CAIRN HOMES CONSTRUCTION LTD

Construction Management Plan

FARRANKELLY, RESIDENTIAL DEVELOPMENT KILCOOLE ROAD, DELGANY, GREYSTONES, CO. WICKLOW

Date: September 2019

CONTENT

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A	Draft	EF	DR	21/08/2019
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C	Final	EF	DR	16/09/2019

1. Construction Management Plan

Cairn Homes Construction Ltd are the appointed PSCS to carry out the residential development of circa 426 Units at Farrankelly, Greystones, Co. Wicklow. The work activities will be carried out in accordance with the Safety, Health & Welfare at Work (Construction) Regulations, 2013.

The Construction Management Plan outlines the procedures to be followed to ensure the minimal impact of the construction activities on the surrounding residential community and the general public. The plan considers the safety of personnel carrying out the work, visitors to site and any unauthorized persons obtaining access to site.

The Construction Management Plan to be read in conjunction with the planning application documentation, in particular the construction mitigation set out in the EIAR and the Construction and Operational Waste Management Plan, prepared by Byrne Environmental. The construction phase mitigation measures are contained in Appendix 1. A more detailed Construction Management Plan will be submitted by the works contractor, expanding on the CMP, and it will be submitted for approval to Wicklow County Council prior to the commencement of any construction works. This plan will ensure that temporary traffic works and road safety measures will be put in place during the construction of the proposed development. The plan will ensure that any required traffic management measures are put in place to minimise the impact on local road users.

During the project all site access points, footpaths and roadways will be maintained in a satisfactory condition and the works carried out in such a manner as to cause minimum inconvenience to adjoining residents and land users.

It is Cairn Homes Construction Ltd. Health & Safety policy to provide and maintain a safe and healthy working environment to all involved with the project. Cairn Homes Construction Ltd. recognizes its duty to comply with the Safety, Health & Welfare at Work Act 2005 and Safety, Health & Welfare at Work (General Application) regulations 2016 and Safety, Health and Welfare at Work (Construction) Regs 2013 and associated legislation and codes of practice.

The project will be notified to the H.S.A online by submitting the forms AF1 and AF2 prior to construction.

2. Description of Project

Image 1 – The site is outlined in red in the image above.

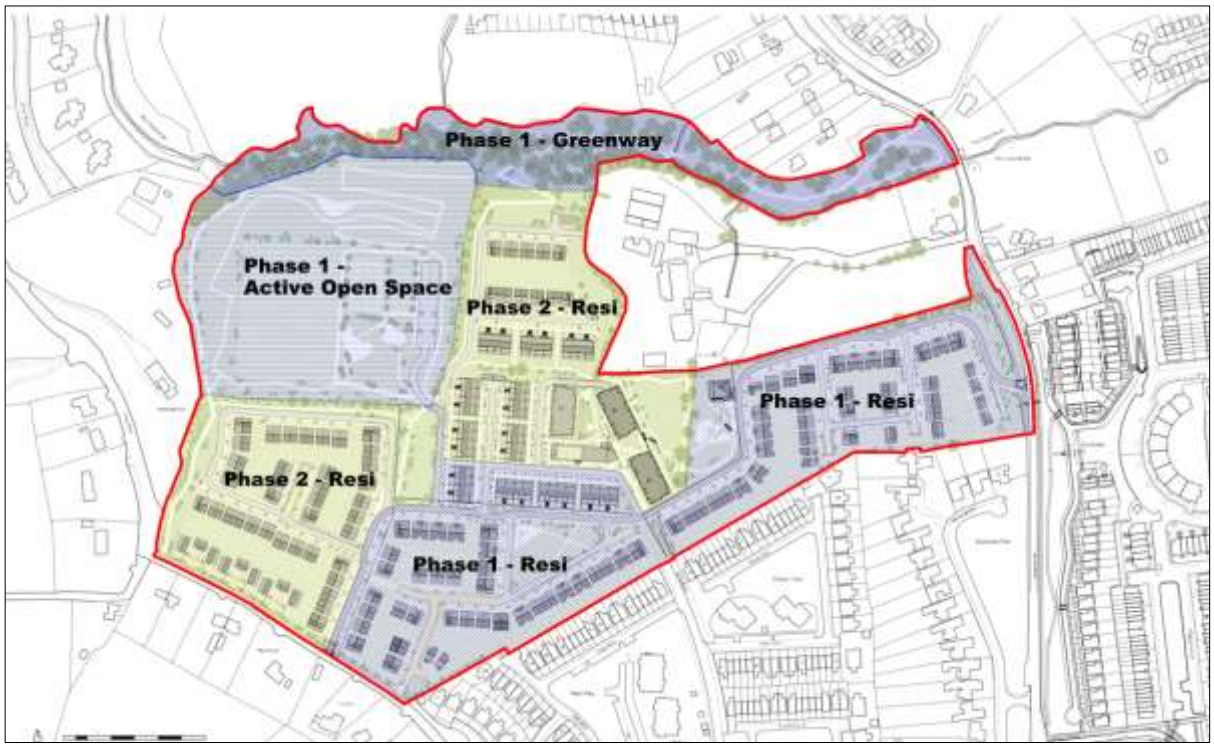


Image 2 – Phasing of the project. (Cairn Homes will develop Phase 1 & 2 on the map above.)

The development will consist of the construction of a residential development of 426 no. dwellings, a creche (c. 599 sq. m), residential amenity building (c. 325 sq. m), active open space of 4.5 hectares, greenway of c. 2.4 hectares as follows:

A) 245 no. houses comprising; 148 no. 3 bedroom houses, 93 no. 4 bedroom houses, and 4 no. 5 bedroom houses [houses are provided with two car parking spaces and solar panels] – House Type E, 3 storey to front – 2 storey to rear; House Types G1,G2,G3, and H dormer house types, all other house types 2 storey;

B) 93 no. apartments with balconies in 3 no. 4 storey apartment buildings (Blocks 1 and 2 over part basement/podium) comprising 36 no. 1 bedroom apartments, 53 no. 2 bedroom apartments and 4 no. 3 bedroom apartments;

C) 44 no. 2 bedroom duplex apartments and 44 no. 3 bedroom duplex apartments in 11 no. 3 storey duplex buildings;

D) Provision of a 2 storey split level residential amenity building of c. 325 sq. m (3 no. car parking spaces and 12 no. bicycle spaces). Temporary use of the residential amenity building as a marketing suite for a period of 3 years.

E) Provision of a 2 storey creche of c. 599 sq. m (10 no. car parking & 12 no. cycle spaces), 1 no. ESB substation (beside creche) and ESB kiosks, associated single storey bicycle storage and refuse storage buildings.

F) Active Open Space of c. 4.5 hectares comprising: 1 no. playing pitch, 1 no. multi-purpose pitch (with all weather surface), tennis courts, children's play area, trim trail and parking (30 no. car parking spaces & 20 no. bicycle spaces),

G) Approximately 4.2 hectares of open space comprising; a pedestrian and cycle route or 'greenway' (and associated paths, stream crossing and lighting) at the "Three Trouts" stream (c. 2.4 hectares); c. 1.8 hectares of open space within the development (including playground areas); all ancillary landscape works with public lighting, planting and boundary treatments including regrading/re-profiling of site where required as well as provision of cycle paths.

H) Access to the subject site will be from a new priority junction (including upgraded frontage), located on the Kilcoole Road (R761). The proposal includes for the construction of a vehicular/pedestrian access from Priory Road as well as 3 no. independent vehicular access points from Priory Road to serve 9 no. dwellings, construction of cyclist and pedestrian link to boundary of Eden Gate development located to the south, 762 no. car parking spaces and 225 no. cycle spaces.

I) Surface water and underground attenuation systems as well as all ancillary site development works (reprofiling of site as required) as well as to drainage services (including underground pumping station), all on a site of c. 21.2 hectares.

J) Temporary marketing signage for a period of 3 years (located beside Priory Road and Kilcoole Road).

K) All associated site development and landscape works.

The project will be constructed in two phases as shown in the map above and is proposed to run over 24 – 36 month period with a planned commencement in Quarter 1 2020.

The works to be included in the phases are outlined below.

- Construction of new site entrance and site compound off Priory Road.
- Erection of site signage and formation of the site accommodation and welfare facilities as indicated on the site map
- Construction of the access point to the site off Kilcoole Road.
- Provision of boundary protection along the Kilcoole Road and Priory Road and protection of the boundary between the site and neighbouring residential developments.
- Site Clearance work
- Site development of services & utilities.
- Construction of retaining walls and reprofiling the site for house construction.
- Construction of the the road from Kilcoole Road to Priory Road and the greenway as part of phase 1.
- Site development of estate roads and footpaths.
- Construction of Residential Units.
- Commence Construction of the sports facility in phase 1
- Landscaping and planting.

