager will be involved, if appropriate.

A significant part of the plan is the ‘good neighbour’ policy. Key aspects of this policy include:

- Implementation of the policy from the commencement of construction;
- Providing a point of contact for queries and complaints;
- Minimising causes of nuisance;
- Maintaining access to neighbouring premises;
- Clear and concise information, distributed widely and updated frequently; and
- Undertaking timely liaison with stakeholders.

With regard to liaison, the contractor will be required to comply with the Plan and develop it further with additional information, which will include providing the details of how the local community, road users and affected residents will be notified in advance of the scheduling of the temporary traffic diversions and the progress of the construction works.

Details of the available communication channels/points of contact for members of the public to contact the project team during construction will be established in advance of the commencement of construction and displayed around working areas. The contractor's additional details will include the following:

- Contractor's community relations policy;
- Personnel nominated to manage community relations, including the Community Liaison Officer;
- A methodology for processing observations, queries and complaints from the general public, relevant authorities, the media and emergency services; and
- The strategy for project-wide liaison with all relevant parties.

7.1.1 Advance Notice of Works

The contractor will ensure that local residents, businesses, occupiers, general users of the area and stakeholders are informed in advance of construction activities that may affect them. The contractor's detailed procedures and the responsible personnel will be identified in the CEMP, when it is updated by the contractor prior to construction.

All notifications will detail the nature of the works, estimated duration and working hours. All notifications will include a project-specific contact number to which any enquires can be directed. The contractor will be responsible for preparing and issuing the notifications subject to the relevant approval and consents.

7.1.2 Enquiries and Complaints

The contractor will establish a process for handling all enquires including complaints. All enquires will be recorded and a log will be maintained to include details of the response and action taken. The log will be available for inspection if requested by DLRCC. All observations, queries and complaints will be dealt with in a timely manner.

The complaints log will include details of

- Name and address of complainant
- Time and date complaint was made
- Characteristics, such as noise rumble, clatters, intermittent, etc.
- Likely cause or source of nuisance
- Weather conditions, such as wind speed and direction

- Investigative and follow -up actions

The employer's representative and the environmental manager will be immediately informed of any environmental-related issues that have been raised.

8 Spill Management Plan

8.1 Grout Management

8.1.1 General

Grouting works will be undertaken from a suspended man basket via crane located on the viewing platform. This will facilitate operatives to manually carry out the works on the seaward side. The grouting works will be carefully planned to minimise spillage into the harbour.

As the bedrock and harbour wall is exposed during low waters this work can be programmed within suitable tide times. Grouting of rock anchors will be via standard procedure using natural hydraulic lime mortar mix or a ‘prompt’ mix which is a fast-setting mix to ensure the works set before high waters. It is likely the standard procedure will be used and is considered the worst-case option in terms of potential for grout leak/spill.

Alternatively, a dry grout/resin capsule bored in with drill rod which is activated during drilling, will be used. The capsule, if used, would further reduce the risk of liquid grout leaking or spilling to the seawater. It will be determined by detailed design if this option can be used.

The volume of injected grout per borehole will be recorded and noted on the daily report sheet. Immediately when grout is detected to be rising to top of borehole, the drill rig operator will direct the grout pump operator to stop pumping, to minimise the liquid grout discharged to the surrounding area. The bottom of the walkway will be bunded to catch any flowing grout which escapes to the top of the bores. Any escaped grout will be scraped from the bund once it sets and will be disposed of offsite to a permitted facility by a licenced contractor.

8.1.2 Pointing

During this first step, as much work as possible will be carried out with manually applied lime mortar mix. This pointing will seal any open joints in the stone masonry wall above the rock.

A natural hydraulic lime mortar mix or a ‘prompt’ mix which is a fast-setting lime mortar mix to ensure the works set before high water. The mortar mix will be mixed on viewing platform and carried in a bucket into works man basket by operative. The mixing area will be bunded with heavy duty polythene to maintain housekeeping. To further prevent accidental spill or leaks of lime mortar into the sea during pointing works, either a toe board connected to the front of the man basket or hessian cloth secured to the seaward face of the wall can be provided.

Prior to pointing, vegetation will be removed and the jointed raked out and cleaned. Missing stones in the wall face will be replaced where possible to limit the amount of lime mortar required.

8.1.3 Compensation Grouting

The grouting mix will be mixed on viewing platform. The mixing area will be bunded with heavy duty polythene to maintain housekeeping.

During compensation grouting, operative will be in a man basket monitoring for escaping grout. If grout leakage is detected, operative will direct pump to cease immediately and joint will be resealed locally.

Care will be taken to make sure grout egressing from top of the borehole locations is collected and not allowed to enter the harbour. This will be achieved by bunding the bottom of walkway to prevent escape of surface runoff grout into harbour. The bunded grout will be allowed to set, then scraped up once in solid form and disposed of offsite by a licenced contractor.

If grout is detected to be rising to the top of the borehole, the drill rig operator will immediately direct the grout pump operator to stop pumping, to minimise liquid grout discharged to the surrounding area.

8.1.4 Grouting of Installed Rock Anchors

During this step, the contractor will use a natural hydraulic lime mortar mix which will be fast-setting (or potentially grout/resin capsules) to minimise quantity and duration of liquid grouting and risk of escaped liquid. The specific grouting solution will be confirmed in detail design.

8.1.5 Ecological Designated Sites Protection

The proposed development does not overlap with any European sites. The nearest European site to the proposed development is Dalkey Islands Special Protection Area (SPA), c. 93m east. The next nearest European site to the proposed development is Rockabill to Dalkey Island Special Area of Conservation (SAC) located c. 183m east. The proposed development is also hydrologically connected to European sites in Dublin Bay, including South Dublin Bay SAC, North Dublin Bay SAC, South Dublin Bay and River Tolka Estuary SPA, North Bull Island SPA, Howth Head Coast SPA, Baldoyle SPA and Ireland's Eye SPA. The proposed development site overlaps with Killiney Hill pNHA.

The potential impacts on these ecologically sensitive sites will be addressed during construction through the following procedures:

- Fast-setting grout or mortar will be used.
- Bunds will be installed where practical, at bottom of walkway site to contain surface runoff to the seawater.
- A licenced waste collector will remove the accumulated wastewater off site and this will be confirmed by the Contractor to DLRCC with appropriate documentation retained.
- Measures will be put in place on the site compound, such as drip trays, spillkits and lined wastewater skips.

