DONNACHADH O'BRIEN
& ASSOCIATES CONSULTING ENGINEERS

CERTAIN ASSETS OF DOWNHILL AND WINDHILL LIMITED

Lands at Kilbride, Arklow, Co. Wicklow

Outline Construction Management Plan

(LRD Application Submission)

2432-DOB-XX-SI-RP-C-0004

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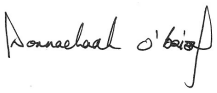
S2.P01	19.05.2025	Issued for Planning	Wicklow County Council	2H, 1E	

Contents

1 Introduction

Donnachadh O'Brien & Associates Consulting Engineers Ltd. (DOBA) have been instructed by the Client, Certain Assets of Dawnhill and Windhill Limited, to prepare an Outline Construction Management Plan (CMP) to accompany an LRD Application Submission to Wicklow County Council (WCC) for the proposed Lands at Kilbride, Arklow, Co. Wicklow. This CMP outlines the Construction Waste arising from the project (**Section 4**) and Construction Management through the project (**Section 5**).

A Greenway Boardwalk Outline Construction Methodology has been prepared by Donnachadh O'Brien & Associates has also been submitted as part of this application and should be referred to in conjunction with this CMP. The Greenway Boardwalk Outline Construction Methodology 24320DOB-XX-SI-RP-0100 has been appended to this report for reference.

The EIAR assesses the likely significant impacts arising from the project. Integration of the engineering design team with the planning and environmental team from an early stage in the Project has enabled mitigation and or reduced impact to the environment during the planning design stage. This CMP, together with all mitigation measures addressed in the EIAR, will be adopted by the appointed contractor post development consent. Following appointment, the Contractor shall be responsible for developing, detailing and maintaining a construction stage CMP and updating it as appropriate as the project progresses. The Construction Stage CMP should be based on this Outline CMP and also should refer to and include to the relevant mitigation measures required in the various chapters of the EIAR as follows:

- Chapter 5: Biodiversity
- Chapter 6: Lands, Soils & Geology
- Chapter 7: Hydrology and Hydrogeology
- Chapter 8: Noise & Vibration
- Chapter 9: Air Quality & Climate Impact
- Chapter 10: Landscape & Visual Assessment
- Chapter 11: Traffic & Transportation
- Chapter 12: Waste Management
- Chapter 13: Cultural Heritage/ Archaeology
- Chapter 14 Material Assets

2 Existing Site

The site is located in the area of Kilbride on the northern side of the Avoca river in Arklow, Co. Wicklow. The site is bounded by open fields to the west and to the north by the Kilbride Industrial estate and Kilbride Road L-6179. The site slopes in a broadly north / south direction to the town marsh and Avoca river. The Pyramid of Arklow; national monument, and its associated graveyard are located to the north west of the ownership area but outside of the subject site. The site is also adjacent to the KWETB proposed school site (Planning Ref. 22/213), which has received planning permission by Wicklow County Council. The site is also adjacent to a recently granted 84 units scheme which was submitted by the same client as this application relates to (ABP Ref. ABP-319604-24 & Wicklow Co. Co. Ref. 23/756).

This submission consists of the initial phase of a large residential development of 666 units to be provided over the coming years. The overall proposed masterplan seeks to provide c.1500 residential units, creches, local centre, the first phase of a future regional road for Arklow town, new roads connecting the site to the surrounding areas and a pedestrian / cycle paths.

Figure 1: Proposed Site Outline

3 Proposed Development

Certain Assets of Dawnhill and Windhill Limited intend to apply for a 7-year planning permission for a Large Scale Residential Development at this site of c.25.07ha on "Lands at Kilbride", Arklow, Co. Wicklow. The site is generally bounded by the town marsh to the south, M11 to the west, housing at Avondale Crescent/Murrell Drive and St Joseph's School to the east and the Kilbride Industrial estate and Kilbride Road L-6179 to the north.

3.1 House Construction

The proposed mixed use Large scale Residential Development will result in the demolition of an existing dwelling and 2 no. sheds/outbuildings and the construction of 666 no. residential units with a mix of semidetached and terraced houses along with duplex apartments and apartments. These will comprise 1, 2, 3 and 4 bed units. All residential units will have associated private open space facing north/ south/ east/ west. The proposal will also deliver a local centre containing 3 no. retail units, 3 no. community/ medical units and 1 no. creche unit. The construction of the houses will generally consist of:

- traditional excavation and strip footing foundations in names reinforced concrete
- masonry rising walls, imported Sr21 Annex E stone fill material to depths of between 300 and 600mm typically
- normal internal sub floor gravity drainage and services connections
- ground floor construction of 150mm RC mesh reinforced slab on 150mm insulation on a radon barrier
- superstructure in off-site timber framed constriction including prefabricated timber trussed roofs
- building envelope in a mixture of brick and rendered blockwork
- roof materials in tiles and/or slates and all associated rainwater goods and guttering
- normal internal trades including electrical, plumbing, carpentry, plastering, painting , decorating and fit out
- external boundary curtilage walls in masonry blockwork and proprietary post and panel fencing
- all associated normal external works including local foul and surface water drainage, telecom and electrical connections, driveway permeable paving and path , landscaping and finishing

3.2 Site Infrastructural Works

A new road providing vehicular access is also proposed connecting to the north to Kilbride Road along with road improvements in the surrounding area. The site infrastructural works will include for:

- All public road to be built to taken in charge standards complete with paths, cycle track, road markings, signage, road crossings, table tops
- All associated foul and surface water drainage infrastructure to service the above roads including all necessary off-site works deemed required by Irish Water of the Local Authority of foot of any planning granted or connection offer for services
- All watermains, hydrant's, valves, meters and connections – all to Irish Water standards
- All utility connections for electricity, Gas, telecoms and public lighting together with substations, mini pillars etc.
- All site landscaping incorporating, trees and planting, public open spaces and all associated site development works to enable the development including boundary treatments, attenuation storage area and SuDS features

3.3 Boardwalk

A significant part of the development will be the provision of a greenway pedestrian and cyclist boardwalk between the proposed development at Kilbride, across the Arklow marshlands and Avoca River connecting to the proposed Arklow to Shilelagh Greenway on the southern bank of the Avoca River. A separate Outline Construction Methodology is submitted with this application and should be referred to by the contractor when developing a final Construction Stage CMP.

This Greenway starts adjacent to the public Cark Park in Arklow town centre. A River Walkway is being delivered by Wicklow County Council (WCC) as part of the Arklow Flood Relief Scheme and the Boardwalk will tie into the proposed levels of the River Walkway. There has been significant consultation and engagement between the applicant and Wicklow County Council prior to the application to co-ordinate the boardwalk design.

The proposed Boardwalk extends form the southern side of the residential development, through the internal cycle and pedestrian network of the residential development. The boardwalk is elevated and across the marshlands (approximately 650m) after which it crosses the Avoca River. Debris trap columns constructed in reinforced concrete are being provided by Wicklow County Council as part of the Avoca River Flood Relief scheme, and following extensive consultation with Wicklow County Council, the boardwalk will extend across the debris trap columns and will tie into the proposed levels of the Greenway on the southern side of the Avoca River. The Debris Trap piers and Greenway are approved works as part of WCC's Arklow Flood Relief Scheme.

Figure 2: Proposed Site Layout (Source: BKD Architects)

4 Construction Waste Management

The content and headings used in this section of the CMP comply with the Department of the Environment, Heritage and Local Government (DoEHLG) Best Practice Guidelines on the Preparation of Waste Management Plans for Construction & Demolition Projects, 2006.

4.1 Definition of Waste

Waste, as defined in Section 4(1) of the Waste Management Act 1996, as amended, means any substance or object which the holder discards or intends or is required to discard.

4.2 Waste Management Objectives

The principal objective of sustainable resource and Waste management is to use material resources more efficiently, where the value of products, materials and resources are maintained in the economy for as long as possible and the generation of Waste is minimised. To achieve resource efficiency there is a need to move from a traditional linear economy to a circular economy as indicated in Figure 3 below.

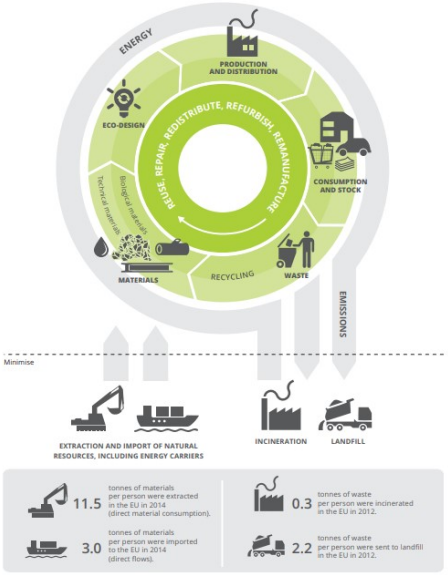


Figure 3: Circular Economy for Materials and Energy (source: European Environment Agency)

In December 2015, the European Commission adopted an ambitious Circular Economy Package, which includes revised legislative proposals on Waste to stimulate Europe's transition towards a circular economy. However, where residual Waste is generated, it should be dealt with in a way that

follows the Waste hierarchy as shown in Figure 4 below and actively contributes to the economic, social and environmental goals of sustainable development.

Figure 4: EU Waste Hierarchy (source: European Commission)

The Waste management objectives for the proposed development are described in the following sections and will facilitate material reuse and recycling where possible and seek to divert Waste from landfill.

4.2.1 Prevention

The Contractor shall prevent and minimise Waste generation where possible by ensuring large surpluses of construction materials are not delivered to site through coordination with the suppliers, operate a just-in-time delivery system and ensure Sub-Contractors conform to the CWDMP for all operations on site.

4.2.2 Reuse

Reuse Wastes and surplus materials where feasible and in as many high values uses as possible.

4.2.3 Recycle

Recycle Waste where possible such as introducing on-site crushers to produce Waste derived aggregates which may, subject to appropriate testing and approvals, may be re-used in the project.

4.2.4 Disposal

Where disposal of Waste is unavoidable this will be undertaken in accordance with the Waste Management Act 1996, as amended.

4.3 Waste Management Legislation & Policy

The key components of EU, national and local policy, legislation and guidance relevant to the proposed Construction works are summarised as follows:

- prevention and minimisation of waste is the preferred option,
- where construction waste is generated, it should be source separated to facilitate recycling and maximise diversion of Waste from landfill,
- where waste may not be prevented or recycled it should be transported and disposed of in accordance with applicable legislation and without causing environmental pollution,
- Waste may only be transferred by a Waste collection permit holder and delivered to an authorised Waste facility.

