ATKINS

Member of the SNC-Lavalin Group

Coastal Quarter SHD 2

Construction Environmental Management Plan

Shankill Property Investment Limited

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Document history

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List of Acronyms

The following list of abbreviations have been used within this document;

- ABP - An Bord Pleanála
- AOD - Above Ordnance Datum
- BRE - Building Research Establishment
- C&D - Construction and Demolition
- CEMP - Construction Environmental Management Plan
- DLRCC – Dun Laoghaire Rathdown County Council
- ECoW- Ecological Clerk of Works
- EIAR – Environmental Impact Assessment Report
- EPA - Environmental Protection Agency
- ERP – Emergency Response Plan
- GSI - Geological Survey of Ireland
- HEMP - Handover Environmental Management Plan
- IFI - Inland Fisheries Ireland
- mBGL - meters below ground level
- NIS - Natura Impact Statement
- NPWS - National Parks and Wildlife Services
- PSCS - Project Supervisor for the Construction Stage
- PSDP - Project Supervisor for the Design Process
- SAC - Special Area of Conservation
- SPA – Special Protection Area
- SuDS - Sustainable Drainage System
- WCC – Wicklow County Council

1. Introduction

1.1. Overview

Shankill Property Investments Limited are applying to An Bord Pleanála (ABP) for permission for a Strategic Housing Development consisting of 586 no. residential units in a mix of apartments, duplexes and houses on a ca. 8.81 hectare (ha) site. In addition, a childcare facility, café, retail unit and 1 no. mixed use commercial unit (incorporating a gym and a juice bar) are proposed along with all associated and ancillary development and infrastructural works, hard and soft landscaping, open spaces, boundary treatment works, ancillary car and bicycle parking spaces at surface, undercroft and basement levels. The proposed houses and duplexes range in height from 2 – 3 storeys with the proposed 4 no. apartment blocks ranging in height from 3 – 12 storeys. Block A will accommodate 162 no. Build-to-Rent (BTR) units. It is proposed that 274 no. units will be located within the administrative area of Dún Laoghaire-Rathdown County Council and 312 no. units will be located within the administrative area of Wicklow County Council. The childcare facility, retail, café and commercial unit will all be located in the administrative area of Wicklow County Council.

Planning permission was granted on part of the subject site for 234 no. residential units, a childcare facility, café and retail unit subject to compliance with the terms of conditions attached to reference ABP-311181-21. The proposed Coastal Quarter development SHD 2 includes development as permitted under ABP-311181-21 together with minor revisions chiefly addressing conditions and new proposals for Blocks A and B which were previously refused. An EIAR was prepared by Atkins (2021) as part of the previous planning application (ABP-311181-21), and included the preparation of a Construction Environmental Management Plan (CEMP).

The Harbour Point Masterplan sets the context for the proposed SHD. The subject lands (outlined in red on Dwg. BRA-GHA-SW-XX-DR-A-05001) are part of a larger landholding (outlined in blue) in ownership of the applicant. The overall Harbour Point development site of ca. 19 hectares comprises the former Bray Golf Club lands. Given the size and strategic location of the site, the applicant appointed Glenn Howell Architects (GHA) to prepare a masterplan to guide the development of the entire land holding. The Harbour Point Masterplan is grounded in national, regional and local planning policy and guidelines as well as best practice in urban design. It provides the overarching development framework for the lands and sets out the design principles that will govern this planning application and all future applications on the overall landholding. The masterplan is included as part of this application.

The site is generally bounded to the north by existing public open space at Corke Abbey Valley Park, to the east by the Irish Rail Dublin-Wexford/Rosslare main rail line, to the south by the River Dargle and undeveloped lands, and to the west by undeveloped lands and the existing Ravenswell schools campus.
The Rathmichael Stream is located to the north of the site, and is separated from the site by a hedgerow / treeline. The Site location (Dwg. No. BRA-GHA-SW-XX-DR-A-05001) is presented in Figure 1-1.

The principle objective of this CEMP is to provide recommended measures to avoid, minimise and control adverse environmental impacts associated with the construction of the proposed SHD 2 development, at the planning stage of this project.

1.2. Purpose of CEMP

The purpose of this CEMP is to provide recommended measures to avoid, minimise and control adverse environmental impacts associated with the construction of the proposed project. The CEMP will document the commitment to safeguarding the environment through the identification, avoidance and mitigation of the potential negative environmental impacts which are associated with the proposed development.

The Contractor will undertake the works in accordance with the provisions of the CEMP. This may be further added to, to address other detailed construction matters. The CEMP will be updated by the Contractor to address any subsequent planning conditions relevant to the proposed development.

The CEMP aims to define good practice as well as specific actions required to implement mitigation requirements as identified in the following;

- Atkins, 2022. Coastal Quarter SHD 2 Environmental Impact Assessment Report; Volume 1 – Volume 3. Issue Date: September 2022.

Note all of the key following documents (non-exhaustive list) are included within the EIAR (Atkins, 2022);

- John Cronin & Associates, 2020. *Archaeological investigations at Ravenswell, Bray Commons, County Wicklow and Cork Great, County Dublin– Archaeological Test Trenching Report*. Issue Date: November 2020;
- Atkins, 2022. *Coastal Quarter SHD 2 Natura Impact Statement (NIS).* Issue Date: September 2022;
- IGSL Ltd, 2021. *Harbour Point, Bray Ground Investigation Report (Factual).* Issue Date: March 2021;
- Bat Eco Services, 2020. *Bat Assessment prepared for Proposed Planning Application*. Issue Date: October 2020;
- Atkins, 2022. Bray Coastal Quarter SHD 2 Bat Conservation Plan. Issue Date: September 2022;
- Fehily Timoney & Company, 2017. *Remediation Option Appraisal – Historic Landfill at Bray Harbour, Co. Dublin.* Issue Date: March 2017*;*
- J.M. Leigh Surveys Ltd, 2020. *Geophysical Survey Report, Ravenswell, Bray, Co. Wicklow. Issue Date: March 2020;*
- Atkins, 2022. *Coastal Quarter SHD 2 Flood Risk Assessment.* Issue Date: September 2022;
- Updated Tree Survey Reports (Independent Tree Surveys, 2021) (ABP Treecare, 2022); and,
- Design / Tender / Construction Drawings.

This document has also been informed by key findings from site visits carried out by an experienced Atkins Senior Environmental Consultant in February, July and August 2020, and July 2022.

1.3. Structure

This CEMP has been structured as follows:

- **Section 1** outlines the purpose of the CEMP and introduces the proposed development/project;
- **Section 2** describes in detail the proposed development/project;
- **Section 3** outlines the minimum standards, legislation and guidance required of the Contractor during the development of the CEMP;
- **Section 4** identifies the relevant roles and responsibilities for developing, implementing, maintaining and monitoring environmental management;
- **Section 5** sets out the mechanisms through which environmental requirements would be managed;
- **Section 6** sets out the general requirements to of the CEMP;
- **Section 7** provides a summary of minimum requirements that should be implemented by the Contractor; and
- **Section 8** sets out the procedures for the Emergency Response Plan.

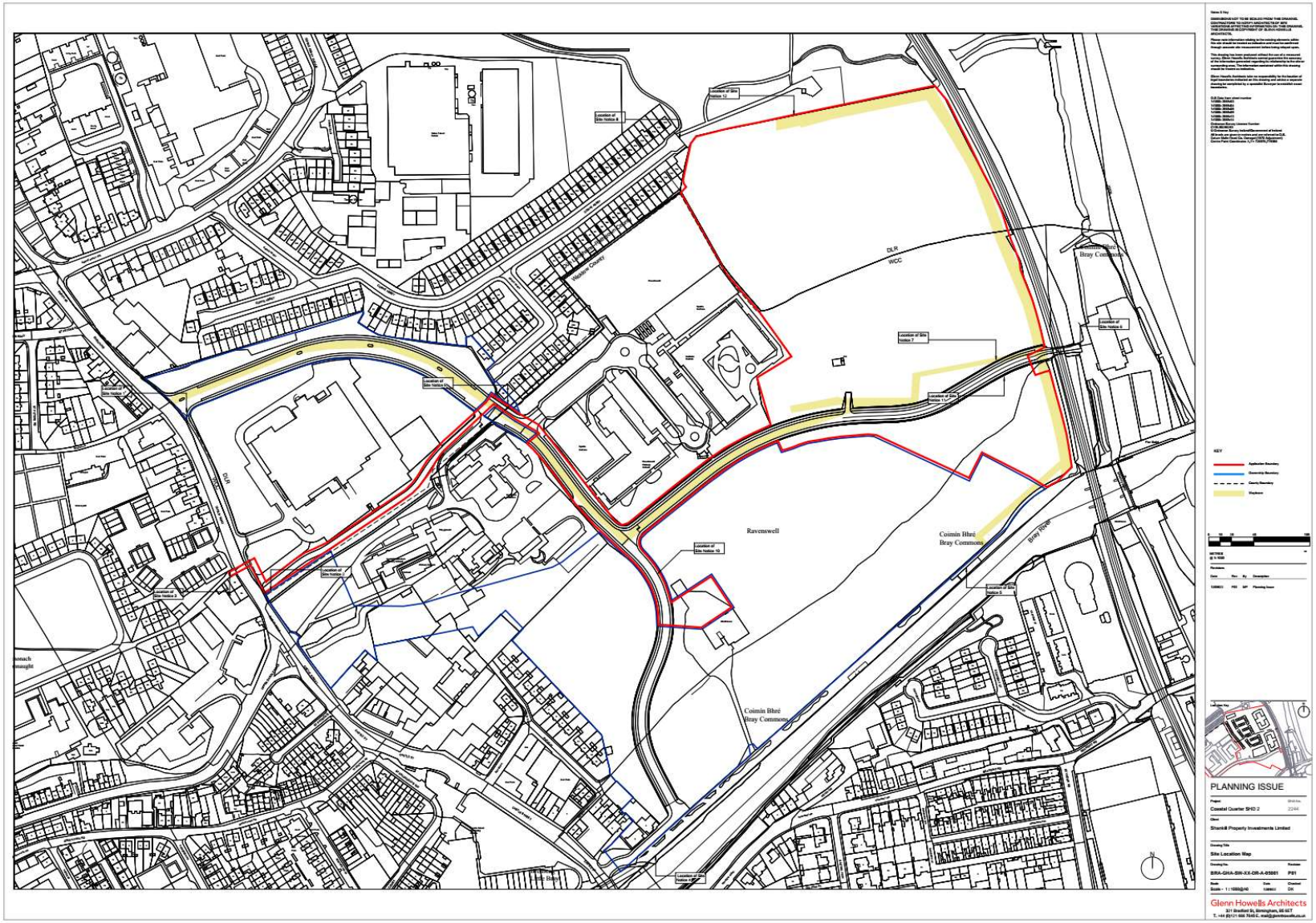


Figure 1.1 - Site Location (showing red-line application / site boundary for the Coastal Quarter) (blue-line denotes overall ownership boundary).

2. The Proposed Development

2.1. Site Location & Surrounding Land use

The proposed development site is located at an existing 8.812ha parcel of land, of which 7.84ha shall be developed within the former Golf Course lands to the north of Bray Town Centre. For the purposes of this report the site boundary is outlined in red in Figure 1.1 above.

The site is generally bounded to the north by existing public open space at Corke Abbey Valley Park, to the east by the Irish Rail Dublin-Wexford/Rosslare main rail line, to the south by the River Dargle and undeveloped lands, and to the west by undeveloped lands and the existing Ravenswell schools campus. The Rathmichael Stream is located to the north of the site, and currently is separated from the site by a hedgerow / treeline. The Site location is presented in Figure 1.1.

The Site is located within 2no. county council boundaries, the northern portion of the Site lies within Dún Laoghaire-Rathdown County Council (DLRCC) bounds, while the southern portion of the Site lies within Wicklow County Council (WCC) bounds.

2.2. Existing Site Setting

The topography of the Site generally falls from north to south with a localised high ridge running in an east-west direction across the centre of the Site. This ridge is identified as a linear earthwork (DU026-124---- / WI004-005----) and is described by Archaeological Survey of Ireland as a postulation that possibly formed part of the medieval Pale ditch which denotes a county council boundary. However, the results of a number of archaeological investigations of the feature indicates that it is a landscaped feature dating to recent centuries.
An existing underground Irish Water foul storage tank is located in the western portion of the Site, with foul services running along the northern and eastern site boundaries before crossing the River Dargle to the south of the Site. There are also two gravity foul sewers that run from west to east across the site as detailed further in the Engineering Planning Report (Doc. Ref: 5214419DG0018). While the Site is private with no formal public access, it is currently used locally as a popular walking and open space amenity.
There are 2no. rivers/streams in the immediate vicinity; River Dargle (River Waterbody Code: IE_EA_10D010300) is located immediately south of the Site and the Rathmichael stream (European Code: IE_EA_10D010300) is located ca. 0.15km north of the Site (EPA, 2022) as presented in Figure 2.1. Both the Dargle River and Rathmichael stream flow in a general easterly direction before discharging to Dargle Estuary and Southwestern Irish Sea - Killiney Bay (HA 10) respectively.

There are 13no. European sites within the potential zone of influence (ZoI) of the proposed development project; 9 no. SACs and 4no. SPAs. The closest European is the Bray Head SAC (Site Code: 0000714) located ca. 1.70km north of the Site.

The Site intercepts 3no. wells; a surface spring (GSI Ref: 3221SWW036), a borehole (GSI Ref: 3221SWW029) which is reported as having an unknown purpose and a domestic well (GSI Ref: 3221SWW070) which is reportedly located within the northern portion of the site. Several other boreholes and springs are reported to be present within the immediate vicinity (2km radius) of the Site; however, none of these are reported by the GSI (2022) to be used for potable use or for major groundwater abstraction. A Geological Heritage Area, Killiney Bay (Site Code: DLR007) which is a 5 kilometres long coastal section which exposes a succession of several units of glacial till, is located 0.05km east of the Site. Killiney Bay has been designated a Geological Heritage Area because of the presence of '*particularly impressive exposure into deep till with many sedimentological characteristics exposed'* (GSI, 2022). There are no karst features present within the Site or within the immediate vicinity of the Site.

Figure 2.1 - Key Hydrological Features in the vicinity of the site

2.3. Proposed Development

The proposed Coastal Quarter SHD 2 development comprises 586no. residential units in a mix of apartments, duplexes and houses with a combined gross floor area of 67,814m^2 on an 8.812ha parcel of land within the former Golf Course lands to the north of Bray Town Centre. In addition, a childcare facility (gross floor area of 627m^2), café (gross floor area of 195m^2), retail unit (gross floor area of 249m^2), and 1no. mixed use commercial unit (gross floor area of 512m^2) are proposed along with all associated and ancillary development and infrastructural works, boundary treatment works, ancillary car and bicycle parking spaces at surface and under croft levels and all associated ancillary works. The proposed development will also include all associated plant, refuse storage areas, communal open space, public open space, playgrounds, multi-use games area, associated internal roads and drainage arrangements, facilitating utility connections, facilitating linkages with adjoining sites; landscaping, public lighting, construction compounds; and all site development works. The proposed development layout is shown in Figure 2.2 below.

The proposed residential units are arranged in a series of character areas that respond to the zoned open space and the existing landscape character of the lands. Views within and from the development are framed by legible links that supervise the space and connect to the existing landscape structure.

Figure 2.2 - Proposed Development Layout

2.4. Key Stages

The proposed development will involve the following key work phases:

- Tender Stage;
- Procurement and appointment of successful Tenderer(s) (hereafter referred to as The Contractor);
- Detailed Design Stage;
- Site preparatory works including the preparation of all required Detailed Safety and Health, and Environmental Management documents;

- Site mobilisation;
- Construction Stage;
- Completion; and,
- Operational Stage.

Details of machinery to be used on site are unknown at this time, but are likely to be standard site equipment including tracked excavators, dumpers, bulldozers etc.

2.5. Environmental Constraints

This section summarises the receiving environment along with key environmental factors (at this preliminary juncture) that should be considered during the construction phase.

2.5.1. Noise

A review of EPA (2022) Noise Maps indicates that the proposed development is within the Dublin agglomeration. There are no recorded daytime and nighttime noise levels within the proposed Site with Lden (day-evening-night) noise levels along the R761 to the east of the Site reported as greater than 70dB within the confines of the road corridor. Noise levels decrease to 60-64dB within a maximum of 50m distance on the west of the roadway. Night-time levels reduce to 60-64dB along the road corridor and 45-49dB within a maximum distance of 40m on the east

2.5.2. Air Quality

Dust arising from excavation and import of soil to the Site, along with vehicle movement as well as emissions from construction vehicles and plant will contribute to reduced air quality. Some activities including infilling of soil, excavation of trenches, stockpiling and movement of materials, and construction vehicle movements may all contribute to generating ambient dust. The air quality within the proposed site is ‘good’ (EPA, 2022).

2.5.3. Soils and Geology

Based on the Teagasc soils database available on the GSI public data viewer, the dominant soil type underlying the Site and surrounding area is made ground. Alluvium is present along the banks of the River Dargle. The Site itself is generally underlain by made ground with alluvium (associated with the River Dargle) present in the southern portion of the Site.

The regional soil descriptions were verified by the ground investigation. Site specific soils records, as observed during the ground investigation (IGSL, 2021) are summarised as follows;

- Topsoil was encountered at most locations across the Site and ranged from ca. 0.1 to 0.3mbgl.
- Made Ground was encountered at various locations across the Site to a maximum depth of 2.3mbgl at TP211. Made ground beneath the Site generally comprised reworked soil or gravel fill material; however rare to occasional inclusions of red bricks, wood and plastic were identified at 4no. locations (TP211, BH219, WS04B and WS05B).
- Till encountered across the Site has been described primarily as firm to very stiff, brown, sandy Silt / Clay with occasional cobbles.
- This is generally underlain by loose to dense grey sandy gravel / gravelly sand, to a maximum depth of 13.8mbgl, beneath which very soft peaty silt / clay was identified within localised areas to a maximum depth of 13.3mbgl. This material was further underlain by gravelly clay and gravel to a maximum depth of 23.8mbgl.

Ground investigation records confirm that no visual or olfactory evidence of soil contamination was encountered at any of the exploratory locations across the Site, with the exception of WS04A, located in the southern portion of the Site, where a ‘hydrocarbon odour’ was noted in a single thin layer of damp native sand (from 2.45mbgl to 2.80mbgl).

There is also a historic landfill located immediately to the east and down gradient of the Site, known as the former Bray Municipal Landfill. This landfill has been the subject of a phased environmental risk assessment

process. A site investigation, Tier 2 Environmental Risk Assessment (Fehily Timoney & Co., 2016)[1] and Remediation Option Appraisal (Fehily Timoney & Co., 2017)[2] have been carried out on the historic landfill Site to fully assess the current ground conditions and potential risk that the former landfill could pose to human health and environmental receptors in the vicinity. The findings of this phased risk assessment process are summarised in the Remediation Option Appraisal report (Fehily Timoney & Co., 2017) presented in Appendix 9.2 of the EIAR.

As a precautionary measure, the potential risk of encountering ground contamination should be addressed by the Contractor in the CEMP.

2.5.4. Ecology

A Natura Impact Statement (NIS) was prepared by Atkins (2022) and is included in the SHD 2 Planning Submission. The purpose of an NIS is to identify potential impacts on European sites and examines the likelihood of the proposed development resulting in a significant effect on the features of interest and conservation objectives of European sites. The NIS outlines avoidance and mitigation measures which are proposed to offset any potential effects on European sites.

The Site was subject to ecological surveys on 27th February, 16th July and 14th August 2020 and 21st July 2022. During the course of both the winter and summer walkover surveys the Site was evaluated for the presence of and suitability for birds, mammals, amphibians and insect groups such as lepidoptera and hymenoptera. Incidental sightings of species were noted during the walkover survey to further evaluate the importance of the Site to flora and fauna in line with the approach set out in the Guidelines for Ecological Impact Assessment in the United Kingdom and Ireland: Terrestrial, Freshwater, Coastal and Marine (CIEEM, 2018, 2022 reprint). A winter site visit was carried out during February 2020 to check the Site for the presence of terrestrial mammals. The Site was further visited during July/August 2020 and July 2022 to target protected terrestrial mammal species, such as badgers. During July-August 2020 and July 2022 the hedgerows, trees and treelines within the Site were also assessed for signs of nesting bird activity. Bird activity was recorded on the Site during the course of each site visit. During all site visits, invasive species noted while on Site were also recorded. A Phase 1 habitat survey was undertaken during July – August 2020 in line with published best practice (Smith et al., 2011), with habitats classified in line with the Heritage Council Classification scheme (Fossitt, 2000). Dominant plant species in each habitat type were recorded. Plant nomenclature follows the Botanical Society of Britain and Ireland's List of Accepted Plant Names (Botanical Society of Britain and Ireland, 2019).

Dr Tina Aughney was commissioned by Atkins to undertake bat surveys for the Site in line with published best practice. The Site was surveyed for evidence of bat activity during July-August 2020. Bat surveys assessed the Site for evidence of roosting, feeding and commuting bats and included Tree Potential Bat Roost (PBR) Surveys, Static Detector Surveys, Dusk and Dawn Bat Surveys, Walking Transects and Building Inspections. The landscape value for bats was also considered (after e.g. Entwhistle et al., 2001; etc.), while lighting proposals were also reviewed. The findings are presented in the Bat Assessment, available at Appendix 4.1 of the EIAR, with the recommended mitigation measures outlined within the Bat Conservation Plan presented in Appendix 4.3 of the EIAR.

Independent Tree Surveys and ABP Treecare were commissioned by Atkins to undertake a survey of the significant trees within the Site boundaries. The surveys were compliant with BS 5837: 2012 Trees in relation to design, demolition and construction – Recommendations. Surveys included and recorded; tree species, height, stem diameter, crown spread, height of crown clearance, age class, physiological and structural condition, management recommendations, estimated remaining contribution in years, BS 5837 retention category and root protection areas. Tree surveys were undertaken during June 2020 and March 2021 with follow up tree surveys undertaken in 2022 and their findings presented in the Tree Survey Reports in Appendix 5.2 of the EIAR.

2.5.5. Landscape and Visual Amenity

The Landscape and Visual Assessment (Refer to Volume 1 - Non Technical Summary; and Chapter 5 of Volume 2 - Main EIAR (Atkins, 2022) for further details) concludes that the potential impacts from the proposed development during the construction phase are as follows;

[1] https://www.dlrcoco.ie/sites/default/files/atoms/files/tier_2_risk_assessment_bray_historic_landfill_co_wicklow.pdf

'The Site is located on the northern outskirts of Bray town centre on Bray Golf Club lands, a former golf course with no formal function. It comprises approximately 8.81 hectares of scattered trees and parkland with large areas of amenity grassland and the remnants of the golf course including bunkers around greens. To the west, adjacent to the Site are primary and post primary schools. The former Industrial Yarns premises, now the Industrial Yarns Complex, lies to the north west and comprises supermarkets and other commercial premises. The R761, Dublin Road, is approximately 5km to the west. The eastern boundary lies adjacent to the railway line, with Bray Daly railway station lying approximately 800m south. To the north west is St. Philomena's Primary School and Corke Abbey residential estate. To the north is Corke Abbey Valley Park, an area of public open space/woodland with residential development located further north. Access to the proposed development will run from Dublin Road, circumventing the primary and post primary school complex adjacent to the Site. In addition, a network of pedestrian and cycle connections will be provided to residential developments via Corke Abbey Valley Park, the adjacent Ravenswell Primary School, the River Dargle walkway and Bray Harbour, Promenade and town centre. The Site is roughly rectangular in shape and falls from north to south with the northern portion located at an elevated position. The land slopes gently from west to east, down to the railway line and coastline at Bray Beach.

The Site traverses the administrative boundaries of Dún Laoghaire-Rathdown County Council (DLRCC) and Bray Municipal District of Wicklow County Council. The Site does not have any value in terms of comparative rarity, distinctiveness or amenity value and is typical of a former golf course with grassland, bunkers and scattered trees. The site is influenced by the presence of existing development. Whilst it is in a prominent position adjacent to Bray Beach and the Dargle River, it is not in a prime position from which to view the beach or river, as there are industrial/commercial buildings around the harbour and along Harbour Road. Whilst it may be appreciated by local walkers it has no wider recognition and the assessment of the value of this landscape is Low. In terms of the susceptibility of the landscape resource to accommodate change of the type proposed, it is considered that the presence of the adjacent existing development to the west, proximity of housing to the north and south and the railway to the east reduces the susceptibility of the Site to change resulting from residential development. The susceptibility is considered Low and sensitivity is assessed as Low, which accords with the Wicklow County Development Plan (WCDP) Appendix 5, Landscape Assessment 2016-2022 published assessment.'

2.5.6. Water Resources

There are 2no. rivers/streams in the immediate vicinity of the Site; River Dargle (River Waterbody Code: IE_EA_10D010300) is located immediately south of the Site and the Rathmichael stream (European Code: IE_EA_10D010300) is located ca. 0.15km north of the Site (EPA, 2022) (see Figure 2.1). Both the Dargle River and Rathmichael stream flow in a general easterly direction before discharging to Dargle Estuary and Southwestern Irish Sea - Killiney Bay (HA 10) respectively.

The River Dargle and Rathmichael stream have '*good'* overall water quality status for the 2013 to 2018 monitoring period and are '*not at risk'* of failing to meet the relevant Water Framework Directive (WFD) objectives by 2027 (EPA, 2022).

The Site is within the Wicklow Ground Groundwater Body (GWB) (European Code: IE_EA_G_076). The Wicklow GWB has '*good'* overall regional groundwater status for the 2013 to 2018 period with its risk of failing to meet the relevant Water Framework Directive (WFD) objectives by 2027 under '*review'* (EPA, 2022).

The GSI provides a methodology for aquifer classification based on resource value (regionally important, locally important and poor) and vulnerability (extreme, high, moderate or low). Resource value refers to the scale and production potential of the aquifer whilst vulnerability refers to the ease with which groundwater may be contaminated by human activities (vulnerability classification primarily based on the permeability and thickness of subsoils). According to the GSI (2022) the site is underlain by a locally important bedrock aquifer.

The groundwater vulnerability rating beneath the site is '*Moderate'* in the northern portion and '*Low'* in the southern portion (GSI, 2022).

The Site intercepts 3no. wells; a surface spring (GSI Ref: 3221SWW036), a borehole (GSI Ref: 3221SWW029) which is reported as having an unknown purpose, and a domestic well (GSI Ref: 3221SWW070) which is located within the northern portion of the site. Several other boreholes and springs are reported to be present within the immediate vicinity (2km radius) of the Site; however, none of these are reported by the GSI (2022) to be used for potable use or for major groundwater abstraction. There are no public supply wells or public drinking water protection areas within 10km of the Site.

2.5.7. Flood Risk

A Flood Risk Assessment (FRA) has been submitted to support this planning application (Atkins, 2022). The overall finding from the FRA, which includes detailed hydraulic modelling, is that identified potential flood risks are sufficiently addressed, and states the following;

- *'A detailed hydrological analysis was undertaken of the River Dargle in order to identify the predicted 1 in 100 year (1% AEP) and 1 in 1000 year (0.1% AEP) flood events in the vicinity of the proposed development site. In addition, the predicted 1 in 200 year (0.5% AEP) and 1 in 1000 year (0.1% AEP) tidal flood levels have been analysed in the vicinity of the site. ……Due to the location of the proposed development adjacent to and partially within a flood zone a Justification Test was carried out in line with the criteria outlined by the Dept. of the Environments guidelines for planning authorities 'The Planning System and Flood Risk Management'. This Justification Test satisfied the required criteria and therefore determined that there is no residual risk of flooding to the proposed Coastal Quarter Development except for that which is planned (during the fluvial 1 in 100 year and 1 in 1000 year event along with the tidal 1 in 200 year and 1 in 1000 year flood events) within the south of the subject site in the open space area. In addition, the proposed development does not pose an increased flood risk to people or the surrounding property outside of the applicant's landholding.*
- *The Finished Floor Levels (FFL) of the proposed units within the Coastal Quarter development have been set at a minimum level of 6.10mOD. A freeboard of 2.131m above the peak 0.1% AEP flood level has been provided which is significantly higher than the minimum freeboard requirement of 500mm. The level of flood protection also provided by the recently constructed River Dargle Flood Defence Scheme mitigates the level of flood risk to people, property and the urban environment.*
- *In summary, the development as proposed shall not result in an adverse impact to the existing hydrological regime of the area nor increase flood risk to areas outside of the landowners' holdings, nor create unacceptable levels of flood risk within the proposed development and is therefore considered to be appropriate from a flood risk perspective.'*

2.5.8. Cultural Heritage

2.5.8.1. Geophysical Survey

A Geophysical Survey report was prepared for the development site in October 2020 by JM Leigh Surveys. This document is presented in Appendix 11.1 of the EIAR.

A summary of the key findings from this survey is as follows (as per the EIAR submitted for planning, September 2022);

'Following consultation with the National Monuments Service (NMS) during the preliminary phase of the assessment process, a geophysical survey of the proposed development was undertaken by Ms. Joanna M. Leigh in October 2020 (Detection Licence Ref. 20R02014). The linear earthwork was presented in the geophysical data as a curvilinear band of increased magnetic and ferrous response. In addition, a number of features of low archaeological potential were identified within the Site. There were no definitive patterns of an archaeological character evident within the survey results and numerous small-scale ferrous responses were evident throughout the survey area. The full report on this Site investigation is presented in Appendix 11.1 and the report has also been submitted to the National Monuments Service in accordance with licensing requirements.'

2.5.8.2. Archaeological Test Trenching

Archaeological Test Trenching was undertaken by John Cronin and Associates (2020) and is summarised (as per the EIAR submitted for planning, September 2022) as follows (presented in Appendix 11.2 of the EIAR):

'The following section presents a summary overview of the results of the archaeological test trenching of the proposed development in November 2020 and should be read in conjunction with the full report on this Site investigation presented in Appendix 11.2, which contains drawn and photographic records of the works. A copy of the test trenching report has been submitted to the National Monuments Service to comply with licensing requirements. The programme of archaeological test trenching, which was carried out following consultation with the National Monuments Service, under Excavation Licence 20E0482 and Detection Device Licence 20R00197 (metal-detecting) was completed within a three-day period in November 2020. Test trenching was carried out in the available areas of the Site and the layout of the ten excavated trenches (650m linear metres

in combined length) targeted the locations of the anomalies identified during geophysical survey, as well as available areas not subjected to geophysical survey (Figure 11-6). Two test trenches were manually excavated across the linear earthwork (WI004-005----/DU026-124---).

In general, the topsoil layer within the excavated trenches consisted of a mid-brown sandy clay with occasional modern inclusions present to its base, including sherds of modern ceramics, glass and other modern objects. The topsoil measured up to 0.6m in depth and contained numerous modern drainage pipes. The underlying natural subsoil was highly disturbed in places, presumably due to landscaping works associated with the former golf club. The sub-surface remains of a levelled field boundary were revealed in Trenches 5, 6 and 7 and the shallow sub-surface remains of this feature contained inclusions of brick fragments. The geophysical survey report tentatively interpreted several anomalies in Trenches 3, 5 and 7 as being of low archaeological potential. The testing programme revealed that these were most likely related to recent burning activity as modern burnt ferrous material was noted down to the surface of the natural subsoil at their locations.