8.2 Pollution Control and Spill Prevention

Fuel/oil spillages can only occur on viewing platform or walkway, based on envisaged logistics. The Contractor will ensure that the following procedures are in place to control and/or prevent spills:

- Emergency response awareness training for all personnel on-site works.
- Grout machine, pressure washer and any fuel/oils on viewing platform laydown area will be stored in drip trays.
- Appropriate and sufficient spill control materials will be installed at strategic locations within the site. Spills kits for immediate use will be kept in on viewing platform.
- Spill kits must include suitable spill control materials to deal with the type of spillage that may occur and where it may occur. Typical contents of an on-site spill kit will include the following as a minimum;
    - Absorbent granules;
    - Absorbent booms; and
    - Absorbent mats/cushions.
- Potentially contaminated run off from plant and machinery on walkway will be contained by bunded area at end of walkway catching surface runoff. This will be disposed of offsite.
- Damaged or leaking containers will be removed from use and replaced immediately.
- Wastewater will be generated from washing out of pumps each evening after grouting. This will be collected in lined skip onsite and disposed of offsite.

8.3 Incident management

Should an environmental incident occur on-site the Contractor will record the event on an Environmental Incident Record. These records will include the following:

- Any malfunction of any environmental protection system,
- Any occurrence with the potential for environmental pollution,
- Any emergency.

The Environmental Incident Record will include relevant details associated with the incident and recommend measures which will prevent a similar incident occurring in the future.

The effectiveness of the amendments to the procedures and plans will be verified by the environmental site manager. A list of contact details for relevant personnel e.g., DLRCC, the local fire station etc. will be maintained in the site office. Access to the emergency phone list will be made available to all members of staff. The Contractor's staff will be informed of the emergency phone list at the tool-box talks.

9 General Site Management Requirements

9.1 Overview

As detailed in **Section 1**, the CEMP will be updated by the Contractor, who will include any specific conditions attached to the planning approval and other more detailed information available at the time, based on the contract requirements and the contractor's works proposals.

It will be the responsibility of the Contractor to ensure compliance with the CEMP and to avoid and/or reduce significant adverse effects on the environment that have been identified, where practicable. Where the Contractor diverts from the methodology outlined in the NIS and/or defined in the planning approval and its associated conditions, it will be the responsibility of the Contractor to obtain the relevant licenses, permits and consents for such changes.

9.2 Good Housekeeping

The Contractor will ensure "good housekeeping" at all times. This will include, but not necessarily be limited to, the following:

- General maintenance of working areas and cleanliness of welfare facilities and storage areas;
- Provision of site layout map showing key areas such as first aid posts, spill kits, material and waste storage and welfare facilities;
- Maintaining all plant, material and equipment required to complete the construction work in good order, clean, and tidy;
- Keeping construction compounds, access routes and designated parking areas free and clear of excess dirt, rubbish piles, scrap wood, etc. at all times;
- Provision of signs giving details of site management contact numbers, including out of hours, and public information at the boundaries of the working areas;
- Provision of adequate welfare facilities for site personnel;
- Installation of appropriate security, lighting, fencing and hoarding at each working area;
- Effective prevention of oil, grease or other objectionable matter being discharged from any working area;
- Provision of appropriate waste management at each working area and regular collections to be arranged;
- Prevention of infestation from pests or vermin including arrangements for regular disposal of food and material attractive to pests. If infestation occurs the contractor will take appropriate action to eliminate and prevent further occurrence;

- Maintenance of wheel washing facilities and other contaminant measures as required in each working area;
- No discharge of site runoff or water discharge without agreement of the relevant authorities;
- Prohibition of open fires at all times;
- Use of less intrusive noise alarms, which meet the safety requirements, such as broadband reversing warnings, or proximity sensors to reduce the requirement for traditional reversing alarms;
- Maintenance of public rights of way, diversions and entry/ exit areas around working areas for pedestrians and cyclists where practicable;
- All loading and unloading of vehicles will take place off the public highway wherever this is practicable; and
- Material handling will be appropriately located to minimise exposure to wind. Water misting or sprays shall be used as required if particularly dusty activities are necessary during dry or windy periods.
- Any empty cement bags will be disposed of in site skip and grout pump will be bunded with heavy duty polythene to maintain onsite housekeeping.

9.3 Hours of Work

9.3.1 Core Working Hours

The construction program will take place over a period of 8 weeks. The proposed core construction working hours (subject to agreement as part of the Road Opening License Process) for the proposed development will be:

- 8am to 6pm , Monday to Friday;
- 8am to 2pm on Saturdays, and;
- No works on Sundays and Public holidays

Drilling works will be carried out within these periods as required, dependent on the suitability of the tides.

All rock breaking/fracturing activities and pile driving will be undertaken during daytime hours. The removal of waste material off site by road and regular deliveries to site will be confined to daytime hours, from 10am to 4pm outside of peak traffic hours, where feasible.

9.3.2 Start-up and Shut-down

The Contractor may require a period of up to one hour before and one hour after core working hours for start-up and shut down activities in working areas. Activities permitted may include deliveries and unloading of materials, movement of staff to their place of work, maintenance and general preparation works. Excepted as noted in **Section 9.3.3** below, the use of plant or machinery likely to cause disturbance, will not be permitted outside of the core working hours.

9.3.3 Additional Working Hours

It may be necessary, for example, due to weather constraints, specialist subcontractor availability or the nature of the activity, to undertake certain activities outside of the construction core working hours. Any construction outside of the construction core working hours will be agreed by the Contractor in advance with DLRCC and scheduling of such works will have regard to nearby sensitive receptors, who will be notified in advance.

In the case of work outside of the core working hours required in an emergency or which if not completed would be result in an unsafe or harmful situation for workers, the public or local environment, DLRCC will be informed as soon as reasonably practicable of the reasons and likely duration and timing.

In the case of works outside of the core working hours, any night works involving high level of noise should be carried out between 7pm and 11pm.