4.3.1 Legislation

The following is a list of the legislation which governs Waste management in Ireland and are applicable to the proposed development: -

European

- Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on Waste and repealing certain Directives

National

- Waste Management Act 1996, as amended and Regulations Made under the Acts
- Waste Management (Collection Permit) Regulations, 2007, S.I. No 820 of 2008, as amended
- Waste Management (Shipments of Waste) Regulations 2007, S.I. No. 419 of 2007

4.3.2 Policy

The following is a list of the policy which governs Waste Management in Ireland and are applicable to the proposed development: -

European

- Circular Economy Package, European Commission (2018)
- Europe 2020 Strategy, European Commission (2010)
- Roadmap to a Resource Efficient Europe, European Commission (2011)
- 7th Environmental Action Programme, European Commission (2014)

National

- Department of the Environment, Heritage and Local Government (2012) A Resource Opportunity- Waste Management Policy in Ireland
- EPA National Waste Statistics and Bulletins

- EPA (2014) National Municipal Waste Recovery Capacity. An Assessment for the Department of the Environment, Community and Local Government
- Environmental Protection Agency (2014) National Hazardous Waste Management Plan, 2014-2020
- EPA (2015) Waste Classification – List of Waste and Determining if Waste is hazardous or Non-Hazardous.

Regional

- The Eastern Midlands Region Waste Management Plan 2015-2021

4.4 Roles & Responsibilities

4.4.1 Waste Producer

In accordance with the Waste Management 1996, as amended, the Waste producer is responsible for Waste from the time it is generated through until it is legally recycled, recovered or disposed of. Therefore, the onerous lies with the producer, i.e. the Client, to ensure that Waste is correctly managed or can face prosecution as a result of incidents of pollution as a result of incorrect management of Waste produced. Contractors appointed by the Client must ensure that facilities receiving Waste hold either a Certificate of Registration (COR) or Waste permit (granted by the Local Authority under the Waste Management (Facility Permit & Registration) Regulations 2007) or Waste licence or Industrial Emissions licence (granted by the EPA) while transporters of Waste must hold a collection permit which is issued by a National Waste Collection Permit Office (NWCPO).

4.4.2 Contractor

The Contractor's shall, prior to the commencement of the works, nominate and appoint an adequately trained Construction and Waste Manager (CWM) with overall responsibility for implementation of this CMP. The Contractor's CWM shall be responsible for the following:-

- Instructing all site personnel to comply with the specific provisions of the CMP, in particular the Objectives regarding the prevention, reduction, re-use and recycling.
- Ensuring that copies of the CMP will be made available to all relevant personnel on site.
- Informing through regular training of all site personnel of the objectives of the plan and their responsibilities in relation to compliance with the plan.
- Ensuring that where training is required regarding the handling and management of Wastes on site that this is provided to staff as required to ensure they can: -
    - Distinguish reusable materials from materials suitable for recycling
    - Ensure maximum segregation at source

- Co-operate with the Contractor's management regarding stockpiling of reusable material and ensure separation of materials for recovery
- Identify and liaise with operates of recovery outlets

- Informing Contractor staff and Sub-Contractors of content of the plan and for maintaining and keeping detailed records.

In addition, an appropriate staff member from each Sub-Contractor on the site shall be assigned the direct responsibility to ensure that the discrete operations stated in the CMP are performed on an on-going basis. In the event of the CWM leaving the project team, the Contractor will nominate a suitable replacement.

4.5 Duration & Sequencing

Table 1 below identifies the key infrastructural deliverables along with the phasing period to which they will be constructed. Given the extent of the project, along with the site's masterplan and the AAP3 lands, the outline phasing strategy for the delivery of necessary external infrastructural works shall be phased in accordance with Table 1 and read in conjunction with the phasing of the residential units in Table 2 and Figure 5 below

Table 1: Outline Infrastructural Phasing Strategy

Infrastructural Upgrade	Commentary	Phasing/Delivery
Dublin Road / Beech Road Junction Improvement	Including signalisation and pedestrian improvement works	Phase 1
Realignment of L-6179 Road to north of site		Phase 1
Avondale Crescent VRU Links	These are already approved as part of the 84 unit scheme	Phase 1
Greenway Boardwalk across Marsh and Avoca River	The phasing of this will be dependent on the delivery of the debris trap columns and the riverside public realm works as part of the Arklow Flood Relief Scheme. Following consultation with WCC on the programme, these works are currently scheduled to be complete in Q3/ Q4 2028. It is therefore expected that this infrastructure can only be delivered in Q1/Q2 2029.	Phase 3 / 4 (subject to completion of OPW Arklow Floor Relief Scheme)
Uisce Eireann – Wastewater (based on advice in current Confirmation of Feasibility from UE)	PWSA currently in place between Lioncor & UE. Upgrade works are required for successful connection agreement.	Phase 1
Uisce Eireann – Water (based on advice in current Confirmation of Feasibility from UE)	(a) Network adjustments to valving arrangements/ DMA on the existing network (b) Upgrade of 300m of 6" AC main to 300mm diameter main along Monument Lane (c) Tie in 50mm uPC main in Ticknock Lane with approx. 130m of 150mm diameter main (d) Upgrade approx. 900m of 6" AC main to 300mm diameter pipe (across bridge)	Phases 1 & 2 Phase 1 Phase 2 Phase 4

Table 2: Outline Construction/ Phasing Strategy

Phase 1	
Enabling Works & Site Set Up	30 months for completion of first 265 units with associated infrastructure
Installation of the surface water outfall pipe and headwalls for both outfall locations	
Installation of Watermain Upgrade along Monument Lane and Installation of Connection to upgraded main.	
Installation of spine surface water sewers, wastewater sewers, water mains and surface water attenuation.	
Installation of Upgraded PWSA Wastewater sewers to the east of the site to the Dublin Road	
Construction of L6179 Road Alignment and modification works to the Beech Road and Dublin Road Junctions	
Construction of Phase 1 housing units	
Installation of Phase 1 roads, footpaths & cycle paths and shared surfaces	
Installation of Phase 1 hard and soft landscaping and permeability links including VRU Greenway link to Avondale Crescent.	
Phase 1A	
Site Set Up	18 months for completion of Neighbourhood Centre, 38 Apartment/ Duplex units with associated infrastructure
Installation of surface water sewers, wastewater sewers, water mains and surface water attenuation.	
Construction of Phase 1A Neighbourhood Centre and Apartment units	
Installation of Phase 1A roads and footpaths	
Installation of Phase 1A hard and soft landscaping and permeability links to adjacent phases	
Phase 2	
Installation of surface water sewers, wastewater sewers, water mains and surface water attenuation.	30 months for completion of second phase of 141 units with associated infrastructure & open space
Construction of Phase 2 housing units	
Installation of Phase 2 roads and footpaths	
Installation of Phase 2 hard and soft landscaping and permeability links to adjacent lands	
Upgrade of Watermain infrastructure in Ticknock Lane	

Phase 3	
Installation of surface water sewers, wastewater sewers, water mains and surface water attenuation.	20 months for completion of third phase of 139 units with associated infrastructure & open space
Construction of Phase 3 housing units	
Installation of Phase 3 roads and footpaths	
Installation of Phase 3 hard and soft landscaping and permeability links to adjacent lands	
Construction of the Boardwalk Greenway Link to Arklow Town	
Phase 4	
Installation of surface water sewers, wastewater sewers, water mains and surface water attenuation.	30 months for completion of second phase of 167 units with associated infrastructure & open space
Demolition of Existing Building and associated boundary walls and hardstanding to the north of the phase.	
Construction of Phase 4 housing units	
Installation of Phase 4 roads and footpaths	
Installation of Phase 4 hard and soft landscaping and permeability links to adjacent lands	
Upgrade works to approx. 900m Watermain to 19 arch bridge	

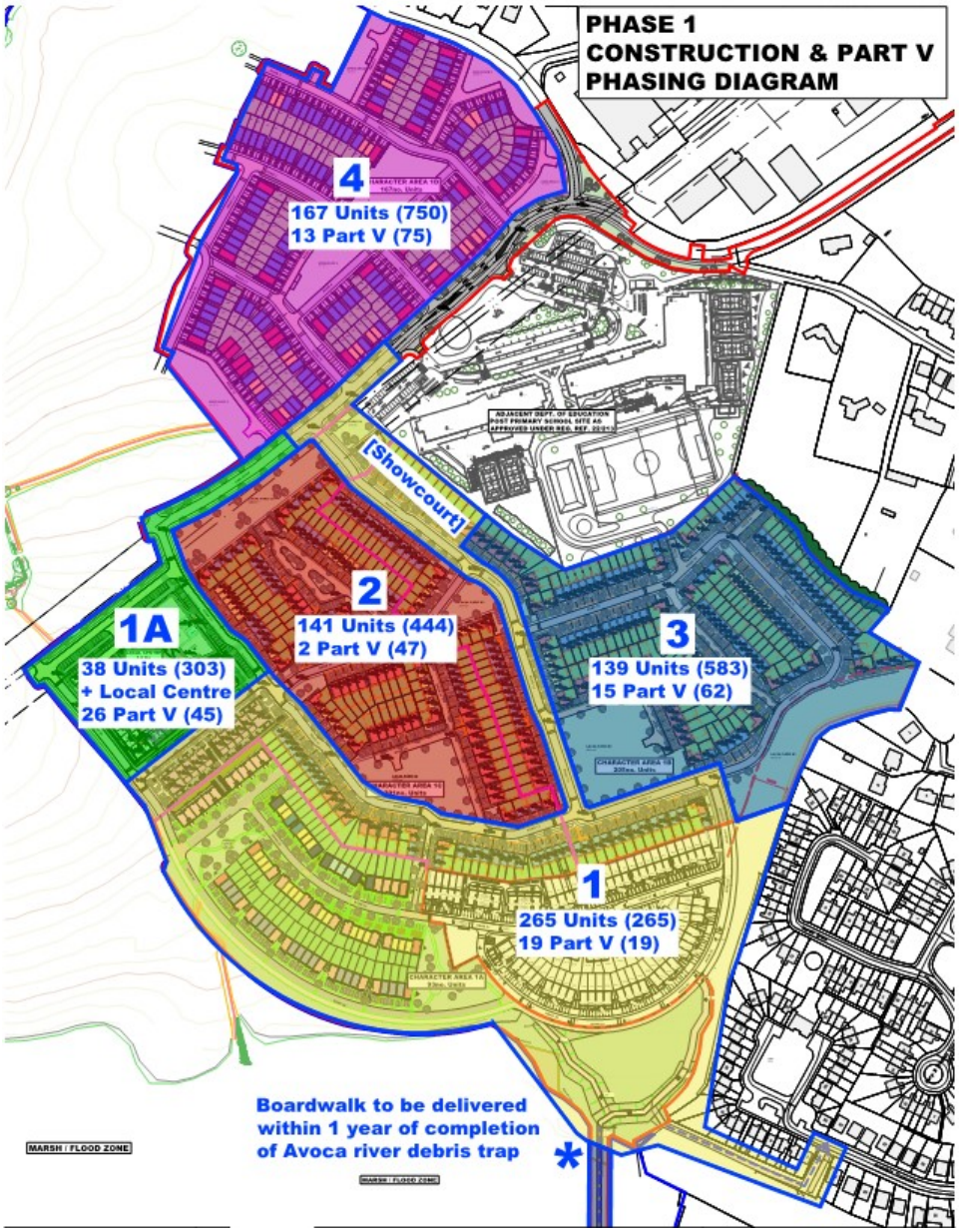


Figure 5: Outline Phase 1 Construction & Part V Phasing.