Two manually excavated trenches (Trenches 3 and 4) were excavated across the alignment of the linear earthwork. The stratigraphy encountered in both trenches suggests that the feature was formed by the demolition of the upper courses of a random rubble wall at this location which may have formed part of a lane shown on historic OS maps. The rubble was primarily heaped on the northern side of the remnant basal course of the wall where the terrain slightly dips and was subsequently overlain with soil to create the slightly elevated flat-topped earthwork. A sub-surface ditch cut measuring 1.5m wide by 0.3m deep was uncovered under the north side of the embankment material and its basal fill contained late 19th /early 20th inclusions such as glass and ceramic sherds. In summation, the results of the archaeological test trenching, in conjunction with the cartographic evidence and previous archaeological investigations of the feature, indicates that the existing linear earthwork within the proposed development is a landscaped feature of late 19th or early 20th century date and is not of archaeological origin. As noted in Section 11.2.7 [See EIAR, September 2022]*, the National Monuments Service reviewed the submitted report on the archaeological test trenching investigations and confirmed by email (14/04/21) that they concurred with this conclusion.'*

2.5.9. Traffic & Transportation

In relation to transport, the Contractor will utilise a Traffic Management Control Plan to mark relevant identified receptors so that construction impacts on them can be considered.

2.5.10. Population and Human Health

Receptors include residential units, amenity facilities and school developments within the vicinity of the proposed residential development. The most recent Census of Population with complete available data was undertaken in April 2016, with limited information available for the 2022 census results. This proposed development falls two Electoral Divisions, Bray No.1 ED (CSO Area Code: 15003) in County Wicklow and Shankill-Shanganagh ED (CSO Area Code: 05062) in County Dublin. During the 2016 Census the population within Bray No.1 ED was recorded to be 1,839 and the population within Shankill-Shanganagh ED was recorded to be 5,488 (CSO, 2016).

Local Services / Amenities (Social Infrastructure) includes a wide range of services and facilities including education, community, recreation and sports facilities that contribute to the quality of life.

3. Legislation and Guidance

All parties, contractors and consultants working on this project shall be subject to the laws of Ireland and the various international/regional protocols and agreements to which Ireland is a party. In the event that legislation is updated the latest version shall be followed. All relevant new legislation will be followed as appropriate. This document outlines most current legislation at the date of issue. It is the responsibility of the Contractor to ensure that they are up to date with the details of the latest iterations of legislation relevant to the project throughout the duration of the contract.

The Designer should be aware of all key environmental risks and associated measures set out within this CEMP, and the final detailed design should take due cognisance of these where relevant.

The Contractor should set out the CEMP in a clear format and must address all key environmental risks and associated measures. The Contractor must be aware of and comply with the legislation and guidance set out in this document, any specific planning conditions which may be associated with the proposed development, and other relevant documentation as prescribed by the Employer and planning authority.

3.1. Legislation

It should be noted that the appointed Contractor will be required to be aware of their obligations under legislation. Such legislation, includes, but is not restricted, to:

- Planning and Development Act, 2000, as amended 2017 (S.I. No. 20 of 2017), 2018 (S.I. No. 16 of 2018), 2020 (S.I. No. 92 of 2020), 2021 (S.I. No. 18 of 2021) and 2022 (S.I. No. 75 of 2022).
- Planning and Development Regulations 2001 to 2022.
- The Birds Directive: Council Directive of 2 April 1979 on the conservation of wild birds (79/409/EEC);
- The Birds Directive: Council Directive 2009/147/EC on the conservation of wild birds;
- The Habitats Directive: Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora;
- The European Communities (Birds and Natural Habitats) Regulations, 2011 (S.I. 477 of 2011), as amended, 2015 (S.I. No. 355 of 2015) and 2021 (S.I. No. 388 of 2021;
- Water Framework Directive (WFD): Directive 2000/60/EC of the European Parliament and Council establishing a framework for Community Action in the field of water policy, as amended;
- European Communities Environmental Objectives (Surface Waters) Regulations, 2009, S.I. No. 272 of 2009, as amended, 2012 (S.I. No. 327 of 2012), 2015 (S.I. No. 386 of 2015), 2019 (S.I. No. 77 of 2019);
- European Communities Environmental Objectives (Groundwater) Regulations 2010, S.I. No. 9 of 2010, as amended, 2016 (S.I. No. 366 of 2016);
- European Communities (Environmental Liability) Regulations, 2008, S.I. No. 547 of 2008, as amended, 2011 (S.I. No. 307 of 2011), 2015 (S.I. No. 293 of 2015);
- Waste Framework Directive 2008/98/EC of the European Parliament and Council on waste, as amended 2018 (S.I. No. 851 of 2018);
- Waste Management Acts of 1996 to 2021;
- The Water Pollution Acts of 1977 & 1998;
- The Wildlife Acts 1976 to 2021;
- Water Policy Regulations 2003, S.I. No. 722 of 2003, as amended, 2005 (S.I No. 413 of 2005), 2008 (S.I No. 219 of 2008), 2010 (S.I. No. 93 of 2010) and Amendment (No. 2) Regulations, (S.I. 326 of 2010) & EU Water Policy Regulations 2014 (S.I 350 of 2014) and 2018 (S.I. No. 261 of 2018);
- Water Conservation Regulations 2008, S.I. No. 527 of 2008;
- European Communities (Drinking Water) Regulations 2014, S.I. No. 122 of 2014, as amended 2017 (S.I No. 464 of 2017) and 2020 (S.I. No. 2184 of 2020);
- Guidelines on protection of fisheries during construction works in and adjacent to waters (IFI, 2016);
- Litter Pollution Act of 1997, as amended, 2017 (Bill 58 of 2017);

- Litter Pollution Regulations 1999, S.I. No. 359 of 1999);
- European Union (Waste Electrical and Electronic Equipment) Regulations 2014 (S.I. No. 149 of 2014), as amended 2019 (S.I. No. 233 of 2019);
- Waste Management (Facility Permit and Registration) Regulations 2007, S.I. No. 821 of 2007, as amended, 2008 (S.I. No. 86 of 2008), 2015 (S.I. No. 198 of 2015), 2019 (S.I. No. 250 of 2019);
- Waste Management (Collection Permit) Regulations 2007, S.I. No. 820 of 2007), as amended, 2015 (S.I. No. 197 of 2015), 2016 (S.I. No. 24 of 2016);
- Waste Management (Licensing) Regulations 2004 (S.I. No. 395 of 2004) as amended 2010 (S.I. No. 350 of 2010);
- Environment (Miscellaneous Provisions) Act 2011, as amended 2015;
- Waste Management (Landfill Levy) Regulations 2008, S.I. No. 199 of 2008, as amended 2009, (S.I. No. 550 of 2009), 2010 (S.I. No. 31 of 2010), 2012 (S.I. No. 221 of 2012), 2013 (S.I. No. 194 of 2013), 2015 (S.I. No. 189 of 2015), 2019 (S.I. No.182 of 2019);
- Waste Management (Hazardous Waste) Regulations, 1998, as amended, 2000 (S.I. No. 73 of 2000);
- Waste Management (Shipment of Waste) Regulations 2007, S.I. No. 419 of 2007;
- Waste Management (Movement of Hazardous Waste) Regulations, 1998 (S.I. No. 147 of 1998);
- European Communities (Shipments of Hazardous Waste Exclusively within Ireland) Regulations 2011, S.I. No 324 of 2011;
- European Communities (Transfrontier Shipment of Waste) Regulations 1994 (S.I. No. 121 of 1994);
- Waste Management (Transfrontier Shipment of Waste) Regulations 1998, as amended, 2014 (S.I. No. 861 of 2014);
- Waste Management (Tyres and Waste Tyres) Regulations 2007 (S.I. No. 664 of 2007), 2017, as amended (S.I. No. 400 of 2017) and 2018 (S.I. No. 96/2018);
- European Union Batteries and Accumulators Regulations 2014, S.I. No. 283 of 2014, as amended, 2014 (S.I. No. 349 of 2014), 2015 (S.I. No. 347 of 2015);
- Waste Management (Registration of Brokers and Dealers) Regulations 2008, SI No. 113 of 2008;
- Waste Management (Prohibition of Material Disposal by burning) Regulations 2009, S.I No. 286 of 2009, as amended 2013 (S.I. No. 504 of 2013), 2017 (S.I. No. 599 of 2017), 2019 (S.I. No. 684 of 2019) and (S.I. No. 51 of 2022);
- European Communities (Waste Directive) Regulations 2011, S.I. No. 126 of 2011, as amended 2016 (S.I. No. 315 of 2016) and (S.I. No. 323 of 2020);
- European Waste Catalogue (EWC) and Hazardous Waste List 2002, 2015 and 2018;
- Waste Management (Food Waste) Regulations 2009, S.I. No 508 of 2009, as amended, 2015 (S.I. No. 430 of 2015);
- Protection of the Environment Act 2003;
- European Union (Properties of Waste Which Render It Hazardous) Regulations 2015, S.I. No. 233 of 2015, as amended, 2018 (S.I. No. 383 of 2018);
- Air Pollution Act, 1987 (Air Quality Standards) Regulations, 1987, as amended, 2002 (S.I. No. 271 of 2002), 2011 (S.I. No. 180 of 2011), 2016 (S.I. No. 659 of 2016);
- Air Pollution Act, 1987 (Emission Limit Values for use of Asbestos) Regulations, 1990, S.I. No. 28 of 1990);
- EC (Control of Emissions of Gaseous & Particulate Pollutants from Non-Road Mobile Machinery) Regulations 2007, S.I. No.147 of 2007, as amended, 2011 (S.I. No. 263 of 2011), 2012 (S.I. No. 407 of 2012), 2013 (S.I No. 417 of 2013), 2016 (S.I. No. 2016/1628);
- The EU Regulation 2037/2000 (CFC's, HCFC's, Halons) - Ozone Depleting Substances. Control of Substances that Deplete the Ozone Layer Regulations 2006, S.I. No 281 of 2006, as amended, 2011 (S.I. No. 465 of 2011);
- EU F Gas Regulations 2006, as amended, 2014, S.I. No. 517 of 2014, 2019 (S.I. No. 367 or 2019);
- Environmental Protection Agency Act 1992 (Noise) Regulations, 1994 S.I. 174 of 1994;

- Environmental Noise Regulations 2006, S.I. No. 140 of 2006;
- European Communities (Environmental Noise) Regulations 2018 (S.I. No. 549 of 2018;
- European Communities (Noise Emission by Equipment for use Outdoors) Regulations, 2001, S.I No. 632 of 2001, as amended, 2006 (S.I No. 241 of 2006);
- European Communities (Construction Plant and Equipment) (Permissible Noise Levels) Amendment Regulations 1996, S.I No. 359 of 1996 and 2001, S.I No. 632 of 2001);
- Local Government (Planning and Development) Act 1963 (S.I. No. 28 of 1963), as amended 1993 (S.I. No. 12 of 1993);
- Wildlife Act, 1976 (Protection of Wild Animals) Regulations, 1990, S.I. No. 112 of 1990 and Wildlife Amendment Act, 2000 (S.I. No. 38 of 2000);
- European Communities Conservation of Wild Bird Regulations 1985, S.I. No. 291 of 1985, as amended, 1986 (S.I. No. 48 of 1986), 1995 (S.I. No. 31 of 1995), 1997, (S.I. No. 210 of 1997), 1998 (S.I. No. 154 of 1998), (S.I. No. 131 of 1999), 2005 (S.I. No. 716 of 2005), 2010 (S.I. No. 65 of 2010), 2011 (S.I. No. 626 of 2011), 2012 (S.I. No. 84 of 2012), 2013 (S.I. No. 281 of 2013), 2019 (S.I. No. 178 of 2019);
- Noxious Weed Act, 1936, S.I. No. 38 of 1936;
- Noxious Weed Order, 1937, S.I. No. 103 of 1937;
- Flora (Protection) Order, 2015, S.I. No 356 of 2015;
- The Forestry Act, 1946, S.I. No. 13 of 1946, as amended, 2009 (S.I. No. 40 of 2009) & Forestry Act, 2014, S.I. No. 31 of 2014;
- Forestry Regulations, S.I. No. 191 of 2017, as amended 2020 (S.I. No. 32 of 2020);
- The National Monuments Act 1930, S.I. No. 2 of 1930, as amended, 2004 (S.I. No. 22 of 2004);
- European Union (Environmental Impact Assessment and Habitats) (Section 181 of the Planning and Development Act 2000) Regulations, 2013 (S.I. No. 403 of 2013), 2015 (S.I. No. 301 of 2015), 2019 (S.I. No. 418 of 2019); and,
- European Union (Environmental Impact Assessment and Habitats) (Environmental Impact Assessment) Regulations, 2018, S.I. No. 296 of 2018.

3.2. Industry Guidance

The Contractor should take due consideration of, and incorporate best practice guidance, including but not limited to the following:

- BS 5837/2012. Trees in relation to design, demolition and construction;
- BS 3998; 2010. Tree Work. Recommendations;
- CIRIA (2001). C532. Control of water pollution from construction sites. Guidance for consultants and contractors;
- CIRIA (2006). C648. Control of water pollution from linear construction projects. Technical Guidance;
- CIRIA (2008). C679. Invasive species management for infrastructure managers and the construction industry.;
- CIRIA (2015). C741. Environmental Good Practice on Site;
- CIRIA (2015). C753. The SuDS Manual;
- Environmental Protection Agency (2021). *'Best Practice Guidelines for the preparation of resources & waste management plans for construction & demolition projects'*
- Invasive Species Ireland (2016). Best Practice Management Guidelines. Japanese knotweed;
- NRA (2008). Guidelines for the Crossing of Watercourses during the Construction of National Road Schemes;
- NRA (2005). Guidelines for the Treatment of Badger Prior to the Construction of National Road Schemes;
- NRA (2008). Guidelines for the Treatment of Otters prior to the Construction of National Road Schemes;

- NRA (2006). Guidelines for the Protection and Preservation of Trees, Hedgerows and Scrub Prior to, During and Post Construction of National Road Schemes;
- NRA (2010). Guidelines on the Management of Noxious Weeds and Non-Native Invasive Plant Species on National Roads (Revision 1); and,
- Sustainability & Environmental Appraisal (March 2020) LA 120 Environmental management.

4. Project Roles & Responsibilities

For the purposes of clarity, the roles and responsibilities of the project team for the proposed development should be determined at the very outset of the Construction Stage of this project. Key roles are listed in Table 4.1. These are typically performed by the Client, Engineer and Contractor as presented below. Specific details will be determined upon the Detailed Design and Contract stage.

Table 4.1 - Roles and Responsibilities

Employer	Planning Agents
The Client: Shankill Property Investments Ltd. Tel: 01 625 9100 Contact: Cathal Dalton	The Planner: RPS Tel: 01 488 2900 Contact: Michael Higgins /Maria Lombard
Employers Representative	**Design Team**
The Engineer: Atkins Tel: 01 8108000 Contact: Garry Hanratty	The Architect: Glenn Howell Architects Tel: +44 12 1666 7640 Contact: Daniel Mulligan
Project Supervisor for the Design Process (PSDP)	**Civil, Structural and Environmental Team**
The Engineer: to be confirmed Tel: to be confirmed Contact: to be confirmed	The Environmental Consultant: Atkins Tel: 01 8108000 Contact: Garry Hanratty / Deirdre Larkin
Masterplan Architect	**Landscape Architect**
The Engineer: Glenn Howells Architects Tel: +44 12 1666 7640 Contact: Daniel Mulligan	The Landscape Architect: Park Hood Tel: +44 28 9029 8020 Contact: Mark Johnston
Project Supervisor Construction Stage (PSCS)	**Contractor**
The Contractor: to be confirmed Tel: to be confirmed Contact: to be confirmed	The Contractor: to be confirmed Tel: to be confirmed Contact: to be confirmed

4.1. The Client/Employer

Shankill Property Investment Limited will be responsible for ensuring that competent parties are appointed to undertake the construction and that sufficient resources are made available to facilitate the appropriate management of risks to the environment.

4.2. Environmental Manager

An Environmental Manager will be appointed by the Contractor to ensure that the CEMP is effectively implemented. The Environmental Manager will be a suitably qualified, competent and experienced professional

that would perform the necessary tasks, review environmental procedures and consult with the members of the construction team and stakeholders as required. The Environmental Manager will be responsible for:

- Ensuring that the CEMP and all relevant documents such as environmental control plans is developed, implemented and maintained on site;
- Ensuring compliance with the Conditions of the Planning Permission;
- Ensuring the mitigation measure set out in the CEMP are implemented;
- Ensuring that construction occurs in accordance with the relevant environmental requirements and that such compliance is adequately recorded and documented;
- Conducting regular environmental inspections 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;
- Ensuring all staff have undertaken adequate environmental inductions, awareness briefings and training;
- Dealing with environmental complaints; and
- Managing and responding to environmental incidents and ensuring that all incidents are recorded and reported in an appropriate manner.

4.3. Construction Director

The Construction Director will be responsible for the overall execution and organisation of all environmental related activities, as appropriate. Some responsibilities of the Construction Director will comprise the following:

- Overall responsibility for the implementation of the CEMP;
- Allocating the correct resources in order to ensure the successful implementation of the CEMP; and,
- Assisting in the management review of the CEMP for suitability and effectiveness.

4.4. Construction Manager

The Construction Manager is directly responsible to the Construction Director in assisting with the successful execution of the Proposed Development. The responsibilities of the construction manager in respect of the CEMP comprise the following:

- To report to the Construction Director on the on-going performance and development of the CEMP;
- To discharge his/her responsibilities as per the CEMP; and,
- To support and augment the Construction Management Team (CMT) through the provision of adequate resources and facilities for the duration of the implementation of the CEMP.

5. Environmental Management Procedures

5.1. General

The Contractor will be required to have a recognised environmental management system such as ISO 14001:2015 or be able to demonstrate that they are actively working towards implementing such a system.

The works Contractor will undertake the works in accordance with the provisions of the CEMP. The CEMP will be updated by the Contractor to address any subsequent planning conditions relevant to the proposed development and will be reviewed by the Employer and/or the Employer's Representative. The Contractor will review and add to the CEMP as appropriate and shall issue the updated CEMP. A record of the review and any recommendations will also provide (for review and approval by the Employer and/or the Employer's Representative) Environmental Control Plans (ECPs), which will be maintained and updated in accordance with the CEMP. ECPs will include (if applicable), but will not be restricted to:

- Air Quality Control Plan;
- Construction Noise and Vibration Control Plan;
- Pollution Prevention Control Plan;
- Water Resources and Energy Use Control Plan;
- Ecological Control Plan;
- Light Pollution Control Plan;
- Archaeological and Cultural Control Plan;
- Traffic Management Control Plan;
- Contamination Land Control Plan; and,
- Soil Erosion and Sedimentation Control Plan.

Guidance on the development of the Control Plans is located in Section 7 of this document.

5.2. Environmental Policy

Contractors shall have an environmental policy dated and signed by the most senior person in the company. The policy shall:

- Be appropriate to the nature, scale and environmental impacts of the organisations activities, products and services;
- Include a commitment to continual improvement in environmental performance;
- Include a commitment to comply with all applicable legislation and with other requirements to which the organisation subscribes which relate to its environmental aspects;
- Provide a framework for setting and reviewing objectives and targets;
- Be documented, implemented and maintained;
- Be communicated to all persons working for or on behalf of the organisation; and
- Be available to the public.

5.3. Environmental Aspects

Contractors are expected to use a qualitative approach to identify and evaluate potential environmental aspects along with any controls to prevent or mitigate environmental damage. A simple risk matrix (as follows) facilitates quick reference and assignment of risk levels for each environmental aspect:

- Extreme/serious risk;
- High risk;
- Moderate risk; and,
- Low risk.

All environmental aspects rated as High or Extreme/Serious will be classified as significant and will require control or mitigation measures to manage the risk. All environmental aspects covered by a legal requirement, for example an Environmental Permit condition will also be classified as significant even if the risk is low or moderate.

Table 5.1 – Example of Qualitative Risk Matrix

					Probability				
Severity	**People**	**Assets**	**Environment**	**Reputation**	**Impossible / Rare**	**Improbable / Possible**	**Probable / Likely**	**Very Likely / Often**	**Certainty/ Frequent**
Catastrophic	Multiple fatalities or permanent total disabilities	Extensive damage	Massive effects	International impact				Extreme / Serious Risk	
Severe / Major	Single fatality or permanent total disability	Major damage	Major effect	National impact		High Risk			
Critical / Moderate	Major injury or health effects	Local damage	Localized effect	Considerable impact					
Marginal / Minor	Minor injury or health effects	Minor damage	Minor effect	Minor impact		Moderate Risk			
Negligible / Insignificant	Slight injury or health effects	Slight damage	Slight effect	Slight impact	Low Risk				

The Contractor shall record the results of the qualitative risk analysis in an Aspects and Impacts Register (Table 5.2).

Table 5.2 – Example of Aspects and Impacts Register

Environmental Aspect	Environmental Impact	Risk Rating	Control / Mitigation Measures	Risk Rating After Control
Use of fuel storage tanks on site	Potential contamination of water and land	High Risk	Double skinned tank, bunding, location on hard standing, emergency spill procedure and equipment and training	Moderate Risk

5.4. Training, Awareness and Competence

The Contractor (and their sub-contractors) would be selected with due consideration of relevant qualifications and experience. The Contractor will be required to employ construction staff with appropriate skills, qualifications and experience appropriate to the needs of the works to be carried out during construction.

A site induction will be provided to all construction staff before they commence work on site. Where appropriate, the Contractor will identify specific training needs for the construction workforce and will ensure that appropriate training requirements are fulfilled. A baseline level of environmental awareness will be established though the site induction programme. Site inductions will cover the following as a minimum:

- Introduction to the Environmental Manager;
- The requirements of the CEMP and consequences of non-compliance;
- The requirements of due diligence and duty of care;
- Identification of environmental constraints and potential impacts of the work;
- Procedures associated with incident notification and reporting including procedures for dealing with damage to the environment; and,
- The benefits of improved environmental and sustainability performance; and the potential consequences of departure from specified procedures, work instructions and method statements.

5.5. Meetings

The Environmental Manager will be responsible for arranging and holding monthly meetings with the Employer and/or the Employer's Representative. The Environmental Manager will develop and distribute minutes on monthly meetings accordingly.

5.6. Monitoring and Inspections

For the duration of the contract, the environmental performance of the Contractor will be monitored through site inspections and audits. The programme for monitoring, inspections and audits shall be specified in the contract. The Contractor shall develop, implement and maintain an Environmental Inspections and Monitoring Plan.

Records of all inspections carried out should be maintained and all actions should be closed out in a reasonable time. If additional monitoring and inspections are required due to any subsequent planning conditions, these will be added to the CEMP.

5.6.1. Monitoring

Mitigation and monitoring will be carried out so that construction activities are undertaken in a manner that does not give rise to negative effects. Suitable monitoring programmes will need to be developed, implemented, documented and assessed in accordance with the specification outlined 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.

5.6.2. Inspections

Inspections of construction activities will be carried out by the Environmental Manager on a daily basis to ensure all necessary environmental measures relevant to the construction activities are being effectively implanted by construction staff, ensuring legal and contractual conformity.

5.6.2.1. Daily Inspections:

The daily inspections should include, but not be limited to, checking that:

- The site boundary is marked out and respected;
- All waste is appropriately stored and segregated;
- Waste skips are covered to prevent wind-blown litter;
- Drip trays are in place for all stored equipment and plant;
- All chemicals/fuels are stored with appropriate containment/bunds/cover;
- Construction noise is within permitted limits and does not create a nuisance;
- Dust does not create a nuisance; and
- Fencing/hoarding is secure.

5.6.2.2. Weekly Inspections

The inspections should include, but not be limited to confirming that:

- Daily checklists have been completed;
- Waste storage areas have been checked and there is no build-up of waste materials;
- Spill kits have been checked and contain all relevant materials;
- The performance of all pollution control equipment has been checked and the equipment is working effectively;
- Noise reduction/monitoring equipment has been checked and is operating effectively;
- Septic tanks are not overfull/discharging; and
- Special control measures identified in Permit/Planning Conditions and the CEMP are adhered to.

5.7. Nonconformity and Corrective and Preventative Action

The Contractor shall establish, implement and maintain procedures to deal with actual and potential non-conformities and for taking corrective and preventative action.

Non-conformities may be identified through:

- Internal contractor audits;
- Audits by the Employer and/or the Employer's Representative;
- Audits undertaken by external certification bodies;
- Audits undertaken by regulatory authorities; and
- General observations.

The Contractor procedures shall define the requirements for:

- Identifying and correcting non-conformities;
- Mitigating the environmental impacts of non-conformities;
- Investigating non-conformities including identify root causes and implementing appropriate actions to avoid their reoccurrence;
- Evaluating the need for actions to prevent non-conformities and implementing appropriate actions designed to avoid their reoccurrence;
- Setting realistic timeframes for undertaking effective corrective and preventative actions;
- Recording the results of corrective and preventative actions taken; and
- Reviewing the effectiveness of corrective and preventative actions.

All actions identified should be appropriate to the nature and magnitude of the issue and the environmental impacts encountered.

5.8. Reporting

The Contractor will be required to submit a report, the frequency to be agreed with the Contractor and Employer and/or the Employer's Representative to the Employer and/or the Employer's Representative for review and approval. The report shall address the following as 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 and/or audits;
- 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).

5.9. Environmental Records

The Contractor shall maintain records of all environmental documentation including monitoring, environmental compliance, test results, method statements and plans. All records will be kept up-to-date and be made available for audits, inspections and periodical reporting. The Contractor will maintain the following environmental records (as a minimum) that will be made available for inspection to the Employer and/or the Employer's Representative and the relevant authorities if required:

- Management plans;
- Records of environmental incidents;
- Environmental reports;
- Records of environmental training;
- Register of environmental complaints;
- Corrective Action Reports;
- Environmental inspection and audit reports;
- All monitoring data;
- Waste and chemical inventories; and
- Health and Safety records.

6. General Requirements

It is the responsibility of the Contractor to ensure compliance and to avoid and/or reduce significant adverse effects that have been identified at this preliminary juncture where practicable. Where the Contractor diverts from the methodologies and working areas outlined herein and/or defined in the granted planning consent and associated conditions that may be granted, it would be the responsibility of the Contractor to obtain the relevant licenses, permits and consents for any such changes.

6.1. Good Housekeeping

The Contractor will employ a 'good housekeeping' policy at all times. This will include, but not be restricted, 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, material storage, spill kits, material and waste storage, welfare facilities etc;
- Maintain all plant, material and equipment required to complete the construction work in good order, clean and tidy;
- Keep construction compounds, access routes and designated parking areas free and clear of excess dirt, rubbish piles, scrap wood, etc. at all times;
- Details of site managers, contact numbers (including out of hours) and public information signs (including warning signs) will be provided at the boundaries of the working areas;
- Provision of adequate welfare facilities for site personnel;
- Installation of appropriate security, lighting, fencing and hoarding;
- Effective prevention of oil, grease or other objectionable matter being discharged from the working area;
- Provision of appropriate waste management at each working area and regular collections to be arranged;
- Excavated material generated during construction will be reused on site as far as practicable and surplus materials/soils shall be recovered or disposed of to a suitably authorised waste facility site;
- Effective prevention of infestation from pests or vermin;
- No discharge of site run-off or water discharge without agreement of the relevant authorities; and
- Maintenance of public rights of way, diversions and entry/exit areas around working areas for pedestrians and cyclists where practicable and to achieve inclusive access.

6.2. Site Compound

All C&D waste materials will be segregated onsite into the various waste streams, via. labelled dedicated skips and storage areas. Waste will be removed from site by a suitably permitted waste haulage contractor. Each waste haulage contractor must hold a current valid waste collection permit issued by the National Waste Collection Permit Office (NWCPO).

Proposed locations of the site compound and site office are shown on Figure 6-1 (refer also to Appendix A). The site office will be located within the existing golf clubhouse building to the south / south west of the development area for the duration of all construction phases. These locations are selected to avoid any potential impacts to environmental receptors and to reduce any potential for impact on sensitive human receptors. The site compound will also act as a storage centre for construction materials. Storage of materials will be minimal. No large materials will be stored on site until such times as they are required. At no time during the project will materials or other items be placed outside the hoarding line. The exact locations of the compound areas will be agreed with the appointed contractor and Dún Laoghaire-Rathdown County Council and Wicklow County Council prior to the commencement of development and will be used throughout the construction period.

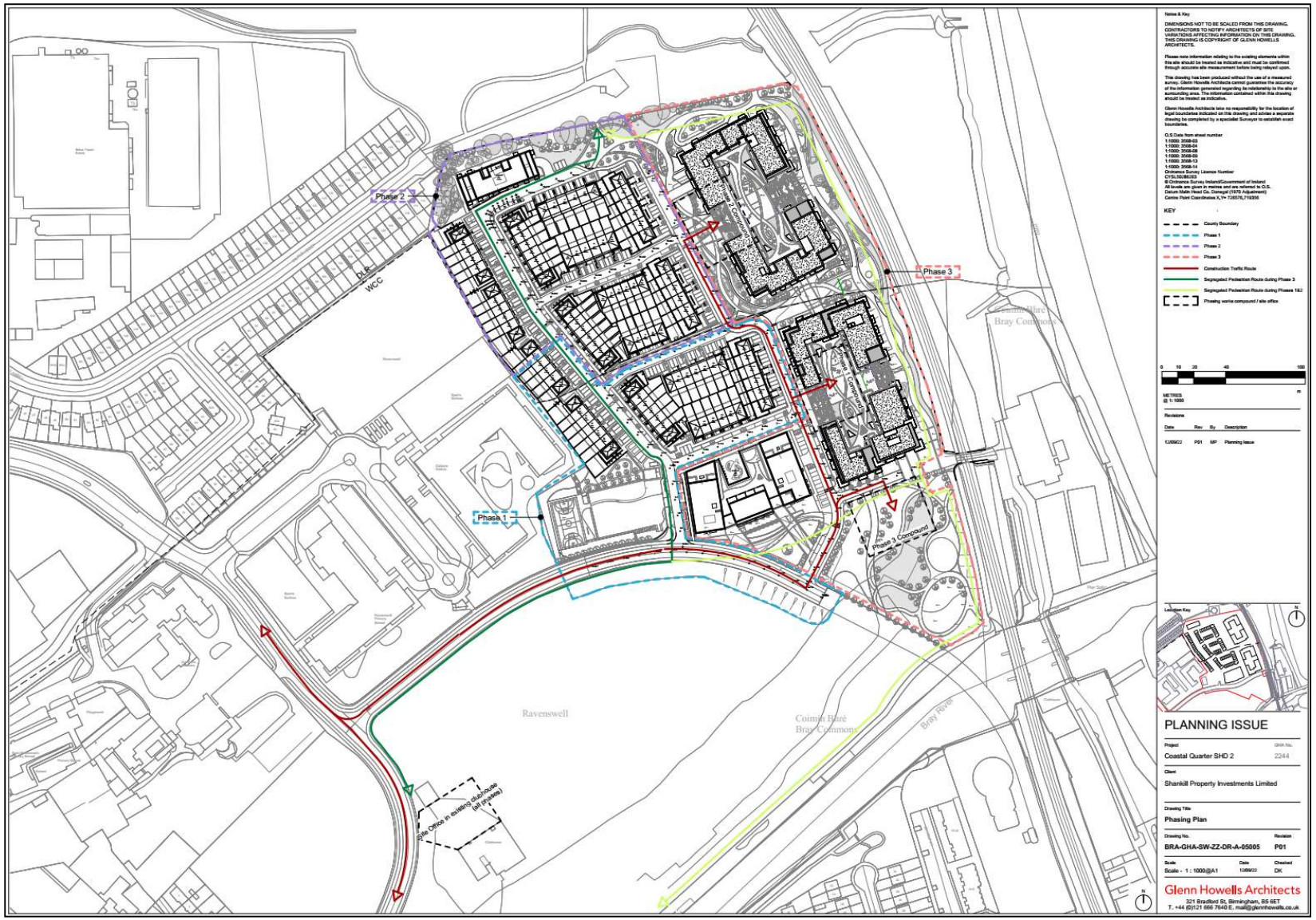


Figure 6-1 - Location of the Site Compound and Site Office

6.3. Hours of Working

6.3.1. Core Working Hours

The timing of construction activities, core working hours and the rate of progress of construction works are a balance between efficiency of construction and minimising nuisance and significant defects. The core construction working hours for the proposed development will be:

- Monday to Friday: 08:00 to 18:00; and,
- Saturdays: 08:00 to 14:00.