9.4 Site Security

The security of the works areas will be the responsibility of the Contractor who will provide adequate security to prevent unauthorised entry to or exit from any working areas. The following measures may be used to prevent unauthorised access:

- Installation CCTV and alarm systems where required;
- CCTV and security systems will be sited and directed so that they do not intrude into occupied residential properties;
- When there is no activity on site, closed and lock site gates and appropriate site security provisions;
- Consultation with neighbouring properties and local crime prevention officers including DLRCC and An Garda Síochána on site security matters as required; and
- Prevention of access to restricted areas and neighbouring properties by securing equipment on site such as scaffolding and ladders.

9.5 Hoarding and Fencing

A site boundary in the form of Heras fencing will be established around the working area before any significant construction activity commences in that working area. The fencing will be a minimum of 2.4m high to provide a secure boundary.

The Heras fencing will be typical of that used on most construction sites.

The following measures will be applied in relation to hoarding and fencing:

- Adequate fencing will be installed to prevent unwanted access to working areas and screening, and site security where required;

- Appropriate sight lines/visibility splays will be maintained around accesses to working areas from the public road to ensure safety of both vehicles and pedestrians is preserved;
- Display information boards will be provided with out of hours contact details, a telephone helpline number for comments/complaints and information on the works;
- Notices to warn of hazards on site such as construction access will be installed on site boundaries; and
- Hoarding and fencing will be maintained free of graffiti or posters.

9.6 Services and Lighting

9.6.1 Services and Utilities

Site services will be installed as part of the enabling works. Working areas will be powered preferably by mains supplies and by diesel generators where an electrical supply is not available.

9.6.2 Lighting

Site lighting will typically be provided by tower mounted temporary portable construction floodlights. The floodlights will be cowled and angled downwards to minimise spillage to surrounding properties. The following measures will be applied in relation to site lighting:

- Lighting will be provided with the minimum luminosity sufficient for safety and security purposes. Where practicable, precautions will be taken to avoid shadows cast by the site hoarding on surrounding footpaths, roads and amenity areas;
- Motion sensor lighting and low energy consumption fittings will be installed to reduce usage and energy consumption; and
- Lighting will be positioned and directed so that it does not to unnecessarily intrude on adjacent buildings and land uses, ecological receptors and structures used by protected species, nor cause distraction or confusion to motorists.

9.6.3 Welfare Facilities

Welfare facilities will be provided, as appropriate, for construction staff and site personnel. The welfare facilities will be located at the temporary works area.

Drinking Water

Potable water will be transported via tanker to site or via large bottles. Typically, one delivery each week will be required for the provision of potable water.

Grey Water

Grey water for non-drinking purposes (construction and toilets) will be sourced via rainfall collection or transported via tanker to site.

Wastewater

Sanitary wastewater will be collected and stored on site in holding tanks, which will be emptied on a regular basis (typically bi-weekly) by licensed contractors and disposed of appropriately.

9.6.4 Deliveries to Site

Deliveries of materials will be planned and programmed to ensure that the materials are delivered only as they are required at the working areas. Storage of material will be at the supplier premises or at the temporary working area, depending on the type of material.

Works requiring multiple vehicle deliveries, will be planned so as to ensure queuing on the public roads around the working areas will be avoided as far as is practical.

Deliveries will, where feasible, be limited to outside of peak traffic hours on the local road network.

9.7 Reinstatement of Working Area on Completion

The Contractor will reinstate the working area post construction. All plant, equipment, materials, temporary infrastructure and vehicles will be removed at the earliest opportunity and the area restored as near as practicable to its original condition.

9.8 Health and Safety

The Contractor will be required to ensure all relevant health and safety, fire safety and security requirements are in place prior to the commencement of construction and in accordance with relevant legislative requirements in addition to the specifications of DLRCC.

Relevant Irish and EU health and safety legislation will be complied with at all times by all construction personnel during construction.

9.9 General Environmental Control Measures

Steps will be taken to reduce the probability of an incident, such as an accidental release, occurring and to also reduce the magnitude of any incident. These measures will include a combination of good site environmental management procedures, including additional precautions when operating machinery close to the harbour, staff training, contingency equipment and emergency plans.

All operatives will be informed of the relevant measures prior to starting on site. The environmental impact of these works is very significant to DLRCC and the community. Considerable attention will be given to the containment of all deleterious materials entering the harbour or injuring the amenity. In addition to risk assessment, the below measures will be undertaken.

Key measures identified to reduce the risk of pollution, erosion and sedimentation into the harbour include:

- Potential pollutant or hazardous substances will be adequately secured against vandalism and stored in accordance with appropriate codes of best practice;
- Oil and chemical storage will be in bunded areas and quantities stored will be limited to the minimum volume required to serve immediate needs with specified delivery and refuelling areas. All bunded storage areas will be a minimum distance of 10m away from the harbour;
- A designated bunded refuelling area on an impermeable surface will be provided at all construction compounds, again at a minimum distance of 10m away from the harbour;
- No vehicles will be left unattended when refuelling;
- Emergency spill kits including an oil containment boom and absorbent pads will be retained onsite at sensitive locations all the time work is under way;
- Should an incident be identified, work will cease and measures to contain and/or remove the pollutant will be identified;
- Silt traps will be employed and maintained in appropriate locations;
- All concrete mixing and batching activities will be located in areas away from the harbour;
- Grouting works will be carried out at low tide where possible and will be strictly controlled and monitored;
- No grout material washout will be allowed to discharge to the harbour.
- Care will be taken when cleaning out (‘blowing out’) grout lines, ensuring nobody is near the end of the line when blowing out and when disconnecting lines, ensuring no pressure is present (the pressure is released through the compressor);
- The pumpman to wear gloves, face mask and glasses at all times to prevent skin, lung and eye irritation from dust;
- When working from the suspended platform over water the appropriate PPE will be worn and specific risk assessments will be adhered to; and
- The drill rig driver and crew to wear hearing protection during drilling, in addition to standard PPE.

9.9.1 Response to a Spill or Leak

Every effort will be made to prevent pollution incidents associated with spills and leaks during the construction of the proposed development.

