


Outline Construction Environmental Management Plan

Proposed Development at Barnhill Garden
Village, Dublin 15



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1. INTRODUCTION

1.1 CONSTRUCTION MANAGEMENT PLAN REQUIREMENT

This outline Construction Environmental Management Plan (OCEMP) has been prepared on behalf of Alanna Homes and Alcove Ireland Four Limited, to support a planning submission for a proposed development comprising 1,243 no. units in Barnhill, Dublin 15.

The OCEMP sets out the relevant guiding principles for the final CEMP which will be prepared on appointment of the contractor, and agreed with Fingal County Council prior to the commencement of development. The CEMP will be a 'live' document that should be reviewed regularly.

This OCEMP incorporates an outline Construction and Demolition Waste Management Plan and outline Construction Traffic Management Plan.

1.2 LEGISLATION & GUIDANCE

Some of the current legislation relevant to this project and which must be considered by the Contractor include:

- The Wildlife Act 1976 (as amended);
- European Communities (Birds and Natural Habitats) Regulations 2011-2015; and
- The Protection of the Environment Act 2003.

Waste management in Ireland is subject to EU, national and regional waste legislation which defines how waste materials must be managed, transported and treated. The overarching EU legislation is the *Waste Framework Directive (2008/98/EC)* which is transposed into national legislation in Ireland. The cornerstone of Irish waste legislation is the *Waste Management Act 1996* (as amended).

The strategy for the management of waste from the construction phase is carried out in line with the requirements of the *Best Practice Guidelines for the preparation of resource & waste management plans for construction & demolition projects* published in 2021. The guidance document *Construction and Demolition Waste Management: A handbook for Contractors and Site Managers* was also consulted in the preparation of this assessment.

1.3 OBJECTIVES

This outline Construction Environmental Management Plan (OCEMP) comprises guiding measures designed to be easily implemented by all site contractors to effectively manage the construction phase of the development including waste and traffic generated by the construction phase.

The preparation and implementation of a CEMP is widely considered to be industry best practice to manage the effects of projects. It provides the framework for recording risks, commitments and environmental constraints, and clearly identifies the structures and processes that will be used to manage and control these aspects.

The final CEMP will be a dynamic document which will evolve to suit the ongoing construction of the site and any changes to local transport conditions while providing the mechanism for monitoring, reviewing and auditing performance and compliance.

The CEMP will be integrated into and implemented throughout the construction phase of the project to ensure the following:

- That all site activities are effectively managed to minimise the generation of waste and to maximise the opportunities for on-site reuse and recycling of waste materials;
- Outline road safety measures to be undertaken at site access / egress locations during the works and including approaches to such access / egress locations
- To ensure that all waste materials generated by site activities, that cannot be reused on site, are removed from site by appropriately permitted waste haulage contractors and that all wastes are disposed of at approved waste licensed / permitted facilities in compliance with the Waste Management Act 1996 (as amended), the Protection of the Environment Act 2003, the *EU Waste Framework Directive (Directive (EU) 2018/851)* and the *EU (Waste Directive) Regulations 2020 (S.I. No. 323 of 2020)*;
- To act as a continuous link and main reference document for environmental issues between the design, construction and the maintenance and operation stages of the residential development;
- To manage and control any environmental impacts (noise, vibration, dust, water) that project construction work activities may have on receptors and properties that are located adjacent to project work areas and on the local receiving environment; and
- To comply with planning conditions and requirements relating to waste management as required by An Bord Pleanála and Fingal County Council.

1.4 TRAINING

Copies of the CEMP will be displayed in the site offices and site canteens for referral by site operatives. Environmental issues, site rules and waste management arrangements will be discussed as part of the Site Safety Induction, which all site personnel must attend. Tool Box Talks will also be held periodically to inform employees of their responsibilities under the plan and current waste management legislation.

1.4.1 CONSTRUCTION HEALTH & SAFETY

The primary aim of planning for safety on this site is ensuring the safety of people involved in and affected by the development. This includes pedestrians, road users, neighbours, site staff and visitors to site. Some of the site-specific issues that will have to be addressed during the construction of the proposed development include;

- Managing demolition works
- Identifying, storing and handling of wastes
- Protecting existing roadways against damage
- Identifying, diverting, maintaining and connecting to existing live services

- Managing vehicular and pedestrian traffic on the surrounding roadways for the duration of the construction works.
- Managing crane movements to limit lifting over live buildings and roadways.

All Contractors must progress their works with reasonable skill, care and diligence and, at all times, proactively manage the works in a manner most likely to ensure the safety, health and welfare of those carrying out construction works, pedestrians, road users and other interacting stakeholders. Contractors are further required to ensure that, as a minimum, all aspects of their works and project facilities comply with legislation, good industry practice and all necessary consents. Health and Safety requirements will be further expanded and developed within the Construction Stage Health and Safety Plan required to be prepared by the Project Supervisor at Construction Stage, prior to the commencement of works on site.

1.5 SITE LOCATION

The application site is located at Barberstown, Barnhill and Passifyoucan, Clonsilla, Dublin 15 and is situated approximately 3 km west of Blanchardstown and approximately 18 km by road to O'Connell Street, Dublin. The site is bounded to the north by the Dunboyne to Clonsilla Rail Line and Hansfield train station and to the east by the Royal Canal and Dublin-Maynooth Railway Line. To the west of the application site is the R149 Clonee-Lucan Road and to the south is Barberstown Lane South. Barberstown Lane North runs through the northern section of the site, providing local access, and linking with the R149 to the west and the Barberstown Lane South to the east.

A watercourse, known as Barnhill Stream, enters the site from the west via an existing culvert under the existing R149 Regional Road. It then flows in an open channel in a south-easterly direction through the site before exiting the lands via a culvert / stream bridge under the existing Barberstown Lane South Road. The stream continues from here towards a long culvert that conveys the stream below the Royal Canal and the Dublin to Maynooth Railway Line. This unnamed stream continues from here through Luttrellstown Golf Course / Demesne and flows into the River Liffey.

The site largely consists of arable lands with existing farm buildings/ sheds and a number of residential dwellings located within the northern part of the site. These farm buildings and residential dwellings are accessed from the existing Barberstown Lane North Road. The lands fall gradually from the existing Dunboyne to Clonsilla Railway Line, located to the north of the site, towards the existing Barberstown Lane South Road, located to the south of the site. Based on existing topographical surveys of the site, the ground levels vary between 61.5m AOD in the north-west of the site to 57.5m AOD in the south-east. The levels range from 61m AOD in the north-east of the site to 58.5m AOD in the south-west. The existing farm buildings/ sheds are to be demolished as part of the proposed development.

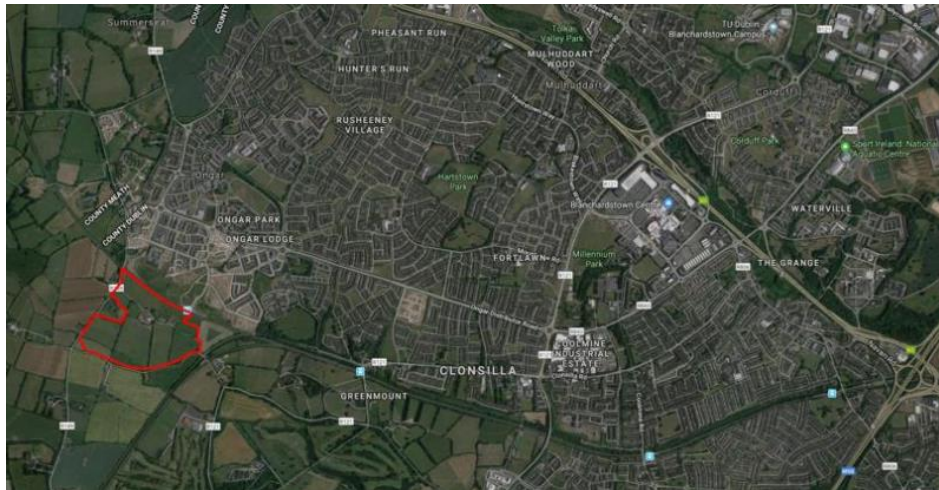


Figure 1: Approximate Site Location



Figure 2: Site Context

2. PROJECT PROGRAMME

2.1 PROJECT DESCRIPTION

The proposed development is for the construction of 1,243 residential units (a mix of houses, duplex and apartments), a crèche, village centre, railway plaza providing access to Hansfield railway station; land set aside for a primary school, a public park and a series of pocket parks throughout the development. The proposed development includes associated infrastructure, the demolition of an existing farmyard/shed complex and the provision of an internal road and cycle/pedestrian access network, incorporating the existing Barberstown Lane North. A full description is provided in the planning and design statement.

Primary access to the Barnhill LAP development shall be via the 2 no. roundabouts of the realigned Barberstown Lane South Road that is to be constructed prior to the proposed development, as part

of the Ongar to Barnhill Distributor Road Scheme by Fingal County Council. The existing Barberstown Lane North Road is expected to become a pedestrian and cyclist only link as part of the Barnhill LAP development, except at the locations of the existing private dwellings adjacent to the Village Centre, where local access to these dwellings will be maintained.

2.2 CONSTRUCTION PROCESS & PHASING

A ten-year permission is being applied for in respect of the proposed development. Given the large size and scale of the development and the level of infrastructure/enabling works required, it is assumed that it may be rolled out over a 10-year period post receipt of planning permission. Subject to a successful planning outcome it is expected that construction will commence by the 3rd quarter of 2024, following completion of the Ongar Barnhill Distributor Road (by Fingal County Council), and be completed by the end of Q2 2032.

The various phases will be as follows;

Phase 1 Infrastructure/ Enabling: Infrastructure/enabling works to include 2 no. access roads, SuDS infrastructure, pumping station, Railway station access & plaza. **October 2024 – August 2025**

Phase 1 (A & B) Residential: 468 no. residential units, creche, associated site works including demolition of existing farm buildings/sheds, landscaping parklands. School site to be made available to the Department of Education. **February 2025 – May 2029 (phased completion from October 2026)**

Phase 2: 182 no. residential units, Village Centre retail & commercial units, works to Barberstown Lane North, Market Square & associated landscaping & site works. **March 2027 – June 2029**

Phase 3: 195 no. residential units, associated site works & landscaping. **September 2028 – Jan 2030**

Phase 4: 214 no. residential units, associated site works & landscaping. **March 2029 – July 2030**

Phase 5: 185 no. residential units, associated site works & landscaping. **September 2030 – July 2032**



Figure 3: Proposed Phasing

2.2.1 CONSTRUCTION SEQUENCE

An overview of the proposed sequence of construction is as follows; however, this is subject to review during construction stage and specifics may require adjustment once planning has been granted and construction is underway. Should there be an adjustment, the CEMP shall be updated and reissued.

- Set up site including compounds and perimeter hoarding, maintaining existing pedestrian and traffic routes around the site;
- Pre construction surveys to include but not limited to;
 - Existing boundaries
 - Existing buildings to be demolished
 - Existing drainage infrastructure
 - Infiltration & ground investigation
 - Underground and overground services e.g. ESB
- Establishment of tree/hedge protection zones in conjunction with project Arborist and the project Ecological Clerk of Works;
- Establishment of protection zones around existing watercourse;
- Site Clearance;
- Demolition of farm buildings - Phase 1;
- Reduced Level excavations where required;
- Site services installations (drainage, power, water etc);
- Basement construction where required;
- Construct Building Frames and Envelopes; and
- Finish Interiors and Exterior Landscaping.
- The contractor should liaise with various stakeholders such as local residents, Fingal County Council, Irish Water, Waterways Ireland, Irish Rail, ESB and other utility provider on an ongoing basis as required.

The construction sequencing for each phase of the development is described in chronological order as follows:

Enabling Works Phase:

- Phase A: Site Establishment
- Phase B: Demolition and Site Clearance

- Phase C: Utility Diversions & Construction

Each Construction Phase will contain the following sub-phases:

- Phase A: Earthworks, Foundation and Podium/Basement Structure Works (if required)
- Phase B: Superstructure Works
- Phase C: Façade & Fit-Out Works
- Phase D: Landscaping Works

This OCEMP should be viewed as an outline plan with the final CEMP to be developed by the Main Contractor in consultation with Statutory Undertakers / Authorities and relevant Stakeholders prior to works commencing on site.

The proposed development is anticipated to be constructed in five sequential phases including an Infrastructure and Enabling Works Phase. At this stage in the project design, it is assumed that the buildings will be constructed using a variety of standard construction techniques depending on final detailed design development prior to commencement of development. These techniques are outlined in the following sections.

2.2.2 BASEMENT CONSTRUCTION IN REINFORCED CONCRETE (RC)

The above-mentioned method of construction is a standard method used in the construction of sub ground level basement carparks.

This method of construction involves:

1. Topsoil strip and store on site for re-use.
2. Bulk level excavation and disposal to licenced tip and/or stored for re-use on site.
3. Some temporary supports will be used if required. However, given the subject site is a green field site with no obstructions and subject to good ground the method envisaged would be to batter out sides of the excavation at 45 degrees with no need for these temporary supports. However, In the Village Centre, the northern extent of the basement excavation will be required to be stabilised given its proximity to the existing Barberstown Lane North Road and the existing dwellings. The use supports for the northern side of this excavation will help mitigate the excavation from undermining the existing road access to the adjacent existing dwellings. Methods of stabilisation of this excavation, and on-site excavations as a whole, shall be explored in greater detail during detailed design of the development.
4. Foundation excavations, including pad foundations, shaft pits and sumps.
5. Lean Mix to base of slab and all foundations/pads.
6. Basement RC Slab construction including any foundations, pads etc.

7. In combination with the above, full water stop works via waterbars formed into the slab.
8. Basement RC Retaining wall Construction.
9. Basement RC Column Construction.
10. Basement RC Core Wall Construction.
11. Basement Podium RC Construction.



Figure 4: Basement Construction in Reinforced Concrete

2.2.3 UNDERCROFT PARKING CONSTRUCTION IN REINFORCED CONCRETE

This method of construction is used in the construction of piled foundations (where required) with an overlying undercroft car park and apartment complex.

This method of work shown above involves:

1. A layer of stone with the capacity to allow for the movement of heavy equipment is laid over the footprint of the site.
2. Supports are installed to a specified depth that provides sufficient bearing capacity and then cropped to the required formation level.
3. A combination of reinforced concrete caps and ground beams are then poured on top of the supports to provide the foundation for the above structure.
4. Excess spoil material is disposed of to a licenced tip and/or stored for re-use on site. The site level is raised to the underside of the ground floor slab using the appropriate fill material.
5. Subfloor drainage is installed below ground level.

6. Sand or concrete blinding is placed on the fill material and a waterproof barrier is installed.
7. Rising elements are erected and a reinforced ground floor concrete slab is poured under the building and duplex footprint.
8. The remaining undercroft parking area may receive a standard asphalt road assembly in lieu of a concrete slab.
9. An RC podium slab is constructed above the car park, supported on a grid or reinforced concrete columns.



Figure 5: Undercroft Parking in Reinforced Concrete

2.2.4 APARTMENT CONSTRUCTION IN INSULATED CONCRETE FORMWORK (ICF)

The above method of construction will be utilised in the construction of Apartments up to 18m in Height. In Apartment construction a thicker 200mm ICF core block is used, which is filled with concrete and steel reinforcement.

This method of construction involves:

1. If built on top of an RC Podium-works begin at GF Walls.
2. If not built on top of an RC Podium- foundation works, ICF Rising walls, ground bearing slab construction done before.
3. Construction of Floor to full height (Usually 3.2m F-F) Lay ICF blocks by hand.
4. Install steel rebar in grid within wall and to heads/sides of opes.
5. Pour entire floor in 1 continuous pour.
6. Install any structural steel for floor installation.
7. Install Pre-cast concrete Hollowcore floor slabs and wide slab balcony slabs.
8. Prepare floor and pour a 75mm screed.
9. Repeat for the next floor.



Figure 6: Apartment Block Construction in ICF

2.2.5 APARTMENT BLOCK CONSTRUCTION IN PRECAST CONCRETE (PC)

The above method of construction is utilised for the construction of Apartments over 18m in Height.

This method of construction involves:

1. If built on top of an RC Podium-works begin at GF Walls.
2. If not built on top of an RC Podium- foundation works, ICF Rising walls, ground bearing slab construction done before.
3. Construction of Floor to full height (Usually 3.2m F-F)-Panels lifted in via crane and grouted into place.
4. Install any structural steel for floor installation.
5. Install Pre-cast concrete hollow-core floor slabs and wide slab balcony slabs.
6. Prepare floor and pour a 75mm screed.
7. Repeat for the next floor.



Figure 7: Apartment Block Construction in Precast Concrete

2.2.6 HOUSE CONSTRUCTION IN INSULATED CONCRETE FORMWORK (ICF)

This method of construction may be utilised for the construction of house and duplex units. A standard 150mm ICF core block is used, which is filled with concrete and steel reinforcement.

This method of construction involves:

1. Foundation works, ICF Rising walls, ground bearing slab construction done before.
2. Construction of Ground Floor to full height (Usually 3.2m F-F)- Lay ICF blocks by hand.
3. Install steel rebar in grid within wall and to heads/sides of opes.
4. Pour entire floor in 1 continuous pour.
5. Install any structural steel for floor installation.
6. Install Prefabricated timber floor joists.
7. Construction of the next floor (Same as below).
8. Install Pre-fabricated roof trusses.



Figure 8: House Construction in ICF

2.2.7 HOUSE CONSTRUCTION IN TRADITIONAL CONCRETE MASONRY

Further to section 2.2.4 above, this method of construction may also be utilised in the construction of housing units, incorporating standard block construction with full fill cavity insulation.

This method of work shown above involves:

1. Foundation works and underground services are completed.
2. A ground bearing steel reinforced concrete slab is poured.
3. Load bearing concrete block walls, with full fill cavity insulation, are built.
4. Installation of intermediate timber floor joists, first floor decking and stairs.
5. Install prefabricated timber roof trusses & roofing system.
6. Installation of windows and completion of exterior finishes.
7. Complete internal finishes.



Figure 9: House Construction in Concrete Masonry

2.3 CRANEAGE

The construction works will require the use of tower cranes on site. The cranes will be required for the moving of building materials on site such as formwork for concrete, reinforcement, precast concrete, steelwork, façade elements, plant and general building materials. Mobile cranes may also be utilised to assist in some elements of the construction works such as façade installation.

The contractor should minimise the use of tower cranes where possible and should develop a crane management plan to limit lifting operations over live buildings and roadways. The layout of cranes to achieve maximum coverage of the site will be determined by the Main Contractor. The contractor should liaise with Irish Rail and other relevant stakeholders as necessary.

2.4 DEMOLITION PROCEDURES

Demolition work will be required in Phase 1. In order to prepare the site area for the new construction and the establishment of the main site compound it is necessary to demolish a number of existing farm buildings/ sheds situated to the south of Barberstown Lane North.

There are a number of risks to be addressed when demolishing this property including:

- Site security and ensuring the safety of the general public. To ensure this hoarding will be erected around the complete perimeter of the demolition site in advance.
- Dust could also be a risk so during demolition a sprinkler system or use a Fog Cannon dust control system shall be used which will spray a fine mist of water droplets over the demolition area and control the dust if required.