No working will be permitted on Sundays or Bank Holidays.

6.3.2. Start-up and shutdown

The Contractor may require a period of up to one hour before and one hour after core working hours for start-up and shutdown 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. The use of plant machinery likely to cause disturbance, will not be permitted outside of the core working hours.

6.3.3. Additional working hours

It may be necessary in exceptional circumstances 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 Wicklow and Dún Laoghaire-Rathdown County Councils and scheduling of such works shall have regard to nearby sensitive receptors.

In the case of work required in an emergency or which if not completed would be unsafe or harmful to workers, the public or local environment, Wicklow and Dún Laoghaire-Rathdown County Councils will be informed as soon as reasonably practicable of the reasons and likely duration and timing (outside of the core working hours).

6.4. Security

Security will be the responsibility of the Contractor- who will provide adequate security to prevent unauthorised entry to or from the site. The following measures may be used to prevent unauthorised access:

- Install CCTV and security systems where required;
- Consult with neighbouring properties and local crime prevention officers including Wicklow and Dún Laoghaire-Rathdown County Councils and An Garda Siochana on site security matters where required;
- Prevent access to restricted areas and neighbouring properties by securing equipment on site such as ladders and scaffolding; and
- When there is no site activity, close and lock site gates and set appropriate site security provisions as required.

6.5. Hoarding and Fencing

A site boundary in the form of hoarding or fencing will be established around each of the working areas before any significant construction activities commences in that working area. The hoarding/fencing shall be a secure boundary to what can be a dangerous environment for those that have not received the proper training and are unfamiliar with construction operations.

Site hoarding also performs am important function in relation to minimising nuisance and effects including:

- Noise emissions (by providing a buffer);
- Visual impact (by screening the working areas, plant and equipment); and
- Dust minimisation (by providing a buffer).

6.6. Services and Utility

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

The Contractor will be responsible for undertaking their own service to establish the full extent of underground services prior to the commencement of construction to support any surveys already undertaken as part of early design work and statutory consent applications.

6.7. Lighting

The following measures will be applied in relation to site lighting:

- Lighting will be provided with a 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; and,
- Motion sensor lighting and low energy consumption fittings will be installed to reduce usage and energy consumption.

6.8. Reinstatement of Working Areas on Completion

The Contractor will reinstate all working areas as work proceeds during construction. All plant, equipment, materials, temporary infrastructure and vehicles will be removed at the earliest opportunity and the surface of the ground restored as near as practicable to its original condition.

On completion of construction works the Contractor will ensure that all waste and potentially polluting material is removed from the site and is disposed of using appropriately authorised contractors as per the Construction RWMP (Atkins, 2022). The Contractor shall, as appropriate, undertake rehabilitation of site compound and other areas no longer to be used by the Contractor. Following site clearance and rehabilitation the Employer or Employer's Representative will undertake a final inspection of the site. Any environmental issues identified during the final inspection will be raised with the Contractor. Mitigation measures and timeframes for completion will be agreed between the Contractor and the Employer's Representative in line with agreed procedures prior to final sign off.

6.9. Health and safety

The Contractor would 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 the relevant legislation requirements in addition to the specifications of Wicklow and Dún Laoghaire-Rathdown County Councils.

Relevant Irish and EU health and safety legislation would be complied with at all times by all construction staff and personnel during construction. Further, the Contractors would also have to ensure that all aspects of their works comply with good industry practice and all necessary consents, licenses and authorisations have been put in place for the proposed development.

7. Environmental Management and Controls

The Contractor will be required to have due regard to and incorporate any additional requirements where relevant from any planning conditions which may apply.

7.1. Waste Management

Construction activities produce a broad range of wastes, as outlined in the Construction RWMP (Atkins, 2022).

This section identifies the potential types of waste which may arise from construction and provides guidance on the management, control and disposal of waste.

7.1.1. Risk Identification

Contractors shall undertake a qualitative waste management risk assessment or appraisal prior to the commencement of construction activities. An example assessment is shown is Table 7.1

Table 7.1 – Example of Waste Management Risk Assessment

	Risk Assessment	Example Procedure
01	Identify the location of all sensitive receptors within or adjacent to the construction site.	Mark up on a site plan with the location of all adjacent housing/commercial centers, schools and educational establishments, agricultural land and other potential receptors. This will help the planning of the overall layout of the construction site and enable the identification of suitable sites for high-risk activities such as waste storage areas.
02	Identify the construction activities and sources of that may result waste production and waste storage, segregation and disposal requirements.	These could include excavations, chemical and materials use, waste storage and bulking areas etc.
03	Implement mitigation to eliminate or reduce risks.	Use the following hierarchy to manage waste: 1. Prevent - Do not generate the waste in the first place. 2. Re-use – Can you re-use without treatment? 3. Recycle – Make sure that wastes are properly segregated to aid recycling. 4. Disposal with energy recovery 5. Disposal without energy recovery

7.1.2. Waste Management

Contractors should develop, implement and maintain a Resource and Waste Management Plan that is in compliance with Dún Laoghaire-Rathdown County Council and Wicklow County Council and includes all requirements from the CRWMP (Atkins, 2022) submitted as part of this planning application. The plan should include but not be restricted to the mitigation measures below (Table 7.2).

In addition, all relevant mitigation measures stipulated within Chapter 15 – Schedule of Environmental Commitments of Volume 2- the Main EIAR (which is replicated for ease within Appendix B of this document) will apply throughout the construction phase, and must be incorporated within the Contractors CEMP.

Table 7.2 –Waste Management Mitigation Measures

Activity	Mitigation Measures
General	An approved person, such as a site/contract/resource manager, will be given responsibility for good site practices and control, arrangements for collection and effective disposal to an appropriate facility, of all wastes generated at the site in accordance with EPA (2021) *'Best Practice Guidelines for the preparation of resources & waste management plans for construction & demolition projects'*. Contractors will apply the waste prevention principles of the waste management hierarchy: 1. Prevent – Do not generate the waste in the first place. 2. Re-use – Can you re-use without treatment? 3. Recycle – Make sure that wastes are properly segregated to aid recycling. 4. Disposal with energy recovery 5. Disposal without energy recovery The Contractor will ensure that all construction staff are trained in good waste management practice and chemical handling procedures.
Collection and Storage of Waste	Contractors will provide designated waste storage areas for the bulk storage of waste prior to removal off-site. A site plan showing the designated site will be provided to and approved by Atkins. Only appropriately authorised contractors and sites will be used for the transport and disposal of waste. The Contractor will provide adequate facilities for the collection and storage of waste material including litterbins and waste skips. Waste containers/skips/bins will be provided with nets or lids to prevent waste being carried around by scavengers or by the wind. Waste containers will not be overfilled. Appropriate measures will be employed to minimise windblown litter and dust during transportation of waste by either covering trucks or by transporting wastes in enclosed containers. Industrial and construction waste including redundant hazardous equipment, tyres, used oil cans/drums etc. will be separated and put into segregated bins for removal and disposal by an appropriately authorised contractor.
Waste Reduction and Sustainability	Good management and control can prevent the generation of significant amounts of waste. Waste reduction is best achieved at the planning and design stage, as well as by ensuring the implementation of good site practices. Purchase materials in the quantity required for the project to minimise unused leftovers. Purchase materials that do not use excessive amounts of packaging to minimise the quantity of used packaging for subsequent disposal/processing. Segregate and store different types of waste in different containers, skips or stockpiles to enhance reuse or recycling of materials and their proper disposal. Collect and segregate waste metals including redundant plant and equipment, metal construction materials and cans. Recycle unused chemicals or those with remaining functional capacity.
Disposal of Wastes	All waste will be disposed of at approved sites using appropriately approved contractors - The Contractor must provide copies of valid EPA Waste licences and Local Authority Waste Permits (including those relating to their subcontractors or brokers, where applicable) for collection and waste treatment/disposal/export facilities. Records of waste disposal, recycling and recovery will be maintained. The contractor will provide sufficient secure waste disposal points and regular collection for disposal. No waste will be disposed of or buried on site. Works that involve onsite filling with material other than virgin excavated natural material is encouraged where material is potentially suitable. Burning any waste on site is prohibited. Divert construction, demolition and land clearing debris from landfill disposal. Redirect recyclable recovered resources back to manufacturing process. Redirect reusable materials to appropriate sites. Waste will be segregated in an onsite recycling center and those components that are recyclable sent to appropriate facilities.

Activity	Mitigation Measures
	Consider recycling cardboard, metal, brick, acoustic tile, concrete, plastic, clean wood, glass, gypsum wallboard, carpet and insulation. Identify approved haulers and recyclers to handle the designated materials. All non-recyclable waste will be disposed of by an appropriately authorised waste contractor. The contractor will follow approved procedures for the classification, sampling, transport and disposal of hazardous waste.
Storage and Stocking of Material	Temporary stockpiling of native soils and imported materials onsite will require careful management in order to prevent the release of sediment into receiving watercourses and any temporarily exposed groundwater (in the event that groundwater is encountered). Stockpiled materials will not be located immediately adjacent to watercourse (Rathmichael stream and River Dargle), or any temporarily exposed groundwater (in the event that groundwater is encountered). Stockpiled materials will be covered as required to prevent it spilling over/blowing onto areas of environmental interest or semi-natural vegetation outside the agreed lands. Stockpile of materials will be kept to an absolute minimum, and where possible, stockpiled for as short a time as possible prior to use. Any stockpiled materials will be stored in low mounds where possible. Slopes of material will be stable, and the side slopes compacted down and stabilised, with regular checks by the Contractor; The Contractor will examine the risk arising from storage areas and identify as appropriate the need for mitigation measures at the toe of slopes to reduce silt transport from areas of stockpiled material. Stockpiles of materials not suitable for onsite re-use will be removed as soon as is practicable in accordance with applicable waste management legislation. The Contractor will comply with best practice when sourcing imported materials for site works, including NRA (2006) A Guide to Landscape Treatments. Imported material will be from a reputable source who can confirm that it has been screened for potential presence of invasive species.

7.2. Air Quality, Greenhouse Gas and Odour

Construction activities have the potential to impact on air quality through the creation of dust and emissions to air from vehicles and plant, along with activities including infilling of soil, excavation of trenches, stockpiling and movement of materials may all contribute to generating ambient dust. This section identifies the potential causes of air pollution which may arise from construction and provides guidance on the management and control of emissions from site.

7.2.1. Risk Identification

Contractors shall undertake a qualitative risk assessment or appraisal prior to the commencement of construction activities. An example risk assessment is shown in Table 7.3.

Table 7.3 – Example of Air Quality Risk Assessment

	Risk Assessment	Example Procedure
01	Identify the location of all sensitive receptors within or adjacent to the construction site.	Mark a site plan with the location of all adjacent housing/commercial centers, schools and educational establishments, agricultural land and other potential receptors. This will help the planning of the overall layout of the construction site and enable the identification of suitable sites for high-risk activities such as material storage areas, refueling points and haul routes.

	Risk Assessment	Example Procedure
02	Identify the construction activities and sources of pollution that may result in emissions to air.	These could include excavations, concrete use, transport, materials storage, traffic management etc.
03	Evaluate the risk of the construction activities resulting in emissions to air.	Assess the likelihood of an activity causing pollution. Assess the significance of the harm pollution would cause to a particular receptor. For example, the impact of dust in a populated urban area would be significantly greater than dust in an unpopulated rural area.
04	Implement mitigation to eliminate or reduce risks.	Use the following hierarchy to manage the risk: 1. Remove the risk (different construction methods/activities). 2. Control the source (modify construction methods, covers for storage areas). 3. Protect the receptor (provide hard standing and covering for compounds/storage areas, filter, control, contain emissions, ensure appropriate environmental permits are in place). 4. Put emergency procedures in place.

7.2.2. Air Quality & Greenhouse Gas Management Plan

Contractors should develop, implement and maintain an Air Quality Management Plan. The plan should include but not be restricted to the mitigation measures below (Table 7.4).

In addition, all relevant mitigation measures stipulated within Chapter 15 – Schedule of Environmental Commitments of Volume 2- the Main EIAR (which is replicated for ease within Appendix B of this document) will apply throughout the construction phase, and must be incorporated within the Contractors CEMP.

Table 7.4 –Air Quality Mitigation Measures

Activity	Mitigation Measures
General	The Contractor is required to implement the standard mitigation. Standard measures should be taken which will minimise dust from demolition and construction activities, at a minimum adhering to standard good practice which includes the Building Research Establishment (BRE) document entitled 'Control of Dust from Construction and Demolition Activities'.
Dust Suppression and Odour Management	Minimise use of internal site roads to limit the ground area that is disturbed. Avoid excessive vehicular traffic and movement. Locate haul routes away from sensitive receptors. Pave heavily used areas. Plan vehicle movements to minimise duration of dust generation. Stockpiles of fine material such as sand, topsoil material, cement, excavated material etc. will be covered / protected from wind. Use dust suppression systems such as a rotary water atomizer (or equivalent) to damp down stock piles and construction roads etc. during dusty conditions and to control dust from site-based activities. Due consideration should be given to use of appropriate water resources for use in dust suppression, see Section 7.4. Dust generating activities will cease during excessively windy periods. Construct dust screens/wind breaks as necessary. Fence off work areas with geotextile type liners. Encourage progressive rehabilitation of disturbed land or stockpiles by establishing temporary or permanent vegetation.

Activity	Mitigation Measures
	Contractors will regularly inspect stockpiles; exposed work areas and construction works practices to ensure compliance. Vehicle speeds will be restricted on un-surfaced roads and tracks to less than 30km/hr to minimise dust. Cover and/or maintain appropriate freeboard (+ 0.3m) on trucks hauling any loose material that could produce dust when travelling.
Traffic, Vehicle, Plant and Equipment Emissions	Produce, implement, and maintain a comprehensive Traffic Management Plan (TMP). Undertake regular construction vehicle, plant, and equipment maintenance. Undertake regular maintenance on particulate traps/filters on trucks. Implement minimum exhaust requirements in line with national standards on equipment (including temporary power generators) and vehicles. Switch plant and vehicles off when not in use. Use public/shared transportation for workers.
Other emissions	No fires will be allowed on the construction site. Burning of waste materials on site will be prohibited. Limit volatile substance emissions/fine particle releases. Local sourcing of construction materials such as the recycling of material won on excavations for reuse on site. Reducing the idle times by providing an efficient material handling plan that minimises the waiting time for loads and unloads. Reducing idle times could save up to 10% of total emissions during construction phase. Turning off engines when not in use for more than five minutes. This restriction will be enforced strictly unless the idle function is necessary for security or functionality reasons; and, Regular maintenance of plant and equipment, and technical inspection of vehicles to ensure they will perform the most efficiently.
Ozone Depleting Substances	Ozone depleting substances will not be used on site. Fire protection products, refrigerants, coolants, degreasing agent should be based on non-ozone depleting alternatives. Any refrigerants used will be limited to R134a type (non-ozone depleting).
Indoor Air Quality (IAQ)	Adopt an IAQ management plan for the construction if appropriate: • Specify low-VOC materials during construction. • Specify low-VOC paints and coatings in construction documents. • Composite wood, agri-fiber products and laminating adhesives used on the interior of the building (defined as inside of the weatherproofing system) shall contain no added urea-formaldehyde resins.
EIAR (Atkins, 2022)	In summary the measures which shall be implemented include: **Air Quality** • Hard surface roads will be swept to remove mud and aggregate materials from their surface while any un-surfaced roads will be restricted to essential site traffic; • Any road that has the potential to give rise to fugitive dust must be regularly watered, as appropriate, during dry and/or windy conditions; • Vehicles exiting the site shall make use of a wheel wash facility where appropriate, prior to entering onto public roads; • Vehicles using site roads will have their speed restricted, and this speed restriction must be enforced rigidly. On any un-surfaced site road, this will be 20 kph, and on hard surfaced roads as site management dictates;

Activity	Mitigation Measures
	• Public roads outside the site will be regularly inspected for cleanliness and cleaned as necessary; • Material handling systems and site stockpiling of materials will be designed and laid out to minimise exposure to wind. Water misting or sprays will be used as required if particularly dusty activities are necessary during dry or windy periods; and, • During movement of materials both on and off-site, trucks will be stringently covered with tarpaulin at all times. Before entrance onto public roads, trucks will be adequately inspected to ensure no potential for dust emissions. At all times, these procedures will be strictly monitored and assessed. In the event of dust nuisance occurring outside the site boundary, movements of materials likely to raise dust would be curtailed and satisfactory procedures implemented to rectify the problem before the resumption of construction operations. **Climate** Construction stage traffic and embodied energy of construction materials are expected to be the dominant source of greenhouse gas emissions as a result of the construction phase of the proposed development. Construction vehicles, generators etc., may give rise to some CO_2 and N_2O emissions. However, due to short-term nature of these works, the impact on climate will not be significant. Nevertheless, below are some Site-specific mitigation measures can be implemented during the construction phase of the proposed development to ensure emissions are reduced further; • The prevention of on-site or delivery vehicles from leaving engines idling (even over short periods), • Minimising waste of materials due to poor timing or over ordering on site (to minimise the embodied carbon footprint of the site). Monitoring of construction dust deposition along the site boundary to nearby sensitive receptors during the construction phase of the proposed development is recommended to ensure mitigation measures are working satisfactorily. This can be carried out using the Bergerhoff method in accordance with the requirements of the German Standard VDI 2119. The Bergerhoff Gauge consists of a collecting vessel and a stand with a protecting gauge. The collecting vessel is secured to the stand with the opening of the collecting vessel located approximately 2m above ground level. The TA Luft limit value is 350 mg/(m2*day) during the monitoring period between 28 - 32 days. • Refer also to Chapter 15 – Schedule of Environmental Commitments of Volume 2-the Main EIAR (which is replicated for ease within Appendix B of this document). All relevant mitigation measures within the EIAR in relation to the construction and operational phases must be fully implemented.

7.3. Construction Noise and Vibration

Construction activities can produce a significant amount of noise and vibration with the potential to impact adversely on a range of receptors. This section identifies the potential causes of noise and vibration which may arise from construction and provides guidance on management and control.

7.3.1. Risk Identification

An example risk assessment is shown in Table 7.5.

Table 7.5 – Example of Noise and Vibration Risk Assessment

	Risk Assessment	Example Procedure
01	Identify the location of all sensitive receptors within or adjacent to the construction site.	Mark up on a site plan the location of all nursing homes, housing/commercial centers, schools and educational establishments, agricultural land and other potential receptors. This will help the planning of the overall layout of the construction site and enable the identification of suitable sites for noisy activities or activities likely to cause vibration such as generators, compressors, haul routes and drilling.
03	Identify the construction activities that may affect the receptors identified.	These could include excavations, dewatering, traffic movements, warning sirens, use of machinery and plant etc.
04	Evaluate the risk of the construction activities impact on receptors.	Assess the likelihood of an activity causing noise pollution. Assess the significance of the noise impact on particular receptors. For example, the impact of noise from construction activities adjacent to housing would be significantly greater than the impact of noise in an uninhabited rural area.
05	Implement mitigation to eliminate or reduce risks.	Use the following hierarchy to manage the risk: 1. Remove the risk (different construction methods, substitution of materials for less noisy options). 2. Control the source (modify construction methods, provide adequate baffling). 3. Protect the receptor using noise barriers, screening etc 4. Put emergency procedures in place.

7.3.2. Noise and Vibration Management Plan

Contractors should develop, implement and maintain a Noise and Vibration Management Plan. The Plan should include but not be restricted to the mitigation measures below (Table 7.6).

In addition, all relevant mitigation measures stipulated within Chapter 15 – Schedule of Environmental Commitments of Volume 2- the Main EIAR (which is replicated for ease within Appendix B of this document) will apply throughout the construction phase, and must be incorporated within the Contractors CEMP.

Table 7.6 –Noise and Vibration Mitigation Measures

Activity	Mitigation Measures
General	The contractor shall comply with the contents and recommendations of BS 5228 – 1:2009 + A1:2014: Code of Practice for Noise and Vibration Control on Construction and Open Sites – Part 1: Noise & Part 2: Vibration. The contractor shall also comply with the contents and recommendations of BS 6471:2008: Guide to Evaluation of Human Exposure to Vibration in Building, Part 1: Vibration Sources other than Blasting. The contractor shall ensure that each item of equipment complies with the noise limits quoted in the European Commission Directive 2000/14/EC. As far as practical construction methods that are likely to cause high levels of noise and vibration e.g. concrete and excavation work, will be restricted to day time hours only. Approval from the local authority should be obtained prior to undertaking work at night. Local residents and people likely to be affected by noise and vibration should be informed prior to the commencement of work. Access roads to the site will be positioned such that vehicular movements cause minimum disturbances to residential buildings (if possible).

Activity	Mitigation Measures
	Replace noisy plant with less noisy alternatives, shield/screen noise making plant especially during the evening and night periods or provide plant which is specifically designed with noise inhibitors such as generators and compressors with silencers and muffled jack-hammers. Construct a solid barrier around the generators. Use plant in accordance with manufacturer's specifications. Orientate machinery away from noise sensitive residential areas. Where machines are fitted with engine covers these shall be kept closed. Ensure all stationary and mobile equipment, construction plant, machinery and vehicles are well maintained on a regular basis, and in good working order. Delivery routes used by trucks and lorries should avoid residential areas to prevent likely vibration impacts from construction traffic to and from the site. Vibrations must be minimised at any neighboring premises. Residents of neighboring premises must be warned of possible vibrations prior to the commencing the activity. Complaints will be responded to within 24 hours and mitigation measures checked and improved within 48 hours. Should a substantiated noise complaint be received by the Contractor, an appropriate noise monitoring campaign shall be instigated by the Contractor to determine the noise source. If necessary, appropriate noise mitigation measures, such as noise barriers, will be implemented.
EIAR (Atkins, 2022)	With regard to construction activities, best practice control measures from construction sites within BS 5228 (2009 +A1 2014) Code of Practice for Noise and Vibration Control on Construction and Open Sites Parts 1 and 2 will be used to control noise and vibration impacts. The implementation of all best practice noise and vibration control methods will ensure potential impacts to nearby residential noise sensitive locations are not significant. This will be particularly important during excavation and foundation construction which are likely to be the activities to have the highest potential noise and vibration impact. Noise-related mitigation methods are described below and will be implemented for the project in accordance with best practice. These methods include: • No plant used on site will be permitted to cause an ongoing public nuisance due to noise; • The best means practicable, including proper maintenance of plant, will be employed to minimise the noise produced by on site operations; • All vehicles and mechanical plant will be fitted with effective exhaust silencers and maintained in good working order for the duration of the contract; • Compressors will be attenuated models fitted with properly lined and sealed acoustic covers which will be kept closed whenever the machines are in use and all ancillary pneumatic tools shall be fitted with suitable silencers; • Machinery that is used intermittently will be shut down or throttled back to a minimum during periods when not in use; • During construction, the contractor will manage the works to comply with noise limits outlined in BS 5228-1:2009+A1 2014. Part 1 – Noise; • All items of plant will be subject to regular maintenance. Such maintenance can prevent unnecessary increases in plant noise and can serve to prolong the effectiveness of noise control measures; • Limiting the hours during which site activities which are likely to create high levels of noise or vibration are permitted; and, • Monitoring levels of noise and vibration during critical periods and at sensitive locations (i.e. at the boundary between the development site and the school and residential buildings). • Furthermore, it is envisaged that a variety of practicable noise and vibration control measures will be employed. These will include: Selection of plant with low inherent potential for generation of noise and/ or vibration; • Erection of good quality site hoarding to the site perimeters adjacent to sensitive receptors which will act as a noise barrier to general construction activity at ground level;

Activity	Mitigation Measures
	• Erection of barriers as necessary around items such as generators or high duty compressors, and; • Situate any noisy plant as far away from sensitive properties as permitted by site constraints. There is a requirement to ensure that construction activities operate within the noise and vibration limits set out within this EIAR. There is also a requirement to undertake regular noise and vibration monitoring at locations representative of the closest sensitive locations to ensure the relevant criteria are not exceeded. Noise monitoring shall be conducted in accordance with the International Standard ISO 1996: 2017: Acoustics – Description, measurement and assessment of environmental noise. It will be a requirement of the appointed contractor to undertake such noise monitoring during the relevant phases of the construction program. Vibration monitoring shall be conducted in accordance with BS 6472 for human disturbance and BS ISO 4866:2010 for building damage. It will be a requirement of the appointed contractor to undertake such vibration monitoring during the relevant phases of the construction program. • Refer also to Chapter 15 – Schedule of Environmental Commitments of Volume 2- the Main EIAR (which is replicated for ease within Appendix B of this document). All relevant mitigation measures within the EIAR in relation to the construction and operational phases must be fully implemented.

7.4. Prevention of Soil and Water Pollution

Construction activities have the potential to cause pollution to groundwater and/or soils and surface water. This section identifies the potential causes of pollution which may arise from construction and provides guidance on the management and control.

7.4.1. Risk Identification

Contractors shall undertake a qualitative pollution risk assessment or appraisal prior to the commencement of construction activities. An example risk assessment is presented in Table 7.7.

Table 7.7 – Example of Soil and Water Pollution Risk Assessment

	Risk Assessment	Example Procedure
01	Identify the location of all sensitive receptors within or adjacent to the construction site.	Mark up on a site plan with the location of all water courses, surface water features, boreholes / wells, field drains, ecologically sensitive areas, surface and foul drainage systems and other potential receptors. This will help the planning of the overall layout of the construction site and enable the identification of suitable sites for high risk activities such as chemical/fuel storage areas, refuelling points, haul routes and wash out areas.
02	Identify sensitive receptors off site or downstream of the construction project that could potentially be affected by the works. For example water courses, ecologically sensitive areas.	Undertake baseline assessment of water ground and surface water quality prior to construction. Establish monitoring regime during construction as appropriate.
03	Identify the construction activities and sources of pollution that may affect the water receptors identified.	These could include excavations, dewatering, water course crossings, as well as general sources of pollution such as surface water runoff, chemical/fuel storage, wash down areas, fuelling areas and concrete use.

	Risk Assessment	Example Procedure
04	Evaluate the risk of the construction activities polluting the identified water receptors.	Assess the likelihood of an activity causing pollution. Assess the significance of the harm pollution would cause to a particular water receptor. For example the impact of polluting a water receptor used for potable water would be significantly greater than the pollution of a foul water system.
05	Implement mitigation to eliminate or reduce risks.	Use the following hierarchy to manage the risk: 1. Remove the risk (different construction methods/activities). 2. Control the source (change location, modify construction methods, provide adequate bunding for fuel and other storage areas, install measures such as silt fences or ditches to control runoff). 3. Protect the receptor (provide hard standing for compounds/storage areas, filter, control, contain discharges, ensure appropriate environmental permits are in place). 4. Put emergency procedures in place.
06	EIAR (Atkins, 2022)	Refer also to Chapter 15 – Schedule of Environmental Commitments of Volume 2- the Main EIAR (which is replicated for ease within Appendix B of this document). All relevant mitigation measures within the EIAR in relation to the construction and operational phases must be fully implemented.

7.4.2. Pollution Prevention Management Plan

Contractors should develop, implement and maintain a Pollution Prevention Management Plan. The Plan should include but not be restricted to the mitigation measures below (Table 7.8).

In addition, all relevant mitigation measures stipulated within Chapter 15 – Schedule of Environmental Commitments of Volume 2- the Main EIAR (which is replicated for ease within Appendix B of this document) will apply throughout the construction phase, and must be incorporated within the Contractors CEMP.

Table 7.8 –Soil and Water Mitigation Measures

Activity	Mitigation Measures
General	Ensure that appropriate permits/consents are in place prior to commencing dewatering activities. Sample collections as required, such as for wastewaters and discharges to the ground and surface waters to facilitate characterisation of contaminants in the event of a leakage or spill that may impact soil or groundwater quality. Appropriate sampling of discharges, to include key parameters to ensure discharges meet appropriate criteria. Carry out regular inspections/audits of hazardous materials usage, handling and storage areas and regular/thorough maintenance of vehicles and hydraulic systems and sanitary/welfare facilities. Avoid impacting adjacent sites by ensuring all contractors activities, equipment and waste storage is confined to the approved site boundary. Where waste waters do not meet approve quality criteria they should be contained and disposed of via an approved disposal route. Ensure regular and controlled disposal of waste using appropriately authorised contractors.
Storage and handling of hazardous substances	Hazardous substances include, but are not limited to: human excrement, fuel, lubrication oils, hydraulic and brake fluid, acids, paints, anti-corrosives, pesticides, detergents, cement etc. All hazardous material, including chemicals and fuels, will be stored at a designated site.

Activity	Mitigation Measures
	Contractors should minimise the amount of diesel, oil, paint, thinners and other chemicals stored on site that pose potential spillage environmental hazards and use materials that minimise environmental impact such as lead free paints, asbestos free materials etc. Contractors will keep a list of all hazardous substances present on site and the MSDS for these substances shall be readily available. Hazardous wastes are the by-products and wastes associated with the use of hazardous substances as well as potentially hazardous items such as spent batteries, used oil filters, light bulbs, circuit boards, sharp objects etc. which require special collection and handling. Each receptacle containing dangerous goods will be marked with the correct technical name of the substance it contains. All markings shall be legible and in appropriate language. Incompatible materials will not be placed in common containment. All refuelling and fuel drum loading operations will take place at a designated site and the ground under the refuelling and fuel drum loading areas will be protected against pollution caused by spills and/or tank overfills. Fill nozzles will be kept within the bunded area when not in use and padlocked. Collection systems will be provided/bunded if necessary under machinery or equipment that may leak hydrocarbons/hazardous substances. Bunds should typically be provided at refuelling stations, under any container with hazardous substances (oil, fuel, paints, solvents etc.) or any piece of machinery (i.e. generators) which may leak fuel, lubricants or hydraulic fluids. It is good practice to provide drip trays under construction vehicles prone to leaking lubricants/and oil. Locate storage areas away from drains/trenches/wastewater collection devices. All hazardous liquids will be stored in an impervious bund area where the volume of the storage bund is >110% of the largest storage tank contained within the bund until collected for off-site disposal by an approved waste contractor at an approved site. All flammable liquids will be stored under cover and in well ventilated areas. No electrical equipment will be used within 10 metres of the storage area. Cylinders of compressed gas or flammable gases will be stored upright in secure racks and out of direct sunlight or heat source. The contractor will ensure that there is adequate fire-fighting equipment at the fuel and hazardous materials storage area. Fire fighting equipment should be well maintained and tested periodically in line with manufacturers recommendations. All contractors handling hazardous materials will keep appropriate spill cleanup material/spill kits adjacent to storage and maintenance areas and take immediate action to contain/clean up the spill using sand/suitable absorbent material. Contaminated soil, rags and other clean up material will be disposed of via an approved waste contractor at an approved site. Spill kits will be inspected on a regular basis. Used or waste fuel or other waste chemicals will be stored in a bunded area until collected for off-site disposal by an approved waste contractor at an approved site. Waste material or water containing waste chemicals such as thinners, oil, and mineral spirits will not be pumped or disposed of into storm water drains, sanitary sewers or into the ground. The contractor will comply with all permit conditions, environmental regulations and legislation with regards to the safe storage and handling of hazardous substances. The contractor is responsible for the training of all personnel on site who will be handling hazardous materials about its proper use, handling, disposal and spills procedures and to provide all staff with appropriate personal protective equipment.
Maintenance and wash down of vehicles and machinery	Ensure all equipment is well maintained and in good working order. A collection system shall be provided (i.e. trays or impervious linings) under machinery or equipment that may leak hydrocarbons/hazardous substances (e.g. generator and pumps). All routine truck and plant maintenance to be carried out off site at contractor depot. Vehicle/machinery repair whether minor or major on open ground or at the side of roads is forbidden. Emergency repairs, mechanical servicing and maintenance of Vehicles/equipment/site plant to be undertaken at designated workshop area designed to contain any spillage.