The risk of oil/fuel spillages will exist on the site and any such incidents will require an emergency response. The following steps describe the procedure to be followed in the event of an oil/fuel spill occurring on site:

- Identify and stop the source of the spill and alert people working in the vicinity;
- Notify the environmental manager immediately giving information on the location, type and extent of the spill so that she/he can take appropriate action;
- If applicable, eliminate any sources of ignition in the immediate vicinity of the incident;
- Contain the spill using the spill control materials, track mats or other material as required. Do not spread or flush away the spill;
- Clean up as much as possible of the spilled substance using the spill control materials;
- Collect all used spill control material and dispose of it appropriately using a fully licensed waste contractor with the appropriate permits so that further contamination is limited;
- The site compound fuel storage areas and cleaning areas will be rendered impervious and will be constructed to ensure no discharges will cause pollution to surface, coastal or ground waters;
- Designated locations for refuelling are within the site compound.

The environmental manager will inspect the site as soon as practicable following a spill and will ensure that the necessary measures are in place to contain and clean up the spill and prevent further spillage from occurring. The environmental manager will notify the appropriate stakeholders such as DLRCC, Department of the Environment, Climate and Communications and Department of Housing, Local Government and Heritage and/or the EPA.

10 Environmental Commitments

10.1 Introduction

The mitigation measures to reduce the impacts on the environment to a practical minimum and mitigation measures which are specified in the CEMP, which are additional to those described in **Sections 5** to **9** above, are described below.

10.2 Biodiversity

The employment of good construction management practice, as described in **Sections 5** to **Section 9** above and in this section, will minimise the risk of adverse impacts on the biodiversity during the construction phase.

10.2.1 General Mitigation for Biodiversity

Every effort will be made to ensure that any significant environmental effects will be avoided, prevented or reduced during the construction phase of the proposed development.

All personnel involved with the proposed development will receive an on-site induction relating to operations and the environmentally sensitive nature of European sites and to re-emphasise the precautions that are required as well as the precautionary measures to be implemented. The workforce, including all subcontractors, will be suitably trained in pollution risks and preventative measures, as described in **Section 8** above.

All staff and subcontractors will have the responsibility to:

- Work to agreed plans, methods and procedures to eliminate and minimise environmental impacts,
- Understand the importance of avoiding pollution on-site, including noise and dust, and how to respond in the event of an incident to avoid or limit environmental impact;
- Respond in the event of an incident to avoid or limit environmental impact;
- Report all incidents immediately to the environmental manager;
- Monitor the workplace for potential environmental risks and alert the environmental manager if any are observed; and
- Co-operate as required, with site inspections.

10.2.2 Mitigation – Water Quality During Construction

The employment of good construction management practices will serve to minimise the risk of pollution of soils, groundwater or surface water during construction.

The Construction Industry Research and Information Association (CIRIA) in the UK has issued a guidance note on the control and management of water pollution from construction sites, *Control of water pollution from construction sites. Guidance for consultants and* contractors (C532). CIRIA. H. Masters-Williams et al (2001) and *Control of water pollution from linear construction projects. Technical guidance (C648).* CIRIA. E. Murnane, A. Heap and A. Swain. (2006)

A set of standardised emergency response procedures will govern the management of emergency incidents, as outlined in the Emergency Response Plan in **Section 6** above. A detailed spillage response procedure will be put in place which is described in **Section 8** above.

Measures, as recommended in the guidance above, that will be implemented to minimise the risk of spills and contamination of soils and waters, include:

- All vehicles and plant will be regularly inspected for fuel, oil and hydraulic fluid leaks.
- Collection systems will be used to prevent any contaminated drainage entering surface water drains, watercourses or groundwater.
- The use of cleaning chemicals will be minimised.
- All staff will be trained and will follow vehicle cleaning procedures. Details of the procedures will be posted in the work area for easy reference.
- All the contractor's workforce will be trained with respect to the relevant procedures to be undertaken in the event of the release of any sediment or hydrocarbons into a watercourse.
- Works will be suspended during severe rainfall or flood events or when such events are forecast. This will make all activities and measures easier to implement and manage and will limit the potential for generation of sediment laden runoff.

Specific environmental control measures for construction run off and accidental spills to minimise the risk of the pollution of waters or the contamination of groundwater are described in **Section 8.**

10.2.3 Protection of Habitats

Works associated with the proposed development will not take place during the breeding bird season (March-August inclusive), to avoid any potential disturbance/displacement impacts on breeding tern species as a result of construction.

There will be a defined working area which will be fenced off to prevent inadvertent damage to adjoining habitats.

10.3 Surface Water Management Plan

10.3.1 Introduction

The employment of good construction management practice, as the mitigation measures will prevent impact on water quality described in in this section, will minimise the risk of adverse impacts on the hydrological regime, water quality and flood risk in the construction phase.

10.3.2 General Mitigation

Specific environmental control measures to minimise the effect on the hydrological regime, water quality and flooding, which will be implemented, include:

- Good housekeeping (site clean-ups, use of disposal bins, etc.) will be implemented on the site;
- No materials will be stored in areas which would impede flood flow paths;
- Weather warnings will be monitored during construction to ensure that there is no flood risk to construction workers. A risk assessment will be carried out in the case of a weather warning to determine what works can proceed, and what works need to be postponed;
- Road run-off will be channelled, to avoid potential ponding on roads during construction; and
- The temporary foul drainage at the construction compounds and works areas will comprise self-contained sanitary facilities, with wastewater stored and removed off-site to appropriately licensed treatment facilities.
- The required bore depth is achieved using air flushing to target depth to avoid spoil contaminating the surrounding environment / harbour water.

10.3.3 Monitoring of Construction Phase Mitigation Measures

Visual monitoring will be undertaken as part of the regular site inspections, during the construction of the proposed development to ensure existing surface water drainage runoff and natural infiltration to ground is not affected by the proposed development.

10.4 Land and Soils

The employment of good construction management practice, as described in **Section 5** to **Section 9** above and in this section, will minimise the risk of adverse impacts on the land and soils during the construction phase.

10.4.1 Runoff Control

Operations will be carried out such that surfaces will utilise adequate falls, profiling and drainage to promote safe runoff and prevent ponding and flooding.

Runoff will be controlled through control structures and spill control materials appropriate to minimise the water impacts. Care will be taken to ensure that surfaces are stable to minimise erosion. Measures to control runoff will comply with the requirements of **Section 8** above.

10.4.2 Surrounding Ground

Ground settlement, horizontal movement and vibration monitoring will be implemented during construction activities to ensure that the construction does not exceed the design limitations. Ground settlement will be controlled through the selection of construction methods which are suitable for the particular ground conditions.