4.6 Construction & Demolition Waste Arising

Construction Waste is defined as Waste which arises from construction, renovation and demolition activities. The following sections analyse the wastes arising from construction activities on site and provides methods for management of waste through prevention, reuse and recycling.

4.6.1 Construction & Demolition Hazardous & Non-Hazardous Wastes

The typical types of Construction & demolition Hazardous and Non-Hazardous Wastes that may be expected on a typical project are as per the EPA List of Wastes (LOW) codes outlined in the following table.

Table 3: EPA Hazardous & Non-Hazardous EPA LoW & associated codes

Description	EPA LoW Codes
HAZARDOUS WASTE	
Wastes from Wood processing and the production of panels and furniture, pulp, paper and cardboard	**03**
Wastes from wood preservation	**03 02**
Non-halogenated organic wood preservatives	03 02 01
Organ chlorinated wood preservatives	03 02 02
Organometallic wood preservatives	03 02 03
Inorganic wood preservatives	03 02 04
Other wood preservatives containing hazardous substances	03 02 05
Wood preservatives not otherwise specified	03 02 09
Oil Wastes and Wastes of Liquid Fuels	**13**
Wastes of Liquid Fuels	**13 07**
Fuel oil and diesel	13 07 01
Petrol	13 07 02
Other fuels (including mixtures)	13 07 03
Wastes not otherwise specified in the list	**16**
Wastes from electrical and electronic equipment	**16 02**
Transformers and capacitors containing PCBs	16 02 09
Discarded equipment containing chlorofluorocarbons, HCFC, HFC	16 02 11
Discarded equipment containing free asbestos	16 02 12
Discarded equipment other than those mentioned in 16 02 09 to 16 02 13	16 02 14
Hazardous components removed from discarded equipment	16 02 15
Batteries & Accumulators	**16 06**
Lead Batteries	16 06 01
Ni-Cd Batteries	16 06 02
Mercury-containing batteries	16 06 03
Alkaline batteries (except 16 06 03)	16 06 04

Other batteries and accumulators	16 06 05
Separately collected electrolyte from batteries and accumulators	16 06 06
Construction & Demolition Wastes (including excavated soil from contaminated sites)	**17**
Mixtures of, or separate fractions of concrete, bricks, tiles and ceramics containing hazardous substances	17 01 06
Glass, plastic and wood containing or contaminated with hazardous substances	17 02 04
Metals (including their alloys)	**17 04**
Metal Waste contaminated with hazardous substance	17 04 09
Cables containing oil, coal tar and other hazardous substance	17 04 10
Soil (including excavated soil from contaminated sites), stones and dredging spoil	**17 05**
Soil and stones containing hazardous substances	17 05 03
Insulation materials and asbestos containing construction materials	**17 06**
Insulation materials containing asbestos	17 06 01
Other insulation materials consisting of or containing hazardous substances	17 06 03
Construction materials containing asbestos	17 06 05
Gypsum-based construction material	**17 08**
Gypsum-based construction materials contaminated with hazardous substances	17 08 01
Other construction and demolition Wastes	**17 09**
Construction and demolition Wastes containing mercury	17 09 01
Construction and demolition Wastes containing PCBs	17 09 02
Construction and demolition Wastes containing dangerous substances	17 09 03
Municipal Wastes (Household Waste & Similar Commercial Waste, Industrial & Institutional Waste) including separately collected fractions	**20**
Fluorescent tubes and other mercury containing Waste	20 01 21
Paint, inks, adhesives and resins containing hazardous substances	20 01 22
NON-HAZARDOUS WASTE	
Construction & Demolition Wastes (including excavated soil from contaminated sites)	**17**
Concrete, bricks tiles and ceramics	**17 01**
Concrete	17 01 01
Bricks	17 01 02
Tiles and ceramics	17 01 03
Wood, glass & plastic	**17 02**
Wood	17 02 01
Glass	17 02 02
Plastic	17 02 03
Bituminous mixtures, coal tar and tarred products	**17 03**

Bituminous mixtures containing coal tar	17 03 01
Coal tar and tarred products	17 03 03
Metals (including their alloys)	**17 04**
Copper, bronze, brass	17 04 01
Aluminium	17 04 02
Lead	17 04 03
Zinc	17 04 04
Iron and steel	17 04 05
Tin	17 04 06
Mixed metals	17 04 07
Municipal Wastes (Household Waste & Similar Commercial Waste, Industrial & Institutional Waste) including separately collected fractions	**20**
Separately collected fractions	**20 01**
Paper and cardboard	20 01 01
Glass	20 01 02
Biodegradable kitchen and canteen Waste	20 01 08
Textiles	20 01 11
Edible oil and fat	20 01 25

4.6.1.1 Asbestos

A Refurbishment/Demolition Asbestos Survey shall be carried out prior to the commencement of the demolition works, which is limited to some agricultural buildings to the north of the site. The buildings will be surveyed for the purpose of detecting and recording incidences of asbestos containing materials (ACMs). A report shall then be prepared which will contain a register showing the location and type of asbestos and the risks and recommendations in relation to the material identified. ACMs identified by the Asbestos survey will be required to be removed by a suitably trained and competent persons and removed from site by a suitably permitted Waste haulier where it shall be transported to a suitably licenced facility. The Contractor shall handle ACMs in accordance with the Safety, Health and Welfare at Work (Exposure to Asbestos) Regulations 2006, as amended and associated approved Codes of Practice. The Contractor shall be responsible for preparing specified Risk Assessment and Method Statements for the identification and removal of all ACMs on site, if appropriate to the works.

4.6.1.2 Invasive Species

An Ecological Site survey was carried out by Altemar Limited as part of the site ecological assessment for which this application relates, to assess, identify and manage any invasive species, such as Japanese Knotweed. No invasive species were recorded within the site, as defined by

Schedule 3 of SI 355/2015, and no site-specific measures are deemed necessary to address the presence of invasive species.

4.6.2 Estimated Demolition Waste Arising

There are 3 no. existing buildings on site as shown red in Figure 6 below. The extent of demolition works consists primarily of the following: -

- Removal of 28.80 tonnes of masonry boundary of walls with associated 3.53 tonnes of steel railings, gates, gate piers and concrete foundations along the L-6179 in conjunction with the removal of external 63.45m^3 concrete driveways/ hardstanding and grassed verges.
- Removal of 1 no. steel framed buildings (533.9m^2) with 53.40m^3 of concrete ground floors & foundations, 13.81 tonnes of non-insulated façades and roof cladding.
- Removal of 1 no. domestic dwelling and 1 no. associated garage building (172 m^2) with 76.36m^3 of concrete ground floors & foundations, 44.91 tonnes of insulated façades and roof cladding and external glazing, 5.93 tonnes of internal load and non-load bearing masonary and lightweight partitions.

Figure 6: Existing buildings to be demolished Indicated in Pink

4.6.3 Demolition Waste Management

The Contractor will seek to reuse demolition material within the proposed development where feasible and in accordance with the Waste Management Act 1996, as amended. If it cannot be reused within the proposed development, the Contractor will endeavour to ensure the material is reused or recovered in accordance with all regulatory requirements. The Contractor shall prepare a Project Specific Demolition Plan as part of the CDWMP which outlines the principal objectives of the

sequence of operations to be followed to demolish the existing structures. The plan, as a minimum, shall address the following issues: -

- Details of competent demolition Sub-Contractor
- Extent of proposed works area
- Proposed dismantling/ demolition sequence for each structure
- Proposed segregation arrangements to be employed to separate out the demolished structure into individual material fractions
- Proposed transportation and reception arrangements associated with the movement of materials to other construction sites for reuse or reprocessing
- Proposals for the isolation of hazardous Wastes from other Wastes to avoid contamination

The Project Specific Demolition Plan shall form part of the Contractor's CDWMP.

4.6.4 Excavation Waste Management

It is estimated that approximately 200mm of topsoil will be stripped and will be available for reuse within the development for landscaping subject to its testing and risk assessment to ensure the material is suitable for its proposed end use. It is expected that all topsoil will be reused on site for open space landscaping and also landscaping withing the curtilage of the residential properties. The Contractor will be responsible for determining how excavation material from the proposed development will be managed. A full list of all facilities to which uncontaminated excavation soil and stones will be sent will be provided in the detailed CMP prepared by the Contractor. This is likely to include an appropriate combination of the options set out below.

The extent of soil excavation has been mitigated by careful design of the site. The existing greenfield site falls gently form north to south at an average gradient of 1 in 26. The road and house layout has been designed to comply with Building Regulation Part M requirements and this ensures that no roads in the scheme are greater than 1:21 gradient. The road and house levels have mirrored the natural topography of the site, and insofar as is reasonably practicable, the site design has for this application has resulted in the below overall cut and fill across the site.