In advance of this work a dilapidation survey of the structures must be undertaken and before work starts a detailed structural assessment must be carried out by a competent person and detailed RAMS (Risk Assessment Method Statement) drawn up for the demolition. The procedure for the demolition of the existing building is as follows;

- Exclusion zone to be established in advance of all demolition work. To ensure this hoarding must be erected around the complete perimeter of the site in advance.
- Remove roof, doors and window to ensure safe separation is achieved with the boundary wall. All materials to be segregated and removed to skips for disposal off site.
- Full time supervision to be in place at all times for demolition work.
- Communication system (two-way radios or similar) to be maintained at all times between person manning/monitoring the exclusion zone and the supervisor/ lead person in charge of the demolition.
- Demolition to proceed using an excavator and demolition grab which will remove small sections in a slow controlled manner. Ongoing assessment by competent engineer/supervisor to ensure the structural integrity of the building is not affected so that operatives could be put at risk.
- The front walls will first be removed using an excavator which will remove small sections in a slow controlled manner. Only the upper sections of the front walls will

be removed at this stage with the wing walls at the corners of the gable and centre wall remaining to maintain structural support. Demolition can then proceed in a piecemeal manner starting at the top and working down in layers/stages. Work will proceed very slowly to ensure the building remains stable.

- Once demolition has progressed to below first floor level along the front of the building the rubble will be stacked by the excavator which will then track up onto the stack to gain height and achieve better control for removing sections of the back and gable walls.
- Demolition can then proceed in a piecemeal manner for the lower sections of the walls.
- Works to be supervised at all times by a competent Supervisor/Engineer who must assess the stability and safety of the structure at all times and take the appropriate action. Each time a section of wall is demolished all rubble will be cleared away in preparation of the next section.
- This process will continue until the wall sections have been removed.
- The foundations and rising walls will then be removed. Full time supervision to be in place at all times for demolition work.
- Dust suppression to be on hand (for use when deemed necessary) using a power washer and operative to spray the work area and rubble with water and or a Fog Cannon Dust control system. Operative to keep out of the line of fire at all times and direct spray upwards over area so that the water jet forms a rain like mist.
- Rubble shall be used as hardcore where possible and otherwise be removed off site to a registered waste facility.



Figure 10: Approximate Demolition Area



Figure 11: Existing Farm Buildings/ Sheds to be Demolished

3. SITE MANAGEMENT

The Main Contractor appointed to the relevant phase of the project will have overall responsibility for the implementation of the CEMP and appointing the following roles and responsibilities within the Construction Management Team (CMT). The Contractor must progress their works with reasonable skill, care, diligence and to proactively manage the works in a manner most likely to ensure the safety and welfare of those carrying out construction works. All contractors are further required to ensure that all aspects of their works and project facilities comply with the final CEMP.

3.1 CONSTRUCTION DIRECTOR

The Construction Director will have an overall responsibility for the organisation and execution of all related environmental activities as appropriate, in accordance with regulatory and project environmental requirements. The principal duties and responsibilities of the Construction Director will include:

- Overall responsibility for the development and implementation of the CEMP;
- Ensuring adequate resources are available to ensure the implementation of the CEMP;
- Appointment of the Traffic Co-ordinator and Logistics Manager;
- Responsibility for the management review of the CEMP for suitability, adequateness, and effectiveness; and
- Setting out the focus of environmental policy, objectives, and targets for the Contractor.

3.2 CONSTRUCTION MANAGER

The Construction Manager is directly responsible to the Construction Director for the successful execution of the project. The principal duties and responsibilities of this position will include:

- Reporting to the Construction Director on the on-going performance of the CEMP.
- Discharging his/her responsibilities as outlined in the CEMP.
- Supporting the CMT and the Environmental Officer through the provision of adequate resources and facilities to ensure the implementation of the CEMP.
- Give Contractors precise instructions as to their responsibility to ensure correct working methods where risk of environmental damage exists.
- Where appropriate, ensure Contractor's method statements include correct waste disposal methods; and
- Co-ordinate environmental planning of CMT activities to comply with environmental authorities' requirements and with minimum risk to the environment.

3.3 ENVIRONMENTAL OFFICER

The Environmental Officer will be responsible to the Construction Manager for, but not limited to, the following activities:

- Ensuring that the requirements of the CEMP are developed and environmental system elements (including procedures, method statements and work instructions) are implemented and adhered to with respect to environmental requirements.
- Reviewing the Environmental responsibilities of all sub-contractors in scoping their work and during their contract tenure.
- Ensuring that advice, guidance, and instruction on all CEMP matters is provided to all managers, employees, construction contractors and visitors on site.

- Reporting to the Construction Manager on the environmental performance of Line Management, Supervisory Staff, Employees and Contractors; and
- Advising site management on environmental matters.
- Be aware of any potential environmental risks relating to the Contractors and bring these to the notice of the appropriate management.
- Ensure materials/waste register is completed; and
- Maintenance of all environmental related documentation.

The Environmental Officer will also have the overall responsibility to oversee recording of all waste management at the site. Some of the principal duties and responsibilities of this role include:

- Report to Project Manager on the management of waste at the site.
- Delegate responsibility to sub-contractors, where necessary.
- Coordinate with suppliers, service providers and sub-contractors.
- Prioritise waste prevention and recovery.
- Maintain a record of each load of waste materials being transported off-site; and
- Maintain a record of all necessary documentation including contractor waste collection permits, waste destination consents, waste transfer documents and waste management facility gate receipts in the waste management file.

3.4 ECOLOGICAL CLERK OF WORKS

An Ecological Clerk of Works (ECoW) will be appointed for the duration of each phase of construction. The ECoW will advise on and monitor implementation of ecological mitigation measures and compliance with legislative requirements concerning ecological features. The ECoW will also carry out pre-commencement checks for protected and/or notable species and provide other ecological advice as necessary.

The earliest enabling works will not take place until late 2024 at the earliest. The ECoW will therefore carry out a survey for protected or notable species to check for any changes to the baseline conditions described in Chapter 9 of the EIAR, in particular any changes to the locations of resting sites used by protected species. The ECoW will be provided with details of the works, so that distances can be determined from the known badger sett and any other protected species resting sites that the ECoW might find. The pre-commencement survey will be completed two to six months prior to the commencement of enabling works (such as site clearance), giving time for derogation licensing if found necessary. The results will be reported and communicated to the appointed principal contractor, and where necessary proportionate avoidance/mitigation measures will be implemented.

Given the different phases of the Development, the ECoW may need to carry out pre-commencement surveys in consecutive years or to carry them out in areas relevant to particular phase(s). This shall be arranged by due communication between the principal contractor(s) and the ECoW.

The above pre-commencement survey will include inspection of the buildings in the industrial yard just south of Barberstown Lane North to check for signs of nesting or roosting barn owl. In the event that barn owl is found to have occupied the vacant buildings, the ECoW will communicate this to relevant stakeholders and carry out any necessary actions to ensure barn owls are not harmed and relevant legislation is complied with, including obtaining any derogation licensing that may be necessary. If a barn owl nest site or roost site will subsequently be lost as a result of the works, a replacement barn owl box will be installed in an appropriate location on a retained hedgerow under the guidance of the ECoW.

Works will be carried out near an existing small single-hole badger sett. The sett will be retained in central retained hedgerow in the proposed park area, but could be subject to disturbance by works. Prior to carrying out any works which could cause disturbance of the sett, the ECoW or other suitably qualified ecologist shall apply for a license from the National Parks & Wildlife Service (NPWS).

As noted above, in the unlikely event that barn owl colonies one or more of the vacant buildings in the industrial area, the ECoW would need to obtain a derogation license to permit disturbance of the nest/roost site, with appropriate mitigation.

If the ECoW should find new resting places of protected species (such as bat roosts) during pre-commencement surveys, that will be destroyed or disturbed by works, then derogation license(s) may be required for those works to proceed. The ECoW shall advise accordingly if this situation arises.

The two trees considered to have moderate bat roost suitability will be retained. However, where Low bat roost suitability trees require to be removed, sectional soft-felling will be used as necessary for the affected tree parts (those with dense ivy) under the supervision of the ECoW or other ecologist qualified and licensed to handle bats. In the unlikely event that the supervising ecologist find bats during removal of such trees, they shall be placed in a pre-existing bat box on a retained tree in a suitable location nearby.

For the small derelict slate-roofed building with Low bat roost suitability on the immediate south edge of Barberstown Lane North, the following shall be carried out;

- A pre-commencement dusk or dawn survey of this building.
- the ECoW or other ecologist qualified and licensed to handle bats shall inspect the building externally and, if safe to do so, internally.
- In the unlikely event that bats or bat evidence are found, the supervising ecologist shall advise accordingly and obtain a derogation licence.
- If no bats are found during the inspections/survey, the manner of demolition of the building shall be at the discretion of the ECoW.

If at the time of commencing vegetation clearance grass has grown and no longer comprises tightly-grazed short swards, then the ECoW shall inspect any grassland prior to its clearance, if necessary prescribing and supervising cutting of the grass to a low height with an intermediate cut if considered appropriate, to discourage amphibian and reptile presence. Similarly, lengths of hedgerow with

adjacent small ditches that require to be removed shall be inspected by the ECoW to check for amphibian or reptile presence before their removal.

If any amphibians or reptiles are found by the ECoW, they shall be returned to sections of retained small ditch beside retained hedgerows. If the proposed wetland feature with pond and surrounding habitat in the park has been constructed and is established, with reasonably developed aquatic vegetation, any found amphibians shall be transferred there, at the discretion of the ECoW.

As far as possible, works directly impacting vegetation that could be used by nesting birds will be undertaken outside the breeding season. Should vegetation clearance be required during the breeding season, a pre-works check for active nests will be carried out by the ECoW or other suitably experienced ornithologist no more than 72 hours in advance of the clearance works taking place. Where any active nests are identified, suitable species-specific exclusion zones will be implemented and maintained until the breeding attempt has concluded.

The following measures will be included to minimise risk of disturbance or harm to protected species:

- any excavations will be left with a method of escape (such as a battered slope or plank of wood) for any animals that may enter overnight, and will be checked at the start of each working day to ensure no animals are trapped;
- any exposed pipes will be capped or otherwise blocked at the end of each working day or if left for extended periods of time, to ensure no animals are trapped;
- as far as possible, works will be carried out in daylight to avoid adverse artificial lighting effects on protected species such as foraging/commuting bats and badger;
- any artificial lighting required for construction works will be strongly directional, directed only at the works area(s) and turned off when not required, to avoid adverse artificial light effects on nocturnal wildlife; and
- sightings or evidence of protected species during construction will be recorded, and if found within 30 m of works then those works will stop immediately and the ECoW will be contacted for further advice.

3.5 PROJECT ARCHAEOLOGIST (AS REQUIRED)

The Project Archaeologist Clerk of Works (if required) will report to the Environmental Officer and is responsible for advising on all archaeological monitoring activities, conducting watching briefs and distributing information relevant to monitoring. The responsibilities and duties of the Project Archaeologist will include the following:

- Monitor all ground disturbance works associated with the construction of the development,
- Ensure the appropriate course of action is taken in the event that archaeological material is discovered during the works,
- Liaison with the CMT throughout the Construction Phase of the project, and
- Liaison with the Department Applications Unit, National Monuments Service, Department of Arts, Heritage and Gaeltacht and Cork County Council as required.

3.6 SITE SUPERVISORS

All Site Supervisors are required to:

- Read, understand, and implement the CEMP when it is fully developed.
- Have knowledge of the requirements of the relevant law in environmental matters and take whatever action is necessary to achieve compliance. Where necessary seek the advice of the contracted Environmental Officer.
- Ensure that environmental matters are considered at all times.
- Be aware of any potential environmental risks relating to the site, plant, or materials to be used on the premises and bring these to the notice of the appropriate management; and
- Ensure that any plant is environmentally suited to the task in hand.

3.7 SITE PERSONNEL

All Contractors, and other site personnel, on the project will adhere to the following principal duties and responsibilities:

- To co-operate fully with the CMT and the Environmental Officer in the implementation and development of the CEMP at the site.
- To conduct all their activities in a manner consistent with regulatory and best environmental practice.
- To participate fully in the environmental training programme and provide management with any necessary feedback to ensure effective environmental management at the site; and
- Adhere fully to the requirements of the site environmental rules.

4. SITE SET UP

4.1 ACCESS & EGRESS

Primary access to the proposed development shall be from the 2 no. roundabouts on the realigned Barberstown Lane South Road that is to be constructed prior to the proposed development, as part of the Ongar to Barnhill Distributor Road Scheme by Fingal County Council. The main contractor will secure the site and establish safe site accesses. The main contractor shall also set up site compounds comprising of site offices, parking areas, canteen, welfare facilities, storage areas and temporary utilities / services. Specific control measures will be implemented to fully segregate construction traffic from external pedestrian traffic.

Warning signage will be provided for pedestrians and other road users on all approaches in accordance with Chapter 8 of the Traffic Signs Manual and the Contractor's Traffic Management Plan.

4.2 CONSTRUCTION COMPOUND

The construction compound will be located within the site boundary and will include site accommodation (inc. site office, welfare facilities, storage area and waste area).

Security personnel will be present at the entrance/exit of the site to ensure all egress vehicle and pedestrian traffic will do so safely. If necessary, a road sweeper will be used to keep the public road around the site clean.

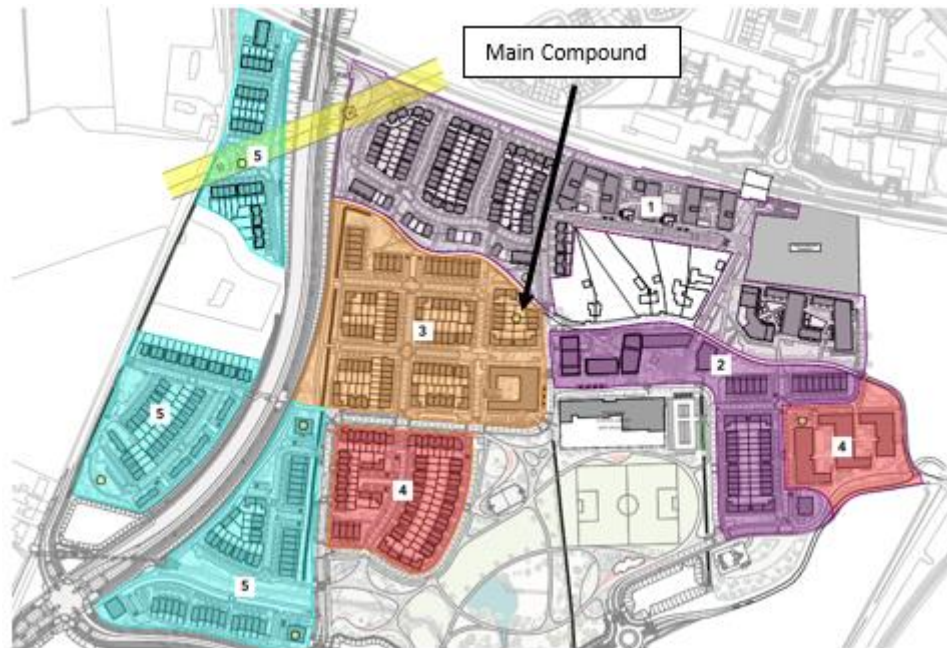


Figure 12: Compound Locations

The proposed site compounds shall be located within the red-line boundary of the proposed development. It is proposed that the main site compound shall be within the site of the existing farm buildings/ sheds (to be demolished) given its central location within the development lands. All cabins will be steel securi-type with steel lockable shutters on the windows and a steel lockable door. All cabins will be brought to site in good condition and will be maintained in good order throughout the project.

The construction compound will include adequate temporary welfare facilities including toilets and cleaning facilities and shall be supplied with a potable water supply. Foul drainage discharge from the compound will be removed, and disposed of, off site to an appropriately licensed facility for disposal until a connection to the public internal development foul sewer network has been established.

A power supply from ESB Networks to power both the compound and the construction site will be applied for by the Main Contractor. The size of supply will be calculated to ensure it is sufficient to power both the site compound and construction site activities. Liaison with ESB Networks shall be made to fully ascertain the extent of the overhead ESB infrastructure that will require to be undergrounded. Implementation of the undergrounding works will be adequately planned so as to reduce impacts to power supply to the existing dwellings in the development area. Interaction with the existing overhead lines will be managed in compliance with the Health and Safety Authority

Construction Regulations 2013 and the Health and Safety Authority Code of Practice for Avoiding Danger from Overhead Electricity Lines May 2019.

Water and drainage will be required to service the site toilets and canteen facilities. The Main Contractor will carry out a site survey to identify the locations of the water and foul drainage connections to the site. It will be the Main Contractor's responsibility to apply to Irish Water for connections to the water main and foul drain, ideally utilising the existing connections.

The main compound will downsize over the lifetime of construction works as the various phases are completed. The location of smaller satellite site compounds shall vary as the phased development works progress over the lifetime of the construction stage. The CEMP shall be updated to reflect any changes to the location of site compounds. Compounds shall be erected at an acceptable minimum clearance from environmentally sensitive features that are to be maintained within the existing site such as the existing hedgerows and ditches and the existing stream that traverses the site. Consideration should also be given to the location of existing dwellings and existing site services and utilities.

At the outset of each phase the main contractor will highlight all hazards including overhead power lines and establish safe working zones near overhead power lines, existing watercourses, and other hazards. An overview of these hazards will be on view in the compounds.

Although indicative locations have been chosen for these activities, the Contractor is permitted to revise this plan within the boundaries of the site, subject to specific client restrictions and agreement prior to start on site.

Visual monitoring will be undertaken as part of the regular site audits during the construction of the proposed development and liaison with the ESB, gas, water, foul and utility providers will be controlled by the main contractor to the construction of the development. All respective utility / service providers shall be notified, in a timely manner, when construction activities are undertaken in close proximity to existing services within the development area.

4.3 DELIVERIES AND STORAGE

Unloading bays are to be provided for deliveries to the site within the hoarding perimeter. They will be accessible by mobile crane and fork lifts. Appropriately demarcated storage zones will be used to separate and segregate materials.

4.4 SITE PARKING ARRANGEMENTS

Parking will only be permitted within the construction compounds during construction works. Staff are not permitted to park on the local road network. 85 no. staff car parking spaces are to be provided within the compound. The car park will be prepared and finished to a standard sufficient to avoid mud spillage onto adjoining roads

The CEMP will be updated to reflect any changes to compound/parking arrangements should they occur.

4.5 PROTECTION OF PUBLIC AREAS

Perimeter fencing will be provided around the site to provide a barrier against unauthorized access from the public areas. Controlled access points to the site, in the form of gates will be kept locked for any time that these areas are not monitored. All fencing will be well-maintained.

4.6 SITE SECURITY

The site will be secured with a hoarding around the perimeter. Access to site will be controlled and monitored by security personnel. A full-time security officer will be on site at all times outside of normal working hours. The security officer will be positioned at a prominent location at the edge of the site compound adjacent to the site access. The security officer will carry out regular patrols of the site perimeter and of the units during construction to ensure there is no unauthorised access.

The security role is a ministering role only and in the event of a break-in or unauthorised access the security officer has been instructed not to confront any threat and to inform the Gardai and Management immediately.

4.7 HOURS OF OPERATION

It is envisaged the hours of operation will be as follows (subject to a grant of planning permission);

- Between 8.00am to 7.00pm Monday to Friday;
- Between 8.00 a.m. to 2.00pm. on Saturdays; and
- No activities shall take place in site on Sundays or Bank Holidays.

The contractor will comply with any planning conditions in relation to hours of operation.

5. CONSTRUCTION TRAFFIC MANAGEMENT

This outline Construction Traffic Management Plan (CTMP) sets out the guiding principles for the management of traffic during the construction phase. A final CTMP should be agreed with the Local Authority prior to the commencement of development. The CTMP should be reviewed regularly and updated as appropriate.