10.4.3 Pollution of groundwater

Measures to be implemented to minimise the risk of spills and contamination of waters are described in **Sections 8** and **10.3** will also minimise the risk of pollution of groundwater.

10.4.4 Monitoring during construction

Movement monitoring shall be carried out during any activities which may result in ground movements or movements of the existing structure.

During grouting works, an operative will be in a man basket at the rock face, monitoring the rock joints for any escaping grout. If grout leakage is detected, the operative will signal for pumping to cease immediately, and the joint will be re-sealed.

10.5 Construction Waste Management Plan

10.5.1 Introduction

This Construction Waste Management Plan (CWMP) has been prepared having regard to the Department of Environment, Heritage & Local Government (2006) *Best Practice Guidelines for the Preparation of Waste Management Plans for Construction and Demolition Projects*, EPA (2021) *Best Practice Guidelines for the Preparation of Waste Management Plans for Construction and Demolition Projects - Draft for Public Consultation* and National Roads Authority (2014) *Guidelines on the Management of Waste from National Road Construction Projects, Revision 1*.

The contractor will further develop, implement and maintain the CWMP during the construction phase. The CWMP addresses:

- Waste management
- Waste minimisation
- Tracking and documentation procedures for off-site waste.

10.5.2 General Mitigation – Construction Waste

The key principles underlying the plan will be to minimise waste generation and to segregate waste at source. The measures to achieve these aims include:

- Where possible recyclable material will be segregated and removed off site to a permitted/licensed facility for recycling.
- Office and food waste arising on the construction compound will be source-separated at least into dry mixed recyclables, biodegradable and residual wastes.
- Waste bins, containers, skip containers and storage areas will be clearly labelled with the waste types which they should contain, including photographs as appropriate.
- The site will be maintained to prevent litter and regular litter picking will take place throughout the site.
- Material management 'just in time' delivery will be used so far as is reasonably practicable to minimise material wastage.
- The contractor will ensure that the material transported off site will go to an appropriately licensed/permitted facility.
- The contractor will record the quantity in tonnes and types of waste and materials leaving the site. The name, address and authorisation details of all facilities and locations to which waste and materials are delivered will be recorded along with the quantity of waste in tonnes delivered to each facility. Records will show material which is recovered and disposed of.
- The recording of gate receipts for the licenced facility to which excavation and demolition wastes are brought is essential to ensure that waste materials removed from sites are properly disposed of and that site management is in compliance with statutory obligations under the Waste Management Acts 1996, as amended.
- All hazardous waste will be separately stored and labelled, in appropriate lockable containers, prior to removal from site by an appropriate waste collection holder.
- In the event that hazardous soil, or historically deposited hazardous waste is encountered during the work, the contractor must notify Dún Laoghaire Rathdown County Council, Environmental Enforcement Section, and provide a Hazardous/Contaminated Soil Management Plan, to include estimated tonnages, description of location, any relevant mitigation or monitoring proposed, and destinations for authorised disposal/treatment, in addition to information on the authorised waste collector(s).
- Waste generated on site will be removed as soon as practicable following generation for delivery to an authorised waste facility.
- The contractor will minimise waste disposal so far as is reasonably practicable;

- Provision of a dedicated and secure compound, containing bins and skips into which all waste generated by construction site activities will be placed and designation of a single person with responsibility for provision of signage and verbal instruction to ensure proper housekeeping, maintenance of records and segregation of construction waste materials;
- Waste Auditing: The contractor will record the quantity in tonnes and types of waste and materials leaving site during the construction phase;
- Any empty cement bags generated as waste and will be disposed of in a separate skip which shall be disposed of offsite by licensed waste haulier;
- Waste fuels/oils will be generated from equipment used on-site during construction and will be classified as hazardous waste. Such wastes will be stored in a secure, bunded area on-site prior to collection by a haulier who holds the appropriate waste collection permit. The quantities of hazardous waste generated during the construction phase are expected to be small and not of significance.

10.6 Noise and Vibration

The employment of good construction management practice will minimise the risk of adverse impacts from the noise and vibration during the construction phase. There is potential for low levels of noise and vibration to be generated from certain construction activities.

Noisy activities associated with the construction of the proposed development include the use of equipment such as a grout mixer and pump, mobile telescopic crane, hand-held pneumatic rock drill, and hand-held pneumatic breaker. The following mitigation measures will be implemented for the construction phase of the proposed development as good practice.

10.6.1 General

This Noise and Vibration Management Plan will be updated by the contractor, prior to construction, to include any specific conditions attached to the approval and other specific construction information, but will at a minimum, include the measures described below.

Mitigation measures will be employed to ensure that potential noise and vibration impacts at nearby sensitive receptors due to construction activities are minimised. The preferred approach for controlling construction noise is to reduce source levels where possible, but with due regard to practicality.

The effect of noise and vibration on nearby human sensitive receptors will be minimised through an effective communication strategy, which is discussed in **Section 7.**

Noise and vibration will be reduced by limiting the daily time that equipment generating high levels of noise and/or vibration is operated.

However, it is acknowledged that sometimes a greater noise/vibration level may be acceptable if the duration of the construction activity, and therefore length of disruption, is reduced.

There is no potential for more than one of any of the noisiest pieces of equipment (namely the grout mixer and pump, mobile telescopic crane, hand-held pneumatic rock drill, and hand-held pneumatic breaker) to be in operation at the same time.

10.6.2 Good Industry Practice

Good industry standards, guidance and practice procedures (i.e., compliance with the Considerate Contractors Scheme) will be followed in order to minimise noise and vibration effects during construction. The measures implemented will ensure that potential impacts relating to noise nuisance, disturbance and vibrational impacts are effectively minimised, controlled and monitored to ensure that site construction activities do not have an adverse or unacceptable impact on local receptors, adjacent property, adjacent users and human health and on the wider receiving environment.