The sequence of work on commencement of the project is in line with the following:

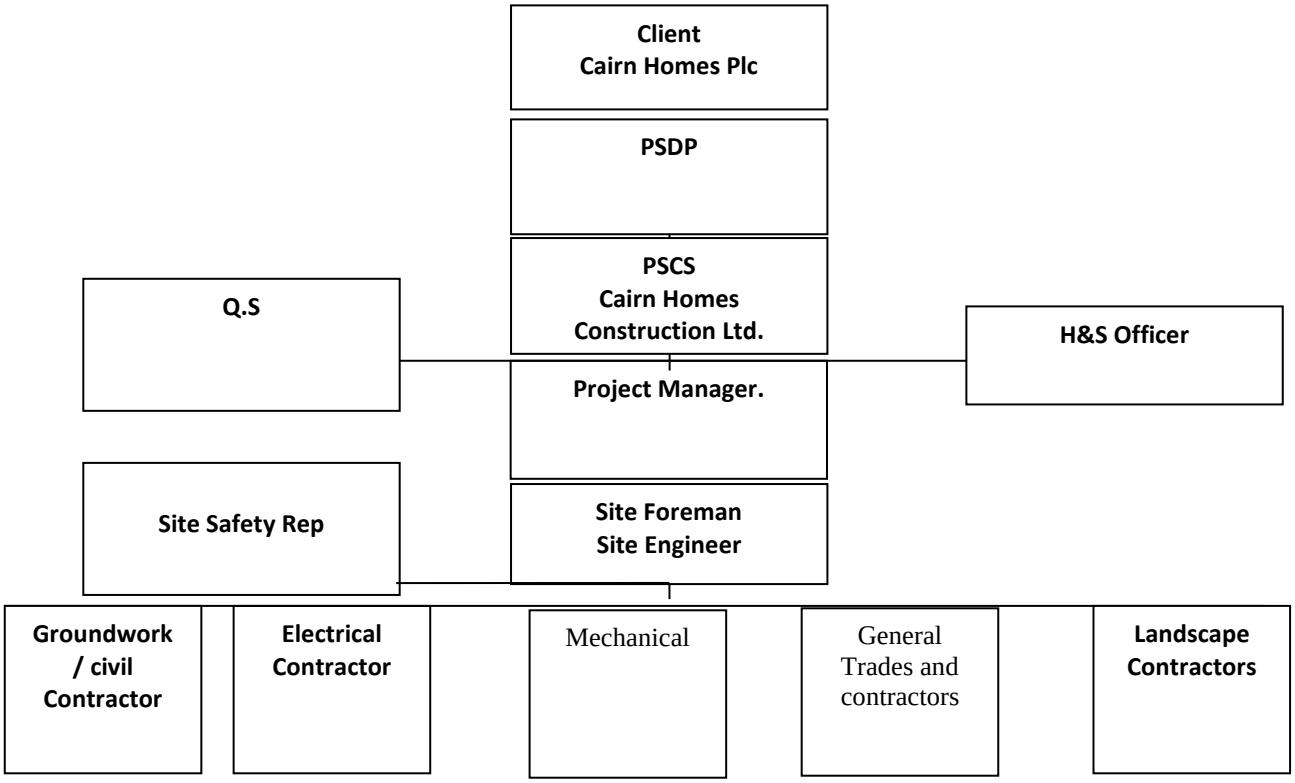
- The development of the compound and the site enabling works – January / February 2020
- Commence the construction of Roads and services – February - April 2020
- Start to prepared footings for house construction – April 2020

3. Restrictions on Working Hours

The site is due to commence January 2020 and run for approx. 24 months. A full program of works will be available in the site office throughout the project.

The planning permission for the site will set out the restriction on working hours on this project. These will be strictly adhered to.

4. Management Structure



The names of the site management team will be appointed at a later stage.

5. Site Set up Plan

As shown below the site is located to the North of the existing Eden Gate Estate and is accessible from the Kilcoole road and Priory Road.

The boundary facing along the public Kilcoole Road will be separated from the construction works by erecting a secure hoarding fixed to concrete Kelly Blocks along this boundary. Additional fencing or hoarding will be provided along the boundary between Priory Road and the Construction site.

A secure 2-metre-high block built boundary wall is located between the existing Eden Gate estate and the Construction site boundary.

The Site is located opposite the entrance to a recently developed Glen Heron development and traffic management considerations will be required when forming the new road joining the Kilcoole Road and the new estate link road.

Image 3- Site layout plan.

- Site Compound area.
- Site Parking area.
- Material Storage area.
- Site Access off Priory Road and Kilcoole Road

The Site Compound

A site compound and contractor parking area will be established within Cairn Homes boundary to ensure there is no parking requirements outside the site boundary, in the local estates or on the surrounding roads. The location of the compound, the material storage area and the site car park are clearly shown on the map above. All light vehicle traffic accessing the site will access off the R774, onto Priory Road and turn right into the site compound and parking areas.

The site compound consists of the following

- Site Parking approx. 100 cars
- Site office –
- Meeting Room,
- Canteen complete with fridges and facility for boiling water and heating food.
- QS office

- Health & Safety / Engineering office.
- Toilet block
- Drying room.
- AED / First Aid Station.

The site set up will be complete prior to commencing construction work.

Signage

- Signage will be erected on the outside of the site entrance gates and on the public road approaching the site entrance along Kilcoole Road and Priory Road.
- The site access points will be clearly highlighted as members of the public will be in close proximity to the site entrance along the public footpaths. One manned gate will be provided as the construction site access point for site parking access off Priory Road. One manned gate will be provided for heavy construction traffic off Kilcoole Road once the link road construction has progressed and the entrance at the Kilcoole Road has been formed.
- General Warning and Keep Out signage will be displayed on site boundary.
- General warnings and safety signage will also be displayed within the site boundary.
- Identification of vehicle access point.
- Identification of the pedestrian access point.
- Visitors report to site office
- Location of parking
- Location of the site offices
- Location of First Aid Boxes and equipment.
- Speed limit signage 15KPH
- Warning live services
- Wear PPE
- General construction site warning signage.
- Directional signs to the site compound.

Site security:

Additional secure fencing is to be erected within the site, this will be erected at the following locations,

- Between the sites pedestrian access walkway and the construction works.
- Between the site car park and the live construction area.
- Between the site compound and the live construction works.

Parking:

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

Parking is not permitted in the following areas.

- any other area of the site
- on the public roads
- within local housing estates.

6. Deliveries Traffic Management and Site Access

Image 5 – Traffic access routes to the site.

The initial site entrance will be located off Priory Road to facilitate the site set up and to commence access to the site to form the permanent access off the Kilcoole Road. As the Project develops the access gate on Priory Road will be used for vans, cars and light traffic accessing the car park and site compound.

The Kilcoole Road entrance will be used for the delivery of construction materials and heavy vehicles throughout the phase 1 construction, however this construction access point will likely be closed to construction traffic once there is occupancy in the estate. (to minimise interaction between the construction traffic and public.)

In order to minimise the impact of the increased traffic in the area construction traffic will access the site off the M11 onto the R774. The light vehicles will exit the R774 onto Priory Road and turn off Priory Road into the site car park. The heavy construction traffic will turn left off the R774 onto the Kilcoole Road and access the site into the permanent access point once it is constructed. A traffic management plan will be prepared and submitted to

Wicklow County Council. The traffic management plan for the development will be reviewed continuously throughout the project.

The site roads and services will be developed at an early stage of the project to provide vehicle access around the site on sealed roads to minimise the potential for muddy road and underfoot conditions.
The traffic management plan will be updated throughout the project as the roads and footpaths are developed.

The site access points as shown in Section 5 above (image 3) will be manned by Task Force security personnel. The security guard at this location will ensure all access into and out of the site is recorded. Site visitors are directed to the site compound and construction traffic will be directed to the construction works area. The security guard must also notify site management if vehicles exiting the site are depositing mud or debris on the public road to ensure the road sweeper is deployed in a timely manner.

Signage will be posted along the R774, Priory Road and Kilcoole Road indicating the “Construction Access ahead” from all directions. The property boundary along the Kilcoole road and Priory Road will be securely fenced off with secure 2-metre-high fencing panels.

Operating and access point off Priory Road for cars, vans and parking minimises the interaction with public pedestrian and vehicle traffic as much as possible.
The security guard at the gate will be set in off the public road and footpath to avoid the build-up of traffic at the site access gates and to avoid large vehicles blocking the access.

All plant and construction vehicles leaving the site will pass through a wheel wash before exiting onto the Kilcoole Road or Priory Road, this will remain in place until the sealed roads are completed.

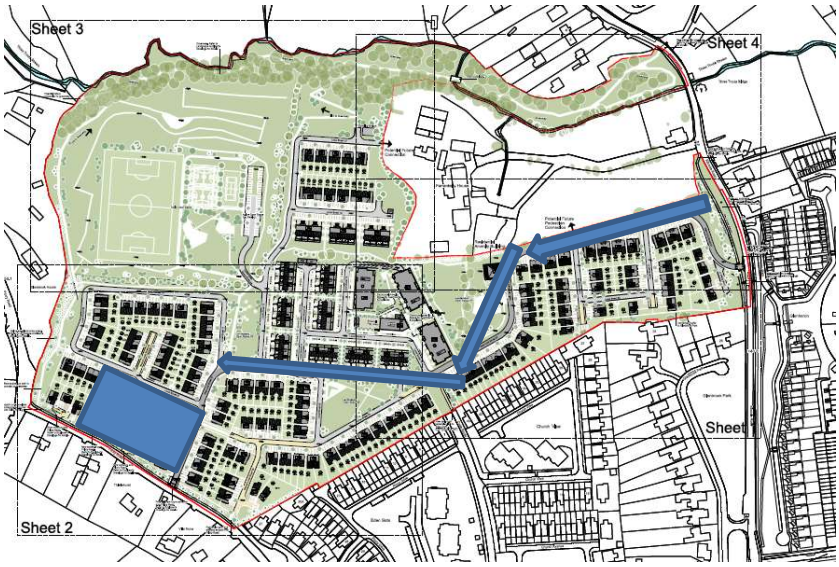
A banks man / spotter will be used with vehicles when reversing or moving within the site. This will be the responsibility of the appointed individual contractors. The security personnel at the site access points will act as a spotter for vehicles exiting the site.

Deliveries and removal of waste will be managed daily to ensure the minimum amount of materials and waste are on site at any time.

