Outline Construction Environmental Management Plan

Coolagad SHD, Greystones, Co. Wicklow

Cairn Homes PLC

Project reference: 60641912

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Quality information

Prepared by	Checked by	Verified by	Approved by
Yvonne McCarthy Graduate Environmental Geologist	Elaine Keenan Environmental Consultant	Niamh Kennedy Associate Director	David Misstear Senior Environmental Consultant

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Prepared for:

Cairn Homes PLC
7 Grand Canal
Grand Canal Street Lower
Dublin 2
Ireland

Prepared by:

Yvonne McCarthy
Graduate Environmental Geologist

M: +353 87 457 5300
E: yvonne.mccarthy@aecom.com

AECOM Ireland Limited
4th Floor
Adelphi Plaza
Georges Street Upper
Dun Laoghaire
Co. Dublin A96 T927
Ireland

T: +353 1 238 3100
aecom.com

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1. Introduction

1.1 Background

AECOM has been appointed to undertake this Outline Construction Environmental Management Plan (Outline CEMP) as part of a project on lands at Coolagad, Greystones, Co. Wicklow (hereafter referred to as 'the Proposed Development Site'/'the site'). The site includes the proposed Strategic Housing Development (SHD) which is the subject of this application (hereafter referred to as the Proposed Development). The Proposed Development Site is a greenfield site located to northern edge of Greystones. The site is bounded to its east and south by built-up areas of Greystones and by agricultural lands to its north and west.

This Outline CEMP sets out the procedures, standards, work practices and management responsibilities to address potential environmental effects that may arise from the Proposed Development.

The Outline CEMP outlines the approach that will be adopted to environmental management throughout the development works at the site, with the primary aim of reducing any adverse effects from construction on the environment. The Outline CEMP will be at all times a 'live' document, subject to amendment including the revision and addition of content throughout the works. In this context, the values and information presented herein is subject to change and refinement through the selection of the contractor and the delivery of the Proposed Development.

This plan shall be further refined and expanded by the appointed contractor (hereafter referred to as the Contractor) into a full detailed CEMP as more certainty and more information becomes available in terms of the proposed layout, construction methods, programme and potential environmental impacts to be mitigated against. The elements contained within this plan will be included in the Contractor's CEMP, which will be prepared prior to construction by the appointed Contractor and approved by the Client and relevant planning authorities.

At the end of the construction phase, the Contractor shall prepare a Handover Environmental Management Plan (HEMP) that shall contain essential environmental information needed by the bodies responsible for the future maintenance and operation of the asset.

1.2 Objectives

The objectives of this Outline CEMP and any subsequent CEMP are therefore to:

- Act as a continuous link and reference document for environmental issues between the design, construction, testing and commissioning stages of the Proposed Development.
- Demonstrate how construction activities and supporting design shall properly integrate the requirements of environmental legislation, planning consent conditions, policy, good practice, and those of the environmental regulatory authorities and third parties.
- Record environmental risks and identify how they will be managed during the construction period.
- Record the objectives, commitments and mitigation measures to be implemented together with programme and date of achievement.
- Identify key staff structures and responsibilities associated with the delivery of the Proposed Development and environmental control and communication and training requirements as necessary
- Act as a vehicle for transferring key environmental information at handover to the body responsible for operational management. This shall include details of the asset, short and long-term management requirements, and any monitoring or other environmental commitments.
- Provide a review, monitoring and audit mechanism to determine effectiveness of, and compliance with, environmental control measures and how any necessary corrective action shall take place.

1.3 Scope

The scope of this Outline CEMP covers the Proposed Development, i.e. the design and construction of the SHD at Coolagad, Greystones, Co. Wicklow.

As described in Chapter 2 (Description of Development) of the Environmental Impact assessment Report (EIAR) produced for the Proposed Development, the spatial scope of the project will cover the:

- Proposed Development Site
- Any additional working areas
- Access to and egress from the site

This Outline CEMP considers the following subject areas:

- Roles and Responsibilities
- Environmental Management
- Biodiversity
- Land, Soil and Geology
- Water Quality
- Air Quality
- Climate
- Noise and Vibration
- Landscape and Visual Impact
- Archaeological and Cultural Heritage
- Traffic and Transportation
- Material Assets – Utilities
- Waste Management

It is noted that the Outline CEMP provides guidance, both descriptive and prescriptive, for the information to be included in the CEMP by the Contractor. The CEMP describes how the information and conditions provided in the Outline CEMP is incorporated and adhered to respectively. This document should be read in conjunction with the mitigation measures expressed in the EIAR document, any contract requirements and any planning permission conditions.

2. Description of Proposed Development Site

Cairn Homes Properties Ltd, intend to apply to An Bord Pleanála for permission for a 7 year planning permission for a strategic housing development at this site of c.26.03ha at 'Coolagad', Greystones, Co. Wicklow. The application site is generally located to the west of the R761 Rathdown Road, north of Gate Lodge; north and west of Coolagad House, Temple Carrig School, Gaelscoil na gCloch Liath and Greystones Educate Together National School. The lands are bounded by Waverly Avenue and Seagreen Park residential areas to the east. Templecarrig Lower is located to the north of the lands and Kindlestown Upper to the west.

The proposed development will consist of:

- 586 residential units including:
  - 351 two storey houses (207 no. 3 bed, 140 no. 4 bed, 4 no. 5 bed) comprising detached, semi-detached and terraced units
  - 203 no. apartments (65 no. 1 bed, 123 no. 2 bed, 15 no. 3 bed) provided within 6 no. blocks ranging from three to four-storey (over basement) with residential amenity facilities .
  - 32 no. duplex units within 2 no. three-storey blocks (16 no. 2 bed and 16 no. 3 bed units)
- c. 5,192 sqm of communal open space is provided to serve the proposed apartment/duplex units;
- Community building (single storey) of 392 sq.m. with 29 car parking spaces, including changing rooms and a multipurpose room.
- Creche building of 734 sq.m. with 21 car parking spaces
- A new vehicular entrance, with signalised junction and pedestrian crossings, will be provided off the R761 (Rathdown Road). The new junction will be linked to the existing signalised junction at Blacklion Manor Road / Redford Park which has a planned upgrade by Wicklow County Council. Cycle lanes will be provided

along this section of the R761 on both sides. A footpath will also be provided on its western side. Car parking will be provided to the east of the R761, in the front of Redford Cemetery.

- The new access will provide a distributor road as part of the long-term objective to provide a northern access route from Greystones to the N11.
- Car and bicycle parking spaces are provided as follows:
  - 702 on curtilage car parking spaces for the houses; 206 car parking spaces at basement level and 5 at surface level for the apartments; and 32 spaces for the duplex units and 10 visitor spaces at surface level;
  - 22 motorbike parking spaces;
  - 436 resident and 118 visitor bicycle parking spaces are proposed in a mix of basement and surface levels for the apartment blocks and duplex units; 12 bicycle spaces are proposed for the creche, 12 for the community centre and 10 at the sport field.
- The development also includes site development infrastructure, a hierarchy of internal streets including bridges, cycle paths & footpaths; new watermain connection and foul and surface water drainage; the development also provides for the construction of a new public foul sewer along the R761/R762 from the site entrance as far as the R762 in front of St. Kevin's National School, Rathdown Road, Greystones.
- c.10.43ha open space to include a sport field, a MUGA, private, communal and public open spaces incorporating an existing stream, formal and informal play areas, and new boundary treatments.
- ESB substations/switchrooms, lighting, site drainage works and all ancillary site development works above and below ground.

3. Environmental Management

3.1 Construction Environmental Management Plan

As noted earlier, the CEMP shall address the particular requirements of the Objectives listed in Section 1.2, and any updated or new supplementary environmental reports made available to the Contractor. The CEMP shall also comply with the requirements of the relevant authorities/environmental statutory bodies.

The CEMP shall be prepared by the Contractor and submitted to the planning authority and agreed in writing prior to works commencing on the Proposed Development Site. It shall be prepared in sufficient detail to describe the framework of the Contractor's proposed management, control and mitigation strategy for each environmental aspect. Consideration will also be given to relevant adjacent developments in the management of future construction activities on the Proposed Development Site. The CEMP should include, where required, specific Method Statements for specific works (e.g. working in or near watercourses/above existing railway lines).

The CEMP shall be developed/updated as necessary during the course of the design and construction phases and will be reviewed on a regular basis (at a minimum every six months) with the Client as necessary.

3.2 Environmental Aspects and Impacts

The Contractor will prepare a project specific Project Environmental Risk Assessment (ERA), as per Appendix B. The Contractor should also include the following:

- Environmental guidelines on how to prepare an ERA.
- Monitoring and checklists that shall be implemented to manage the environment.
- Environmentally sensitive area(s) and control measures to be implemented onsite which will be included as an appendix to the CEMP.
- The procedure for undertaking an ERA to assist in the identification of environmental aspects of the project's activities, products and services.

3.3 Roles and Responsibilities

The Contractor shall employ a suitably experienced and qualified Construction Environmental Site Manager to undertake co-ordination of monitoring of the works' impacts and implementation of the Contractor's proposals, in respect of all environmental requirements. Further information on roles and responsibilities is provided in Table 1.

A Construction Environmental Site Manager or an Environmental Site Representative(s) shall be present onsite for the duration of the Project.

The Construction Environmental Site Manager shall be the point of contact for dealing with environmental issues for the Contractor's employees, Subcontractors, relevant authorities/environmental bodies, and members of the public. The Construction Environmental Site Manager will also be responsible for controlling the construction impacts arising from the activities of the Contractor and Subcontractors in accordance with the CEMP.

The Construction Environmental Site Manager shall prepare, implement, manage, review and revise the CEMP with the sole purpose of ensuring that the environment is safeguarded at all times from anticipated or unexpected adverse impacts during construction.

Within the Contractor's team, the Construction Environmental Site Manager shall have the authority to ensure that the CEMP is effectively implemented. The Construction Environmental Site Manager must notify the Client of any transgressions in respect of the CEMP so that necessary sanctions can be imposed.

In general, the duties of the Construction Environmental Site Manager shall include the following:

- Implementation of the CEMP procedures.
- Routine environmental monitoring, recording and reporting.
- Maintaining and auditing the CEMP and documents that underpin it.
- Environmental training including daily toolbox talks to site staff and design staff. Topics for toolbox talks should include, but not be limited to:
  - Invasive species and biodiversity
  - Water quality
  - Archaeology
  - Noise and vibration
  - Dust
  - Material and waste management
  - Contaminated land
- Liaison with statutory authorities, relevant local interest groups and the local community as required.
- Any other activities that may be necessary in order to protect wildlife and the environment during the works.

In addition, other environmental specialists as listed in Table 1 must be available to provide advice on the CEMP during construction. The CEMP shall typically place environmental responsibilities on the key roles within the Project (Proposed Development) as set out below.

Table 1 Key Contractor Team Roles and Responsibilities (indicative)

Role	Responsibilities
Contractor's Project Director	• Assign specific environmental duties to competent members of the Contractor's Team. • Identify the environmental training needs of personnel under their control and arrange appropriate training programmes and ensure records are being maintained. • Ensure that significant environmental aspects identified for the Project are managed. • Promote the continual improvement of environmental performance.
Construction Environmental Site Manager	• Develop, maintain and audit the CEMP (and supporting documents/plans) to ensure all aspects, impacts and statutory requirements etc. are reflected in the CEMP. • Develop and implement a programme of regular Project environmental inspections, monitoring, recording and reporting by the Environmental Site Representative(s) in accordance with procedures set out in the CEMP and agreed with WCC. • Derive key performance indicators (KPIs) for the Project in conjunction with WCC for items such as water usage, waste reduction and energy usage.