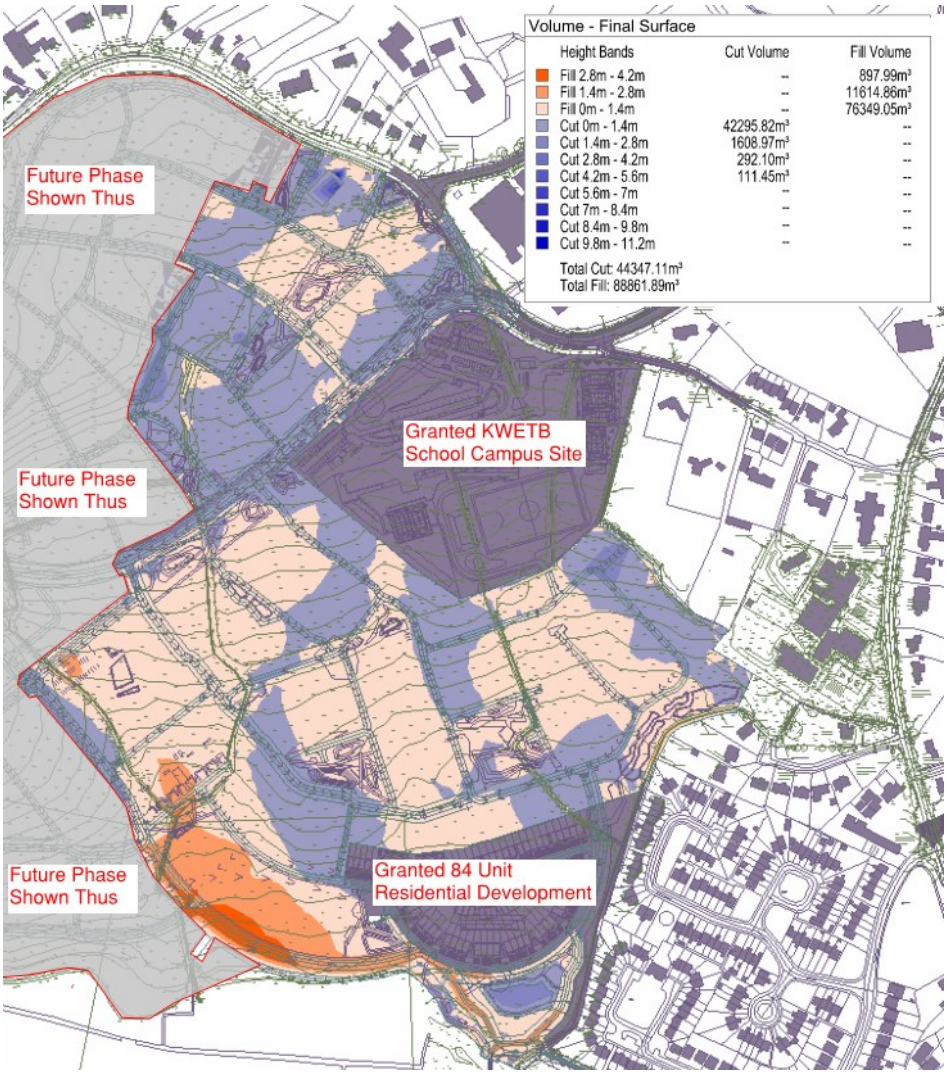


Figure 7: Site Isopath illustrating site areas subject to Cut & Fill

A volume of 88,861.89 cubic metres of fill material is calculated across the site to deliver the proposed development to final levels. 44,347.11m3 of this fill material will be provided by the initial cut material which has been calculated to final levels. The remaining fill material required for the site shall be supplemented by the material from dwelling unit foundation excavations, sewer / watermain excavations, utilities and services excavations, and road excavations. It is anticipated that overall, the development will have a balanced cut and fil when all surplus soil for the construction is taken into account. It is normal that some soil material becomes unusable, or cross contaminated with other material and this material will need to be disposed of in the normal manner to a licenced facility.

4.6.4.1 Reuse

It has been demonstrated through the site design and cut and fill analysis conducted that any reuse of excavated material on this site is certain and there is be no further processing required in order for it to be reused. Topsoil, soil, rock and naturally occurring material excavated in the course of construction activities can be reused within the proposed development where feasible, subject to further soil/geotechnical testing and Quality Control procedures to determine if materials meet the specific engineering standards for their proposed end-use. Where naturally occurring, material is used for the purpose of construction in its natural state within the proposed development this material is not deemed to be a Waste in accordance with Article 2 of the Waste Directive 2008/98/EC, the European Communities (Waste Directive) Regulations, 2011 and Section 3 of the Waste Management Act 1996, as amended. Where a certificate of registration, Waste facility permits or Waste licence is required by the Contractor in order to reuse excavation material within the proposed development this will be obtained from either the local authority or the EPA.

4.6.4.2 Article 27

Article 27 of the EC Waste Directive Regulations 2011 permits surplus excavation material to be declared as a by-product for use in one of more known construction projects. An Article 27 notification to the EPA under Article 27 of the EC Waste Directive Regulations 2011 is required to achieve by-product status for soil and stones. By-product notifications to the EPA provide an opportunity for reuse of surplus clean soil & stone material arising from construction activity which bring significant economic benefits while facilitating beneficial re-use of by-products.

In the event that there is surplus suitable material, the Contractor may propose to use an Article 27 EPA notification in relation to such excavation, and the Contractor shall be responsible for submission of the Article 27 notification to the EPA and must demonstrate the following: -

- Further use of the soil and stone is certain;
- The soil and stone can be used directly without any further processing other than normal industrial practice;
- The soil and stone is produced as an integral part of a production process; and
- Further use is lawful in that the soil and stone fulfil all relevant requirements for the specific use and will not lead to overall adverse environmental or human health impacts.

The Contractor is responsible for ensuring all applicable regulatory requirements under Waste, planning and other laws are complied with prior to movement of excavation material and any movement of excavation material undertaken prior to determination of an Article 27 notification by the EPA will be undertaken at the risk of the Contractor.

4.6.4.3 Licenced Waste Facilities

Where removal of Wastes from the proposed development is unavoidable it will be delivered by the Contractor to licensed Waste facilities which are authorised under the Waste Management Act 1996, as amended, and which hold the appropriate certificate of registration, Waste facility permits or EPA licence. Activity in relation to soil recovery facilities described in Class 5 Third Schedule, Part 1 of the Waste Management (Facility Permit and Registration) Regulations 2007, as amended, notes

> "*Recovery of excavation or dredge spoil, comprising natural materials of clay, silt, sand, gravel or stone and which comes within the meaning of inert Waste, through deposition for the purposes of the improvement or development of land, where the total quantity of Waste recovered at the facility is less than 100,000 ton*nes."

EPA licensed Waste activities authorised to accept soil and stones for recovery and disposal include soil recovery sites, landfills, transfer stations and materials recovery facilities which typically handle a larger tonnage of Wastes than facilities holding certificates of registration of Waste facility permits.

Where the Contractor proposes to deliver excavated materials from the proposed development to facilities holding a certificate of registration, Waste facility permit or EPA Waste licence the Contractor is responsible for ensuring the authorisation is valid and allows acceptance of the relevant List of Waste Code. A copy of the authorisation will be included in the CMP and evidence will be provided that the proposed facility will have capacity to accept the required quantity of Waste from the proposed development.

4.6.5 Estimate of Construction Waste Arising

The Building Research Establishment (BRE) UK have produced benchmarks derived from data out of the BRE SMARTWaste Plan issued in June 2012 as outlined in Figure 8 below.

Project Type	Number of projects data relates to	Average $m^3/100m^2$	Number of projects data relates to	Average m^3/£100K
Residential	677	18.1	669	12.3
Public Buildings	49	20.9	55	10.7
Leisure	71	14.4	69	9.2
Industrial Buildings	54	13.0	55	10.8
Healthcare	86	19.1	85	9.1
Education	263	20.7	272	10.0
Commercial Other	4	17.4	2	9.7
Commercial Offices	60	19.8	56	9.3
Commercial Retail	123	20.9	122	15.0
Total number of projects	**1387**		**1385**	

Figure 8: BRE SMARTWaste benchmark data by project type

The table below is a breakdown of the quantities of Construction Waste which will be produced based on the BRE data outlined above.

Table 4: Quantities of Proposed Construction Waste

Type	Proposed Gross Floor Area (m^2)	Average m^3/ 100m^2	Construction Waste (m^3)
Residential	63,859.3	18.10	11,558.53
Residential (Apartment)	8,078.1	18.10	1,462.14
Commercial (Offices)	-	-	-
Commercial (Retail)	1,240-	20.90	259.16
Commercial (Other)	1,095-	17.40	190.53

Therefore, the total Waste to be generated during the construction phase of the project is estimated at 13470.36m^3. The Contractor will ensure that Waste generation on site is minimised and that Waste removed from site for recovery or disposal is reduced where feasible.

4.6.6 Construction Waste Management

The Contractor shall as a minimum implement the following measures to prevent Waste generation, facilitate Waste recycling and minimise Waste disposal during the construction phase:

4.6.6.1 Source Segregation

Metal, timber, glass and other recyclable material will be segregated and removed off site to a permitted/licensed facility for recycling. Waste stream colour coding and photographs will be used to facilitate segregation. Office and food Waste arising on site will be source separated at least into dry mixed recyclables, biodegradable residual Wastes. Paints, sealants and hazardous chemicals etc. will be stored in secure, bunded locations. All hazardous Waste will be separately stored in appropriate lockable containers prior to removal from site by an appropriate Waste collection holder. Waste bins, containers, skip containers and storage areas will be clearly labelled with Waste types which they should contain, including photographs as appropriate. The site will be maintained to prevent litter and regular litter picking will take place throughout the site.

4.6.6.2 Material Management

'Just in time' delivery will be used so far as is reasonably practicable to minimise material wastage. Waste generated on site will be removed as soon as practicable following generation for delivery to an authorised Waste facility. The Contractor will ensure that any off-site interim storage facilities for excavated material have the appropriate Waste licences or Waste facility permits in place.

4.6.6.3 Further Detailed Development of the CMP by the Contractor

The Contractor will be required to further develop and detail this CMP prior to commencement of the proposed demolitions and, as a minimum, include the following: -

- Details of the Contractor including the nominated project manager,
- names, roles, responsibilities and authority of key personnel involved in Waste management in the design team and on site,
- Estimates of Waste generation including the types and quantity of Wastes generated,
- Types and quantities of excavation material, if any,
- Measures to reduce Waste generation,
- The amounts of material intended to be stored temporarily on site and the location of such storage,
- Measures to prevent nuisances etc.,
- Authorised Waste hauliers with appropriate and up to date Waste Collection Permits,
- Identification of all local and appropriate recycling and disposal sites, for all material leaving site, including providing copies of permits/licences for Waste facilities,
- Any other relevant item during construction, which may be brought to the attention of the design team or the Contractor which should be reasonably addressed and inserted into the detailed Construction Waste management plan.

The following procedures, as a minimum, should be included in the plan where relevant: -

- Control of Sub-Contracts, if applicable, which must include the assessment of the sub-Contractor's Waste management policies and control capabilities, and the identification and implementation of additional controls needed on such Sub-Contractors to fulfil the design teams and Contractor's obligations in respect of Waste management,
- Waste management including liaison with third parties, statutory bodies, Waste hauliers, Waste disposal facilities and other companies,
- Excavation and handling of Waste materials to prevent nuisance,
- Segregation and proper storage of materials on site to facilitate reuse and recycling,
- Management of any hazardous or contaminated Waste,
- Control of all documentation relating to the handling, transportation and disposal of Waste,
- Management review/audits to monitor and demonstrate control over the implementation of the detailed Construction Waste Management Plan.

4.7 Collection of Construction Waste

Waste from Construction will be transported by authorised Waste collectors in accordance with the Waste Management (Collection Permit) Regulations 2007, as amended. An up-to-date list of all Waste collectors used to transport Waste from site during the proposed development will be maintained on site and updated by the Contractor and be similar to the sample Waste Collection Permit table below. The Contractor shall hold valid Waste collection permits on site.