The most onerous construction period with regards to traffic generation and associated impacts upon the local road network is expected to be associated with the volume and size of HGVs during the following work elements;

- Excavation stage where material is removed from site;
- Bringing construction materials to site;
- Bringing concrete / steel to site for Superstructure, and
- Waste collections.

5.1 TRAFFIC CO-ORDINATOR

A Traffic Co-ordinator shall be appointed by the Construction Director. The duties of the Traffic Co-ordinator will include;

- implementing traffic control through the use of signs and traffic signals;
- maintaining a safe environment for pedestrians and vehicles;
- directing traffic;
- liaison with existing and future residents
- evaluating traffic patterns for control needs to limit any potential traffic congestion;
- manage site deliveries in conjunction with the Logistics Manager
- coordinating traffic flow in construction areas ensuring priority for future and existing residents.

5.2 CONSTRUCTION TRAFFIC VOLUMES

Estimated volumes and rates of construction traffic have been calculated on the basis of the extent of the excavation and earthworks involved in the development. Topsoil and subsoil will be excavated to accommodate elements of the development including roads, paths, services, housing and basements as required.

Estimated volumes of materials have been calculated on the basis of the required excavations for the following;

- Demolition waste – there will be c.12,900m³ of demolition waste arising from the demolition of existing structures on the site. The majority of this waste will be recycled on and off the site (concrete, timbers and metals). Non-recyclable materials will be disposed off site to a licenced facility.
- Topsoil – it is expected that all topsoil stripped within the development lands, which is currently estimated at 88,260m³, will be suitably stored on site for future re-use.
- Subsoils – all excavated subsoils from roads and footpath areas, which is currently estimated at 24,500m³, will be removed off site to a licenced facility.
- Subsoils – all excavated subsoils from underground services including watermain, foul and surface water services and utility ducting, which is currently estimated at 45,000m³, will be removed off site to a licenced facility.
- Subsoils – all excavated subsoils arising from building foundations and basements which is currently estimated at 71,000m³, will be removed off site to a licenced facility.
- Subsoil – all excavated subsoils from SUDS detention areas, which is currently estimated at 7,200m³, will be removed off site to a licenced facility.
- Subsoil – all excavated subsoils from a proposed foul sewer pumping station, which is currently estimated at 3,600m³, will be removed off site to a licenced facility.
- Total subsoil excavation and removal off site is currently estimated at 159,386m³.

- Imported Fill material – there will be 90,000m³ of fill material imported on to the site.

Based on the above calculations and recent experience during the construction of the nearby Hansfield development (approx. 1,250 units) and based on the anticipated programme it is estimated that there will be, on average, a maximum of nine HGV loads per working day which equates to 234 HGV loads per month. Allowing for increased rates of HGV movements during peak excavation periods it is estimated that the average will increase to eighteen HGV loads per day with further fluctuations for seasonal and holiday periods.

Measures will be put in place to minimise the volume of construction traffic generated by the development. These measures will include the storage of all excavated topsoil on site for re-use within the completed development. Similar efforts will be made to re-use excavated subsoil where possible.

The construction methodologies to be utilised in this development by the contractor will involve the use of prefabricated systems. This will result in lower numbers of construction workers on site which will result in less traffic than traditional construction methodologies. Additionally given the proximity to the Hansfield Train Station construction workers will be encouraged to use public transport as much as possible.

During the ‘fit out’ period of the construction programme construction vehicles are likely to be dominated by LGVs with only the occasional rigid HGV.

Construction traffic will not be permitted to park on the public roads or within the general area outside the main site. Furthermore loading / unloading of all delivery / collection vehicles will not be permitted to be undertaken whilst the vehicle is parked on the public road network. All construction related traffic will be required to park within the site boundary. Construction traffic overspill concerns will be addressed immediately.

5.3 ACCESS & EGRESS

Construction traffic routes shall be used strategically by construction vehicles to minimise traffic impact to surrounding properties. It is proposed that all construction traffic will use the Ongar Barnhill Distributor Road. As mentioned in section 4.1 above, access to the proposed development shall be from the 2 no. roundabouts on the realigned Barberstown Lane South Road. Both access roads from the 2 no. roundabouts are to be constructed as part of the Phase 1 infrastructure works. These access roads will provide access to phase 1, 2, 3, 4 & part of phase 5 (the ‘Stream’). Access to the remaining areas in phase 5 (‘Link Road West’ and ‘Parkside’) will be from the existing R149 road via the newly constructed Ongar Barnhill Distributor Road which will include cycle and pedestrian connections to the east of the site. All local paths, footpaths and cycleways will be constructed in tandem with each phase. Access to Hansfield Train Station is being provided as part of the phase 1 infrastructure works.

Warning signage will be provided for all road users on all approaches in accordance with Chapter 8 of the Traffic Signs Manual and the Contractor’s Traffic Management Plan.

Should it prove necessary for adjacent roadways, within the charge of Fingal County Council, to be closed or partially closed temporarily during the course of the subject construction works all

necessary licences are to be obtained from Fingal County Council and a temporary management plan put in place.

5.2.1 EXISTING DWELLINGS

Access to the existing dwellings on Barberstown Lane North is to be maintained at all times.

During the Phase 1 infrastructure works residents of the existing dwellings will continue to be able to travel east along Barberstown Lane North (towards Pakenham bridge) to access the wider area. It is noted that the construction of the Ongar Barnhill Distributor Road, by Fingal County Council, will result in Barberstown Lane North terminating in a cul-de-sac to the west.

Once the phase 1 infrastructure works have been completed existing residents will have access via the new roads from the 2 no. roundabouts on the realigned Barberstown Lane South. Access to Hansfield Train Station will also be provided as part of the phase 1.

Works to Barberstown Lane North are proposed as part of phase 2. Once pedestrian and cycle priority has been established along the lane vehicle access will be provided for the existing dwellings only.

5.4 PARKING

Parking will only be permitted within the construction compounds during construction works. Staff are not permitted to park on the local road network. It is anticipated that there will be c. 150 -200 employees working on site at the peak of construction. 85 no. staff car parking spaces are to be provided within the compound. The number of car parking spaces provided will reduce over the lifetime of construction as the number of site employees reduces.

All operatives are encouraged to use sustainable travel options when traveling to / from the subject site. Secure bicycle storage will be provided with the site compound.

This CEMP will be updated to reflect any changes to compound/parking arrangements should they occur.

5.4 DELIVERIES

A dedicated 'delivery zone' will be identified at the construction compound. The delivery zone incorporates the following principal elements;

- a) A dedicated area to accommodate HGV vehicles that will be permitted access to the site.
- b) A temporary materials storage area where materials can be offloaded immediately from the delivery vehicle prior to being transferred elsewhere on site.
- c) Waste bins / skips to enable the appropriate segregation of all construction waste prior to being collected and transferred off-site.
- d) Located within the reach (and lifting capacity) of the onsite mobile crane.

5.5 LOGISTICS MANAGER

A logistics manager will be appointed. The logistics manager is responsible for managing the delivery zone and coordinating all deliveries into and collections from the subject construction site.

Formal delivery / collection protocols will be implemented by the appointed logistics manager. In addition to the principal contractor all sub-contractors are required to take account and respect the sites delivery protocols.

All contractors are required to advise the logistics manager of all deliveries and collections for the upcoming week. The logistics manager will utilise a dedicated 'white board' delivery / collection schedule that will be located in a highly visible location adjoining the delivery zone to enable all site personnel to conveniently and quickly review the status of available / booked delivery slots.

Any delivery / collection not booked in will not be accommodated on-site and may be refused entry to the site.

All deliveries / collections need to be arranged and assigned an appropriate delivery slot (allowing sufficient time to unload / load the vehicle) at least 48 hours in advance. When approaching the logistics manager to book a delivery / collection slot the following information is to be provided;

- The name of the company and contact details of who the delivery is for;
- The approximate time of arrival on-site within a reasonable buffer period to allow for any traffic conditions;
- What material is being delivered / collected;
- The type of vehicle that will be transferring the materials;
- The proposed method of unloading / loading; and
- The name and contact details of at least two contractor / sub-contractor personnel who will be made available to assist gate security with the loading / unloading activity and traffic / pedestrian safety.

5.6 MINIMISATION OF MOVEMENT & IMPACT

Construction vehicle movements and their impact will be minimised through the implementation of the following measures by the appointed contractor;

- Consolidation of delivery loads to / from the site and management of large deliveries on site to occur outside of peak periods;
- The majority of buildings will be constructed using precast / prefabricated materials;
- "Cut" materials generated by the construction works to be re-used onsite where possible, through various works;
- Adequate storage space on site to be provided;

- Scheduling of movements to outside local peak traffic times and school pickup / drop-off times.
- Vehicle, pedestrian & cycle access for the existing houses along Barberstown Lane North will need to be provided for 24 hours a day, 7 days a week.

5.7 PUBLIC ROADS

The following measures will be taken to ensure that the site and surroundings are kept clean and tidy;

- No material deliveries (unloading / loading of vehicles) will be permitted on the public road unless in special circumstances (e.g. delivery / erection / removal of mobile crane or such large equipment's as required to enable the construction works) and with prior agreement with the local planning authority. In all such circumstances a formal exclusion zone must be implemented and controlled / policed by dedicated personnel.
- A regular programme of site tidying to be established to ensure a safe and orderly site;
- Mud and material spillages on roads and footpaths outside the site to be cleaned regularly and will not be allowed to accumulate;
- Wheel-wash facilities or similar will be provided for vehicles exiting the site if deemed appropriate or when significant vehicle movements are planned (e.g. disposal of topsoil from site);
- Dedicated road sweeper will be put in place if site conditions require.

5.8 STAFF/ DRIVER/ CONTRACTOR INFORMATION

All Staff/HGV drivers/contractors will be provided with details of the site restrictions and implemented measures.

A Site Staff Information Sheet will be produced which details the site's restrictions, advisory routes, operational preferences regarding construction traffic and car parking arrangements. The factsheet will be provided to all new staff and used within the tendering and appointment process.

The site's restrictions, implemented measures and operational preferences will be reminded during regular staff/contractor briefing sessions on site. Any breach of rules and restrictions may be subject to standard disciplinary procedures.

5.9 MONITORING AND REPORTING

Monitoring and reporting procedures will be implemented at the site prior to the commencement of the construction works and will be maintained throughout the life of the scheme. The procedures will encourage all stakeholders to report any issues, breach of restrictions or risks to site management.

Site staff and drivers are expected to contribute to the monitoring and reporting programme, highlighting any instances such as vehicle routeing violations or where unwanted material is deposited on roadways from site vehicles.

Site management contact details will be advertised at the site access in order to allow members of the public to report any issues.

The site operator shall document records of the following and be able to provide the information on request:

- all HGV movements; and
- any reported transport issues.

5.10 MATERIAL HOISTING AND MOVEMENT THROUGHOUT THE SITE

As noted in section 3.2 it is envisaged that construction works will require the use of a tower cranes on site. The cranes will be required for the moving of building materials on site such as formwork for concrete, reinforcement, precast concrete, steelwork, façade elements, plant and general building materials. Mobile cranes may also be utilised to assist in some elements of the construction works such as façade installation.

Hoists and teleporters may also be utilised around the perimeter as required during the project to facilitate material movement into the structures and waste movements out of the buildings.

6. ENVIRONMENTAL MANAGEMENT

The following section provides a summary of the environmental control measures that will be implemented during the construction phase of the development. These measures alongside the standard construction measures outlined in earlier sections of this document and the mitigation measures contained in the EIAR which accompanies the planning application must be adhered to by all contractors during the construction phase.

Full details of the EIAR mitigation measures are included in Appendix 1.

6.1 TREES & VEGETATION

Trees and hedgerows are to be retained in line with the Tree Survey and Arboricultural Assessment prepared by Arborcare Limited. Overhanging limbs will be pruned back where required. All tree works are to be undertaken by a qualified tree surgeon under the direction of Arborcare Limited and in accordance with BS. 3398 2010.

The proposed development retains significant lengths of existing hedgerows/tree lines, including the majority of the north-south hedgerows with numerous mature trees and significant sections of hedgerow and trees along Barberstown Lane North; the total retained hedge length is 2.1 km.

Root protection zones are to be established prior to the commencement of each construction phase and maintained throughout the construction period. Site management shall meet with the project arborist prior to the commencement of development to ensure root protection zones have been established appropriately.

Where trees or section of hedgerow are to be removed, all works in that regard will be constrained to outside the period 1st March - 31st August. Should removal be required within this time then a relevant derogation licence must be sought.

6.2 NOISE & VIBRATION

During the construction phase of development, the contractor shall comply with best practice control measures for construction sites in relation to noise and vibration. The contractor will be required to comply with the following documents;

- BS5228-1 Code of Practice for Noise and Vibration Control on Construction and Open Sites. Noise;
- BS5228-2 Code of Practice for Noise and Vibration Control on Construction and Open Sites. Vibration;
- Safety, Health and Welfare at Work (Control of Vibration at Work) Regulations 2006;
- National Roads Authority, 2004. Guidelines for the Treatment of Noise and Vibration in National Roads Schemes;
- BS6187:2011 Code of Practice for Full and Partial Demolition; and
- BS7385:1993 Evaluation and Measurement for Vibration in Buildings – Guide to Damage Levels from Groundborne Vibration
- BS ISO 4866: 2010: Mechanical vibration and shock – Vibration of fixed structures – Guidelines for the measurement of vibrations and evaluation of their effects on structures.

Earthworks will generate typical construction activity related noise and vibration sources from use of a variety of plant and machinery such excavators, lifting equipment, dumper trucks, compressors and generators. The noise limits to be applied for the duration of the infrastructure works are those specified in the B Category of BS 5228. These limits are summarised below and will be applied at the nearest sensitive receptors to the works.

- Night (23:00-07:00) = 55dB LAeq,1hr
- Evening (19:00-23:00) = 65dB LAeq,1hr
- Day (07:00-19:00) = 70dB LAeq,1hr

The total construction noise (LAeq,1hr) which should not be exceeded during daytime is therefore 70dB.

The contractor shall implement the following measures during the works;

- Avoid unnecessary revving of engines and switch off equipment when not required.
- Keep internal haul roads well maintained and avoid steep gradients.
- Minimise drop height of materials.
- Start-up plant sequentially rather than all together
- In accordance with “Best Practicable Means”, plant and activities to be employed on site are reviewed to ensure that they are the quietest available for the required purpose.
- Where required, improved sound reduction methods are used e.g. enclosures.
- Site equipment is located away from noise sensitive areas, as much as physically possible.
- Regular and effective maintenance by trained personnel is carried out to reduce noise and / or vibration from plant and machinery.

- Plant maintenance operations should be undertaken as far away from noise-sensitive receptors as possible;
- Any compressors brought on to site should be silenced or sound reduced models fitted with acoustic enclosures;
- Reduce the speed of vehicle movements;
- All pneumatic tools should be fitted with silencers or mufflers;
- Ensure that operations are designed to be undertaken with any directional noise emissions pointing away from noise-sensitive receptors where practicable;
- When replacing older plant, ensure that the quietest plant available is considered wherever possible;
- Hours are limited during which site activities likely to create high levels of noise and vibration are carried out.
- A site representative responsible for matters relating to noise and vibration will be appointed prior to construction on site.

External noise and vibration monitoring should be undertaken at locations on the site boundary closest to sensitive locations. It is considered that it will be appropriate to amend the monitoring program as the works progress. Accordingly, monitors may be added, removed or relocated as necessary

Vibration monitoring terminals should continually log vibration levels in accordance with BS ISO 4866: 2010: Mechanical vibration and shock – Vibration of fixed structures – Guidelines for the measurement of vibrations and evaluation of their effects on structures.

6.3 AIR QUALITY AND DUST MONITORING

Best Practicable Means shall be employed to minimise air blown dust being emitted from the site. This shall include covering skips and slack heaps, netting of any scaffolding, daily washing down of pavements or other public areas and any other precautions deemed necessary to prevent dust nuisances. All contractors shall comply with *BS 5228 Noise Control on Construction and Open Sites* and *BS 6187 Code of Practice for Demolition*.

A small 1500 L towed bowser which emits a fine spray through a number of power washer nozzles will be used to suppress dust if required.

The following measures shall be undertaken to manage air quality and dust during construction;

- Develop and implement a stakeholder communications plan that includes community engagement before work commences on site.
- Display the name and contact details of person(s) accountable for air quality and dust issues on the indicative site boundary. This may be the environment manager or the site manager.
- Display the head or regional office contact information.
- Develop and implement a Dust Management Plan (DMP), which may include measures to control other emissions, approved by the Local Authority.
- Ensure construction vehicles have a clean surface to travel on within the site.

- Ensuring an appropriate wheel or road washing facility is provided as and when required throughout the various stages of construction on site. If conditions require it then a manned power washer shall be put in place to assist the wheel wash system.
- The use of appropriate water-based dust suppression systems will greatly reduce the amount of dust and windborne particulates as a result of the construction process. This system will be closely monitored by site management personnel particularly during extended dry periods and in accordance with site management methods.
- Skips and slack heaps shall be covered
- Scaffolding shall be netted
- Avoid scabbling (roughening of concrete surfaces) if possible.
- Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place.
- Ensure bulk cement and other fine powder materials are delivered in enclosed tankers and stored in silos with suitable emission control systems to prevent escape of material and overfilling during delivery.
- Ensure effective water suppression is used during demolition operations.
- Bag and remove any biological debris or damp down such material before demolition.
- Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable.
- Use Hessian, mulches or tackifiers where it is not possible to re-vegetate or cover with topsoil, as soon as practicable.
- Only remove the cover in small areas during work and not all at once.
- Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction
- Ensure an adequate water supply on the site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate.
- Use enclosed chutes and conveyors and covered skips.
- Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate
- Ensure equipment is readily available on site to clean any dry spillages, and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods
- Erect solid screens or barriers around dusty activities or the indicative site boundary that are at least as high as any stockpiles on site.
- Fully enclose site or specific operations where there is a high potential for dust production and the site is active for an extensive period.
- Avoid site runoff of water or mud.
- Keep site fencing, barriers and scaffolding clean using wet methods.
- Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used on site.
- Record all dust and air quality complaints and take appropriate measures
- Make the complaints log available to the local authority when asked.
- Record any exceptional incidents that cause dust and/or air emissions, either on- or offsite, and the action taken to resolve the situation in the log book.

- Hold regular liaison meetings with other high risk construction sites within 500m of the site boundary.
- Ensure there is an adequate area of hard surfaced road between the wheel wash facility and the site exit, wherever site size and layout permits.
- Access gates to be located at least 10m from receptors where possible.
- Undertake daily on-site and off-site inspection, where receptors (including roads) are nearby.
- Carry out regular site inspections to monitor compliance with the DMP.
- Increase the frequency of site inspections by the person accountable for air quality and dust issues on site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions.
- Agree dust deposition, dust flux, or real-time PM10 continuous monitoring locations with the Local Authority.

6.4 WATER QUALITY – MANAGING RUN OFF

All works carried out as part of construction works will comply with all Statutory Legislation including the Local Government (Water Pollution) Act, 1977 (as amended) and the contractor will cooperate in full with the Environmental Section of Fingal County Council. The first step towards preventing silt pollution from the works shall be to minimise the generation of silt-laden runoff. This will be achieved by careful planning of the site works so that activities likely to generate silt-laden runoff are carried out during drier months where possible, and erosion of surface soils is controlled. Seasonal weather patterns should be taken into consideration by the Contractor when programming and planning construction activities. Excavations will only remain open for the shortest possible time to reduce groundwater ingress. Silt traps will be placed around the site to reduce silt loss and these will be inspected and cleaned or replaced regularly.