Role	Responsibilities
	• Ensure that the works are constructed in line with the CEMP, the EIAR and planning conditions. • Liaise with statutory authorities, relevant local interest groups and the local community as required. • Attend regular construction meetings to ensure environmental issues are discussed and addressed by the Contractor's Team. • Comply with duties under relevant legislation and company procedures in relation to environmental incident investigation and reporting. • Provide support and training to the workforce with regard to understanding environmental aspects, impacts, regulatory requirements, best practice, constraints and methods of working. • Nominate the Environmental Site Representative(s). • Appoint environmental specialists as required. • Ensure identified environmental specialists are in attendance onsite as required by the CEMP. • Review non-conformance reports provided by the Inland Fisheries Ireland Environmental Advisors, and/or the National Parks and Wildlife Service (NPWS) advisors to identify any underlying issues or patterns to identify suitable ameliorative measures. • Procedures for investigation environmental incidents and incident notification procedures shall involve both the Client and relevant authorities / environmental bodies. • Ensure that the Project Ecologist implements ecological mitigation and control measures satisfactorily. • Liaise with the Project Ecologist on all matters relating to ecology (particularly protected species including badgers, roosting bats and nesting birds). • Engage and consult with the Project Ecologist and a bat specialist prior to any felling or removal of trees within the Proposed Development Site and if bats are unexpectedly encountered during any element of construction works. • Ensure there is a waste management plan (WMP) in place should contaminated land/ soils be encountered during the reprofiling/ earthworks of the construction phase.
Site Manager	• Ensure that all personnel undergo suitable and sufficient environmental induction before starting work on the Project, and periodic refresher environmental awareness training throughout the construction. • Ensure staff attend the appropriate environmental courses • Ensure the Construction Environmental Site Manager is maintaining records of training delivered to site staff. • Monitor the performance of personnel and activities under their control and ensure arrangements are in place so that all personnel can work in a manner which minimises risks to them and to the environment. • Undertake a programme of regular environmental inspections in liaison with the Construction Environmental Site Manager. • Complete any corrective actions identified by the Construction Environmental Site Manager and provide status reports as required to the Client. • Assist and support the Construction Environmental Site Manager and statutory bodies in the investigation of any incidents. • Notify the Construction Environmental Site Manager of all environmental issues or incidents arising over the course of operations.
Environmental Specialists (e.g. Project Ecologist)	• The Project Ecologist shall hold a relevant degree in ecology and have appropriate relevant experience. • Provision of specialist input and supervision (licensed or otherwise), where necessary, of construction in relation to protected species including roosting bats. • Training of construction staff regarding measures to protect nesting birds and roosting bats. • Attend site as required to monitor the protection of asset in accordance with the requirements of relevant legislation, the construction contract and the CEMP. • Identify potential risks to wildlife and develop suitable control measures. • Provide status reports and updates to the Environmental Site Representative(s) in the completion of their activities. • Liaison with the NPWS, WCC and other nature conservation agencies on ecological matters where required.
Noise Consultant	A suitably qualified and competent noise consultant should be employed to attend site as required to: • Complete noise impact assessments/monitoring. • Identify sources of noise which have the potential to impact negatively on the environment and appropriate mitigation measures. • Provide status reports and updates to the Construction Environmental Site Manager in the completion of their activities.
Waste Officer	• The appointed Waste Officer will have overall responsibility to oversee and record everyday waste management on the Proposed Development Site. • The Waste Officer will have the authority to select a waste team • The Waste Officer will maintain the record keeping system for waste management on the Proposed Development Site including a log of each load of waste material being transported off-

Role	Responsibilities
	site and maintain a record of all documentation including waste transfer documents and landfill gate receipts in the waste management file.

3.4 Complaints

A Complaints Register for internal communication and for receiving, documenting and responding to environmental complaints from external parties will be established and will be maintained by the contractor. When a complaint is received, the following information must be taken:

- Date and time of the complaint are recorded.
- Name of complainant (if provided).
- Nature of complaint.
- All complaints received from external sources must be reported to the Construction Environmental Site Manager.
- Complaints must be dealt with in a timely manner and reported to WCC monthly, or at a frequency as agreed with WCC.

3.5 Environmental Auditing

Planned and documented audits aimed at evaluating the conformance of the project shall be carried out. The frequency of the audits will be agreed in advance with WCC. As a minimum, the CEMP will be reviewed and audited every 6 months and updated in line with current guidance and legislation.

It will be the Contractor's responsibility to update the list/appendix of legislation/guidance within the Contractor's CEMP and ensure all relevant regulations, policy and guidance are listed and followed.

Key Performance Indicators (KPI) will be agreed in advance of construction between Contractor and the client.

Any audits and site inspection results and KPI will be discussed between the contractor and the client on a monthly basis within a designated monthly meeting. Environmental Management Procedures and Plans

The Contractor shall ensure that mitigating measures outlined in the Outline CEMP, EIAR, planning consent, relevant legislation, policy and guidance documents (see example list in Appendix A), WCC's requirements, and any updated or new supplementary environmental reports are included in the Contractors CEMP prior to construction works.

The Contractor shall be responsible for managing its construction activities and those of any sub-contractors under its control.

3.6 General Site Management

3.6.1 Working Hours / Periods

For the duration of the construction programme, the working hours will likely be restricted to times as follows, although these are subject to approval:

- Monday to Fridays – 07:00 to 19:00
- Saturday, Sunday and Public Holidays – No activity onsite

Working outside the normal hours would require advance agreement between the Contractor and WCC. The advanced consent should include what activity is being applied for, how long it will take and what equipment will be used. This should be submitted a minimum of 5 working days in advance of the works taking place. Night-time works are not generally envisaged.

3.6.2 Site Compound

A site compound, visitor & contractor parking area will be established within Cairn Homes boundary on the proposed Phase 2 section of the site. This site will be accessed via the proposed distributor road off the R761. It

is proposed to separate construction traffic and movement from occupied phases of the development as construction progresses.

The compound may be used as material staging areas, temporary car parking for construction workers, site offices and huts, welfare facilities for workers (including changing rooms & lockers), storage of plant and equipment, etc.

The location of the compound is indicated on the site layout submitted as part of the planning application. It is noted that the location is indicative, and may change as the scheme is built out.

Designated parking area is provided in the site car park. It is proposed to cater for up to 100 cars /vans in this area to minimise the disruption to the local amenities and parking facilities. There is a designated pedestrian walkway from the car park to the site compound and from the compound to the construction works areas located away from the live construction site.

3.6.3 Site Housekeeping

Good housekeeping is an important part of good environmental practice and helps to maintain a more efficient and safer site. The Proposed Development Site should be tidy, secure, and have clear access routes that are well signposted. The appearance of a tidy, well-managed site can reduce the likelihood of theft, vandalism, complaints and/or specific hazards that could affect the safe operation of the other businesses in the area, such as wind-blown litter.

As outlined in the fourth edition of CIRIA's 'Environmental good practice on site guide' (C741), when considering good housekeeping, the Contractor will implement the following steps:

- Adequately plan the Proposed Development Site with designated areas of materials and waste storage.
- Segregate different types of waste as it is produced and arrange frequent removal.
- Keep the Proposed Development Site tidy and clean.
- Ensure that no wind-blown litter or debris leaves the Proposed Development Site, use covered skips to prevent wind-blown litter.
- Keep hoardings tidy – repair and repaint when necessary, removing any fly posting or graffiti.
- Frequently brush-clean wheel washing facilities and keep haul routes clean from site derived materials.
- Keep roads free from mud by using a road sweeper.
- Ensure site is secure.

3.7 Biodiversity

3.7.1 Biodiversity Control Measures

All mitigation measures as outlined in the EIAR, NIS and planning conditions will be incorporated into the CEMP prior to construction works.

Proposed mitigation measures as outlined in Chapter 5 Biodiversity of the EIAR are detailed below. A number of the mitigation measures are also relevant to other topics of this Outline CEMP but are set out here for completeness:

3.7.1.1 Environmental Control Measures

The following measures will be implemented to protect biodiversity:

- A pre-construction survey for invasive species, bats and terrestrial mammals will be carried out. This will include an inspection for resting and breeding places for both terrestrial mammals and bats. Should resting or breeding places be found a derogation licence will be acquired from NPWS and conditions followed prior to works commencing in the vicinity of the resting or breeding place.
- As existing springs, a watercourse and drainage ditches are present on site and substantial reprofiling and instream works are proposed, a project ecologist will be appointed prior to works or site clearance commencing on site. A project ecologist will oversee the project from prior to the commencement to the completion of the project including all landscaping, construction and drainage connections.
- The retention of existing habitats as outlined with in the EIAR including springs, hedgerows and wetland areas will involve significant input from a project ecologist and arborist prior to construction commencing on

site. The names, qualifications and experience of the ecologist, hydrologist and arborist will be provided to WCC prior to any works commencing on site.

- Tree retention will be carried out as outlined in the arborist report produced for the Proposed Development. Additional exclusion zones will be implemented by the project ecologist in order to protect biodiversity on site.
- A specific site clearance, reprofiling and phasing plan will be provided to the arborist and project ecologist for approval prior to any site clearance or works commencing on site. No site clearance works will commence on site until approval has been provided by the arborist and project ecologist for the works to commence.
- All site clearance, reprofiling and enabling works will be approved and monitored by the arborist and project ecologist to ensure that the integrity of the remaining habitats on site are maintained.
- All works in the riparian corridor will be carried out in consultation with and to the satisfaction of Inland Fisheries Ireland and the project ecologist, following the best practice guidelines for construction in the vicinity of watercourses. All works onsite and in the riparian corridor will include mitigation measures to prevent silt from runoff during works as set out below.
- All works in the riparian corridor will be approved by Inland Fisheries Ireland prior to works commencing.
- Abstraction of water from the watercourse or springs will not be permitted.
- Relevant legislation (Section 40 of the Wildlife Acts, 1976 to 2012) states “It shall be an offence for a person to cut, grub, burn or otherwise destroy during the period beginning on the 1st day of March and ending on the 31st day of August in any year, any vegetation growing on any land not then cultivated.” Should this not be possible, a pre-works check by a qualified ecologist should be undertaken to ensure nesting birds are absent. If bird nests are present the woody vegetation will not be removed unless a derogation licence has been provided by NPWS and the conditions applied.
- 50 Nest boxes placed onsite during landscaping to compensate for resource loss.
- Light falling upon any areas of benefit to birds such as hedgerow will not exceed 3 lux to ensure that resting and nesting species are not unnecessarily disrupted.
- A biodiversity pack will be presented to each registered owner upon moving in. This will outline the importance of biodiversity of the area and additional biodiversity resources to promote and enhance biodiversity within each of the developments.
- Lighting at all stages should be done sensitively onsite as directed by the project ecologist, with no direct lighting of hedgerows and treelines.
- Replanting of the riparian corridor will be at the initial phase of the project.

3.7.1.2 Monitoring

During construction an Ecologist will monitor the site from pre-construction surveys, during Construction Phases and Post Construction.

3.8 Land, Soil & Geology

The Proposed Development will include stripping and clearance of topsoil; excavation of subsoil layers; and infilling of soil and materials. In addition, there is a risk of accidental spills and leaks of stored oils, fuels, concrete and lime. Construction phase activities are considered to have impacts on the soil environment if they are not managed properly during the construction stage. In order to prevent/minimise potential impacts, a number of mitigation measures outlined below will be adopted as part of the construction works on the Proposed Development Site as discussed in the following sections. Measures set out in Section 4.5 are also considered applicable to the groundwater environment.

3.8.1 Environmental Control Measures

This section summarises the mitigation measures necessary for the Contractor to minimise impacts and monitor effects upon the site’s soil, geology and hydrogeology during construction. In order to do this, the Contractor shall be responsible for managing its construction activities and those of any sub-contractors under its control.

3.8.1.1 Excavation and Ground Stability

Detailed design will be specified by an appropriately qualified geotechnical Engineer for the soil cut and fill requirements at the site to ensure that ground stability is engineered and controlled appropriately.

Where appropriate, suitable batters or retained vertical walls will need to be maintained on excavation faces to ensure the stability of adjacent ground, structures and services. The geotechnical site investigation report (SIL, 2021) set out recommendations for the management of temporary sloped sides for excavations of 33º, or 1:1.5 and where excavations extend to stiffer CLAY the temporary slope angle could be increased to 45º, or 1:1. The report also recommends that temporary slope protection measures should also be considered to minimise the risk of spalling.

Temporary measures required during cut and fill groundworks will be determined as part of the detailed design and also in the construction methods that will be specified by the appointed contractor. These measures will include measures to ensure any impacts on ground stability at offsite locations are avoided including the adjoining residential and school sites.

3.8.1.2 Management of Stockpiles (soil and other materials/wastes)

Segregation and storage of soils for re-use onsite or removal offsite and waste for disposal offsite will be segregated and temporarily stored onsite (pending removal or for re-use onsite) in accordance with the CEMP and the CDWMP.

The reuse of up to 102,159.264cu.m of excavated soil and stone for the Proposed Development (i.e. engineered fill, profiling green areas) will be undertaken in accordance with the engineered design and landscape plan for the Proposed Development. Soil including topsoil and subsoil will be segregated and stored appropriately to prevent deterioration of soil structure and quality to ensure the material will be suitable for re-use onsite. Material surplus to onsite requirements will be segregated and stockpiled appropriately for removal offsite in accordance with the resource and material management plan.

For any excavated material identified for removal offsite, while assessment and approval of acceptance at a destination re-use, recovery site or waste facility is pending, excavated soil for recovery/disposal shall be stockpiled as follows:

- A suitable temporary storage area shall be identified and designated;
- All stockpiles shall be assigned a stockpile number;
- Material identified for reuse onsite, offsite and waste materials will be individually segregated; and all segregation, storage & stockpiling locations will be clearly delineated on the site drawings;
- Soil stockpiles will be sealed to prevent run-off from the stockpiled material generation and/or the generation of dust;
- Stockpiles will be placed at an appropriate distance from Site boundaries and not at boundaries adjoining sensitive receptors; and
- Any waste that will be temporarily stored/stockpiled will be stored on impermeable surface high-grade polythene sheeting, hardstand areas or skips to prevent cross-contamination of the soil below or cross contamination with soil.

The location and moisture content of storage piles are important factors which determine their potential for dust emissions.

- Stockpiles will not be located adjoining site boundaries with sensitive receptors including public roads and residential areas;
- Overburden material will be protected from exposure to wind by storing the material in sheltered regions of the site;
- Regular watering will take place to ensure the moisture content is high enough to increase the stability of the soil and thus suppress dust.