Activity	Mitigation Measures
	Oil or lubricants only to be changed at designated workshops. The ground under the servicing areas shall be constructed of an impervious material and bunded as necessary. It is prohibited to allow wash water to cause pollution of the ground, surface water or ground water. Vehicle and equipment wash down shall only be undertaken at designated areas. The ground under the wash down area shall be impervious and designed to collect wash water. Install oil interceptors and silt traps where wastewater may be contaminated. Wash water will be re-used where possible (such as vehicle washing, dust suppression) and excess water collected and disposed of by an approved contractor to an approved site.
Sanitary facilities	Adequate sanitary facilities including restrooms, showers, water tanks, cold drinking water facilities and sewage waste collection facilities will be provided as appropriate. The siting of the facilities will be agreed with Irish Water (IW). Holding tanks will be fitted with overflow alarms and will be emptied on a regular basis at a frequency which ensures no overflow of sewage effluent by an approved waste disposal company to an approved site. It is prohibited to discharge sewage onto the open ground. It is prohibited to use open ground for sanitary purposes including bathing, defecating, urination, cooking, washing (dishes or clothing). Disposal of settled solids in accordance with permit conditions. Sludge will also be disposed of on a regular basis in accordance with regulations. Confirmation of underground infrastructure such as sewage lines will be obtained prior to excavation.
Dewatering discharges	All dewatering activities will be agreed in advance with the EPA/ Wicklow and Dún Laoghaire-Rathdown County Councils. Prepare a Dewatering Management Plan (if required). Collect/submit representative dewatering discharge samples for laboratory analyses at prescribed intervals as required by the EPA/ Wicklow and Dún Laoghaire-Rathdown County Councils. Conduct visual inspections at the time of sample collection. Treat all discharges to remove sediments using filtration/settling tank. The contractor will not discharge contaminated or potentially contaminated water to ground. The contractor will only use water of an appropriate quality for dust suppression, contaminated or potentially contaminated water will not be used. Where waste waters do not meet approved quality criteria they should be contained and disposed of via an approved disposal route. Determine most appropriate disposal option – onsite/offsite recycling/aquifer recharges etc. The contractor will undertake regular leak monitoring during dewatering.
EIAR (Atkins 2022)	With regard to groundwater and surface water quality impacts the following mitigation measures are proposed. The Contractor will be responsible for ensuring these measures are fully implemented: • In advance of commencement of the Construction Stage, all onsite monitoring wells (as identified in the Ground Investigation Report (IGSL, 2021) presented in Appendix 9.1 of the EIAR, and the historic well located in the north eastern portion of the Site, will be fully decommissioned by an experienced borehole specialist in accordance with relevant guidelines, '*Good practice for decommissioning redundant boreholes and wells'* (UK Environment Agency, 2012); • The construction management of the Site will take account of the recommendations of the Construction Industry Research and Information Association (CIRIA) guidelines '*Control of Water Pollution from Construction Sites' and 'Groundwater control - design and practice*' and CIRIA 2010 '*Environmental Good Practice on Site'* to minimise as far as possible the risk of pollution. • All of the mitigation measures (for the protection of soils and geology) listed in Chapter 9 of Volume 2 EIAR will be implemented onsite during the construction phase. • Any groundwater temporarily dewatered during the excavation works for the proposed attenuation tanks and for building foundations in the central and southern portions of the Site, and during piling (as required), will be treated via. the installation of a temporary in-situ water treatment system;

Activity	Mitigation Measures

- This system should be designed and sized to ensure that all pumped groundwater water is treated via. a temporary attenuation pond, prior to discharge to a selected onsite location (via. a temporary soakaway).
- The Contractor will be required to provide a Site-specific dewatering plan, clearly setting out proposed excavation methodology, estimated dewatering rates, details of proposed treatment system, and discharge location.

- The Contractor will be responsible for ensuring that the existing drainage network, specifically along the existing road, and as required elsewhere across the site, will be suitably protected (via. the use of physical barriers and / or the implementation a Site-specific water run-off management plan as required).
- In order to prevent any potential surface water / groundwater impacts via. release of hydrocarbon / chemical contaminants the following standard measures will be implemented:
  - Fuels, lubricants and hydraulic fluids for equipment used on the construction Site, as well as any solvents, oils, and paints will be carefully handled to avoid spillage, properly secured against unauthorised access or vandalism, and provided with spill containment according to best codes of practice;
  - Waste oils and hydraulic fluids will be collected in leak-proof containers and removed from the proposed development for disposal or re-cycling;
- A response procedure will be put in place to deal with any accidental pollution events. Any spillage of fuels, lubricants or hydraulic oils will be immediately contained and the contaminated soil removed from the proposed development and properly disposed of in accordance with all relevant waste management legislation;
  - All Site vehicles used will be refuelled in bunded and adequately sealed and covered areas in the construction compound area.
  - Strict supervision of contractors will be adhered to in order to ensure that all plant and equipment utilised on-Site is in good working condition. Any equipment not meeting the required standard will not be permitted for use within the Site. This will minimise the risk of groundwater becoming contaminated through Site activity.
  - All oil stored on Site for construction vehicles will be kept in a locked and bunded area;
  - Generators, pumps and similar plant will be placed on drip-trays to prevent contamination;
  - All Site vehicles used will be refuelled in bunded areas;
  - All temporary construction fuel tanks will also be located in a suitably bunded area and all tanks will be double skinned. Relevant Material Safety Data Sheets along with oil absorbent materials will be kept on Site in close proximity to any fuel storage tanks or bowsers during proposed Site development works; and,
  - All fuel / oil deliveries to on-Site oil storage tanks will be supervised, and records will be kept of delivery dates and volumes.
- In order to prevent any potential surface water / groundwater impacts via. release of cementitious materials the following measures will be implemented where poured concrete is being used on Site;
  - The production, transport and placement of all cementitious materials will be strictly planned and supervised. Site batching/production of concrete will not be carried out on Site and therefore these aspects will not pose a risk to the waterbodies present, namely any temporarily exposed groundwater, the River Dargle or the Irish Sea;
  - Shutters will be designed to prevent failure. Grout loss will be prevented from shuttered pours by ensuring that all joints between panels achieve a close fit or that they are sealed;
  - Any spillages will be cleaned up and disposed of correctly;
  - Where concrete is to be placed by means of a skip, the opening gate of the delivery chute will be securely fastened to prevent accidental opening;
  - Where possible, concrete skips, pumps and machine buckets will be prevented from slewing over water when placing concrete;
  - Mixer washings and excess concrete will not be discharged directly into the drainage network, or any drainage ditches, surface water bodies or exposed groundwater; and,
  - Surplus concrete will be returned to batch plant after completion of a pour.

Activity	Mitigation Measures
	• Foul drainage from Site offices and Site compound will be directed to the existing wastewater network or will be contained and disposed of off-site in an appropriate manner and in accordance with the relevant statutory regulations. The above mitigation measures will be further developed by the Contractor within the project-specific Detailed CEMP which will be in operation during the construction phase. Regular checks and maintenance of the proposed surface water drainage system should be implemented, as recommended in the Stormwater Impact Assessment Report (Atkins, 2022) (document. ref.: 5214419DG0012) submitted as part of this planning application. Refer also to Chapter 15 – Schedule of Environmental Commitments of Volume 2- the Main EIAR (which is replicated for ease within Appendix B of this document). All relevant mitigation measures within the EIAR in relation to the construction and operational phases must be fully implemented.

7.5. Water Resources and Energy Use

Construction activities have the potential to use significant volumes of water and energy. This section identifies the potential impacts associated with water and energy use which may arise from construction and provides guidance on the management and control of water and energy on site.

7.5.1. Risk Identification

Contractors shall undertake a qualitative water resources and energy use assessment or appraisal prior to the commencement of construction activities. An example risk assessment is shown in Table 7.9.

Table 7.9 – Example of Water Resources and Energy Use Risk Assessment

	Risk Assessment	Example Procedure
01	Identify all items and activities on the construction site with high water and/or energy demands.	Mark up on a site plan with the location of all items and activities with high water and/or energy demands. This will help the planning of the overall layout of the construction site and enable the identification of efficiency opportunities.
02	Implement mitigation to eliminate or reduce water and/or energy demand.	Use the following hierarchy promote water and energy efficiency: 1. Remove the requirement (different construction methods, substitution of materials for that require less water and/or energy). 2. Control the use (modify construction methods, monitoring, target setting, procedures, switch off, training).

7.5.2. Water Resources and Energy Use Management Plan

Contractors should develop, implement and maintain a Water Resources and Energy Use Management Plan. The Plan should include but not be restricted to the mitigation measures below (Table 7.10).

In addition, all relevant mitigation measures stipulated within Chapter 15 – Schedule of Environmental Commitments of Volume 2- the Main EIAR (which is replicated for ease within Appendix B of this document) will apply throughout the construction phase, and must be incorporated within the Contractors CEMP.

Table 7.10 –Water Resources and Energy Use Mitigation Measures

Activity	Mitigation Measures
General	Reduce water consumption through recovery strategies. Conserve water by maximising opportunities for infiltration runoff. Conserve water by matching water quality with its intended use and using water saving devices. Contractors will carry out regular inspections/audits of water resource and energy use. In the event of excessive water use/leaking pipes etc, immediate action will be taken to repair equipment or reassess water needs. Use an irrigation system which utilises cooling water, condensate, TSE or other wastewater. Water arising from vehicle and equipment wash-down will be treated to remove silt and reused where possible. For example wetting down roads and stockpiles. Turn out the lights at night and only light areas as required for safety and comfort (employment of lighting sensors). Ensure that the light source is the minimum intensity for the required purpose. Ensure that fittings are chosen that direct light accurately to where it is needed. Vehicles will not be allowed to idle for long periods. Machinery and generators shall be regularly maintained and operated in an efficient manner. The use of solar powered instruments/machines should be considered. Temporary site offices should be well insulated to retain heat or cool, utilise energy efficient bulbs and energy efficient cooling systems. Choose locally sourced building materials and products thereby reducing the environmental impacts from transportation. Choose rapidly renewable materials over finite raw and long cycle renewable materials. Use timber and wood, including that used in construction, from a certified sustainable source, or be postconsumer re-used timber, or similar.

7.6. Ecology – Natural Habitats, Flora and Fauna

Construction activities can have adverse impacts on natural habitats, flora and fauna. This section identifies potential adverse impacts which may arise from construction and provides guidance on management and control.

7.6.1. Risk Identification

Contractors shall undertake a qualitative ecology risk assessment or appraisal prior to the commencement of construction activities. An example risk assessment is shown in Table 7.11.

Table 7.11 – Example of Ecology Risk Assessment

	Risk Assessment	Example Procedure
01	Identify the location of all sensitive ecological receptors within or adjacent to the construction site.	Mark on the site plan the location of all water courses, surface water features, ecologically sensitive areas and habitats, other potential receptors including key wildlife populations. Particular attention should be paid to existing ecological features within the project area. This will help the planning of the overall layout of the construction site and enable the identification of suitable sites for high risk activities such as chemical/fuel storage areas, refuelling points, haul routes and wash out areas.

	Risk Assessment	Example Procedure
02	Identify sensitive receptors off site or downstream of the construction project that could potentially be affected by the works. For example water courses, ecologically sensitive areas and habitats.	Undertake baseline assessment of water quality prior to construction. Establish monitoring regime during and post construction.
03	Identify the construction activities and sources of pollution that may affect the water/ecological receptors identified.	These could include excavations, dewatering, water course crossings, as well as general sources of pollution such as surface water runoff, fuel storage and concrete use.
04	Evaluate the risk of the construction activities polluting the identified receptors.	Assess the likelihood of an activity causing pollution, damage or harm.
05	Implement mitigation to eliminate or reduce risks.	Use the following hierarchy to manage the risk: 1. Remove the risk (different construction methods/activities). 2. Control the source (modify construction methods, provide adequate bunding for fuel and other storage areas, install measures such as silt fences or ditches to control runoff). 3. Protect the receptor (provide hard standing for compounds/storage areas, filter, control, contain discharges, ensure appropriate environmental permits are in place). 4. Put emergency procedures in place.

7.6.2. Ecology Management Plan

Contractors should develop, implement and maintain an Ecology Management Plan. The Plan should include but not be restricted to the mitigation measures below (Table 7.12).

In addition, all relevant mitigation measures stipulated within Chapter 15 – Schedule of Environmental Commitments of Volume 2- the Main EIAR (which is replicated for ease within Appendix B of this document) will apply throughout the construction phase, and must be incorporated within the Contractors CEMP.

Table 7.12 – Ecology Mitigation Measures

Activity	Mitigation Measures
General	Where practicable maintain areas of natural vegetation. Maintain good water quality as outlined in the Pollution Prevention Plan. No disposal of waste on site - adhere to the Waste Management Plan. Minimise the impact of erosion and sedimentation by the management strategies described in the Erosion and Sedimentation Management Plan. Wildlife awareness talk to staff if in /near to sensitive areas. Biodiversity Management will be implemented as part of the WwTP upgrade, the proposed landscaping around and within the site will consist of native species and pollinator-friendly planting, in accordance with the Irish Water's Biodiversity Action Plan – Spring 2021. All trees will be protected in accordance with BS: 5837:2012 Trees in relation to design, demolition and construction. Do not handle or kill any animal on the site. The following activities shall be prohibited: • Disposal or burial of waste on site. • Illegal dumping, including roadside dumping and illegal land filling. • Burning of waste on site.

Activity	Mitigation Measures
EIAR (Atkins 2022).	The appointed Contractor shall ensure specialist ecological surveying is undertaken where required i.e. mammal surveys, bat surveys, and nesting bird surveys as detailed further below. Construction phase ecological mitigation measures shall be developed and undertaken in coordination with ecological specialists (i.e. bat specialist and suitably qualified ecologist) as required. Protection of Sites Designated for Nature Conservation Protection of sites designated for conservation, and the features of interests associated with designated sites, is through prevention of potential impacts to the aquatic environment during the construction phase. Mitigation measures as set out in Chapter 9 – Land, Soils and Geology; and Chapter 10 – Water will be implemented during the Construction phase. Works will follow best practice guidance as outlined in *Guidelines on the Protection of Fisheries during Construction Works in and Adjacent to Waters* (IFI, 2016). Mitigation of habitat loss/damage during construction Hedgerows, treelines and boundary woodland areas are to be retained on-site; Site boundaries will be protected from any accidental damage during construction by means of exclusion through use of fencing. All trees, including cypresses, along the northern boundary will be retained with only unsafe trees being removed during the construction phase. This is set out in full in the accompanying Tree Survey Report and Landscape Planting Plan. Measures will be taken to ensure that trees and hedges being retained are incorporated into the development without being impacted upon. Protective fencing will be provided around retained trees and hedgerows and fencing will be erected so as to encompass the Root Protection areas (RPAs) of trees and hedgerows. The fencing will be at least 2m high and constructed in accordance with the RPA outlines in the Tree Survey Report (Appendix 5.2 EIAR). Similarly, a buffer is to be maintained between the Site and neighbouring woodland to prevent negative impacts to woodland during construction. Site clearance of potential bird nesting habitat is detailed below. Site clearance of potential bat roost habitat is detailed below. To compensate for the loss of woodland substantial native tree and hedgerow planting will be planted on the Site and existing hedges which are to be retained will be reinforced with native planting. This will reduce the impact of the proposed development upon habitats in the area and there will be no significant operational impact upon habitats due to the provision of substantial native and pollinator friendly habitats proposed for the Site (refer to Landscape Planting Plan Drawings Nos. 6948_L-2000 & 2002). Landscape enhancement measures are outlined in greater detail below in Section 4.5.1.10. Bats **Loss of Foraging and Commuting Habitat** Loss of commuting and foraging habitat at the Site will be mitigated by the landscaping proposals, which include hedgerow planting, wildflower and woodland planting. Planting schemes should ensure connectivity to linear/ woodland habitats in the wider landscape. It is noted that the landscaping proposals also include retention of hedgerow and boundary treeline and the planting of hedgerow where none is currently in situ. Trees that are being retained in the Site shall be protected during clearance and construction works in line with current guidelines e.g. British Standard 5837:2012 and National Roads Authority 2006a. **Lighting** To minimise disturbance to bats and other fauna (badger and otter) that are roosting/resting or active at night, no construction operations will be undertaken during the hours of darkness. If construction lighting is required during the bat activity period (dusk April to September), lighting shall be directed away from all hedgerow/ treeline habitats to be retained. This can be achieved by using directional lighting (i.e. lighting which only shines on the proposed works and not nearby countryside) to prevent overspill. **Bat Conservation Plan and Bat Roosts**

Activity	Mitigation Measures
	A Bat Conservation Plan has been developed for the construction phase of the proposed development. The Bat Conservation Plan is included in Appendix 4.3 (EIAR). The Contractor will appoint a bat specialist prior to construction activities to supervise and implement the Bat Conservation Plan. The Bat Conservation Plan includes the following commitments; all trees noted to have potential bat roosting habitat will be surveyed by the appointed bat specialist prior to Site clearance works and if roosts are found the bat specialist will develop a method statement for the tree / roost clearance in consultation with the planning authority and NPWS and will seek the necessary derogation licence from local NPWS staff (if required). The Bat Conservation Plan also includes for the surveying and protection of existing bat roosts identified in the 2 no. oaks trees located on the former golf clubs lands outside of the Site boundary (refer to Appendix 4.3 of EIAR for Bat Conservation Plan). Whilst there will be a loss of a number of trees which have the potential to have bat roosts, the design of the development includes for the installation of 36 no. bat boxes to act as summer and winter roosting sites. The installation of bat boxes will include 14no. winter bat boxes and 14 no. summer bat boxes to be installed within boundary landscaped areas and 8 no. bat tubes installed within walls around the pumping station (Refer to Landscape Masterplan for locations). The installation of bat boxes will be supervised and overseen by the appointed bat specialist. The landscape design also includes for the planting of native tree species which will in time provide for further potential roosting site habitat. Birds Removal of nesting habitat (hedgerows, scattered trees and woodland utilised by local and common bird species) will be carried out outside the breeding bird season from 1st March to 31st August inclusive. Where nesting habitat clearance cannot be avoided during this period the NPWS will be consulted in advance and if, in consultation, it is deemed necessary then a suitably qualified ecologist will be appointed by the Contractor to oversee clearance of nesting habitat and ensure the area is free of nesting birds. The appointed ecologist will develop a method statement for the nesting habitat clearance in consultation with local NPWS staff. The comprehensive landscaping design calls for the planting of native trees and plant species suitable for pollinating insect species. The landscape design also includes for gorse planting which will provide for habitat suitable for stonechat. The landscape design should provide for a net gain in suitable bird nesting and foraging habitat. The landscaping design has followed the principles outlined in the All-Ireland Pollinator Plan 2021-2025. Terrestrial mammals During the construction phase the Contractor will adhere to the '*Guidelines for the Treatment of Badgers prior to the Construction of National Road Schemes*' (NRA 2006). The Site and all areas within 150m around the perimeter of the Site will be resurveyed for badger activity and the presence of setts by a suitably qualified ecologist (appointed by the Contractor) prior to the commencement of construction activities. Should an active sett be noted within the Site or survey area, NPWS will be informed and consulted. The suitable qualified ecologist will develop a method statement in agreement with NPWS for construction activities near an active badger sett. Method statement for works near an active sett will include; there shall be no blasting or pile driving within 150m of an active sett during the breeding season (December to June) or construction works within 50m of such an active sett during the breeding season. The creation of an ecological buffer zone along the northern and eastern boundaries of the Site will allow for connectivity of habitats and the continuance of the site to be used as a badger foraging area. The buffer zone allows for connectivity between Rathmichael woodlands/stream and the railway underpass which leads to scrub habitat and Woodbrook golf club lands which are known to be badger foraging territory. During the construction phase no works will be undertaken during night time hours and as such the construction activities will not take place whilst local badgers

Activity	Mitigation Measures
	are foraging. During the construction phase an access track will be in situ along the northern and eastern boundaries which will allow for continued connectivity from Rathmichael woodlands to the railway underpass and to the important foraging habitats to the east of the railway line. During the construction phase the following standard management and protection measures will be implemented during the construction works and monitored by the project ecologist: • No excavations are to be left uncovered overnight or without a means of egress (e.g. a ramp or sloped plank) to prevent badgers from falling in or entering in search of food and becoming trapped; • No buildings or storage units are to be left open overnight to prevent badgers from entering in search of food and becoming trapped; • All food waste is to be properly secured and disposed of to avoid attracting badgers to the Site; • No toxic, poisonous or potentially harmful substances or materials are to be left unsecured overnight; and, • Should any new badger setts or mammal burrows be discovered within the Site or immediately adjoining areas the project ecologist is to be contacted for immediate inspection, advice and liaison with NPWS as necessary. Prevention of pollution to surface waters Mitigation measures as set out in Chapter 9 – Land, Soils and Geology; and Chapter 10 – Water will be implemented during the Construction phase. Works will follow best practice guidance as outlined in *Guidelines on the Protection of Fisheries during Construction Works in and Adjacent to Waters* (IFI, 2016). Invasive species prevention No legally restricted invasive species, such as Japanese knotweed, were found onsite. Strict bio-security protocols will be implemented during the construction phase so as to ensure no imported materials potentially contaminated with invasive plant species are brought to Site. All imported soil materials will be visually inspected by the Contractor's ecologist for signs of invasive plant contamination (such as root fragments, rhizome material) prior to arrival on Site. Disturbance of faunal species mitigation Removal of nesting habitat (hedgerows, scattered trees and woodland) will be carried out outside the breeding bird season from 1st March to 31st August inclusive. Where nesting habitat clearance cannot be avoided during this period the NPWS will be consulted in advance and if, in consultation, it is deemed necessary then a suitably qualified ecologist will be appointed by the Contractor to oversee clearance of nesting habitat and ensure the area is free of nesting birds. The appointed ecologist will develop a method statement for the nesting habitat clearance in consultation with local NPWS staff. Additional Construction Phase Ecological Mitigation Measures With regard to potential impacts on ecological features the following mitigation measures are proposed: • The Contractor shall engage a suitably experienced and qualified ecologist and/or specialist ecologist to undertake the required ecological surveying prior to construction activities. Pre-construction ecological surveys should include; terrestrial mammal surveys, bat roost surveys and breeding bird surveys (breeding bird surveys will be required if vegetation clearance is to be undertaken within nesting season 1st March – 31st August);

Activity	Mitigation Measures
	• The Contractor shall employ good practice environmental and pollution control measures with regard to current best practice guidance such as Environmental Good Practice On-site Guide (CIRIA, 2018); • The construction management of the Site will take account of the recommendations of the Construction Industry Research and Information Association (CIRIA) guides 'Control of Water Pollution from Construction Sites' and 'Groundwater control - design and practice' to minimise as far as possible the risk of pollution; • All of the mitigation measures for the protection of soils listed in Chapter 9 will be implemented onsite during the construction phase; • The Contractor shall take all necessary precautions to prevent potential impact upon aquatic species of the River Dargle from construction activities. The mitigation measures for prevention of potential surface water impacts as detailed in Water Chapter 10 shall be implemented; • The Contractor shall take all necessary precautions to prevent potential impact upon aquatic species of the River Dargle via the local groundwater body. All groundwater mitigation measures as outlined in Chapter 10 - Water shall be implemented; and, • The Contractor shall take all necessary precautions to prevent potential impact upon habitats and species from dust generated during the construction phase. All air quality mitigation measures as outlined in Chapter 11- Air Quality & Climate shall be implemented. The above mitigation measures will form part of the Construction Environmental and will be further added to by the Contractor within the project-specific Detailed CEMP which will be in operation during the construction phase. The Bat Conservation Plan (refer to Appendix 4.3, EIAR) will be implemented by the Contractor under the supervision of the appointed bat specialist. Pre-construction (pre-site clearance) monitoring shall be undertaken by the Contractor appointed Bat Specialist where trees shall be inspected for the presence of roosting bats. Following the tree surveys, specific Site clearance protocols will be established and, if necessary and bat roosts are found within trees to be lost, then NPWS consultation will be undertaken. If required, method statements will be proffered and derogation sought from NPWS for the safe removal of bats from roost sites. The identified bat roosts in 2 no. oak trees off Site (refer to Appendix 4.3 of EIAR for locations) will be surveyed for the presence of bats. These 2 no. oak trees will be retained and the bat and bat roost protection measures outlined in the Bat Conservation Plan will be adhered to throughout the construction phase. Pre-construction / pre-Site clearance terrestrial mammal surveys will be undertaken by the Contractor appointed suitably qualified ecologist to assess if badgers, or any other protected mammals, have established refugia (e.g. a badger sett) within the Site. If protected mammal refugia is found within the Site, then consultation with NPWS will be undertaken by the project ecologist and associated method statements and mitigation will be proffered and derogation sought from NPWS. Removal of nesting habitat (hedgerows, trees and woodland) must be carried out outside of the bird breeding season (from 1st March to 31st August). Consultation must be undertaken with the National Parks and Wildlife Service for any nesting habitat clearance works outside of this seasonal window (as detailed in the Construction phase mitigation measures above). Refer also to Chapter 15 – Schedule of Environmental Commitments of Volume 2- the Main EIAR (which is replicated for ease within Appendix B of this document). All relevant mitigation

Activity	Mitigation Measures
	measures within the EIAR in relation to the construction and operational phases must be fully implemented.

7.7. Light Pollution

Obtrusive light from a construction site is a form of pollution. Construction lights can cause glare and light trespass. These are forms of obtrusive light which may cause nuisance to others.

7.7.1. Risk Identification

Contractors shall undertake a qualitative light pollution risk assessment or appraisal prior to the commencement of construction activities. An example risk assessment is shown in Table 7.13.

Table 7.13 – Example of Light Pollution Risk Assessment

	Risk Assessment	Example procedure
01	Identify the location of all sensitive receptors within or adjacent to the construction site.	Mark a site plan with the location of all potential receptors including housing, schools, hospitals, roads and key wildlife populations. This will help the planning of the overall layout of the construction site and enable the identification of suitable sites for lighting.
02	Identify the construction activities and sources of light pollution that may affect the receptors identified.	These could include depots, storage areas, night working activities etc.
03	Evaluate the risk of the construction activities creating light pollution for the identified receptors.	Assess the likelihood of an activity causing pollution, damage or harm.
04	Implement mitigation to eliminate or reduce risks.	Use the following hierarchy to manage the risk: 1. Remove the risk (different construction methods/activities). 2. Control the source (modify construction methods; provide adequate screening, directional light). 3. Protect the receptor (screens). 4. Put emergency procedures in place.

7.7.2. Light Pollution Control Plan

Contractors should develop, implement and maintain a Light Pollution Control Plan. The Plan should include but not be restricted to the mitigation measures below (Table 7.14).

In addition, all relevant mitigation measures stipulated within Chapter 15 – Schedule of Environmental Commitments of Volume 2- the Main EIAR (which is replicated for ease within Appendix B of this document) will apply throughout the construction phase, and must be incorporated within the Contractors CEMP.

Table 7.14 –Light Pollution Mitigation Measures

Activity	Mitigation Measures
General	Maintain levels of lighting acceptable for health and safety and avoid over lighting areas. Dim or switch off lights when task is finished. Minimise the spread/glare of light by assessing/managing direction.

	Lower the height of lights to minimise glare. Use screens, shields, baffles and louvers to help reduce light spill. Use specifically designed lighting equipment to minimise the upward spread of light near to and above the horizontal.
EIAR (Atkins 2022)	To minimise disturbance to bats and other fauna (badger and otter) that are roosting/resting or active at night, no construction operations will be undertaken during the hours of darkness. If construction lighting is required during the bat activity period (dusk April to September), lighting shall be directed away from all hedgerow/ treeline habitats to be retained. This can be achieved by using directional lighting (i.e. lighting which only shines on the proposed works and not nearby countryside) to prevent overspill. Street Lighting will be implemented in accordance with the MEP Engineering Report & Design Statement prepared by Atkins (2022) as presented in Volume 3 of the EIAR submitted for planning in September 2022. Refer also to Chapter 15 – Schedule of Environmental Commitments of Volume 2- the Main EIAR (which is replicated for ease within Appendix B of this document). All relevant mitigation measures within the EIAR in relation to the construction and operational phases must be fully implemented.

7.8. Archaeology and Cultural Heritage

Heritage is an irreplaceable resource, so it is recognised that cultural resources must be safeguarded for future generations. Construction activities have the potential to impact on archaeology and heritage through the destruction or disturbance of sites or artefacts.

7.8.1. Risk Identification

Contractors shall undertake a qualitative archaeological and heritage risk assessment or appraisal prior to the commencement of construction activities. An example risk assessment is shown in Table 7.15.

Table 7.15 – Example of Archaeology and Cultural Heritage Risk Assessment

	Risk Assessment	Example Procedure
01	Identify the location of all sensitive receptors within or adjacent to the construction site.	Mark a site plan with the location of all potential receptors including villages, forts, palaces, houses, and towers. This will help the planning of the overall layout of the construction site.
02	Identify the construction activities that may affect the receptors identified.	These could include depots, storage areas, excavation, waste storage, haul roads etc.
03	Evaluate the risk of the construction activities damaging the identified receptors.	Assess the likelihood of an activity causing pollution, damage or harm.
04	Implement mitigation to eliminate or reduce risks.	Use the following hierarchy to manage the risk: 1. Remove the risk (different construction methods/activities). 2. Control the source (modify construction methods or operations - alternative haul roads). 3. Protect the receptor (screens). 4. Put emergency procedures in place.

7.8.2. Archaeology and Cultural Heritage Management Plan

Contractors should develop, implement and maintain an Archaeology and Heritage Management Plan. The Plan should include but not be restricted to the mitigation measures below (Table 7.16).

In addition, all relevant mitigation measures stipulated within Chapter 15 – Schedule of Environmental Commitments of Volume 2- the Main EIAR (which is replicated for ease within Appendix B of this document) will apply throughout the construction phase, and must be incorporated within the Contractors CEMP.