The number and height of stockpiles should be kept to a minimum, however to control erosion, areas of exposed ground and stockpiles should be minimised to reduce silty runoff and located well away from drains and watercourses and stabilised as soon as possible and bunded by earth or silt fences (if required) at the toe of the stockpile to intercept silt-laden runoff during rainfall events.

Consideration should be given to ground water level and ground saturation to prevent excessive overland flow and associated scouring and mobilisation of suspended solids. The area to be stripped should be kept to a minimum and phased during the planning and construction phase to reduce the amount of land exposed, which will generate suspended solids.

Runoff from spoil heaps will be prevented from entering watercourses by diverting it through the on-site settlement ponds and removing material off-site as soon as possible to designated storage areas. Silt traps will be placed at crossing points to avoid siltation of watercourses and, if the need arises, silt fences shall be used within nearby watercourses during the course of works in order to reduce the potential for pollution of watercourses. These will be maintained and cleaned regularly throughout the construction phase. Good construction practices will also be used during the construction phase, such as wheel washers and dust suppression on site roads and at site access points, as well as road sweepers.

The drainage system and settlement ponds should be constructed prior to the commencement of major site works. All design and construction will be carried out in accordance with CIRIA C532 Control of Water Pollution from Construction Sites Guidance for Consultants and Contractors.



Figure 13: Silt Fence

6.5 WATER QUALITY – MANAGING SOILED GROUND WATER

The site work involves the construction of foundations and pipelines etc for a residential development. If soiled ground water is encountered during construction from excavations, it will be pumped into designated tankers and brought to a designated settlement facility off site where it will be allowed to soak back into the water table. The canal and any storm drains will be protected at all times so that silty water is not allowed to enter. When any pumping is ongoing there will be constant monitoring of the silt ponds/water filtration areas to ensure they can handle the flow of water and do not become overwhelmed.

If a potential problem is identified extra silt fencing fans or other measures will be implemented to ensure that any water leaving the site is free of suspended solids.

6.6 FEUL AND CHEMICAL HANDLING/STORAGE ARRANGEMENTS

In order to prevent spillages to ground of fuels, and to prevent any consequent soil or groundwater quality impacts, it will be necessary to adopt the following measures during the construction phase of the Proposed Development;

- Secondary containment will be constructed of chemically resistant, impervious material designed to withstand exposure to the elements and hazardous substances contained. These storage areas will be at least 50 m from the Barnhill Stream;
- Tracked machines and static equipment may be refuelled locally by an onsite mobile bowser over secondary containment;
- Drip trays are to be used during refuelling operations if performed outside of a contained area and spill kits will be carried in the fuel bowser vehicle;
- Refuelling of rubber tyre vehicles will only to be carried out at designated areas using appropriate funnels or fuel nozzles. All mobile equipment which is either fuelled or uses hydraulic power shall be placed on suitably sized drip trays;

- If spills occur within the drip trays, these will be cleaned up immediately using a spill kit. Drip trays should always be kept free of rainwater;
- No flammable liquids will be stored within the enclosures and all plant operating within the enclosures will be refuelled in designated refuelling areas;
- Refuelling of construction vehicles and the addition of hydraulic oils or lubricants to vehicles, will take place in designated impermeable refuelling areas isolated from surface water drains. Spill kit facilities shall be provided at the fuelling area in order to provide for any accidental releases or spillages in and around the area. Any used spill kit materials should be disposed of using a hazardous waste contractor.
- Where mobile fuel bowzers are used on the site in the event of a machine requiring refuelling outside of the designated area, fuel will be transported in a mobile double skinned tank. Any flexible pipe, tap or valve must be fitted with a safety lock where it leaves the container and locked shut when not in use. Each bowser should carry a spill kit and each bowser operator must have spill response training. No refuelling will be allowed within 50 m of a stream.
- Adequate stocks of hydrocarbon absorbent materials (e.g. spill-kits and/or booms) shall be held on-site in order to facilitate response to accidental spills. Spill response materials shall also be stored on all construction vehicles.
- Spill kit stations will be established at a number of key locations on the site and staging area and will be regularly checked and restocked; and
- An emergency response plan will be developed and implemented throughout the duration of the Proposed Development, which will detail the measures to be taken in the event of spills and leaks

Within the site compound area there will be a designated bunded (110%) oil and chemical store set up. This will be a specially manufactured bunder and covered storage unit. All small containers of chemicals, oils and fuels will be stored securely, and the unit will be kept locked after hours at all times. The bunded area will be fitted with a locking penstock valve that will be opened only to allow stormwater to discharge to interceptor



Figure 14: Typical Storage Arrangement

For larger volumes/quantities such as site fuel storage a designated double skinned and banded fuel tank will be used. The tank will have an automatic shut off nozzle to prevent overfilling. Drainage from the banded area shall be diverted for collection and safe disposal. All containers within the storage area will be clearly labelled so that appropriate remedial action can be taken in the event of a spillage. When moving drums from the banded storage area to locations within the site plot, a suitably sized spill pallet will be used for containing any spillages during transit.

Refuelling Procedure - Plant and Machinery

- All refuelling shall be from diesel bowser equipped with shut off fuel nozzles.
- No fuel should be decanted into cans or other unapproved containers.
- Never leave a vehicle unattended during refuelling.
- Only plant operators are permitted to refuel plant.
- Appropriate PPE to be used – wear gloves and glasses in addition to mandatory PPE of hard hat, hi-vis vest and boots.
- Ensure that the area around the diesel bowser is clear of obstructions and personnel.
- Position the plant as close as possible to the bowser.
- Place drip tray into position.
- Ensure that all booms, loading arms, etc. are lowered.
- Ensure that the tank is not overfilled during the process.
- Do not leave the vehicle running during the process. Switch off engine.
- Never prop open a delivery valve / never prop the filler mechanism in the open position.
- Ensure that the flow has stopped before removing the service pipe from the vehicle tank
- Refit the fuel filler cap and tighten properly.
- Spillages (even minor ones) must be cleaned up immediately using the spill kit provided.
- Contaminated materials shall be removed from site for appropriate waste disposal.
- Make sure that the area is clear of obstructions and that the service pipe attached to the bowser is returned to its storage place.

Refuelling Procedure - Generators / Small Equipment

- All small / mobile plant must be refuelled and serviced on a designated hard standing area.
- Use only approved containers to transfer fuel to fixed plant.
- Appropriate PPE to be used – wear gloves and glasses in addition to mandatory PPE of hard hat, hi-vis vest and boots.
- Ensure that the area around the plant/equipment is clear of obstructions and personnel.
- Always use an appropriately sized funnel when refuelling from approved containers.

- Refuelling should only take place when the plant/equipment has been switched off and allowed to cool sufficiently – never refuel hot equipment – risk of fuel vaporising and causing an explosion.
- The plant/equipment should be filled before starting in the morning, switched off at lunch time and topped up before recommencing work.
- All small equipment must be stored in a drip tray or on a plant nappy.

6.7 CONTROL OF CONCRETE & LIME

Ready-mixed concrete will be brought to the Proposed Development site by a suitable truck. A suitable risk assessment for wet concreting will be completed prior to works being carried out which will include measures to prevent discharge of alkaline wastewaters or contaminated water to the underlying subsoil and groundwater.

The pouring of concrete will take place within a designated area protected to prevent concrete runoff into the soil/groundwater media. Washout of concrete transporting vehicles will take place at an appropriate facility, offsite where possible, alternatively, where wash out takes place on-site, it will be carried out in carefully managed on-site wash out areas.

6.8 SOIL EXCAVATION & FILLING

Temporary storage of soil will be carefully managed in such a way as to prevent potential negative impact on the receiving environment. Spoil and temporary stockpiles including stone stockpile areas will be positioned in locations which are distant from drainage systems and the Barnhill Stream and away from areas subject to flooding so as not to cause potential run off to soil and groundwater. Movement of material will be minimised in order to reduce degradation of soil structure and generation of dust. To help shed rainwater and prevent ponding and infiltration, the sides and top of the stockpiles will be regraded to form a smooth gradient with compacted sides reducing infiltration and silt runoff.

Soil requiring off-site disposal will be managed in accordance with relevant waste legislation. The imported fill materials will be brought to the site on the public road network, prior to being distributed throughout the proposed development site via the internal site haul routes. Any hard core required along the haul routes during construction stage will be reused where possible and subject to testing for suitability.

Temporary drainage during construction stage will be managed so as to reduce the direct runoff to ground and water. Surface water runoff from the proposed development site may impact the surrounding soils and groundwater introducing silts and increased chemical concentrations to the existing environment.

6.9 SOURCES OF AGGREGATES & CLEAN FILL

It is considered from the site investigation that topsoil from the proposed development site will be suitable for re-use within the proposed development. The source of the remaining fill material

requirement will be sourced where possible from local quarries. Prior to construction, these shall be reviewed and only those quarries that conform to all necessary statutory consents will be used in the construction phase. Soils/fill material to be brought to the proposed development site will be vetted with chemical soil testing if necessary, in order to check that it is of a reputable origin and that it is 'clean' (i.e. will not introduce contamination to the environment; soil and groundwater). All potential suppliers will be vetted for the following criteria:

- Environmental management status; and
- Regulatory and legal compliance status of the company.

'Clean' fill material will be sourced from suppliers which comply with the above requirements. If recycled aggregate is used as imported fill, chemical testing will be undertaken to confirm that it is 'clean' (i.e. will not introduce contamination to the environment).

6.10 EXISTING WATERMAINS

The existing 4" ø uPVC watermain, installed in 1965, that travels through the site along the Barberstown Lane North Road is to be fully protected during construction of the development so that water supply to the existing properties within and surrounding the development is not disturbed as a result of construction activities. Irish Water are to be notified in advance of any construction works on, or adjacent to, any existing watermains within the development area so as to mitigate against the potential disruption of water supply

6.11 BIODIVERSITY

Further to measures contained in the previous sections, the following measures shall be implemented during the construction phase to limit impacts on biodiversity;

- Pre commencement surveys are to be undertaken at the outset of each phase.
- The security lighting and operational public lighting shall be designed so that there is negligible light spill on the wetland in the park area, along the Barnhill Stream and along the retained north-south hedgerow through the proposed park. This will maximise benefit to nocturnal protected species such as otter and bats.
- The Barnhill Stream shall be protected in its current alignment and covering shrubs vegetation shall be removed
- A passage for otter along the Barnhill Stream shall be maintained.
- The existing badger sett is to be protected.
- Provision of native tree planting forming woodland blocks within the proposed park, near the proposed wetland.
- An Ecological Clerk of Works (ECoW) shall be appointed prior to the commencement of development and shall carry out the duties noted in section 3.2.

6.12 ARCHAEOLOGY

Archaeological features were identified within the proposed development site during previous site investigations. If development proceeds in this area, preservation by record, or archaeological

excavation of these features, will be required. These works will be undertaken under licence to the National Monuments Service at the Department of Housing, Local Government and Heritage.

A suitably qualified archaeological consultant shall be appointed to undertake licenced archaeological monitoring of all topsoil excavation during the construction phase of the development. This will be under license from the National Monuments Service (NMS) of the Department of Housing, Local Government and Heritage.

Should additional archaeological or architectural heritage features, deposits or structures be uncovered during archaeological monitoring the NMS should be contacted and a strategy for the resolution of these features be formulated. The appointed archaeologist will be required to obtain a licence from the NMS this will involve preparing an archaeological method statement to outline the required works.

Prior to commencement of development, it is recommended that a building record of the derelict farm complex be prepared by a suitably qualified historic building specialist. The resultant survey records will be submitted to Fingal County Council for archival purposes.

7 OUTLINE CONSTRUCTION & DEMOLITION WASTE MANAGEMENT PLAN

This outline Construction & Demolition Waste Management Plan sets out the guiding principles for the management of waste during the construction stage. A final Construction & Demolition Waste Management Plan is to be agreed with the Local Authority prior to the commencement of development. Waste from Construction and Demolition (C&D) activity is the largest waste stream in the EU and represents one third of all waste produced within the EU. The quantity of C&D waste managed nationally has shown an increasing trend in the volume of waste managed. The proper management of C&D waste and resources can have significant benefits in terms of sustainability and quality of life and increased demand for C&D recycled materials. In the preparation of this C&D Waste Management Plan regard has been had to the following;

- *Best Practice Guidelines for the Preparation of Resource & Waste Management Plans for Construction & Demolition Projects*, EPA 2021
- *EU Waste Framework Directive (Directive (EU) 2018/851)*
- *EU (Waste Directive) Regulations 2020 (S.I. No. 323 of 2020)*
- *Waste Management Act 1996 (as amended)*
- *A Waste Action Plan for a Circular Economy – Ireland’s National Waste Policy 2020–2025*

In recent years waste policy has shifted from the established linear economic model to a circular economic model. Circular economy-inspired interventions focus not only on increasing recycling quantitatively but also on:

- Reducing the use of primary resources;
- Keeping materials in the economy as long as possible;
- Maintaining their intrinsic value/quality as high as possible; and
- Reducing hazardous substances in products and waste;

The European Environmental Agency notes the following;

The circular economy is restorative in nature, and it aims to maintain the utility of products, components and materials for as long as possible while also retaining their value. It thus minimises the need for new inputs of virgin materials and energy, while reducing environmental pressures linked to resource extraction, emissions and waste management.



Figure 15: The Circular Economy (source: EPA 2021)

The Site Manager shall be designated as the responsible person and have overall responsibility for the implementation of the on-site C&D Waste Management Plan. The Project Manager will be assigned the authority to instruct all site personnel to comply with the specific provisions of the plan. At the operational level, the Site Engineers, Foremen and Gangers, shall be instructed on the operational procedures and shall be responsible for ensuring that personnel under their control are complying with the plan.

7.1 WASTE AUDITING

The Site Manager shall arrange for full details of all arisings, movements and treatment of construction & demolition ('C&D') waste discards to be recorded during the construction stage of the project. Each consignment of C&D waste taken from the site will be subject to documentation, which will conform to the table below and ensure full traceability of the material to its destination

Details of the inputs of materials to the construction site and the outputs of wastage arising from the project will be investigated and recorded in a Waste Audit, which will identify the amount, nature and composition of the waste generated on the site. The audit will examine the manner in which the waste is produced and provide a commentary highlighting how management policies and practices may inherently contribute to the production of C&D waste. The measured waste quantities will be used to quantify the costs of management and disposal of waste, which will also record lessons learned from these experiences and which can be applied to future projects. The total cost of C&D waste will be measured.

7.2 ESTIMATED C & D WASTE ARISING ON SITE

The estimated waste produced on this project will be surplus soil and timber demolition waste, unsuitable for placement in the works due to either the location of its source or the material not meeting specified requirements. There will also be waste relating to packaging material and small amounts off-cuts from plastic pipes/ducts and some small amounts of timber waste from shuttering activities.

Site management with responsibility for ordering of material 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.

HAZARDOUS MATERIALS - Have there been any precondition surveys carried out that have identified Hazardous materials and if so please give details.				
Survey of buildings to be demolished to be undertaken prior to demolition.				
CONSTRUCTION WORKS– ESTIMATED WASTE ARISING ON SITE.				
In the course of the Project, it is estimated that the following quantities of C&D wastes/material surpluses will arise:				
Waste Type (EWC Code)	Waste Type (Description)	Volume of waste generated (Estimated Tonnes)	Waste re-used within the works (Estimated Tonnes)	Waste exported off-site / Recycled off-site (Estimated Tonnes)
	Construction and Demolition Waste.			
17 01	Concrete, bricks, tiles and ceramics	1460t	1460t	0
17 02	Wood, glass and plastic	115t	0	115t
17 03	Bituminous mixtures, coal tar, and tarred products	N/A	N/A	N/A

17 04	Metals (<i>including their alloys</i>)	29t		29t
17 05	Soil (<i>including excavated soil from contaminated sites</i>), stones and dredging spoil	216000t	0t	216000t
17 06	Insulation materials and asbestos-containing construction materials	N/A	N/A	N/A
17 08	Gypsum-based construction material	19t	0	19t
17 09	Other construction and demolition waste	225t	0	225t
20 01 01	Paper / Cardboard	2t	0	2t
20 01	Canteen Waste / Domestic	40t	0	40t
13 01	Waste Oil & Oil Filters	573L	0	573l
20 03 04	Septic Tank Sludge	N/A	N/A	N/A
	TOTAL WASTE	215195t	1460t	213735t
Quantities are based on records generated on previous projects.				

7.3 SOIL

Excavated soil will be carefully stored in segregated piles on the site for subsequent re-use or until removed from site for direct beneficial use elsewhere. It is anticipated that surplus soil will be recycled to permitted agricultural disposal areas. Copies of these permits will be maintained in the

Site Managers Office. If it is to be reused on another site as by-product (and not as a waste), this will need to be done in accordance with Article 27 of the EC (Waste Directive) Regulations 2011.

7.4 CONCRETE, BLOCKS, BRICKS, TILES & CERAMICS

The majority of concrete blocks, bricks, tiles and ceramics generated as part of the construction works are expected to be clean, inert material and should be recycled, where possible. If this waste at any time does need to be removed from site it will be stockpiled in a segregated area until it can be collected for recycling by a licensed haulier.

7.5 WOOD, GLASS & PLASTICS

Timber waste will be kept to a minimum through the re-use of shutters, etc. throughout the job. At the end of the job, most of the timber will be sent on to the next site for re-use. Any timber that cannot be re-used because of poor quality, etc. will be segregated and stored for recycling in a skip. Where possible pallets will be stored for return to the supplier. In the case of hard plastic, it is a highly recyclable material, much of the plastic generated will be primarily from material off-cuts. All recyclable plastic will be segregated and recycled, where possible.

7.6 STEEL

All waste steel, etc. such as off-cuts from reinforcement etc will be stockpiled and at the end of work on each structure, it will be collected for recycling by a scrap steel merchant.

7.7 PACKAGING

Where possible, packaging will be segregated for recycling or returned to the supplier. Any waste stored on site or any other activity carried out on-site must not cause a litter nuisance in a public place. Some packaging materials are easily carried by the wind and represent a slip hazard, especially when wet. Ensure that all plastic packaging wastes are collected and covered/weighed down as work continues.

7.8 DOMESTIC NON- HAZARDOUS

A licensed external waste disposal contractor, as required, transports this waste to a licensed tip. Records are maintained of the quantity of domestic waste generated. Containers are also to be provided for gathering plastic bottles, etc. at the compound.

7.9 FUEL WASTE

Waste oil, filters, etc. are stored in labelled bunded containers or in a filter bin and will be collected by a licensed oil-recycling contractor (ENVA), as necessary. Records will be maintained of the volumes of waste oil generated.

7.10 HAZARDOUS MATERIAL

Should Hazardous material (Asbestos etc) be found it will only be removed by a licensed specialised contractor and will be stored in the interim, as per their instructions and requirements. A

Transfrontier Shipment Notification and Final Certificate of Disposal will be obtained by the disposal contractor where required.

7.11 PAPER & CARDBOARD

Office paper, cardboard and packaging will be collected in a recycling bin and will be collected by a company for recycling as necessary.

7.12 GYPSUM BASED CONSTRUCTION MATERIALS

There are currently a number of recycling services for plasterboard and gypsum based construction materials in Ireland. All such material from the construction phase will be stored in a separate skip, pending collection for recycling. The site manager will ensure that oversupply of new plasterboard is carefully monitored to minimise waste.

7.13 ENCAPSULANT WASTE

This includes containers of Encapsulant materials including cans, lids, primer bottles and lids, brushes, cardboard boxes and other contaminated materials. These should be bagged and placed with hazardous waste for correct disposal.

7.14 OTHER WASTE

Printer cartridges: These cartridges will be stored in a marked container and brought for re-filling rather than being disposed of.