When a stockpile has been sampled for classification purposes, it shall be considered to be complete and no more soil shall be added to that stockpile prior to removal offsite. An excavation/stockpile register shall be maintained onsite

Waste will be stored onsite, including concrete, asphalt and soil stockpiles, in such a manner as to:

- Prevent environmental pollution (bunded and/or covered storage, minimise noise generation and implement dust/odour control measures, as may be required);
- Maximise waste segregation to minimise potential cross contamination of waste streams and facilitate subsequent re-use, recycling and recovery; and

- Prevent hazards to site workers and the general public during construction phase (largely noise, vibration and dust).

3.8.1.3 Exportation of Soil

All surplus materials and any waste will be removed offsite in accordance with the requirements outlined in the Outline CDWMP (Enviroguide Consulting, 2022) and will be managed in accordance with all legal obligations. It will be the contractor's responsibility to either; obtain a waste collection permit or, to engage specialist waste service contractors who will possess the requisite authorisations, for the collection and movement of waste offsite.

The re-use of soil offsite will be undertaken in accordance with all statutory requirements and obligations including where appropriate re-use as by-product in accordance with Article 27 of the European Communities (Waste Directive) Regulations 2011 (SI No. 126 of 2011) as amended.

Any surplus soil not suitable for re-use as a by-product and other waste materials arising from the Construction Phase will be removed offsite by an authorised contractor and sent to the appropriately authorised (licensed/permitted) receiving waste facilities. As only authorised facilities will be used, the potential impacts at any authorised receiving facility sites will have been adequately assessed and mitigated as part of the statutory consent procedures.

Any waste soils will be transported under a valid waste collection permit issued under the Waste Management (Collection Permit) Regulations 2007, as amended and will be delivered to an appropriately authorised waste management facility.

Materials and waste will be documented prior to leaving the site. All information will be entered into a waste management register kept on the site.

Vehicles transporting material with potential for dust emissions to an offsite location shall be enclosed or covered with a tarpaulin at all times to restrict the escape of dust.

Public roads outside the site shall be regularly inspected for cleanliness, as a minimum on a daily basis, and cleaned as necessary. A road sweeper will be deployed to ensure that public roads are kept free of debris.

The wheels of all lorries will be cleaned prior to leaving the site so that traffic leaving the site compound will not generate dust or cause the build-up of aggregates and fine material in the public domain.

3.8.1.4 Importation of Aggregates

Contract and procurement procedures will ensure that all aggregates and fill material required are sourced from reputable suppliers operating in a sustainable manner and in accordance with industry conformity and compliance standards and statutory obligations.

The importation of aggregates will be subject to management and control procedures which will include testing and assessment of the suitability for use in accordance with engineering and environmental specifications for the Proposed Development including the suitability of material that may be imported in accordance with an Article 27 By-Product Notification. Therefore, any unsuitable material will be identified and avoided prior to importation to the site.

3.8.1.5 Handling of Chemicals and Fuel

Fuel, oils and chemicals used during construction are classified as hazardous.

Storage of hazardous fuel will be undertaken with a view to protecting any essential services (electricity, water etc.) and the receiving land, soil and geology environment.

Storage areas for any fuel, oils and chemicals will be bunded and clearly marked. Fuel will only be stored in the quantities required for emergency use and re-fuelling. All drums to be quality approved and manufactured to a recognised standard. If drums are to be moved around the site, they will be secured and moved on spill pallets. Drums will be loaded and unloaded by competent and trained personnel using appropriate equipment.

Oils and chemicals used and stored onsite will be sealed, secured and stored in a dedicated internally bunded chemical storage cabinet unit or inside concrete bunded areas to prevent any seepage to ground. The location of the site compound shall be marked within Cairn Homes boundary on the proposed Phase 2 section of the site. There will be clear labelling of containers so that appropriate remedial measures can be taken in the event of a spillage.

- Bunds will have regard to Environmental Protection Agency guidelines 'Storage and Transfer of Materials for Scheduled Activities' (EPA, 2004) and Enterprise Ireland. Best Practice Guide BPGCS005. Oil Storage Guidelines. All tank and drum storage areas will, as a minimum, be bunded to a volume not less than the greater of the following:
  - 110% of the capacity of the largest tank or drum within the bunded area; or
  - 25% of the total volume of substance that could be stored within the bunded area.
- Vehicle or equipment maintenance work will take place in a designated impermeable area within the site;
- Emergency response procedures will be put in place, in the unlikely event of spillages of fuels or lubricants;
- Spill kits including oil absorbent material will be provided so that any spillage of fuels, lubricants or hydraulic oils will be immediately contained;
- In the event of a leak or spill from equipment in the instance of a mechanical breakdown during operation, any contaminated soil will be removed from the Site and compliantly disposed off-site in accordance with waste management legislation and the procedures outlined in the CDWMP.
- Residual soil remaining onsite will be tested to validate that all potentially contaminated material has been removed. This procedure will be undertaken in accordance with industry best practice procedures and EPA guidelines including 'Guidance On The Management Of Contaminated Land And Groundwater At EPA Licensed Sites' (EPA, 2013);
- Site staff will be familiar with emergency procedures for in the event of accidental fuel spillages;
- All staff onsite will be fully trained on the use of equipment to be used onsite; and
- Portable generators or similar fuel containing equipment will also be placed on suitable drip trays or bunds.

Refuelling of plant and vehicles during the Construction Phase will only be permitted at designated refuelling station locations onsite. Each station will be fully contained and equipped for spill response and a specially trained and dedicated Environmental and Emergency Spill Response team will be appointed by the Contractor before the commencement of works onsite.

A procedure will be drawn up which will be adhered to during refuelling of onsite vehicles. This will include the following:

- Fuel will be delivered to plant onsite by dedicated tanker;
- All deliveries to onsite vehicles will be supervised and records will be kept of delivery dates and volumes;
- The driver will be issued with, and will carry at all times, absorbent sheets and granules to collect any spillages that may accidentally occur;
- Where the nozzle of a fuel pump cannot be placed into the tank of a machine then a funnel will be used; and
- All re-fuelling will take place in a designated impermeable area. In addition, oil absorbent materials will be kept onsite in close proximity to the re-fuelling area.

3.8.1.6 Concrete Works

The cementitious grout used during the construction of the basement drainage channels and connections to the unnamed streams and Greystone Stream in the vicinity of the site, will avoid any contamination of ground through the use of appropriate design and methods implemented by the Contractor and in accordance with industry standards.

All ready-mixed concrete shall be delivered to the site by truck. Concrete mixer trucks will not be permitted to wash out onsite with the exception of cleaning the chute into a container which will then be emptied into a skip. A suitable risk assessment for wet concreting shall be completed prior to works being carried out.

3.8.1.7 Monitoring

During construction phase the following monitoring measures will be considered:

- Inspections and monitoring will be undertaken during excavations, piling and other groundworks to ensure that any geotechnical design measures are implemented and effective to prevent instability of soils during groundworks and piling.
- Routine monitoring and inspections will be undertaken during refuelling, concrete works to ensure no impacts and compliance with ameliorative, remedial and reductive measures.

- Monitoring and site audits will be undertaken daily by the contractor to check for any detectable nuisances such as, noise (see Section 4.7.1 for noise and vibration limits), dust (see Section 4.5.1.4 for dust monitoring requirements) or other such issues associated with excavation and offsite removal of soil.
- Materials management and waste audits will be carried out at regular intervals to monitor the following:
  - management of surplus soils onsite and for removal offsite,
  - record keeping,
  - traceability of all materials, surplus soil and other waste removed from the site and
  - ensure records are maintained of material acceptance at the end destination.

3.9 Water Quality

3.9.1 Environmental Control Measures

This section summarises the mitigation measures necessary for the Contractor to minimise impacts and monitor effects upon the water environment during construction. In order to do this, the Contractor shall be responsible for managing its construction activities and those of any sub-contractors under its control.

For each of the potential sources of an environmental impact on the groundwater, the Contractor shall identify the control and protection measures to be implemented.

3.9.1.1 Control and Management of Water

Groundwater will be encountered during the construction works in particular the basement excavation and cut sections along the western boundary. All excavations will be encompassed by secant pile wall or other specified by the engineer or contractor around the basement excavation to allow dewatering and dry excavation. Robust dewatering methodologies will be developed as part of the detailed design to minimise the potential impact on the local groundwater flow regime within the soil and subsoil associated receptors (e.g. springs, water courses and habitats) at the site and to prevent any impact for habitats and receptors along site boundaries and offsite that could arise from dewatering. This could include the requirement for discharge of groundwater downgradient of the dewatering works area to minimise any hydrogeological impact on sensitive receptors.

Surface water or groundwater encountered throughout the Construction Phase of the Proposed Development will not be discharged to water courses.

Discharge of groundwater to ground may be required as part of the dewatering methodology and will be undertaken in accordance with the EPA (2011) ‘Guidance on the Authorisation of Discharges to Groundwater’.

Where necessary the water will be treated onsite to remove sediment or other potentially contaminating compounds. The treated water will be tankered offsite or discharged to foul sewer only under licence from Irish Water (IW). Straw bales or silt fences will be appropriately located near watercourses to help prevent untreated surface and surface water runoff entering any watercourse. A buffer zone of 10m will be maintained between the silt trap and the watercourse with natural vegetation left intact. The Contractor is to ensure that no contaminated water/liquids leave the Proposed Development Site (as surface water and surface water run-off or otherwise), enter the local drainage system or direct discharge drainage ditches or water courses or springs.

A regular review of weather forecasts of heavy rainfall will be conducted, and a contingency plan will be prepared for before and after such events to minimise any potential nuisances. As the risk of the break-out of silt laden run-off is higher during these weather conditions, no work will be carried out during such periods where possible.

Any erosion control measures (i.e. silt-traps, silt-fencing and swales) will be regularly maintained during the Construction Phase.

Where water must be pumped from the excavations, water will be managed through robust dewatering and water treatment methodologies in accordance with best practice standards (CIRIA – C750) and regulatory consents. Water will not be discharged to open water courses and will be disposed via temporary connection to foul sewer or tinkered offsite.

There will be no direct discharge of surface runoff or groundwater from the Proposed Development Site to surface water. Water from the works will be discharged into the public sewer in accordance with the necessary consent from IW. Any such discharge licence is likely to be subject to conditions regarding the flow (rates of discharge, quantity etc.); effluent quality prior to discharge and pre-treatment (e.g. settlement/filtration, hydrocarbon separation etc.) and monitoring requirements.

A monitoring programme will be implemented to ensure that water quality criteria set out in the discharge licence are achieved prior to discharging to the sewer. The monitoring programme shall be designed by an appropriately qualified Environmental Consultant. Groundwater level monitoring prior to construction as part of the detailed design stage should be undertaken.

3.9.1.2 Management and Control of Works Adjoining Water Courses and Instream

All open water bodies adjacent to areas of proposed works will be protected by fencing including settlement ponds.

A 10m buffer is to be retained on either side of the Greystones Stream and the other streams, springs and water courses at the Proposed Development Site and construction works and site traffic will only be permitted within this 10m buffer to facilitate instream works to enable construction of the outfalls, culvert road crossing sections of the Greystones Stream.

All instream works or works carried out adjacent to the watercourse, will follow the guidelines published by Inland Fisheries Ireland (IFI) Guidelines on Protection of Fisheries during Construction Works in and Adjacent to Waters (2016) and The National Roads Authority (now Transport Infrastructure Ireland) Guidelines for the Crossing of Watercourses during the Construction of National Road Schemes.

If temporary crossings are to be constructed, they must be constructed to prevent any erosion of sediment of other potential contamination of surface water taking account of the following:

- The approach and departure routes to temporary crossing structures will be designed and installed so that drainage will fall away from the water course being crossed.
- Temporary crossing structures will be covered or fenced with terram or similar material to prevent wind blow carrying dusts and other potentially polluting matter to the water course.
- Side armour will be provided on temporary crossing structures to ensure machinery cannot drive over its edge or force the discharge of material from the bridge deck to the water course.
- Temporary crossings will not be repositioned where these are not of a clear span.
- The creation of fords on rivers through the introduction of stone is prohibited and will not be undertaken.
- There must be no significant alteration to hydraulic flow within the water course.
- Instream machine works should be minimised, and any machines working in the watercourse must be protected against leakage or spillage of fuels, oils, greases and hydraulic fuels.
- Instream earthworks must be executed so as to minimise the suspension of solids.
- When cofferdams are being kept dry by pumping, the discharge must be routed to an approved settlement facility before return to the river.
- Every care must be taken to insure against spillage of concrete or leakage of cement grout within cofferdams.

3.9.1.3 Concrete Works

The use of cementitious grout used during the construction of the basement, piling, drainage and other infrastructure that could result in potential impacts on water quality will be avoided through appropriate design and construction methods that will be implemented by the appointed contractor. The construction methods used by the contractor shall be in accordance with industry standards to prevent impact on groundwater and surface water quality, such as the use of water compatible grout.

If cast-in-place concrete is required, all work must be carried out in dry conditions and be effectively isolated from any water courses or drainage ditches. Pouring of concrete for aprons, sills, and other works should be carried out in dry conditions and allowed cure for 48 hours before re-flooding. Pumped or tremied concrete should be monitored carefully to ensure no accidental discharge into the watercourses. Concrete works for in-stream works must be carried out in accordance with the procedures outlined in Section 3.9.1.2.