Table 5: Sample Waste Collection Permit Table

Name of Authorised Waste Collector	Company Address	National Waste Collection Permit Number	Waste Types Collected (Text Description)	Waste Types Collected (EPA LoW Codes)

4.8 Offsite Disposal of Construction Waste

Waste from Construction will be delivered to authorised Waste facilities in accordance with the Waste Management Act 1996, as amended. The Contractor shall maintain an up-to-date list, similar to the sample Table below, of all Waste facilities to which Waste from the site will be delivered and copies of valid appropriate facility Certificates of Registration, Waste Facility Permits and Waste Licences.

Table 6: Sample Authorised Waste Facilities

Name of Authorised Waste Facility	Waste Facility Address	Number of Waste Licence/ Waste Permit/ Certificate of Registration	Regulatory Authority	Waste Types to be delivered (Text Description)	Waste Types to be delivered (EPA LoW Coes

4.9 Construction Waste Management Costs

As required by the Department of the Environment, Heritage and Local Government Best Practice Guidelines on the Preparation of Waste Management Plans for Construction & Demolition Projects this section addresses costs of Waste management. The total cost of implementation of the CMP will

be measured by the Contractor and will take into account handling costs, storage costs, transportation costs, revenue from rebates and disposal costs.

4.9.1 Reuse/ Recovery

By reusing materials on site, there will be a reduction in the transport and disposal costs associated with the requirement for a Waste Contractor to take the material away to landfill. Clean and inert soils, gravel, stones etc. which cannot be reused on site may be classified as a by-product (under Article 27 of the 2011 Waste Directive Regulations), used as capping material for landfill sites, or for the reinstatement of quarries etc. subject to approvals by EPA. This material is often taken free of charge for such purposes, or when used as capping in landfills will not attract the landfill tax levy, thereby reducing final Waste disposal costs.

4.9.2 Recycling

Salvageable metals will earn a rebate which can be offset against the cost of collection and transportation of the skips. Clean, uncontaminated cardboard and certain hard plastics can be recycled. Waste Contractors will charge considerably less to take segregated Wastes such as recyclable Waste from a site than mixed Waste. Timber can be recycled as chipboard. Again, Waste Contractors will charge considerably less to take segregated Wastes, such as timber from a site than mixed Waste.

4.9.3 Disposal

Landfill charges are currently at approximately €160/tonne (includes a €75 per tonne landfill levy introduced under the Waste Management (Landfill Levy) (Amendment) Regulations 2012) for non-hazardous Waste and €25/tonne for inert Waste. In addition to disposal costs, Waste Contractors will also charge a collection fee for skips. Collection of segregated Waste usually costs less than municipal Waste. Specific Waste Contractors take the Waste off-site to a licensed or permitted facility and, where possible, remove salvageable items from the Waste stream before disposing of the remainder to landfill. Clean soil, rubble, etc. is also used as fill/capping material wherever possible.

4.10 CMP Auditing

The Contractors CWM shall carry out regular Waste Audits in accordance with the Contractors Project Specific Waste Audit Plan which shall be a systematic study of the Waste management practices applied in the project to highlight the problems that Waste can cause and the benefits of prevention and minimisation. The CWM's Audits shall allow the Contractor to monitor the quantity and type of Waste produced by different Sub-Contractors and identify opportunities for Waste reduction throughout each stage of the project. The Audit should identify details of raw material inputs and the quantity, type and composition of all Waste form the site. The Contractor will record the quantity in

tonnes and types of Waste and materials leaving the site during the construction works. The name, address and authorisation details of all facilities and locations to which Waste and materials are delivered will be recorded along with the quantity of Waste in tonnes delivered to each facility. Records will show material which is recovered and disposed of. The Audit shall highlight corrective actions that may be taken in relation to management policies or site practice in order to bring about further Waste reductions which shall be supplemented with a tracking system to determine the success or failure of the corrective actions. Finally, summary audit reports outlining types, quantities of Waste arising's and their final treatment method should be sent to the relevant Authority for their information.

4.11 References

- Department of the Environment, Heritage and Local Government (DoEHLG), 2006a. Best Practice Guidelines on the Preparation of Waste Management Plans for Construction & Demolition Projects.
- Environmental Protection Agency (EPA), 2017. Construction and Demolition Waste Statistics for Ireland. Latest Reference Year: 2014
- EPA, 2016. Ireland's Environment 2016 – An Assessment. EPA, Ireland
- EPA, 2015. Waste Classification, List of Waste & Determining if Waste is Hazardous or Non-hazardous.
- EPA, 2014. National Waste Report 2012. EPA, Ireland

5 Construction Management Plan

The following sections outline the Construction Management Plan (CMP) which provides a framework that outlines how the appointed Contractor will manage and minimise, where possible, negative environmental effects during the construction of the proposed development where construction is considered to include all site preparation, enabling works, demolition works, construction activities, materials delivery, materials and waste removal and associated engineering works. This CMP

- Outlines an indicative programme for Construction,
- Describes the land-use requirements of the construction phase,
- Outlines the employment requirements, roles and responsibilities associated with the construction phase of the proposed development,
- Outlines all the measures which shall be implemented by the appointed contractor to ensure that no significant effects on the environment occur during the construction phase of the proposed development.
- A Greenway Boardwalk Outline Construction Methodology has been prepared by Donnachadh O'Brien & Associates has also been submitted as part of this application and should be referred to in conjunction with this CMP. The Greenway Boardwalk Outline Construction Methodology 2432-DOB-XX-SI-RP-0100 has been appended to this report for reference.

Following appointment, the Contractor, as part of the CMP, shall be required to develop more specific Method Statements and submit a Project Specific CMP that is cognisant of the proposed construction activities, equipment and plant usage and environmental monitoring plan for the proposed development. This CMP outlines the range of potential types of construction methods, plant and equipment which may be used by any Contractor appointed in order to enable their impacts to be assessed by the competent authority for the purposes of the environmental impact assessment and appropriate assessment prior to determining whether to grant planning permission. This CMP identifies the minimum requirements with regard to the appropriate mitigation, monitoring, inspection and reporting mechanisms that need to be implemented throughout construction. Compliance with this CMP does not absolve the Contractor or its Sub-Contractors from compliance with all legislation and bylaws relating to their construction activities.

5.1 Construction Compound

The Contractor's construction compound will be located on site for the duration of the project and shall primarily consist of

- Site Offices & associated welfare facilities,
- Staff Car Parking facilities,

- Materials drop-off and storage areas;
- Set down areas for HGVs

Materials to be stored on site will be stored in a safe manner and will minimise the risk of any negative environmental effects and will be managed on a 'just-in-time' basis. All fuel storage areas will be bunded in the compound and will be clearly marked. Fuel will be transported from the offsite compound to the plant and equipment in mobile units based on need. A dedicated fuel filling point will be set up on site with all plant brought to this point for filling. Temporary toilets and wash facilities will be provided for construction workers which may require periodic waste pumping and waste offsite haulage and shall be carried out by an authorised sanitary waste contractor.

5.2 Site Management

5.2.1 Hoarding

The Contractor will establish a site boundary with the provision of appropriate signage, construction of hoarding, and welfare facilities, site office, and establishment of appropriate access and egress. The construction site hoarding will be provided as a secure site boundary to what can be a dangerous environment for people who have not received the proper training and are unfamiliar with construction operations established around the work area before any significant construction activity commences. Site hoarding minimises some of the potential environmental impacts associated with construction, namely:

- Noise,
- Visual impact,
- Dust.

Controlled access points to the site, in the form of gates or doors, will be kept locked for any time that these areas are not monitored (e.g., outside working hours). The hoarding shall be painted, well maintained and contain graphics relating to the proposed development.

5.2.2 Security

The Contractor shall ensure that the site hoarding will avoid unauthorised entry to site particularly along the L-6179 road where it may be quieter and certain hours and thus minimise the risk of vandalism. The Contractor shall also place hoarding down along the entrance to the greenway from Avondale Crescent.

5.2.3 Site Maintenance

The Contractor shall continuously maintain the site and its surround environs by carrying out the following: -

- Maintain work areas and ensure staff welfare facilities and material storage areas are kept clean and away from the marsh area to the south of the site
- Provide site layout maps identifying key areas such as first aid posts, material storage, spill kits, material and waste storage and welfare facilities,
- Maintain all plant, material and equipment required to complete the construction work,
- Maintain construction compounds, access routes and designated parking areas free and clear of excess dirt, rubbish piles, scrap wood, etc. at all times,
- Prevention of the discharge of fuel & oil from bunded areas and ensure no oil/ fuel runoff to discharge to the marsh area to the south of the site
- Provision of appropriate waste management at each working area,
- Prevention of infestation from pests or vermin,
- Maintenance of wheel washing facilities,
- Prevention of site runoff or surface water discharge,
- Maintenance of public rights of way, diversions and entry/ exit areas around working areas for pedestrians and cyclists where practicable,
- Material handling and/or stockpiling of materials, where permitted, will be appropriately located to minimise exposure to wind. Water misting or sprays shall be used as required if particularly dusty activities are necessary during dry or windy periods.

5.2.4 Site Lighting

The Contractor shall implement the following measures in relation to site lighting: -

- Site lighting will be provided with the minimum luminosity sufficient for safety and security purposes to avoid shadows cast by the site hoarding on surrounding footpaths, roads and amenity areas. Areas along the L-6197 and Monument Ln should be sufficiently illuminated during the construction phase.
- Motion sensor lighting and low energy consumption fittings will be installed to reduce usage and energy consumption,
- With the site located in an area/ with neighbouring properties, It must be ensured that site lighting positioned and directed so as not to unnecessarily intrude on adjacent buildings and land uses, ecological receptors and to avoid causing distraction or confusion to passing motorists,

5.2.5 Working Hours

The proposed normal working hours, subject to Planning Permission, during the construction phase are as follows: -

Start	Finish	Day(s)
07 00	18 00	Monday to Friday
08 00	14 00	Saturday

No works are proposed on Sundays or Bank Holidays or after the hours noted above, however, it may be necessary to work outside of these hours in exceptional circumstances such as Night Works or Weekend Works during certain construction activities such as Road Junction Works.

5.2.6 Employment

It is anticipated that at the peak of the construction phase that there will be an average work force of 250 people.

5.2.7 Construction Health & Safety

The Contractor shall comply with the requirements of the Safety, Health and Welfare at Work Act 2005, the Safety, Health and Welfare at Work (Construction) Regulations, 2006 and other relevant Irish and EU safety legislation at all times. As required by the Regulations, a Health and Safety Plan will be formulated which will address health and safety issues from the design stages through to completion of the construction and maintenance phases. This plan will be reviewed and updated as required, as the development progresses. In accordance with the Regulations, a "Project Supervisor Construction Stage" will be appointed as appropriate. The Project Supervisor Construction Stage will assemble the Safety File as the project progresses.