Domestic Batteries: All used batteries should be kept in a marked container and sent for proper disposal or recycling at the end of the project.

Waste Electrical Equipment: This type of waste must be brought to a licensed disposal site, if required.

Fluorescent Bulbs: All fluorescent tubes and bulbs will be set aside in a designated area and disposed of periodically.



Figure 16: Typical Skip Arrangement

7.15 PROPOSALS FOR BENEFICIAL USE OF C&D WASTE MATERIAL

Excavated soil and other C&D waste-derived aggregates are considered suitable for certain on-site construction applications including road construction and backfill of drainage lines etc. Where possible and when material is suitable it is intended to reuse as much material within the site boundary as possible.

Material	Estimated Quantities & Costs (Tonnes & Euro)
Soil	
Quantity of Waste Soil (Tonnes)	216,000 T
Purchase Cost, ie. Imported Soil	0
Materials Handling Costs	0
Material Storage Costs	0
Material Transportation Costs	0
Revenue from Material Sales	0
Material Disposal Costs	2,255,518 Euro
Material Treatment Costs	
Timber	
Quantity of Waste Timber (Tonnes)	115T
Purchase Cost,	80/CUBE
Materials Handling Costs	0
Material Storage Costs	0
Material Transportation Costs	0
Revenue from Material Sales	0
Material Disposal Costs	9,200 Euro
Material Treatment Costs	0
Steel	
Quantity of Waste Steel (Tonnes)	29 T
Purchase Cost,	1600/TSDDDD
Materials Handling Costs	0
Material Storage Costs	0
Material Transportation Costs	0
Revenue from Material Sales	0
Material Disposal Costs	46,400 Euro
Material Treatment Costs	0
Waste Oil	
Quantity of Waste Oil (Litres)	573L
Purchase Cost,	1.20 Euro
Materials Handling Costs	0
Material Storage Costs	0
Material Transportation Costs	0
Material Disposal Costs	687.60 Euro

General Waste	
Quantity of Waste (Tonnes)	286T
Purchase Cost,	Varies
Materials Handling Costs	0
Material Storage Costs	0
Material Transportation Costs	0
Revenue from Material Sales	00
Material Disposal Costs	38,810 Euro
Material Treatment Costs	

7.16 PROPOSED WASTE TRANSPORTATION & DESTINATION FACILITIES

All waste will be documented prior to leaving the site. Waste will be weighed by the contractor, either by weighing mechanism on the truck or at the receiving facility. These waste records will be maintained on site by the Site Manager.

All movement of waste and the use of waste contractors will be undertaken in accordance with the Waste Management Acts 1996 – 2011 (as amended), Waste Management (Collection Permit) Regulations 2007 and Amendments and Waste Management (Facility Permit & Registration) Regulations 2007 and Amendments. This includes the requirement for all waste contractors to have a waste collection permit issued by the NWCPO. The site manager will maintain a copy of all waste collection permits on-site.

If the waste is being transported to another site, a copy of the Local Authority waste COR/permit or EPA Waste/IED Licence for that site will be provided to the nominated project manager. If the waste is being shipped abroad, a copy of the Transfrontier Shipping (TFS) notification document will be obtained from Dublin City Council (as the relevant authority on behalf of all local authorities in Ireland) and kept on-site along with details of the final destination (COR, permits, licences etc.). A receipt from the final destination of the material will be kept as part of the on-site waste management records.

The Site Manager shall arrange for full details of all arisings, movements and treatment of construction and demolition waste discards to be recorded in the “Project Waste Traceability Register” during the construction stage of the Project. Each consignment of C&D waste taken from the site will be subject to documentation which will conform with the table below and ensure full traceability of the material to its final destination. A sample Project Waste Traceability Register is provided below;

Project Waste Traceability Register – Note subject to detailed design and change during life time of project				
Waste Type (EWC Code)	Waste Type (Description)	Waste exported off-site (Annual amount Tonnes)	Authorised Waste Collector and NWCPO number	Authorised Waste Facility and licence no.
17	Construction and Demolition Waste.			
17 01	Concrete, bricks, tiles and ceramics		Cool Cat Plant Services NWCPO-14-11321-02	Callans Sand and Gravel WFP-KE-16-009-0
17 02	Wood, glass and plastic		Callan Recycling NWCPO-14-11366-2	Thorntons Recycling W0044-02
17 03	Bituminous mixtures, coal tar, and tarred products		Nil	Nil
17 04	Metals (including their alloys)		Callan Recycling NWCPO-14-11366-2	Thorntons Recycling W0044-02
17 05	Soil (including excavated soil from contaminated sites), stones and dredging spoil		Cool Cat Plant Services NWCPO-14-11321-02	Callans Sand and Gravel WFP-KE-16-009-0
17 06	Insulation materials and asbestos-containing construction materials		Barnmore Demolition NWCPO-10-01305-02	RILTA Greenogue W0192-03
17 08	Gypsum-based construction material		Callan Recycling NWCPO-14-11366-2	Thorntons Recycling W0044-02
17 09	Other construction and demolition waste		Callan Recycling NWCPO-14-11366-2	Thorntons Recycling W0044-02
20 01	Canteen Waste / Domestic		Callan Recycling NWCPO-14-11366-2	Thorntons Recycling W0044-02
20 01 01	Paper / Cardboard		Callan Recycling NWCPO-14-11366-2	Thorntons Recycling W0044-02
20 02	Green Waste		Callan Recycling NWCPO-14-11366-2	Thorntons Recycling W0044-02

13 01	Waste Oil & Oil Filters		RIALTA Environmental W0185-01	RIALTA Environmental W0185-01
20 03 04	Septic Tank Sludge		Nil	Nil
	TOTAL WASTE			

APPENDIX 1 – EIAR MITIGATION MEASURES

Potential Impact	Construction	Operation
EIAR Topic: Chapter 2 Project Description		
Potential impacts during construction and operation	<p>Chapter 2 provides a description of the proposed development, phasing and construction activities and provides a summary of the outline Construction and Environmental Management Plan (CEMP) which accompanies the planning application.</p> <p>All construction activities will be managed and directed by a Construction Traffic Management Plan (CTMP) prepared by the main contractor. Details of the final CTMP are to be agreed with Fingal County Council prior to the commencement of construction activities on site.</p> <p>Measures will be put in place to minimise the volume of construction traffic generated by the development. These measures will include the storage of all excavated topsoil on site for re-use within the completed development. Similar efforts will be made to re-use excavated subsoil where possible.</p> <p>The construction of the proposed development will be in accordance with the Outline Construction and Environmental Management Plan (CEMP) which accompanies this planning application (and will take into account the Schedule of Environmental Commitments presented within this EIAR document). The CEMP will be a live document and is to be further developed by the appointed works contractor in advance of the commencement of the construction of the development. The CEMP will be fully implemented on site for the entire duration of the project construction phase. Environmental monitoring will be carried out during the construction phase as detailed within the Schedule of Environmental Commitments presented in Chapter 17.</p> <p>The outline CEMP details the appropriate measures that will be implemented during construction of the proposed development to avoid, reduce or mitigate against the following:</p> <ul style="list-style-type: none"> • Excess Removal of Existing Trees, Hedgerows and Vegetation. • Noise Pollution. • Air Quality and Dust Pollution. • Excess Surface Water Runoff from Site to adjacent watercourses and Water Pollution. • Litter and Organic Waste Pollution. <p>The construction of the proposed development will be carried out in adherence with the Outline Construction and Demolition (C&D) Waste Management Plan (WMP) which is incorporated into the CEMP which</p>	<p>The significant impacts and appropriate mitigation measures associated with the proposed development are detailed in the relevant discipline chapters throughout the EIAR.</p>

	<p>accompanies the application. The C&D WMP has been prepared in accordance with the relevant guidance, in particular the “Best Practice Guidelines for the Preparation of Resource and Waste Management Plans for Construction and Demolition Projects”, published in 2021, by the Environmental Protection Agency (EPA).</p> <p>The Outline C&D WMP will assist in providing a method for monitoring and auditing waste management performance and compliance for the duration of the construction of the development.</p> <p>An outline Operational Waste Management Plan (OWMP) has been prepared and accompanies the planning application. The OWMP aims to provide a strategy to ensure maximum recycling, reuse and recovery of waste with diversion from landfill, wherever possible.</p>	
EIAR Topic: Chapter 3 Alternatives Considered		
Potential impacts have been mitigated by design, as set out in Chapter 2	<p>Alternatives may be described at six levels: do-nothing alternative, alternative locations, alternative layouts, alternative design, alternative processes and alternative mitigation measures.</p> <p>The consideration of the main alternatives in respect of the development of the subject land was undertaken by the Design Team. The proposed final strategy is the most appropriate scheme and was chosen as it was considered to respond most effectively to:</p> <ul style="list-style-type: none"> • Policy objectives for Barnhill LAP, • Topography and constraints of the site, • Opportunities to provide sustainable development focused on active and public transport modes, • Issues raised through pre-consultation with Fingal County Council, An Bord Pleanála, and • Issues raised during the EIAR consultation process. <p>The significant impacts and appropriate mitigation measures associated with the proposed development are detailed in the relevant discipline chapters throughout the EIAR.</p>	<p>The significant impacts and appropriate mitigation measures associated with the proposed development are detailed in the relevant discipline chapters throughout the EIAR.</p>
EIAR Topic: Chapter 4 Landscape and Visual Impact		
Visual effects	<p>During the construction stage the effects on visual amenity would be minimised, by the full implementation of the proposed outline Construction & Environmental Management Plan (CEMP), submitted with the planning application. The CEMP is based on mitigation measures contained in the chapters of the EIAR including measures resulting in reduction of landscape and visual effects, such as:</p> <ul style="list-style-type: none"> • the early establishment of tree/hedgerow protection zones, as part of each of the construction phases; 	<p>During the operational phase the main mitigation measure would be the high-quality design of the Proposed Development. For that matter, the proposed architectural layout and associated landscape design strategy aim to create a sustainable community, balancing the needs of the people that would live in the area with a biodiversity centred landscape treatment.</p> <p>The finishes of the proposed buildings would utilise high-quality materials, in a muted</p>

	<ul style="list-style-type: none"> • keeping the number and height of stockpiles to a minimum; • using perimeter hoarding, and • minimizing the number of tower cranes present within the site. 	<p>colour palette which both tie in with the buildings in the Hansfield SDZ and respect the surrounding agricultural landscape, consisting of numerous shades of green but with few contrasting colour elements.</p> <p>The proposed landscape design would create a connection between the different architectural character areas, bringing the whole development together as one neighbourhood, by proposing</p> <ul style="list-style-type: none"> distinctive placemaking tools, such as the red path and moon gates throughout the Site; numerous walking/cycling paths for easy access between the different areas; similarly designed pocket parks and play areas throughout the Site; the retention of and ecological enhancement of some of the existing landscape elements, such as the hedgerows and associated mature trees and the Barnhill stream; and ample tree and shrub planting areas throughout the development, along streets, along the site boundaries and within all public open spaces and public plaza areas, based on a development wide planting palette, which includes many native and/or pollinator friendly species. <p>Assuming that all of the proposed architectural and landscape features would be implemented in full and to a high standard, it is not considered that additional landscape or visual mitigation measures are required.</p>
Monitoring	None Proposed.	None Proposed.
EIAR Topic: Chapter 5 Material Assets: Traffic and Transportation		
Increased traffic	<p>During the construction phase of the development, the following measures will be put in place to reduce the impact on the surrounding environment:</p> <ul style="list-style-type: none"> ▪ The contractor will be required to provide wheel cleaning facilities, and regular cleaning site access will be carried out. ▪ Temporary car parking facilities for the construction workforce will be provided within the site and the surface of the car park will be prepared and finished to a standard sufficient to avoid mud spillage onto adjoining roads. ▪ Monitoring and control of construction traffic will be ongoing during construction works. 	<p>None Proposed.</p> <p>As discussed in preceding sections, the traffic modelling undertaken demonstrated that the junction under study will continue to operate successfully with the proposed development in place.</p> <p>Based on the modelling results obtained for all junctions, it can be concluded that the local road network will operate within capacity and at satisfactory levels during peak hours for all assessment years with the proposed development in place. Therefore, the potential traffic impact associated with</p>

	<ul style="list-style-type: none"> Construction traffic routes shall be use strategically by construction vehicles to minimise traffic impact to surrounding properties. <p>Note: Further details of the mitigation measures to be put in place at construction stage can be found in the Outline Construction and Environmental Management Plan submitted with this application.</p>	<p>the development was found to be long-term, neutral and imperceptible.</p> <p>The proposal has been designed to be a walking/cycling friendly scheme, very well served by public transport and with plenty of amenities available at a short walk distance. A Mobility Strategy has been created for the development, submitted as a separate document, to promote active travel and to minimising the potential car trips in the local area.</p>
Monitoring	None Proposed.	None Proposed.
EIAR Topic: Chapter 6 Material Assets, Service Infrastructure and Utilities		
Potential impacts to services	<p>Appropriate environmental controls will be put in place during construction of the development to ensure that negative impacts on existing watercourses from construction processes are mitigated against. The contractor will be obliged to put temporary measures in place to limit the rate of surface runoff from the site. The contractor will also be obliged to manage the quality of surface water runoff and ensure run-off from the site does not result in excessive siltation of the receiving drainage channels.</p> <p>The construction compound will include adequate temporary welfare facilities including toilets and cleaning facilities and shall be supplied with a potable water supply. Foul drainage discharge from the compound will be removed, and disposed of, off site to an appropriately licensed facility for disposal until a connection to the public internal development foul sewer network has been established.</p> <p>The existing 4" ø uPVC watermain, installed in 1965, that travels through the site along the Barberstown Lane North Road is to be fully protected during construction of the development so that water supply to the existing properties within and surrounding the development is not disturbed as a result of construction activities. Irish Water are to be notified in advance of any construction works on, or adjacent to, any existing watermains within the development area so as to mitigate against the potential disruption of water supply.</p> <p>Extensive liaison with ESB Networks shall be made to fully ascertain the extent of the overhead ESB infrastructure that will require to be undergrounded. Implementation of the undergrounding works will be adequately planned so as to reduce impacts to power supply to the existing dwellings in the development area.</p> <p>The aforementioned mitigation measures have been included in the Outline Construction and Environmental Management Plan (CEMP), which accompanies the planning application, and should be included in the final CEMP issued at construction stage.</p>	<p>A suitable SuDS network system shall be constructed as part of the development to ensure that all surface water runoff generated by the proposed development is appropriately stored, and treated, during heavy rainfall events. Treated runoff shall be subsequently discharged to the existing watercourses at a controlled rate. To ensure that all surface water network and SuDS measures are operating to optimum efficiency during the operational stage of the development, all SuDS features, petrol interceptors and silt trap manholes shall be regularly, maintained, cleaned of litter and debris, and checked that all inlets and outlets where water enters or leaves a SuDS feature are clear of obstructions. Maintenance of planting, such as grass cutting, within and adjacent to the SuDS features is be undertaken at regular intervals. The proposed SuDS features are to be regularly inspected for damage and remedial works carried out when necessary. Maintenance of the Surface Water Network and SuDS features proposed as part of the scheme will be carried out in accordance with the Taking in Charge strategy for the development.</p> <p>The proposed development internal foul sewer network and its associated foul pumping station and rising main shall be constructed in line with Irish Water's Code of Practice and Standard Details for Wastewater Infrastructure. Adherence to these Irish Water Guidelines will allow for provision of a modern, high quality, foul sewer network, something which does not currently exist within the site area and its surrounds. The upgrade of the existing foul sewer on Ongar Road, to be completed prior to the commencement of the Barnhill SHD shall increase the capacity of the existing network. Therefore, the additional wastewater generated by the development shall be fully catered as part of this upgrade.</p>

		<p>Connection agreements will be made with Irish water regarding wastewater discharge off site.</p> <p>The proposed development internal water infrastructure network shall be constructed in accordance with Irish Water's Code of Practice and Standard Details for Water Infrastructure. This will allow for the provision of a modern, high quality, watermain that will have sufficient capacity to meet the water demand requirements of the development and its existing adjacent properties.</p> <p>The provision of enhanced watermain infrastructure as part of the proposed development is anticipated to have slight, long-term positive impacts for the site area and its surrounds as it will allow for increased water supply and has the potential to allow for the removal / upgrade of the older existing watermain passing through the site.</p> <p>As utility operators predominately upgrade their networks in anticipation of future opportunities, it is anticipated surrounding businesses and residents are likely to benefit from the provision of utilities without any requirement for long-term mitigation measures. As noted previously, this will positively impact the local community with strengthening of the existing utilities in the locality although there may be slight short-term negative impacts such as local outages as the utilities tie into these existing networks.</p>
Monitoring	<p>Visual monitoring will be undertaken as part of the regular site audits during the construction of the proposed development and liaison with the ESB, gas, water, foul and utility providers will be controlled by the main contractor to the construction of the development. All respective utility / service providers shall be notified, in a timely manner, when construction activities are undertaken in close proximity to existing services within the development area.</p>	<p>All utilities will be monitored and metered in accordance with the service agreements made with each utility provider.</p> <p>In an effort to monitor the effectiveness of the SuDS measures proposed for the Barnhill SHD Fingal County Council (FCC) have requested that monitoring devices be installed at appropriate locations along the "SuDS train". This will allow for rates of flow to be measured and compared with previous measurements, thus giving an indication as to the overall effectiveness of the SuDS system within the site. The installation of a number of flow monitoring devices at focal locations along the SuDS network would allow for problem areas to be pinpointed with less difficulty and, as such, allow for greater ease of maintenance.</p> <p>Sampling by an appointed ecologist of the water discharging from the wetland pond to the existing stream will be undertaken and documented in a SuDS maintenance report</p>

		that will be updated annually as per FCC requirements.
EIAR Topic: Chapter 7 Land		
Accidental spills and leaks	<p>In order to prevent spillages to ground of fuels, and to prevent any consequent soil or groundwater quality impacts, it will be necessary to adopt mitigation measures during the construction phase, which include:</p> <p>Secondary containment will be constructed of chemically resistant, impervious material designed to withstand exposure to the elements and hazardous substances contained. These storage areas will be at least 50 m from the Barnhill Stream. A dedicated bunded area will be present onsite for the supply of fuel. The bunded area will be fitted with a locking penstock valve that will be opened only to allow stormwater to discharge to interceptor;</p> <p>Tracked machines and static equipment may be refuelled locally by an onsite mobile bowser over secondary containment;</p> <p>Drip trays are to be used during refuelling operations if performed outside of a contained area and spill kits will be carried in the fuel bowser vehicle;</p> <p>Refuelling of rubber tyre vehicles will only to be carried out at designated areas using appropriate funnels or fuel nozzles. All mobile equipment which is either fuelled or uses hydraulic power shall be placed on suitably sized drip trays;</p> <p>If spills occur within the drip trays, these will be cleaned up immediately using a spill kit. Drip trays should always be kept free of rainwater;</p> <p>No flammable liquids will be stored within the enclosures and all plant operating within the enclosures will be refuelled in designated refuelling areas;</p> <p>Spill kit stations will be established at a number of key locations on the site and staging area and will be regularly checked and restocked; and</p> <p>An emergency response plan will be developed and implemented throughout the duration of the Proposed Development, which will detail the measures to be taken in the event of spills and leaks.</p>	None Proposed.
Use of Concrete and Lime	Ready-mixed concrete will be brought to the Proposed Development site by a suitable truck. A suitable risk assessment for wet concreting will be completed prior to works being carried out which will include measures to prevent discharge of alkaline wastewaters or contaminated water to the underlying subsoil and groundwater.	None Proposed as Not Applicable.