The foundation design including the requirement for raft, pad or strip or piled foundations will be determined at detailed design stage. The foundation design and detailed design for other structures (e.g. basement) that may come in contact with water in particular groundwater will include measures as part of the detailed design and contractors method to prevent any potential impact on water quality.

All ready-mixed concrete shall be delivered to the Proposed Development Site by truck. Concrete mixer trucks will not be permitted to wash out onsite with the exception of cleaning the chute into a container which will then

be emptied into a skip for appropriate compliant removal offsite. A suitable risk assessment for wet concreting shall be completed prior to works being carried out. Daily audits of concrete washouts shall be carried out and documented on site, these shall be available for inspection upon requests.

3.9.1.4 Importation of Soil and Aggregates

Contract and procurement procedures will ensure that all aggregates and fill material required are sourced from reputable suppliers operating in a sustainable manner and in accordance with industry conformity and compliance standards and statutory obligations.

The importation of aggregates will be subject to management and control procedures which will include testing and assessment of the suitability for use in accordance with engineering and environmental specifications for the Proposed Development including the suitability of material that may be imported in accordance with an Article 27 By-Product Notification. Therefore, any unsuitable material will be identified and avoided prior to importation to the site.

3.9.1.5 Stockpile Management

Stockpiled soil and stone materials pending removal offsite or reuse onsite will be located in in designated areas only and there will be no storage of materials within 10m of any surface water features/drainage ditches etc. Where necessary, stockpiles will be surrounded with silt fencing to filter out any suspended solids from surface water arising from these materials.

3.9.1.6 Handling of Fuels and Hazardous Materials

Fuel, oils, and chemicals used during construction are classified as hazardous.

Storage of fuel hazardous will be undertaken with a view to protecting any essential services (electricity, water etc.) and the receiving land, soil and geology environment.

Bulk quantities of fuel will not be stored at the site and re-fuelling will take place offsite.

Storage areas for any fuel, oils and chemicals will be bunded and clearly marked. Fuel will only be stored in the quantities required for emergency use and re-fuelling. All drums to be quality approved and manufactured to a recognised standard. If drums are to be moved around the site, they will be secured and moved on spill pallets. Drums will be loaded and unloaded by competent and trained personnel using appropriate equipment.

Oils and chemicals used and stored onsite will be sealed, secured and stored in a dedicated internally bunded chemical storage cabinet unit or inside concrete bunded areas to prevent any seepage to ground. The location of the site compound shall be marked within Cairn Homes boundary on the proposed Phase 2 section of the site. All storage areas should be located away from drainage and watercourses. There will be clear labelling of containers so that appropriate remedial measures can be taken in the event of a spillage.

- Bunds will have regard to Environmental Protection Agency guidelines ‘Storage and Transfer of Materials for Scheduled Activities’ (EPA, 2004) and Enterprise Ireland. Best Practice Guide BPGCS005. Oil Storage Guidelines. All tank and drum storage areas will, as a minimum, be bunded to a volume not less than the greater of the following:
  - 110% of the capacity of the largest tank or drum within the bunded area; or
  - 25% of the total volume of substance that could be stored within the bunded area.
- Vehicle or equipment maintenance work will take place in a designated impermeable area within the site;
- Emergency response procedures will be put in place, in the unlikely event of spillages of fuels or lubricants;
- Spill kits including oil absorbent material will be provided so that any spillage of fuels, lubricants or hydraulic oils will be immediately contained;
- In the event of a leak or spill from equipment in the instance of a mechanical breakdown during operation, any contaminated soil will be removed from the site and compliantly disposed offsite. Residual soil will be tested to validate that all potentially contaminated material has been removed. This procedure will be undertaken in accordance with industry best practice procedures and EPA guidelines including ‘Guidance On The Management Of Contaminated Land And Groundwater At EPA Licensed Sites’ (EPA, 2013);
- Site staff will be familiar with emergency procedures for in the event of accidental fuel spillages;
- All staff onsite will be fully trained on the use of equipment to be used onsite; and
- Portable generators or similar fuel containing equipment will also be placed on suitable drip trays or bunds.

Refuelling of plant and vehicles during the Construction Phase will only be permitted at designated refuelling station locations onsite. The location of the designated refuelling station shall be within the Contractor's compound. Each station will be fully contained and equipped for spill response and a specially trained and dedicated Environmental and Emergency Spill Response team will be appointed by the Contractor before the commencement of works onsite.

A procedure will be drawn up which will be adhered to during refuelling of onsite vehicles. This will include the following:

- Fuel will be delivered to plant onsite by dedicated tanker;
- All deliveries to onsite vehicles will be supervised and records will be kept of delivery dates and volumes;
- The driver will be issued with, and will carry at all times, absorbent sheets and granules to collect any spillages that may accidentally occur;
- Where the nozzle of a fuel pump cannot be placed into the tank of a machine then a funnel will be used; and
- All re-fuelling will take place in a designated impermeable area. In addition, oil absorbent materials will be kept onsite in close proximity to the re-fuelling area.

3.9.1.7 Boreholes and Piling

Existing site investigation boreholes/monitoring wells and supply wells (PW1) that are no longer required at the Site will be decommissioned in accordance with the specifications outlined in EPA Advice Note 14 (EPA, 2013). This will remove any potential direct conduit for contaminants to enter the groundwater directly.

During piling including bored piles or driven, there is a potential to introduce surface contaminants (by pushing down through the strata) or provide a potential conduit to groundwater for contaminations including existing surface materials or drilling fluids used in piling.

The piling method will include procedures to ensure any potential impact to water quality is prevented including preventing surface runoff or other piling/drilling fluids from entering the pile bores. Where there is a requirement to use lubricants, drilling fluids or additives the contractor will be required to use water-based, biodegradable and non-hazardous compounds.

3.9.1.8 Welfare Facilities

Welfare facilities have the potential, if not managed appropriately, to release organic and other contaminants to ground or surface water courses. All waste from welfare facilities will be managed in accordance with the relevant statutory obligations through either a temporary connection to mains foul sewer (subject to receipt of the relevant consent from IW) which will be constructed in accordance with IW and WCC guidelines or by tankering of waste offsite by an appropriately authorised contractor.

3.9.1.9 Monitoring

During the construction phase the following monitoring measures will be considered:

- Inspections and monitoring will be undertaken during excavations, piling and other groundworks to ensure that measure that are protective of water quality are fully implemented and effective.
- Discharges to sewers will be monitored where required in accordance with statutory consents (discharge licence).
- Monitoring and inspection of water courses will be undertaken at a frequency to be agreed with Wicklow County Council in advance of construction. Should a pollution event occur, corrective or preventative action will be taken and shall be reported to the site manager and the client who will in turn contact the appropriate authorities (should this be required).
- Monitoring of the in-stream works by an appropriately qualified Environmental Clerk of Works will be undertaken and key stages of the works. Monitoring of water courses will be undertaken during the works.
- Routine monitoring and inspections during refuelling, concrete works to ensure no impacts and compliance with ameliorative, remedial and reductive measures.
- Materials management and waste audits will be carried out at regular intervals to monitor the following:
  - management of soils on site and for removal offsite,
  - record keeping,

- traceability of all materials, surplus soil and other waste removed from the site and
- ensure records are maintained of material acceptance at the end destination.

3.10 Air Quality

3.10.1 Environmental Control Measures

3.10.1.1 General Air Quality Measures

The Contractor will be required to implement measures to minimise the amount of dust and emissions (including odour) produced during the construction of the Proposed Development. There will be a Duty of Care on the Contractor to ensure that dust-raising activities are located away from sensitive receptors wherever possible, such as nesting birds and residential dwellings as much as feasibly possible and duration kept to a minimum when in proximity to a receptor/activity.

The Contractor shall follow the relevant mitigation measures that are outlined below, within the EIAR, outlined within relevant legislation, policy and guidance documents and any updated or new supplementary environmental reports made available to the Contractor as necessary, statutory authority requirements and any additional mitigation measures from the planning consent document.

The important aspects of air quality mitigation include:

- The assignment of responsibility for dust and emissions (including odour) management to an individual member of the Contractor's team (i.e. Construction Environmental Site Manager).
- Training site staff to understand the importance of the issue.
- Communicating with the local community (as necessary).
- Regular site inspections shall be undertaken by the Contractor's Construction Environmental Site Manager to monitor compliance with the CEMP and record inspection results.
- Works shall be planned to take into account the location of sensitive receptors, sensitive core activities associated with operation of other businesses, local topography, wind direction and any potential sources of pollution.
- Discussion with the Client shall be undertaken at an early stage by the Contractor to determine any specific monitoring requirements and to agree to any proposed trigger/action levels.

3.10.1.2 Vehicle and Plant Emissions

Emissions to the atmosphere, in terms of gaseous and particle pollutants from vehicles and plant used on-site, should be controlled and limited, as far as reasonably practicable, using measures and appropriate control techniques as listed below:

- The engines of all vehicles and plant onsite should not be left running unnecessarily (i.e. idling) to minimise exhaust emissions (and noise).
- Vehicles and plant shall adhere to applicable emissions standards.
- Plant, equipment and emission control apparatus shall be selected to minimise the engine exhaust emissions, taking into consideration economic constraints and practicability.
- Enclosed vehicles or tarpaulins shall be used to transport debris, aggregates, and fine materials to and from the site to prevent blow-off of such materials.
- Vehicles and plant shall be in good working order and certified where applicable, with servicing completed in line with manufacturer's recommendations. Records of servicing shall be maintained and visual checks carried out to ensure that black smoke is not emitted at times other than at ignition.
- Haul routes and plant shall be situated and operated away from sensitive receptors and sensitive core activities associated with operation of other businesses (where possible).
- The use of diesel or petrol-powered generators shall be minimised, with mains electricity or battery powered equipment used as an alternative (where feasible).
- Unnecessary vehicle movement and manoeuvring will be avoided, and speed limits will be in place so as to prevent resuspension of particulate matter.

- Exhaust emissions of volatile organic compounds, nitrogen oxides, and sulphur oxides from vehicles and machinery will be minimised by avoidance of engines running unnecessarily as idle engines shall not be permitted for excessive periods.
- Maximise energy efficiency, which may include using alternative modes of transport, maximising vehicle utilisation by ensuring full loading and efficient routing.

3.10.1.3 Control of Dust

3.10.1.3.1 Generation of Dust

As with most new builds, a significant proportion of pre-made elements will be brought to the site which reduces the potential for dust emissions. Similarly, typical dust generation sources such as batch concreting is not likely to be carried out. Pre-mixed concrete will be brought to site.

The following measures shall be implemented to ensure that dust generation is minimised. The principal objective of measures with regards to dust is to ensure that dust emissions do not cause significant dust soiling on nearby residential receptors:

- Stockpiles of soil and sub-soil and activities potentially giving rise to soil erosion shall be strictly controlled and maintained as low as possible.
- Material handling systems and site stockpiling of materials will be designed and laid out to minimise exposure to wind and shorten the length of time for which material will be stockpiled.
- Stockpiled material shall be located away (>10m) from surface water features/drainage ditches.
- The construction compound area shall have hard standing areas to minimise dust generation from wind-blow.
- Hard surfaced areas shall be swept regularly to remove mud and aggregate materials.
- In order to minimise the potential for wind-generated emissions from material storage bays, these bays shall be oriented away from the dominant wind direction (west-southwest) to minimise the effects of wind on release of dust and particulate.
- Fixed and mobile water sprays shall be used to control dust emissions from material stockpiles and road and yard surfaces as necessary in dry and/or windy weather.
- Watering can be utilised to keep unpaved areas moist, preventing dust generation. The required application frequency will vary according to soil type, weather conditions and vehicular use.
- Dust suppression techniques will include employment of water bowsers to dampen the site and haul roads, and temporary ceasing of specific operations during unfavourable weather conditions.
- A wheel-wash shall be available to trucks exiting the site where necessary and used to reduce mud deposition on local roads.
- Public roads should be inspected on a daily basis (at a minimum) for cleanliness and cleaned as necessary in order to avoid causing a hazard to road users.
- Daily visual observations will be made on fugitive dust levels; in the event of high dust levels, operations giving rise to such emissions will be ceased or curtailed.
- A daily inspection programme shall be formulated and implemented in order to ensure that dust control measures are inspected to verify effective operation and management. Daily visual observations will be made on fugitive dust levels; in the event of high dust levels, operations giving rise to such emissions will be ceased or curtailed.
- A communication programme with local residents shall be implemented and shall include:
  - Designation of a responsible person for dust management;
  - Signage displaying contact numbers for person responsible for dust management on the Proposed Development Site;
  - A complaints logbook or record shall be maintained on site detailing nature of complaint, preventative and corrective actions taken and close-out communication with complainant.

3.10.1.3.2 Site Fires

No fires are permitted on site.

