



Preliminary Construction, Demolition & Waste Management Plan

Proposed Strategic Housing Development at Belcamp, Dublin 17

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Comments

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This report is confidential to the Client and we accept no responsibility of whatsoever nature to third parties to whom this report, or any part thereof, is made known. Any such party relies on the report at its own risk.

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1. Introduction

1.1 Context

This Preliminary Construction, Demolition & Waste Management Plan has been prepared by Waterman Moylan as part of the documentation in support of proposed Strategic Housing Development (SHD) planning submission in Belcamp, Dublin 17.

This document has been set up to be a 'living document' which will be updated and implemented by the Developer and Main Contractor as the project progresses.

1.2 Site Description

The Belcamp lands are located centrally in the Dublin Fringe area, north of the Northern Cross Route, R139, to the east of the IDA lands, and to the west of the Malahide Road (R107). The IDA lands are zoned "High Technology" (HT), to provide for office, research and development and high technology/high technology manufacturing type employment in a high quality built and landscaped environment. The total site area of the subject lands is c.67.2 hectares.

The subject site is bounded to the north and west by agricultural lands, to the south by the R139 Regional Road and to the east by an existing mixed-use development, by Phase 1 of the Belcamp development, which is currently under construction by the Applicant, and by the Malahide Road (R107).

The Mayne River flows from west to east through the site. The northern portion of the subject site is within Fingal County Council's jurisdiction, while the southern portion of the site is within Dublin City Council's jurisdiction, with the Mayne River forming the border between the two Local Authorities.

The site location is shown in the Figure below:

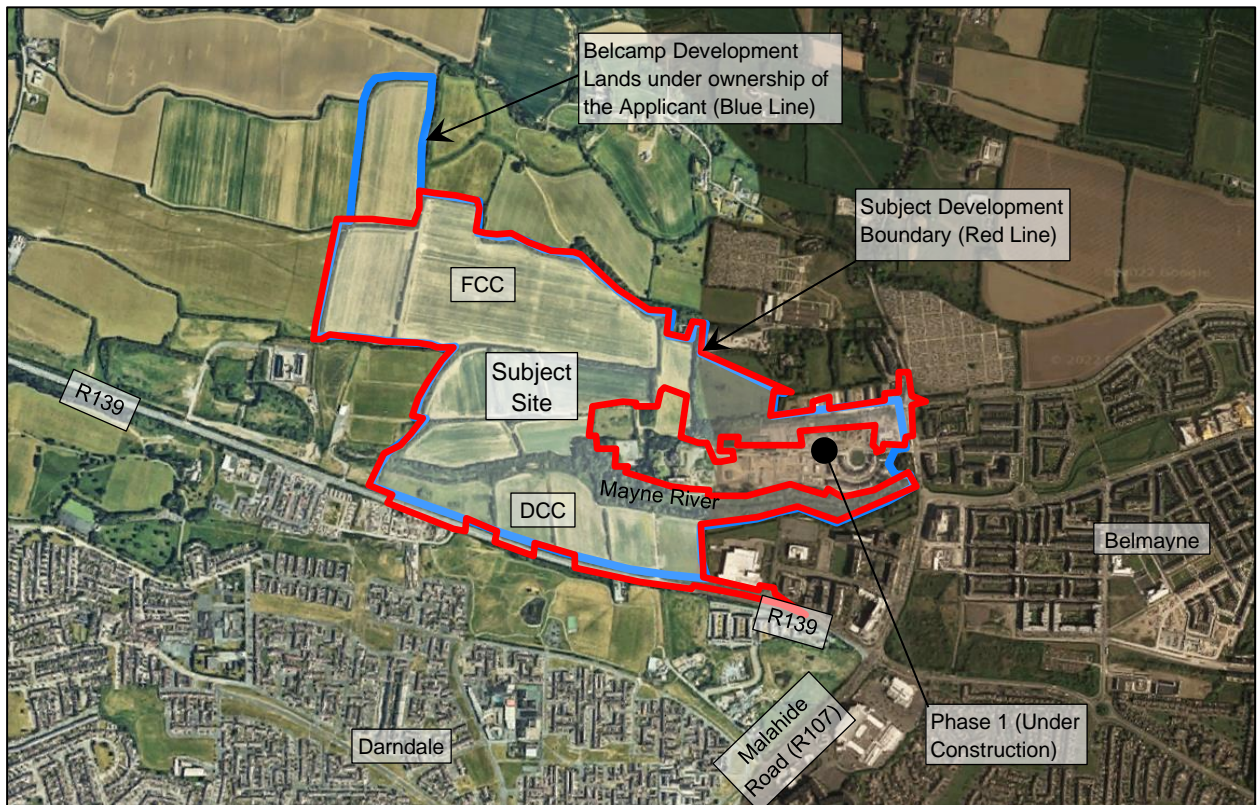


Figure 1 | Site Location (Source: Google Maps)

Topographic survey data shows that the southern portion of the site falls generally from south-west to north-east, towards the Mayne River, with a high point of c.35.5m OD Malin at the south-west of the site and a low point of c.26.5m OD Malin at the north-east of the main development area. The strip of land proposed as a greenway continues to fall to a low point of c.17m OD Malin close to the Malahide Road.

The northern portion of the site falls generally from north-west to south-east towards the Mayne River, though some of the lands at the north-east of the site fall to the north-east, away from the river and towards a ditch and culvert at the north-eastern boundary of the site.

1.3 Proposed Development

The proposed development comprises a total of 473 houses, 274 duplexes and 1,780 apartment units in 18 no. blocks, all on a c.67.2 Ha site. All of the proposed houses/duplexes are in the northern portion of the site, within Fingal County Council, and there are 550 apartment units proposed in this portion of the site, with 1,230 apartment units proposed in the southern portion of the site, within Dublin City Council. The schedule of accommodation is set out in the Table below:

Description		1-Bed	2-Bed	3-Bed	4-Bed	Total Residential	Commercial Space
Dublin City Council	Block 1	94	139	40	-	273	-
	Block 2	71	73	16	-	160	-
	Block 3	96	176	25	-	297	925.8m ² Retail/Café and Childcare
	Block 4	70	178	37	-	285	-
	Block 5	37	51	8	-	96	-
	Block 6	19	80	20	-	119	-
	DCC Subtotal	387	697	146	0	1,230	925.8m²
Fingal County Council	Houses	-	16	385	72	473	-
	Duplexes	24	40	210	-	274	-
	Block A	8	15	-	-	23	-
	Block B	8	15	-	-	23	-
	Block C	7	20	-	-	27	-
	Block D	22	15	5	-	42	1,020.5m ² Pub/Restaurant & Retail
	Block F	44	56	3	-	103	1,162.0m ² Café/Bar/Restaurant & Retail
	Block G	29	36	-	-	65	140.0m ² Retail
	Block H	20	26	-	-	46	-
	Block J	16	24	-	-	40	472.0m ² Retail
	Block L	20	26	-	-	46	-
	Block M	24	32	-	-	56	-
	Block N	26	25	5	-	56	-
	Block P	5	18	-	-	23	-
	Crèche	-	-	-	-	-	606.7m ² Childcare
	Clubhouse	-	-	-	-	-	97.0m ² Changing Rooms
FCC Subtotal	253	364	608	72	1,297	3,498.2m²	