Table 7.16 – Example of Archaeology and Cultural Heritage Mitigation Measures

Activity	Mitigation Measures
General	In the event that intact and/or important archaeological or cultural items are identified during construction activities, work must stop and Wicklow / DLR County Council and the Department of Arts, Heritage and the Gaeltacht and the National Museum of Ireland should be notified immediately. Work should not recommence until authorised by Wicklow County Council and the Department of Arts, Heritage and the Gaeltacht and the National Museum of Ireland. Records should be maintained of all finds. Where practicable remains should be preserved in situ using appropriate engineering methods: 1. Raising ground levels 2. Using suitable materials and loading 3. Maintenance of Hydrological regimes.
EIAR (Atkins 2022)	• *A Geophysical Survey was prepared for the development site in October 2020 by JM Leigh Surveys and Archaeological Test Trenching was undertaken by John Cronin and Associates in October 2020.* • *The following mitigation measures and monitoring shall be implemented in full by the Contractor during the construction works (Refer to Chapter 11 of Volume 2 EIAR submitted as part of this application);* • *'A suitably qualified archaeologist will be appointed by the Developer to carry out a programme of archaeological monitoring of ground excavation works during the construction phase and this will be carried out under a licence issued by the National Monument Service. Given the absence of any unrecorded, sub-surface archaeological features identified during the geophysical survey and subsequent test trenching investigations carried out as part of this assessment the potential for the presence of such features is not considered likely but in the event that any archaeological remains are identified during monitoring they will be recorded and left to remain securely in situ while the National Monuments Service are consulted to determine further appropriate mitigation measures, which may entail preservation in situ by avoidance or preservation in record by archaeological excavation.* • *The positioning of the roads and residential blocks have been arrayed so that they form a spatial marker (or morphological memory) of the 'Nun's Walk' former location and alignment. The Nun's walk will feature and be defined by engraved paving slabs laid through the public open space area located between apartment blocks A and B to echo the alignment of this linear earthwork along with the alignment of the boundary between Dublin and Wicklow. This feature will run through the paved area that also provides drop off access to the entrance of Block A. The space also allows for the potential installation of public artwork to further define the character and mark the history of the space, including delineation of the alignment of the earthwork through paving, interpretive text and imagery. In addition, the design provides for a feature stone wall along this section of the railway boundary to act as 'stage scenery' and reinforce the importance of this area of open space. This open space will provide connectivity with the Green Spine and the Coastal Gardens character areas to maintain pedestrian permeability throughout the development. The Landscape Design also provides for high quality surface materiality - refer to the Landscape Design Strategy Report and Cultural Heritage Chapter for further information.* • *'There are a number of obligatory processes required as part of archaeological licence applications to the National Monuments Service and these will allow for monitoring of the successful implementation of the archaeological mitigation measures presented in Section 11.7.1. The archaeologist appointed to undertake licensed monitoring of the construction phase shall submit a method statement detailing the proposed strategy for archaeological*

	supervision of ground works to the National Monuments Service as part of the license application. This will clearly outline the proposed extent of ground works and outline the consultation process to be enacted in the event that any unrecorded archaeological remains are identified, which may include preservation in situ by avoidance or preservation in record by archaeological excavation. The appointed archaeologist will compile a report on all archaeological Site investigations which will clearly present the results in written, drawn and photographic formats. Copies of this report will be submitted to the National Monuments Service and the National Museum of Ireland by the appointed archaeologist.' • Refer also to Chapter 15 – Schedule of Environmental Commitments of Volume 2- the Main EIAR (which is replicated for ease within Appendix B of this document). All relevant mitigation measures within the EIAR in relation to the construction and operational phases must be fully implemented.

7.9. Traffic Management

Accidents involving construction vehicles and/or mobile equipment have the potential to cause serious injury or death and damage to the environment. Work zones on construction sites are used to move traffic in an approved direction and are typically identified by signs, cones, barrels, and barriers.

7.9.1. Risk identification

Contractors shall undertake a traffic management risk assessment or appraisal prior to the commencement of construction activities. An example risk assessment is shown in Table 7.17.

Table 7.17 – Example of Traffic Management Risk Assessment

	Risk Assessment	Example Procedure
01	Identify the location of all traffic sensitive areas within or adjacent to the construction site.	Mark a site plan with the location of all potential traffic sensitive areas including villages, forts, palaces, houses, schools, shopping districts, commercial/leisure areas roads and other rights of way. This will help the planning of the overall layout of the construction site and enable the identification of suitable sites for vehicle/pedestrian entrances, storage areas etc.
02	Identify the construction activities may affect the traffic sensitive areas identified.	These could include depots, storage areas, excavation, waste storage, haul roads etc.
03	Evaluate the risk of the construction activities impacting on traffic sensitive areas.	Assess the likelihood of an activity causing harm or obstruction.
04	Implement mitigation to eliminate or reduce risks.	Use the following hierarchy to manage the risk: 1. Remove the risk (different construction methods/activities). 2. Control the source (modify construction methods or operations - alternative haul roads). 3. Protect the receptor (screens, signs, barriers). 4. Put emergency procedures in place.

7.9.2. Traffic Management Control Plan

Contractors should develop, implement and maintain a Traffic Management Control Plan. The Plan forms an important management tool that acts as the catalyst for reducing the negative transport effects of construction work (e.g. congestion, air pollution and noise) on local communities, residents, businesses and the environment. By promoting efficient working practices, shorter haulage routes and reducing deliveries, the implementation of the Plan not only gives rise to the above benefits, but also helps saves costs.

The Plan should include but not be restricted to the mitigation measures below (Table 7.18).

In addition, all relevant mitigation measures stipulated within Chapter 15 – Schedule of Environmental Commitments of Volume 2- the Main EIAR (which is replicated for ease within Appendix B of this document) will apply throughout the construction phase, and must be incorporated within the Contractors CEMP.

Table 7.18 –Traffic Management Mitigation Measures

Activity	Mitigation Measures
General	Contractors will ensure that all operators are fit and competent to operate vehicles, machines and attachments by: • Undertaking checks when recruiting drivers/operators or hiring contractors. • Providing appropriate training for drivers and operators. • Managing the activities of visiting drivers. • Ensuring that signallers, flag men and bank men are appropriately trained and authorised. Access to vehicles will be restricted to prevent unauthorised access. Routes will be clearly marked and where practicable turning circles will be provided to prevent reversing. Contractors will ensure that all roads and footpaths are maintained free of mud and debris. All visitors to the site will be required to undertake a site induction and wear high visibility clothing/PPE. All roads and footpaths affected by construction activity will be appropriately reinstated/repaired.
Travel Plan	The plan will be prepared to ensure access to the site by sustainable travel modes is encouraged. The following measures should be considered where relevant: • The provision of showers/change rooms for construction staff; • The provision of cycle parking for staff; • The promotion of car sharing among staff, including van pooling travel between different work sites.
Pedestrian Safety	Contractors will provide clear warning signage, lighting and barriers at construction works. . Where practicable the contractor will provide separate entrances and exits for vehicles and pedestrians in work areas. Contractors will ensure that drivers driving onto public roads can see and be seen before moving on to it. Appropriately trained signallers/flag man/banks men will be used to control vehicle and plant movement on public roads. Contractors will ensure that, as far as practicable, construction works do not block/obstruct walkways and roads.
EIAR (Atkins, 2022)	A Traffic and Transport Assessment has been prepared by Atkins (2022) in support of this planning application which outlines the following mitigation measures which are to be adopted during the construction works by the Contractor. Note that this is not an exhaustive list, and it will be the appointed contractor's responsibility to prepare a detailed Construction Traffic Management Plan to be approved with the Planning Authority prior to commencement of construction. • Warning signs / Advanced warning signs will be installed at appropriate locations in advance of the construction access; • Construction and delivery vehicles will be instructed to use only the approved and agreed means of access and movement of construction vehicles will be restricted to these designated routes; • Restriction of HGV movements during drop off and pick up times associated with the adjacent schools;

- Appropriate vehicles will be used to minimise environmental impacts from transporting construction material, for example the use of dust covers on trucks carrying dust producing material;
- Speed limits of construction vehicles to be managed by appropriate signage, to promote low vehicular speeds within the Site;
- Parking of Site vehicles will be managed, and will not be permitted on public roads, unless proposed within that designated area that is subject to traffic management measures;
- A road sweeper will be employed to clean the public roads adjacent to the Site of any residual debris that may be deposited on the public road leading away from the construction Site;
- On Site wheel washing will be undertaken for construction trucks and vehicles to remove any debris prior to leaving the Site, to avoid any potential for debris on the local roads;
- All vehicles will be suitably serviced and maintained to avoid leaks or spillage of oil, petrol or diesel. Spill kits will be available on Site. All scheduled maintenance carried out off Site will not be carried out on the public highway; and,
- Safe and secure pedestrian facilities are to be provided where construction works obscure any existing pedestrian footway. Alternative pedestrian facilities will be provided in these instances, supported by physical barriers to segregate traffic and pedestrian movements, and to be identified by appropriate signage. Pedestrian facilities will cater for vulnerable users and mobility impaired persons.
- HGV movements will be managed so as not to occur during the background traffic peak period, particularly the AM school drop off period.

The above mitigation measures will minimise any significant environmental degradation or safety concerns in the vicinity of the proposed works, due to the presence of construction traffic. Furthermore, it is in the interest of the construction programme that deliveries, particularly concrete deliveries are not unduly hampered by traffic congestion, and as a result continuous review of haulage routes, delivery timings and access arrangements will be undertaken as construction progresses to ensure smooth operation.

- Refer also to Chapter 15 – Schedule of Environmental Commitments of Volume 2- the Main EIAR (which is replicated for ease within Appendix B of this document). All relevant mitigation measures within the EIAR in relation to the construction and operational phases must be fully implemented.

7.10. Contaminated Land

The term ‘land contamination’ covers a wide range of situations where land is contaminated in some way by previous use. This is often associated with industrial processes or activities that have now ceased, but where waste products or remaining residues present a hazard to the general environment.

7.10.1. Risk Identification

Contractors shall undertake a contaminated land risk assessment or appraisal prior to the commencement of construction activities. An example risk assessment is shown in Table 7.19.

Table 7.19 – Example of Contaminated Land Risk Assessment

	Risk Assessment	Example Procedure
01	Identify the location of contamination risks by undertaking site visits and desk based studies of relevant documents - EIA etc.	Mark a site plan with the location of all potential contamination risks including waste deposits, petrol stations, oil stores etc.

	Risk Assessment	Example Procedure
02	Identify the construction activities may create ground contamination.	These could include depots, storage areas, waste storage, etc.
03	Evaluate the risk of the construction activities leading to ground contamination.	Assess the likelihood of an activity causing pollution, damage or harm.
04	Implement mitigation to eliminate or reduce risks.	Use the following hierarchy to manage the risk: 1. Remove the risk (different construction methods/activities). 2. Control the source (modify construction methods or operations) 3. Protect the ground (screens). 4. Put emergency procedures in place.

7.10.2. Contaminated Land Control Plan

Contractors should develop, implement and maintain a Contaminated Land Control Plan. The Plan should include but not be restricted to the mitigation measures below (Table 7.20).

In addition, all relevant mitigation measures stipulated within Chapter 15 – Schedule of Environmental Commitments of Volume 2- the Main EIAR (which is replicated for ease within Appendix B of this document) will apply throughout the construction phase, and must be incorporated within the Contractors CEMP.

Table 7.20 – Example of Contaminated Land Mitigation Measures

Activity	Mitigation Measures
General	The contractor will manage and control the potential contamination of land from construction activities through the implementation of the CEMP and method statements as appropriate. The contractor will notify Atkins immediately if contaminated land is discovered or suspected. The contractor will work with Atkins to: • Undertake a risk assessment of the potential contamination. • Evaluate options for remediation including: o Containment o Monitoring o Treatment o Removal/Disposal The contractor will implement a remediation strategy and monitor as appropriate.
EIAR (Atkins 2022)	Ground investigation records confirm that no visual or olfactory evidence of soil contamination was encountered at any of the exploratory locations across the Site, with the exception of WS04A, located in the southern portion of the Site, where a 'hydrocarbon odour' was noted in a single thin layer of damp native sand (from 2.45mbgl to 2.80mbgl). There is also a historic landfill located immediately to the east and down gradient of the Site, known as the former Bray Municipal Landfill. This landfill has been the subject of a phased environmental risk assessment process. A site investigation, Tier 2 Environmental Risk Assessment (Fehily Timoney & Co., 2016)[3] and Remediation Option Appraisal (Fehily Timoney & Co., 2017)[4] have been carried out on the historic landfill Site to fully assess the current ground

[3] https://www.dlrcoco.ie/sites/default/files/atoms/files/tier_2_risk_assessment_bray_historic_landfill_co_wicklow.pdf

conditions and potential risk that the former landfill could pose to human health and environmental receptors in the vicinity. The findings of this phased risk assessment process are summarised in the Remediation Option Appraisal report (Fehily Timoney & Co., 2017) presented in Appendix 9.2 of the EIAR.

As a precautionary measure, the potential risk of encountering ground contamination should be addressed by the Contractor in the Detailed CEMP.

- A response procedure will be put in place to deal with any accidental pollution events. Any spillage of fuels, lubricants or hydraulic oils will be immediately contained and the contaminated soil removed from the proposed development and properly disposed of in accordance with all relevant waste management legislation:
  - All Site vehicles used will be refuelled in bunded and adequately sealed and covered areas in the construction compound area;
  - All oil stored on Site for construction vehicles will be kept in a locked and bunded area;
  - Generators, pumps and similar plant will be placed on drip-trays to prevent contamination;
  - All Site vehicles used will be refuelled in bunded areas;
  - All temporary construction fuel tanks will also be located in a suitably bunded area and all tanks will be double skinned. Relevant Material Safety Data Sheets along with oil absorbent materials will be kept on Site in close proximity to any fuel storage tanks or bowsers during proposed Site development works; and,
  - All fuel / oil deliveries to on-Site oil storage tanks will be supervised, and records will be kept of delivery dates and volumes.
- Stripping of topsoil will be carried out in a controlled and carefully managed way and coordinated with the proposed staging for the development. At any given time, the extent of topsoil strip (and consequent exposure of subsoil) will be limited to the immediate vicinity of active work areas. Topsoil stockpiles will be protected for the duration of the works and will be located so as not to necessitate double handling.
- Soil beneath the proposed footprint of all housing and duplex units is suitable (from a human health and environmental perspective) for reuse within the proposed residential gardens, with the exception of two localised hotspots (TP205 and TP208). The extent of these hotspot areas (from ground level to 1mbgl) is estimated to be 10m x 10m, centred around each of the following locations:
  - TP205 Hotspot - Grid Reference: 726,442.09 E, 719,477.12 N; and,
  - TP208 Hotspot - Grid Reference: 726,491.25 E, 719,426.98 N.
- This material (ca. 200m^3) should be removed for reuse elsewhere onsite, or for offsite disposal to a suitably licenced / permitted waste facility. These soils can be replaced if needed by soils from elsewhere beneath the proposed footprint of all housing and duplex units, or from the north western portion of the Site (e.g. excavated material from Block D), or via. suitable imported uncontaminated soil / topsoil. The Contractor, in consultation with the Client and the Engineer, will be responsible for ensuring that these two localised soil hotspots (TP205 and TP208) are removed and replaced with suitable material as required.
- The design of road levels and finished floor levels has been carried out in such a way as to minimise cut/fill type earthworks operations. The duration that subsoil layers are exposed to the effects of weather will be minimised. Disturbed subsoil layers will be stabilised as soon as practicable (e.g. backfill of service trenches, construction of road capping layers, construction of building foundations and completion of landscaping). Similar to comments regarding stripped topsoil, stockpiles of excavated subsoil material will be protected for the duration of the works. Stockpiles of subsoil material will be located separately from topsoil stockpiles. The Contractor will be responsible for ensuring these measures are fully implemented.
- The excavation of material will be minimised as much as possible to reduce the impact on soils and geology. Any surplus material, or materials which are deemed not suitable for onsite reuse will be classified in accordance with the EPA Guidance Document *'Waste Classification, List of Waste & Determining if Waste is Hazardous or Non-Hazardous'* (2015). It will be the Contractors responsibility to ensure that all waste soils are classified correctly and managed, transported and disposed of offsite in accordance with the requirements of the Waste Management Act 1996, as amended, the Waste Framework Directive 2008/98/EC of the European Parliament and Council on waste and any relevant subsequent waste management legislation.

- The minor amount of waste C&D material observed in a localised area within the southern portion of the Site will also be removed from site and disposed of in accordance with all relevant waste management legislation. An Outline Construction and Demolition Resource and Waste Management Plan has been generated for the Site (Document Ref: 5214455DG0004 (Atkins, 2022)). It will be the Contractors responsibility to ensure that a project specific Detailed Waste Management Plan is fully implemented onsite for the duration of the project.
- Based on CIRIA 665 guidance, gas protection measures would be required in the vicinity of proposed apartment blocks B and C, based on this part of the Site being CS2. The typical scope of protective measures for residential buildings (not low rise traditional housing), such as apartment blocks B and C (for CS2) is as follows (CIRIA 665, 2007):
  - Option a) - Reinforced concrete cast in situ floor slab (suspended, non-suspended or raft) with at least 1200g damp proof membrane (DPM) and underfloor venting; or;
  - Option b) - Beam and block or pre-cast concrete and 2000g DPM / reinforced gas membrane and underfloor venting; and,
- All joints and penetrations sealed.

Gas protection measures (based on the above scope) for apartment blocks B and C will be incorporated into the Detailed Design Stage of the proposed development; and will be installed by experienced and trained specialists and will be subject to inspection and certification, during the Construction Stage. The Contractor, in consultation with the Client and the design team, will be responsible for ensuring that these measures are fully implemented and verified.

Further mitigation measures for the prevention of soil / bedrock contamination during construction are proposed below. The Contractor will be responsible for ensuring these measures are fully implemented. Mitigation measures outlined in Section 6.16, Water Management are also applicable to the protection of soils and geology during the construction phase:

- In advance of commencement of the Construction Stage, all onsite monitoring wells (as identified in the Ground Investigation Report (IGSL, 2021) presented in Appendix 9.1 of the EIAR, and the historic well located in the north eastern portion of the Site, will be fully decommissioned by an experienced borehole specialist in accordance with relevant guidelines, 'Good practice for decommissioning redundant boreholes and wells' (UK Environment Agency, 2012);
- Earthworks / piling plant and vehicles delivering construction materials to Site will be confined to predetermined haul routes around the Site for each phase of the proposed development;
- The need for vehicle wheel wash facilities will be assessed by the Contractor depending on the phasing of works and onsite activity and will be installed as needed, near any Site entrances and road sweeping implemented as necessary to maintain the road network in the immediate vicinity of the Site;
- Dust suppression measures (e.g. dampening down) will be implemented as necessary during dry periods;
- All excavated materials / piling arisings will be stored away from the excavations / immediate works area, in an appropriate manner at a safe and stable location. The maximum height of temporary stockpiles will be 3m;
- A comprehensive monitoring and supervisory regime including monitoring of all excavations and stability assessments as required will be put in place to ensure that the proposed construction works do not constitute a risk to the stability of the Site;
- The employment of good construction management practices will serve to minimise the risk of pollution from construction activities at the proposed development in line with the Construction Industry Research and Information Association (CIRIA) publication entitled, Control of Water Pollution from Construction Sites, Guidance for Consultants and Contractors, CIRIA - C532 (2001); and,
- Specifically, regarding pollution control measures, the following will be adhered to;
  - Fuels, lubricants and hydraulic fluids for equipment used on the construction Site, as well as any solvents, oils, and paints will be carefully handled to avoid spillage, properly

secured against unauthorised access or vandalism, and provided with spill containment according to best codes of practice;

- Waste oils and hydraulic fluids will be collected in leak-proof containers and removed from the proposed development for disposal or re-cycling;
- Any spillage of fuels, lubricants or hydraulic oils will be immediately contained and the contaminated soil removed from the proposed development and properly disposed of;
- All Site vehicles used will be refuelled in bunded and adequately sealed and covered areas in the construction compound area;
- All plant and machinery will be serviced before being mobilised to Site;
- No plant maintenance will be completed on Site, any broken-down plant will be removed from Site to be fixed;
- Refuelling will be completed in a controlled manner using drip trays at all times;
- Mobile bowsers, tanks and drums will be stored in secure, impermeable storage areas away from open water;
- Fuel containers will be stored within a secondary containment system, e.g. bunds for static tanks or a drip tray for mobile stores;
- Containers and bunding for storage of hydrocarbons and other chemicals will have a holding capacity of 110% of the volume to be stored;
- Ancillary equipment such as hoses and pipes will be contained within the bund;
- Taps, nozzles or valves will be fitted with a lock system;
- Fuel and chemical stores including tanks and drums will be regularly inspected for leaks and signs of damage;
- Drip-trays will be used for fixed or mobile plant such as pumps and generators to retain oil leaks and spills;
- Only designated trained operators will be authorised to refuel plant on Site;
- Procedures and contingency plans will be set up to deal with emergency accidents or spills;
- An emergency spill kit with oil boom, absorbers etc. will be kept on-site for use in the event of an accidental spill. A specific team of staff will be trained in the use of spill containment;
- Strict supervision of contractors will be adhered to in order to ensure that all plant and equipment utilised on-Site is in good working condition. Any equipment not meeting the required standard will not be permitted for use within the Site. This will minimise the risk of soils and bedrock becoming contaminated through Site activity; and,
- The highest standards of Site management will be maintained and utmost care and vigilance followed to prevent accidental contamination or unnecessary disturbance to the Site and surrounding environment during construction. A named person will be given the task of overseeing the pollution prevention measures agreed for the Site to ensure that they are operating safely and effectively.

The above mitigation measures will be incorporated (as required) during Detailed Design Stage, and will form part of a site-specific Construction Environmental Management Plan (CEMP) which will be implemented during the Construction Stage (including initial Site preparatory / enabling works).

Refer also to Chapter 15 – Schedule of Environmental Commitments of Volume 2- the Main EIAR (which is replicated for ease within Appendix B of this document). All relevant mitigation measures within the EIAR in relation to the construction and operational phases must be fully implemented.

7.11. Soil Erosion and Sedimentation

Soil eroded during land disturbance can wash away and contaminate storm water drains and nearby water bodies. The plan establishes a series of mitigation and management measures to control and minimise these issues if required. Water erosion potential depends on the intensity of the rainfall and/or construction discharges, the soil type and topography. This section identifies the potential causes of erosion and sedimentation which may arise from construction and provides guidance on the management, control and disposal of waste.

7.11.1. Risk Identification

Contractors shall undertake a qualitative soil erosion and sedimentation risk assessment or appraisal prior to the commencement of construction activities. An example risk assessment is shown in Table 7.21.

Table 7.21 – Example of Soil Erosion and Sedimentation Risk Assessment

	Risk Assessment	Example Procedure
01	Identify the location of all activities that could result in erosion and sedimentation, for example dewatering, and sensitive receptors within or adjacent to the construction site.	Mark a site plan with the location of all water courses, surface water features, boreholes, field drains, ecologically sensitive areas including surface and foul drainage systems and other potential receptors. This will help the planning of the overall layout of the construction site and enable the identification of suitable sites for high risk activities such as dewatering, haul routes and wash out areas.
02	Identify sensitive receptors off site or downstream of the construction project that could potentially be affected by the works. For example water courses and ecologically sensitive areas/nature reserves.	Mark a site plan with sensitive receptors outside the site boundary. This will help the planning of the overall layout of the construction site and enable the identification of suitable sites for high risk activities such as dewatering, haul routes and wash out areas.
03	Identify the construction activities and sources of sedimentation/erosion that may affect the water receptors identified.	These could include excavations, dewatering, water course crossings, as well as general sources of pollution such as surface water runoff and concrete use.
04	Evaluate the risk of the construction activities polluting the identified water receptors.	Assess the likelihood of an activity causing pollution. Assess the significance of the harm sedimentation/erosion would cause to a particular water receptor.
05	Evaluate the risk of the construction activities contributing to and/or being affected by the groundwater table.	Assess the likelihood of an activity contributing to raised groundwater levels or being affected by these. Assess the significance of the harm additional water would cause to groundwater or other projects/receptors and the significance of the high water table on construction.
06	Implement mitigation to eliminate or reduce risks.	Use the following hierarchy to manage the risk: 1. Remove the risk (different construction methods/activities). 2. Control the source (modify construction methods, provide adequate bunding for storage areas, install measures such as silt fences or ditches to control runoff). 3. Protect the receptor (provide hard standing for compounds/storage areas, filter, control, contain discharges, ensure appropriate environmental permits are in place). 4. Put emergency procedures in place.

7.11.2. Soil Erosion and Sedimentation Management Plan

Contractors should develop, implement and maintain an Erosion and Sedimentation Management Plan. The Plan should include but not be restricted to the mitigation measures below (Table 7.22).

In addition, all relevant mitigation measures stipulated within Chapter 15 – Schedule of Environmental Commitments of Volume 2- the Main EIAR (which is replicated for ease within Appendix B of this document) will apply throughout the construction phase, and must be incorporated within the Contractors CEMP.

Table 7.22 –Soil Erosion and Sedimentation Mitigation Measures

Activity	Mitigation Measures
Soil Erosion	Methods to control erosion need to take into account the factors causing erosion – rainfall discharge intensity, soil type and topography. Possible erosion control measures may include, but are not limited to the following: • Avoid the creation of steep slopes. Consider implementing terraces instead of long steep slopes to avoid runoff from precipitation. • Do not release heavy discharges of water onto the soil. • Prevent over-watering of loose areas for dust suppression. • Keep site traffic to designated routes. • Consider covering temporary roads and routes within site with either asphalt or stone. Appropriate rehabilitation will need to be applied. • Undertake regular leak monitoring and maintenance of dewatering pipes. • Maintain recommended maximum vehicle weightings to avoid destabilization and subsequent erosion of soil surface. • Progressive rehabilitation of disturbed land or stockpiles by establishing temporary or permanent vegetation supported by irrigation. • Cover excess work areas with geotextile type liners. • Provide collection systems under machinery or equipment during wash down to prevent erosion from runoff. • Flow attenuation - Employ mechanisms to control run off of precipitation such as temporary structures to slow running water to facilitate pollutant removal and infiltration and reduce runoff.
Sediment Control	Possible sedimentation control measures may include but are not limited to the following: • Place sediment traps on all drainage lines such as geotextile lining. • Construct collection channels capable of collecting all runoff water during storms if it contains fine clay particles. • Use contained concrete washout control facility. • Treat and discharge runoff water from retention basin at controlled flow rate through storm water discharge network. • Inspect and clean the collection channels and retention basin on regular basis to prevent sediment build up. • Stabilise the site as soon as possible after construction

EIAR (Atkins 2022)	Temporary stockpiling of native soils and imported materials onsite will require careful management in order to prevent the release of sediment into drainage ditches (and receiving streams), and any temporarily exposed groundwater (in the unlikely event that groundwater is encountered). The following mitigation measures should be implemented by the Contractor: • Stripping of topsoil will be carried out in a controlled and carefully managed way and coordinated with the proposed staging for the development. At any given time, the extent of topsoil strip (and consequent exposure of subsoil) will be limited to the immediate vicinity of active work areas. Topsoil stockpiles will be protected for the duration of the works and will be located so as not to necessitate double handling. • Stockpiled materials should not be located immediately adjacent to any onsite drainage ditches, or any temporarily exposed groundwater (in the unlikely event that groundwater is encountered); • Stockpiled materials should be covered as required to prevent it spilling over/blowing onto areas of environmental interest or semi-natural vegetation outside the agreed lands; • Stockpile of materials to be kept to an absolute minimum, and where possible, stockpiled for as short a time as possible prior to use; • Any stockpiled materials will be stored in low mounds where possible; • Slopes of material should be stable, and the side slopes compacted down and stabilised, with regular checks by the Contractor; • The Contractor is to examine the risk arising from storage areas and identify as appropriate the need for mitigation measures at the toe of slopes to reduce silt transport from areas of stockpiled material (in line with IFI best practice guidance); • Stockpiles of materials not suitable for onsite re-use should be removed as soon as is practicable in accordance with applicable waste management legislation, and under no circumstances to be stockpiled in sensitive ecological areas; • The Contractor should develop a contingency plan for temporary covering of stockpiles during adverse weather conditions, or other measures as deemed necessary in order to minimise risk of sediment release to watercourses; • The Contractor should comply with best practice when sourcing imported materials for site works, including NRA (2006) A Guide to Landscape Treatments; and, • If imported material is required, it must be from a reputable source who can confirm that it has been screened for potential presence of invasive species. Refer also to Chapter 15 – Schedule of Environmental Commitments of Volume 2- the Main EIAR (which is replicated for ease within Appendix B of this document). All relevant mitigation measures within the EIAR in relation to the construction and operational phases must be fully implemented.

8. Emergency Response Plan

The contractor shall establish, implement and maintain procedures to identify and manage potential environmental emergency situations and potential accidents. The contractor shall respond to actual emergency situations and prevent and mitigate adverse environmental impacts.

The contractor should periodically test, review and update emergency preparedness and response procedures.

8.1. Key Requirements

During construction accidents, incidents and emergencies that have an environmental impact may occur. In the event of an emergency, the first response is to locate the source of that which is giving rise to the environmental impact where appropriate and stop continuation of the situation, followed by the containment, control and mitigation of the situation.

The Emergency Response Procedure will be displayed within the Site Office / compound.

A copy of the Material Safety Data Sheets for all the chemicals used on the project site will also be kept at the site office.

The main objectives of the Emergency Response Plan are to:

- Ensure that all means are available to contain the consequences of an accidental spill, fire or release of oil/fuel;
- Ensure that employees are suitably trained to respond to fire and spill;
- Ensure that proper reporting takes place; and
- Ensure that proper investigation is undertaken.

All contractor personnel and sub-contractors will be instructed and rehearsed, as appropriate, in the requirements of the emergency response procedure. Following control of an incident or emergency, an investigation will be conducted, and corrective actions identified and addressed. The Contractor's Environmental Manager will verify the close out of environmental related actions and notify the Employer and/or the Employer's Representative of any emergency.

8.2. Emergency Incidents

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

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

8.3. Spill Contingency Plan

The main causes of contamination can occur through:

- Spillage of hazardous material including fuel oils, waste materials or chemicals;
- Spillage of wastewater sewage and other liquid effluents; and
- Spillage of contaminated wash down water with oils, chemicals etc from vehicles, equipment and machinery.

Prior to commencing activities on site, Contractors should develop, implement and maintain a Spill Contingency Management Plan. The Plan should include but not be restricted to the mitigation measures below (Table 8.1).

In addition, all relevant mitigation measures stipulated within Chapter 15 – Schedule of Environmental Commitments of Volume 2- the Main EIAR (which is replicated for ease within Appendix B of this document) will apply throughout the construction phase, and must be incorporated within the Contractors CEMP.

Table 8.1 –Spill Mitigation Measures

Activity	Mitigation Measures
Mitigation Actions /Emergency Response	Contractors will carry out regular inspections/ audits of hazardous materials usage, handling and storage areas and regular/thorough maintenance of vehicles and hydraulic systems and inspections of sanitary facilities and disposal. All contractors handling hazardous materials will keep appropriate spill cleanup material adjacent to storage and maintenance areas. Minimise the amount of diesel, oil, paint, thinners and other chemicals stored on site that pose potential spillage environmental hazards and use materials that minimize environmental impact such as lead free paints, asbestos free materials etc. Storage areas will be located away from drains/trenches/wastewater collection devices in an impervious bund area (volume of the storage bund >110% of the largest storage tank contained within the bund). Collection systems will be provided/bunded if necessary under machinery or equipment that may leak hydrocarbons/hazardous substances. The contractor shall be responsible for training all staff in the procedures for handling spills and shall provide all staff with appropriate personal protective equipment. The contractor shall provide all staff with appropriate personal protective equipment. Avoid impacting adjacent sites by ensuring all contractors activities, equipment and waste storage is confined to the allocated site boundary. In the event of a spill: • 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 they can take appropriate action; • If applicable, eliminate any sources of ignition in the immediate vicinity of the incident; • Contain the spill using spill control materials, track mats or other materials as required. Do not spread or flush away the spill; • If possible, cover or bund off any vulnerable areas where appropriate such as drains, watercourses and/or sensitive habitats; • If possible, clean up as much as possible using the spill control materials; • Contain any used spill control material and dispose of used materials appropriately using a fully licensed waste contractor with appropriate permits so that further contamination is limited; • The Environmental Manager shall inspect the site as soon as practicable and ensure the necessary measures are in place to contain and clean up the spill and prevent further spillage from occurring; and • The Environmental Manager will notify the appropriate stakeholders such as Dún-Laoghaire Rathdown County Council and Wicklow County Council, National Parks and Wildlife Service and/or the EPA.
EIAR (Atkins 2022) submitted to support the planning application in August 2021.	The project specific Detailed CEMP will include an Emergency Response Plan (ERP) based on the Contractor's Risk Assessment, to be reviewed and approved by the Project Ecologist. The ERP will include (but not limited to): • training of relevant staff, including cover staff, in the implementation of the ERP and the use of spill kits; • procedures to be undertaken in the event of the release of any sediment into a watercourse, or any spillage of chemicals, fuel, oil or other hazardous materials or wastes;

- procedures to be undertaken in the event of any non-compliance incidents with any permit or licence, or other such risks that could lead to a pollution incident, including flood risks;
- the number, specification and location of all spill kits which shall be carried/kept on the Site;
- information on clean-up and reporting procedures; etc.