Materials will be stored in a designated storage area on site suited to the ongoing works.

Vehicle access is provided along a hard standing to reduce the amount of construction waste and mud attaching to vehicles.

Cairn Homes Construction Ltd will ensure the maintenance of the public road and footpath, to prevent a build-up of mud or waste being dragged out onto the roadway. A combination of washing down vehicles and road sweepers will be utilised.



- Pedestrian Access route from the compound to the works location.

Vehicle access from the site entrance through the site. Will follow the line of the link road constructed at an early stage of the project.

Image 6 – proposed vehicle & pedestrain access route within the site.

7. Environmental impacts

Waste removal.

All site clearance work is carried out by an appointed specialist contractor in accordance with their proposed safe system of work. The sequence of the site clearance is carried out in advance of the work. A full survey of potential hazards is carried out by the design team and the Client in advance of appointing the contractor.

Some soil strip will be stockpiled on site for reuse as much as possible to minimse the amount of heavy traffic accessing the site.

General waste will be separated into skips on site for removal by licensed waste companies.

All permits and waste records will be maintained on site.

Pollution Control

Contamination of Watercourses and ground water is a risk during the construction phase of the greenway due to the close proximity with the local water course. Detailed construction method statements will be prepared by the appointed civil works contractors and approved by Inland Fisheries Ireland and the clients design team.

Identified risks include spillages into water courses and unprotected ground, allowing pollutants to enter watercourses or ground water. The measures proposed to be put in place to mitigate this risk would be the use of exclusion zones where practicable and ensuring construction haul roads are not formed adjacent to the water course. Exclusion zones would the defined by erecting a 1m high barrier along the watercourse formed by steel road pins supporting an orange PVC barrier with warning signs appropriately fixed at regular intervals.

Sediment and Erosion

Similar to the above, adjacent watercourses/groundwater need to be protected from sedimentation and erosion due to direct surface water runoff generated onsite during the construction phase. To prevent this from occurring surface water discharge from site will be managed and controlled for the duration of the construction works until the permanently attenuated surface water drainage system of the proposed site is complete.

A temporary drainage system shall be installed prior to the commencement of the construction works to collect surface water runoff by the site during construction. A series of geotextile lined cascading, high level outfall, settling basins will be installed upstream of agreed discharge points. This temporary surface water management facility will throttle runoff and allow suspended solids to be settled out and removed before being discharged in a control manner to the agreed outfall. All inlets to the cascading settling basins will be riprapped to prevent scour and erosion in the vicinity

Accidental Spills and Leaks

All oils, fuels, paints and other chemicals will be stored in a secure bunded construction hardstand area located at the site compound. Refuelling and servicing of construction machinery will take place in a designated hardstand area which is also remote from any surface water features and ditches (when not possible to carry out such activities off site). A response procedure will be put in place to deal with any accidental pollution events and spillage kits will be available and construction staff will be familiar with the emergency procedures and use of the equipment

Concrete

Concrete batching will take place off site, wash down and wash out of concrete trucks will take place off site and any excess concrete is not to be disposed of on site. Pumped concrete will be monitored to ensure there is no accidental discharge. Mixer washings are not to be discharged into surface water drains.

Disposal of Wastewater from Site

Discharge from any vehicle wheel wash areas is to be directed to on-site settlement ponds, debris and sediment captured by vehicle wheel washes are to be disposed off-site at a licensed facility. Foul drainage discharge from the construction compound will be tankered off site to a licensed facility until a connection to the public foul drainage network has been established

Pest Control

It is essential that a good standard of hygiene be maintained on site during the course of construction if rodents are not to be attracted to it. Cairn Homes appoints a specialist Pest Control Contractor to manage potential infestations around the site and around the site compounds.

It is not unusual for the site of new buildings to be infested with rats before construction commences. The rats may be living in hedges, on the banks of a nearby river, in old drains etc. Prior to Construction the following work is carried out

- Determine if the land is infested, and if so, the land should be disinfested before building operations commence.
- All refuse should be removed from site.
- Old drains and other disused pipes should either be filled with concrete, or alternatively dug out and the junctions with working drains sealed.

Good housekeeping and high hygiene standards are essential to maintaining high levels of pest control on the site. The following day to day controls are strictly adhered to.

- Canteen and break facilities are provided at a single location. Taking breaks and eating food are not permitted in construction areas.
- Waste food, empty food tins, and other waste which might attract rodents should be stored in bins with tight fitting lids.
- Accumulations of old timber, bricks and debris, provide harbourage for rodents and should be cleared away as quickly as is possible.
- Stocks of building material should be neatly stacked and stored in the site compound.
- Building materials are delivered to site as needed to avoid prolonged stockpiling of materials.
- Waste is removed from site regularly by a licenced waste contractor. All waste permit numbers and records are maintained in the site folders.

Restrictions on Noise

Site management will ensure all noise levels in the working area are assessed around the site perimeter and within the site, with the relevant appropriate action to reduce the noise emissions, implemented once the noise levels are known.

Site management is fully aware of the location of the construction works in relation to the neighboring residential properties and will take all appropriate measures to reduce noise emissions from the site. These include but are not exclusive to:

- Shutting down plant when not in use,
- Keeping covers on compressors and other plant closed.
- Managing work activities and work sequences to minimize noise exposure.
- Use of well-maintained and certified plant and machinery.
- Ongoing noise monitoring on site and around the perimeter.

Restrictions on Dust

Site Management will take all necessary measures to reduce high dust levels on site. While levels of dust cannot be eliminated, Cairn Homes Construction Ltd. will implement the process of wetting down the area to keep dust at ground level this will be particularly important in the following times:

- Throughout the site development works.
- During summer works due to dryer weather wetting down and high levels of housekeeping will minimise rising dust.
- When using abrasive wheels. All cuts with Con saw / grinder will be subject to water suppression to minimise rising dusts.
- Site personnel will wear dust masks when sweeping out houses or other dust generating activities
- The company housekeeping policy will be implemented with all trades to minimise the creation of dusts and waste on site.

Dust creation is unavoidable however the scaffold boards, crash decks and ground area are to be cleaned down daily as high wind can blow dusts and debris off the scaffolds into public and resident access areas.

Cairn Homes have a water bowser available to the site for use to wet down the internal site roads during extended dry spells.

Maintenance of the public roadways

A wheel wash will be constructed on site located at the base of the Haul Road, ensuring the vehicles return to a hard standing inside the site boundary prior to exiting onto the public road. This wheel wash will be maintained

until the permanent sealed roads are constructed. This will minimise the amount of waste dragged onto public roads from site plant.

Carin Homes will appoint a road sweeping contractor and the will monitor the public roads. The Road sweeper will be deployed as required throughout the project.

Construction Site Lighting

The external lighting will be limited to the site compound area, the car park and site storage area to provide sufficient lighting for access and egress to and from the site. The lighting provided in the compound and the storage areas will be directed down locally to the required areas and at no stage will site lighting be directed at existing residential dwellings or public access areas.

The lighting in the construction area is limited to task lighting provided within houses under construction by the individual trades.

8. **Public Safety:**

The following key points are to be followed in order to address the public safety issues in the local area.

- The permanent access point for the new development will be formed off the Kilcoole Road at the initial stages of the project.
- The access gate to the site will be attended to by Task force Security.
- The construction site will be secured at the end of each working day by locking the front gates to the site. Warning signs will be erected all around the perimeter of the site.
- Netwatch security system will be in place throughout the site compound outside of working hours.
- The site will be secured on all sides by secure 2-meter-high boundary protection.
- A diligent housekeeping policy will be operated to prevent a build-up of waste and construction materials.
- Noisy works must be kept to a minimum and the contractors must comply with the Safety, Health & Welfare at Work (General Application) Regulations 2016
- Dusty works to be kept to a minimum.
- The public roads and footpath will be monitored on an ongoing basis to ensure the waste or debris will not create a hazard on the public road.
- Any work to be carried out on public roads will be planned and road opening licence requested from the local authority. This will be required for works forming the permanent estate entrance off the Kilcoole Road.
- Work on public roads will be carried out after careful planning, a traffic management plan, method statement and road opening licence are in place.
- All traffic management works will be set up and managed by persons trained to CSCS Signing, lighting and guarding at roadworks.

- Vehicles will be banked in the direction of movement when exiting the site into public access areas.
- Site hazards such as excavations and scaffolding will be left in a safe and secure manner. Excavations will be backfilled or fenced off and scaffolds will be management as set out below.
- All chemical agents and other harmful substances will be stored in a locked container within the secured site compound.

Summary

Cairn Homes is accredited with Safe-T-Cert health and safety management system for Construction companies. **Safe-T-Cert** is a certification scheme designed for certifying the Safety Management Systems of contractors working in the construction industry. The Scheme's objective is to improve health and safety management by providing objective standards and certifying those contractors whose safety management systems have been assessed, and can demonstrate that they:

- Are in line with the ILO guidelines for Safety Management Systems
- Meet the basic requirements for training and competence
- Implement an occupational health and safety management system which meets the requirements of the organisation – incorporating continual improvement.
- Address relevant national legislation
- Demonstrates commitment at all levels within the organisation

The site management team are experienced and well-resourced. The H&S management of the project is reviewed and managed continuously throughout the project.

Appendix 1 – EIAR Construction Phase Mitigation.

1.1 Project Description & Alternatives Examined

1.1.1 Construction Management Strategy

It is envisaged that the development of the lands subject of the proposed development will occur over 2-5 year period. Given the nature of the project and the need for flexibility to respond to market demand, the development phases are indicative. A CMP has been prepared by Cairn Homes, has been reviewed by the relevant EIAR consultants and is included in the SHD application.