	<p>The pouring of concrete will take place within a designated area protected to prevent concrete runoff into the soil/groundwater media. Washout of concrete transporting vehicles will take place at an appropriate facility, offsite where possible, alternatively, where wash out takes place on-site, it will be carried out in carefully managed on-site wash out areas.</p>	
Soil Excavation and Filling	<p>Temporary storage of soil will be carefully managed in such a way as to prevent potential negative impact on the receiving environment. Spoil and temporary stockpiles including stone stockpile areas will be positioned in locations which are distant from drainage systems and the Barnhill Stream and away from areas subject to flooding so as not to cause potential run off to soil and groundwater. Movement of material will be minimised in order to reduce degradation of soil structure and generation of dust. To help shed rainwater and prevent ponding and infiltration, the sides and top of the stockpiles will be regraded to form a smooth gradient with compacted sides reducing infiltration and silt runoff.</p> <p>Soil requiring off-site disposal will be managed in accordance with relevant waste legislation.</p> <p>The imported fill materials will be brought to the site on the public road network, prior to being distributed throughout the Proposed Development Site via the internal site haul routes. Any hard core required along the haul routes during construction stage will be reused where possible and subject to testing for suitability.</p> <p>Temporary drainage during construction stage will be managed so as to reduce the direct runoff to ground and water. Surface water runoff from the Proposed Development site may impact the surrounding soils and groundwater introducing silts and increased chemical concentrations to the existing environment.</p>	None Proposed as Not Applicable.
Use of natural resources	<p>It is considered from the site Investigation that topsoil from the Proposed Development site will be suitable for re-use within the Proposed Development. The source of the remaining fill material requirement will be sourced where possible from local quarries. Prior to construction, these shall be reviewed and only those quarries that conform to all necessary statutory consents will be used in the construction phase. Soils/fill material to be brought to the Proposed Development site will be vetted with chemical soil testing if necessary, in order to check that it is of a reputable origin and that it is 'clean' (i.e. will not introduce contamination to the environment; soil and groundwater). All potential suppliers will be vetted for the following criteria:</p> <ul style="list-style-type: none"> Environmental management status; and Regulatory and legal compliance status of the company. <p>'Clean' fill material will be sourced from suppliers which comply with the above requirements. If recycled</p>	None Proposed as Not Applicable.

	aggregate is used as imported fill, chemical testing will be undertaken to confirm that it is 'clean' (i.e. will not introduce contamination to the environment).	
Land take	None Proposed.	None Proposed as Not Applicable.
Discharge to ground	None Proposed as Not Applicable.	None Proposed.
Water balance changes	None Proposed as Not Applicable.	None Proposed.
Please Note:	An outline CEMP (OCEMP) for the Proposed Development accompanies the planning application. The OCEMP incorporates relevant environmental avoidance or mitigation measures to reduce potential environmental impact, to include all mitigation measures set out in this chapter. Prior to construction, the Contractor will further refine and develop the OCEMP into a detailed site-specific CEMP. The CEMP will include a Construction, Erosion and Sediment Control Plan (CESCP) and a Resource and Waste Management Plan (RWMP), to be prepared in accordance with Department of Environment, Community & Local Government guidelines ¹ and any construction related requirements imposed as conditions of any planning permission granted. It will also include details of proposed environmental monitoring for the duration of the construction works, be this good practice or as a planning condition requirement.	
Monitoring	The proposed CEMP will include requirements for monitoring during the construction phase.	None Proposed - It is not anticipated any monitoring will be required during the operational phase with respect to soil, geology or hydrogeology.
EIAR Topic: Chapter 8 Water		
Sedimentation	<p>During the construction phase, the mitigation measures below, as included in the outline construction and environmental management plan (OCEMP, see Section 8.4.1.4 of Chapter 8 of the EIAR), will ensure that no sediment contamination, contaminated runoff or untreated wastewater will enter watercourses on or near the site.</p> <ul style="list-style-type: none"> ▪ Excavations will only remain open for the shortest possible time to reduce groundwater ingress. Silt traps will be placed around the site to reduce silt loss and these will be inspected and cleaned or replaced regularly. ▪ Runoff from spoil heaps will be prevented from entering watercourses by diverting it through the on-site settlement ponds and 	None Proposed as Not Applicable.

¹ Best Practice Guidelines for the preparation of resource & waste management plans for construction & demolition projects. EPA, 2021.

	<p>removing material off-site as soon as possible to designated storage areas.</p> <ul style="list-style-type: none"> ▪ Silt traps will be placed at crossing points to avoid siltation of watercourses and, if the need arises, silt fences shall be used within nearby watercourses during the course of works in order to reduce the potential for pollution of watercourses. These will be maintained and cleaned regularly throughout the construction phase. ▪ Good construction practices will also be used during the construction phase, such as wheel washers and dust suppression on site roads and at site access points, as well as road sweepers. ▪ A Construction, Erosion and Sediment Control Plan (CESCP) and a Water Quality Management Plan will be implemented during the construction phase. ▪ Drains carrying high sediment load will be diverted through settlement ponds. Surface water runoff from working areas will not be allowed to discharge directly to the local watercourses. To achieve this, the drainage system and settlement ponds should be constructed prior to the commencement of major site works. All design and construction will be carried out in accordance with CIRIA C532 Control of Water Pollution from Construction Sites Guidance for Consultants and Contractors. 	
Accidental spills and leaks	<p>Due to the presence of a locally important aquifer beneath the site and the presence of surface water drainage, it will be necessary to adopt the following mitigation measures at the construction site in order to prevent spillages to ground and drains of fuels, and to prevent any consequent surface water impacts.</p> <ul style="list-style-type: none"> ▪ Designate a bunded storage area at the contractor's compound(s) and away from surface water gullies or drains for oils, solvents and paints used during construction. The fuel storage tanks shall be bunded to a volume of 110% of the capacity of the largest tank/container within the bunded area. ▪ Drainage from the bunded area shall be diverted for collection and safe disposal. All containers within the storage area will be clearly labelled so that appropriate remedial action can be taken in the event of a spillage. When moving drums from the bunded storage area to locations within the site plot, a suitably sized spill pallet will be used for containing any spillages during transit. ▪ Refuelling of construction vehicles and the addition of hydraulic oils or lubricants to 	<p>None Proposed -.Interceptors will be included in the drainage system, at all of the discharge points to the detention basins and the infiltration area, to mitigate against potential pollution of surface water features from spills/leaks of oils/fuels from parked vehicles.</p>

	<p>vehicles, will take place in designated impermeable refuelling areas isolated from surface water drains. Spill kit facilities shall be provided at the fuelling area in order to provide for any accidental releases or spillages in and around the area. Any used spill kit materials should be disposed of using a hazardous waste contractor.</p> <ul style="list-style-type: none"> ▪ Where mobile fuel bowzers are used on the site in the event of a machine requiring refuelling outside of the designated area, fuel will be transported in a mobile double skinned tank. Any flexible pipe, tap or valve must be fitted with a safety lock where it leaves the container and locked shut when not in use. Each bowser should carry a spill kit and each bowser operator must have spill response training. No refuelling will be allowed within 50 m of a stream. ▪ Adequate stocks of hydrocarbon absorbent materials (e.g. spill-kits and/or booms) shall be held on-site in order to facilitate response to accidental spills. Spill response materials shall also be stored on all construction vehicles. 	
Use of concrete and lime	<p>All ready-mixed concrete will be brought to site by truck. A suitable risk assessment for wet concreting will be completed prior to works being carried out, which will include measures to prevent discharge of alkaline wastewaters or washwater to the surface water drainage system or to the underlying subsoil. Wash down and washout of concrete transporting vehicles will take place at an appropriate bunded area and direct discharge of wash water to surface waters will be strictly prohibited.</p>	None Proposed as Not Applicable.
Culverting and drainage works and Flood Risk	None Proposed.	<p>Watercourse Maintenance</p> <p>The ultimate owner / occupier(s) of the site shall be required to include general watercourse / culvert maintenance which will reduce the risk of blockage at downstream culverts and screens and maintain the capacity of the channels. The following measures are intended to inform any future maintenance programme for watercourses and culverts:</p> <ul style="list-style-type: none"> ▪ Maintenance should consist of removal of any items within the channel that can impede its flow including (small) trees, excess vegetation etc. ▪ Riverbanks should be due adequate attention which would normally consist of removal of brambles, bushes, and stiff vegetation; these reduce flow capacity and can encourage

		<p>collection of debris increasing the risk of blockages. Grass and nettles do not always need removing as they will lay flat during high flows.</p> <ul style="list-style-type: none"> ▪ Weed growth should be removed from the centre of the channel as this will impede the flow and increase water levels up stream. Hand picking is best but cutting off under the water level is acceptable if it is done on an annual basis. ▪ Build-up of silt in watercourse channels and at culvert inlets should be removed and disposed of appropriately. ▪ Cyclical (min. annual) visual inspection of culvert inlets and screens and removal of debris as required, ensuring debris removed is not deposited in an area likely to fall back into the channel.
	None Proposed.	<p>Drainage System Maintenance</p> <p>The owner / occupier(s) will be responsible for the maintenance of site drainage systems. Where drainage assets have not been taken in charge, provision for the maintenance of these assets should be made as part of the overall site management plan. The detailed drainage layout for the site should ensure that key SUDS features requiring maintenance are situated in accessible locations.</p> <p>Maintenance plans for drainage assets should, where applicable, include:</p> <ul style="list-style-type: none"> ▪ Cyclical (min. annual) check of all surface water drainage features (in particular, clearing of debris). ▪ Cyclical (min. annual) visual inspection of any surface or underground features (blockages and obstructions should be removed by jetting as required).
Please Note:	<p>The mitigation measures set out in this chapter have been included in an OCEMP for the Proposed Development, which accompanies the planning application. Prior to construction, the Contractor will further refine and develop the OCEMP into a detailed site-specific CEMP. The final CEMP will include a CEMCP, a Water Quality Management Plan and any construction related requirements imposed as conditions of any planning permission granted. It will also include details of proposed environmental monitoring for the duration of the construction works, be this good practice or as a planning condition requirement.</p>	

Monitoring	No Monitoring Proposed.	No Monitoring Proposed.
EIAR Topic: Chapter 9 Biodiversity		
Embedded Mitigation Measures	<p>Several aspects of the Proposed Development constitute embedded ecological mitigation that is part of the design and has been taken into account during the initial impact assessment. These are listed below and in Table 9.12 of Chapter 9, which notes compliance with key biodiversity objectives in local policy (either the Barnhill LAP or the Fingal Development Plan (FDP)). Refer to Table 9.12 for further details on local biodiversity policy compliance.</p> <ul style="list-style-type: none"> ▪ Retention of significant lengths of existing hedgerows/tree lines, including the majority of the north-south hedgerows with numerous mature trees and significant sections of hedgerow and trees along Barberstown Lane North; the total retained hedge length is 2.1 km (see Landscape Design Report, Sections 1 and 4, provided by Gannon Associates and accompanying the planning application – retained hedges are green). ▪ Provision of 5 m width or more of buffering grassland beside much of the length of the retained north-south hedges/tree lines, sown with suitable meadow mix incorporating locally-native species advised by an ecologist (see Landscape Design Report, Section 5, provided by Gannon Associates and accompanying the planning application). ▪ Retention of a 10 m riparian strip along both sides of the Barnhill Stream (discounting small footpaths and footbridges), widened to incorporate substantial parts of the flood zone within the proposed park area, sown with suitable meadow mix incorporating locally-native species advised by an ecologist (see Landscape Design Report, Section 5, provided by Gannon Associates and accompanying the planning application). ▪ Provision of a substantial wetland feature in the main risk flood zone in the proposed park area, functioning both as a Sustainable Drainage System (SuDS) feature and significant biodiversity feature including open water and wetland vegetation of high ecological value, planted with suitable locally-native species advised by an ecologist (see Landscape Design Report, Section 5, provided by Gannon Associates and accompanying the planning application). ▪ Design of the lighting scheme so that there is negligible light spill on the wetland in the park area, along the Barnhill Stream and along the retained north-south hedgerow through the proposed park. This will maximise benefit to nocturnal protected species such as otter and bats. See Landscape Design Report, Section 4, provided by Gannon Associates and accompanying the planning application – in the lighting figure, the purple line indicates a light level of 1 lux, i.e. all land beyond this line receives less than 1 lux). ▪ Incorporation of herbs and shrubs providing foraging opportunity for pollinating invertebrates, which will include the provided meadow areas in the proposed park and various shrubs in general planting throughout the Proposed Development (see Landscape Design Report, Section 5, provided by Gannon Associates and accompanying the planning application). ▪ Retention of the Barnhill Stream in its current alignment and improvement of its ecological function by removal of covering shrubs and sowing of adjacent meadow (as well as the incidental removal of adverse livestock impacts), and connection to the proposed wetland (see Landscape Design Report, Section 5, provided by Gannon Associates and accompanying the planning application). ▪ Maintenance of passage for otter along the Barnhill Stream, through absence of culverts within the Proposed Development along the stream, and use of bridges (comprising foot bridges in the proposed park, and one road bridge at the west end of the park) that do not involve in-stream or immediate stream-bank works, and leave vegetated strips on both banks. ▪ Provision of native tree planting forming woodland blocks within the proposed park, near the proposed wetland (see Landscape Design Report, Section 5, provided by Gannon Associates and accompanying the planning application). ▪ Design is in accordance with a) the flood risk assessment (McCloy Consulting, 2022), avoiding inappropriate construction in flood risk areas, and b) the SuDS Strategy Report (Clifton Scannel Emerson Associates, 2021), ensuring that there is no untreated run-off into watercourses in or beyond the Proposed Development. As stated in the Appropriate Assessment screening of the Barnhill LAP (Fingal County Council, 2019), discharge is to be limited to that of a greenfield site. Incorporated run-off control measures include the above hedge retention, retention of many of the small ditches beside hedges, the above provision 	

	<p>of a wetland feature in the flood risk area in the proposed park, and urban controls including permeable paving, rainwater butts, underground stormwater system and infiltration trenches, and monitoring of the effectiveness of these measures. This contributes to ensuring the prevention of operational waterborne pollution.</p> <ul style="list-style-type: none"> ▪ Design of the foul water discharge to feed into the extra capacity of the upgraded Ringsend Waste Water Treatment Plant and upgraded sewer network, which are expected to be completed by 2023, contributing to ensuring prevention of operational waterborne pollution. Note that the Barnhill LAP requires adequate capacity for waste water treatment to be in place for new development at Barnhill (protecting downstream European sites). ▪ Taking of clean water ultimately from Leixlip Water Treatment Plant, with no abstraction of the water from the Study Area or adjacent areas. This avoids hydrological effects by abstraction on habitats in or near the Study Area. 	
Potential impacts to Designated European Sites	<p>None Proposed.</p> <p>The NIS for the Proposed Development (AECOM, 2021) determined that there were no Likely Significant Effects on European sites for all construction impacts. This included construction disturbance of the qualifying features of European sites, construction waterborne and airborne pollution, and construction hydrological effects, and was primarily due to separation distances. The overall conclusion of the NIS was that there would be no adverse effect on the integrity of European sites as a result of the Proposed Development, either alone or in-combination with other plans/projects. Refer to NIS for further details.</p>	<p>None Proposed.</p> <p>The NIS for the Proposed Development (AECOM, 2021) determined that there were no Likely Significant Effects on European sites for most possible impacts. It investigated in further detail the possible effects of waterborne pollution during the operational phase and recreational pressure during the operational phase on European site habitats or their qualifying species. It concluded there would be no adverse effects on the integrity of European sites from operational waterborne pollution and there would be no adverse effects on the integrity of European sites or their qualifying species through recreational pressure. Refer to NIS for further details.</p>
Waterborne pollution	<p>Pollution prevention is important in reducing the risk of damage to ecological features, particularly those that are aquatic. The CEMP shall include the following pollution prevention measures that are of particular importance for protection of biodiversity, that will be implemented throughout all construction of the Proposed Development:</p> <ul style="list-style-type: none"> controls and contingency measures will be provided to manage run-off from construction areas and to manage sediment, including silt fencing if necessary, with monitoring of silt ponds etc.; all oils, lubricants or other chemicals will be stored in appropriate secure containers in suitable bunded storage areas, with spill kits provided at the storage locations; all refuelling and servicing of vehicles and plant will be carried out in a designated area; and, dust suppression measures including wheel-washing and if necessary water-based dust suppression. 	No mitigations proposed.
Airborne pollution	No mitigations proposed.	No mitigations proposed.
Potential impacts to Terrestrial Habitats	The final CEMP shall include measures for the protection of biodiversity including retained trees and hedgerows, which will be protected from damage during construction activity using suitable barriers and in accordance with BS 3398 2010.	No mitigations proposed.