3.10.1.4 Monitoring

The monitoring of construction dust during the Construction Phase of the Proposed Development will be carried out to ensure that impacts are not experienced beyond the site boundary. Monitoring of dust can be carried out by using the Bergerhoff Method. This involves placing Bergerhoff Dust Deposit Gauges at a strategic locations along the site boundaries for a period of 30 +/- 2 days. The selection of sampling point locations should be carried out in consideration of the requirements of VDI 2119 with respect to the location of the samplers relative to buildings and other obstructions, height above ground, and sample collection and analysis procedures. After the exposure period is complete, the Gauges should be removed from the site; the dust deposits in each Gauge will then be determined gravimetrically and expressed as a dust deposition rate in mg/m2/day in accordance with the relevant standard.

3.11 Climate Factors

There is the potential for a number of greenhouse gas emissions to be emitted into the atmosphere during the construction of the development. Construction vehicles, generators etc., may give rise to CO_2 and N_2O emissions. Site-specific mitigation measures will be implemented during the construction phase of the Proposed Development to ensure emissions are reduced further, such as:

- Vehicles and plant are serviced routinely, rather than just following breakdowns
- Exhausts should be positioned at a height to ensure adequate local dispersal of emissions
- Best practice measures will be implemented to minimise exhaust emissions from construction vehicles and machinery. All plant not in operation shall be turned off to avoid engines running unnecessarily, and idling engines shall not be permitted for excessive periods

All proposals for development shall seek to achieve the greatest standards of sustainable construction and design and will have regard to sustainable building design criteria.

3.12 Noise and Vibration

Noise and vibration may arise from a wide variety of sources during construction and to varying degrees during the course of the works, depending upon the stage of construction (i.e. ground works, tarmacking etc.).

The Contractor shall identify potential sources of noise and vibration from selected plant and equipment and from activities that will be carried out during the works. This shall also include offsite noise and vibration generation from road traffic directly associated with the works (e.g. deliveries to the Proposed Development Site, waste transportation from the Proposed Development Site, etc.).

3.12.1 Environmental Control Measures

The following noise and vibration management measures shall apply to the Proposed Development to ensure the threshold values are complied with:

- A Site Representative shall be appointed for matters related to noise and vibration.
- Any complaints received shall be thoroughly investigated and corrective or preventative action taken where validated.
- A written complaints log shall be maintained by the Site Representative. This shall, at a minimum, record complainant's details (where agreed) the date and time of the complaint, details of the complaint including where the effect was observed, corrective and preventative actions taken and any close-out communications. This will ensure that the concerns of local residents who may be affected by site activities are considered during the management of activities at the site.
- Noise monitoring with capability for real-time review both onsite and remotely shall be conducted at nearby noise sensitive receptors (NSRs) throughout the site development and construction phases. The equipment shall be moved as appropriate depending on location of works and proximity to nearby NSRs.
- In the event of exceedance of the limits, onsite or at NSRs, works shall be ceased and measures implemented immediately to ensure that the limits are complied with.
- Temporary acoustic screening shall be placed along the boundaries with NSRs at Waverly, the gate lodge and the existing landowners' residential dwellings where works take place close to the boundary. Temporary screening will be used to break the "line of sight" from the sources to the ground floor windows of the nearest NSRs where possible.

- The operation of certain pieces of equipment, where substitution etc cannot be carried out shall be managed through monitoring and timing of use to ensure that the threshold values/criteria specified are complied with.
- During the construction phase all equipment shall be required to comply with noise limits set out in EC Directive 2000/14/EC and the 2005/88/EC amendment on the approximation of the laws of the Member States relating to the noise emission in the environment by equipment for use outdoors. The directive covers equipment such as compressors, welding generators, excavators, dozers, loaders and dump trucks.

A conservative approach to assessing piling noise was undertaken. However, the final piling method chosen shall include a consideration of low noise and vibration methods.

As a precautionary measure, vibration monitoring shall be carried out where works are in close proximity to NSRs especially during piling. In this regard, test monitoring will be conducted with the equipment on at low levels before increasing incrementally to operational levels if deemed necessary. Works will be ceased and mitigation measures implemented where monitoring detects vibration levels associated with the works above the relevant guidance values. The location of NSRs is indication on Figure 1.

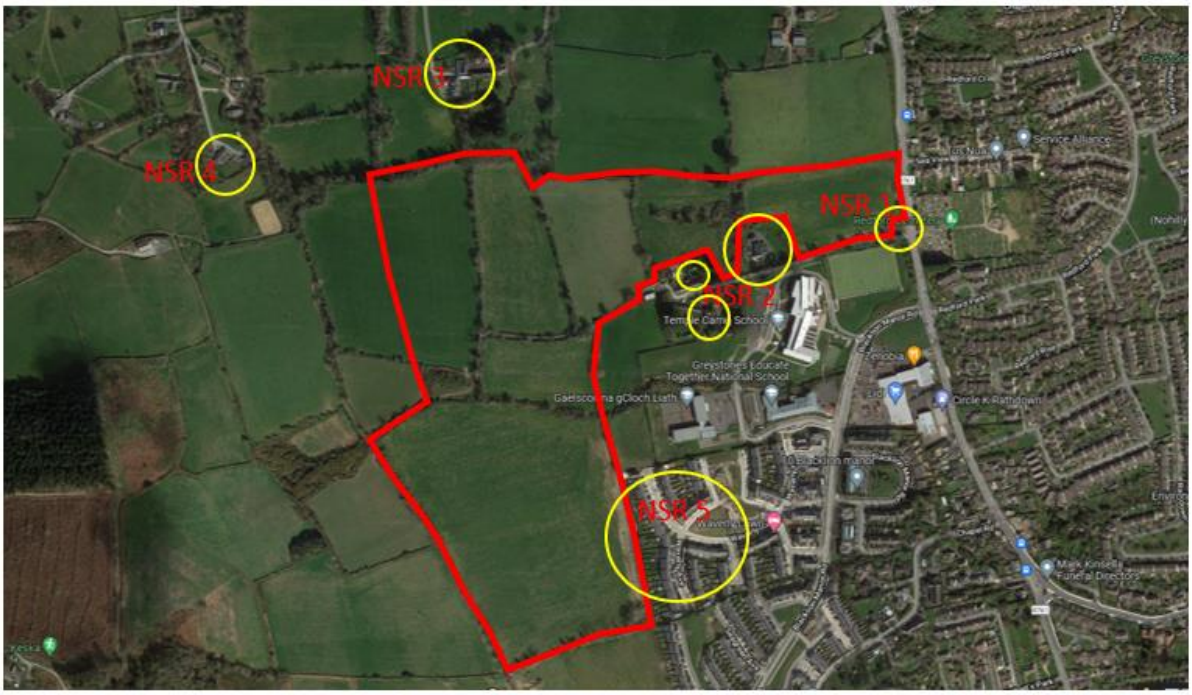


Figure 1 Nearest Noise Sensitive Receptors

Vibration impacts can typically potentially occur during site development and construction works through the use of equipment such as rock breakers or piling. Vibration can affect both human beings and buildings. Accordingly, there are separate criteria for both.

Guidance relevant to the protection of building structures is contained in the following documents:

- British Standard BS 7385: 1993: Evaluation and measurement for vibration in buildings Part 2: Guide to damage levels from ground borne vibration, and;
- British Standard BS 5228: 2009+A1 2014: Code of practice for noise and vibration control on construction and open sites – Part 2: Vibration.

BS7385-2 and BS5228-2 contain similar guidance relating to building damage criteria. The standards note that the risk of cosmetic damage to residential buildings starts at a Peak Particle Velocity (PPV) of 15mm/s at 4Hz rising to 20mm/s at 15Hz and 50mm/s at 40Hz and above for unreinforced or light framed structures. The standard also notes that below 12.5mm/s PPV the risk of damage tends to zero. This is for transient or intermittent vibrations. The criteria should be reduced by half for more sustained or continuous vibration which may occur during activities such as piling.

Human being responses to vibration typically occur well below the order of magnitude for building damage. BS5228-2 also provides the following range of vibration values and associated potential effects on humans:

Table 2. Vibration Criteria – Human Beings

Vibration Level mm/sec PPV	Effect
0.14	Vibration might just be perceptible in the most sensitive in the most sensitive situations for most vibration frequencies.
0.3	Vibration might just be perceptible in residential environments.
1	A vibration level of this magnitude is likely to cause complaint.
10	Vibration is likely to be intolerable for any more than a very brief exposure to this level.

BS6472:2008 Guide to evaluation of human exposure to vibration in buildings: Part 1: Vibration sources other than blasting also provides guidance in terms of vibration dose value (VDV) where time varying exposure is likely. The daytime dose values relative to the likelihood of adverse comment are presented in Table 3 below. VDV measurements can be used for transient, intermittent and continuous vibration monitoring.

Table 3. Applicable Vibration Dose Values

Building Type	Low probability of adverse impact	Adverse comment possible	Adverse comment probable
	VDV (m/sec-1.75)		
Residential building - day	0.2 - 0.4	0.4 – 0.8	0.8 – 1.6

PPV (Table 2) criteria are more commonly used on construction sites based upon the more usual concern of damage to buildings.

The main potential source of vibration during the construction programme is associated ground-breaking activities. It is anticipated that excavations will be made using standard excavation machinery, which typically do not generate appreciable levels of vibration close to the source.

3.12.1.1 Monitoring

Real-time and continuous construction noise monitoring at locations representative of the closest NSRs shall be conducted throughout all development stages to ensure that the relevant criteria are not exceeded. Test vibration monitoring shall be conducted as a precautionary measure where equipment is operated close to the boundaries with receptors (<50m) to ensure that limits are not exceeded at the nearest sensitive receptors.

3.13 Landscape and Visual Impact

3.13.1 Environmental Control Measures

The following mitigation measures will be implemented:

- Height of temporary stockpiles to be restricted to a practicable minimum to avoid impact on local sensitive receptors.
- Hoarding will be erected around site boundaries to reduce visual impact of construction works
- Plant will be held in designated compound on site
- Protective fencing will be installed around the Root Protection Areas (RPAs) of existing boundary trees and tree lines particularly to the tree groups identified to the east of the site.
- Visual impacts during the construction phase will be mitigated somewhat by appropriate site management measures and work practices to ensure the site is kept tidy, dust is kept to a minimum, and that public areas are kept free from building material and site rubbish.
- Appropriate site hoardings will be put in place around the perimeter of the site where required to minimise the landscape and visual impact.
- The existing topography, which has informed the design in terms of the overall urban structure, arranging the different housing cells and road alignments according to the ground contours. This principle enables to minimise ground works during construction.

3.13.1.1 Monitoring

In order to ensure the landscape design outlined and illustrated within this planning application is implemented in accordance with best practice, detailed documents for the tender and construction stages (which will be based on

and comply with the drawings and details set out in this planning application), including drawings and specifications, will be produced by a suitably qualified landscape architect. These drawings and documents will illustrate details and procedures for the proper implementation and execution of the scheme; these works will also be overseen be a suitably qualified landscape architect.

Before the commencement of construction, the tree protection measures outlined in the Arboricultural Report prepared by The Tree File Ltd. and specifically the measures outlined within Appendix A1 – Preliminary Arboricultural Method Statement of the report. A project arborist will be appointed to oversee the implementation of these protective measure outlined in this method statement and will supervise any related works at construction stage. The planting scheme will be fully implemented within the first planting season after the main construction works have been completed.

All completed landscape works outside the Taking In Charge areas will be subject to regular maintenance which will be outlined in a landscape management and maintenance plan by an appointed management company. Amongst other measures, this ongoing maintenance will consist of pruning of trees, the control of weeds, and the replacement of planting which has failed. The roads within the proposed development and the large area called 'The Park' on the eastern side of the proposed development will be taken in charge and maintained by WCC. Monitoring will be carried out on an ongoing basis to ensure overall quality and that the landscape strategy is implemented at each phase.

Monitoring of avoidance, remedial and mitigation measures is not relevant to the assessment of visual impacts on the built environment during construction or operational phase in the case of the subject application.

3.14 Archaeological and Cultural Heritage Considerations

3.14.1 Environmental Control Measures

A suite of proposed measures designed to mitigate the impacts of the Proposed Development has been drafted in consultation with the National Monuments Service. These proposed measures are outlined below.

- The northern 60% of Archaeological Area 1, will be preserved in-situ beneath public amenity greenspace within the development. To ensure the integrity of the archaeology, a Construction Exclusion Zone will be established around this area. This will be delineated by a 1m high post and sheep-wire fence at a minimum of 5m distant from the recorded remains. The fence will be removed upon completion of the construction phase of the project. This area will be precluded from use as a compound or stockpile area and no services or drainage runs will be installed within the Construction Exclusion Zone. This public amenity greenspace will be landscaped to ensure that the underlying archaeology is protected (see Figure 3 herein and Appendix 11.8, Monument Management Plan of the EIAR). The existing hedgerows will be retained. The existing Greystones Stream will be maintained – ensuring no substantive change to local hydrology (though some gorse thickets will be removed to improve the amenity value of the space). While additional native broadleaf planting will be carried out locally within the public amenity greenspace, a root barrier will first be set down 200mm below current ground level, leaving at least 200mm clearance over the level of the archaeology. This will comprise a water permeable, non-woven geotextile Terram Rootguard Barrier - Water Permeable, of polypropylene/polypropylene fibres with 18.0 tensile strength, 30 elongation and 3250 CBR puncture resistance. Mounds of up to 2m of imported topsoil will then be imported and installed to accommodate the areas of copse woodland. Significant root system won't surpass 2m and the root barrier will protect from any smaller rooting that makes it that deep (Figure 4 herein and Appendix 11.8 of the EIAR). All pathways installed within this area will be constructed as 'no-dig' features on formation layers of imported subsoil that will be laid over the current ground surface. The importation of topsoil for the tree planting and subsoil for the formation material for the 'no-dig' paths will be carried out using lightweight dump truck (8 tonnes) and lightweight mechanical excavator (5-8 tonnes). This work be carried out during a period when the ground is dry and the use of displacement mats will be considered should there be a requirement to track over any soft ground.