1.2 Population and Human Health

Avoidance, remedial and mitigation measures describe any corrective or mitigative measures that are either practicable or reasonable, having regard to the potential likely and significant environmental impacts.

Avoidance, remedial and mitigation measures describe any corrective or mitigative measures that are either practicable or reasonable, having regard to the potential likely and significant environmental impacts. A CMP prepared by Cairn Homes, is included with the SHD application material.

1.2.1 Construction Phase

A range of construction related remedial and mitigation measures are proposed throughout this EIAR document with reference to the various environmental topics examined and the inter-relationships between each topic. These remedial and mitigation measures are likely to result in any significant and likely adverse environmental impacts on population and human health during the construction phases being avoided. Readers are directed to Chapter 15 of this EIAR document which summarises all of the remedial and mitigation measures proposed as a result of this EIA.

POP & HH CONST 1:

In order to protect the amenities enjoyed by nearby residents, premises and employees a Construction Management Plan (including traffic management) shall be submitted by the contractor and implemented during the construction phase.

With reference to the construction phase of the proposed development, the objective of the Construction Waste Management Plan prepared by Byrne Environmental Consulting Ltd is to ensure that waste generated during the proposed construction and operation phases will be managed and disposed of in a way that ensures the provisions of the Waste Management Acts 1996 - 2013 are complied with.

1.2.2 Operational Phase

The operational phase is considered to have likely significant positive impacts on human beings in relation to the provision of additional residential units, open space, childcare provision, to cater for the demands of a growing population in accordance with the residential zoning objectives pertaining to the site.

During the operational phase of the development the design of the scheme has undergone a Road Safety Audit and has had regard to Design Manual for Urban Roads and Streets (DMURS) during its design. This will promote a pedestrian friendly environment, promoting sustainable development and reducing the influence of cars. This has the potential to reduce accidents within the proposed development.

1.3 Biodiversity

1.1.1 Construction Phase

1:Mortality to animals during construction – mitigation by avoidance.

1a.The removal of hedgerow, treeline or scrub vegetation should not take place from March to August inclusive as per the Wildlife Act.

1b.The following mitigation is taken directly from the bat survey report:

"Removal of trees

a) Minimise the removal of mature trees, where possible. As many of the PBRs will be retained, where possible.
b) A total of 9 trees, deemed as PBRs, are proposed to be removed (Additional 4 PBR trees may be removed for Health & Safety). If the trees are to be removed, planting will be undertaken to mitigate for tree removal and landscaping plans will planted "like for like" in relation to tree and shrub species removed. Consideration will be given towards hawthorn, blackthorn mix with individual ash, alder and birch to form a native tree hedge) and deciduous trees (native tree species include ash, oak, alder, birch).
c) A 2nd assessment of the trees proposed to be removed will be undertaken prior to tree removal to determine total number of trees to be felled and the tree felling procedure to be undertaken. This will be undertaken in consultation with the tree surgeons.
Where possible, trees, which are to be removed, should be felled on mild days during the autumn months of September, October or November or Spring months of February and March (felling during the spring or autumn months avoids the periods when the bats are most active).
1c. Loss of Broadleaved Woodland. The detailed design of the greenway should ensure that the loss of trees be minimised, and the loss of high-value trees (very old or specimen) should be avoided entirely. The greenway must be set back from the stream by a minimum of 10m to ensure the continued integrity of the riparian zone. The width of the trackway should be minimised and the surfacing used should be rough/permeable (and so eliminate run-off).

The landscaping plan has been developed as part of the project design process. This process has retained a significant portion of the semi-natural habitat on the site. In addition, new native planting is proposed to reconnect the features being retained to the woodland along the Three Trouts Stream. Additional landscaping of open spaces will also increase connectivity and potential foraging areas for bats. The landscaping plan will incorporate:

Retention and enhancement of the majority of internal existing treelines / hedgerows, particularly those connected in the landscape to the wooded valley of the Three Trouts Stream.
- Retention and enhancement of boundary habitats.
- Retention of woodland along the Three Trouts Stream
- Retention of a number of mature trees in linear habitats proposed to be retained.
- Planting of new native hedgerow around the playing pitches
- Planting of new native hedgerow along two sections of the site boundary

In addition, the Landscape Plan proposes:
- Three open spaces with additional planting are proposed. This will potentially provide additional foraging areas for local bat populations.

2: Pollution during construction – mitigation by reduction

A Construction Management Plan has been prepared, and which includes pollution prevention measures in accordance with best practice guidelines from Inland Fisheries Ireland (2016). This identifies the location of the site compounds, storage areas for potentially polluting substances, and specific measures to prevent the loss of silt-laden water to any water course. This also takes into account the potential for pollution of the river during construction of the greenway.

Good site management in relation to sediment control during the construction phase will prevent this from occurring and mitigation measures are outlined below. Other measures to be implemented on site include briefing of all site contractors regarding the sensitivity of the watercourses within the site and the need for strict site management in relation to potential run off.

1.4 Land and Soils

1.4.1 Construction Phase

Avoidance and reduction of the volume of excavated material and backfill material has been a key consideration throughout the design process. Some of the residential units have been designed as a split level buildings in order to suit the topography of the site. The foul/surface drainage and watermain lines are located new proposed roads or footpaths in most of the proposed scheme so they do not require separate excavations.

All excavated materials will be assessed for signs of possible contamination such as staining or strong odours. While no such contamination was found during the Ground Investigation Report, best practice requires that this is continually assessed during the works.. Should it be determined that any of the soil excavated is contaminated, this will be managed according to best practice and disposed of accordingly by a licensed waste disposal contractor.

Construction operation will be required to take cognisance of the following guidance documents for construction work on, over or near water. CIRIA C532 Control of Water Pollution from Construction Sites Guidance for Consultants and Contractors.

The Construction Management Plan covers the design, construction, operation and maintenance phases of each project component. The Construction management plan will identify the key environmental issues across the project and provides strategies and plans for managing them effectively. It also defines the legal requirements for the project and identifies the regulatory permits and licences required for construction activities.

The project specific Construction Management Plan (CMP) has been prepared and submitted to the planning authority with this application and will be maintained by the contractor during the construction phase. The CMP is included in the SHD application material. The CMP includes a range of site specific measures which also include the following mitigation measures:-

- Stripping of topsoil will be carried out in a controlled and carefully managed way and coordinated with the proposed staging for the development.
- At any given time, the extent of topsoil strip (and consequent exposure of subsoil) will be limited to the immediate vicinity of active work areas.
- Topsoil stockpiles will be protected for the duration of the works and not located in areas where sediment laden runoff may enter watercourses.
- Topsoil stockpiles will also be located on site so as not to necessitate double handling.
- Topsoil will be re-used where possible in gardens and landscaping areas around the subject site.
- The design of road levels and finished floor levels has been carried out to minimise cut/fill type earthworks operations.
- Disturbed subsoil layers will be stabilised as soon as practicable. Therefore, backfilling of service trenches, construction of road capping layers, construction of building foundations and completion of landscaping), will all be carried out promptly to minimise the duration that subsoil layers are exposed to the effects of weather.
- Similar to comments regarding stripped topsoil, stockpiles of excavated subsoil material will be protected for the duration of the works. Stockpiles of subsoil material will be located separately from topsoil stockpiles.
- Measures will be implemented to capture and treat sediment laden surface water runoff (e.g. sediment retention ponds, surface water inlet protection and earth bunding adjacent to open drainage ditches).
- Where feasible, excavated material will be reused as part of the site development works (e.g. for landscaping works and for backfill in trenches under non-trafficked areas).
- Earthworks plant and vehicles delivering construction materials to site will be confined to predetermined haul routes around the site.
- Construction site mitigation such as wheel wash and dust suppression measures will be implemented as part of the construction process and will be detailed in the appointed contractor's construction management plan.
- All oils, fuels, paints and other chemicals will be stored in a secure bunded hardstand area.
- Refuelling and servicing of construction machinery will take place in a designated hardstanding area, remote from surface water inlets (when it is not possible to carry out such activities off-site).
- The results of the Site Investigations indicate that bedrock is between 3.6mBGL and 6.7mBGL. Therefore, it is unlikely that bedrock will be exposed during construction works accept in localised areas such as bridge abutment construction. Deep drainage works will be avoided where possible to reduce the possibility of impacting on bedrock. Should bedrock be encountered, the extent of exposed bedrock will be limited to the immediate vicinity of active work areas. Where bedrock

is encountered it will be crushed, screened and tested for use within the designed works to reduce the volume of material required to leave site. This will also reduce the volume of material to be imported to the site.

- Good housekeeping (site clean-ups, use of disposal bins, etc.) on the site project.
- In order to prevent the accidental release of hazardous materials (fuels, paints, cleaning agents, etc.) during construction site activity, all hazardous materials will be stored within secondary containment designed to retain at least 110% of the storage contents. Temporary bunds for oil/diesel storage tanks will be used on the site during the construction phase of the project. Safe materials handling of all potentially hazardous materials will be emphasised to all construction personnel employed during this phase of the project.

During construction works, all excavated materials including existing stockpiles will be visually assessed for signs of contamination. Should material appear to be contaminated, soil samples will be analysed by an appropriate testing laboratory. All potentially contaminated material will be either left in situ and characterised through laboratory testing; or segregated and stockpiled in a contained manner and characterised through laboratory testing. Any contaminated material will be appropriately disposed of or treated using a licensed waste contractor and in accordance with the Waste Management Regulations, 1998.