Description	1-Bed	2-Bed	3-Bed	4-Bed	Total Residential	Commercial Space
TOTAL	640	1,061	754	72	2,527	4,424.0m²

Table 1 | Schedule of Accommodation

The eastern portion of the site, between the Mayne River to the north and existing development to the south, is proposed to be used as a greenway. It will serve as a connection for pedestrians and cyclists between the subject site and the Malahide Road (R107).

There is a large open space proposed at the north-west of the site, in addition to several smaller open spaces throughout the development.

1.4 Wider Development Area

The subject site is part of a larger proposed multi-phased development which includes lands to the east of the site, which are also under the ownership of the Applicant. As such, portions of the land are already under construction, with a full construction management plan in place and agreed with Fingal County Council. No construction work has begun within the Dublin City Council portion of the lands.

Phase 1A of the Belcamp development was approved and is currently under construction under Planning Reference F15A/0609. Phase 1B of the development, immediately north of the Phase 1 lands and south of the Crosswaithe development (which is under construction by others under Planning Reference F18A/0092), has received a Decision to Grant permission under Planning Reference F21A-0401 and is currently under appeal by a third party. Planning submissions have been made for Phase 1C, located immediately north of the old Belcamp College building complex. Proposals to conserve the existing walled garden and provide for amenities within the enclosure are included as part of Phase 1C.

In addition to the development of the Applicant’s Belcamp lands, there is development proposed and underway by others in the vicinity of the site, including development of the Belmayne – Belcamp Lane Masterplan area, located to the south and to the east of the subject lands.

1.5 Background of Report

This Preliminary Construction, Demolition and Waste Management Plan sets out typical arrangements and measures which may be undertaken during the construction phase of the project in order to mitigate and minimise disruption/disturbance to the area around the site. The purpose of this report is to summarise the possible impacts and measures to be implemented and to guide the Main Contractor who will be required to develop and implement the Preliminary Construction, Demolition and Waste Management Plan on site during the course of the construction period.

As is normal practice, the Main Contractor for the construction will be responsible for the method in which the construction works are carried out and to ensure that best practices and all legal obligations including Local Authority requirements (Fingal County Council and Dublin City Council, as appropriate) and Health and Safety legislation are complied with.

The Main Contractor is also responsible for the design and installation of all temporary works required to complete the permanent works. The plan can be used by the Main Contractor to develop their final Construction, Demolition and Waste Management Plan. The Applicant reserves the right to deviate from the contents of this Report as the construction of the development progresses on site. Any such deviation from this report, however, shall still comply with all relevant Local Authority requirements and legislation. All relevant policy and legislation are outlined at section 3.1 of the Preliminary Construction, Demolition & Waste Management Plan.

This report provides the baseline of the CDWMP that will be implemented during construction of the proposed development. It will, as always, remain a live document which may be updated following a grant of permission to incorporate relevant planning conditions and over the course of construction to incorporate any updates or new innovations.

2. General Site Set-Up and Pre-Commencement Measures

The following measures will be carried out by the Main Contractor:

- A general condition survey of the roads and infrastructure in the area prior to any work being carried out on the site.
- A site compound including offices and welfare facilities will be set up by the Main Contractor.
- Prior to any site works commencing, all existing services and utilities around and through the site will be investigated/identified and the exact locations tagged by the Main Contractor, with the assistance of the relevant DCC technical divisions and utility companies.
- Permitted operational hours are to be agreed with the relevant Local Authorities. The typical operational hours for the site are expected to be 08:00 to 17:00 Mondays to Fridays and 08:00 to 14:00 Saturdays. No work is permitted on Sundays or public holidays. Deviation from the hours agreed with the Local Authority will only be allowed in exceptional circumstance with prior written approval from the Authority.
- Hoarding lines and site security will be set up within the development site as required.
- Hoarding and security fencing will be established at access to the public road network.
- Fencing will be set up in order to keep construction activity separated from the existing bodies of water.

Access gates will be provided at all site and compound access points. The construction access will be from the site entrances located along Malahide Road, at the existing construction access in use for Phase 1A, and at a proposed new site access from the R139. A detailed traffic management plan will be prepared and implemented by the Main Contractor and agreed with the Local Authority prior to commencing works.

3. Construction and Demolition Waste Management

The main sources of construction waste arising from this project will be:

- Topsoil and subsoil;
- Packaging and general waste from construction activities; and
- General site clearance waste including tree stumps, etc.

This Preliminary Construction, Demolition and Waste Management guideline will be incorporated into the requirements for the Main Contractor and the Plan will be developed by the Main Contractor as the construction progresses.

In the event that contaminated soil is encountered, this soil will be removed by an appropriately accredited contractor and disposed of at an appropriately accredited facility. If an asbestos survey is required and indicates the presence of asbestos, it must be safely removed and disposed of by an appropriate specialist before further demolition can be undertaken. Any structures constructed before 2000 are required to undergo a refurbishment/demolition asbestos survey (RDAS) prior to demolition.

3.1 Policy and Legislation

The principles and objectives to deliver sustainable waste management for this project have been incorporated in the preparation of this report and are based on the following strategic objectives:

- National Policy: The Waste Management Acts 1996 to 2011
- Local Policy: The Eastern-Midlands Region (EMR) Waste Management Plan 2015-2021

This Waste Management Plan is also in accordance with the following:

- Waste Management Acts 1996 to 2011
- Waste Management (Collection Permit) Regulations 2007 (SI No. 820 of 2007)
- Waste Management (Collection Permit) (Amendment) Regulations 2008
- Department of the Environment, Heritage and Local Government
- Best Practice Guidelines on the Preparation of Waste Management Plans for Construction and Demolition Projects – July 2006
- The Eastern-Midlands Region Waste Management Plan 2015-2021
- EPA “Guidance on Soil and Stone By-Products in the context of Article 27 of the European Communities (Waste Directive) Regulations – Version 3 June 2019.
- EPA Draft Best Practice Guidelines for the preparation of resource management plans for construction and demolition projects, April 2021
- The Final County Development Plan 2017 – 2023 Construction and Demolition waste
- The Dublin city Development Plan

The hierarchy of waste management sets out the guiding principles in order of importance as follows:

1. Reduction of the amount of waste generated by the construction process.

2. Segregation of waste is a key concept that will be implemented during the course of the construction phase of the development to enable ease of re-use and recycling, wherever appropriate.
3. Recycle waste material where feasible, including the use of excess excavations as fill material, recycling of various waste fractions such as metals and packaging etc.