<p>Potential impacts to Habitats and Fauna: Bats, Otter, Badger, Other Protected Mammals, Amphibians, Reptiles, Breeding and Wintering Birds, Lake Orb Mussel.</p>	<ul style="list-style-type: none"> ▪ An Ecological Clerk of Works (ECoW) will be appointed for the duration of each phase of construction. The ECoW will advise on and monitor implementation of ecological mitigation measures and compliance with legislative requirements concerning ecological features. The ECoW will also carry out pre-commencement checks for protected and/or notable species and provide other ecological advice as necessary. Note that the ECoW should ideally be qualified and licensed to handle bats, in case bats are found during supervised removal of any trees (and the one building) with Low bat roost suitability. ▪ The earliest enabling works will not take place until late 2024 at the earliest. The ECoW will therefore carry out a survey for protected or notable species to check for any changes to the baseline conditions described in this Chapter, in particular any changes to the locations of resting sites used by protected species. The ECoW will be provided with details of the works, so that distances can be determined from the known badger sett and any other protected species resting sites that the ECoW might find. The pre-commencement survey will be completed two to six months prior to the commencement of enabling works (such as site clearance), giving time for derogation licensing if found necessary. The results will be reported and communicated to the appointed principal contractor, and where necessary proportionate avoidance/mitigation measures will be implemented. ▪ Given the different phases of the Development, the ECoW may need to carry out pre-commencement surveys in consecutive years or to carry them out in areas relevant to particular phase(s). This shall be arranged by due communication between the principal contractor(s) and the ECoW. ▪ The above pre-commencement survey will include inspection of the buildings in the industrial yard just south of Barberstown Lane North to check for signs of nesting or roosting barn owl, since the industrial yard (it is assumed) would be vacant for a period before demolition and could therefore become used by barn owl(s) if accessible to them. Barn owl is protected under the Wildlife Acts, with slightly stricter protection afforded by inclusion on the Fourth Schedule. ▪ In the event that barn owl is found to have occupied the vacant buildings, which is considered possible but unlikely, the ECoW 	<p><u>Provision of bat boxes:</u></p> <p>The Proposed Development will result in loss of 16 trees with Low bat roost suitability, and one building with Low bat roost suitability. There will therefore be a reduction in the number of potential roost features in the Site. This will be compensated by the provision of 20 bat boxes, ideally constructed from woodcrete so as to be long-lasting, positioned in appropriate mature trees along retained hedgerows. The positioning of the bat boxes will be advised by the ECoW. Unlit sections of the hedgerow through the proposed park area near the wetland feature would be appropriate locations.</p> <p>Note that the bat boxes will need to be provided shortly before any works (including clearance/demolition works) so that they are also available for use by the ECoW in the unlikely event that bats are found during sectional soft-felling of trees with Low bat roost suitability and demolition of the one building with Low bat roost suitability.</p>
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	<p>will communicate this to relevant stakeholders and carry out any necessary actions to ensure barn owls are not harmed and relevant legislation is complied with, including obtaining any derogation licensing that may be necessary. If a barn owl nest site or roost site will subsequently be lost as a result of the works, a replacement barn owl box will be installed in an appropriate location on a retained hedgerow under the guidance of the ECoW.</p> <ul style="list-style-type: none"> ▪ Works will be carried out near an existing small single-hole badger sett (described above). The sett will be retained in central retained hedgerow in the proposed park area, but could be subject to disturbance by works. Prior to carrying out any works which could cause disturbance of the sett, the ECoW or other suitably qualified ecologist shall apply for a licence from NPWS. This would be likely to be received if NPWS is satisfied with the proposed mitigation (such as an exclusion zone of appropriate size/shape from which plant, machinery and materials will be excluded, to avoid damaging the sett). ▪ As noted above, in the unlikely event that barn owl colonises one or more of the (then) vacant buildings in the industrial area, the ECoW would need to obtain a derogation licence to permit disturbance of the nest/roost site, with appropriate mitigation. ▪ No other licensing is currently considered necessary. However, if the ECoW should subsequently find new resting places of protected species (such as bat roosts) during pre-commencement surveys, that will be destroyed or disturbed by works, then derogation licence(s) may be required for those works to proceed. The ECoW shall advise accordingly if this situation arises. ▪ The two trees with Moderate bat roost suitability will be retained (see Figure 9.4 and Arbor-Care, 2022). Those identified with Low bat roost suitability do not require survey under BCT guidelines (Collins, 2016). However, where Low bat roost suitability trees require to be removed, sectional soft-felling will be used as necessary for the affected tree parts (those with dense ivy) under the supervision of the ECoW or other ecologist qualified and licensed to handle bats. In the unlikely event that the supervising ecologist find bats during removal of such trees, they shall be placed in a pre-existing bat box on a retained tree in a suitable location nearby. ▪ For the small derelict slate-roofed building with Low bat roost suitability on the immediate south edge of Barberstown Lane 	
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	<p>North, the following shall be carried out. The pre-commencement surveys shall include dusk or dawn survey of this building, and the ECoW or other ecologist qualified and licensed to handle bats shall inspect the building externally and, if safe to do so, internally. In the unlikely event that bats or bat evidence are found, the supervising ecologist shall advise accordingly and obtain a derogation licence, and in this case mitigation (in addition to supply of compensatory roost box(es)) would likely require careful demolition in a piece-meal fashion rather than bulldozing (with slates, as far as possible, removed individually under supervision of the supervising ecologist, and other parts also carefully removed to the extent considered necessary by the supervising ecologist). If, as is more likely, no bats are found during the inspections/survey, the manner of demolition of the building shall be at the discretion of the ECoW.</p> <ul style="list-style-type: none"> ▪ As discussed above, there is considered to be limited opportunity in the baseline Study Area for amphibians and reptiles. Heavily-grazed pasture is unfavourable habitat for both as it provides no shelter. However, if at the time of commencing vegetation clearance the grass has grown and no longer comprises tightly-grazed short swards, then the ECoW shall inspect any grassland prior to its clearance, if necessary prescribing and supervising cutting of the grass to a low height with an intermediate cut if considered appropriate, to discourage amphibian and reptile presence. Similarly, lengths of hedgerow with adjacent small ditches that require to be removed shall be inspected by the ECoW to check for amphibian or reptile presence before their removal. ▪ If any amphibians or reptiles are found by the ECoW, they shall be returned to sections of retained small ditch beside retained hedgerows (such as the central north-south hedgerow through the proposed park area). If the proposed wetland feature with pond and surrounding habitat in the park has been constructed and is established, with reasonably developed aquatic vegetation, any found amphibians shall be transferred there, at the discretion of the ECoW. ▪ As far as possible, works directly impacting vegetation that could be used by nesting birds (including all hedgerows, shrubs and trees) will be undertaken outside the breeding season (taken to be March to August, inclusive). Should vegetation 	
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	<p>clearance be required during the breeding season, a pre-works check for active nests will be carried out by the ECoW or other suitably experienced ornithologist no more than 72 hours in advance of the clearance works taking place (since nests can be quickly established). Where any active nests are identified, suitable species-specific exclusion zones will be implemented and maintained until the breeding attempt has concluded.</p> <ul style="list-style-type: none"> ▪ The following measures will be included to minimise risk of disturbance or harm to protected species: <ul style="list-style-type: none"> ○ any excavations will be left with a method of escape (such as a battered slope or plank of wood) for any animals that may enter overnight, and will be checked at the start of each working day to ensure no animals are trapped; ○ any exposed pipes will be capped or otherwise blocked at the end of each working day or if left for extended periods of time, to ensure no animals are trapped; ○ as far as possible, works will be carried out in daylight to avoid adverse artificial lighting effects on protected species such as foraging/commuting bats and badger; ○ any artificial lighting required for construction works will be strongly directional, directed only at the works area(s) and turned off when not required, to avoid adverse artificial light effects on nocturnal wildlife; and ○ sightings or evidence of protected species during construction will be recorded, and if found within 30 m of works then those works will stop immediately and the ECoW will be contacted for further advice. 	
Monitoring	<ul style="list-style-type: none"> ▪ Construction pollution controls will be monitored by the ECoW or other person(s) stipulated in the CEMP. In the event of any issue with construction pollution control, the ECoW or other responsible person(s) will notify the principal contractor and any other relevant parties, and will verify when remedial action has been taken and record this. ▪ Monitoring will be carried out of the effectiveness of the permanent SuDS measures to control operational pollution. ▪ On-going monitoring for protected species will be carried out by the ECoW, as required, 	<ul style="list-style-type: none"> ▪ The embedded measures for habitat creation and enhancement (including provision of the proposed wetland feature, meadows and woodland, and removal of overshadowing shrubs from the Barnhill Stream) will be monitored as set out in the Landscape Design Report (provided by Gannon Associated and accompanying the planning application) and the period of time set out therein or as subsequently agreed with the planning authority.

	for the duration of the construction phases. If this identifies a need for additional avoidance or mitigation measures, these will be communicated to the principal contractor and will be implemented with ECoW guidance as necessary, to ensure legislative and planning policy compliance on protected species and biodiversity preservation.	Monitoring of sown habitat shall ensure, where applicable, that management follows seed supplier guidance. Where necessary, remedial action will be taken should monitoring identify failures or problems with the establishment of planted or sown vegetation. This will ensure that the desired species and proposed habitats establish successfully.
Natura Impact Statement (Standalone Report)		
Likely significant effects were eliminated at the screening stage for most impacts. Two impacts (operational waterborne pollution and disturbance of SCI/QI species, habitats or supporting habitats) were taken forward to Appropriate Assessment for more detailed consideration, however, there was found to be no adverse effect on the integrity of European sites and no mitigation was required. See the NIS for further details		
EIAR Topic: Chapter 10 Noise and Vibration		
Impacts to receptors from noise and vibration during construction and operation	<p>Mitigation measures that may be implemented to reduce construction noise and vibration levels are set out in Appendix 10.1. The majority of these mitigation measures can be incorporated within a suitable Construction Environmental Management Plan ('CEMP') to be implemented during the construction phase.</p> <p>In general, construction methods adjacent to existing residents will be like those adopted where construction works in basements take place. The basement is set back a minimum of 2.4m from the Barbastown lane north and approximately 15m from existing houses. However, if piling is required bored secant piles will be used to minimise vibration. Full dilapidation surveys will be carried out on existing houses in advance of construction. Noise and vibration monitors will be installed with real time alarms set to minimum thresholds to ensure damage will not occur to existing houses.</p> <p>Several safeguards exist to minimise the effects of construction and demolition noise and include:</p> <ul style="list-style-type: none"> the various EC Directives that limit noise emissions of a variety of construction plant; guidance set out in BS5228-1:2009+A1:2014, that covers noise control on construction and open sites; and the powers that exist for local authorities under The Environment Protection Agency Act 1992. It is recommended that the precise mitigation measures to control noise from the works are agreed with the local authority prior to the works starting. Generic measures below are given to illustrate the range of techniques available. The adoption of Best Practicable Means, as defined in The Environment Protection Agency Act 1992, is usually the most effective means of controlling noise from sites. Within the constraints of efficient site operations and the requirements of the 	<p>Operational Phase Mitigation - External</p> <p>At a small number of plots the amenity space is within an area of Moderate or High Impact. At these plots mitigation will be required.</p> <p>At these plots mitigation will be included in the Site design as follows:</p> <ul style="list-style-type: none"> 1.8m high solid wooden fences at the boundary of the effected plots. The effected plots are those directly adjacent to the road network that have gardens parallel to the road, i.e. with no building between the amenity space and the adjacent road. <p>Operational Phase Mitigation - Internal</p> <p>With regards to acceptable internal noise levels BS8233:2014 has the following three limits:</p> <ul style="list-style-type: none"> Bedrooms 30 dB L_{Aeq} (15 Minutes) (2300 hrs – 0700 hrs). Living/Bedrooms 35 dB L_{Aeq} (15 Minutes) (0700 hrs – 2300 hrs). All Other Habitable Rooms 40 dB L_{Aeq} (15 Minutes) (0700 hrs – 2300 hrs). <p>With regards to the maximum internal noise level limit of 45dB(A) in a bedroom, at this stage this cannot be tested as maximum noise levels across the Site cannot be determined from the traffic flow data provided for 2030. It is recommended that if permitted consideration is given to further modelling of maximum noise levels across the Site to determine an appropriate glazing specification.</p> <p>Windows do not reduce noise equally across the entire frequency spectrum, so the</p>

	<p>relevant Standards, the following is advisable:</p> <ul style="list-style-type: none"> ▪ limit the use of particularly noisy plant, i.e. do not use particularly noisy plant early in the morning; ▪ limit the number of plant items in use at any one time; ▪ plant maintenance operations should be undertaken as far away from noise-sensitive receptors as possible; ▪ phasing the works to maximise the benefit from perimeter structures; ▪ any compressors brought on to site should be silenced or sound reduced models fitted with acoustic enclosures; ▪ reduce the speed of vehicle movements; ▪ all pneumatic tools should be fitted with silencers or mufflers; ▪ ensure that operations are designed to be undertaken with any directional noise emissions pointing away from noise-sensitive receptors where practicable; ▪ when replacing older plant, ensure that the quietest plant available is considered wherever possible; any deliveries/spoil removal vehicles should be programmed to arrive and depart during daytime hours only. ▪ drop heights must be minimised when loading vehicles with rubble. ▪ care should be taken when loading vehicles to minimise disturbance to local residents. Vehicles should be prohibited from waiting within the site with their engines running; ▪ all plant items should be properly maintained and operated according to the manufacturers' recommendations in such a manner as to avoid causing excessive noise. All plant should be sited so that the noise impact at nearby noise-sensitive properties is minimised; ▪ local hoarding, screens or barriers should be erected as necessary to shield particularly noisy activities; and ▪ any problems concerning noise from construction works can sometimes be avoided by taking a considerate and neighbourly approach to relations with local residents. Works should not be undertaken outside of the hours agreed with the local authority <p>Experience from other sites has shown that by implementing these measures, typical noise levels from construction works can be reduced by 5dB(A) or more.</p> <p>Further best practice means are set-out at Appendix 10.1 of the EIAR to further reduce the possibility of adverse noise impacts from construction activities. These relate to training, maintenance, public relations and the preparation of an action plan setting out</p>	<p>frequency content of the sound will influence the overall sound reduction performance of a given window and by extension, the resulting noise levels within the receiving room.</p> <p>However, many glazing manufacturers test their products under laboratory conditions using a typical road traffic noise frequency spectrum source. The resultant measured noise attenuation, in dB, gives a very useful guide to in-situ sound reduction performance of the window for situations where road traffic noise dominates. This performance index is known as the R_{TRA}, and the sound reduction requirement set out above should be considered as an R_{TRA} noise level.</p> <p>From an analysis of the data, it has been determined that the highest glazing specification is decided by the daytime limit except for facades facing (with a clear line of sight) the northern railway line where an intensification of use has been factored into the model. The glazing required to meet the daytime and the night-time ambient limits is presented for each plot in Appendix 10.2. At those facades facing the northern railway line it is indicated that the required glazing specification is 5dB higher than the number shown.</p> <p>With regards to the ventilation strategy to be adopted, at this stage the exact design is not known, the design will however have due regard to internal noise levels, i.e., should overheating require an open window, an open window would not be the primary means for mitigation, with for example MVHR provided. With reference to overheating, the apartment buildings that are located close to the boundary with the railway are designed with dual aspect apartment units that are orientated both north toward the train line and either east, west or south onto an adjacent open space. This orientation enables these units to be ventilated to the east, west or south accordingly. As the train line lies directly to the north of the proposed development, there will be no anticipated overheating to any of the facades facing onto the train line – which are exclusively north facing facades.</p>
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	actions to undertake following a complaint being received. Refer to Appendix 10.1 of the EIAR for further details.	
Monitoring	<p>The noise limit is met during all assessed activities at each Receptor assessed. However, construction noise levels may be reduced.</p> <p>Whilst the mitigated limits are expected to be met, at the request of the Council the applicant would undertake attended short term monitoring at nearby noise sensitive receptors to validate the predicted construction noise levels in this Report.</p> <p>With regards to construction vibration, it is anticipated that with good site management, and communication with residents should impacts be encountered, the Impact would be at worst Minor, a Minor level of Effect. As it is anticipated that there may be an impact, at the request of the Council the applicant would undertake attended short term monitoring at nearby noise sensitive receptors to validate the predicted construction vibration levels in this Report.</p> <p>It is anticipated that short term noise and vibration monitoring may be completed on a minimum of four occasions to coincide with the beginning of each phase of construction. If the limit is exceeded, SLR would recommend that further provision is made for additional monitoring.</p>	None Proposed.
EIAR Topic: Chapter 11 Air Quality		
Emissions of dust and particulate matter	<p><u>Communications:</u></p> <ul style="list-style-type: none"> Develop and implement a stakeholder communications plan that includes community engagement before work commences on site. Display the name and contact details of person(s) accountable for air quality and dust issues on the indicative site boundary. This may be the environment manager/engineer or the site manager. Display the head or regional office contact information. Develop and implement a Dust Management Plan (DMP), which may include measures to control other emissions, approved by the Local Authority. The level of detail will depend on the risk, and should include as a minimum the highly recommended measures in this document. The desirable measures should be included as appropriate for the site. <p><u>Construction:</u></p> <ul style="list-style-type: none"> Avoid scabbling (roughening of concrete surfaces) if possible. Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure 	<p>The road traffic emissions assessment predicts a 'negligible' impact on annual mean NO₂ and PM₁₀ concentrations, a 'negligible' impact on 24-hour mean PM₁₀ concentrations at all considered receptors in each of the 2025, 2030 and 2040 assessment scenario years. Exceedences of the 1-hour mean NO₂ AQAL are unlikely to occur, and there is no predicted risk of exceedence of the 24-hour mean AQAL. Predicted absolute annual mean NO₂ and PM₁₀ concentrations indicate large headroom with the AQALs. As such, specific mitigation are not considered to be necessary.</p>

	<p>that appropriate additional control measures are in place.</p> <ul style="list-style-type: none"> ▪ Ensure bulk cement and other fine powder materials are delivered in enclosed tankers and stored in silos with suitable emission control systems to prevent escape of material and overfilling during delivery. <p><u>Demolition:</u></p> <ul style="list-style-type: none"> ▪ Ensure effective water suppression is used during demolition operations. Hand held sprays are more effective than hoses attached to equipment as the water can be directed to where it is needed. In addition, high volume water suppression systems, manually controlled, can produce fine water droplets that effectively bring the dust particles to the ground. ▪ Bag and remove any biological debris or damp down such material before demolition. <p><u>Earthworks:</u></p> <ul style="list-style-type: none"> ▪ Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable. ▪ Use Hessian, mulches or tackifiers where it is not possible to re-vegetate or cover with topsoil, as soon as practicable. ▪ Only remove the cover in small areas during work and not all at once. <p><u>Operating Vehicle / Machinery and Sustainable Travel:</u></p> <ul style="list-style-type: none"> ▪ Ensure all vehicles switch off engines when stationary - no idling vehicles. ▪ Avoid the use of diesel or petrol powered generators and use mains electricity or battery powered equipment where practicable. ▪ Impose and signpost a maximum-speed-limit of 15mph on surfaced and 10mph on unsurfaced haul roads and work areas (if long haul routes are required these speeds may be increased with suitable additional control measures provided, subject to the approval of the nominated undertaker and with the agreement of the local authority, where appropriate). ▪ Produce a Construction Logistics Plan to manage the sustainable delivery of goods and materials. ▪ Implement a Travel Plan that supports and encourages sustainable travel (public transport, cycling, walking, and car-sharing). <p><u>Operations:</u></p> <ul style="list-style-type: none"> ▪ Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g. suitable local exhaust ventilation systems. ▪ Ensure an adequate water supply on the site for effective dust/particulate matter 	
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	<p>suppression/mitigation, using non-potable water where possible and appropriate.</p> <ul style="list-style-type: none"> ▪ Use enclosed chutes and conveyors and covered skips. ▪ Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate ▪ Ensure equipment is readily available on site to clean any dry spillages, and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods. <p><u>Preparing and Maintaining the Site:</u></p> <ul style="list-style-type: none"> ▪ Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible. ▪ Erect solid screens or barriers around dusty activities or the indicative site boundary that are at least as high as any stockpiles on site. ▪ Fully enclose site or specific operations where there is a high potential for dust production and the site is active for an extensive period. ▪ Avoid site runoff of water or mud. ▪ Keep site fencing, barriers and scaffolding clean using wet methods. ▪ Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used on site. If they are being re-used on-site cover as described below. <p><u>Site Management:</u></p> <ul style="list-style-type: none"> ▪ Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken. ▪ Make the complaints log available to the local authority when asked. ▪ Record any exceptional incidents that cause dust and/or air emissions, either on- or offsite, and the action taken to resolve the situation in the log book. ▪ Hold regular liaison meetings with other high risk construction sites within 500m of the site boundary, to ensure plans are co-ordinated and dust and particulate matter emissions are minimised. It is important to understand the interactions of the off-site transport deliveries which might be using the same strategic road network routes. <p><u>Track-out:</u></p> <ul style="list-style-type: none"> ▪ Use water-assisted dust sweeper(s) on the access and local roads, to remove, as necessary, any material tracked out of the site. This may require the sweeper being continuously in use. ▪ Avoid dry sweeping of large areas. 	
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	<ul style="list-style-type: none"> ▪ Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport. ▪ Inspect on-site haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably practicable. ▪ Record all inspections of haul routes and any subsequent action in a site log book. ▪ Install hard surfaced haul routes, which are regularly damped down with fixed or mobile sprinkler systems, or mobile water bowsers and regularly cleaned. ▪ Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable). ▪ Ensure there is an adequate area of hard surfaced road between the wheel wash facility and the site exit, wherever site size and layout permits. ▪ Access gates to be located at least 10m from receptors where possible. <p><u>Waste Management:</u></p> <ul style="list-style-type: none"> ▪ Avoid bonfires and burning of waste materials. ▪ Soft strip inside buildings before demolition (retaining walls and windows in the rest of the building where possible, to provide a screen against dust). 	
Monitoring	<ul style="list-style-type: none"> ▪ Undertake daily on-site and off-site inspection, where receptors (including roads) are nearby, to monitor dust, record inspection results, and make the log available to the local authority when asked. This should include regular dust soiling checks of surfaces such as street furniture, cars and window sills within 100m of indicative site boundary, with cleaning to be provided if necessary. ▪ Carry out regular site inspections to monitor compliance with the DMP, record inspection results, and make an inspection log available to the local authority when asked. ▪ Increase the frequency of site inspections by the person accountable for air quality and dust issues on site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions. ▪ Agree dust deposition, dust flux, or real-time PM₁₀ continuous monitoring locations with the Local Authority. Where possible commence baseline monitoring at least three months before work commences on site or, if it a large site, before work on a phase commences. Further guidance is provided by IAQM on monitoring during demolition, earthworks and construction. 	<p>The impact on local air quality as a result of road traffic emissions from development generated traffic flows is predicted to be 'negligible' and not exceed the Limit Values set in the Air Quality Standards Regulations. As such, specific mitigation and monitoring is not considered to be required and residual impacts are considered to be negligible.</p>
EIAR Topic: Chapter 12 Climate Change		