Noise and vibration will be minimised through the adoption of good industry practice as standard working practices across the working areas whenever practicable. The following measures will be adhered to where practicable throughout the construction programme:

- Rubber linings shall be used to reduce impact noise;
- Drop heights of materials will be minimised;
- The contractor will ensure that all plant complies with the relevant statutory requirements;
- Construction plant and activities to be employed on site will be reviewed, where feasible, to ensure that they are the quietest available for the required purpose;
- Vehicles and mechanical plant used for the purpose of the works will be fitted with effective exhaust silencers and will be started sequentially rather than all together;
- Plant will be maintained in good working order so that extraneous noise from mechanical vibration, creaking and squeaking is kept to a minimum;
- Machines in intermittent use will be shut down or throttled down to a minimum when not in use;
- Compressors will be fitted with properly lined and sealed acoustic covers which will be kept closed whenever in use.
- Pneumatic percussive tools will be fitted with mufflers or silencers of the type recommended by the manufacturers;
- Where possible, the use of impact tools will be avoided;
- Wherever possible, equipment powered by mains electricity will be used in preference to equipment powered by internal combustion engine or locally generated electricity;

- Generators will be enclosed and they and other static plant will be located away from sensitive receivers, where feasible;
- The construction activities including rock breaking activities will not take place outside of the standard working hours as outlined in **Section 9.3.1.**;
- No part of the works nor any maintenance of plant will be carried out in such a manner as to cause unnecessary noise except in the case of an emergency when the work is absolutely necessary for the saving of life or property or the safety of the works; and
- Noise emitting machinery which is required to run continuously will be housed in a suitable acoustically lined enclosure.

10.6.3 Communication Strategy

The nuisance effect of noise and vibration on nearby sensitive receptors can be minimised through a good communication strategy. Sometimes a greater noise level may be acceptable if the duration of the construction activity, and therefore length of disruption, is reduced. The Community Liaison Plan is described in **Section 7** above.

10.6.4 Noise and Vibration Monitoring

Maximum noise levels of 97dBLAeq are predicted to occur at a distance of 10m from the proposed works for relatively brief periods of time. This is a worst-case scenario, principally associated with the operation of a hand-held pneumatic breaker and a hand-held pneumatic rock drill at the same time. The Contractor will monitor noise levels during these peak periods of operating this equipment to ensure that these predicted noise levels are not exceeded.

- Prior to the commencement of the proposed site works noise monitors stations shall be installed and maintained by a suitable qualified specialist firm to provide continuous noise monitoring to measure and record the impact of site activities on local receptors.
- All noise monitoring data shall be compiled into a weekly technical report which will include a full assessment of the noise impacts arising from site construction activities.
- Trigger limits at which remedial action will be taken and maximum limits at which work will be suspended should be clearly set out.
- Should construction noise trigger limits be approached or exceeded appropriate measures shall be implemented to address the issues raised.

The contractor will adhere to any conditions imposed by the planning approval which impose a noise and vibration monitoring requirement. Monitoring data will be made available to DLRCC at an appropriate frequency.

10.7 Air Quality

10.7.1 Introduction

The employment of good construction management practice, as described in **Section 5** to **Section 9** above and in this section, will minimise the risk of adverse impacts on the air quality during the construction phase.

All operations on-site shall be carried out in a manner such that air emissions do not result in significant impairment of, or significant interference with amenities or the environment beyond the site boundary.

A dust management plan will be implemented for the proposed development as outlined in **Section 10.7.3**.

10.7.2 Construction Phase Mitigation Measures

It is envisaged that no significant dust will be generated as a result of the proposed works. Any dust generated during the works would be an inert material. The following mitigation measures will be implemented for the construction phase of the proposed development as good practice.

10.7.2.1 Site Management

- All dust and air quality incidents and complaints will be recorded, the cause(s) will be identified, appropriate measures to reduce emissions will be taken in a timely manner, and the measures taken will be record.
- Site fencing, barriers and scaffolding will be maintained clean using wet methods.

10.7.2.2 Operating Vehicle/Machinery

- All vehicles will switch off engines when stationary - no vehicles will idle.
- Mains electricity or battery powered equipment will be used where practicable and the use of diesel-powered generators avoid, where practical.
- Adherence to posted / legal speed limits will be adhered to. Drivers of construction vehicles will be advised that vehicular speeds in sensitive locations, such as local community areas, will be restricted to appropriate levels.

10.7.3 Dust Management Plan

Dust arising from construction activities will be mitigated by implementation of the dust management plan.

Employee awareness is an important way that dust may be controlled on a construction site.

Staff training and the management of operations will ensure that the dust suppression methods, described below, are implemented and continuously inspected.

The following dust mitigation measures will be implemented by the contractor:

10.7.3.1 Preparing and maintaining the working areas

- The site layout at working area will be planned so that machinery and dust causing activities are located away from receptors, as far as is practicable.
- Site fencing, barriers and scaffolding will be maintained clean using wet methods.
- An adequate water supply for effective dust/particulate matter suppression/mitigation will be supplied on the working areas.

10.7.3.2 Site Operations

- Only cutting, grinding or sawing equipment, fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g., suitable local exhaust ventilation systems, will be used.
- Enclosed chutes and conveyors and covered skips will be used.
- Drop heights from loading or handling equipment will be minimised and fine water sprays will be used on such equipment wherever appropriate.
- Sand and other aggregates will be stored in bunded areas and will not be allowed to dry out, unless this is required for a particular process, in which case appropriate additional control measures will be put in place.
- Materials, that have a potential to produce dust, will be removed from site as soon as possible, unless being re-used on site. If they are being re-used on-site, they will be covered as described below.
- A wheel washing system, with rumble grids to dislodge accumulated dust and mud, will be used prior to leaving the site where reasonably practicable.
- Water-assisted dust sweeper(s) will be use on the access and local roads, to remove, as necessary, any material tracked out of the site.
- Should dust occur during drilling, water sprays can be added to suppress this dust.

10.7.3.3 Monitoring

- A programme of air quality monitoring shall be put in place at the site boundaries for the duration the construction activities to ensure that the air quality standards as set out in the Air Quality Standards Regulations (2011) relating to dust deposition, specifically PM_{10}, are not exceeded.
- Measures to ensure that where levels exceed specified air quality limit values, dust generating activities cease and alternative working methods are identified and implemented.

- The selection of sampling point locations will be completed after consideration of the requirements of Standard Method VDI 2119 (Measurement of Dustfall, Determination of Dustfall using Bergerhoff Instrument (Standard Method) German Institute) including the consideration of the location of the samplers relative to obstructions, height above ground and sample collection and analysis procedures. The optimum locations will be determined by a suitably qualified air quality expert to ensure that dust gauge locations are positioned in order to best determine potential dust deposition in the vicinity of site boundaries and existing buildings.
- Technical monitoring reports detailing all measurement results shall be subsequently prepared and maintained on site.