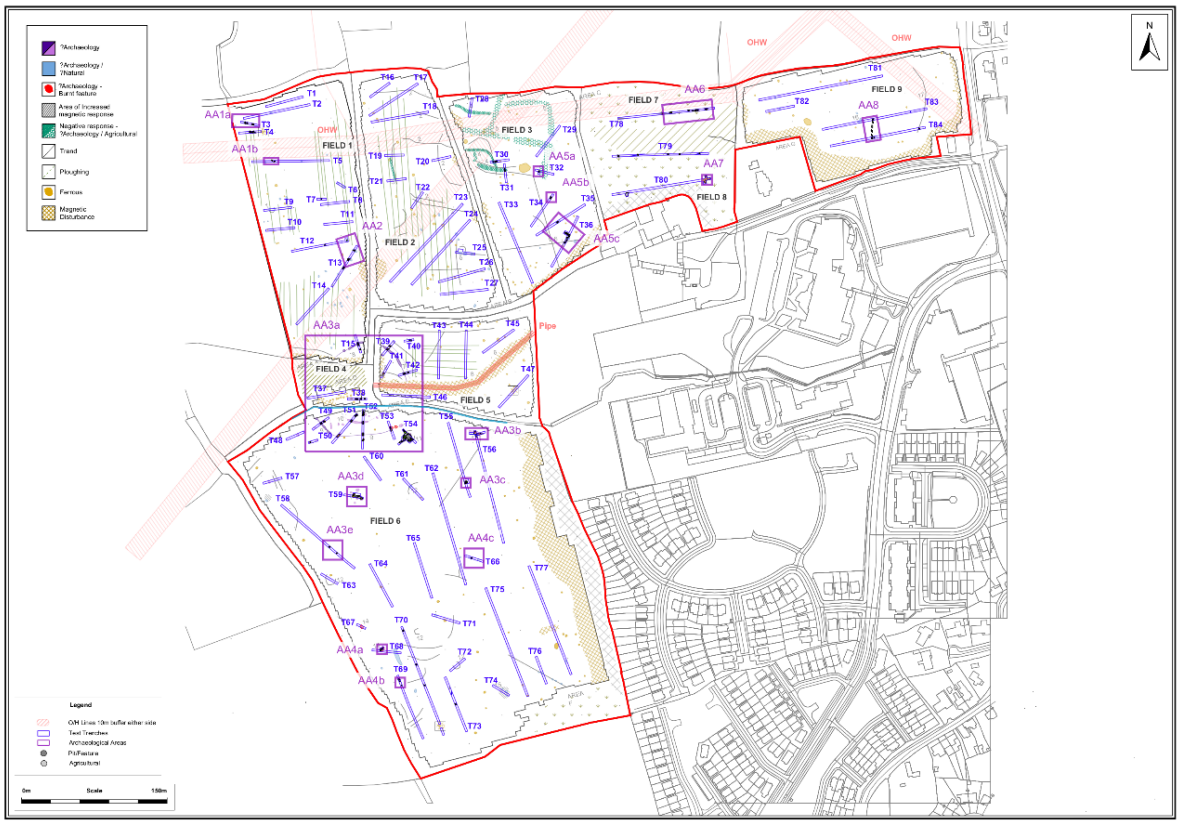


Figure 2 Plan indicating Archaeological Areas

Figure 3 Landscape plan, Archaeological Area 1 (see Appendix C)

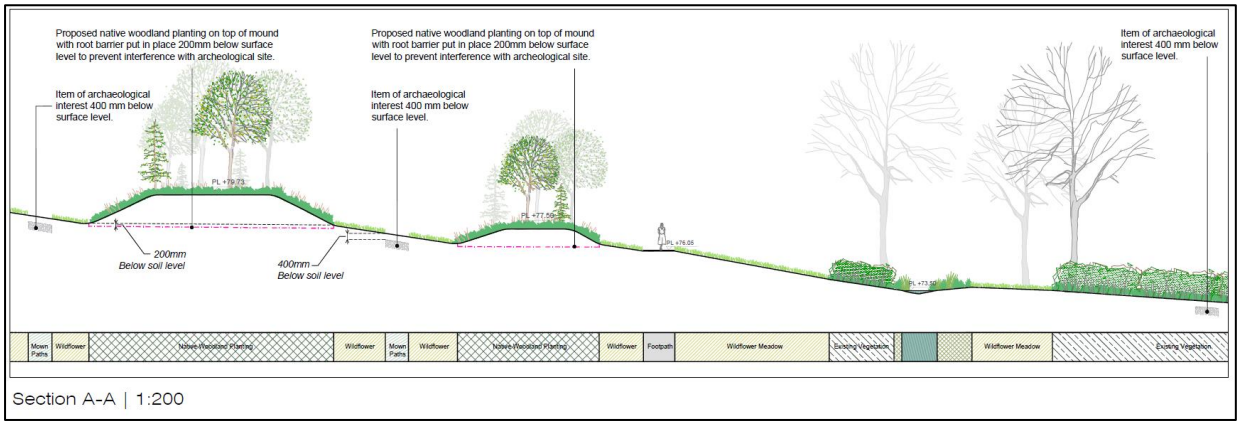


Figure 4 Section across proposed planting showing depth of root barrier and archaeology (see Appendix C)

- The southern 40% of Archaeological Area 1 and Archaeological Areas 2, 3a-e, 4a-b, 5a & b, 6, 7 and 8 will be preserved by record (archaeological excavation) in advance of construction activity (see Table 4 below). Preservation by record will be undertaken under licence to the National Monuments Service of the Department of Housing, Local Government and Heritage (DoHLGH), with work being undertaken in accordance with a pre-agreed methodology that would include detailed finds retrieval and environmental remains strategies.
- Archaeological monitoring of the topsoil stripping across the site will be undertaken in order to identify any archaeological features that have the potential to survive outside of the identified Archaeological Areas. While stockpiled soil may be managed with bulldozers, the removal of the topsoil across the site will be carried out using back acting 360 degree tracked excavators fitted with toothless grading buckets. If any features of archaeological potential are discovered during the course of the works further archaeological mitigation may be required, such as preservation in-situ or by record. Any further mitigation will require approval from the National Monuments Service of the DoHLGH.
- A Heritage Induction outlining the nature and significance of the archaeology within the Construction Exclusion Zone at Archaeological Area 1 will be a mandatory pre-start requirement for all contractors throughout the life of the project.
- Signage should be erected in order to identify the Construction Exclusion Zone as having archaeological sensitivity and to notify any personnel that access to the exempt lands is strictly forbidden.
- No construction plant or heavy vehicles with the exception of those detailed above, will be allowed to enter the Construction Exclusion Zone exclusion zone nor may any materials or plant be stored in this area.
- The above mitigation measures will be enshrined in and implemented through a CEMP.

Table 4. Archaeological Areas Identified During Test Excavations

AA No.	Description
AA 1	Testing at AA1 confirmed the presence of a partially disturbed, plectrum-shaped enclosure (possible original int. diameter: 95m x 90m). A smaller central, possibly oval enclosure (possible original int. diameter: 55m x 50m; see Figure 11.4) was also identified. Testing also confirmed the presence of internal features including slot trenches, pits, postholes and hearths. External features including hearths, gullies and a concentration of industrial activity probably associated with cereal drying activity were also identified. No diagnostic artefacts were retrieved but the form of the bi-vallate enclosure is suggestive of early medieval date, as with the nearby, though smaller, plectrum-shaped enclosure excavated at Farrankelly. However, an earlier origin cannot yet be ruled out, particularly in light of the nearby hillfort WI008-015 and the evidence for prehistoric activity at the subject site (see Archaeological Areas 2, 3, 5, 6, 7 and 8). Some areas of the enclosure appear to have been heavily disturbed/truncated by the installation of water pipes feeding from the stream at the east and the construction of the farm laneway at the west. The construction of the tree lined field boundaries, visible on the first edition OS mapping, and dividing the four fields will also have had an adverse impact on the enclosure ditches. While the outer enclosure ditch ranges in width from 2.5m to 4m, and the inner enclosure ditch from 2.1 to 3.2m, the relatively shallow nature of the ditches in areas investigated (outer: 0.84m-1m deep, inner: 0.76m), as well as the shallowness of some of the internal and external features (average depth 0.18m-0.3m), suggests the site has been truncated from prolonged agricultural activity.
AA 2a-c	Probable prehistoric activity was identified in this area. Evidence consists of troughs and pits associated with burnt mound activity along with pits and in-situ burning of unknown date

AA No.	Description
AA 3a-e	A burnt spread of probable prehistoric date was identified in this area. Other features identified included a slot trench windbreak surrounding in-situ burning, a possible kiln and various linear features and pits of unknown date.
AA 4a-b	Archaeological features identified in this area include an irregular pit with burnt bone and charcoal inclusions, a cluster of hearths and a pit of unknown date
AA 5a-c	Archaeological features identified in this area include a large pit with prehistoric pottery sherds along with pits, postholes and hearth features of prehistoric date.
AA 6	Archaeological features identified in this area include a potential field system of possible prehistoric date.
AA 7	Archaeological features identified in this area include probable prehistoric activity in the form of a burnt spread and trough.
AA 8	Archaeological features identified in this area include a pit and linear feature of possible prehistoric date.

3.14.1.1 Monitoring

Archaeological monitoring of the topsoil stripping across the site will be undertaken in order to identify any archaeological features that have the potential to survive outside of the identified Archaeological Areas. While stockpiled soil may be managed with bulldozers, the removal of the topsoil across the site will be carried out using back acting 360 degree tracked excavators fitted with toothless grading buckets.

Archaeological monitoring of the landscaping works at the site of the enclosure at Archaeological Area 1 will be archaeologically monitored to ensure that the installation of root barriers and importation of topsoil into the area is achieved without tracking across archaeologically sensitive areas or disturbing the ground.

A biennial inspection will be carried out, modelled on the inspections undertaken by the OPW, as stipulated in the Monument Management Plan. These inspections will be carried out by an archaeological contractor employed by the management agency and any issues, threats, deterioration or damage will be reported on.

3.15 Outline Construction Traffic Management Plan

A Construction Traffic Management Plan (CTMP) will be produced by the Contractor for the construction phase in order to minimise impacts upon construction operatives, the local community, residents and landowners directly affected by the works. This will include methods to address construction vehicle traffic routing, travel management and vehicle usage.

AECOM has prepared a Traffic and Transport Assessment (TTA), which sets out an Outline CTMP as reproduced in Sections 3.15.1 to 3.15.7 below. It will be the Contractor's responsibility to prepare a CTMP for the approval of WCC in advance of any works. The plan will outline the measures to be taken to minimise the impacts associated with the works on the surrounding local road network.

3.15.1 Policy Guidance

Guidance for the temporary control of traffic at road works to facilitate the safety of the public during the works is provided below:

- Traffic Signs Manual Chapter 8 Temporary Traffic Measures and Sign for Roadworks (2019);
- Traffic Management Guidelines, Department of Transport (2003); and
- Requirements of Wicklow County Council.

3.15.2 Likely Construction Programme & Phasing

The construction programme is expected to require approximately three years to complete from occupation of the site. The Proposed Development is outlined to be phased in its delivery to provide a scheme which does not adversely impact the local road network. The completion of the full development of the site will rely on the opening of the N11 link between the N11 and R761 via the Coolagad Link Street. The proposed phasing of the development is in accordance with Table 5 below.

Table 5. Proposed Programme of Phasing

Phase	Number of Units	Cumulative Units	Proposed Delivery Year
Phase 1	106	106	2023
Phase 2 and 3	191	297	2024
Phase 4 and 5	289	586	2025

3.15.3 Construction Route

To minimise construction impacts upon the surrounding road network, it is recommended that all construction traffic access and exits from the M11 Junction 5, then travels along the R761 before turning right into the Proposed Development site. This route is approximately 7.8 km in length and is shown via the red route in Figure 5. The alternative route recommended for construction traffic is along the M11 and continuing along the N11 until turning off onto the R762 at Delgany. Following the R762 until turning left on to the R761, then left into the site. This is approximately 14.7 km in length and is illustrated as the green route on the map below in Figure 5.

Figure 5 Proposed Construction Routing (Source: Google Maps)

3.15.4 Parking

All contractors' vehicles will park within the Proposed Development Site area, it is recommended that as part of the construction management plan the contactor designates an area within the confines of the site dedicated to operative car parking. There will be no parking permitted on the surrounding road network or estate roads by the contractor or site operatives.

3.15.5 Mitigation Measures

A construction management plan will be developed by the contractor prior to the commencement of work on site and will be prepared in consultation with WCC.