5.2.8 Emergency Response

The Contractor will maintain an Emergency Response Action Plan which will cover all foreseeable risks, i.e. fire, spill, flood, etc. and will be developed in accordance with the site emergency plan. Appropriate site personnel will be trained as first aiders and fire marshals and be trained in environmental issues and spill response procedures.

5.2.9 Construction & Demolition Waste Management

The Contractor will be required to produce a Construction Waste Management Plan (CWMP) for approval by Wicklow County Council prior to commencing the Works. The Contractor shall refer to and expand on the Outline Construction Waste Management Plan prepared by Donnachadh O'Brien & Associates Consulting Engineers and shall include but not be limited to the following: -

- Description of the Project and details of the Contractor's Construction Waste Manager;
- Construction Waste Arising and proposals for waste minimisation, reuse and recycling;
- Procedures for waste prevention & management;
- Estimated costs of waste management;

- Training & education proposals for the workforce regarding Waste procedures;
- Waste collection & disposal including licensing, permits and associated records;
- CMP Auditing;

5.2.10 Construction Surface Water Run-off

The There are several activities during construction that pose a high risk of surface water impact as indicated below in figure 9which is an extract from 'Control of water pollution from linear construction projects' by Murnane et al (2006).

Pollution risk	Hazards
1 Activities that provide a pollution source	❖ Uncontrolled sediment erosion and contaminated silty runoff ❖ refuelling facilities, chemical and waste storage or handling areas ❖ polluted drainage and discharges from site ❖ contaminated groundwater from dewatering of contaminated sites
2 Activities that cause significant variations in natural flow	❖ Unregulated and poorly considered abstractions and discharges eg dewatering ❖ changes to the existing drainage network including interception and redirection of natural and artificial watercourses (eg field drains) ❖ discharge of groundwater to surface water ❖ increased runoff from cleared and capped areas (relative to greenfield values)
3 Activities that significantly modify or destroy physical habitats	❖ Watercourse crossings ❖ works within water ❖ outfall points

Figure 9: Foul Drainage Catchments Extract from 'Control of water pollution from linear construction projects'.

Construction works are required to take place adjacent to the Arklow town marshland, therefore there is significant risk of pollution to the marshland and other existing on-site watercourses arising from the proposed development. Outlined below are the proposed mitigation strategies that will be adopted to reduce and prevent impact on the surrounding areas during the construction phase of works.

To mitigate against the potential impacts outlined in the table above, the following measures are proposed for the construction stage of the project:

Groundwater or run-off that collects in excavations or foundation trenches will be drained or pumped to a construction site water treatment arrangement. The water is to be directed into a proprietary temporary settlement tank pond with a proprietary 'silt bag' to intercept bulk silt volumes. This process entails sediment-laden water being pumped into a filter bag, which traps the solids inside and allows the filtered water to flow freely out through the Geotextile fabric to disperse into the collection point. The proposed collection points adjacent to a final temporary pond which will act as a final temporary settling during the construction and there shall be a series of silt trap fences and filter drain arrangements along the perimeter of the marshlands for further protection. The water and silt within the pond are to be emptied into water vacuum tanker and is to be disposed of off-site to a licensed facility.

Figure 10: Typical Example of Silt Bag

Figure 11: Typical Example of Settlement Tanks

Due to the gently sloping nature of the existing topography from North to south (towards the Marshlands) , there is a risk of silt/ sediment accumulating/ discharging towards the marsh area. To mitigate against unwanted silt discharge, Silt traps in the form of silt fences or hay bale structures will be adopted across lengths of the site as indicated in figure 12 to intercept runoff and provide a stage of treatment and runoff filtration.

Figure 12: Typical Example of a Silt Trap fence

Runoff filtered through the silt trap fence shall be then intercepted by a temporary filter drain which will run directly parallel to the downstream side of the silt trap fence. The collected, filtered runoff shall discharge to the constructed ponds which shall act as temporary settlement structures during the

construction phase. The use of filter drains and temporary settlement ponds shall further treat any potential contaminated/ polluted runoff prior to discharge to a Silt Bag arrangement which will provide maximum treatment of surface water runoff entering the Marshland.

During the construction phase of the development, all silt/ pollution removal strategy structures shall be constructed/ installed outside the extent of the riparian buffer which has been determined as 10m from the Bluebell Stream bank. A summary of the proposed series of silt/ pollution prevention has been provided in figure 13 below.

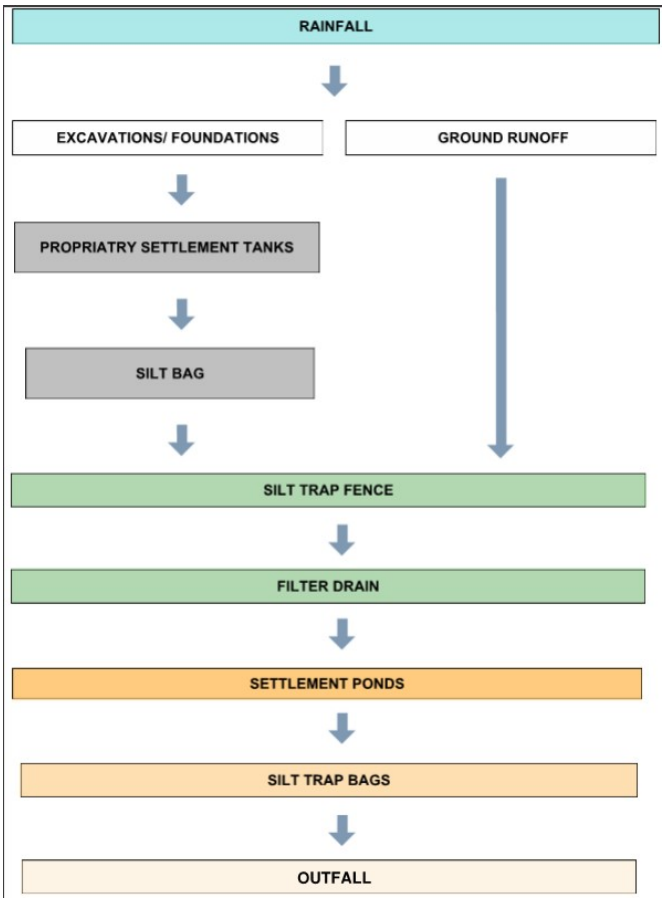


Figure 13: Typical Silt prevention Strategy Summary

To assess the entirety of the proposed mitigation measures and their potential/ predicted impacts, please refer to Chapter 6 'Land, Soils & Geology' and Chapter 14 'Material Assets' of the EIAR submitted with the application.

Phasing of the development is discussed in section 4.5 of this report. The above surface water mitigation measures will be implemented in Phase 1, the works phase which shares a boundary with the marshlands to the south. For subsequent phases of work, the surface water drainage network will be completed in Phase 1 and the mitigation measures of temporary settlement ponds/tanks, filter bags and silt fences shall be employed in the open spaces of the each subsequent phase prior to discharge to the piped network previously constructed. It is recommended that a further temporary pond and filter bag arrangement is maintained and the 2 No. permanent outfall locations to the marsh to ensure a secondary level of surface water treatment/management, until such time as the full scheme is built out.

5.3 Construction Traffic Management Plan

An Construction Traffic Management Plan (CTMP) shall be prepared separately for the project. This report is a 'Preliminary' version to identify and establish key principles concerning construction traffic movement and reference should be made to EIAR Chapter 11: Traffic & Transport Assessment which provides a basis for preparing the final Construction Traffic Management Plan, and the Systra Traffic & Transport Assessment & Outline Mobility Management Plan submitted with this application.

As highlighted in Section 3 of this CMP, A boardwalk traversing the Marshland to the south is proposed to increase pedestrian and cyclist permeability from the site to Arklow Town. The ground conditions of the upper soils of the Marsh consist of soft silts and peaty soils. In order to have the least impact of the existing marshland and vegetation, it is proposed for construction traffic to access across the marsh via temporary timber bog mats. Please refer to the Greenway Boardwalk Outline Construction Methodology which has been prepared by Donnachadh O'Brien & Associates for further detail regarding the temporary construction traffic access to the Marsh

The appointed construction contractor will be required to prepare the final CTMP. The CTMP will address the following:

- Minimise the impact of HGV movements on the existing road network. Figure 14 below identifies the route for construction traffic entering and exiting the site. The construction access route shall follow the existing Dublin Road/ Beech Road/ L-6179 route north of Arklow town. This route ensures all construction traffic approached form the M11, avoids Arklow town and avoids and l minimise vehicular movement conflicts with local residential traffic.
- The routes outlined in figure 14 below shall maintain the level of safety for pedestrian and cyclists, as well as the operational efficiency of the access as the construction movements shall be more consistent and predictable.

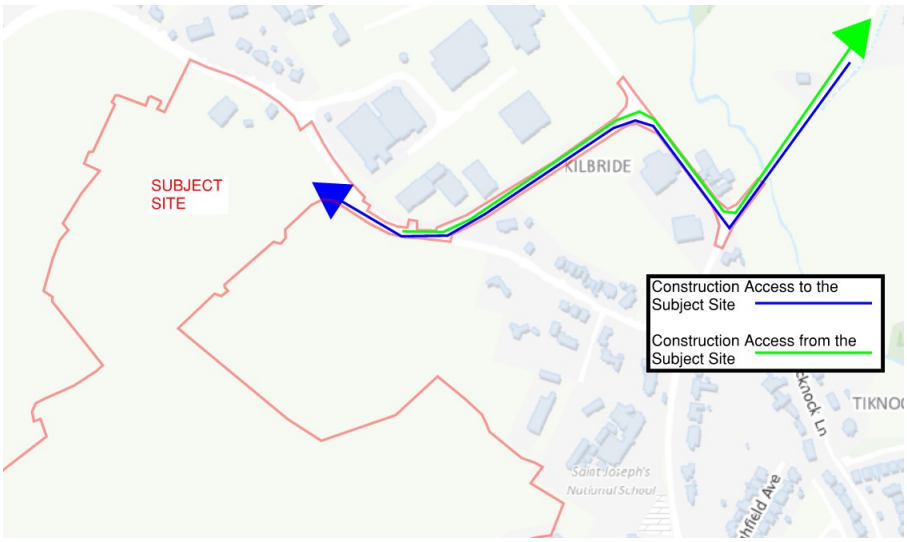


Figure 14: Proposed Construction Access Routes to and From the Subject Site

- The construction access routes outlined in figure 14 to and from the site will be discussed and agreed with Wicklow County Council, with all drivers accessing the site being advised of these routes and instructed accordingly
- Minimise the impact that the construction works will have on local residents and surrounding environment. The Contractor will be required to appoint a Construction Traffic Manager
- The Construction Traffic Manager will be responsible for ensuring all delivery vehicles to and from the site are managed efficiently and reduce nuisance or unnecessary disruption to the operation of the existing road network
- The Construction Traffic Manager role will also include advising haulage contractors and their drivers of the most appropriate route to follow when approaching the site in particular providing advice on local width and weight restrictions
- The Construction Traffic Manager will ensure traffic management principles and the mitigation measures are implemented and that the public road is kept clear of mud and debris through ensuring that loads are suitably sheeted and secured and undertaking regular street cleaning as necessary
- Warning signs/advanced warning signs will be installed at appropriate locations in advance of the construction access locations
- Speed limits of construction vehicles to be managed by appropriate signage to promote lower speeds

5.4 Environmental Management

The following section summaries all construction related mitigation and monitoring measures that must be implemented by the appointed Contractor during the construction phase of the proposed development. The following sections should be read in conjunction with the EIAR submitted with this application and the relevant chapters should be reviewed for further details.