10.8 Climate

The employment of good construction management practice, as described in **Section 5** to **Section 9** above and in this section, will minimise the risk of adverse impacts on the climate during the construction phase.

The following mitigation measures will be implemented for the construction phase of the proposed development:

- Low carbon construction materials will be used, where feasible;
- Site management and transport will be as energy efficient as is feasible;
- Resources will be managed efficiently to tackle inefficiencies across the supply chains, overuse of resources (e.g., materials, energy and water) and waste generation.

10.9 Material Assets

The employment of good construction management practice, as described in **Section 5** to **Section 9** above and in this section, will minimise the risk of adverse impacts on the material assets during the construction phase.

The contractor will put measures in place to ensure that there are no interruptions to existing services unless this has been agreed in advance with the relevant service provider. Further methods that will be used to mitigate the risk of damage to existing services will be as follows:

- All works near existing services and utilities will be carried out in consultation with the relevant utility company or local authority and will follow any requirements or guidelines they may have;
- The contractor will ensure that that all necessary site and service investigations have been carried out, utility drawings obtained, and utility enquiries complete prior to commencing works;

- The contractor will ensure that the existing infrastructure beneath the viewing platform (comprising an existing storm tank and pumping chamber, flowmeter and wash-water tanks, 160mm diameter rising main and 450mm diameter emergency overflow) will be protected throughout the works by ensuring that no HGV vehicles or crane tacks on or over the existing services infrastructure and the choice of crane entry point and operational position based on avoiding this infrastructure;
- The spreader mats and beams for load distribution across crown of rowing club arched roof will be used when the crane is tracking onto viewing platform to move into the operational position and when the crane is de-mobilising. The crane operation position is situated away from top of rowing club;
- The contractor will liaise with asset owners to agree clearances and where necessary.

10.10 Landscape and Visual

The employment of good construction management practice, as described in **Section 5 – Section 9** above and in this section, will minimise the risk of adverse impacts on the landscape and visual amenity during the construction phase.

Following completion of the works, all working areas will be returned to their original form, with only temporary visual effects to the appearance of the rock surface until natural weathering processes and recolonisation by maritime flora help to blend interventions into the surrounding rock face. The temporary barriers will be removed.

10.11 Archaeology, Architectural and Cultural Heritage

The appropriately-finished rings to be fixed to the rock anchors will have a minor effect on the overall visual amenity of the harbour; however, the nineteenth-century form and masonry finish will remain unchanged by the proposed works.

The proposed development will utilise the appropriate-coloured steel rings on the heads of rock anchors, as outlined above, which will be the only legible element of the works. The rings will allow for ongoing monitoring and adjustment of the rock anchors as well as ensuring durability while reducing visual impact in comparison to other potential measures.

The design of the proposed development incorporates measures for minimal intrusion. During the construction phase, all precautionary measures will be taken to ensure no damage to the existing structure during the construction operations, as outlined in **Section 5** to **9** and **Section 10.4**.

10.12 Construction Traffic Management Plan

10.12.1 Introduction

The Contractor shall undertake consultation with DLRCC's Roads Control section in order to obtain a Road Opening License to carry out the works which will require the CTMP with detailed of expected road closures. The license will be in place for the duration of the works.

Following consultation with An Garda Síochána and DLRCC's Roads Control section, the Construction Traffic Management (CTMP) will be further developed by the contractor, prior to the commencement of construction, to ensure that construction traffic will be managed and monitored safely and efficiently throughout the construction phase.

10.12.1.1 Purpose and Scope

This Construction Traffic Management Plan will be a key construction contract document, the implementation of which will reduce possible impacts which may occur during the construction of the proposed scheme.

The objectives of this CTMP are to:

- Outline minimum road safety measures to be implemented at the site access/egress locations and at the approaches to such access/egress locations, during the works;
- Demonstrate to the contractor and suppliers the need to adhere to the relevant guidance documentation for such works; and
- Provide the basis for the contractor to further develop the details of this CTMP.

The employer's representative will be responsible for ensuring that the contractor manages the construction activities in accordance with this CTMP.

Objectives and measures are also included for the management, design and construction of the project to control the traffic impacts of construction insofar as it may affect the environment, local residents and the public in the vicinity of the construction works.

In the event that the approval is granted for the proposed development, the CTMP will address the requirements of any relevant conditions, including any additional mitigation measures which are conditioned. The CTMP (updated by the contractor prior to construction to incorporate these conditions) will require approval from the DLRCC and An Garda Síochána.

The objective of this CTMP is to ensure that the residual impacts to the public road network during the construction phase of the proposed development are minimised and that transport related activities are carried out as safely as possible and with the minimum disruption to other road users. The CTMP has also been prepared for the purpose of identifying appropriate and safe methods of access for construction traffic to the proposed scheme.

This CTMP describes the traffic management for the transportation of construction materials, equipment and personnel along the public road network to facilitate the construction of the proposed development. Light vehicles, such as cars and vans, will be used by site operatives travelling to and from the site.

There will be a small number of Heavy Construction Vehicles (HCV) required to deliver general construction materials to the site and for the removal of material that is to be disposed of off-site.

This CTMP will remain a live document that will be reviewed by the contractor and updated, where necessary, throughout the construction phase.

10.12.1.2 Implementation

All site personnel will be charged with following good practice and will be encouraged to provide feedback and suggestions for improvements. Site personnel will also be required to ensure compliance with the requirements of the site's CTMP.

10.12.1.3 Document Revision

The CTMP will be subject to on-going review throughout the construction phase of the proposed scheme, and site inspections.

All of the information required to further develop the CTMP will be highlighted in the specification for the construction contract. The contractor will be required to include further details and/or confirmation, as described below.

10.12.2 Proposed Construction Traffic Generation

10.12.2.1 Overview

The potential temporary impacts of the scheme on the road network are as follows:

- Temporary impacts associated with the importing of construction materials to the works areas, and the relevant movements of delivery and construction vehicles and construction workforce;
- Single lane closure on Coliemore Road adjacent to the pier and viewing platform for approximately 4 hours to facilitate the removal of the temporary walkway;
- Construction staff commuting to and from the construction compound; and
- General service traffic associated with construction activities (i.e. plant deliveries, visitors, traffic between compounds and working areas, etc.)