Climate Change Effects	<p><u>Extreme Rainfall, Flash Flood:</u></p> <ul style="list-style-type: none"> ▪ Mitigation measure will consider changes / flexibility in construction / operations that allow for rising water levels and groundwater levels based on the masterplan design. ▪ Mitigation measure will consider design of adequate surface water drainage during construction phase based on the masterplan design. <p><u>Risk Reduction Mechanism:</u></p> <ul style="list-style-type: none"> ▪ Mitigation measure will consider secure insurance for damage of assets / site incidents based on the masterplan design. <p><u>Storms and Winds:</u></p> <ul style="list-style-type: none"> ▪ Mitigation measure will ensure construction activities can withstand increases in high winds and storms based on the masterplan design. ▪ Mitigation measure will ensure the choice of equipment is weather efficient based on the masterplan design. <p><u>Other concerns based on the design:</u></p> <ul style="list-style-type: none"> ▪ In this section the mitigation measures will be considered on the design in the masterplan layout. 	<p><u>Extreme Rainfall, Flash Flood:</u></p> <ul style="list-style-type: none"> ▪ Mitigation measure will consider changes / flexibility in construction / operations that allow for rising water levels and groundwater levels based on the masterplan design. ▪ Mitigation measure will consider design of provide adequate surface water drainage during construction phase based on the masterplan design. <p><u>Storms and Winds:</u></p> <ul style="list-style-type: none"> ▪ Mitigation measure will ensure design can withstand increases in high winds and storms based on the masterplan design. <p><u>Heat:</u></p> <ul style="list-style-type: none"> ▪ Mitigation measure will ensure building design for ventilation and cooling based on the masterplan design. ▪ Mitigation measure will ensure design of outdoor spaces to reduce urban heat island effect based on the masterplan design. <p><u>Drought:</u></p> <ul style="list-style-type: none"> ▪ Mitigation measure will ensure design for droughts emergency based on the masterplan design. <p><u>Other concerns based on the design:</u></p> <ul style="list-style-type: none"> ▪ In this section the mitigation measures will be considered on the design in the masterplan layout.
Reduction of GHG Emissions	<p>The construction and occupation of any new development at the scale proposed will inevitably result in increased Greenhouse Gas Emissions. Whilst current technologies and construction techniques can deliver properties that are effective carbon sinks when associated with environmentally friendly lifestyles, it is not currently possible to deliver such properties in a commercially viable way at the scales required to meet current housing demands.</p> <p>However, the construction of new build properties provides the greatest opportunity for the reduction of energy demand as it is considerably easier, cheaper and more effective to build in energy reduction strategies than it is to retro-fit them to existing housing stock. The proposed development will adopt a 'fabric first' approach to the reduction of energy demand, seeking to reduce energy demand through the materials, development design and layout, and the mechanical and electrical specification.</p> <p>In addition to the buildings themselves, the proposed development is also being designed to be efficient and sustainable at a masterplan landscape scale. This level of large-scale planning results in significant benefits for sustainability as the use of land,</p>	<p>None Proposed.</p>

	<p>infrastructure and transport links can be planned to a greater degree, at the community scale, and the development overall has a greater weight with regards to the creation of new public transport links etc. which would not be feasible for a smaller, independent development.</p> <p>In particular, the development layout has been designed to reduce reliance on private travel by motorcar for the future residents. A local centre has been incorporated to provide the services most used by residents on a regular basis, including a primary school (with secondary education facilities 150m to the north of the application site), units designed to provide a range of shops/cafes, play areas, and access to open green space. This will be served by a network of dedicated car-free pedestrian and cycle paths assisting in the reduction of CO₂ emissions arising from transport by providing a safe and pleasant alternative to private vehicle use.</p> <p>Greenhouse gas emissions from transport will further be reduced by the location of the existing Hansfield railway station on the northern boundary of the application site. Direct pedestrian access to the station will be possible from the application site, with all residential properties being located within approximately 850m of the station via safe dedicated pedestrian routes, and the majority lying within approximately 500m. Hansfield Station gives direct access to Dublin and a range of other major employment centres.</p>	
Energy Demand Reduction	<ul style="list-style-type: none"> As described above, the construction of new build properties provides the greatest opportunity for the reduction of energy demand as it is considerably easier, cheaper and more effective to build in energy reduction strategies than it is to retro-fit them to existing housing stock. The proposed development would adopt a 'fabric first' approach to the reduction of energy demand, seeking to reduce energy demand through the materials, development design and layout, and the mechanical and electrical specification. At the macro-scale the development seeks to reduce energy demand by incorporating the dwellings into blocks and terraces where possible, as this has notable benefits for energy reduction. Combining the dwellings into blocks, rather than having numerous smaller individual properties, enables the buildings to take advantage of better surface area to volume ratios. Larger buildings with multiple residences have less surface area for a given internal volume/floor area and as heat loss through the building envelope is one of the key sources of wasted energy for 	<p>Once the dwellings are occupied, their energy demand is partially a function of the habits of the occupants. However, measures will be taken to encourage energy efficient living:</p> <ul style="list-style-type: none"> All lighting installed within the development will be highly efficient, being fitted with lamps which must have a luminous efficiency greater than 40 lumens per circuit-watt and a total output greater than 400 lamp lumens. It is proposed to fit Energy Display Devices to the electricity supply of each dwelling. These will display (amongst other information): current mains energy consumption, current emissions, the current tariff and the current cost of the energy bill. This will encourage occupants to minimise wastage and improve energy efficiency. Information on the EU Energy Efficiency Labelling Scheme would be provided to each dwelling, educating occupants

	<p>residential developments, reducing the proportional area through which energy can dissipate can significantly increase the energy efficiency of the building and dwellings within. Larger buildings typically also have a greater thermal mass, this makes them slower to overheat in summer and slower to cool down in winter, as the building fabric can store more thermal energy. In turn this results in less energy being expended to cool the buildings in summer and warm them in winter.</p> <ul style="list-style-type: none"> ▪ The orientation of the buildings has been carefully designed to balance the risk of over-heating through thermal gain, whilst still seeking energy efficiencies available from positioning habitable rooms on south-facing aspects. This is particularly important with respect to the larger buildings where whilst the size of the buildings has benefits for energy efficiency, as described above, this can result in a greater risk of large buildings overheating in the sun, particularly as they frequently have a proportionally larger glazed surface area than smaller dwellings. By orienting the apartment buildings along a north/south alignment wherever possible, and presenting the majority of the windows to the east and west, the risk of over-heating through solar gain is minimised, and with it the energy demand for cooling is also consequently minimised. ▪ Each dwelling will be constructed with high levels of insulation, air tightness and fabric energy efficiency and high quality double glazed uPVC window systems will be provided to all openings, manufactured and installed by manufacturers with a U-value to comply with TGD Part L 2011 or subsequent improved standards. ▪ Air leakage will be limited in the building fabric by sealing all external door and window frames, and service penetrations to walls, floors, joists and ceilings will be sealed both internally and externally with proprietary sealing products such as mastic sealants, expanding foam and approved tape. It would be proposed to conduct pressure testing in compliance with Part L 2011. As a minimum, the thermal resistivity of the walls will be in compliance with TGD Part L 2011. The roofs will be similarly thermally insulated and compliant with TGD Part L 2011 as a minimum standard. ▪ Space and hot water heating methods have not yet been confirmed but will be specified by the mechanical and electrical engineer to 	<p>about the benefits of efficient white goods (washing machines, tumble driers, dishwashers etc.) and encouraging their purchase. Additionally, each dwelling will be provided with a secure drying space (internal or external) for drying laundry without the requirement of a tumble drier. Internal drying spaces will be adequately ventilated to prevent damp related issues. The ability to dry washing without recourse to electric machinery can significantly reduce non-regulated energy demands.</p> <ul style="list-style-type: none"> ▪ Motor vehicle movement throughout the development is minimised, being limited to short spurs from the perimeter road giving access to the residential buildings. The development has been designed to be pleasant and easily traversable on foot and by cycle, with car-free pedestrian and cycle routes throughout, which are green and safe, being overlooked by adjacent properties. The development will have a pedestrianised, green and leafy character that encourages walking and cycling over transport by car. ▪ The proposed development has excellent public transport links, with the positioning of the railway station on the northern boundary and accessible by safe walking and cycling routes. It is proposed to investigate the extension of bus routes into the residential development areas once occupation of the properties reaches the critical weight required to support the services, reducing the distance to the nearest bus stops (currently 600m to the north of the boundary on Ongar Road). Combining the excellent access to public transport with the pedestrian and cyclist focussed design, the requirement for private vehicle transport will be minimised. ▪ Where private transport is required, the development will have excellent access to the M3 via the L302.
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	<p>achieve at least a minimum efficiency to comply with TGD Part L of the Building Regulations. It is proposed that the systems shall be provided with automatic time and zone control for space heating, to minimise energy wastage resulting from heating being on when not required or heating zones of the dwelling unnecessarily. All hot water cylinders will be insulated with a minimum of 50mm factory applied PU foam and likewise connected to time control systems.</p>	
Monitoring	None Proposed.	<p>A set of indicators shall be developed to assess project preparedness for adaptation against climate change. Provision shall be made for a periodic review of plans and the allocation of reporting responsibilities for a regime to measure and evaluate progress on adaptation. This can be carried out by the property management company or resident association. This process shall include regular feedback and/or updates from the implementation efforts.</p>
ElAR Topic: Chapter 13 Cultural Heritage		
Archaeological features	<p>A comprehensive programme of licenced archaeological investigations was undertaken as part of a previous assessment of the subject site and a number of archaeological features (including three pits) were identified within the proposed development site. The features are located with an area proposed for development at the site. If development proceeds in this area, preservation by record, or archaeological excavation of these features, will be required. These works will be undertaken under licence to the National Monuments Service at the Department of Housing, Local Government and Heritage. Notwithstanding the proposed programme of archaeological excavation of the previously-identified features, a suitably qualified archaeological consultant shall be appointed to undertake licenced archaeological monitoring of all topsoil excavation during the construction phase of the development. This will be under license from the National Monuments Service (NMS) of the Department of Housing, Local Government and Heritage. Should additional archaeological or architectural heritage features, deposits or structures be uncovered during archaeological monitoring the NMS should be contacted and a strategy for the resolution of these features be formulated. The appointed archaeologist will be required to obtain a licence from the NMS this will involve preparing an archaeological method statement to outline the required works.</p> <p>Prior to commencement of development, it is recommended that a building record of the derelict farm complex be prepared by a suitably qualified historic building specialist. This record would be based</p>	<p>None Proposed.</p> <p>Any archaeology features uncovered during the course of site development works will be resolved before the operational stage of the proposed development. There are no anticipated archaeological, built, or cultural heritage mitigation measures required during the operational phase.</p>

	on background research, annotated photographic record, and drawn survey of the upstanding features within the farmyard identified within Appendix 13.2 of this EIAR. The resultant survey records will be submitted to Fingal County Council for archival purposes. Notwithstanding the lack of architectural heritage significance of the derelict buildings and other farmyard features, the proposed building record will allow for the full documenting of this much-altered complex of late-eighteenth or early-nineteenth-century origin.	
Monitoring	There are a number of obligatory processes to be undertaken as part of licence applications to the NMS for archaeological excavation and archaeological monitoring and these will allow for monitoring of the successful implementation of mitigation measures. In addition, the building records to be produced prior to commencement of development will be submitted to Fingal County Council for compliance purposes.	None Proposed.
EIAR Topic: Chapter 14 Population and Human Health		
Impact on Population and Human Health	<p>Appropriate mitigation measures in regard to issues that may potentially impact on human health such as traffic, visual amenities, built and natural heritage, air quality, noise emissions and climate change have been addressed under other chapters within this report including Landscape and Visual Impact (Chapter 4); Traffic and Transport (Chapter 5); Land (Chapter 7); Water (Chapter 8); Noise and Vibration (Chapter 10); Air Quality (Chapter 11); and Climate Change (Chapter 12).</p> <p>The proposed development design incorporates sufficient community, recreation, childcare, and education facilities to meet the needs of the future population of Barnhill Garden Village.</p>	<p>Appropriate mitigation measures in regard to issues that may potentially impact on human health such as traffic, visual amenities, built and natural heritage, air quality, noise emissions and climate change have been addressed under other chapters within this report including Landscape and Visual Impact (Chapter 4); Traffic and Transport (Chapter 5); Land (Chapter 7); Water (Chapter 8); Noise and Vibration (Chapter 10); Air Quality (Chapter 11); and Climate Change (Chapter 12).</p> <p>The proposed development design incorporates sufficient community, recreation, childcare, and education facilities to meet the needs of the future population of Barnhill Garden Village.</p> <p>There is sufficient capacity in the existing post-primary education facilities to accommodate any demand that might arise from Barnhill Garden Village. Cumulatively there is potential for a deficit in post-primary education facilities if all the permitted developments are fully built out and additional capacity is not provided by the Department of Education.</p> <p>The Department of Education has been a statutory consultee during the preparation of the Barnhill LAP and have been consulted by applicants during the development of the application. As a further mitigation measure it is proposed that, should permission be granted, the applicants will submit an updated report to the Department of Education detailing the proposed phasing and estimated primary and post-primary demands arising from the development to</p>

		<p>inform continuing Department investment decisions. The applicants will also provide an annual report of progress to the Department of Education noting number of completed units, estimates of primary and post-primary demands arising and projections for future demand when the development is complete.</p> <p>No further significant negative impacts on Population and Human Health during the operational phase have been identified within this chapter and therefore no additional mitigation measures are proposed.</p>
Monitoring	<p>Measures to avoid negative impacts on Population and Human Health have been integrated into the design and layout of the proposed development. Compliance with the design and layout will be a condition of any permitted development. Monitoring will be undertaken by the Building Regulations certification process and by the requirements of specific conditions of a planning permission.</p> <p>Monitoring of compliance with Health and Safety requirements will be undertaken by the Project Supervisor for the Construction Process.</p>	<p>Measures to avoid negative impacts on Population and Human Health have been integrated into the design and layout of the proposed development. Compliance with the design and layout will be a condition of any permitted development. Monitoring will be undertaken by the Building Regulations certification process and by the requirements of specific conditions of a planning permission.</p>
Wind Microclimate Assessment (Standalone Report)		
Embedded Mitigation Measures	<p>Figure 1.3.12, Figure 1.3.13, Figure 1.3.14, Figure 1.3.15, Figure 1.3.16, Figure 1.3.17, Figure 1.3.18, and Figure 1.3.19 in this report shows plan views of character areas in the proposed development with mitigation features highlighted according to the colours in Table 4 of this report. These embedded mitigation features in Table 4 include fence, screen, railing, planter, hedge, extra hedge, pergola, banners, extra trees, bike shelter.</p> <p>Please refer to Wind Microclimate Assessment for further details.</p>	
Impact on wind microclimate	<p>No specific off-site mitigation measures are modelled or proposed as part of this assessment. On-site mitigation, if required, is likely to be in the form of evergreen planting, porous screens or awnings. Alternatively, this may involve closing pedestrian access to breached areas during high winds if an alternative route around an unacceptable region is not available.</p>	
Monitoring	<p>None Proposed.</p> <p>This investigation shows that the wind microclimate of the proposed development site is safe for able bodied pedestrians according to the Lawson method.</p> <p>Comparisons of the baseline and proposed scenarios show that the proposed development does not negatively impact the wind microclimate of the development site in terms of 20 m/s Lawson Distress.</p> <p>The investigation shows that the wind microclimate of the proposed development site is almost entirely safe for frail/elderly pedestrians and cyclists according to the Lawson method.</p> <p>One small region within the south-eastern most point of the development site boundary and some tiny regions on the corners of balconies indicate 15 m/s Lawson Distress.</p> <p>Comparisons of the baseline and proposed scenarios show that the proposed development positively impacts the wind microclimate of the development site and its surroundings to the northeast according to the Lawson method.</p>	

	<p>The investigation shows that the wind microclimate of the proposed development site is comfortable for its intended pedestrian uses and is acceptable according to the Lawson method.</p> <p>Comparisons of the baseline and proposed scenarios show that the proposed development positively impacts the wind microclimate of the development site and its surroundings to the northeast according to the Lawson method.</p>	
EIAR Topic: Chapter 15 Major Accidents and Disasters		
Fire / explosion during instillation or maintenance of natural gas supply for Proposed Development.	None Proposed.	<p>Following installation, the mains supply of natural gas at defined conditions (composition, temperature, and pressure) currently managed by Gas Networks Ireland (GNI) who provide continuous monitoring and would respond in the event of supply issues.</p> <p>Gas mains and service pipes are designed and installed in accordance with the requirements of The NSAI Gas transmission Pipelines and pipeline installations I.S328: 2021. These Regulations are supported by guidance published by the Health and Safety Executive.</p> <p>In addition to Regulatory standards, the design and installation of gas pipework is in accordance with industry codes and technical standards, such as those produced by the Institution of Gas Engineers and Managers (IGEM).</p> <p>Valves will be installed at appropriate locations in the gas pipework to enable gas engineers to isolate the supply in an emergency and for maintenance purposes.</p> <p>Installing gas pipework below ground reduces the potential for accidental damage. The depth and location is carefully controlled to maintain a constant temperature, protecting the pipework against thermal effects.</p> <p>All combustion installations within buildings must be accommodated in ways that meet the requirements of Building Standards. Gas installations also have to comply with the Gas Safety Regulatory Framework for Ireland 2018, which require professional work to be undertaken by competent, registered and accredited Gas Safe engineers.</p>
Accidental damage or failure of electrical systems including 110kV powerlines which cross the lands in the north-west corner of the Proposed Development.	A CEMP will be produced for the Proposed Development which will consider the risks associated with overhead powerlines during construction. These will be managed in compliance with the Health and Safety Authority Construction Regulations 2013 and the Health and Safety Authority Code of Practice for Avoiding Danger from Overhead Electricity Lines May 2019.	Electrical power lines are designed, installed, and maintained in accordance with industry standards and guidance.

	Construction management plan will consider hazard zones, exclusion zones and plant and machinery minimum safe distances from the powerlines.	
Monitoring	<p>In addition to the mitigation measures, the design of the Proposed Development will be in accordance with all relevant building standards. Compliance with these standards is monitored by Building Control Ireland and includes requirements for fire safety as well as health, structural stability, energy conservation and accessibility. The Proposed Development will be designed in accordance with Building Regulations 2017, Technical Guidance Document - Fire Safety Volume 2, Dwelling Houses</p> <p>Chapter 15 notes that Hazards identified during the construction phase of the project should be managed via the appropriate risk assessments for compliance with the Health and Safety Authority Construction Regulations 2013. These will be described in the CEMP.</p>	<p>In addition to the mitigation measures, the design of the Proposed Development will be in accordance with all relevant building standards. Compliance with these standards is monitored by Building Control Ireland and includes requirements for fire safety as well as health, structural stability, energy conservation and accessibility. The Proposed Development will be designed in accordance with Building Regulations 2017, Technical Guidance Document - Fire Safety Volume 2, Dwelling Houses.</p>