3.2 On-Site Construction Waste Management

Skips will be provided for the disposal of wood from the site. It is envisaged that the majority of the wood for disposal will come from pallets used for the transport of construction materials.

Other non-hazardous waste generated by the site (packaging and running of site offices) will be collected in separate roll-on skips.

Any hazardous material encountered will be disposed of to a suitably licence facility. See Section 3.4 for a detailed outline of how hazardous waste shall be dealt with.

The Main Contractor's Purchasing Manager shall ensure that materials are ordered so that the quantity delivered, the timing of the delivery and the storage is not conducive to the creation of unnecessary waste.

C & D Waste Material	Quantity (tonnes)
Clay and stones	<i>Minimal quantities anticipated. All arisings will be used as fill and landscaping on the site.</i>
Concrete	<i>Minimal quantities anticipated. Arisings will be used as crushed and used as site haul roads (a concrete crushing permit will be required if crushing is to occur).</i>
Masonry	<i>Minimal quantities anticipated. All arisings will be crushed and used as site haul roads.</i>
Wood	<i>To be Completed by C&D Waste Manager</i>
Packaging & Other Waste Materials	<i>To be Completed by C&D Waste Manager</i>
Hazardous Materials	<i>To be advised by pre-commencement survey</i>
Total Arisings Off Site	<i>To be Completed by C&D Waste Manager</i>

Table 2 | Estimated C&D Waste Arisings on Site

3.3 Off-Site Waste Management Licensing/Permitting

All waste materials (where necessary, after in-situ reuse and recycling options have been fully considered) shall be disposed of off-site, under the appropriate duty of care and subject to approvals/consents from the relevant statutory bodies. It is the responsibility of the Main Contractor to ensure that any company to whom waste is transferred is legally permitted to do so and that the facility they bring the waste to is licensed to handle that type of waste as outlined in the Waste Management Acts 1996-2005. The Waste Collection Permit Register, in accordance with the Waste Management (Collection Permit) Regulations 2001 will be consulted to ensure that waste carriers hold the appropriate permit.

The relevant waste collection permits and waste licences shall be provided by the Main Contractor and shall be amended to this report upon availability.

An inspection of the site shall be made by the Main Contractor for hazardous substances, gas cylinders and the like. If such substances are encountered during the course of construction, then works must be

halted. The project supervisor for construction stage (PSCS) and the responsible Statutory Authority shall be informed immediately.

The Main Contractor shall prepare a detailed inventory of construction based hazardous waste generated, such as tars, adhesives, sealants and other dangerous substances, and these will be kept segregated from other non-hazardous waste to prevent possible contamination. Arrangements shall be made for such substances for disposal in a safe manner to an authorized disposal site or by means acceptable to the relevant Authority.

The Main Contractor will ensure that the excavation works are carried out in accordance with best standard practice and excavation materials are well segregated to minimize any potential cross-contamination.

The Main Contractor shall carry out appropriate environmental chemistry testing in order to determine the waste classification of the soils that are to be excavated and that shall include Waste Acceptance Criteria testing. The test regime shall be agreed with the receiving landfill operator and the testing shall be carried out by an accredited laboratory.

Should excavation materials be assessed to be hazardous, the Main Contractor shall carry out pre-treatment of the waste soils to a methodology that is agreed with the receiving landfill operator and in accordance with Environmental Protection Agency guidance.

The Main Contractor is encouraged to reuse and recycle any waste materials as far as is reasonably practicable.

In respect of any liquid disposal including underground water, the Main Contractor shall carry out appropriate environmental chemistry testing in order to determine whether the liquid is contaminated or not. The test regime shall be agreed with the receiving disposal facility and the testing shall be carried out by an accredited laboratory.

The Main Contractor shall manage and carry out the works in accordance with best environmental practice and in accordance with the requirements of Local Authority, EPA and all requirements as specified in this document.

3.4 Appointment of C&D Waste Manager

The Main Contractor shall appoint a C&D Waste Manager. The C&D Waste Manager will have overall responsibility for the implementation of the project Waste Management Plan (WMP) during the construction phase.

Copies of the Waste Management Plan will be made available to all relevant personnel on site. All site personnel and sub-contractors will be instructed about the objectives of the Waste Management Plan and informed of the responsibilities which fall upon them as a consequence of its provisions. Where source segregation, selective demolition and material reuse techniques apply, each member of staff will be given instructions on how to comply with the Waste Management Plan. Posters will be designed to reinforce the key messages within the Waste Management Plan and will be displayed prominently for the benefit of site staff.

3.5 C&D Record Keeping

It is the duty of the C&D Waste Manager to ensure that necessary licenses have been obtained as needed. Each consignment of C&D waste taken from the site will be subject to documentation which will conform with Table 4 along with Transportation Dockets to ensure full traceability of the material to its final destination.

Detail	Particulars
Project of Origin	<i>Belcamp, Malahide Road, Dublin 17</i>
Material being Transported	<i>Soil, Construction waste</i>
Quantity of Material	<i>To be completed by C&D Waste Manager</i>
Date of Material Movement	<i>To be completed by C&D Waste Manager</i>
Name of Carrier	<i>To be completed by C&D Waste Manager</i>
Destination of Material	<i>To be completed by C&D Waste Manager</i>
Proposed Use	<i>To be completed by C&D Waste Manager</i>

Table 3 | *Details of materials taken from site*

3.6 Topsoil

Careful planning and on-site storage can ensure that topsoil is reused on-site as much as possible. Any surplus of soil not reused on site can be sold. However, topsoil is quite sensitive and can be rendered useless if not stored and cared for properly.

- It is important that topsoil is kept completely separate from all other construction waste as any cross-contamination of the topsoil can render it useless for reuse.
- It is important to ensure that topsoil is protected from all kinds of vehicle damage and kept away from site-track, delivery vehicle turning areas and site plant and vehicle storage areas.