While it is expected that the Site drainage system will be installed and commissioned early in the Site construction programme, and will, therefore, be operational for much of the construction phase, there will be a period of the construction phase during which the Site drainage system will not be operational. The project specific Detailed Construction Environmental Management Plan (CEMP) is required to cover this period and to deal with other issues during the construction phase.

Refer also to Chapter 15 – Schedule of Environmental Commitments of Volume 2- the Main EIAR (which is replicated for ease within Appendix B of this document). All relevant mitigation measures within the EIAR in relation to the construction and operational phases must be fully implemented.

8.4. Emergency Incident Response Plan

The Contractor will be required to detail emergency incident procedures in the CEMP and develop an Emergency Incident Response Plan. The Plan will contain emergency phone numbers and method of notifying local authorities, statutory authorities and stakeholder. The Plan will include contact numbers for key personnel. The Contractor will ensure that all staff and personnel on site are familiar with the emergency requirements.

In the case of work required in an emergency, or which if not completed would be harmful or unsafe to workers, the public or to the local environment, Wicklow / DLR County Council will be informed as soon as reasonably practicable of the reasons and likely duration. Examples may include: where the ground needs stabilising if unexpected ground conditions are encountered or equipment failure.

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

- A description of the incident, including location, type of incident and the likely receptor;
- Contributory causes;
- Negative effects;
- Measures implemented to mitigate adverse effects; and
- Any recommendations to reduce the risk of similar incidents occurring.

Further, if any sensitive receptor is impacted, the appropriate environmental specialists will be informed and consulted with accordingly.

Any response measures will be incorporated into an updated Emergency Incident Response Plan.

8.5. Emergency Access

The Contractor will be required to maintain emergency access routes throughout construction and identify site access points for the working area.

8.6. Extreme Weather Events

The Contractor will consider the impacts of extreme weather events and related conditions during construction. The CEMP should consider all measures deemed necessary and appropriate to manage extreme weather events and should specifically cover training of personnel and prevention and monitoring arrangements for staff. As appropriate, method statements should also consider extreme weather events where risks have been identified.

9. References

Atkins (2022) Environmental Impact Assessment Report (Volume 1 – Volume 3);

Atkins (2022). Construction Resource and Waste Management Plan (RWMP);

Atkins (2022). Operational Waste Management Plan;

Atkins (2022). Traffic and Transport Assessment;

Air Pollution Act, 1987 (Air Quality Standards) Regulations, 1987, as amended, 2011 (S.I. No. 180 of 2011), 2016 (S.I. No. 659 of 2016);

Air Pollution Act, 1987 (Emission Limit Values for use of Asbestos) Regulations, 1990, S.I. No. 28 of 1990);

Any additional information as determined at the detailed design and tender stages.

BS 3998; 2010. Tree Work. Recommendations.

BS 5837/2012. Trees in relation to design, demolition and construction.

CIRIA (2001). C532. Control of water pollution from construction sites. Guidance for consultants and contractors;

CIRIA (2006). C648. Control of water pollution from linear construction projects. Technical Guidance;

CIRIA (2008). C679. Invasive species management for infrastructure managers and the construction industry. Updated in 2014;

CIRIA (2015). C741. Environmental Good Practice on Site;

CIRIA (2015). C753. The SuDS Manual;

DoEHLG (2006). Best Practice Guidelines on the Preparation of Waste Management Plans for Construction & Demolition Projects;

EC (Control of Emissions of Gaseous & Particulate Pollutants from Non-Road Mobile Machinery) Regulations 2007, S.I. No.147 of 2007, as amended, 2011 (S.I. No. 263 of 2011), 2012 (S.I. No. 407 of 2012), 2013 (S.I No. 417 of 2013), 2016 (S.I. No. 2016/1628);

Environment (Miscellaneous Provisions) Act 2011, as amended 2015;

Environmental Noise Regulations 2006, S.I. No. 140 of 2006;

Environmental Protection Agency Act 1992 (Noise) Regulations, 1994 S.I. 174 of 1994;

EU F Gas Regulations 2006, as amended, 2014, S.I. No. 517 of 2014;

European Communities (Construction Plant and Equipment) (Permissible Noise Levels) Amendment Regulations 1996, S.I No. 359 of 1996 and 2001, S.I No. 632 of 2001);

European Communities (Drinking Water) Regulations 2014, S.I. No. 122 of 2014, as amended 2017 (S.I No. 464 of 2017);

European Communities (Environmental Liability) Regulations, 2008, S.I. No. 547 of 2008, as amended, 2011 (S.I. No. 307 of 2011), 2015 (S.I. No. 293 of 2015);

European Communities (Environmental Noise) Regulations 2018 (S.I. No. 549 of 2018;

European Communities (Noise Emission by Equipment for use Outdoors) Regulations, 2001, S.I No. 632 of 2001, as amended, 2006 (S.I No. 241 of 2006);

European Communities (Shipments of Hazardous Waste Exclusively within Ireland) Regulations 2011, S.I. No 324 of 2011;

European Communities (Transfrontier Shipment of Waste) Regulations 1994 (S.I. No. 121 of 1994);

European Communities (Waste Directive) Regulations 2011, S.I. No. 126 of 2011, as amended 2016 (S.I. No. 315 of 2016);

European Communities Conservation of Wild Bird Regulations 1985, S.I. No. 291 of 1985, as amended, 1986 (S.I. No. 48 of 1986), 1995 (S.I. No. 31 of 1995), 1997, (S.I. No. 210 of 1997), 1998 (S.I. No. 154 of 1998), (S.I. No. 131 of 1999), 2005 (S.I. No. 716 of 2005), 2010 (S.I. No. 65 of 2010), 2011 (S.I. No. 626 of 2011), 2012 (S.I. No. 84 of 2012), 2013 (S.I. No. 281 of 2013);

European Communities Environmental Objectives (Groundwater) Regulations 2010, S.I. No. 9 of 2010, as amended, 2016 (S.I. No. 366 of 2016);

European Communities Environmental Objectives (Surface Waters) Regulations, 2009, S.I. No. 272 of 2009, as amended, 2012 (S.I. No. 327 of 2012), 2015 (S.I. No. 386 of 2015), 2019 (S.I. No. 77 of 2019);

European Union (Environmental Impact Assessment and Habitats) (Environmental Impact Assessment) Regulations, 2018, S.I. No. 296 of 2018.

European Union (Environmental Impact Assessment and Habitats) (Section 181 of the Planning and Development Act 2000) Regulations, 2013 (S.I. No. 403 of 2013), 2015 (S.I. No. 301 of 2015).

European Union (Properties of Waste Which Render It Hazardous) Regulations 2015, S.I. No. 233 of 2015, as amended, 2018 (S.I. No. 383 of 2018);

European Union (Waste Electrical and Electronic Equipment) Regulations 2014 (S.I. No. 149 of 2014);

European Union Batteries and Accumulators Regulations 2014, S.I. No. 283 of 2014, as amended, 2014 (S.I. No. 349 of 2014), 2015 (S.I. No. 347 of 2015);

European Waste Catalogue (EWC) and Hazardous Waste List 2002;

Flora (Protection) Order, 2015, S.I. No 356 of 2015;

Forestry Regulations, S.I. No. 191 of 2017;

Guidelines on protection of fisheries during construction works in and adjacent to waters (IFI, 2016);

Inland Fisheries Act 2019, as amended 2017;

Inland Fisheries Ireland (2016). Guidelines on protection of fisheries during construction works in and adjacent to waters;

Inland Fisheries Ireland IFI, Jan. 2011. Biosecurity Protocol for Field Survey Work;

Invasive Species Ireland (2016). Best Practice Management Guidelines. Japanese Knotweed;

Litter Pollution Act of 1997, as amended, 2017 (Bill 58 of 2017);

Litter Pollution Regulations 1999, S.I. No. 359 of 1999);

Local Government (Planning and Development) Act 1963 (S.I. No. 28 of 1963), as amended 1993 (S.I. No. 12 of 1993);

Noxious Weed Act, 1936, S.I. No. 38 of 1936;

Noxious Weed Act, 1937, S.I. No. 103 of 1937:

NRA (2005a). Guidelines for the Crossing of Watercourses during the Construction of National Road Schemes;

NRA (2005b). Guidelines for the Treatment of Badger Prior to the Construction of National Road Schemes;

NRA (2006). Guidelines for the Protection and Preservation of Trees, Hedgerows and Scrub Prior to, During and Post Construction of National Road Schemes;

NRA (2008). Guidelines for the Treatment of Otters prior to the Construction of National Road Schemes;

NRA (2010). Guidelines on the Management of Noxious Weeds and Non-Native Invasive Plant Species on National Roads (Revision 1).

Planning and Development Act, 2000, as amended 2017 (S.I. No. 20 of 2017) and 2018 (S.I. No. 16 of 2018);

Planning and Development Regulations 2001 to 2022, as amended 2018 (S.I. No. 20 of 2018)

Protection of the Environment Act 2003;

The Birds Directive: Council Directive 2009/147/EC on the conservation of wild birds;

The Birds Directive: Council Directive of 2 April 1979 on the conservation of wild birds (79/409/EEC);

The EU Regulation 2037/2000 (CFC's, HCFC's, Halons) - Ozone Depleting Substances. Control of Substances that Deplete the Ozone Layer Regulations 2006, S.I. No 281 of 2006, as amended, 2011 (S.I. No. 465 of 2011);

The European Communities (Birds and Natural Habitats) Regulations, 2011 (S.I. 477 of 2011), as amended, 2015 (S.I. No. 355 of 2015);

The Fisheries (Consolidation) Acts 1959 & 2001

The Forestry Act, 1946, S.I. No. 13 of 1946, as amended, 2009 (S.I. No. 40 of 2009) & Forestry Act, 2014, S.I. No. 31 of 2014;

The Habitats Directive: Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora;

The National Monuments Act 1930, S.I. No. 2 of 1930, as amended, 2004 (S.I. No. 22 of 2004); and,

The Salmonid Regulations 1988, S.I. No. 293 of 1988;

The Water Pollution Acts of 1977 & 1990;

The Wildlife Act 1976 & Wildlife (Amendment) Acts, 2000 and 2010;

Waste Framework Directive 2008/98/EC of the European Parliament and Council on waste, as amended 2018 (S.I. No. 851 of 2018);

Waste Management (Collection Permit) Regulations 2007, S.I. No. 820 of 2007), as amended, 2015 (S.I. No. 197 of 2015), 2016 (S.I. No. 24 of 2016);

Waste Management (Facility Permit and Registration) Regulations 2007, S.I. No. 821 of 2007, as amended, 2008 (S.I. No. 86 of 2008), 2015 (S.I. No. 198 of 2015)

Waste Management (Food Waste) Regulations 2009, S.I. No 508 of 2009, as amended, 2015 (S.I. No. 430 of 2015);

Waste Management (Hazardous Waste) Regulations, 1998, as amended, 2000 (S.I. No. 73 of 2000);

Waste Management (Landfill Levy) Regulations 2008, S.I. No. 199 of 2008, as amended 2009, (S.I. No. 550 of 2009), 2010 (S.I. No. 31 of 2010), 2012 (S.I. No. 221 of 2012), 2013 (S.I. No. 194 of 2013), 2015 (S.I. No. 189 of 2015), 2019 (S.I. No.182 of 2019);

Waste Management (Licensing) Regulations 2004 (S.I. No. 395 of 2004) as amended 2010 (S.I. No. 350 of 2010);

Waste Management (Movement of Hazardous Waste) Regulations, 1998 (S.I. No. 147 of 1998);

Waste Management (Prohibition of Material Disposal by burning) Regulations 2009, S.I No. 286 of 2009, as amended 2013 (S.I. No. 504 of 2013), 2017 (S.I. No. 599 of 2017);

Waste Management (Registration of Brokers and Dealers) Regulations 2008, SI No. 113 of 2008;

Waste Management (Transfrontier Shipment of Waste) Regulations 1998, as amended, 2014 (S.I. No. 861 of 2014);

Waste Management (Tyres and Waste Tyres) Regulations 2007 (S.I. No. 664 of 2007), 2017, as amended (S.I. No. 400 of 2017) and 2018 (S.I. No. 96/2018);

Waste Management Acts of 1996 to 2019;

Waste Management Shipment of Waste Regulations 2007, S.I. No. 419 of 2007;

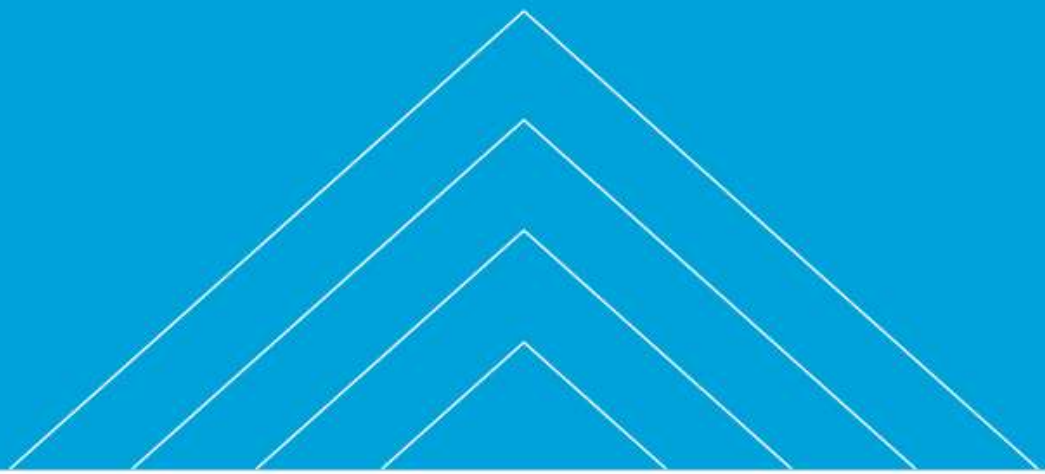
Water Conservation Regulations 2008, S.I. No. 527 of 2008;

Water Framework Directive (WFD): Directive 2000/60/EC of the European Parliament and Council establishing a framework for Community Action in the field of water policy, as amended;

Water Policy Regulations 2003, S.I. No. 722 of 2003, as amended, 2005 (S.I No. 413 of 2005), 2008 (S.I No. 219 of 2008), 2010 (S.I. No. 93 of 2010) and Amendment (No. 2) Regulations, (S.I. 326 of 2010) & EU Water Policy Regulations 2014 (S.I 350 of 2014), 2018 (S.I. No. 261 of 2018);

Wildlife Act, 1976 (Protection of Wild Animals) Regulations, 1990, S.I. No. 112 of 1990 and Wildlife Amendment Act, 2000 (S.I. No. 38 of 2000);

Appendices



Appendix A. Design Drawings. Refer to Design Drawings submitted as part of the Planning Application.

Appendix B. Schedule of Environmental Commitments (as per Chapter 15, Volume 2 of the EIAR).

15. Schedule of Environmental Commitments

All mitigation and monitoring commitments detailed within this EIAR have been included in a separate compendium and are presented in Table 15-1 and 15-2 below. Together these tables form the Schedule of Environmental Commitments which will be implemented as required during the construction and operational phases of the proposed residential development at Dublin Road, Bray, Co. Wicklow. In addition, the following reinstatement commitments must be fully implemented upon completion of the construction phase:

- All temporary construction compounds and site entrances are to be removed upon completion of the construction phase. Such areas are to be reinstated in accordance with the landscape architects plan and engineer's drawings;
- All construction waste and / or scrapped building materials are to be removed from Site on completion of the construction phase;
- Oil, fuel etc. storage areas are to be decommissioned on completion of the construction phase; and,
- Any remaining liquids are to be removed from Site and disposed of at an appropriately licenced waste facility.

All of the mitigation and monitoring commitments detailed below have been incorporated into the Construction Environmental Management Plan (CEMP) submitted as part of this planning application; this is a live document which will be further added to in the Detailed CEMP prepared by the Contractor and will include any future additional mitigation measures as may be required.

Table 15-1 – Schedule of Environmental Commitments – Mitigation Measures (Construction and Operational Phases)

Item Ref.	Environmental Topic	Schedule of Environmental Commitments – Mitigation Measures	Construction Phase	Operational Phase
1	Chapter 3 – Population and Human Health	During the construction phase, all legal duties under the Construction Regulations (Safety, Health and Welfare at Work (Construction) Regulations 2013) will be adhered to. In accordance with these duties, a Project Supervisor Design Process (PSDP) will be appointed by the relevant contractor to co-ordinate the design effort and minimise the construction risks during the design period. In addition, a Project Supervisor - Construction Stage (PSCS) will be appointed to coordinate and supervise all safety aspects of the project.	✓	
		The CEMP (document ref.: 5214419DG0005) for the project which accompanies this planning application, sets out the basic measures to be employed in order to mitigate potential negative effects during construction. This document represents a comprehensive approach to construction phase mitigation which in accordance with good practice, will be refined and added to as the project proceeds on Site. The CEMP includes the following with regard to population and human health.	✓	
		"A rodent and pest control plan will be put in place so as to manage and limit any potential disturbance to populations that may utilise the Site. The pest control plan will be in accordance with the Chartered Institute of Environmental Health's "Pest minimisation Best practice for the construction industry" guidelines or a similar appropriate standard."	✓	
		Procedures shall also be adopted to ensure that noise impacts from construction operations are minimised, to protect local amenity as detailed in Chapter 7 - Noise and Vibration. The proposed mitigation measures to minimise noise impacts during the construction phase are detailed in Section 7.7.1 in Chapter 7 – Noise and Vibration. Prior to the commencement of construction, the CEMP will be refined by the selected contractor prior to work commencing on Site.	✓	
		The main purpose of a CEMP is to provide a mechanism for implementation of the various mitigation measures which are described in this EIAR and contained within the CEMP that accompanies this application under separate cover.	✓	
		All personnel will be required to understand and implement the requirements of the CEMP and shall be required to comply with all legal requirements and best practice guidance for construction sites.	✓	
		There are a number of existing significantly scaled open spaces available for use by walkers and dog walkers in the local environs including, Bray Promenade and Beach, the People's Park and Corke Abbey Valley Park.	✓	

Item Ref.	Environmental Topic	Schedule of Environmental Commitments – Mitigation Measures	Construction Phase	Operational Phase
1	Chapter 3 – Population and Human Health	Mitigation measures will be implemented during the detailed design, and construction phase, and are detailed in full in the following sections of this EIAR: Chapter 6 – Air Quality and Climate; Chapter 7 – Noise and Vibration; and Chapter 9 – Land, Soils and Geology. Adherence to the construction phase mitigation measures presented in this EIAR will ensure that the construction of the proposed development will have an imperceptible and neutral impact in terms of health and safety.	✓ ✓	
		Mitigation measures will be implemented during the detailed design and construction phase, as described in full in Chapter 9 – Land, Soils and Geology, to remove the potential identified risk during the operational phase to human health receptors (i.e. new residents) through ingestion of naturally occurring barium in soils in two localised hotspots in the vicinity of the proposed housing / duplex units. Accordingly, no significant human health impacts are likely to arise during the operational phase of the proposed development. There are a number of existing significantly scaled open spaces available for use by walkers and dog walkers in the local environs including, Bray Promenade and Beach, the People's Park and Corke Abbey Valley Park. In addition the operational site will provide new routes connecting existing public spaces for use by all and proposed public open space.		✓ ✓
2	Chapter 4 – Biodiversity	The appointed Contractor shall ensure specialist ecological surveying is undertaken where required i.e. mammal surveys, bat surveys, and nesting bird surveys as detailed further below. Construction phase ecological mitigation measures shall be developed and undertaken in coordination with ecological specialists (i.e. bat specialist and suitably qualified ecologist) as required. Protection of Sites Designated for Nature Conservation Protection of sites designated for conservation, and the features of interests associated with designated sites, is through prevention of potential impacts to the aquatic environment during the construction phase. Mitigation measures as set out in Chapter 9 – Land, Soils and Geology; and Chapter 10 – Water will be implemented during the Construction phase. Works will follow best practice guidance as outlined in *Guidelines on the Protection of Fisheries during Construction Works in and Adjacent to Waters* (IFI, 2016). Mitigation of habitat loss/damage during construction Hedgerows, treelines and boundary woodland areas are to be retained on-site; Site boundaries will be protected from any accidental damage during construction by means of exclusion through use of fencing. All trees, including cypresses, along the northern boundary	✓ ✓ ✓ ✓ ✓	

Item Ref.	Environmental Topic	Schedule of Environmental Commitments – Mitigation Measures	Construction Phase	Operational Phase
2	Chapter 4 – Biodiversity	will be retained with only unsafe trees being removed during the construction phase. This is set out in full in the accompanying Tree Survey Report and Landscape Planting Plan. Measures will be taken to ensure that trees and hedges being retained are incorporated into the development without being impacted upon. Protective fencing will be provided around retained trees and hedgerows and fencing will be erected so as to encompass the Root Protection areas (RPAs) of trees and hedgerows. The fencing will be at least 2m high and constructed in accordance with the RPA outlines in the Tree Survey Report (Appendix 5.2). Similarly, a buffer is to be maintained between the Site and neighbouring woodland to prevent negative impacts to woodland during construction.		
		Site clearance of potential bird nesting habitat is detailed below. Site clearance of potential bat roost habitat is detailed below.	✓	
		To compensate for the loss of woodland substantial native tree and hedgerow planting will be planted on the Site and existing hedges which are to be retained will be reinforced with native planting. This will reduce the impact of the proposed development upon habitats in the area and there will be no significant operational impact upon habitats due to the provision of substantial native and pollinator friendly habitats proposed for the Site (refer to Landscape Planting Plan Drawings Nos. 6948_L-2000 & 2002). Landscape enhancement measures are outlined in greater detail below in Section 4.5.1.10.	✓	
		Bats		
		Loss of Foraging and Commuting Habitat		
		Loss of commuting and foraging habitat at the Site will be mitigated by the landscaping proposals, which include hedgerow planting, wildflower and woodland planting. Planting schemes should ensure connectivity to linear/ woodland habitats in the wider landscape. It is noted that the landscaping proposals also include retention of hedgerow and boundary treeline and the planting of hedgerow where none is currently in situ. Trees that are being retained in the Site shall be protected during clearance and construction works in line with current guidelines e.g. British Standard 5837:2012 and National Roads Authority 2006a.	✓	
		Lighting		
		To minimise disturbance to bats and other fauna (badger and otter) that are roosting/resting or active at night, no construction operations will be undertaken during the hours of darkness. If construction lighting is required during the bat activity period (dusk April to September), lighting shall be directed away from all hedgerow/ treeline habitats to be retained. This can be achieved by using directional lighting (i.e. lighting which only shines on the proposed works and not nearby countryside) to prevent overspill.	✓	

Item Ref.	Environmental Topic	Schedule of Environmental Commitments – Mitigation Measures	Construction Phase	Operational Phase
2	Chapter 4 – Biodiversity	**Bat Conservation Plan and Bat Roosts** A Bat Conservation Plan has been developed for the construction phase of the proposed development. The Bat Conservation Plan is included in Appendix 4.3 of this document. The Contractor will appoint a bat specialist prior to construction activities to supervise and implement the Bat Conservation Plan. The Bat Conservation Plan includes the following commitments; all trees noted to have potential bat roosting habitat will be surveyed by the appointed bat specialist prior to Site clearance works and if roosts are found the bat specialist will develop a method statement for the tree / roost clearance in consultation with the planning authority and NPWS and will seek the necessary derogation licence from local NPWS staff (if required). The Bat Conservation Plan also includes for the surveying and protection of existing bat roosts identified in the 2 no. oaks trees located on the former golf clubs lands outside of the Site boundary (refer to Appendix 4.3 for Bat Conservation Plan).	✓	
		Whilst there will be a loss of a number of trees which have the potential to have bat roosts, the design of the development includes for the installation of 36 no. bat boxes to act as summer and winter roosting sites. The installation of bat boxes will include 14no. winter bat boxes and 14 no. summer bat boxes to be installed within boundary landscaped areas and 8 no. bat tubes installed within walls around the pumping station (Refer to Landscape Masterplan for locations). The installation of bat boxes will be supervised and overseen by the appointed bat specialist. The landscape design also includes for the planting of native tree species which will in time provide for further potential roosting site habitat.	✓	
		Birds Removal of nesting habitat (hedgerows, scattered trees and woodland utilised by local and common bird species) will be carried out outside the breeding bird season from 1st March to 31st August inclusive. Where nesting habitat clearance cannot be avoided during this period the NPWS will be consulted in advance and if, in consultation, it is deemed necessary then a suitably qualified ecologist will be appointed by the Contractor to oversee clearance of nesting habitat and ensure the area is free of nesting birds. The appointed ecologist will develop a method statement for the nesting habitat clearance in consultation with local NPWS staff. The comprehensive landscaping design calls for the planting of native trees and plant species suitable for pollinating insect species. The landscape design also includes for gorse planting which will provide for habitat suitable for stonechat. The landscape design should provide for a net gain in suitable bird nesting and foraging habitat. The landscaping design has followed the principles outlined in the All-Ireland Pollinator Plan 2021-2025.	✓	

Item Ref.	Environmental Topic	Schedule of Environmental Commitments – Mitigation Measures	Construction Phase	Operational Phase
2	Chapter 4 – Biodiversity	Terrestrial mammals During the construction phase the Contractor will adhere to the '*Guidelines for the Treatment of Badgers prior to the Construction of National Road Schemes*' (NRA 2006). The Site and all areas within 150m around the perimeter of the Site will be resurveyed for badger activity and the presence of setts by a suitably qualified ecologist (appointed by the Contractor) prior to the commencement of construction activities. Should an active sett be noted within the Site or survey area, NPWS will be informed and consulted. The suitable qualified ecologist will develop a method statement in agreement with NPWS for construction activities near an active badger sett. Method statement for works near an active sett will include; there shall be no blasting or pile driving within 150m of an active sett during the breeding season (December to June) or construction works within 50m of such an active sett during the breeding season.	✓	
		The creation of an ecological buffer zone along the northern and eastern boundaries of the Site will allow for connectivity of habitats and the continuance of the site to be used as a badger foraging area. The buffer zone allows for connectivity between Rathmichael woodlands/stream and the railway underpass which leads to scrub habitat and Woodbrook Golf Club lands which are known to be badger foraging territory. During the construction phase no works will be undertaken during night time hours and as such the construction activities will not take place whilst local badgers are foraging. During the construction phase an access track will be in situ along the northern and eastern boundaries which will allow for continued connectivity from Rathmichael woodlands to the railway underpass and to the important foraging habitats to the east of the railway line.	✓	
		During the construction phase the following standard management and protection measures will be implemented during the construction works and monitored by the project ecologist: • No excavations are to be left uncovered overnight or without a means of egress (e.g. a ramp or sloped plank) to prevent badgers from falling in or entering in search of food and becoming trapped;	✓	
		• No buildings or storage units are to be left open overnight to prevent badgers from entering in search of food and becoming trapped;	✓	
		• All food waste is to be properly secured and disposed of to avoid attracting badgers to the Site;	✓	
		• No toxic, poisonous or potentially harmful substances or materials are to be left unsecured overnight; and,	✓	

Item Ref.	Environmental Topic	Schedule of Environmental Commitments – Mitigation Measures	Construction Phase	Operational Phase
2	Chapter 4 – Biodiversity	• Should any new badger setts or mammal burrows be discovered within the Site or immediately adjoining areas the project ecologist is to be contacted for immediate inspection, advice and liaison with NPWS as necessary. Prevention of pollution to surface waters Mitigation measures as set out in Chapter 9 – Land, Soils and Geology; and Chapter 10 – Water will be implemented during the Construction phase. Works will follow best practice guidance as outlined in *Guidelines on the Protection of Fisheries during Construction Works in and Adjacent to Waters* (IFI, 2016). Invasive species prevention No legally restricted invasive species, such as Japanese knotweed, were found onsite. Strict bio-security protocols will be implemented during the construction phase so as to ensure no imported materials potentially contaminated with invasive plant species are brought to Site. All imported soil materials will be visually inspected by the Contractor's ecologist for signs of invasive plant contamination (such as root fragments, rhizome material) prior to arrival on Site. Disturbance of faunal species mitigation Removal of nesting habitat (hedgerows, scattered trees and woodland) will be carried out outside the breeding bird season from 1st March to 31st August inclusive. Where nesting habitat clearance cannot be avoided during this period the NPWS will be consulted in advance and if, in consultation, it is deemed necessary then a suitably qualified ecologist will be appointed by the Contractor to oversee clearance of nesting habitat and ensure the area is free of nesting birds. The appointed ecologist will develop a method statement for the nesting habitat clearance in consultation with local NPWS staff. Additional Construction Phase Ecological Mitigation Measures With regard to potential impacts on ecological features the following mitigation measures are proposed: • The Contractor shall engage a suitably experienced and qualified ecologist and/or specialist ecologist to undertake the required ecological surveying prior to construction activities. Pre-construction ecological surveys should include; terrestrial mammal surveys, bat roost surveys and breeding bird surveys (breeding bird surveys will be required if vegetation clearance is to be undertaken within nesting season 1st March – 31st August);	✓ ✓ ✓ ✓ ✓	

Item Ref.	Environmental Topic	Schedule of Environmental Commitments – Mitigation Measures	Construction Phase	Operational Phase
2	Chapter 4 – Biodiversity	• The Contractor shall employ good practice environmental and pollution control measures with regard to current best practice guidance such as Environmental Good Practice On-site Guide (CIRIA, 2018);	✓	
		• The construction management of the Site will take account of the recommendations of the Construction Industry Research and Information Association (CIRIA) guides 'Control of Water Pollution from Construction Sites' and 'Groundwater control - design and practice' to minimise as far as possible the risk of pollution;	✓	
		• All of the mitigation measures for the protection of soils listed in Chapter 9 will be implemented onsite during the construction phase;	✓	
		• The Contractor shall take all necessary precautions to prevent potential impact upon aquatic species of the River Dargle from construction activities. The mitigation measures for prevention of potential surface water impacts as detailed in Water Chapter 10 shall be implemented;	✓	
		• The Contractor shall take all necessary precautions to prevent potential impact upon aquatic species of the River Dargle via the local groundwater body. All groundwater mitigation measures as outlined in Chapter 10 - Water shall be implemented; and,	✓	
		• The Contractor shall take all necessary precautions to prevent potential impact upon habitats and species from dust generated during the construction phase. All air quality mitigation measures as outlined in Chapter 11- Air Quality & Climate shall be implemented.	✓	
		The above mitigation measures will form part of the Construction Environmental Management Plan (CEMP) submitted as part of this planning application, and which will be further added to by the Contractor within the project-specific Detailed CEMP which will be in operation during the construction phase.	✓	
		Design Measure Mitigation **Landscaping** A comprehensive landscaping design has been developed for the Site which will include for additional boundary planting and the creation of an ecological buffer zone along the northern and eastern boundaries of the Site. In line with DLRCC and WCC Biodiversity Action Plans and the All Ireland National Pollinator Plan and in order to create a biodiversity net grain at the Site the landscaping plan will include areas of ecological enhancement such as substantial areas of native tree planting and wild flower areas. The planted areas will link with the	✓	