Construction debris particularly site clearance, spoil removal and dirty water run off can have a significant impact on footpaths and roads adjoining a construction site, if not adequately dealt with.

3.15.6 Hours of Operation

Site development and building works shall be carried out between the hours of operation recommended by WCC to safeguard the residential amenities of properties in the vicinity. The typical hours of operation are as follows:

- Monday to Friday, 7am – 7pm; no work Saturdays Sundays or Public holidays.

3.15.7 Traffic Management Measures

Below is a list of the proposed traffic management measures to be adopted during the construction works. Please note that this is not an exhaustive list, and that it will be the appointed Contractor's responsibility to prepare a detailed construction traffic management plan.

- Warning signs / Advanced warning signs will be installed at appropriate locations in advance of the construction access locations.
- 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.
- 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 road, unless proposed within a designated area that is subject to traffic management measures and agreed with WCC.
- 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 roads leading away from the construction works.
- Onsite wheel washing will be undertaken for construction trucks and vehicles to remove any debris prior to leaving the site, to remove any potential debris on the local roads.
- All vehicles will be suitably serviced and maintained to avoid any leaks or spillage of oil, petrol or diesel. Spill kits will be available onsite. All scheduled maintenance carried out offsite will not be carried out on the public highway.
- Safe and secure pedestrian facilities are to be provided where construction works obscure any existing pedestrian footways. 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 including mobility impaired persons.

The mitigation measures will therefore ensure that the presence of construction traffic will not lead to any significant environmental degradation or safety concerns in the vicinity of the proposed works. Furthermore, it is in the interests 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.

3.16 Material Assets – Waste

The Construction Phase will give rise to the requirement to remove and bring quantities of various materials to and from the site of the Proposed Development. Construction and demolition related wastes will be created during the Construction Phase.

A full CDWMP will be prepared in advance of site works beginning, and site clearance activities will occur in accordance with the CDWMP. An Outline CDWMP has been prepared by Enviroguide. An Operational Waste Management Plan (OWMP) has been prepared for the Proposed Development by Enviroguide Consulting (January 2022) and has been submitted with this planning application.

3.16.1 Environmental Control Measures – Waste

An Outline CDWMP has been produced by Enviroguide Consulting for the Proposed Development. The Outline CDWMP will be finalised into a CDWMP by the Contractor. The Contractor Shall adhere to the Outline CDWMP.

3.16.1.1 General Measures

The following mitigation measures will be undertaken during the Construction Phase of the Proposed Development regarding waste:

- Waste materials shall be separated at source and should follow the Construction & Demolition Waste Management Plan.
- Prior to commencement a detailed calculation on the quantities of topsoil, subsoil and green waste should be prepared, and soils should be tested to confirm they are clean, inert or non-hazardous.
- Beneficial use must be identified for the entirety of the excavated soil from the Proposed Development prior to its production for the excavated soil and stone to be considered as a by-product under Article 27.
- A suitably competent and fully permitted waste management company will be employed to manage all waste arising for the Construction Phase. The appointed waste contractor must have the relevant authorisations for the collection and transport of waste materials, issued by the National Waste Collection Permit Office (NWCPO).
- Similarly, all waste materials will be transported to an appropriately authorised facility, which must have the relevant authorisations for the acceptance and treatment of the specific waste streams, i.e., a Certificate of Registration (COR) or a Waste Facility Permit (WFP) as granted by a Local Authority, or a Waste/Industrial Emission Licence as granted by the Environmental Protection Agency.
- All waste quantities and types shall be recorded and quantified with records retained onsite for the duration of the Construction phase.

3.16.1.2 Monitoring

The excavated soil and stone will be classified in accordance with the methods described in Section 6 of the CDWMP – Waste Classification. Materials and waste generated during the Construction Phase will be carefully monitored by the Construction Environmental Site Manager, and/or an appointed Waste Officer, to ensure compliance with relevant local authority requirements and effective implementation of the CDWMP, including maintenance of waste documentation.

3.17 Material Assets – Utilities

The proposed utilities on the existing utility network includes the following infrastructure:

- Water Supply;
- Foul Water Drainage;
- Surface Water Drainage;
- Telecommunications;
- Natural Gas, and;
- Electricity Supply.

3.17.1 Environmental Control Measures – Utilities

A range of construction related mitigation measures are outlined below:

- Procedures for dewatering the site during construction works including licensing requirements, monitoring requirements and discharge points;
- Foul sewage arising from temporary toilets and sanitary facilities on the Project site will initially be discharged to an on-site cesspit which will require to be emptied on a regular basis. This arrangement will be in place until the sewage infrastructure is constructed and commissioned, at which point foul sewage can be transferred off-site via this main;
- Provision of grease traps at the canteen drain outlet and connection to the foul sewer;

- The site construction compound's potable water supply shall be located where it is protected from contamination by any construction activities or materials. Appropriate licences may be required to be obtained from WCC and Irish Water for abstraction of water and discharge to the foul sewer network;
- Prevention of silt pollution from the subject site shall be carried out by minimising the generation of silt-laden runoff. This will be achieved by the Contractor carefully planning the site works so that activities likely to generate silt-laden runoff are carried out during drier weather and erosion of surface soils and excavations is controlled;
- Stockpiles will be kept to a minimum, to control erosion areas of exposed ground. Stockpiles shall be minimised to reduce silty runoff and located well away from watercourses, drains and dewatering points. Stockpiles must not be higher than 2 m high in the case of topsoil and 3 m high in the case of other materials;
- Mud shall be controlled at entry and exits to the site using wheel washes and/or road sweepers, and tools and plant must be washed out and cleaned in designated areas. A wheel wash method statement will be drawn up by the contractor to include the appropriate treatment of wheel washings. This will be agreed in advance of construction with WCC;
- Daily visual checks will be undertaken of suspended solids in the stream;
- Topsoil strip areas to be kept to a minimum and phased during the planning and construction phase to reduce the amount of land exposed to prevent excessive overland flow and mobilisation of suspended solids;
- Storage of oils and diesel, along with the general maintenance and refuelling of plant, will be restricted to impermeable bunded areas with a minimum volume of 110% of the capacity of the largest tank/container within the bunded area or 25% of the total volume stored within the bund, whichever is greater, and away from surface waters or areas where any spillages could easily reach surface water;
- Drip trays will be utilised on site for pumps situated within 25m of the watercourse and spill kits will be available at these locations for the duration of the contract. Any used spill kits will be disposed of using a hazardous waste disposal contractor and in accordance with all relevant EU and Irish waste management legislation;
- Drip trays will be used underneath mobile plant and drums whilst in use on site;
- Refuelling of plant and machinery shall take place using a mobile fuel bowser and restricted to designated areas on hard standing. Only double bunded fuel bowsers shall be used. Vehicles must not be left unattended during refuelling operations;
- Leaking or empty oil drums shall be removed from the Project site immediately and disposed of via an appropriately licensed waste disposal contractor;
- Spill kits and oil absorbent material must be carried with mobile plant and located at vulnerable locations to reduce risk of spillages entering the sub-surface or groundwater environment. Booms shall be held on-site for works near drains or dewatering points. Any used spill kits will be disposed of using a hazardous waste disposal contractor and in accordance with all relevant EU and Irish waste management legislation;
- Fixed plant shall be self-bunded. Mobile plant must be in good working order, kept clean and fitted with drip trays where appropriate The Contractor will regularly inspect these drip trays and empty the contents into a treatment system. All water runoff from designated refuelling areas shall be channelled to an oil interceptor or an alternative treatment system prior to discharge;
- Care shall be taken whilst using shuttering oils when preparing formwork. This requires operatives to be trained in the proper handling of materials, the sensitive nature of the wider drainage system, and the consequences of accidental spillage;
- All hazardous substances on-site shall be controlled within enclosed storage compounds that shall be fenced off and locked when not in use to prevent theft and vandalism;
- Ready-mixed concrete will be brought to the Project site by truck. A suitable risk assessment for wet concreting will be completed prior to works being carried out which will include measures to prevent discharge of alkaline wastewaters or contaminated storm water to the underlying subsoil;
- The pouring of concrete will take place within a designated area to prevent concrete runoff into the soil/ groundwater media. Washout of concrete transporting vehicles chutes will only take place at a designated site wash out location. The washout of full vehicle drums is not permitted on the Project site;

- Equipment, and cleaning shall be washed-out on-site into a designated area that has been designed to contain wet concrete / wash waters (see PPG6 – Working at Construction and Demolition Sites). The washout facilities should be checked and maintained on a daily basis. A record of all checks and maintenance should be kept by the Contractor and should be available for inspection at any time. The washout facility must be in good condition, must not overflow or leak and must be easily accessible to the vehicle. pH of the wash waters should be checked regularly;
- Only concrete delivery truck chutes may be washed out at the designated concrete wash out location;
- Provision of additional surveys within the subject site to identify the full extent and status of the existing surface water drainage pipes and culvers.
- Liaison with Irish Water regarding the wastewater and water connections at construction stage. Currently Irish Water has issued the Statement of Design Acceptance and a Confirmation of Feasibility where there is capacity issues within the Treatment Plant are not highlighted;
- Liaison with ESB regarding the connection/diversion of the 38KV powerline at construction stage; and
- Care shall be taken when construction is taking place close to or in the vicinity of ESB network overhead power lines. The “H.S.A. ESB code of practice for Avoiding Danger from Overhead Electricity Power Lines” shall be complied with.

As noted above, connections to the existing electricity, water services and telecommunications networks will be coordinated with the relevant utility provider and carried out by approved contractors.

Appendix A Example List of Relevant Guidance

The following list is an example only and shall be updated by the Contractor ahead of construction.

Area	Publication
Biodiversity	• European Communities (EC) (Birds and Natural Habitats) Regulations 2011 (as amended) • Wildlife Act 1976, as amended • TII (Transport Infrastructure Ireland) guidelines for the protection of the environment during construction.
Land, Soil & Geology	• Environmental Protection Agency, August 2017. Draft Guidelines on the information to be contained in Environmental Impact Assessment Reports (EPA, 2017); • Environmental Protection Agency, September 2015. Draft Advice Notes for preparing Environmental Impact Statements (EPA, 2015); • Environmental Protection Agency, 2002. Guidelines on Information to be contained in Environmental Impact Statements (EPA, 2002); • Environmental Protection Agency, 2003. Advice Notes on Current Practice in the preparation of Environmental Impact Statements (EPA, 2003); • Environmental Protection Agency, 2006. Environmental Management Guidelines. Environmental Management in the Extractive Industry (non-scheduled minerals); • Institute of Geologists of Ireland Guidelines, 2002. Geology in Environmental Impact Statements, A Guide (IGI, 2002); and • Institute of Geologists of Ireland Guidelines for the Preparation of Soils, Geology and Hydrogeology Chapters of Environmental Impact Statements (IGI, 2013).
Water Quality	• Council Directive 80/68/EEC, 1979. On the protection of groundwater against pollution caused by certain dangerous substances. Council of European Communities; • Council Directive 2006/118/EEC, 2006. On the protection of groundwater against pollution and deterioration. European Parliament and the Council of European Communities; • Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy with amendments 2455/2001/EC, 2008/32/EC and 2008/105/EC (Water Framework Directive, WFD); • Department of the Environment, Heritage and Local Government, Environmental Protection Agency and Geological Survey of Ireland, 1999. Groundwater Protection Schemes (Groundwater Protection Schemes, 1999); • Department of the Environment, Heritage and Local Government, 2009. Appropriate Assessment of Plans and Projects in Ireland - Guidance for Planning Authorities (DEHLG, 2009); • Environmental Protection Agency, August 2017. Draft Guidelines on the information to be contained in Environmental Impact Assessment Reports (EPA, 2017); • Environmental Protection Agency, September 2015. Draft Advice Notes for preparing Environmental Impact Statements (EPA, 2015); • Environmental Protection Agency (September 2015): Draft – Revised Guidelines on the Information to be Contained in Environmental Impact Statements; • Environmental Protection Agency, 2002. Guidelines on Information to be contained in Environmental Impact Statements (EPA, 2002); • Environmental Protection Agency, 2003. Advice Notes on Current Practice in the preparation of Environmental Impact Statements (EPA, 2003); • European Commission (2017), Environmental Impact Assessment of Projects Guidance on the preparation of the Environmental Impact Assessment Report. • European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2001 – 2018; • Institute of Geologists of Ireland Guidelines for the Preparation of Soils, Geology and Hydrogeology Chapters of Environmental Impact Statements (IGI, 2013); • Local Government, July 1990. No. 21.1990. Local Government (Water Pollution) (Amendment) Act, 1990. • Local Government, March 1977. No. 01/1977. Local Government (Water Pollution) Act, 1977. • National Roads Authority, 2009. Guidelines on Procedures for the Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes (NRA, 2009); • Planning and Development Act, 2000, as amended; • PPG1 - General Guide to Prevention of Pollution (UK Guidance Note); • PPG5 – Works or Maintenance in or Near Watercourses (UK Guidance Note); • S.I. No. 41 of 1999: Protection of Groundwater Regulations, resulting from EU Directive 80/68/EEC on the protection of groundwater against pollution caused by certain dangerous substances (the Groundwater Directive);