If topsoil is stored in piles of greater than two metres in height the soil matrix (internal structure) can be damaged beyond repair. It should also be kept as dry as possible and used as soon as possible to reduce any deterioration through lengthy storage and excess moving around the site.

Records of topsoil storage, movements and transfer from site will be kept by the C&D Waste Manager.

3.7 Earthworks – Cut and Fill Policy

Earthworks for the basement/under-croft parking and structure foundations form a major part of the quantity of waste that will be generated by the construction phase of this project. In order to optimise the impact of the generation of surplus material due to excavation the following principles shall be considered during the detail design and construction phase:

- The quantity of excavated materials to be removed from or imported to the site has been greatly reduced by establishing levels of the proposed buildings which optimise the volume of cut and fill.
- Surplus subsoil excavated from the site will be reviewed for possible reuse as engineering fill.
- Unsuitable sub-soils generated by excavations on site will be reviewed for reuse as landscaping or non-engineering fills on adjoining or other construction sites within the region.
- Careful separation of builder's rubble packaging and contaminated waste from re-usable material will result in the minimisation of the disposal of material to landfill.

3.8 Earthworks – General

All excavations on site will be battered back open-cut excavations to a safe angle of repose using conventional methods. The new foundation shall be kept shallow (strip and pad footings) to minimise the depths of excavation. Rock breaking is not anticipated. However, the removal of boulders/cobbles will likely be required within the clay strata. Dewatering of the excavations is not anticipated.

An article 27 notification to the EPA will be required in the future should any top-/sub-soil transfers be made between sites, but this is not currently anticipated.

4. Deliveries

It is intended that deliveries to the construction site will typically be made to one of 2 main access points. The site south of the Mayne River will be served by an access point from the R139, and the lands north of the Mayne River will be served via the east-west link road (through Belcamp Phase 1B), just off the R107 (Malahide Road).

Materials should be ordered and delivered to site on an “as needed” basis in order to prevent over supply to site. Deliveries will be managed upon arrival to the site and systems should be provided in order to avoid any queuing of delivery vehicles.

A number of the construction traffic movements will be undertaken by heavy goods vehicles, though there will also be vehicle movements associated with the appointed contractors and their staff.

An estimate of the day-to-day traffic movements associated with the construction activities, based on experience of similar sites, projects that the number of construction related HGV movements to and from the application site will be approximately 40 arrivals and departures per day.

Similarly, the general workforce, which equates to 300-480 employees and with an allowance for shared journeys could equate to a maximum of around 150-240 arrivals and departures per day by private vehicle.

This number of construction vehicle movements is low compared to the number of trips expected to be generated by the proposed development during the operational phase. It should be noted that the majority of such vehicle movements would be undertaken outside of the traditional peak hours, and it is not considered that this level of traffic would result in any operational problems.

Care will be taken to ensure existing pedestrian and cycling routes are suitably maintained or appropriately diverted as necessary during the construction period, and temporary car parking is provided within the site for contractor’s vehicles. It is likely that construction will have a negligible impact on pedestrian and cycle infrastructure.

A Construction and Environmental Management Plan has been prepared and accompanies this submission under separate cover.

5. Parking and Storage

Parking will be provided on site. No on-street parking or parking in the local residential areas will be permitted.

The Main Contractor will be required to schedule delivery of materials strictly on a daily basis. As there are adequate storage facilities available on site it is not envisaged that there will be any necessity to provide a secure material staging compound remote from the site in which to temporarily store materials from suppliers until such time as these can be accommodated on site. Instead, a dedicated material storage area will be set up on the site.

6. Dust and Dirt Control

Nuisance dust emissions from construction activities are a common and well recognised problem. Fine particles from these sources are recognised as a potential significant cause of pollution.

The Main Contractor will be required to demonstrate that both nuisance dust and fine particle emissions from the site are adequately controlled and are within acceptable limits.

Dust and fine particle generation from construction and demolition activities on the site can be substantially reduced through carefully selected mitigation techniques and effective management. Once particles are airborne it is very difficult to prevent them from dispersing into the surrounding area. The most effective technique is to control dust at source and prevent it from becoming air borne, since suppression is virtually impossible once it has become air borne.

6.1 Mitigation Measures

The following are techniques and methods that will be implemented to ensure that dust and dirt are not emitted from the site:

1. The roads in the vicinity of the site are all surfaced and no dust is anticipated arising from unsealed surfaces outside the site.
2. A regime of 'wet' road sweeping will be set up to ensure the roads around the immediate site are as clean and free from dirt / dust arising from the site, as is reasonably practicable. This cleaning will be carried out by approved mechanical sweepers.
3. Footpaths immediately around the site will be cleaned by hand regularly, with damping as necessary.
4. High level walkways and surfaces such as scaffolding will be cleaned regularly using safe 'wet' methods, as opposed to dry methods.
5. Vehicle waiting areas or hard standings will be regularly inspected and kept clean by brushing or vacuum sweeping and will be regularly sprayed to keep moist, if necessary.
6. Vehicle and wheel washing facilities will be provided at site exit(s) where practicable. If necessary, vehicles can be washed down before exiting the site.
7. Netting will be provided to enclose scaffolding in order to mitigate escape of air borne dust from the existing and new buildings.
8. Vehicles and equipment shall not emit black smoke from exhaust system, except during ignition at start up.
9. Engines and exhaust systems shall be maintained so that exhaust emissions do not breach stationary emission limits set for the vehicle / equipment type and mode of operation.
10. Servicing of vehicles and plant will be carried out regularly, rather than just following breakdowns.
11. Internal combustion plant will not be left running unnecessarily.
12. Where possible fixed plant such as generators will be located away from residential areas.
13. The number of handling operations for materials will be kept to a minimum in order to ensure that dusty material is not moved or handled unnecessarily.
14. The transport of dusty materials and aggregates will be carried out using covered / sheeted lorries.
15. Material handling areas will be clean, tidy and free from dust.