1.4.2 Monitoring

A pumping station will be constructed to pump sewage from the northern part of the site that will accommodate 43 dwelling sewage and pump it where it is going to be connected into the proposed sewer which will then be discharged by gravity sewer. The pumping station would also have enough storage to store up to 24 hours of sewage for the proposed 43 dwellings that it will serve. This timeframe would allow Irish Water to mitigate and implement remedial action to have the pumping station operational again in case of any malfunctions.

Construction phase monitoring relates to the good maintenance of mitigation measures outlined above in section 5.6 including the measures set out in the Construction Management Plan (CMP) submitted. Soil removed during the construction phase is to be monitored to maximise potential for re-use on site. Monitoring of any hazardous material stored on-site will form part of the proposed Construction & Waste Management Plan. A dust management/monitoring programme will be implemented during the construction phase of the development. The quantities of topsoil, subsoil and rock removed off site will be recorded.

Proposed monitoring during the construction phase in relation to the soil and geological environment are as follows:

- Adherence to the appointed contractors “Construction and Demolition Waste Management Plan”.
- Construction monitoring of the works (e.g. inspection of existing ground conditions on completion of cut to road sub-formation level in advance of placing capping material, stability of excavations etc.).
- Inspection of fuel / oil storage areas.
- Monitoring cleanliness of adjacent road network, implementation of dust suppression and provision of vehicle wheel wash facilities.
- Monitoring of contractor’s stockpile management (e.g. protection of excavated material to be reused as fill; protection of soils from contamination for removal from site)
- Monitoring sediment control measures (sediment retention ponds, surface water inlet protection etc.)
- Soil removed during the construction phase will be monitored to maximise potential for re-use on site.
- The quantities of topsoil, subsoil and rock removed off site will be recorded.

No ongoing monitoring will be required during the operational phase. An ongoing monitoring will be carried out by Irish Water on the proposed pumping station that will have a telemetry and wet kiosk that will monitor the inflows and outflows in the pumping station with an alert system that sends out a signal to Irish Water monitoring systems in case the pumping station fails.

1.5 Water

Mitigation measures follow the principles of avoidance, reduction and remedy. The most effective measure of avoidance is dealt with during the site selection and design stage, by ensuring that the development does not traverse or come in close proximity to sensitive hydrological attributes.

Where avoidance of the feature has not been possible, consideration has been given to locally modify the proposed development so as to reduce / minimise the extent of the impact. If any modifications are proposed to reduce hydrological impacts, it is necessary to also consider any associated impacts to the hydrological and ecological regimes.

1.5.1 Construction Phase

A new surface water drainage system has been designed to cater for the all impermeable paving throughout the site with a number of attenuation tanks proposed due to the additional surface water runoff due to the sheer scale of the site. Runoff will be stored on site with an allowable outflow of 2 l/s/ha, southern and eastern part of the site will be drained into existing drainage system and northern and western side of the site is going to be drained into Three Trout River stream.

- Construction activities will take cognisance of the following guidance documents for construction work on, over or near water.
- CIRIA C532 Control of Water Pollution from Construction Sites Guidance for Consultants and Contractors.
- IRIA C648 Control of Water Pollution from Constructional Sites. Guidelines for the Crossing of Watercourses during the Construction
- Adherence to the contractor's Construction Management Plan
- Adherence to the Operational Construction and Construction Management Plan that is submitted separately as part of the Planning process

The Construction Management Plan manual for the Proposed Project site has been formulated in consideration of the standard best practice. This Construction Management Plan encompasses a range of site-specific measures which include:

- Existing topsoil will be retained on site to be used for the proposed development. Topsoil will be stored in an appropriate manner on site for the duration of the construction works and protected for re-use on completion of the main site works. Stockpiles of topsoil/soils will be covered/dampened during dry weather to prevent spreading of sediment/dust;
- The Greenway along the stream will be constructed using a no dig method to prevent entry of sediment laden run-off to the Three Trout stream;
- Excavations would be backfilled as soon as is possible to reduce any infiltration of potentially polluting compounds to the subsurface and the aquifer;
- Top-soiling and landscaping of the works will take place as soon as finished levels are achieved, in order to reduce weathering and soil erosion and limit the generation of sediment laden run-off;
- A temporary site drainage system will be established for the duration of the construction works. All run-off from the site will be directed to settlement ponds and oil interceptors prior to discharge to existing site drain. This temporary system will throttle run-off and allowed suspended solids to settle out prior to entry to the site drain. The discharge to the site drain will be designed to prevent erosion and scour in the vicinity of the discharge. The discharge will be visually inspected regularly for any signs of contamination. Where any suspected contamination is observed, the discharge will cease immediately and will be treated and disposed of appropriately.
- Any minor volumes of groundwater required to be pumped during excavations will be passed through the temporary drainage system settlement prior to discharge to the existing site drain.
- Handling, transport and storage of fuel and chemicals will be controlled e.g. oil and fuel stored on site will be stored in designated areas. These areas will be bunded and located away from any surface water drainage.
- Refuelling of construction machinery will be undertaken in designated areas located away from surface water drainage.
- All machinery will be inspected at the start of each work shift for signs of leaking hydrocarbons. Parking areas will be inspected on a daily basis for evidence of hydrocarbons leaking from machinery.
- All potentially polluting materials will be stored in bunded areas, the capacity of which will be 110% the volume of the largest volume of material or 25% of the total volume of liquid to be stored, whichever is greater. The site manager will be responsible for ensuring that a copy of all relevant material safety data sheet for each product is available at storage locations as well as the site office.
- The washing of any plant equipment will be carried out in designated areas constructed to prevent potentially polluting material from entering surface or groundwater.
- Spill kits shall be kept in the machinery refuelling areas and any chemical/fuel storage areas in the event of spillages. The spill-kits will comprise suitable absorbent material, refuse bags etc. to allow for the appropriate clean-up and storage of contaminated material in the event of a spillage or leak occurring.

- Wheel wash facilities to prevent soil and mud being tracked onto the adjoining roads. In addition to this road washing machinery will be employed where possible;
- There will be no discharge of effluent to groundwater during the construction phase. All wastewater from the construction facilities will be stored for removal off site for disposal and treatment;
- If concrete mixing is carried out on site, the mixing plant will be sited in a designate area with impervious surface. Washwaters from cement mixing equipment will not be disposed of the surface
- The Contractor will be obliged to ensure no deleterious discharges are released from the site to surrounding watercourses during the construction stage. Throughout the works the Contractor will also take account of relevant legislation and best practice guidance including but not limited to the following:
- C532 Control of water pollution from construction sites: guidance for consultants and contractors.
- C648 Control of water pollution from linear construction projects
- SP156 Control of water pollution from construction sites – guide to good practice

Mitigation during the construction phase will include implementing best practice during excavation works to avoid sediment running into the drainage system which discharges to the Three Trout stream

1.5.2 Monitoring

Construction phase monitoring relates to the good maintenance of mitigation measures outlined above including the measures set out in the Construction Management Plan (CMP) submitted.

It is proposed that the construction of the development will be carried out in multiple phases. The primary access will be from Kilcoole Road where the proposed entrance will be constructed at the commencement of the project and the completion of the spine road that will eventually link between Kilcoole Road and Priory Road will be completed within the first phase. Priory Road may also be used for construction traffic, but this will be limited to access for the initial site setup and light vehicles only. The subject site has more than sufficient space that the construction compound and car parking for staff and operations can be accommodated entirely within the site. During the Construction Phase of the works, the Construction Management Plan requires the Contractor to put in place measures for monitoring the quality of run-off from the site into the Three Trouts river. These results are to be submitted to Wicklow County Council on an ongoing basis.

1.6 Air Quality and Climate

This section provides the measures that shall be implemented during the construction and operational phase and into the design of the development to miminise the impacts on the receiving environment, local population and human health, livestock and agricultural lands, local flora and fauna, local businesses and on climate.

1.6.1 Construction Phase

In order to ensure that adverse air quality impacts are minimised during the construction phase and that the potential for soiling of property and amenity and local public roads is minimised, the following mitigation measures shall be implemented during the course of all construction activities:

AQ CONST 1: Air Quality Mitigation Measures

- Avoid unnecessary vehicle movements and manoeuvring, and limit speeds on site so as to minimise the generation of airborne dust.
- Use of rubble chutes and receptor skips during construction activities.
- During dry periods, dust emissions from heavily trafficked locations (on and off site) will be controlled by spraying surfaces with water and wetting agents.
- Hard surface roads will be swept to remove mud and aggregate materials from their surface while any un-surfaced roads will be restricted to essential site traffic only.
- Re-suspension in the air of spillages material from trucks entering or leaving the site will be prevented by limiting the speed of vehicles within the site to 10kmh and by use of a mechanical road sweeper.
- The overloading of tipper trucks exiting the site shall not be permitted.
- Aggregates will be transported to and from the site in covered trucks.

- Where the likelihood of windblown fugitive dust emissions is high and during dry weather conditions, dusty site surfaces will be sprayed by a mobile tanker bowser.
- Wetting agents shall be utilised to provide a more effective surface wetting procedure.
- Exhaust emissions from vehicles operating within the construction site, including trucks, excavators, diesel generators or other plant equipment, will be controlled by the contractor by ensuring that emissions from vehicles are minimised by routine servicing of vehicles and plant, rather than just following breakdowns; the positioning of exhausts at a height to ensure adequate local dispersal of emissions, the avoidance of engines running unnecessarily and the use of low emission fuels.
- All plant not in operation shall be turned off and idling engines shall not be permitted for excessive periods.
- Material handling systems and site stockpiling of materials will be designed and laid out to minimise exposure to wind. Water misting or sprays will be used as required if particularly dusty activities are necessary during dry or windy periods.
- Material stockpiles containing fine or dusty elements including top soils shall be covered with tarpaulins.
- Where drilling or pavement cutting, grinding or similar types of stone finishing operations are taking place, measures to control dust emissions will be used to prevent unnecessary dust emissions by the erection of wind breaks or barriers. All concrete cutting equipment shall be fitted with a water dampening system.
- A programme of air quality monitoring shall be implemented at the site boundaries for the duration of construction phase activities to ensure that the air quality standards relating to dust deposition and PM_{10} are not exceeded. Where levels exceed specified air quality limit values, dust generating activities shall immediately cease and alternative working methods shall be implemented.
- A complaints log shall be maintained by the construction site manager and in the event of a complaint relating to dust nuisance, an investigation shall be initiated.
- Dust netting and site hoarding shall be installed along the north, south, east and western site boundaries to minimise fugitive windblown dust emissions falling on third party lands and existing residential areas.