5.4.1 Mitigation Measures

5.4.1.1 Traffic & Transport

The Contractor is required to develop a Site-Specific CEMP and CTMP in order to implement the requirements as outlined in this CMP and shall be agreed with Wicklow County Council and An Garda Síochána prior to commencement, and shall mitigate the Construction Impacts in accordance with section 6.10 of Systra's Traffic & Transport Assessment & Outline Mobility Management Plan submitted with this application, as follows:

6.10 Mitigation of Impact of Construction Traffic

6.10.1 Prior to commencement of construction, the appointed contractor will be required to prepare a comprehensive and detailed Construction Stage Traffic Management Plan (CTMP), to indicate how it is proposed to manage the traffic impacts during the construction stage and minimise the impact on local residents and businesses.

6.10.2 The CTMP will provide information on the potential location of contractor compounds, likely construction routes used for HGV's and general staff, indicative construction working hours and information regarding the potential sub-phases and associated estimated movements. The CTMP shall be submitted to Wicklow County Council for approval prior to commencement of works.

5.4.1.2 Air Quality

The pro-active control of fugitive dust will ensure the prevention of significant emissions, rather than an inefficient attempt to control them once they have been released. The main contractor will be responsible for the coordination, implementation and ongoing monitoring of the dust management plan. The key aspects of controlling dust are listed below. Full details of the dust minimisation plan can be found in Appendix 9B of EIA Chapter 9 : Air & Climate

- The specification and circulation of a dust management plan for the site and the identification of persons responsible for managing dust control and any potential issues;
- The development of a documented system for managing site practices with regard to dust control

- The development of a means by which the performance of the dust management plan can be monitored and assessed;
- The specification of effective measures to deal with any complaints received.
-

The following are the Air Quality mitigation measures which are deemed appropriate to the proposed development. Refer to EIAR Chapter 9, Table 9-9 which presents a summary of dust control techniques which will be implemented at the site during demolition activities.

Summary of Dust Control Techniques	
Sources of Particular Matter	**Control Technique**
Loading and unloading processes	**Containment / Suppression**
	Reducing drop heights
	Use of variable height conveyors
	Use of chutes
Double handling transfers points	**Site and process design**
	Reduction of vehicle movements
Aggregate stockpiles	**Appropriate siting**
	Away from closest receptors/site boundaries
	Use of enclosures and bunding
	Reduced drop heights
	Water suppression
	Sprays
	Bowsers
	Covering
	Covered stock bins
	Dust covers
Mobile Crushing of site generated C&D Waste (if applicable)	**Appropriate siting**
	Away from closest receptors/site boundaries
	Use of enclosures and bunding
	Reduced drop heights
	Water suppression
	Sprays
	Bowsers
Conveyors / transfer points	**Containment**
	Wind boards
	Housings
	Suppression
	Water sprays
	Housekeeping

	Clean up of spilled materials
	Appropriate siting
	Away from closest receptors/site boundaries
Concrete Cutting Plant	**Suppression**
	Water sprays fitted to equipment/plant
Roadways including site yard area.	**Suppression**
	Water sprays and bowsers
	Wheel wash at site compounds
Vehicles	**Washing / Covering**
	Wheel wash to be installed at site exit
	Vehicles exiting the site with C&D loads shall be covered with tarpaulin

Extract from EIAR Chapter 9 Table 9-9: Summary of Dust Control Techniques

- Spraying of exposed earthwork activities and site haul roads during dry weather;
- Provision of wheel washes,
- Covering of stockpiles,
- Control of vehicle speeds, speed restrictions and vehicle access;
- Sweeping of hard surface roads.

In addition, the following measures will be implemented for during the construction phase of the proposed development:

- A min. 1.8m hoarding will be provided around the site works to minimise the dispersion of dust from the working areas,
- Any generators will be located away from sensitive receptors in so far as practicable.

5.4.1.3 Noise & Vibration

With regard to construction activities, best practice control measures for noise and vibration from construction sites are found within BS 5228 (2009 +A1 2014) *Code of Practice for Noise and Vibration Control on Construction and Open Sites Parts 1 and 2*. Whilst construction noise and vibration impacts are expected to vary during the construction phase depending on the distance between the activities and noise sensitive buildings, the contractor will ensure that all best practice noise and vibration control methods will be used, as necessary in order to ensure impacts at off-site noise sensitive locations are minimised.

The best practice measures set out in BS 5228 (2009) Parts 1 and 2 includes guidance on several aspects of construction site mitigation measures, including, but not limited to:

- Selection of quiet plant.

- Noise control at source.
- Screening.
- Liaison with the public
- Monitoring

A detailed comment is offered on these items in Chapter 8 on noise mitigation during the construction phase. The Contractor shall implement the following mitigation measures during construction activities in order to reduce the noise and vibration impact to nearby noise sensitive areas.

- Site compounds will be located away from noise sensitive receptors within the site constraints.
- The use lifting bulky items, dropping and loading of materials within these areas will be restricted to normal working hours.
- For steady continuous noise, such as that generated by diesel engines, it may be possible to reduce the noise emitted by fitting a more effective exhaust silencer system or utilising an acoustic canopy to replace the normal engine cover.
- For concrete mixers, control measures will be employed during cleaning to ensure no impulsive hammering is undertaken at the mixer drum.
- For all materials handling ensure that materials are not dropped from excessive heights, lining drops chutes and dump trucks with resilient materials.
- Demountable enclosures to screen operatives using hand tools and will be moved around site as necessary.
- All items of plant will be subject to regular maintenance to prolong the effectiveness of noise control measures.
- Construction site hoarding to be constructed around the site boundaries of a material with a mass per unit of surface area greater than 7 kg/m^2 to provide adequate sound insulation.
- Construction noise monitoring will be undertaken at periodic sample periods at the nearest noise sensitive locations to the development works to check compliance with the construction noise criterion and be conducted in accordance with the International Standard ISO 1996: 2017: Acoustics – Description, measurement and assessment of environmental noise.
- The Contractor shall carry out construction activities on site below the recommended vibration criteria set out in BS 7385-2 (1993).

5.4.1.4 Biodiversity

The potential vector for impacts would be seen to be via surface water networks measures should be in place to protect the biodiversity of the watercourses downstream. No additional mitigation measures are required besides those outlined below, during the construction and operational phases

of the development, to protect against potential negative impacts on designated conservation sites or species of conservation importance.

The 25m riparian buffer zone should be clearly demarcated in advance of Phase 1 construction work with demarcation maintained throughout the construction phase. The construction of the Culvert facilitating the Greenway crossing over the eastern 'dry ditch', regrading works to the 'dry ditch' will be the only exception to buffer demarcation. Site specific method statements including adequate control measure for these works will be prepared ahead of the commencement of construction.

Additional measures to be carried out to prevent impacts on Habitats, Botany and Avian Ecology

- Relevant guidelines and legislation (Section 40 of the Wildlife Acts, 1976 to 2012) in relation to the removal of trees and timing of nesting birds will need be followed e.g. do not remove trees or shrubs during the nesting season (1st March to 31st August).
- Replanting of the perimeter treelines, hedgerows and wildflower meadows should be carried out with native species.
- Construction operations outside of daylight hours should be kept to a minimum in order to minimise disturbance to fauna in addition to roosting bird species.
- Where possible, treelines and mature trees that are located immediately adjacent to planned construction areas or are not directly impacted should be avoided and retained intact. Overall impacts on these sites should be reduced through modified design and sensitivity during construction. Retained trees should be protected from root damage by machinery by an exclusion zone of at least 5 metres or equivalent to canopy height. Such protected trees should be fenced off by adequate temporary fencing prior to other works commencing.
- Boundary vegetation. Linear features such as hedgerows and treelines may serve as commuting corridors for bats (and other wildlife) and the onsite boundary vegetation should be retained and/or replaced once construction ends. Native species should be chosen in all landscaping schemes. Planting schemes should attempt to link in with existing wildlife corridors (hedgerows and treelines), both onsite and off, to provide continuity of wildlife corridors. Retention of boundary hedgerows and treelines will also serve to screen the development.
- Lighting restrictions. In general, artificial light creates a barrier to bats so lighting should be avoided where possible. Where lighting is required, directional lighting (i.e. lighting which only shines on work areas and not nearby countryside) should be used to prevent overspill. This can be achieved by the design of the luminaire and by using accessories such as hoods, cowls, louvers and shields to direct the light to the intended area only. Mature trees should not be directly lit during construction or operation of the proposed development.

Additional Mitigation

- All water leaving the site during construction will be desilted using standard techniques as typically noted in section 5.2.10 of this outline Construction methodology.
- Desilting and petrochemical interception of all surface runoff/pumped water will take place for the length of the construction project.
- A petrochemical interceptor will be placed on the surface water network prior to discharge.
- Local silt traps established throughout site, particularly adjacent to the marshlands to the south of the site
- Mitigation measures on site include dust control, stockpiling away from watercourse and drains
- Stockpiling of loose materials will be a minimum of 20m from drains.
- Stockpiles and runoff areas following clearance will have suitable silt barriers to prevent runoff of fines into the drainage system.
- Fuel, oil and chemical storage will be sited within a bunded area. The bund will be at least 50m away from drains, excavations and other locations where it may cause pollution. The bund shall be located a sufficient distance from the marshland to the south to avoid any pollution
- Bunds will be kept clean and spills within the bund area will be cleaned immediately to prevent groundwater contamination. Any water-filled excavations, including the attenuation tank during construction, that require pumping will not directly discharge to the surface water network. Prior to discharge of water from excavations adequate filtration and petrochemical interception will be provided to ensure no deterioration of water quality and ensure compliance with the Water Pollution Acts.
- Site layout during excavation works will be designed to ensure vehicles do not enter the works area unless necessary for the excavation and soil removal processes. All machinery leaving the works area will be thoroughly cleaned before being allowed on to public roads. A road sweeper (including vacuum) will be in place (as required) to unsure cleanliness of nearby and haul roads (where necessary), particularly during enabling works.
- Dust may deposit on surrounding roads thus entering into the surface water network. Effective site management regarding dust emissions will be carried out.