16. Vehicle loading will be dampened down and drop heights for material to be kept to a minimum.
17. Drop heights for chutes / skips will be kept to a minimum.
18. Dust dispersal over the site boundary will be minimised using static sprinklers or other watering methods as necessary.
19. Stockpiles of materials will be kept to a minimum and if necessary, they should be kept away from sensitive receptors such as residential areas etc.
20. Stockpiles, where necessary, will be sheeted or watered down.
21. Methods and equipment will be in place for immediate clean-up of spillages of dusty material.
22. No burning of materials will be permitted on site.
23. Earthworks excavations will be kept damp where necessary and where reasonably practicable.
24. Cutting on site will be avoided where possible by using pre-fabrication methods.
25. Equipment and techniques for cutting / grinding / drilling / sawing / sanding etc., which minimise dust emissions and which have the best available dust suppression measures, will be employed.
26. Where scabbling is to be employed, tools will be fitted with dust bags, residual dust will be vacuumed up rather than swept away, and areas to be scabbled will be screened off.
27. Wet processes will be used to clean building facades if possible. If dry grit blasting is unavoidable then ensure areas of work are sealed off and dust extraction systems used.
28. Where possible, pre-mixed plasters and masonry compounds will be used to minimise dust arising from on-site mixing.
29. Prior to commencement, the Main Contractor will identify the construction operations which are likely to generate dust and to draw up action plans to minimise emissions. Furthermore, the Main Contractor will prepare environmental risk assessments for all dust generating processes, which are envisaged.
30. The Main Contractor will allocate suitably qualified personnel to be responsible for ensuring the generation of dust is minimised and effectively controlled.

7. Water

7.1 Excavations

Following completion of any required initial dewatering of excavations for the basements/under-croft parking, drainage pipes, water supply, utilities and foundations, it is expected that flows of water into the excavation will be relatively small. These flows will be managed by sump pumping on an as-required basis.

During any discharge of surface water from the excavations, the quality of the water will be regularly monitored visually for hydrocarbon sheen and suspended solids. Periodic laboratory testing of discharge water samples will be carried out in accordance with the requirements of the discharge licence obtained from the Local Authority.

7.2 General Water Protection Measures

Several mitigation measures are proposed to monitor and improve surface water quality and protect the Mayne River. All works carried out adjacent to the Mayne River will be supervised by the Ecological Clerk of Works (ECoW) and will follow the guidelines published by Inland Fisheries Ireland (IFI) Guidelines on Protection of Fisheries during Construction Works in and Adjacent to Waters (2016) and The National Roads Authority (now Transport Infrastructure Ireland) Guidelines for the Crossing of Watercourses during the Construction of National Road Schemes.

Appropriate storage facilities will be provided on Site. Areas of high risk include:

- Fuel and chemical storage;
- Refuelling Areas;
- Site Compound; and
- Waste storage areas.

There will be no washdown facilities for plant and equipment on the Proposed Development Site. Designated impermeable cement washout areas must be provided. Concrete mixer trucks will not be permitted to wash out on Site with the exception of cleaning the chute into a container which will be removed off Site to an authorised facility.

If required, fuel, oils and chemicals will be stored on an impervious base within a bund remote from any surface water ditches or locations. Temporary oil interceptor facilities will be installed and maintained where Site Works involve the discharge of drainage waters to nearby watercourses. All containment and treatment facilities will be regularly inspected and maintained.

Refuelling of plant during the Construction Phase will only be carried out at designated refuelling station locations on site. Each station will be fully equipped for spill response and a specially trained and dedicated Environmental and Emergency Spill Response team will be appointed before the commencement of works on site.

Only emergency breakdown maintenance will be carried out on site. Drip trays and spill kits will be available on site to ensure that any spills from vehicles are contained and removed off site. All personnel working on site will be trained in pollution incident control response.

All tank, container and drum storage areas shall be rendered impervious to the materials stored therein. Bunds shall be designed having regard to Environmental Protection Agency guidelines 'Storage and Transfer of Materials for Scheduled Activities' (2904). All tank and drum storage areas shall, as a minimum, be banded to a volume not less than the greater of the following:

- 110% of the capacity of the largest tank or drum within the bunded area; or
- 25% of the total volume of substance that could be stored within the bunded area.

Water will not be discharged to open water courses. No direct discharges will be made to waters where there is potential for cement or residues in discharges. The pH of any and all discharges made from and during the Construction Phase of the Proposed Development shall be in the range of 6-9 units and not alter the pH of any receiving waters by more than +/- 0.5 pH units. The level of suspended solids in any discharges to fisheries waters as a consequence of construction works shall not exceed 25mg/l, nor result in the deposition of silts on gravels or any element of the aquatic flora or fauna.

Run-off from the working site or any areas of exposed soil will be channelled and intercepted at regular intervals for discharge to silt-traps or lagoons with over-flows directed to land rather than to a watercourse.

All open water bodies adjacent to areas of proposed works will be protected by fencing including settlement ponds. Silty water generated on site will be treated using silt traps/settlement ponds and temporary interceptors and traps will be installed until such time as permanent facilities are constructed. Straw bales or silt fences will be appropriately located near watercourses and woodland to help prevent untreated surface water run-off entering them. A buffer zone should remain between the silt trap and the watercourse with natural vegetation left intact. The developer will ensure that erosion control i.e. silt-traps, silt-fencing and swales are regularly maintained during the Construction Phase.

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

Any imported materials will, as much as possible, be placed on site in their proposed location and double handling will be avoided. Where this is not possible designated temporary material storage areas will be used. These temporary storage areas will be located at least 10m away from any surface water features/drainage ditches etc. and will be surrounded with silt fencing to filter out any suspended solids from surface water arising from these materials

If cast-in-place concrete is required, all work must be carried out in the dry and effectively isolated from any water courses or drainage ditches.

If portaloos and/or containerised toilets and welfare units will be used to provide facilities for site personnel, all associated waste will be removed from site by a licenced waste disposal contractor. Under no circumstances will any untreated wastewater generated onsite (from equipment washing, road sweeping etc.) be released into nearby drains, woodland or watercourses.

8. Noise Assessment and Control Measures

8.1 Air Quality Monitoring and Noise Control Unit's Good Practice Guide for Construction and Demolition

Prior to the commencement of work on the site a construction and demolition plan must be developed. When developing the construction and demolition plan reference must be made to the requirements of the Air Quality Monitoring and Noise Control Unit's Good Practice Guide for Construction and Demolition.

This Guide has been produced with reference to the London Good Practice Guide: Noise and Vibration Control for Demolition and Construction produced by the London Authorities Noise Action Forum, July 2016.

8.2 Environmental Noise Mitigation Measures

General:

1. All site staff shall be briefed on noise mitigation measures and the application of best practicable means to be employed to control noise.
2. Site hoarding shall be erected to maximise the reduction in noise levels.
3. The contact details of the Main Contractor and site manager shall be displayed to the public, together with the permitted operating hours, including any special permissions given for out of hours work.
4. In the event that the Main Contractor gets a complaint about noise from a neighbour he will act immediately to remedy the situation.
5. The site entrance shall be located to minimise disturbance to noise sensitive receptors.
6. Internal haul routes shall be maintained, and steep gradients shall be avoided.
7. Material and plant loading and unloading shall only take place during normal working hours unless the requirement for extended hours is for traffic management (i.e. road closure) or health and reasons (written approval, must be obtained from the planning authority prior to this activity being undertaken).
8. Rubber linings shall be used in chutes, dumpers and hoppers to reduce impact noise.
9. Opening and shutting of gates shall be minimised through good coordination of deliveries and vehicle movements.