1.6.2 Monitoring

1.6.2.1 Construction Phase

This section describes the dust monitoring methodologies that shall be implemented at the site during the construction phases to ensure that dust and construction vehicle exhaust emissions as NO_2 generated by site activities does not cause nuisance or cause adverse health effects to residential areas and other receptors located in the vicinity of the site boundaries.

Dust Deposition Monitoring Methodology

Dust deposition levels will be monitored to assess the impact that site construction site activities may have on the local ambient air quality and to demonstrate that the environmental control measures in place at the site are effective in minimising the impact of construction site activities on the local receiving environment including existing residential developments and lands bordering the site. The following procedure shall be implemented at the site on commencement of site activities:

The dust deposition rate will be measured by positioning Bergerhoff Dust Deposit Gauges at strategic locations near the boundaries of the site for a period of 30 +-2 days. Monitoring shall be conducted on a monthly basis during periods when the highest levels of dust are expected to be generated i.e., during site preparation works and soil stripping activities and on a quarterly basis thereafter.

The selection of sampling point locations will be completed after consideration of the requirements of *Method VDI 2119* with respect to the location of the samplers relative to obstructions, height above ground and sample collection and analysis procedures. The optimum locations will be determined by a suitably qualified air quality expert to ensure that the dust gauge locations are positioned in order to best determine potential dust deposition in the vicinity of the site boundaries and existing on-site buildings.

After each (30 +-2 days) exposure period, the gauges will be removed from the sampling location, sealed and the dust deposits in each gauge will be determined gravimetrically by an accredited laboratory and expressed as a dust deposition rate in mg/m^2-day in accordance with the relevant standards.

Technical monitoring reports detailing all measurement results, methodologies and assessment of results shall be subsequently prepared and maintained by the Site Manager. Monitoring reports shall be made available to the Local Authority as requested.

A dust deposition limit value of 350 mg/m^2-day (measured as per German Standard Method VDI 2119 – Measurement of Particulate Precipitations – Determination of Dust Precipitation with Collecting Pots Made of Glass (Bergerhoff Method) or Plastic. is commonly specified by Local Authorities and by the EPA to ensure that no nuisance effects will result from specified activities and it is to this Best Practice standard method that this programme of dust monitoring and control has been prepared.

The *German Federal Government Technical Instructions on Air Quality Control - TA Luft* specifies an emission value for the protection against significant nuisances or significant disadvantages due to dustfall. This limit value is 350 mg/m^2-day and it is to this limit value that all measured dust deposition levels shall be assessed. This limit value is commonly specified by Local Authorities at construction sites.

The results of all dust deposition surveys shall be maintained by the Project Manager and shall be made available to Wicklow County Council.

NO_2 Monitoring Methodology

In order to assess the impact on existing air quality that vehicle and plant exhaust emissions associated with the construction phase of the development may have, it is proposed that a programme of Nitrogen Dioxide monitoring shall be undertaken for a 1 year period at the baseline air quality locations, A1 & A2. The purpose of this monitoring programme will be to verify the effectiveness of the various construction phase mitigation measures and to quantify by measurement, the concentration of NO2 in the ambient air to allow for the assessment of measured NO_2 levels against levels measured in EPA Zone D areas over a similar period. NO2 levels shall also be assessed against the annual limit value NO_2 as defined in National Air Quality Standards Regulations 2011 (S.I No. 180 of 2011) which specify an annual limit value of 40 µg/m^3, for the protection of human health, over a calendar year.

1.7 Noise and Vibration

1.7.1 Construction Phase

General Construction Site Management

The following noise management measures shall be implemented at the site from the outset of site activities to control and manage noise levels during the construction phase of the proposed development:

NV CONST 1 Noise Mitigation Measures

An independent acoustic consultant shall be engaged by the contractor prior to the commencement of site activities to ensure that all noise mitigation measures as specified in this Section of the EIAR are implemented and to prepare a site specific *Construction Phase Noise Management Plan.* The Plan shall include all relevant noise and vibration control measures as specified in this Chapter of the EIAR. The Plan shall be submitted to Meath County Council for approval as required.

The nominated contractor shall appoint a designated person to manage all environmental complaints including noise and vibration.

A noise complaint procedure shall be implemented in which the details of any noise related complaint are logged, investigated and where required, measures are taken to ameliorate the source of the noise complaint.

Appropriate signage shall be erected on all access roads in the vicinity of the site to inform HGV drivers that engines shall not be left idling for prolonged periods and that the use of horns shall be banned at all times.

HGV's queuing on any local or public road shall not be permitted and it shall be the responsibility of site management to ensure this policy is enforced.

The hours of operation for the site shall be limited to the following hours (or where otherwise agreed with the Planning Authority):

07:00hrs – 19:00hrs Monday to Friday
08:00hrs – 14:00hrs Saturday
Closed on Sundays and Bank/Public Holidays

All onsite generator units (if required) used to supply electricity to the site shall be silenced models or enclosed and located away from any receptor.

The site compound shall be located at a point on site furthest away from any residential development.

Mains power shall be used to supply electricity to all site offices and site lighting at the earliest instance.

The use of generators during the night-time shall be avoided.

Construction Phase Noise Control & Mitigation

The following shall be implemented to mitigate construction noise impacts in order to ensure that the construction phase of the development does not have an unacceptable impact on sensitive receptors:

NV CONST 2 Construction Works Noise Mitigation Measures

- A strictly enforced noise management programme shall be implemented at the site from the outset of construction activities.

- The Developer shall appoint an acoustic consultant independent of the Contractor to conduct routine noise audit surveys which shall be conducted at the baseline noise monitoring locations throughout the construction phase of the development to assess compliance with the construction noise limit criteria and to assess the effectiveness and implementation of the specific Construction Phase noise mitigation measures detailed in this document.

- The principal of controlling noise at source shall be implemented at the site. Best practice mitigation techniques as specified in *BS 5228:2009+A1 2014 – Noise and Vibration Control on Construction and Open Sites* shall be implemented during the construction phase and are detailed in this Section.

- Noisy stationary equipment shall be sited away from sensitive site boundaries as far as practicable.

- Where reasonable practicable, noisy plant or activities shall be replaced by less noisy alternatives if noise breaches and/or complaints occur.

- Proper use of plant with respect to minimising noise emissions and regular maintenance will be required.

- All vehicles and mechanical plant will be fitted with effective exhaust silencers and will be maintained in good efficient order

- Where noisy plant is required to operate in works areas next to residential houses low noise plant options will be used wherever practicable.

- Dumpers and any plant used for moving materials around the site will have high performance exhaust silencers.

- Selected use of rubber-tyred equipment over steel track equipment where practicable.

- The use of inherently quiet plant is required where appropriate – all compressors and generators will be “sound reduced” or “super silent” models fitted with properly lined and sealed acoustic covers, which will be kept closed whenever the machines are in use, and all ancillary pneumatic percussive tools will be fitted with mufflers or silencers of the type recommended by the manufacturers.

- All compressors, generators and pumps shall be silenced models fitted with properly lined and sealed acoustic covers or enclosures, which will be kept closed whenever the machines are in use.

- All pneumatic percussive tools such as pneumatic hammers shall be fitted with dampers, mufflers or silencers of the type recommended by the manufacturer.

- Fixed items of plant shall be electrically powered in preference to being diesel or petrol driven.

- Vehicles and mechanical plant utilised on site for any activity associated with the works shall be fitted with effective exhaust silencers and shall be maintained in good working order and operated in a manner such that noise emissions are controlled and limited as far as reasonably practicable.

- Any plant, equipment or items fitted with noise control equipment found to be defective in shall not be operated until repaired / replaced.

- Machines in intermittent use shall be shut down in the intervening periods between works or throttled down to a minimum during periods when not in use.

- Static noise emitting equipment operating continuously shall be housed within suitable acoustic enclosure, where appropriate.

- All excavator mounted pneumatic breakers used for demolition and ground breaking activities shall be fitted with effective dampeners and /or enclosed within a noise adsorbing blanket structure to minimise noise emissions.

- Site activities shall be staggered when working in proximity to any receptor, that is concrete cutting and rock breaking should where possible. This proposed method of working will provide effective noise management of site activities to ensure that any receptor is not exposed to unacceptably high levels of noise over extended periods.

- Excessive reviving of all vehicles shall be avoided.

- Unnecessary dropping of heavy items onto ground surfaces shall be banned.

- The use of an excavator bucket to break up slabs of concrete or tarmacadam shall not be permitted.

- The dragging of materials such as steel covers, plant or excavated materials along ground surfaces shall not be permitted.

- The use of acoustic screens to attenuate noise at source shall be implemented as deemed necessary.

- Plant Reversing Alarms: Where reasonably practicable and deemed safe by risk assessment, taking into account onsite hazards and working environment, the tonal reversing alarms of mobile plant shall be replaced with broadband alarms.