5.4.1.5 Archaeology

All archaeological issues will be resolved during the pre-construction phase, or in advance of the main construction stage, during the site clearance / ground reduction stage.

5.4.1.6 Water

The Contractor shall implement the following to minimise the risk of pollution of soil, surface water and groundwater: -

- All water leaving the site during construction will be desilted using standard construction techniques as typically noted in section 5.2.10 of this outline Construction methodology.
- Earthworks operations shall be carried out such that surfaces shall be designed with adequate falls, profiling and drainage to promote safe run-off and prevent ponding and flooding;
- Run-off will be controlled to minimise the water effects in outfall areas;
- All concrete mixing and batching activities will be located in areas away from watercourses and drains; and
- Good housekeeping (site clean-ups, use of disposal bins, etc.) will be implemented on the site.
- All hazardous materials will be stored within secondary containment designed to retain at least 110% of the storage contents and temporary bunds for oil/diesel storage tanks will be used on the site

The Contractor shall apply best practice standards which will follow the guidance set out in the following CIRIA documents: -

- C532 Control of Water Pollution from Construction Sites
- C692 Environmental Good Practice on Site
- ICE Earthworks, A Guide
- TII Specification for Road Works Series 600 - Earthworks

5.4.1.7 Land & Soils

Precautionary measures will be taken to contain any areas within the planning boundary at risk of contaminated run-off. The Contractors CMP shall include the following measures: -

- Provide adequate security to potential pollutants against vandalism,
- Provide procedures to ensure that any spillages will be immediately contained, and contaminated soil shall be removed from the proposed development and properly disposed of in an appropriately licensed facility,
- Minimise dust generation by wetting down haul roads,
- Store stockpiles of earthworks and site clearance material on impermeable surfaces and covered with appropriate materials,
- Place silt traps in road gullies to capture any excess silt in the run-off from working areas,
- Carry out earthworks operations such that surfaces shall be designed with adequate falls, profiling and drainage to promote safe runoff and prevent ponding and flooding,

- Control runoff will be controlled erosion and sediment control structures appropriate to minimise the possible impacts.

The Contractors CMP shall include a plan for responding to emergencies and shall include actions for dealing with potential pollution incidents such as: -

- Containment measures;
- Emergency discharge routes;
- List of appropriate equipment and clean-up materials;
- Maintenance schedule for equipment;
- Details of trained staff, location and provision for 24-hour cover;
- Details of staff responsibilities;
- Notification procedures to inform the EPA or Environmental Department of Wicklow County Council;
- Audit and review schedule;
- Telephone numbers of statutory water consultees; and
- List of specialist pollution clean-up companies and their telephone numbers.

5.4.1.8 Hydrogeology

The Contractor's CMP shall take account of the recommendations `Chapter 7 of the EIAR on Hydrology and CIRIA guidance Control of Water Pollution from Construction Sites – Guidance for Consultants and Contractors to minimise the risk of soil, groundwater and surface water contamination.

Groundwater Monitoring shall be carried out by the Contractor, throughout the Construction Phase of the project and for a minimum of one full hydrological year following completion or such time as approved by WCC and/ or as specified in the planning decision. The Contractor shall appoint a suitably qualified professional to monitor ground water during and after construction and shall install a minimum of 10 no. boreholes with standpipes to monitor groundwater at locations to be agreed with the Engineer prior to the commencement of construction.

The Contractor shall implement the following measures to minimise the risk of spills and contamination of soils and waters: -

- Treat all excavated spoil will to remove excess fluid prior to stockpiling and transportation where possible,
- Transfer excess soil materials from stockpile areas off-site during dry periods where feasible,
- Restrict stockpile and transfer of excess soil material to specified and impermeable areas that are isolated from the surrounding environment,
- Provide wheel washes at site entrances and exit points,
- Train staff to follow vehicle cleaning procedures.

- Train site managers, foremen and workforce, including all subcontractors, in pollution risks and preventative measures,
- Bund all fuel storage facilities away
- Implement a regular vehicle inspection plan for fuel, oil and hydraulic fluid leaks.
- Provide suitable equipment to deal with spills on site;
- Minimise the use of cleaning chemicals; and

A boardwalk traversing the Marshland to the south is proposed to increase pedestrian and cyclist permeability from the site to Arklow Town. The ground conditions of the upper soils of the Marsh consist of soft silts and peaty soils. In order to ensure that the operational phase of the boardwalk will have insignificant impacts on the existing marshland and vegetation, A Greenway Boardwalk Outline Construction Methodology which has been prepared by Donnachadh O'Brien & Associates and has been submitted as part of this application.

AWN Consultants have prepared and submitted a Hydrological and Hydrogeological Qualitative Assessment to ensure a comprehensive understanding of the study's findings, methodologies, and conclusions. This review forms the basis of the Greenway Boardwalk Outline Construction Methodology for the informed feedback and any subsequent recommendations or actions. It sets out requirements and standards which must be met during the construction stage and will include these, and other relevant mitigation measures outlined in the CEMP and any subsequent conditions relevant to the proposed boardwalk. These include management of soils, re-fuelling of machinery and chemical handling, control of water during the construction phase and treatment of discharge water where required.

The following table sets out the mitigation measures identified by AWM Consulting's Hydrological and Hydrogeological Qualitative Assessment (Document Ref. 257501.0051WR01, submitted under separate cover), and compiled the following table of responses to the mitigation measures identified:
Please refer to the Greenway Boardwalk Outline Construction Methodology which has been prepared by Donnachadh O'Brien & Associates and the Hydrological and Hydrogeological Qualitative Assessment submitted as part of this application for further detail.

Table 7: Risk and Mitigation Table for Boardwalk

AWN Identified Risks/Impacts	DOBA Responses and Mitigation Measures
The construction of infrastructure near watercourses poses a significant risk in terms of contamination arising from spillages and sediment transport areas which can lead to degradation of water quality, ecological damage and flooding.	The risk is significantly reduced by the removal of any equipment or plant servicing areas from the marsh. Any equipment or plant will be refuelled/serviced within the construction compound located outside of the marsh. Sufficient bunding and spill kits will be provided at the compound. There are no direct flow paths toward the watercourses.
Construction activities will require localised clearance although removal of topsoil/subsoil is not foreseen. These works would potentially increase the erosion potential of the area during heavy rainfall and flooding events during which sediment can be transferred to the river via overland flow	The risk is removed by utilising a construction method not involving any soil movement. The use of bog mats will avoid excavations, resulting in the least possible disruption to the marsh.
Boardwalk construction across the Avoca River negative impact on the water quality of the Avoca River.	The additional piling works will be conducted in conjunction with the WCC Part 8 in-river works and will make use of all their construction access preparation and facilities. There is therefore no additional risks/impact over and above those identified as part of the WCC works.
Water levels in the marsh are very shallow and respond rapidly to rainfall events, so recurrent flooding is to be expected during the construction phase	The construction of the boardwalk will take place during the spring-autumn period, where potential flooding is negligible. It is further anticipated that any possible spillages will be contained within the site compound, located outside of the marsh.
The interception of rainfall by the boardwalk during the operational period.	The marsh will remain in its unaltered condition, and the impact of the additional hardstanding area of the elevated boardwalk is considered negligible.
The risk of pollution to both surface and groundwater resulting from accidental spillage.	The boardwalk is intended for the use of pedestrians and cyclists only. It is considered that the impact is negligible.

5.4.1.9 Waste Management

As noted previously, the Contractor will be required to produce a Construction Waste Management Plan (CMP) for approval by Wicklow County Council prior to commencing the Works. The Contractor shall refer to and expand on the Outline Construction Management Plan prepared by Donnachadh O'Brien & Associates Consulting Engineers.

5.4.1.10 Material Assets

The Contractor shall put measures in place to ensure that there are no interruptions to existing services and that all services and utilities are maintained, unless this has been agreed in advance with the relevant service provider and local authority. Where new services are required, the Contractor will apply to the relevant utility company for a connection permit where appropriate and will adhere to their requirements.

5.4.1.11 Major Accidents & Incidents

The construction phase of the proposed development will be carried out by the Contractor in compliance with best practice construction measures.

5.4.2 Monitoring Measures

5.4.2.1 Air Quality

The Contractor shall undertake dust monitoring at a range of nearest sensitive receptors during the construction phase with the Technical Instructions on Air Quality Control (TA Luft) dust deposition limit set at 350 mg/m^2/day, averaged over one year and applied as a 30-day average.

5.4.2.2 Climate

As no significant impact is predicted to occur during the construction phase of the proposed development, no monitoring measures are required.

5.4.2.3 Noise & Vibration

The Contractor shall carry out noise monitoring in accordance with the International Standard ISO 1996: 2017: Acoustics - Description, measurement and assessment of environmental noise and vibration in accordance with BS 7385-2 (1993)

5.4.2.4 Biodiversity

The Contractor shall ensure that the discharge of treated surface water from dewatering activities will be monitored to ensure that the discharged treated water will be in accordance with the Irish Water agreed Discharge Licence. The Contractor shall employ a suitably qualified Site Environmental Manager to oversee the control of settlement and advise of silt bag replacement where required.

5.4.2.5 Archaeology

Where archaeological material is found during the course of monitoring, the archaeologist may have work on the site stopped, pending a decision on the best approach to deal with the archaeology. The developer shall be prepared to be advised by the Department of Environment, Heritage and Local

Government with regard to the necessary mitigation action.' The operator shall facilitate the archaeologist in recording any material found.

5.4.2.6 Water

The Contractor shall carry out visual monitoring of the proposed development to ensure existing surface water runoff is draining from the site and is not exposed to any contaminants. In addition, the contractor is required to monitor the weather forecasts to inform the programming of earthworks and stockpiling of materials.

5.4.2.7 Land & Soils

The Contractor shall employ a suitably qualified person to monitor excavations in made ground to ensure that any contaminated material is identified, segregated and disposed of appropriately. The Contractor shall monitor excavations to ensure consistency with the descriptions and classifications according to waste acceptance criteria testing carried out as part of the site investigations. Any identified hotspots shall be segregated and stored in an area where there is no possibility of runoff generation or infiltration to ground or surface water drainage. In addition, care shall be taken to ensure that the hotspots do not cross contaminate clean soils elsewhere.

5.4.2.8 Hydrogeology

The Contractor shall carry out visual monitoring to ensure the groundwater resource is not impacted by the proposed development.

5.4.2.9 Waste Management

The Contractor shall manage waste during the construction phase in accordance with the Contractors CMP. The data will be maintained to advise on future projects.

5.4.2.10 Material Assets

Construction phase mitigation measures have been proposed to ensure that significant negative effects on material assets will be avoided, prevented or reduced during the construction of the proposed development. As such, no monitoring measures are proposed during the construction phase.

5.4.2.11 Major Accidents & Incidents

No monitoring is proposed specific to reducing the risk of major accidents/ disasters during construction.