Item Ref.	Environmental Topic	Schedule of Environmental Commitments – Mitigation Measures	Construction Phase	Operational Phase
2	Chapter 4 – Biodiversity	Rathmichael woodland and the River Dargle. The landscape design incorporates additional standard size trees to be planted along the northern boundary to thicken the exiting treeline to help minimise potential light spillage from the development on the Rathmichael stream and woodland area. The landscape design includes for linear shrub planting along the eastern boundary adjacent to the railway line, with the inclusion of gorse, to provide cover for the movement of terrestrial mammals and to provide for habitat suitable for bird species; stonechat. This planting will comprise an appropriate mixture of native trees and shrubs, preferably of local provenance, and including species attractive to pollinators. The planting will incorporate a range of species that will attract feeding invertebrates, including moths, butterflies and bees. Refer to Landscape Planting Plans (Drawings Nos. 6948_L-2000 & 2002) for details of the landscaping design. The landscape planting design provides for a net gain in number of trees within the Site. There are ca. 350 no. standard sized trees detailed within the proposed design including species:- *Pinus nigra, Tilia tomentosa, Quercus cerris, Acer pseudoplatanus, Crataegus laevigata and Prunus* 'Accolade'. The soft landscaping design includes for additional hedgerow planting including species:- *Ilex crenata, Carpinus betulus, Escallonia* 'Apple Blossom', *Crataegus monogyna and Hedera helix* 'Hibernica'. Extensive areas of woodland screening planting is also included in the design. There are ca. 4,718m^2 of woodland mix screening planting including species:- *Quercus robur, Cornus alba, Ilex aquifolium, Betula pendula, Alnus glutinosa, Corylus avellana, Pinus sylvestris, Sorbus aucuparia, Crataegus monogyna, Prunus spinosa* and *Acer campestre.* Extensive areas of wildflower meadows are also included in the soft landscaping design including species: - Black Medick, Common Vetch, Cowslip, Field Scabious, Greater Birdsfoot Trefoil, Hemp Agrimony, Common/Lesser Knapweed, Meadow Buttercup, Oxeye Daisy, Purple Loosetrife, Ragged Robin, Ribwort Plantain, Rough Hawkbit, Selfheal, Wild Carrot, Hedge Woundowrt, Yarrow Iris, Yellow Rattle, Browntop Bentgrass, Slender Creeping Red Fescue, Chewings Fescue, Musk mallow, Wild primrose and Corncockle. There are ca. 3,930m^2 of wildflower meadow to be planted within the Site. **Bats** The following recommendations for enhancement are adapted from Landscape and Urban Design for Bats and Biodiversity (BCT, 2012). To attract nocturnal flying insects, plant: • Mixtures of flowering plants, trees and shrubs to encourage a diversity of insects to sustain bats and other wildlife throughout the year. New planting will include pollinator-friendly tree species (Refer to Landscape Planting Plan Drawing No.6948-L-2002);	✓ ✓ ✓ ✓ ✓	

Item Ref.	Environmental Topic	Schedule of Environmental Commitments – Mitigation Measures	Construction Phase	Operational Phase
2	Chapter 4 – Biodiversity	• Hedgerows will include a range of different species to provide food throughout the year, for example blackthorn for early season nectar; hawthorn and bramble for summer flowers and autumn berries; ivy for autumn nectar and later winter berries; • Flowers that vary in colour, fragrance, shape, amount of nectar and time of flowering; • Pale flowers that are more easily seen in poor light, so attracting insects at dusk; • Single flowers, which tend to produce more nectar than double varieties; and • Flowers with insect-friendly landing platforms and short florets, like those in the daisy families. Other enhancement measures include: • Bat roost boxes on mature trees and integrated bat boxes built into structures are included as biodiversity enhancement measures. 14 no. Rocket Bat boxes are to be installed in the dark zones within northern woodland and treeline habitats. These will be free standing chambers on free standing poles. 14 no. Summer Bat Boxes (1FF Schwegler woodcrete or similar design) will be erected within the treeline on the northern boundary of the Site. In the area of the pumping station (south east of the Site), 8 no. bat tubes to be installed within this structure. These are specifically designed boxes that provided alternative roosting for bats. **Birds** Within the landscape plan wildflowers, shrubs and trees which have the potential to support foraging populations of birds are proposed in the landscape plan and include (non-exhaustive list): - • Gorse (*Ulex europaeus*) • Hawthorn (*Crataegus monogyna*) • Holly (*Ilex aquifolium*) • Rowan/Mountain Ash (*Sorbus aucuparia*) • *Agapanthus africanus* • *Alchemilla mollis* • *Achillea millefolium*	✓ ✓ ✓ ✓ ✓ ✓ ✓	

Item Ref.	Environmental Topic	Schedule of Environmental Commitments – Mitigation Measures	Construction Phase	Operational Phase
2	Chapter 4 – Biodiversity	• *Armeria maritima* • *Rudbeckia fulgida* The development design also includes for 10 no. bird nesting boxes to be erected in the woodland area to the northwest of the Site as well as along the ecological buffer zone along the northern and eastern boundaries of the Site. **Invertebrates** The Landscape design for the proposed development includes for the creation of wildflower areas to incorporate plant species which will attract pollinating insects. The installation of 10 no. insect hotels will also form part of the wildflower landscaping measures and these insect boxes will allow for insects to establish and have refuge in the landscaped areas. The planting schedule contains a mix of native plant species and emphasis has been placed on adhering to the objectives outlined in the All-Ireland Pollinator Plan 2021-2025 with the aim of planting species which are beneficial to pollinator species. Pollinator beneficial plant species include (non-exhaustive list): - • *Nepeta* 'Walker Low' • *Salvia nemorosa* • *Lavandula angustifolia* • *Achillea millefolium* • *Armeria maritima* • Hemp Agrimony • Black Meddick • Musk mallow • Wild primrose • Hedge woundwort In addition, the roof level of apartment blocks will be developed into green spaces to have a mix of sedum and wildflowers to further benefit pollinating species. There are 11,980m^2 of green roof spaces within the design. Insect hotels are to be placed within these roof garden areas (Refer to Landscape Planting Plan Drawing No.6948-L-2002).	✓ ✓ ✓ ✓	

Item Ref.	Environmental Topic	Schedule of Environmental Commitments – Mitigation Measures	Construction Phase	Operational Phase
2	Chapter 4 – Biodiversity	The following operational mitigation measures will be implemented either through the design of the proposed development (e.g. lighting, foul drainage, landscaping etc.), or by those in charge of maintenance and management of the development. Lighting The design of the lighting within and around the proposed development has been designed to be cognisant of minimising effects on local nocturnal species, such as bats and badgers, and has been developed so as to allow for a dark ecological corridor around the northern and eastern boundary of the Site. The lighting scheme for the Site has been developed with the following principals; only illuminating what needs to be illuminated (e.g. light directed to the path only), reducing night time light levels, reducing the height of the luminaires, shielding of luminaires and correct choice of light (e.g. a warm white spectrum <2700 Kelvins). Project specific lighting designs include for: • All luminaires shall lack UV/IR elements to reduce impact; • LED luminaires shall be used due to the fact that they are highly directional, have lower intensity, have good colour rendition and dimming capability; • A warm white spectrum <2700 Kelvins shall be used to reduce the blue light component of the LED spectrum; • Luminaires shall feature peak wavelengths higher than 550nm to avoid the component of light most disturbing to bats; • Column heights shall be carefully considered to minimise light spill. The shortest column height allowed shall be used where possible. Ca. 5.5m or less; • Bollard lighting shall be used for pedestrian and greenway areas, if lighting is deemed necessary; • Only luminaires with an upward light ratio of 0% and with good optical control shall be used; • Luminaires shall be mounted on the horizontal, i.e. no upward tilt; • Any external security lighting shall be set on motion-sensors and short (1min) timers; and, • The intensity of external lighting shall be limited to ensure that skyglow does not occur in order to reduce light pollution.		✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓

Item Ref.	Environmental Topic	Schedule of Environmental Commitments – Mitigation Measures	Construction Phase	Operational Phase
2	Chapter 4 – Biodiversity	The lighting scheme has been designed in accordance with guidance contained in; *Institution of Lighting Professionals; Guidance Note 08/18; Bats and artificial lighting in the UK* (ILP 2018). The lighting design has been reviewed by a bat specialist and recommendations have been incorporated into the design. A lighting design review letter, as provided by bat specialist Dr Tina Aughney (2022), is provided in Appendix 4.2. Surface water drainage Sustainable drainage (SuDS) is also a key focus for the entire design of the development. Along with permeable paving for parking areas, the landscape design includes for attenuation areas throughout the development by channelling runoff to planted areas and tree pits. This has the added benefit of reducing surface water runoff rates. In addition, planted swales will be created to aid with storm water flow and these planted areas will contain suitably water tolerant plant species. The roof areas which will include sedum and wildflower green roof treatments will further slowdown the flow of water from areas that traditionally contribute to high runoff flow rates during rainfall events. SuDS features are also outlined as mitigatory measures in the accompanying NIS (Atkins document reference; 5214419DG0006). Foul Disposal Mains infrastructure for foul sewage disposal has been designed in accordance with Irish Water Code of Practice. All wastewater streams will be collected within the local foul water network and will be transferred to Shanganagh Wastewater Treatment Plant (WWTP). Irish Water has confirmed that the existing foul network has sufficient capacity to meet the wastewater discharge volumes expected from the proposed development, once operational. Landscaping Establishment The landscape design calls for an ecological buffer zone around the northern and eastern boundaries of the Site. This planted buffer zone will ensure the area provides for bat flight lines and badger foraging connectivity to/from the ecological features to the north (Rathmichael woodlands), east (scrub habitat and golf club lands) and south (River Dargle and remainder of former Bray Golf Club lands). Once operational the implementation of the landscape plan and compensatory habitat such as wild flower meadows and additional planting will be inspected by the Contractor within one year post planting. If measures have failed due to lack of management an alternative solution will be proposed by the Contractor. Operational phase monitoring (in order to ensure the continued success of the landscape features, specifically in relation to biodiversity enhancement measures) shall be undertaken by those in charge of the maintenance and management of the development.		✓ ✓ ✓ ✓

Item Ref.	Environmental Topic	Schedule of Environmental Commitments – Mitigation Measures	Construction Phase	Operational Phase
2	Chapter 4 – Biodiversity	Refuge Habitats The design of the development calls for the installation of numerous bird nesting boxes, bat roosting boxes and insect boxes. Refuge boxes will be checked and maintained to ensure they do not fall into disrepair. It is recommended that bird boxes are checked and cleared of remnant nests during the winter season (as required). Operational phase monitoring in order to ensure the success of the refuge habitats shall be undertaken by those in charge of the maintenance and management of the development.		✓
3	Chapter 5 – Landscape and Visual	Due to the nature of construction, it is inevitable that adverse effects will occur to the landscape and visual amenity in the immediate area. The significance of these temporary effects will be limited by implementing the following measures:	✓	
		• Construction methods and procedures should accord to an agreed - Construction Method Statement - Construction Management Plan - Construction Environmental Management Plan - Earthworks/materials Management Plan - Detailed design of drainage, including SuDs, water and sewerage disposal to mitigation against flooding, discharge of storm/surface waters with potential pollution discharge, increase of silt and sediment from construction works - Construction impact assessment to mitigate against dust pollution, noise and light pollution.	✓	
		• Phasing to assimilate changes into the landscape;	✓	
		• Temporary hoarding erected around construction areas to clearly delineate working areas and protect the public from the works. This will reduce visual effects on adjoining roads and pedestrian paths;	✓	
		• Publicity materials may be displayed on the hoardings to inform the public and passer-bys about the proposed development;	✓	
		• Advance planting and retention of key woodland areas.	✓	
		Design Considerations		
		• The external and internal network including roads, cycle lanes, parking areas, footpaths and kerbs, pedestrian crossings and car parking will be constructed to avoid traffic congestion in the vicinity. It will also improve permeability and connectivity from, for	✓	

Item Ref.	Environmental Topic	Schedule of Environmental Commitments – Mitigation Measures	Construction Phase	Operational Phase
3	Chapter 5 – Landscape and Visual	instance Corke Abbey Valley Park and Corke Abbey and the adjacent school development through to Bray Harbour, Promenade and town centre.		
		• The design, finishes of buildings will draw reference and inspiration from the existing traditional town centre with the development flowing from 'old' to 'new' and matching in scale, format and design.	✓	
		• Public and Communal open space is overlooked and dispersed throughout the scheme with a strong visual and functional relationship with the scheme. The maintenance responsibilities for all public open space areas will be the responsibility of the development Management Company to ensure all mitigation measures contained within these areas are fully maintained over a long-term basis to ensure they provide the maximum required impact.	✓	
		• The development has a series of new public open spaces including the Market Square incorporating space for artisan markets, seasonal community events and commercial ventures providing an element of social, community and residential services and The Orchard area with a multi-sports ball court and dog exercise area. Natural play areas will be developed within the open space areas to provide focal points along walking routes.	✓	
		• To increase biodiversity and wildlife habitats, the roof level of the apartment blocks will be planted with a mix of sedum and wildflowers to increase wildlife habitats. In addition, bird and bat boxes will be fixed to existing trees or on stand alone poles throughout the scheme and insect hotels will be introduced in wild flower meadow areas and on roofs.	✓	
		• The streets will be tree lined providing enclosure and a sense of place. Footpaths will be designed to encourage walking and cycling and seating areas will encourage social interaction and a sense of community.	✓	
		• Sustainable drainage is a key focus of the landscape treatment for the entire development. Along with permeable paving for parking areas, attenuation areas in the form of planting beds, tree pits and green roofs are incorporated into the landscape proposals.	✓	
		• The positioning of the roads and residential blocks have been arrayed so that they form a spatial marker (or morphological memory) of the 'Nun's Walk' former location and alignment. The Nun's walk will feature and be defined by engraved paving slabs laid through the public open space area located between apartment blocks A and B to echo the alignment of this linear earthwork along with the alignment of the boundary between Dublin and Wicklow. This feature will run through the paved area that also provides drop off access to the entrance of Block A. The space also allows for the potential installation	✓	

Item Ref.	Environmental Topic	Schedule of Environmental Commitments – Mitigation Measures	Construction Phase	Operational Phase
3	Chapter 5 – Landscape and Visual	of public artwork to further define the character and mark the history of the space, including delineation of the alignment of the earthwork through paving, interpretive text and imagery. In addition, the design provides for a feature stone wall along this section of the railway boundary to act as 'stage scenery' and reinforce the importance of this area of open space. This open space will provide connectivity with the Green Spine and the Coastal Gardens character areas to maintain pedestrian permeability throughout the development. The Landscape Design also provides for high quality surface materiality - refer to the Landscape Design Strategy Report and Cultural Heritage Chapter for further information. • Whilst the public can enjoy the variety of spaces in the proposed development including the Market Square adjacent to apartment Block C, the Woodland Park on the northern boundary which provides a link to the existing adjacent Corke Abbey Valley Park; the Coastal Gardens which run along the eastern boundary of the site and link Corke Abbey Valley Park with the existing riverside pathway and cycle path to Bray Harbour; the Riverside Park – a new parkland area adjacent to the River Dargle in the south eastern corner of the Site; the Green Spine through the centre of the site which links with the Woodland Park and Coastal Gardens and provides access to apartment Block A; the Orchard on the existing underground Irish Water foul storage tank site at the site entrance, there are also semi-private communal amenity areas in the podium gardens of the apartment Blocks A, B and C and a communal woodland garden for the residents of apartment Block D. All houses, duplex units and apartments will also avail of private open space to the required standards. • The residential housing will incorporate car parking spaces. Car parking for the apartment blocks will be at the centre of the ground floor level enclosed by the creche, café, retail outlets, and services such as refuse area, cycle parking and other plant services. Landscape Design • The landscape design comprises of the following outdoor spaces: - Home Zone – tree lined streets that provide shade and privacy to pedestrians and residents, SuDs integrated into planting schemes to enhance biodiversity in an urban setting, wide footpaths to encourage walking and cycling, seating area and car parking (not dominating space). - Private and communal gardens; - Play/recreation/leisure;	✓ ✓ ✓	3

Item Ref.	Environmental Topic	Schedule of Environmental Commitments – Mitigation Measures	Construction Phase	Operational Phase
3	Chapter 5 – Landscape and Visual	- General landscape/public amenity/park; - Boundary treatments - Open space for areas for outdoor commercial opportunities; tables and seating and market.		3
		• Proposed habitats include: - Woodland; - Hedgerows; - Shrub and herbaceous planting; - Amenity grass; - Meadow planting; - Green roofs – incorporating sustainable urban drainage within sedum planting; - Bat, bird and insect boxes/hotels.	✓	
		• The proposed development will retain existing trees where possible and maintain strong native boundary planting to ensure existing wildlife corridors are retained, particularly along the northern, eastern and western boundaries of the site. It is intended to retain the hedgerow along the northern boundary and include additional planting along the entire boundary.	✓	
		• The landscape planting design provides for a net gain in number of trees within the Site. There are ca. 380no. standard sized trees included within the proposed design.	✓	
		• The north west corner of the site is densely stocked with existing conifers and poplar trees, some of which will need to be removed to facilitate the construction of Block D – refer to Appendix 5.2. It is proposed to create a woodland setting across the northern boundary, which will help to integrate Block D in the landscape and provide screening from the adjacent residential development on Corke Avenue.		
		• Plans include a connection with Corke Abbey Valley Park and access routes through to Corke Abbey Valley Park, all subject to agreement with DLRCC.	✓	
		• The Coastal Gardens border the eastern side of the proposed development and run parallel with the railway line. They incorporate a combined footpath and cycleway, with play provision dispersed along the path leading to the existing railway underpass and a link to Bray town centre, the popular walk from Bray seafront to Greystones and the future East Coast Trail along with a connection to the Dargle Riverside Walkway.	✓	

Item Ref.	Environmental Topic	Schedule of Environmental Commitments – Mitigation Measures	Construction Phase	Operational Phase
3	Chapter 5 – Landscape and Visual	• Native planting to the Coastal Gardens bordering the railway boundary will create a green corridor and also soften the façade of Blocks A and B from views from the Harbour Wall and coastal path. Part of this boundary will incorporate a feature stone wall of approximately 22m.	✓	3
		• A Green Spine runs through the centre of the northern half of the proposed development and links into the Woodland Setting. This incorporates footpaths, green spaces and pocket parks uniting the residential area, providing new habitat creation and Sustainable Urban Drainage.	✓	
		• Creation of the following habitats are included as biodiversity enhancement measures: - 14no. Rocket Bat Boxes – free-standing chamber on free standing poles - will be provided in dark zones within woodland and treeline habitats; - 14no. summer bat boxes will be provided on mature trees; - existing pumping station screened with feature stone walls with 8no. interconnecting bat tubes; - 20no. bird nesting boxes attached to existing trees or on standalone poles including 2no. swift nesting boxes along the northern boundary and 10 no nesting boxes on the eastern boundary; - 10 no. insect hotels to be provided in wild flower meadow areas and on roofs.	✓	
		• Hard landscaping materials have been chosen based on suitability for a residential scheme and long-term use with variations provided in the form of shape, unit size, mix and colour. All of the specified materials are robust in nature in order to maximize the longevity of the development and minimise maintenance issues.	✓	
		Root protection in accordance with BS 5837:2012 will be applied to the existing trees to be retained to ensure ongoing viability – refer to 6948-L-0001 – Vegetation Development Impact. All recommendations for tree removal due to poor condition will also be followed to maintain the ongoing safety of the site.	✓	
4	Chapter 6 – Air Quality and Climate	**Air Quality** The pro-active control of fugitive dust will ensure the prevention of significant emissions, rather than an inefficient attempt to control them once they have been released. The main contractor will be responsible for the coordination, implementation and ongoing monitoring of the Dust Management Plan. The key aspects of controlling dust are listed below. Full details of the Dust Management Plan can be found in Appendix 6.3. These measures have been	✓	

Item Ref.	Environmental Topic	Schedule of Environmental Commitments – Mitigation Measures	Construction Phase	Operational Phase
4	Chapter 6 – Air Quality and Climate	incorporated into the Outline Construction Environmental Management Plan (CEMP) prepared for the site. In summary the measures which will be implemented will include: • Hard surface roads will be swept to remove mud and aggregate materials from their surface while any un-surfaced roads will be restricted to essential site traffic; • Any road that has the potential to give rise to fugitive dust must be regularly watered, as appropriate, during dry and/or windy conditions; • Vehicles exiting the site shall make use of a wheel wash facility where appropriate, prior to entering onto public roads; • Vehicles using site roads will have their speed restricted, and this speed restriction must be enforced rigidly. On any un-surfaced site road, this will be 20 kph, and on hard surfaced roads as site management dictates; • Public roads outside the site will be regularly inspected for cleanliness and cleaned as necessary; • Material handling systems and site stockpiling of materials will be designed and laid out to minimise exposure to wind. Water misting or sprays will be used as required if particularly dusty activities are necessary during dry or windy periods; and, • During movement of materials both on and off-site, trucks will be stringently covered with tarpaulin at all times. Before entrance onto public roads, trucks will be adequately inspected to ensure no potential for dust emissions. At all times, these procedures will be strictly monitored and assessed. In the event of dust nuisance occurring outside the site boundary, movements of materials likely to raise dust would be curtailed and satisfactory procedures implemented to rectify the problem before the resumption of construction operations. **Climate** Construction stage traffic and embodied energy of construction materials are expected to be the dominant source of greenhouse gas emissions as a result of the construction phase of the proposed development. Construction vehicles, generators etc., may give rise to some CO_2 and N_2O emissions. However, due to short-term nature of these works, the impact on climate will not be significant. Nevertheless, below are some Site-specific mitigation measures can be implemented during the construction phase of the proposed development to ensure emissions are reduced further;	✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓	

Item Ref.	Environmental Topic	Schedule of Environmental Commitments – Mitigation Measures	Construction Phase	Operational Phase
4	Chapter 6 – Air Quality and Climate	• The prevention of on-site or delivery vehicles from leaving engines idling (even over short periods), • Minimising waste of materials due to poor timing or over ordering on site (to minimise the embodied carbon footprint of the site).	✓ ✓	
		The proposed development has been designed to minimise the impact to climate where possible during operation. Details of the measures to be incorporated into the design of the development are outlined in Section 6.5.2 and within the Building Lifecyle Report prepared in support of this planning application. The impact of the proposed development on air quality and climate is predicted to be direct and imperceptible with respect to the operational phase in the long term. Therefore, no site specific mitigation measures are required.		✓
5	Chapter 7 – Noise and Vibration	With regard to construction activities, best practice control measures from construction sites within BS 5228 (2009 +A1 2014) Code of Practice for Noise and Vibration Control on Construction and Open Sites Parts 1 and 2 will be used to control noise and vibration impacts. The implementation of all best practice noise and vibration control methods will ensure potential impacts to nearby residential noise sensitive locations are not significant. This will be particularly important during excavation and foundation construction which are likely to be the activities to have the highest potential noise and vibration impact. Noise-related mitigation methods are described below and will be implemented for the project in accordance with best practice. These methods include: • No plant used on site will be permitted to cause an ongoing public nuisance due to noise; • The best means practicable, including proper maintenance of plant, will be employed to minimise the noise produced by on site operations; • All vehicles and mechanical plant will be fitted with effective exhaust silencers and maintained in good working order for the duration of the contract; • Compressors will be attenuated models fitted with properly lined and sealed acoustic covers which will be kept closed whenever the machines are in use and all ancillary pneumatic tools shall be fitted with suitable silencers; • Machinery that is used intermittently will be shut down or throttled back to a minimum during periods when not in use;	✓ ✓ ✓ ✓ ✓ ✓	

Item Ref.	Environmental Topic	Schedule of Environmental Commitments – Mitigation Measures	Construction Phase	Operational Phase
5	Chapter 7 – Noise and Vibration	• During construction, the contractor will manage the works to comply with noise limits outlined in BS 5228-1:2009+A1 2014. Part 1 – Noise; • All items of plant will be subject to regular maintenance. Such maintenance can prevent unnecessary increases in plant noise and can serve to prolong the effectiveness of noise control measures; • Limiting the hours during which site activities which are likely to create high levels of noise or vibration are permitted; and, • Monitoring levels of noise and vibration during critical periods and at sensitive locations (i.e. at the boundary between the development site and the school and residential buildings). • Furthermore, it is envisaged that a variety of practicable noise and vibration control measures will be employed. These will include: Selection of plant with low inherent potential for generation of noise and/ or vibration; • Erection of good quality site hoarding to the site perimeters adjacent to sensitive receptors which will act as a noise barrier to general construction activity at ground level; • Erection of barriers as necessary around items such as generators or high duty compressors, and; • Situate any noisy plant as far away from sensitive properties as permitted by site constraints.	✓ ✓ ✓ ✓ ✓ ✓ ✓	
		Operational Phase – Mechanical and Electrical Plant As part of the detailed design of the development, plant items with appropriate noise and vibration ratings and, where necessary, appropriately selected remedial measures (e.g. enclosures, silencers, anti-vibration mounts etc.) will be specified in order that the adopted plant noise criteria is achieved at the façades of noise sensitive properties, including those within the development itself. Operational Phase – Inward Noise (Acoustic Design Strategy Part 2) As is the case in most buildings, the glazed elements and ventilation paths of the building envelope are typically the weakest element from a sound insulation perspective. In general, all wall constructions (i.e. blockwork or concrete and spandrel elements) offer a high degree of sound insulation, much greater than that offered by the glazing systems. Therefore, noise intrusion via the wall construction will be minimal.		✓ ✓

<table>
<tr><th>Item Ref.</th><th>Environmental Topic</th><th>Schedule of Environmental Commitments – Mitigation Measures</th><th>Construction Phase</th><th>Operational Phase</th></tr>
<tr><td>5</td><td>Chapter 7 – Noise and Vibration</td><td>
In this instance the facades highlighted in Figure 7-10 will be provided with upgraded acoustic glazing and ventilation that achieves the minimum sound insulation performance as set out in the tables below. Other facades in the development have no minimum requirement for sound insulation.

The sound insulation specifications are expressed in the following units:

R_w Weighted Sound Reduction Index – This is the value of the sound insulation performance of a partition or element measured under laboratory conditions. It is a weighted single figure index that is derived from values of sound insulation across a defined frequency spectrum. Technical literature typically presents sound insulation data in terms of the R_w parameter.

$D_{n,e,w}$ Weighted element-normalized level difference. This is the value of sound insulation performance of a ventilator measured under laboratory conditions. It is a weighted single figure index that is derived from values of sound insulation across a defined frequency spectrum. Technical literature for acoustic ventilators typically presents sound insulation data in terms of the $D_{n,e,w}$ parameter.

Sound Insulation Performance Requirements for Upgraded Acoustic Glazing, SRI (dB)
<table>
<tr><th colspan="6">SRI (dB) per Octave Band Centre Frequency (Hz)</th></tr>
<tr><td>125</td><td>250</td><td>500</td><td>1k</td><td>2k</td><td>4k</td></tr>
<tr><td>26</td><td>27</td><td>34</td><td>40</td><td>38</td><td>46</td></tr>
</table>

Sound Insulation Performance Requirements for Upgraded Acoustic Ventilation, SRI (dB)
<table>
<tr><th colspan="6">SRI (dB) per Octave Band Centre Frequency (Hz)</th></tr>
<tr><td>125</td><td>250</td><td>500</td><td>1k</td><td>2k</td><td>4k</td></tr>
</table>
</td><td></td><td>✓
✓
✓
✓</td></tr>
</table>

Item Ref.	Environmental Topic	Schedule of Environmental Commitments – Mitigation Measures	Construction Phase	Operational Phase
5	Chapter 7 – Noise and Vibration	31 | 33 | 42 | 43 | 39 | 44 The overall R_w and $D_{n,e}$ outlined above are provided for information purposes only. The over-riding requirements are the octave band sound insulation performance values which may also be achieved using alternative glazing and ventilation configurations. Any selected system will be required to provide the same or greater level of sound insulation performance as that set out in Table 7-15 and Table 7-16. It is important to note that the acoustic performance specifications detailed herein are minimum requirements which apply to the overall glazing and ventilation systems. In the context of the acoustic performance specification the 'glazing system' is understood to include any and all of the component parts that form part of the glazing element of the façade, i.e. glass, frames, seals, openable elements etc. The assessment has demonstrated that the recommended internal noise criteria can be achieved through consideration of the proposed façade elements at the detailed design stage. The calculated glazing and ventilation specifications are preliminary and are intended to form the basis for noise mitigation at the detailed design stage. Consequently, these may be subject to change as the project progresses.	42	✓ ✓
6	Chapter 8 – Traffic	The following mitigation measure shall apply during the construction stage: • All construction activities will be managed and directed by a Construction Traffic Management Plan (CTMP). The details of the CTMP will be agreed with the roads department of the Local Authority in advance of construction activities commencing on-site. Below is a list of proposed traffic management measures to be adopted during the construction works by the Contractor. Note that this is not an exhaustive list, and it will be the appointed contractor's responsibility to prepare a detailed Construction Traffic Management Plan to be approved with the Planning Authority prior to commencement of construction. • Warning signs / Advanced warning signs will be installed at appropriate locations in advance of the construction access; • Construction and delivery vehicles will be instructed to use only the approved and agreed means of access and movement of construction vehicles will be restricted to these designated routes; • Restriction of HGV movements during drop off and pick up times associated with the adjacent schools;	✓ ✓ ✓ ✓	

Item Ref.	Environmental Topic	Schedule of Environmental Commitments – Mitigation Measures	Construction Phase	Operational Phase
6	Chapter 8 – Traffic	• Appropriate vehicles will be used to minimise environmental impacts from transporting construction material, for example the use of dust covers on trucks carrying dust producing material;	✓	
		• Speed limits of construction vehicles to be managed by appropriate signage, to promote low vehicular speeds within the Site;	✓	
		• Parking of Site vehicles will be managed, and will not be permitted on public roads, unless proposed within that designated area that is subject to traffic management measures;	✓	
		• A road sweeper will be employed to clean the public roads adjacent to the Site of any residual debris that may be deposited on the public road leading away from the construction Site;	✓	
		• On Site wheel washing will be undertaken for construction trucks and vehicles to remove any debris prior to leaving the Site, to avoid any potential for debris on the local roads;	✓	
		• All vehicles will be suitably serviced and maintained to avoid leaks or spillage of oil, petrol or diesel. Spill kits will be available on Site. All scheduled maintenance carried out off Site will not be carried out on the public highway; and,	✓	
		• Safe and secure pedestrian facilities are to be provided where construction works obscure any existing pedestrian footway. Alternative pedestrian facilities will be provided in these instances, supported by physical barriers to segregate traffic and pedestrian movements, and to be identified by appropriate signage. Pedestrian facilities will cater for vulnerable users and mobility impaired persons.	✓	
		• HGV movements will be managed so as not to occur during the background traffic peak period, particularly the AM school drop off period.	✓	
		The above mitigation measures will minimise any significant environmental degradation or safety concerns in the vicinity of the proposed works, due to the presence of construction traffic. Furthermore, it is in the interest of the construction programme that deliveries, particularly concrete deliveries are not unduly hampered by traffic congestion, and as a result continuous review of haulage routes, delivery timings and access arrangements will be undertaken as construction progresses to ensure smooth operation.	✓	

Item Ref.	Environmental Topic	Schedule of Environmental Commitments – Mitigation Measures	Construction Phase	Operational Phase
6	Chapter 8 – Traffic	The proposed development is consistent with all national, regional and local policies. In particular, those policies and objectives aligned with active and sustainable travel and transportation. Specific mitigation measures proposed include the following: • Implementation of the public transport bridge (Part 8 – Bray Sustainable Transport Bridge, Planning Reference PRR 21/869) by Wicklow County Council which will link both bus and future Luas services to the Bray DART station. This bridge will improve connectivity to the Site and facilitate the future extension of the Luas to the Bray DART Station; • The Riverside Quarter includes for the provision of LUAS Stop(s) within the development lands which are expected to decrease dependence on private vehicles; • The overall Harbour Point Masterplan for the development lands takes cognisance of the provision of the Luas extension and its interface with the development and locations of LUAS stops; • The proposed BusConnects – Core Bus Corridor Route 13 has been included in the development plans which will further decrease private vehicle usage in the future; • The development takes cognisance of the NTA's plans to redesign the bus network and provide a more efficient network with high frequency spines, new orbital routes and increased bus services; • The development is adjacent and accessible to Routes B1 and 14 /N5 Greater Dublin Area Cycle Network Plan; • Demand Management is also underpinned by the co-location of residential, education, local retail and leisure and amenity facilities; and, • The propensity for car ownership and car use is managed through measures that include reduced residential parking provision and increased cycle parking provision in line the 'Design Standards for New Apartments'. The provision of car club parking spaces will facilitate a lower level of car ownership. The above mitigation measures will provide alternatives to the private car for making trips and are envisaged to promote low car ownership which will in turn ensure that the level of traffic generation and thus the traffic impact on the local road network is mitigated.		✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓

Item Ref.	Environmental Topic	Schedule of Environmental Commitments – Mitigation Measures	Construction Phase	Operational Phase
7	Chapter 9 – Land, Soils and Geology	Stripping of topsoil will be carried out in a controlled and carefully managed way and coordinated with the proposed staging for the development. At any given time, the extent of topsoil strip (and consequent exposure of subsoil) will be limited to the immediate vicinity of active work areas. Topsoil stockpiles will be protected for the duration of the works and will be located so as not to necessitate double handling.	✓	
		Soil beneath the proposed footprint of all housing and duplex units is suitable (from a human health and environmental perspective) for reuse within the proposed residential gardens, with the exception of two localised hotspots (TP205 and TP208). The extent of these hotspot areas (from ground level to 1mbgl) is estimated to be 10m x 10m, centred around each of the following locations: • TP205 Hotspot - Grid Reference: 726,442.09 E, 719,477.12 N; and, • TP208 Hotspot - Grid Reference: 726,491.25 E, 719,426.98 N.	✓	
		This material (ca. 200m^3) should be removed for reuse elsewhere onsite, or for offsite disposal to a suitably licenced / permitted waste facility. These soils can be replaced if needed by soils from elsewhere beneath the proposed footprint of all housing and duplex units, or from the north-western portion of the Site (e.g., excavated material from Block D), or via. suitable imported uncontaminated soil / topsoil. Any subsoil or topsoil removed from a 10mx10m area surrounding the location of WS01B, WS03A, WS05A, TP203, TP209 and TP211 shall not be reused in the location of the houses or duplexes or any other location where there is a likelihood of home grown produce being grown. The Contractor, in consultation with the Client and the Engineer, will be responsible for ensuring that the two localised soil hotspots (TP205 and TP208) are removed and replaced with suitable material as required.	✓	
		The design of road levels and finished floor levels has been carried out in such a way as to minimise cut/fill type earthworks operations. The duration that subsoil layers are exposed to the effects of weather will be minimised. Disturbed subsoil layers will be stabilised as soon as practicable (e.g., backfill of service trenches, construction of road capping layers, construction of building foundations and completion of landscaping). Similar to comments regarding stripped topsoil, stockpiles of excavated subsoil material will be protected for the duration of the works. Stockpiles of subsoil material will be located separately from topsoil stockpiles. The Contractor will be responsible for ensuring these measures are fully implemented.	✓	
		The excavation of material will be minimised as much as possible to reduce the impact on soils and geology. Any surplus material, or materials which are deemed not suitable for onsite reuse will be classified in accordance with the EPA Guidance Document *'Waste Classification, List of Waste & Determining if Waste is Hazardous or Non-Hazardous'* (2015). It will be the Contractors responsibility to ensure that all waste soils are classified correctly and managed,	✓	

Item Ref.	Environmental Topic	Schedule of Environmental Commitments – Mitigation Measures	Construction Phase	Operational Phase
7	Chapter 9 – Land, Soils and Geology	transported and disposed of offsite in accordance with the requirements of the Waste Management Act 1996, as amended, the Waste Framework Directive 2008/98/EC of the European Parliament and Council on waste and any relevant subsequent waste management legislation.		
		The minor amount of waste C&D material observed in a localised area within the southern portion of the Site will also be removed from site and disposed of in accordance with all relevant waste management legislation. A Resource and Waste Management Plan has been generated for the Site (Document Ref: 5214419DG0011(Atkins, 2022)). It will be the Contractors responsibility to ensure that a project specific Detailed Waste Management Plan is fully implemented onsite for the duration of the project.	✓	
		Based on CIRIA 665 guidance, gas protection measures would be required in the vicinity of proposed apartment blocks B and C, based on this part of the Site being CS2. The typical scope of protective measures for residential buildings (not low rise traditional housing), such as apartment blocks B and C (for CS2) is as follows (CIRIA 665, 2007):	✓	
		• **Option a)** - Reinforced concrete cast in situ floor slab (suspended, non-suspended or raft) with at least 1200g damp proof membrane (DPM) and underfloor venting; or;	✓	
		• **Option b)** - Beam and block or pre-cast concrete and 2000g DPM / reinforced gas membrane and underfloor venting; and,	✓	
		• All joints and penetrations sealed.	✓	
		Gas protection measures (based on the above scope) for apartment blocks B and C will be incorporated into the Detailed Design Stage of the proposed development; and will be installed by experienced and trained specialists and will be subject to inspection and certification, during the Construction Stage. The Contractor, in consultation with the Client and the design team, will be responsible for ensuring that these measures are fully implemented and verified.	✓	
		Further mitigation measures for the prevention of soil / bedrock contamination during construction are proposed below. The Contractor will be responsible for ensuring these measures are fully implemented. Mitigation measures outlined in Chapter 10 - Water are also applicable to the protection of soils and geology during the construction phase:	✓	
		• In advance of commencement of the Construction Stage, all onsite monitoring wells (as identified in the Ground Investigation Report (IGSL, 2021) presented in Appendix 9.1, and the historic well located in the north-eastern portion of the Site, will be fully decommissioned by an experienced borehole specialist in accordance with relevant	✓	

Item Ref.	Environmental Topic	Schedule of Environmental Commitments – Mitigation Measures	Construction Phase	Operational Phase
7	Chapter 9 – Land, Soils and Geology	guidelines, 'Good practice for decommissioning redundant boreholes and wells' (UK Environment Agency, 2012);		
		• Earthworks / piling plant and vehicles delivering construction materials to Site will be confined to predetermined haul routes around the Site for each phase of the proposed development;	✓	
		• The need for vehicle wheel wash facilities will be assessed by the Contractor depending on the phasing of works and onsite activity and will be installed as needed, near any Site entrances and road sweeping implemented as necessary to maintain the road network in the immediate vicinity of the Site;	✓	
		• Dust suppression measures (e.g., dampening down) will be implemented as necessary during dry periods;	✓	
		• All excavated materials / piling arisings will be stored away from the excavations / immediate works area, in an appropriate manner at a safe and stable location. The maximum height of temporary stockpiles will be 3m;	✓	
		• A comprehensive monitoring and supervisory regime including monitoring of all excavations and stability assessments as required will be put in place to ensure that the proposed construction works do not constitute a risk to the stability of the Site;	✓	
		• The employment of good construction management practices will serve to minimise the risk of pollution from construction activities at the proposed development in line with the Construction Industry Research and Information Association (CIRIA) publication entitled, Control of Water Pollution from Construction Sites, Guidance for Consultants and Contractors, CIRIA - C532 (2001) which are also detailed in Chapter 10 – Water; and,	✓	
		• Specifically, regarding pollution control measures, the following will be adhered to;		
		- Fuels, lubricants and hydraulic fluids for equipment used on the construction Site, as well as any solvents, oils, and paints will be carefully handled to avoid spillage, properly secured against unauthorised access or vandalism, and provided with spill containment according to best codes of practice;	✓	
		- Waste oils and hydraulic fluids will be collected in leak-proof containers and removed from the proposed development for disposal or re-cycling;	✓	
		- Any spillage of fuels, lubricants or hydraulic oils will be immediately contained and the contaminated soil removed from the proposed development and properly disposed of;	✓	

Item Ref.	Environmental Topic	Schedule of Environmental Commitments – Mitigation Measures	Construction Phase	Operational Phase
7	Chapter 9 – Land, Soils and Geology	- All Site vehicles used will be refuelled in bunded and adequately sealed and covered areas in the construction compound area;	✓	
		- All plant and machinery will be serviced before being mobilised to Site;	✓	
		- No plant maintenance will be completed on Site, any broken-down plant will be removed from Site to be fixed;	✓	
		- Refuelling will be completed in a controlled manner using drip trays at all times;	✓	
		- Mobile bowsers, tanks and drums will be stored in secure, impermeable storage areas away from open water;	✓	
		- Fuel containers will be stored within a secondary containment system, e.g., bunds for static tanks or a drip tray for mobile stores;	✓	
		- Containers and bunding for storage of hydrocarbons and other chemicals will have a holding capacity of 110% of the volume to be stored;	✓	
		- Ancillary equipment such as hoses and pipes will be contained within the bund;	✓	
		- Taps, nozzles or valves will be fitted with a lock system;	✓	
		- Fuel and chemical stores including tanks and drums will be regularly inspected for leaks and signs of damage;	✓	
		- Drip-trays will be used for fixed or mobile plant such as pumps and generators to retain oil leaks and spills;	✓	
		- Only designated trained operators will be authorised to refuel plant on Site;	✓	
		- Procedures and contingency plans will be set up to deal with emergency accidents or spills;	✓	
		- An emergency spill kit with oil boom, absorbers etc. will be kept on-site for use in the event of an accidental spill. A specific team of staff will be trained in the use of spill containment;	✓	
		- Strict supervision of contractors will be adhered to in order to ensure that all plant and equipment utilised on-Site is in good working condition. Any equipment not meeting the required standard will not be permitted for use within the Site. This will minimise the risk of soils and bedrock becoming contaminated through Site activity; and,	✓	
		- The highest standards of Site management will be maintained and utmost care and vigilance followed to prevent accidental contamination or unnecessary disturbance to the Site and surrounding environment during construction. A named person will be	✓	

Item Ref.	Environmental Topic	Schedule of Environmental Commitments – Mitigation Measures	Construction Phase	Operational Phase
7	Chapter 9 – Land, Soils and Geology	given the task of overseeing the pollution prevention measures agreed for the Site to ensure that they are operating safely and effectively. The above mitigation measures will be incorporated (as required) during Detailed Design Stage and will form part of a site-specific Construction Environmental Management Plan (CEMP) which will be implemented during the Construction Stage (including initial Site preparatory / enabling works).	✓	
		Taking account of the relevant mitigation measures to be implemented during the Detailed Design Stage and Construction Stage (specifically the installation of an appropriate ground gas membrane beneath apartment blocks B and C, and the removal of two localised soil hotspots from the proposed footprints of the housing and duplex units and associated gardens), no further mitigation measures will be required during the operational phase.		✓
8	Chapter 10 – Water	With regard to groundwater and surface water quality impacts the following mitigation measures are proposed. The Contractor will be responsible for ensuring these measures are fully implemented: • In advance of commencement of the Construction Stage, all onsite monitoring wells (as identified in the Ground Investigation Report (IGSL, 2021) presented in Appendix 9.1, and the historic well located in the north eastern portion of the Site, will be fully decommissioned by an experienced borehole specialist in accordance with relevant guidelines, '*Good practice for decommissioning redundant boreholes and wells'* (UK Environment Agency, 2012);	✓	
		• The construction management of the Site will take account of the recommendations of the Construction Industry Research and Information Association (CIRIA) guidelines '*Control of Water Pollution from Construction Sites' and 'Groundwater control - design and practice*' and CIRIA 2010 '*Environmental Good Practice on Site'* to minimise as far as possible the risk of pollution.	✓	
		• All of the mitigation measures (for the protection of soils and geology) listed in Chapter 9 will be implemented onsite during the construction phase.	✓	
		• Any groundwater temporarily dewatered during the excavation works for the proposed attenuation tanks and for building foundations in the central and southern portions of the Site, and during piling (as required), will be treated via. the installation of a temporary in-situ water treatment system;	✓	

Item Ref.	Environmental Topic	Schedule of Environmental Commitments – Mitigation Measures	Construction Phase	Operational Phase
8	Chapter 10 – Water	- This system should be designed and sized to ensure that all pumped groundwater water is treated via. a temporary attenuation pond, prior to discharge to a selected onsite location (via. a temporary soakaway).	✓	
		- The Contractor will be required to provide a Site-specific dewatering plan, clearly setting out proposed excavation methodology, estimated dewatering rates, details of proposed treatment system, and discharge location.	✓	
		• The Contractor will be responsible for ensuring that the existing drainage network, specifically along the existing road, and as required elsewhere across the site, will be suitably protected (via. the use of physical barriers and / or the implementation a Site-specific water run-off management plan as required).	✓	
		• In order to prevent any potential surface water / groundwater impacts via. release of hydrocarbon / chemical contaminants the following standard measures will be implemented:		
		- Fuels, lubricants and hydraulic fluids for equipment used on the construction Site, as well as any solvents, oils, and paints will be carefully handled to avoid spillage, properly secured against unauthorised access or vandalism, and provided with spill containment according to best codes of practice;	✓	
		- Waste oils and hydraulic fluids will be collected in leak-proof containers and removed from the proposed development for disposal or re-cycling;	✓	
		• A response procedure will be put in place to deal with any accidental pollution events. Any spillage of fuels, lubricants or hydraulic oils will be immediately contained and the contaminated soil removed from the proposed development and properly disposed of in accordance with all relevant waste management legislation;	✓	
		- All Site vehicles used will be refuelled in bunded and adequately sealed and covered areas in the construction compound area.	✓	
		- Strict supervision of contractors will be adhered to in order to ensure that all plant and equipment utilised on-Site is in good working condition. Any equipment not meeting the required standard will not be permitted for use within the Site. This will minimise the risk of groundwater becoming contaminated through Site activity.	✓	
		- All oil stored on Site for construction vehicles will be kept in a locked and bunded area;	✓	
		- Generators, pumps and similar plant will be placed on drip-trays to prevent contamination;	✓	

Item Ref.	Environmental Topic	Schedule of Environmental Commitments – Mitigation Measures	Construction Phase	Operational Phase
8	Chapter 10 – Water	- All Site vehicles used will be refuelled in bunded areas;	✓	
		- All temporary construction fuel tanks will also be located in a suitably bunded area and all tanks will be double skinned. Relevant Material Safety Data Sheets along with oil absorbent materials will be kept on Site in close proximity to any fuel storage tanks or bowsers during proposed Site development works; and,	✓	
		- All fuel / oil deliveries to on-Site oil storage tanks will be supervised, and records will be kept of delivery dates and volumes.	✓	
		• In order to prevent any potential surface water / groundwater impacts via. release of cementitious materials the following measures will be implemented where poured concrete is being used on Site;	✓	
		- The production, transport and placement of all cementitious materials will be strictly planned and supervised. Site batching/production of concrete will not be carried out on Site and therefore these aspects will not pose a risk to the waterbodies present, namely any temporarily exposed groundwater, the River Dargle or the Irish Sea;	✓	
		- Shutters will be designed to prevent failure. Grout loss will be prevented from shuttered pours by ensuring that all joints between panels achieve a close fit or that they are sealed;	✓	
		- Any spillages will be cleaned up and disposed of correctly;	✓	
		- Where concrete is to be placed by means of a skip, the opening gate of the delivery chute will be securely fastened to prevent accidental opening;	✓	
		- Where possible, concrete skips, pumps and machine buckets will be prevented from slewing over water when placing concrete;	✓	
		- Mixer washings and excess concrete will not be discharged directly into the drainage network, or any drainage ditches, surface water bodies or exposed groundwater; and,	✓	
		- Surplus concrete will be returned to batch plant after completion of a pour.	✓	
		• Foul drainage from Site offices and Site compounds will be directed to the existing wastewater network or will be contained and disposed of off-site in an appropriate manner and in accordance with the relevant statutory regulations.	✓	
		The above mitigation measures will form part of the Construction Environmental Management Plan (CEMP) submitted as part of this planning application, and which will be further developed by the Contractor within the project-specific Detailed CEMP which will be in operation during the construction phase.		

Item Ref.	Environmental Topic	Schedule of Environmental Commitments – Mitigation Measures	Construction Phase	Operational Phase
8	Chapter 10 – Water	With regard to groundwater and surface water quality impacts the following mitigation measures are proposed; • All of the mitigation measures (for the protection of soils and geology) listed in Chapter 9 will be implemented onsite during Detailed Design Stage and Construction Stage (specifically the installation of an appropriate ground gas membrane beneath apartment blocks B and C, and the removal of two localised soil hotspots from the proposed footprints of the housing and duplex units and associated gardens). The Contractor, in consultation with the Client and the design team, will be responsible for ensuring that these measures are fully implemented. • All plant and equipment utilised onsite during maintenance works should be checked and in good working condition. Any equipment not meeting the required standard will not be permitted for use within the Site. Relevant maintenance contractors will be responsible for ensuring that these measures are fully implemented; • Any minor volumes of fuel, oil or chemicals required during routine maintenance works will be brought to and from Site by the maintenance contractor. While temporarily onsite all chemicals will be kept in secure and bunded areas, with relevant Material Safety Data Sheets available onsite. Any fuel / oil tanks temporarily stored on Site will be located in a suitably bunded area and all tanks will be double skinned, with oil / chemical absorbent materials held onsite in close proximity to the tanks. Relevant maintenance contractors will be responsible for ensuring that these measures are fully implemented; • In the unlikely event of a fuel / oil or chemical spill / leak during routine maintenance works, emergency spill response measures will be implemented with the aim of limiting the volume spilled and recovering as much of the lost product as possible (relevant maintenance contractors will be responsible for ensuring that these measures are fully implemented); and, • A maintenance programme for the proposed surface water drainage system should be implemented. The Contractor, in consultation with the Client and the design team, will be responsible for ensuring that these measures are fully implemented. Regular checks and maintenance of the proposed surface water drainage system should be implemented, as recommended in the Stormwater Impact Assessment Report (Atkins, 2022) (document. ref.: 5214419DG0012) submitted as part of this planning application.		✓ ✓ ✓ ✓ ✓
9	Chapter 11 – Cultural Heritage	A suitably qualified archaeologist will be appointed by the Developer to carry out a programme of archaeological monitoring of ground excavation works during the construction phase and this will be carried out under a licence issued by the National Monument Service. Given the		

Item Ref.	Environmental Topic	Schedule of Environmental Commitments – Mitigation Measures	Construction Phase	Operational Phase
9	Chapter 11 – Cultural Heritage	absence of any unrecorded, sub-surface archaeological features identified during the geophysical survey and subsequent test trenching investigations carried out as part of this assessment the potential for the presence of such features is not considered likely but in the event that any archaeological remains are identified during monitoring they will be recorded and left to remain securely in situ while the National Monuments Service are consulted to determine further appropriate mitigation measures, which may entail preservation in situ by avoidance or preservation in record by archaeological excavation. Whilst the linear earthwork feature is of no great antiquity or cultural heritage significance (as evidenced by a series of archaeological investigations of the feature), The positioning of the roads and residential blocks have been arrayed so that they form a spatial marker (or morphological memory) of the 'Nun's Walk' former location and alignment. The Nun's walk will feature and be defined by engraved paving slabs laid through the public open space area located between apartment blocks A and B to echo the alignment of this linear earthwork along with the alignment of the boundary between Dublin and Wicklow. This feature will run through the paved area that also provides drop off access to the entrance of Block A. The space also allows for the potential installation of public artwork to further define the character and mark the history of the space, including delineation of the alignment of the earthwork through paving, interpretive text and imagery. In addition, the design provides for a feature stone wall along this section of the railway boundary to act as 'stage scenery' and reinforce the importance of this area of open space. This open space will provide connectivity with the Green Spine and the Coastal Gardens character areas to maintain pedestrian permeability throughout the development. Refer to Chapter 5 - Landscape and Visual for further information.	✓ ✓	
		Given the factors outlined in Section 11.5 of this chapter combined with the implementation of the mitigation measures presented in Section 11.7.1 which will provide for either the avoidance or the proper and adequate recording of any currently unrecorded archaeological features within its boundary, there are no predicted mitigation measures required for the cultural heritage resource during the operational phase.		✓
10	Chapter 12 – Material Assets	**Built Services** The following mitigation measures will be implemented during the construction phase; • A project-specific Detailed Construction Environmental Management Plan (CEMP) will be prepared by the appointed Contractor prior to the commencement of construction works. This document will take account of all of the environmental considerations (including water, dust and noise nuisance control; soil / stockpile management; temporary groundwater management; appropriate Site management of compound area; fuel, oil and	✓	

Item Ref.	Environmental Topic	Schedule of Environmental Commitments – Mitigation Measures	Construction Phase	Operational Phase
10	Chapter 12 – Material Assets	chemical storage and use; and waste management) set out in the Outline CEMP submitted as part of this planning application; • Phasing of the diverted foul water network is to be fully coordinated with Irish Water to ensure the reduced likelihood of requirements to use the existing system while the diversion is being made; • The construction compounds will include adequate temporary welfare facilities including foul drainage and potable water supply. Foul drainage discharge from the compound will be removed off site to an appropriately licensed facility for disposal until a connection to the public foul drainage network has been established; • All newly installed utilities/ services will be assessed, tested and certified as required prior to being fully commissioned; • Connections to the existing and proposed foul networks will be coordinated with the relevant utility provider. All works associated with the existing and proposed utilities for the proposed development will be carried out in strict accordance with the guidelines of the relevant stakeholders (specifically ESB, eir and Irish Water), Health and Safety Authority and any additional site specific requirements; • A copy of all available existing, and as built utility plans will be maintained on Site during the construction of the proposed development. The underground power lines and foul water mains within the existing Irish Water services, located onsite will be clearly marked and all Site personnel will be made aware of the known location of any onsite underground or over ground services during the construction phase; and, • Street Lighting will be implemented in accordance with the MEP Engineering Report & Design Statement prepared by Atkins (2022). **Waste Management** The following mitigation measures will be implemented during the construction phase: • All waste management procedures implemented onsite during the construction phase will be in accordance with the RWMP (Atkins, 2022) submitted as part of this planning application. In advance of commencement onsite, the Contractor will prepare a project specific Detailed RWMP which will further develop this plan, and will provide specific details in terms of proposed permitted haulage contractors, and permitted / licenced waste disposal / recovery facilities; • Scheduling and planning the delivery of materials will be carried out on an '*as needed*' basis to limit any surplus materials;	✓ ✓ ✓ ✓ ✓ ✓ ✓	

Item Ref.	Environmental Topic	Schedule of Environmental Commitments – Mitigation Measures	Construction Phase	Operational Phase
10	Chapter 12 – Material Assets	• Materials will be ordered in sufficient dimensions so as to optimise the use of these materials onsite, and will be carefully handled and stored so as to limit the potential for any damage; • Where feasible, sub-contractors will be responsible for the provision of any materials they require onsite in order to help reduce any surplus waste; • All loaded trucks entering and exiting the Site will be appropriately secured and covered; and, • Dust will be controlled at entry and exits to the Site using wheel washes (as required) and/or road sweepers, and tools and plant will be washed out and cleaned in designated areas. Wheel / road sweeper washings will be contained and treated prior to discharge.	✓ ✓ ✓ ✓	
		Built Services • On site network surveys, which can only be carried out once the development has been constructed, will be required to determine whether additional microwave radio transmitters are required. Recommendations will be implemented as needed (BBSC, 2022). • The proposed development would result in an approximate range of 1,465 to 2,637 additional people within the locality. For this quantum of development, a minimum of 3 to 4 additional mobile phone transmitters may be required to provide 4G or better service within the area. As is the case for developments of this scale, any requirement for additional mobile phone transmitters will be subject to a network load analysis by the mobile phone network providers that can only be carried out once the development has been constructed. Should this network load analysis conclude that additional mobile phone transmitters are required, these could be located in or at Block B2 as it is the tallest building within the proposed development (12 storeys). A standalone planning permission would be required for any mobile phone transmitters (BBSC, 2022). **Waste Management** Waste management during the operational phase of the development will be undertaken by private waste contractors (in accordance with statutory waste management and environmental requirements, regional waste related policy, and best practice waste management guidance), and regulated by Dún Laoghaire-Rathdown and Wicklow County Council. All waste management procedures implemented onsite during the operational phase will be in accordance with the Operational WMP (Atkins, 2022) submitted as part of this		✓ ✓ ✓

Item Ref.	Environmental Topic	Schedule of Environmental Commitments – Mitigation Measures	Construction Phase	Operational Phase
10	Chapter 12 – Material Assets	planning application. Therefore, no further mitigation measures are required with regard to the transport and disposal or recovery of all waste streams which will be generated during the operational phase. The following mitigation measures will be implemented during the operational phase in order to minimise the potential impact of litter pollution; • Suitably sized waste receptacles will be provided in communal areas within the residential development and commercial units by private waste contractors; • During the operational phase waste shall be collected on a fortnightly basis from all houses and duplexes, and on a weekly basis from all apartment blocks and commercial units; and, • It will be the responsibility of residents, crèche users, commercial unit occupants and maintenance workers to ensure that all waste generated is disposed of appropriately and responsibly, with penalties and legal sanctions being issued to anyone who is found to litter in accordance with the Litter Pollution Act by Wicklow County Council (2019-2024) and Litter Management Plan for Dún Laoghaire-Rathdown County Council (2021-2023).		✓ ✓ ✓

Table 15-2 – Schedule of Environmental Commitments – Monitoring Requirements (Construction and Operational Phases)

Item Ref.	Environmental Topic	Schedule of Environmental Commitments – Monitoring Requirements	Construction Phase	Operation Phase
11	Chapter 3 – Population and Human Health	Measures to avoid negative impacts on population and human health are largely integrated into the design and layout of the proposed development. Compliance with the design and layout will be a condition of any permitted development. Monitoring will be undertaken by the Building Regulations certification process and by the requirements of specific conditions of a planning permission. Monitoring of compliance with Health and Safety requirements will be undertaken by the Project Supervisor for the Construction Process. It is considered that the monitoring measures outlined in regard to the other environmental topics will ensure that the proposed development is unlikely to result in any adverse impacts in relation to population and human health.	✓ ✓ ✓	

Item Ref.	Environmental Topic	Schedule of Environmental Commitments – Monitoring Requirements	Construction Phase	Operation Phase
12	Chapter 4 – Biodiversity	The Bat Conservation Plan (refer to Appendix 4.3) will be implemented by the Contractor under the supervision of the appointed bat specialist. Pre-construction (pre-site clearance) monitoring shall be undertaken by the Contractor appointed Bat Specialist where trees shall be inspected for the presence of roosting bats. Following the tree surveys, specific Site clearance protocols will be established and, if necessary and bat roosts are found within trees to be lost, then NPWS consultation will be undertaken. If required, method statements will be proffered and derogation sought from NPWS for the safe removal of bats from roost sites. The identified bat roosts in 2 no. oak trees off Site (refer to Appendix 4.3 for locations) will be surveyed for the presence of bats. These 2 no. oak trees will be retained and the bat and bat roost protection measures outlined in the Bat Conservation Plan will be adhered to throughout the construction phase.	✓	
		Pre-construction / pre-Site clearance terrestrial mammal surveys will be undertaken by the Contractor appointed suitably qualified ecologist to assess if badgers, or any other protected mammals, have established refugia (e.g. a badger sett) within the Site. If protected mammal refugia is found within the Site, then consultation with NPWS will be undertaken by the project ecologist and associated method statements and mitigation will be proffered and derogation sought from NPWS.	✓	
		Removal of nesting habitat (hedgerows, trees and woodland) must be carried out outside of the bird breeding season (from 1st March to 31st August). Consultation must be undertaken with the National Parks and Wildlife Service for any nesting habitat clearance works outside of this seasonal window (as detailed in the Construction phase mitigation measures above).	✓	
		Once operational the implementation of the landscape plan and compensatory habitat such as wild flower meadows and additional planting should be inspected by the Contractor within one year post planting. If landscaping measures have failed an alternative solution should be proposed by the Contractor.	✓	
		Operational phase monitoring (in order to ensure the continued success of the landscape features, specifically in relation to biodiversity enhancement measures) shall be undertaken by those in charge of the maintenance and management of the development. Operational phase monitoring in order to ensure the success of the refuge habitats shall be undertaken by those in charge of the maintenance and management of the development.	✓	
		Operational phase monitoring (in order to ensure the continued success of the landscape features, specifically in relation to biodiversity enhancement measures) shall be undertaken by those in charge of the maintenance and management of the development. Operational phase monitoring in order to ensure the success of the refuge habitats shall be undertaken by those in charge of the maintenance and management of the development.		✓

Item Ref.	Environmental Topic	Schedule of Environmental Commitments – Monitoring Requirements	Construction Phase	Operation Phase
13	Chapter 5 – Landscape and Visual	Not applicable to this chapter		
14	Chapter 6 – Air Quality and Climate	Monitoring of construction dust deposition along the site boundary to nearby sensitive receptors during the construction phase of the proposed development is recommended to ensure mitigation measures are working satisfactorily. This can be carried out using the Bergerhoff method in accordance with the requirements of the German Standard VDI 2119. The Bergerhoff Gauge consists of a collecting vessel and a stand with a protecting gauge. The collecting vessel is secured to the stand with the opening of the collecting vessel located approximately 2m above ground level. The TA Luft limit value is 350 mg/(m2*day) during the monitoring period between 28 - 32 days.	✓	
		There is no monitoring recommended for the operational phase of the development as impacts to air quality and climate are predicted to be imperceptible.		✓
15 15	Chapter 7 – Noise and Vibration	There is a requirement to ensure that construction activities operate within the noise and vibration limits set out within this EIAR. There is also a requirement to undertake regular noise and vibration monitoring at locations representative of the closest sensitive locations to ensure the relevant criteria are not exceeded. Noise monitoring shall be conducted in accordance with the International Standard ISO 1996: 2017: Acoustics – Description, measurement and assessment of environmental noise. It will be a requirement of the appointed contractor to undertake such noise monitoring during the relevant phases of the construction program. Vibration monitoring shall be conducted in accordance with BS 6472 for human disturbance and BS ISO 4866:2010 for building damage. It will be a requirement of the appointed contractor to undertake such vibration monitoring during the relevant phases of the construction program.	✓ ✓	
16	Chapter 8 – Traffic	Not applicable for this Chapter.		
17	Chapter 9 – Land, Soils and Geology	A comprehensive monitoring and supervisory regime including monitoring of all excavations and stability assessments as required will be put in place to ensure that the proposed construction works do not constitute a risk to the stability of the Site.	✓	
18	Chapter 10 – Water	Regular checks and maintenance of the proposed surface water drainage system should be implemented, as recommended in the Stormwater Impact Assessment Report (Atkins, 2022) (document. ref.: 5214419DG0012) submitted as part of this planning application.		✓
19	Chapter 11 – Cultural Heritage	There are a number of obligatory processes required as part of archaeological licence applications to the National Monuments Service and these will allow for monitoring of the successful implementation of the archaeological mitigation measures presented in Section 11.7.1. The archaeologist appointed to undertake licensed monitoring of the construction		

Item Ref.	Environmental Topic	Schedule of Environmental Commitments – Monitoring Requirements	Construction Phase	Operation Phase
19	Chapter 11 – Cultural Heritage	phase shall submit a method statement detailing the proposed strategy for archaeological supervision of ground works to the National Monuments Service as part of the license application. This will clearly outline the proposed extent of ground works and outline the consultation process to be enacted in the event that any unrecorded archaeological remains are identified, which may include preservation in situ by avoidance or preservation in record by archaeological excavation. The appointed archaeologist will compile a report on all archaeological Site investigations which will clearly present the results in written, drawn and photographic formats. Copies of this report will be submitted to the National Monuments Service and the National Museum of Ireland by the appointed archaeologist.	✓	
20	Chapter 12 – Material Assets	As detailed within the RWMP (Atkins, 2022) prepared as part of this planning application, the Contractor will be responsible for maintaining waste records and documentation for the full duration of the construction phase. The Contractor will track and monitor all waste volumes transported offsite. All waste records will be maintained onsite throughout the project and will be made available for viewing by the Client, Employer's Representative and statutory consultees (WCC, DLRCC, EPA) as required.	✓	

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