Plant:

1. Each item of plant and equipment shall comply with the noise limits quoted in the relevant European Commission Directive 2000/14/EC.
2. All plant and equipment shall be fitted with appropriate mufflers or silencers of the type recommended by the manufacturer.
3. All plant and equipment shall be used only for the tasks for which it has been designed.
4. All plant and equipment shall be shut down in intermittent use in the intervening periods between work or throttle down to a minimum.
5. All plant shall be powered by mains electricity where possible rather than generators.

6. Screening from existing features or structures shall be maximised and employ the use of partial or full enclosures for fixed plant.
7. Movable plant shall be located away from noise sensitive receptors where possible
8. All plant operators shall be qualified in their specific piece of plant.
9. Compressors and generators will be sited in areas least likely to give rise to nuisance where practicable.

Vehicle activity:

1. All vehicle movement (on site) will occur within normal working hours. (other than where extension of work requiring such movements has been granted in cases of required road closures or for health and safety reasons).
2. Deliveries and vehicle movements will be planned so that vehicles are not waiting or queuing on the public highway, if unavoidable engines shall be turned off.
3. The site layout will ensure that reversing is kept to a minimum.
4. Where reversing is required broadband reverse sirens will be used, or where it is safe to do so banksmen will be used and sirens disengaged.
5. Rubber/neoprene or similar non-metal lining material matting will be used to line the inside of material transportation vehicles to avoid first drop high noise levels.
6. Wheel washing of vehicles prior to exiting the site shall take place to ensure that adjoining roads are kept clean of dirt and debris. Regular washing of adjoining streets should also take place as required by road sweepers.

Demolition Phase:

1. The use of acoustic screening shall be employed; this can include planning the demolition sequence to utilise screening afforded by buildings to be demolished.
2. If working out of hours for Health and Safety reasons (following approval by council) demolition activities will be limited to low level noise activity (unless absolutely unavoidable).
3. Low impact demolition methods such as non-percussive plant will be used where practicable.
4. Rotary drills and 'bursters' will be activated by hydraulic or electrical power or chemically based expansion compounds to facilitate fragmentation and excavation of hard material.
5. The transfer of noise and vibration from demolition activities to adjoining occupied buildings will be avoided through cutting any vibration transmission path or by structural separation of buildings.
6. The removal of larger sections will be considered by lifting them out and breaking them down either in an area away from sensitive receptors or off site.

Ground Works and Piling Phase:

1. The following hierarchy of groundwork/piling methods should be used if ground conditions, design and safety allows;
 - Pressed in methods, e.g., hydraulic jacking
 - Auger/bored piling
 - Diaphragm walling
 - Vibratory piling or vibro-replacement

- Driven Piling or dynamic consolidation
2. The location and layout of the piling plant should be designed to minimise potential noise impact of generators and motors.
 3. Where impact piling is the only option utilise a non-metallic dolly between the hammer and driving helmet or enclose the hammer and helmet with an acoustic shroud.
 4. Consider concrete pour sizes and pump locations. Plan the start of concrete pours as early as possible to avoid overruns.
 5. Where obstructions are encountered, work should be stopped, and a review undertaken to ensure that work methods that minimise noise are used.
 6. When using an auger piling rig do not dislodge material from the auger by rotating it back and forth. Use alternate methods where safe to do so.
 7. Prepare pile caps using methods which minimise the use of breakers, e.g., use hydraulic splitters to crack the top of the pile.

Monitoring:

1. Carry out regular on-site observation monitoring and checks/audits to ensure that BPM is being used at all times. Such checks shall include;
 - Hours of work
 - Presence of mitigation measures
 - Number and type of plant
 - Construction methods
2. In the event that the Main Contractor gets a complaint about noise from a neighbour he will act immediately to remedy the situation.
3. A sound level digital meter will be employed as necessary to monitor noise, with results recorded to inform the contractor of noise level.
4. Site reviews must be recorded and made available for inspection.
5. Appraise and review working methods, processes and procedures on a regular basis to ensure continuous development of BPM.

Communication and Liaison:

1. A Community Liaison Plan should be developed by the developer in consultation with local residents/businesses and a single point of contact nominated to engage with Fingal County Council, Dublin City Council and the residents/businesses and to handle complaints and communication of site information.
2. All site staff should be briefed on the complaints procedure and mitigation requirements and their responsibilities to register and escalate complaints received.

8.3 Risk Assessment & Mitigation

The Main Contractor shall deal with the immediate dangers to hearing etc. associated with high noise levels and the impact of same on construction operatives, by means of risk assessment and mitigation / precautionary measures and equipment, all pursuant to the current health and safety legislation.

Current legislation limits, assessment period of 8 hours of one week (noisiest 8 hours likely to experience):

- Lower Action Value (LAV) – 80 dBA $L_{EX,8}$, 135 dB Peak – Hearing Protection shall be made available and information shall be provided.
- Upper Action Value (UAV) – 85 dBA $L_{EX,8}$, 137 dB Peak – Use of Hearing Protection is mandatory, measures to eliminate the noise as much as possible shall be applied.
- Exposure Limit Value (ELV) – 87 dBA $L_{EX,8}$, 140 dB Peak – Not to be exceeded

Protection by ear plugs/muffs given by their Signal-to-Noise Ratio (SRN) or Noise Reduction Rating (NRR) is typically 20 – 30 dB.

- Exposure = $L_{EX,8} - (SNR - 10)$

As a guide, if it is difficult to hear a normal conversation at a distance of 2m or if a workplace is consistently noisier than a busy street, it is likely that the noise levels in the area are above 80 dBA.

Noise due to the normal operation of the proposed development shall not cause a noise nuisance to nearby noise sensitive locations and in general shall not exceed the background level by 10dB(A) or exceed the limits set out in the EPA's Guidance Note for Noise (NG4), as measured from the nearest noise sensitive location.