- A nominated person from the Project Management team will be appointed to liase with local residents and businesses regarding noise nuisance events.

- In the event of the requirement for out of hours work to occur which will involve the generation of noise levels that are predicted to exceed out of hours noise limit criteria, Wicklow County Council shall be immediately notified prior to the works commencing.

- A nominated person from the Project Management team will be appointed to liaise with and inform local residents and Wicklow County Council regarding out of hours works.

- An independent acoustic consultant shall review the implementation of the recommended mitigation measures on a monthly basis.

The images below describe the use of noise screens for construction activities.

It is recommended that high performing acoustic barriers are utilised such as Echo Barrier products or Ventac products.

Double height acoustic blanket enclosure

Acoustic blankets screening piling and excavations

3 sided Acoustic enclosure for surrounding breaking, cutting works

Construction Phase Vibration Control & Mitigation

The following specific vibration mitigation and control measures shall be considered during the construction phase:

NV CONST 3 Vibration Mitigation Measures

- Breaking out concrete elements using low vibration tools
- Choosing alternative, lower-impact equipment or methods wherever possible
- Scheduling the use of vibration-causing equipment, such as jackhammers, at the least sensitive time of day
- Routing, operating or locating high vibration sources as far away from sensitive areas as possible
- Sequencing operations so that vibration causing activities do not occur simultaneously

- Isolating the equipment causing the vibration on resilient mounts
- Keeping equipment well maintained.
- Confining vibration-generating operations to the least vibration-sensitive part of the day which could be when the background disturbance is highest
- A nominated person from the Project Management team will be appointed to liaise with local residents and businesses regarding vibrational nuisance events.
- An independent acoustic consultant shall review the implementation of the recommended mitigation measures on a monthly basis.

In order to ensure that site construction activities are conducted to minimise the vibration impacts on the receiving environment, structural vibration monitoring shall be conducted during the course of the project works if required.

It is proposed that vibration monitoring will be conducted at properties adjacent to or within 50m of the site as required using calibrated vibration monitors and geophones capable of transmitting live text and email alerts to ensure that if vibration levels approach or exceed specified warning and limit values, site personnel will be alerted to cease at the earliest instance and appropriate mitigation measures may then be implemented to minimise the vibrational impacts of protected structures.

As detailed in Section 8.2.2 the transient vibration guide values for cosmetic damage as specified in British Standard BS 7385:, Evaluation and measurement for vibration in buildings, Part 2 1993 Guide to damage levels arising from ground borne vibration is 15 mm/sec Peak Component Particle Velocity at 4 Hz increasing to 20 mm/sec at 15 Hz. This limit value rises to 50 mm/sec at frequencies of 40 Hz and greater. The applied conservative limit of 12.5 mm/sec PPV (peak particle velocity) applied for this assessment is significantly lower than these levels.

Having regard to the above we suggest the inclusion of the following mitigation measure for ease of reference:

N V CONST 4

In order to protect the amenities enjoyed by nearby residents, premises and employees a full Construction Management Plan (including traffic management) shall be put in place prior to the commencement of development. This will have regard to the mitigation measures set out in Section 8.9 of the EIA Report.

1.8 Landscape and Visual

1.8.1 Construction Phase

The remedial measures proposed revolve around the implementation of appropriate site management procedures – such as the control of site lighting, storage of materials, placement of compounds, delivery of materials, car parking, etc. Visual impact during the construction phase will be mitigated somewhat through appropriate site management measures and work practices to ensure the site is kept tidy, dust is kept to a minimum, and that public areas are kept free from building material and site rubbish.

Site hoarding will be appropriately scaled, finished and maintained for the period of construction of each section of the works as appropriate. To reduce the potential negative impacts during the construction phase, good site management and housekeeping practices will be adhered to. The visual impact of the site compound and scaffolding visible during the construction phase are of a temporary nature only and therefore require no remedial action other than as stated above.

A number of existing trees are to be retained and these are shown in the Arboricultural Reports. Existing trees to be retained are particularly sensitive to negative impacts during the construction phase if proper protection measures are not adhered to. With regard to the protection of the retained trees on site during proposed construction works, reference should be made to BS5837: Trees in relation Design, Demolition and Construction – Recommendations (BSI, 2012). Tree protection details will be included with the application to the Board.

1.9 Material Assets – Traffic

1.9.1 Construction Phase

It is considered that the construction traffic, with primary access from the Regional Roads of the R761 Kilcoole Road and the R744 Farrankelly Road, will not impact significantly on the existing traffic situation on the surrounding road network.
To minimise disruption to the surrounding environment, the following mitigation measures will be implemented:

- During the pre-construction phase, the site will be securely fenced off from adjacent properties, public footpaths and roads.
- All road works will be adequately signposted and enclosed to ensure the safety of all road users and construction personnel.
- A dedicated 'construction' site access / egress junction will be provided with manned security during all construction phases.
- Provision of sufficient on-site parking and compounding to ensure no potential overflow of construction generated traffic onto the local network.
- Site offices and compound will be located within the site boundary. The site will be able to accommodate employee and visitor parking throughout the construction period through the construction of temporary hardstanding areas.
- A material storage zone will also be provided in the compound area. This storage zone will include material recycling areas and facilities.
- A series of 'way finding' signage will be provided to route staff / deliveries into the site and to designated compound / construction areas.
- Dedicated construction haul routes will be identified and agreed with the local authority prior to the commencement of constructions activities on-site.
- Truck wheel washes will be installed at construction entrances if deem necessary and any specific recommendations with regard to construction traffic management made by the Local Authority will be adhered to.

1.10 Material Assets – Waste Management

The Construction and Operational Waste Management Plans have been designed to ensure that the construction and operational phases of the proposed development will be managed to reduce the generation of unsegregated wastes, to maximise the potential for recycling, recovery and re-use and to demonstrate how the development will operate in a sustainable manner in terms of waste management and contribute to the achievement of the Regions compliance with the waste reduction targets specified in *The Eastern-Midlands Region Waste Management Plan 2015-2021* (and any subsequent future revisions).
The general principles and key aspects of the Construction and Operational Waste Management Plans are detailed as follows:

1.10.1 Construction Phase Waste Management Plan

The Construction Phase Waste Management Plan prepared by Byrne Environmental (included with the SHD application) specifically addresses the following points:

Waste materials generated by construction activities will be managed according to the Department of the Environment, Heritage and Local Government's 2006 Publication - *Best Practice Guidelines on the Preparation of Waste Management Plans for Construction and Demolition Projects.*

- Analysis of waste arisings / material surpluses
- Specific Waste Management objectives for the Project including the potential to re-use existing on-site materials for further use in the construction phase.
- Methods proposed for Prevention, Reuse and Recycling
- Waste Handling Procedures
- Waste Storage Procedures
- Waste Disposal Procedures
- Record Keeping
- Record Keeping

Waste minimisation and prevention shall be the primary responsibilities of the Construction Project Manager who shall ensure the following:

Materials will be ordered on an *"as needed"* basis to prevent over supply

Materials shall be correctly stored and handled to minimise the generation of damaged materials

Materials shall be ordered in appropriate sequence to minimise materials stored on site

Sub contractors will be responsible for similarly managing their wastes

1.10.1.1 Programme of Waste Management for Construction Works

It is proposed that the construction Contractor as part of regular site inspection audits will determine the effectiveness of the waste management statement and will assist the project manager in determining the best methods for waste minimisation, reduction, re-use, recycling and disposal as the construction phase progresses and waste materials are generated.

1.10.1.2 Construction Waste Disposal Management

It is proposed that from the outset of construction activities, a dedicated and secure compound containing bins, and/or skips, and storage areas, into which all waste materials generated by construction site activities, will be established within the active construction phase of the development site.

In order to ensure that the construction contractor correctly segregate waste materials, it is the responsibility of the site construction manager to ensure all staff are informed by means of clear signage and verbal instruction and made responsible for ensuring site housekeeping and the proper segregation of construction waste materials.

It will be the responsibility of the Project Construction Manager to ensure that a written record of all quantities and natures of wastes exported -off site are maintained on-site in a Waste File at the Project office.

It is the responsibility of the Project Manager or his/her delegate that all contracted waste haulage drivers hold an appropriate Waste Collection Permit for the transport of waste loads and that all waste materials are delivered to an appropriately licenced or permitted waste facility in compliance with the following relevant Regulations:

Waste Management (Collection Permit) Regulations 2007 (SI No. 820 of 2007)
Waste Management (Collection Permit) Amendment Regulations 2008 (SI No. 87 of 2008)
Waste Management (Facility Permit and Registration) Regulations S.I.821 of 2007 and the Waste Facility Permit under the Waste Management (Facility Permit and Registration) Amendment Regulations S.I.86 of 2008.

Prior to the commencement of the Project, the Construction / Project Manager shall identify a permitted Waste Contractor who shall be employed to collect and dispose of all wastes arising from the project works. In addition, the Construction / Project Manager shall identify and all waste licensed / permitted facilities that will accept all expected waste exported off-site and will maintain copies of all relevant Waste Permits / Licences as required.

All waste soils prior to being exported off-site, shall be classified as inert, non-hazardous or hazardous in accordance with the *EPA's Waste Classification Guidance – List of Waste & Determining if Waste is Hazardous or Non-Hazardous* document dated 1st June 2015 to ensure that the waste material is transferred by an appropriately permitted waste collection permit holder and brought to an appropriately permitted or licensed waste facility.