10.12.2.2 Envisaged Construction Equipment

Construction equipment and vehicles required for each construction element/operation will be delivered to site by appropriate vehicles.

Specific equipment and vehicles which are deemed to be required for the proposed development by the principal contactor, suppliers and staff are to be confirmed and included in the CTMP. The contractor will keep his working space to a minimum and pedestrian access to adjacent properties will be maintained at all times.

10.12.3 Matters to be Addressed in More Detail

The contractor will be required to ensure that the contents of this CTMP are further developed prior to the commencement of works. The contractor will implement monitoring measures to confirm the effectiveness of the mitigation measures outlined in the CTMP. The updated CTMP will address the following issues:

- Site/works area access and egress;
- Traffic management signage;
- Timings of material deliveries to site;
- Traffic management speed limits;
- Road cleaning;
- Vehicle cleaning;
- Road condition;
- Road closures;
- Enforcement of traffic management plan;
- Emergency procedures during construction;
- Variable Message Signage at strategic locations is reflected to facilitate advance notice to key stakeholders.
- Workers parking;
- Damages to adjacent public roads arising from works and
- Communication.

These items are explained in detail in the remainder of this section of the plan.

10.12.3.1 Site Access and Egress

The proposed site access location will be identified and the contractor will provide advanced warning signs, in accordance with Department of Transport's 'Traffic Signs Manual, Chapter 8: *Temporary Traffic Measures and Signs for Roadworks* (August 2019), on the approaches to proposed site access locations, a minimum of one week prior to construction works commencing at that location.

In addition, Traffic Management Operatives will control access/egress of Heavy Construction vehicles HCV of the site during the works.

10.12.3.2 Road Network

Where possible higher order roads will be the preference for haul routes. This does not apply to construction personnel.

It is likely that the following local and regional roads will be utilised as haul routes during the construction period:

- R119
- R829
- Coliemore Road.

10.12.3.3 Traffic Management Signage

The Contractor will undertake consultation with the relevant authorities for the purpose of identifying and agreeing signage requirements. Such signage will be installed prior to works commencing on site.

Proposed signage will include warning signs to provide warning to road users of the works access/egress locations and the presence of construction traffic. All signage will be provided in accordance with the Department of Transport's 'Traffic Signs Manual, Chapter 8: *Temporary Traffic Measures and Signs for Roadworks* (August 2019).

In summary, the contractor will ensure that the following elements are implemented:

- Consultation with the relevant authorities for the purpose of identifying and agreeing signage requirements;
- Provision of temporary signage indicating site access route and locations for contractors and associated suppliers; and
- Provision of general information signage to inform road users and local communities of the nature and locations of the works, including project contact details.

10.12.3.4 Timings of Material Deliveries to Site

In order to reduce impacts on local communities and residents adjacent to the proposed sites:

- The contractor will liaise with the management of other construction projects in the area and the local authorities to co-ordinate deliveries;
- The contractor will schedule deliveries in such a way that construction activities and deliveries activities do not run concurrently, where practicable;
- The anticipated deliveries will be via pickup truck or van to minimise frequency of large vehicles/HGVs accessing site area;

- The contractor will schedule deliveries to and from any proposed compound such that traffic volumes on the surrounding road network are kept to a minimum;
- A construction phase programme of works will be developed by the contractor in liaison with the DLRCC, specifically taking into account potential road repair works that are included in the local authority's road works schedule;
- Deliveries will be suspended on the days of any major local events, etc. that have the potential to cause larger than normal traffic volumes in the overlap areas;
- The contractor will liaise with members of the local community to ensure that construction-related traffic will not conflict with sensitive events such as funerals;
- Specific construction moratoria (for example, certain busy periods) as indicated by DLRCC will be respected and incorporated into the construction phasing programme; and
- Construction activities will normally be undertaken during daylight hours for all construction stages.

10.12.3.5 Traffic Management Speed Limits

Adherence to posted / legal speed limits will be emphasised to all staff and suppliers and contractors during induction training. Drivers of construction vehicles will be advised that vehicular speeds in sensitive locations, such as local community areas, will be restricted to appropriate levels.

Special speed limits will be implemented for construction traffic in sensitive areas. Such recommended speed limits will only apply to construction traffic and not to general traffic.

10.12.3.6 Enforcement of Traffic Management Plan

All project staff and material suppliers will be required to adhere to the CTMP. The contractor will agree and implement monitoring measures to confirm the effectiveness of the CTMP and compliance will be monitored by the supervising employer's representative. Regular inspections / spot checks will also be carried out to ensure that all project staff, material suppliers and hauliers follow the measures specified in the CTMP.

10.12.3.7 Emergency Procedures During Construction

The contractor will ensure that unobstructed access is provided for all emergency vehicles along all routes and site accesses.

The contractor will provide to DLRCC and the emergency services, the contact details of the contractor's personnel responsible for construction traffic management.

The site must have in operation a radio-controlled system for emergencies in order that certain vehicles, i.e., ambulances, fire brigade, security envoys, state cars, etc., can travel through the site uninterrupted.

In the case of an emergency which occurs off site all construction traffic will be notified of the incident and location.

10.12.3.8 Communication

The contractor will ensure that close communication with DLRCC and the emergency services is maintained throughout the construction phase.

The contractor will also ensure that the local community is informed of proposed traffic management measures in advance of their implementation. Such information will contain the contractor's contact information for members of the public to obtain additional information and to provide additional knowledge such as local events, sports fixtures etc. which may conflict with proposed traffic management measures.

10.12.4 Conclusions

This CTMP will form part of the construction contract and is designed to reduce possible impacts which may occur during the construction of the proposed development.

The CTMP will be further developed by the contractor following consultation with An Garda Síochána and DLRCC.

The Employer representative will be responsible for ensuring that the contractor manages the construction activities in accordance with this CTMP and will ensure that any conditions of planning are incorporated into the site specific CTMP.

10.13 Population and Human Health

The implementation of this CEMP will minimise the effects of construction works on the local population, as outlined below.

- The environmental management procedures, described in **Section 5** and the general site management requirements, specified in **Section 9** above, will minimise the nuisance and inconvenience caused to the local population for the duration of the construction works.
- The Emergency Response Plan, **Section 6,** above, will address all foreseeable construction risks.

11 References

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