8.4 Potential Noise Sources

It is not envisaged that any excessively noisy activities to be carried out over extended periods of time during the construction stage. However, due to the nature of the construction works, exposure to noise levels in excess of 80 dBA (Safe Working Limit) may occur occasionally. The Main Contractor will carry out a noise assessment in relation to the proposed works at construction stage. The noise assessment shall identify, but not limited to, the following steps in its analysis; -

1. Potentially Hazardous Activities: Use of site machinery and power tools. For example, concrete saws, angle grinders, vibratory plate compactors etc.
2. Potential Hazards: Excessive noise
3. Persons at Risk: People in the vicinity of the work generating an excessive noise. These persons include employees, contractors and members of the public.
4. Risk of Exposure to the Potential Hazard: Temporary or permanent hearing loss.
5. Risk Assessment before the Implementation of Control Measures: Medium
6. Risk Assessment after the Implementation of Control Measures: Low
7. Control Measures Implemented by: Site Manager / Works Supervisor

8.5 Mitigation Measures

The following control measures are to be implemented: -

1. Site Manager shall monitor a likelihood of prolonged exposure to excessive noise and commission noise surveying/monitoring programme where necessary.
2. Works Supervisor shall assess risk arising from noise prior to each particular activity taking place and determine appropriate action. The aim shall be to minimise the exposure to excessive noise levels.
 - a. If it is likely that the noise exposure exceeds Lower Action Value, then hearing protection must be made available.

- b. If it is likely that the noise exposure exceeds Upper Action Value, then hearing protection is mandatory to be used. Work Supervisor shall decide on the most suitable hearing protection to be used based on Exposure (see formula above) and worker's personal preference (earmuffs or earplugs).
3. Works Supervisor shall ensure proposed measures are put in place and that their effectiveness and suitability is evaluated on regular bases.
4. Site management shall minimise noise at work by looking for alternative processes and/or working methods, which would make the work quieter and/or exposure times shorter.
5. Site Manager shall liaise with all site contractors in order to effectively control noise exposure.
6. Number of people working near source of the noise shall be minimised.
7. Plant and machinery will be compliant with current legislation and fitted with silencers where possible.
8. Employees must use hearing protection where its use is made compulsory.
9. Hearing protection zones shall be identified where necessary.
10. Spot checks on appropriate use of hearing protection shall be carried out.
11. Operators of rock breaking machines and workers nearby must wear adequate ear protection.

8.6 Proper Use of Hearing Protection

- Earmuffs: Worker must make sure that they totally cover their ears, fit tightly and that there are no gaps around the seals. Hair, glasses, jewellery, hats etc. shall not interfere with the seal. Seals and insides of earmuffs shall be kept clean. Worker shall make sure that any headband keeps its tension.
- Earplugs: Workers shall make sure that they are wearing them properly. They shall practice fitting them and get help if they are having trouble. Hands shall be clean before fitting earplugs. Earplugs must not be shared with other workers.
- Semi-inserts/caps: Same applies as for earplugs. Worker shall make sure that any headband keeps its tension.

All workers are expected to:

- Co-operate: Help the Company to do what is needed to protect their hearing. Make sure that they use properly any noise control device and follow any working methods that are put in place.
- Wear any hearing protection they are given: Make sure that they are wearing it properly. They shall wear it all the time when they are exposed noisy environment (over UAV). Removing hearing protection in a noisy environment, even for a short period, can result in hearing damage.
- Look after their hearing protection.
- Report any problems: Report any problems with the hearing protection or effectiveness of the measures to the work supervisor.

9. Erosion and Sediment Control

9.1 Run-Off to Ditches

Significant quantities of waste and potential pollutants can be generated during construction. Controls must be put in place to prevent these pollutants from washing into the local storm water system.

Protection of the Mayne River, which traverses the site, is paramount during the construction stage of the subject development. Temporary measures will be put in place to remove sediments, oils and pollutants.

The recommendations as outlined in the Eastern Regional Fisheries Board document outline the following seven items to be considered for the protection of adjacent water courses during the construction stage:

1. Fuels, oils, greases and hydraulic fluids must be stored in bunded compounds well away from the watercourse. Refuelling of machinery, etc., should be carried out in bunded areas.
2. Runoff from machine service and concrete mixing areas must not enter the watercourse.
3. Stockpile areas for sands and gravel should be kept to minimum size, well away from the watercourse.
4. Runoff from the above should only be routed to the watercourse via suitably designed and sited settlement ponds/filter channels.
5. Settlement ponds should be inspected daily and maintained regularly.
6. Temporary crossings should be designed to the criteria laid down for permanent works.
7. Watercourse banks should be left intact if possible. If they have to be disturbed, all practicable measures should be taken to prevent soils from entering the watercourses.

The main pollutants of site water are silt, fuel/oil, concrete and chemicals. See Table 5, below, for a list and brief description of pollution prevention measures.

Source	Action
Detergents	Use of detergents should be carried out in designated areas draining to the foul sewer.
Fuel/Oil	Fuel/oil stores must be located away from the site drainage system and the edge of watercourses.
	Ensure adequate measures are identified to prevent or contain any spillage such as creating a fall away from any drainage grid or blocking drainage points.
	Prevent oil pollution by:
	<ul style="list-style-type: none"> • Suitable bunded storage of fuel/oil, and use of drip trays under plant, and
	<ul style="list-style-type: none"> • An oil separator, and/or • On-site spill-kit • Commercially available absorbent granules, pads or booms.
Material Storage	Store drums, oil and chemicals on an impervious base and within a secured bund.

	Ensure topsoil and/or spoil heaps are located at least 10m away from water courses. Consider seeding them or covering with a tarpaulin to prevent silty runoff and losses due to wind.
Leaks and Spills	Storage facilities are to be checked on a regular basis to ensure any leaks or drips are fixed to prevent loss and pollution.
	Ensure appropriate spill response equipment is located near to the material in case of containment failure or material spills and ensure site staff know how to use it.
	Adequate stocks of absorbent materials, such as sand or commercially available spill kits and booms should be available at all times.
Litter	Provide waste bins on-site as appropriate.
Construction Vehicles	Provide vehicle wheel washing.
Concrete, Cement and Bentonite	Washout of these materials should be carried out in a designated, impermeable contained area. The washout water itself should be disposed of off-site or discharged to the foul sewer if authorised.

Table 4 | Pollution Prevention Measures

9.2 Sediment Control

Construction runoff is heavily laden with silt which can block road gullies and reduce the hydraulic capacity in pipes and rivers, contributing to ponding and flooding. Continued development without appropriate controls will ultimately keep maintenance costs elevated, whether that be in cleaning gullies, jetting pipes or dredging. Sediment control plans can be implanted on site to mitigate these issues.

Sediment basins and traps should be installed before any major site grading takes place. Additional sediment traps and silt fences should be installed as grading takes place to keep sediment contained on site at appropriate locations.