1.10.1.3 On-Site Waste Reuse and Recycling Management

Construction waste material such as soils, damaged or broken concrete slabs, blocks, bricks and tiles generated that is deemed by the Project Engineer to be suitable for reuse on the Project site for ground-fill material and landscaping. This initiative shall provide a positive environmental impact to the construction phase as follows:

- Reduction in the requirement for virgin aggregate materials from quarries
- Reduction in energy required to extract, process and transport virgin aggregates
- Reduced HGV movements associated with the delivery of imported aggregates to the site
- Reduced noise levels associated with reduced HGV movements
- Reduction in the amount of landfill space required to accept C&D waste
- Reduction in the volume of soils to be exported off-site

1.10.1.4 Waste Storage Compound

A waste storage compound shall be set up on-site from the commencement of site activities. The compound shall include the following:

Separate waste skips labelled with signage stating the nature of waste materials that can only be placed in the skips

Waste oils / containers shall be placed in dedicated mobile bunds units.

Soils contaminated by accidental on-site spillages of oils / construction hydrocarbons shall be stored in clearly identified hazardous waste storage containers.

Spill kits with instructions shall be located in the waste storage compound.

1.10.1.5 Soils

As the subject development site is currently greenfield and in agricultural use with no evidence of historic dumping or industrial use, it is predicted that the top and subsoils will be characterised as being inert in accordance with *Landfill Directive (2003/33/EC).*

Top and subsoils shall be re-used on-site for landscaping purposes to minimise the volume of soils to be exported off-site

Excess soils shall be exported to an appropriately waste permitted/licenced facility.

The project manager shall inform Wicklow County Council of the volume of excess soils generated and the permitted / licenced waste facility they shall be exported to.

Excess soils shall be removed off-site throughout the duration of the construction phase. Prior to being removed off-site the excess soils shall be characterised as being inert, non-hazardous or hazardous in accordance with *Landfill Directive (2003/33/EC).* The classification of the soils shall be established by WAC testing which shall occur throughout the construction phase.

Excavated excess soils that are required to be exported off-site shall be tested to determine their classification as hazardous or non-hazardous in accordance with EPA *Waste Classification – List of Waste & Determining if Waste is Hazardous or Non-Hazardous. Non-Hazardous soils may be suitable for re-use in other construction sites and may be declared as a by-product in accordance with Article 27* of the *European Communities (Waste Directive) Regulations 2011*. Article 27 requires that the material classified not a waste but a by-product must meet specific criteria and that that a declaration of a material as a by-product is notified to the EPA.

1.10.1.6 Contaminated Soils

Where contaminated soils/materials are discovered or occur as a result of accidental spillages of oils or fuels during the construction phase, these areas of ground will be isolated and tested in accordance with the *2002 Landfill Directive (2003/33/EC)* for contamination, and pending the results of laboratory WAC testing, will be excavated

1.10.1.7 Soils

As the subject development site is currently greenfield and in agricultural use with no evidence of historic dumping or industrial use, it is predicted that the top and subsoils will be characterised as being inert in accordance with *Landfill Directive (2003/33/EC).*

Top and subsoils shall be re-used on-site for landscaping purposes to minimise the volume of soils to be exported off-site

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1.10.1.8 Contaminated Soils

Where contaminated soils/materials are discovered or occur as a result of accidental spillages of oils or fuels during the construction phase, these areas of ground will be isolated and tested in accordance with the *2002 Landfill Directive (2003/33/EC)* for contamination, and pending the results of laboratory WAC testing, will be excavated

1.10.1.9 Record Keeping

It is the responsibility of the Project Manager or his/her delegate that a written record of all quantities and natures of all wastes reused / recycled and exported off-site and Article 27 declarations during the project are maintained in a Waste File at the Project office.

The following information shall be recorded for each load of waste exported off-site:

- Waste Type EWC Code and description
- Volume of waste collected
- Waste collection contractor's Waste Collection Permit Number and collection receipt including vehicle registration number
- Destination of waste load including Waste Permit / Licence number of facility
- Description of how waste at facility shall be treated : disposal / recovery / export
- The waste records shall be issued to Wicklow County Council as required / requested.

1.10.1.10 Waste Management Auditing

In order to ensure that construction wastes generated during the course of the development are being effectively managed and recorded, a waste management audit shall be conducted on a routine basis by an independent waste management consultant to determine compliance with the Construction Phase Waste Management Plan.

1.11 Material Assets – Utilities

1.11.1 Construction Mitigation

The construction works contractor should liaise with the relevant utilities provider prior to works commencing, with on-going consultation throughout the proposed development. Where new services would be required, the construction works contractor should apply to the relevant utility provider and adhere to the requirements outlined in the connection permit / licence.

- The Contractor will be obliged to put measures in place to ensure that there are no interruptions to existing services unless this has been agreed in advance with the relevant service provider.
- All works in the vicinity of utilities apparatus will be carried out in ongoing consultation with the relevant utility company or local authority and will be in compliance with any requirements or guidelines they may have.
- Where new services or diversions to existing services are proposed, the Contractor will apply to the relevant utility company for a connection permit where appropriate, and will adhere to their requirements.
- Mitigation measures proposed in relation to the drainage and water infrastructure include the following:
- A detailed "Construction Management Plan" will be developed and implemented during the construction phase. Site inductions will include reference to the procedures and best practice as outlined in the "Construction Management Plan".
- Surface water runoff from areas stripped of topsoil and surface water collected in excavations will be directed to on-site settlement ponds where measures will be implemented to capture and treat sediment laden runoff prior to discharge of surface water at a controlled rate.
- In the event of groundwater being encountered during the construction phase, mitigation measures will include dewatering by pumping to an appropriate treatment facility prior to discharge. Other measures would include excluding contaminating materials such as fuels and hydrocarbons from sensitive parts of the site i.e. highly vulnerable groundwater areas.
- In order to reduce the risk of defective or leaking sewers, all new sewers should be laid in accordance with Irish Water standards, pressure tested and CCTV surveyed to ascertain any possible defects.
- The construction compound will include adequate staff welfare facilities including foul drainage and potable water supply. Foul drainage discharge from the construction compound will be removed off site to a licensed facility until a connection to the public foul drainage network has been established.
- The construction compound's potable water supply shall be protected from contamination by any construction activities or materials.
- Where possible backup network supply to any services will be provided should the need for relocation or diversion or existing services be required otherwise relocation or diversion works will be planned to incur minimal impact, with users notified in advance of any works.
- Connections to the existing gas and telecommunications networks will be coordinated with the relevant utility provider and carried out by approved contractors.

1.12 Archaeology, Architecture and Cultural Heritage

Archaeology

A full programme of archaeological excavation (preservation by record) will be carried out at Archaeological Areas 1-3, as identified in the testing report, prior to the commencement of the development. This will be carried out by an archaeologist under licence to the DoCHG. Full provision will be made available for the resolution of the archaeological remains, both during fieldwork and the post-excavation process.

At the time of previous archaeological testing, Field 4 was not included within the proposed development area. It is now proposed to install playing pitches and car parking in this area. Additional archaeological testing will be carried out within Field 4 prior to the commencement of the development. This will be carried out by an archaeologist under licence to the DoCHG. Full provision will be made available for the resolution of the archaeological remains, both during fieldwork and the post-excavation process.

All topsoil stripping associated with the proposed development will be monitored by a suitably qualified archaeologist. Full provision will be made available for the resolution of any archaeological remains that may be identified, both during fieldwork and the post-excavation process.

1.13 Risk Management for Major Accidents

The proposed development will involve the ground works to facilitate the proposed development. Site investigations have been carried out and have not identified any hazardous material. Further testing will be carried out prior to construction to inform the detailed design. In the event that any hazardous material is identified the appropriate measures will be taken in accordance with the requirements of the EPA. The excavation and movement of soil from the site will be undertaken by a registered specialist contractor and removed to a licenced facility. The following are outlined:

- Hazardous materials used during construction will be appropriately stored so as not to give rise to a risk of pollution.
- In the event of storms or snow, construction activity can be halted and the site secured. The construction activity will involve a number of potential risks, as set out below. The risks identified include traffic management, and fire strategy.
- During the construction stage, the risk of accidents associated with the proposed development are not predicted to cause unusual, significant or adverse effects to the existing public road network. The vast majority of the works are away from the public road in a controlled environment. The objective of which is to minimise the short term disruption to local residents, and reduce the potential for accidents.
- Furthermore, is expected that the risk of accidents would be low during the construction of the proposed development considering the standard construction practices which are to be used.
- With reference to natural disasters (e.g. flooding), the proposed development has undergone a Site Specific Flood Risk Assessment, prepared by ROD Consulting Engineers. The main area of the site where development is proposed is not at risk of fluvial, pluvial or groundwater flooding.
- A Health and Safety Plan will be prepared (required by the Safety, Health and Welfare at Work (Construction) Regulations 2013) to address health and safety issues from the design stages through to the completion of the construction and maintenance phases. The Health and Safety Plan will comply with the requirements of the Regulations and will be reviewed as the development progresses.
- Safety on site will be of paramount importance. Only contractors with the highest safety standards will be selected. During the selection of the relevant contractor and the respective subcontractors their safety records will be investigated.
- Prior to working on site, each individual will receive a full safety briefing and will be provided with all of the safety equipment relevant to the tasks the individual will be required to perform during employment on site.
- Safety briefings will be held regularly and prior to any onerous or special task. 'Toolbox talks' will be held to ensure all workers are fully aware of the tasks to be undertaken and the parameters required to ensure the task will be successfully and safely completed.
- All visitors will be required to wear appropriate personal protective equipment prior to going on to the site and will undergo a safety briefing by a member of the site safety team.
- Regular site safety audits will be carried out throughout the construction programme to ensure that the rules and regulations established for the site are complied with at all times.