Area	Publication
	• S.I. No. 272/2009 - European Communities Environmental Objectives (Surface Waters) Regulations 2009 including amendments S.I. No. 327/2012, S.I. No. 386/2015 and S.I. No. 77/2019. • S.I. No. 249 of 1989: Quality of Surface Water Intended for Abstraction (Drinking Water), resulting from EU Directive 75/440/EEC concerning the quality required of surface water intended for the abstraction of drinking water in the Member States (repealed by 2000/60/EC in 2007); • S.I. No. 439 of 2000: Quality of Water intended for Human Consumption Regulations and S.I. No. 278 of 2007 European Communities (Drinking Water) Regulations, arising from EU Directive 98/83/EC on the quality of water intended for human consumption (the Drinking Water Directive) and WFD 2000/60/EC (the Water Framework Directive); • S.I. No. 9 of 2010 - European Communities Environmental Objectives (Groundwater) Regulations 2010 including amendments S.I. No. 149 of 2012 and S.I. No. 366 of 201; and • WFD Working Group, 2005. Guidance on the Assessment of the Impact of Groundwater Abstractions (WFD, 2005).
Air Quality	• Air Pollution Act 2012 (S.I. No. 326 of 2012) Irish Statute Book. • Air Quality Standards Regulations 2011 (S.I. No. 180 of 2011) Irish Statute Book. • Air Quality, Clean Air for Europe Directive (2008/50/EC) EUR-Lex. • Department of Communications, Climate Action and Environment (DCCAE) (2017) National Mitigation Plan • Department of Communications, Climate Action and Environment (DCCAE) (2018) National Adaptation Framework • German VDI (2002) Technical Guidelines on Air Quality Control – TA Luft. • Government of Ireland (2019) Climate Action Plan 2019. • Institute of Air Quality Management (2014) Guidance on the Assessment of Dust from Demolition and Construction. • Institute of Air Quality Management (2016) Guidance on the Assessment of Mineral Dust Impacts for Planning. • Institute of Air Quality Management (2017) Land-Use Planning & Development Control: Planning for Air Quality. • Intergovernmental Panel on Climate Change (2006) IPCC Guidelines for National Greenhouse Gas Inventories. • Intergovernmental Panel on Climate Change (2019) Refinement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories. • Transport Infrastructure Ireland (TII) 2011 Appendix 8; Institute of Air Quality Management (IAQM) 2014 • Transport Infrastructure Ireland (2011) Guidelines for the Treatment of Air Quality During the Planning and Construction of National Road Schemes. • Technische Anleitung zur Reinhaltung der Luft (TA Luft) Regulations (2002) • Environmental Protection Agency (2010) Air Dispersion Modelling from Industrial Installations Guidance Note (AG4) • Environmental Protection Agency Air Quality in Ireland 2017: Indicators of Air Quality
Noise and Vibration	• Environmental Protection Agency Act 1992 (Noise) Regulations 1994 • BS5228-1:2009 +A1:2014: Code of Practice for Noise and Vibration Control on Construction and Open Sites: Part 1: Noise and Part 2: Vibration • Sites: Part 1: Noise and Part 2: Vibration • BS 7385: 1993: Evaluation and measurement for vibration in buildings Part 2: Guide to damage levels from ground borne vibration • BS6472-1:2008: Guide to evaluation of human exposure to vibration in buildings. Vibration sources other than blasting • BS8233:2014: Guidance on Sound Insulation and Noise Reduction for Buildings • The EPA Guidance Note for Noise: License Applications, Surveys and Assessments in Relation to Scheduled Activities, (NG4), revised January 2016 • Environmental Noise Guidelines for the European Region, World Health Organisation (WHO), Oct 2018 • ISO 9613-2 – 1996 Acoustics – Attenuation of sound during propagation outdoors – Part 2: General method of calculation • Institute of Environmental Management and Assessment, Guidelines for Environmental Noise Impact Assessment, Version 1.2, November 2014 • Dublin Agglomeration Environmental Noise Action Plan (2018-2023) • CIRIA guidance document C741'Environmental good practice on site guide' • Transport Infrastructure Ireland (TII) publication Guidelines for the Treatment of Noise & Vibration in National Road Schemes, 2004 • National Roads Authority guidance 'Guidance for the treatment of noise and vibration in National Road Schemes'

Area	Publication
	• Environmental Noise Guidance for Local Authority Planning & Enforcement Departments, June 2019.
Archaeological and Cultural Heritage	• National Monuments Act, 1930, as amended in 1954, 1987, 1994, 2004 and 2012 (S.I. 249 of 2012) • European Convention on the Protection of the Archaeological Heritage (Valletta Convention), ratified by Ireland in 1997 • European Communities (Environmental Impact Assessment) Regulations 1989 • Architectural Heritage (National Inventory) and Historic Monuments (Miscellaneous Provisions) Act 1999 • The Heritage Act 1995 • Chartered Institute for Archaeologists. 2014a. Standards & Guidance for Field Evaluation. • Chartered Institute for Archaeologists. 2014b. Standards & Guidance for Archaeological Excavation. • Chartered Institution of Field Archaeologists. 2014c. Standards & Guidance for an Archaeological Watching Brief (Monitoring). • Department of Arts, Heritage, Gaeltacht and the Islands. 1999b. Policy and Guidelines on Archaeological Excavation. Government Publications Office, Dublin. • Sustainable Residential Development in Urban Areas-guidelines for Local Authorities. 2009. Government of Ireland. • Department of Arts, Heritage, Gaeltacht and Islands (1999a), Framework and Principles for the Protection of the Archaeological Heritage • Architectural Heritage Protection Guidelines (2004)
Traffic Management Plan	• Environmental good practice on site guide (C741), CIRIA • Guidelines for the Creation, Implementation and Maintenance of an Environmental Operating Plan, 2007, National Roads Authority (NRA) • The Essential Guide to Travel Planning, 2008, Department for Transport (DfT)
Waste Management Plan	• EPA, Waste Classification, List of Waste & Determining if Waste is Hazardous or Non-hazardous, June 2015 • EPA, 2021. Best Practice Guidelines for the preparation of resource & waste management plans for construction & demolition projects. • Environmental Good Practice on Site (C962), CIRIA • European Waste Catalogue (EWC) Codes • Guidelines for the Creation, Implementation and Maintenance of an Environmental Operating Plan, 2007, National Roads Authority (NRA) • EPA guidance on Waste Classification List of Waste & Determining if Waste is Hazardous or Non-hazardous Applicable, July 2018 • Environment Agency, Guidance on the classification and assessment of waste (1st Edition v1.1) Technical Guidance WM3, May 2018 • Annex to Council Decision 2003/33/EC establishing criteria and procedures for the acceptance of waste at landfills pursuant to article 16 of and Annex II to Directive 1999/31/EC • EPA, Guidance on Waste Acceptance Criteria at Authorised Soil Recovery Facilities, February 2020 • Chartered Institute for Archaeologists. 2014a. Standards & Guidance for Field Evaluation. • Chartered Institute for Archaeologists. 2014b. Standards & Guidance for Archaeological Excavation. • Chartered Institution of Field Archaeologists. 2014c. Standards & Guidance for an Archaeological Watching Brief (Monitoring). • Department of Arts, Heritage, Gaeltacht and the Islands. 1999b. Policy and Guidelines on Archaeological Excavation. Government Publications Office, Dublin. • Environmental Protection Agency. 2017. Draft Advice Notes on Current Practice (in the preparation of Environmental Impact Statements). Government Publications Office, Dublin. • Environmental Protection Agency. 2017. Draft Guidelines on the Information to be Contained in Environmental Impact Statements. Government Publications Office, Dublin. • Sustainable Residential Development in Urban Areas-guidelines for Local Authorities. 2009. Government of Ireland. • Department of Arts, Heritage, Gaeltacht and Islands (1999a), Framework and Principles for the Protection of the Archaeological Heritage • Architectural Heritage Protection Guidelines (2004)
Working Hours / Periods	• Environmental good practice on site guide (C741), CIRIA

Appendix B Environmental Risk

This procedure has been developed in order to define the criteria used to:

- Identify the environmental impacts and aspects associated with work activities
- Identify a procedure for assessing the significance of environmental impacts and aspects
- Develop an environmental aspect register specific to site constriction works

B.1 Scope

This document applies to all activities associated with site construction works including the activities of its staff, contractors and subcontractors.

B.2 Responsibilities

The Environmental Coordinator has the responsibility for ensuring the Register of Environmental Aspects and Impacts is reviewed on a monthly basis and updated as necessary.

B.3 Procedure – Environmental Aspect Identification

The procedure for developing an aspects register is as follows:

- Representatives from relevant functional areas should be co-ordinated to participate in the identification and assessment process to ensure affectivity
- The environmental aspects associated with all construction works shall be documented in the aspect evaluation table
- The impact associated with each aspect shall then be listed. Impacts can range from global impacts such as an increase in greenhouse gases to local impacts such as change to local air quality as a consequence of works
- For each aspect, a rank order is assigned in respect of:
  - Likelihood of Occurrence (L)
  - Severity of Consequences (S)
  - To obtain an overall significance rating factor (C), the values for (L) and (S) are multiplied, C = L x S
- Tables B-1 and B-2 detail the criteria for assessing Likelihood of Occurrence (L) and the Severity of Consequences (S)
- An aspect with a score of 9 or greater (post-control measure) is considered to be a significant environmental risk and must be controlled

Table B-1 Rating (L) the Likelihood of Occurrence

Rating value	1	2	3	4	5
	Never/ cannot occur	Unlikely to occur	Likely to occur once/twice	Possibility of a number of occurrences	Highly likely

Rating (S) the Severity of Consequences takes into account the following six categories:

- Legislative and regulatory compliance
- Community/employee sensitivity
- Impact on air, land or water
- Cost to organisation
- Potential for resource depletion
- Accident and emergency situations

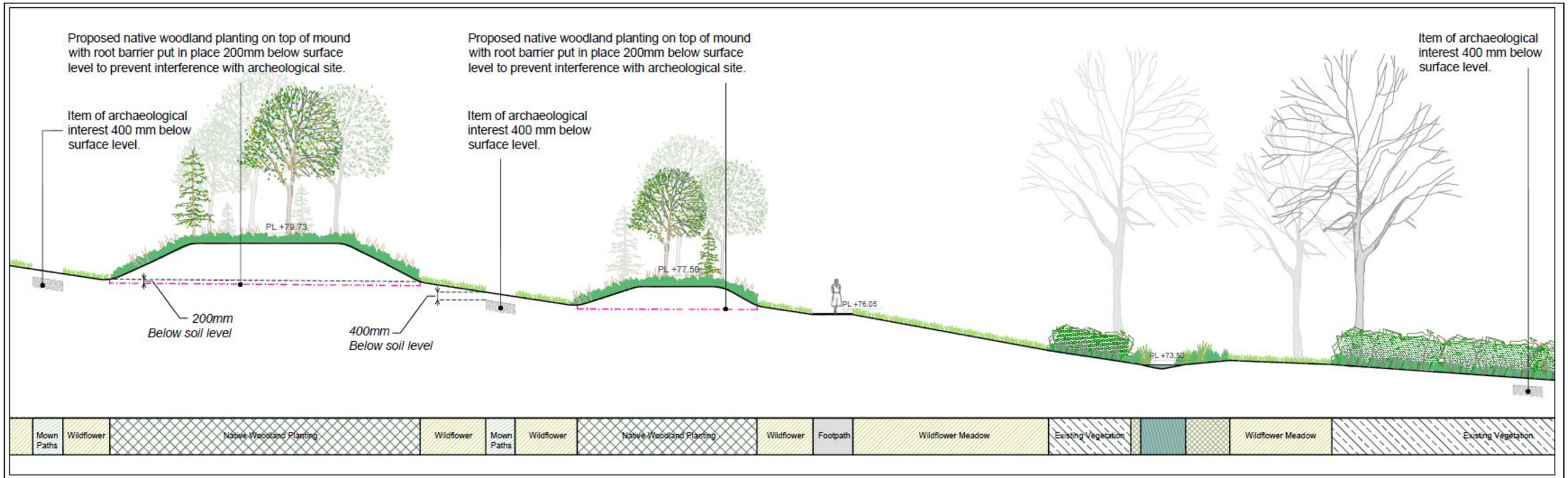
Table B-2 Rating (L) the Severity of Consequences

Rating value	1	2	3	4	5
	Unlikely to have an impact on any of the previous categories	May have a low impact on some of the previous categories	May have a moderate impact on three or more of the previous categories	Likely to have a moderate to major impact on most of the previous categories	Likely to have a major impact on all of the previous categories

Ref.	Work Activity	Environmental Aspect	Environmental Impact before Controls	Initial Risk Level (without controls)			Risk Control Measures: Design action taken, record of decision process including option considered, design constraints and justification for options/actions not taken	Residual Risk Level (with controls)			Is there a "significant" residual risk to be passed on? (Y/N)	Actions necessary to control the risk – comments, recommendations	Responsibility	Status (Active/Closed)

Appendix C Archaeological Figures

Landscape Plan, Archaeological Area 1 (source: IAC Archaeology Limited)



Section across proposed planting showing depth of root barrier and archaeology (source: IAC Archaeology Limited)

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