Key runoff-control measures should be located in conjunction with sediment traps to divert water from planned undisturbed areas away from the traps and sediment-laden water into the traps. Diversions should be installed above the areas to be disturbed before any grading operations. Any perimeter drains should be installed with stable outlets before opening major areas for development. Any additional facilities needed for runoff control should be installed as grading takes place.

During grading operations temporary diversions, slope drains, and inlet and outlet protection installed in a timely manner can be very effective in controlling erosion and sediment build up.

The main run-off conveyance system with inlet and outlet protection measures should be installed early and used to convey stormwater run-off through the development site without creating gullies or channels. Install inlet protection for storm drains as soon as the drain is functional to trap sediment on site in shallow pools and to allow the flood flows to enter the storm drainage system safely. Install outlet protection at the same time as the conveyance system to prevent damage to the Mayne River.

9.3 Sediment Control Measures

Sediment entrapment facilities are necessary to reduce sediment discharges to downstream properties and receiving waters. All run-off leaving a disturbed area should pass through a sediment entrapment facility before it exits the site and flows downstream.

- **Straw Bales:** Straw bales can be placed at the base of a slope to act as a sediment barrier. These are not recommended for use within a swale or channel. Straw bales are temporary in nature and may perform for only a period of weeks or months. Proper installation and maintenance is necessary to ensure their performance.
- **Silt Fencing:** A silt fence is made of a woven synthetic material, geotextile, and acts to filter run-off. Silt fencing can be placed as a temporary barrier along the contour at the base of a disturbed area, but is not recommended for use in a channel or swale. The material is durable and will last for more than one season if properly installed and maintained. Silt fencing is not intended to be used as a perimeter fence or in area of concentrated flow. If concentrated flow conditions exist, a more robust filter should be considered.
- **Silt Barriers:** Silt barriers can also be temporarily installed in any road gullies of partially constructed roads to prevent sediment movement into downstream drainage systems or SUDS components. When the catchment area is greater than that allowed for straw bale barriers or silt fences, runoff should be collected in diversion drains and routed through temporary sediment basins.
- **Diversion Drains:** Diversion drains are simple linear ditches, often with an earth bund, for channelling water to a desired location. If the drains are being eroded, they can be lined with geotextile fabric or large stones or boulders.

10. Proposed Construction Phasing and Programme

The proposed development is to be constructed in two stages which will include, in broad terms, the following:

- **Stage I:** Site demolition, clearance and preparation work for the construction.
- **Stage II:** Site development and construction. The development includes all associated site works and infrastructure which includes roads, utilities, foul and surface water drainage.

The construction programme is intended to be a 10-year programme, and is divided into three main phases, as shown in the Figure below:

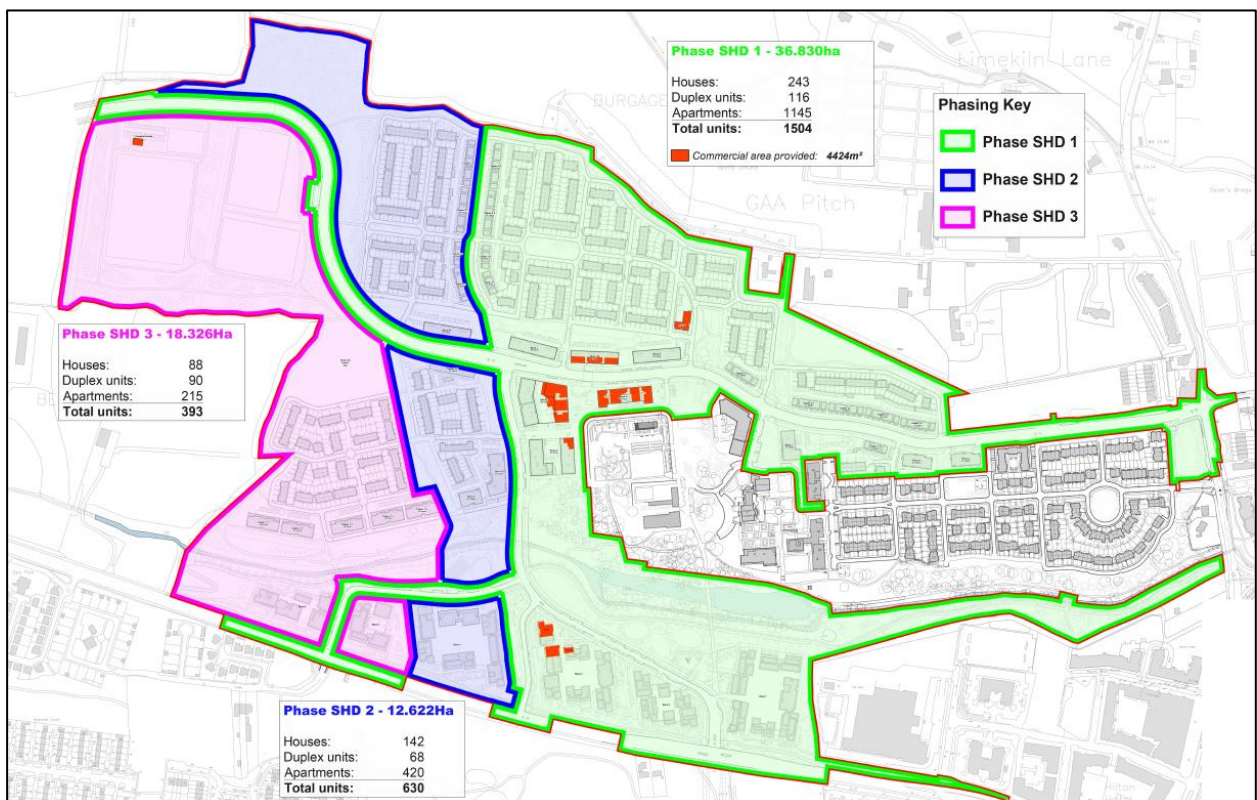


Figure 2 | SHD Phasing Plan

It is proposed to include the main internal transportation infrastructure as part of the first phase of development, including the East–West Link Road, Belcamp Parkway and the proposed Bus Gate. This will ensure that there is adequate transportation provision in place before the development is occupied – refer to Section 5 of the accompanying Engineering Assessment Report for further information.

The proposed construction programme is indicated in the Table below:

Belcamp Programme	Start	Finish
Infrastructure (Main Roads)	Q1/2023	Q1/2025
SHD Phase 1	Q1/2023	Q3/2028
SHD Phase 2	Q3/2028	Q3/2030
SHD Phase 3	Q3/2030	Q4/2032

Table 5 | Belcamp Construction Programme

UK and Ireland Office Locations

