CS CONSULTING
GROUP
DUBLIN - LONDON - LIMERICK

CRONIN & SUTTON CONSULTING (part of the CS Consulting Group)
19-22 Dame Street, Dublin 2, D02 E267, Ireland

T | 353 1 5480863 E | info@csconsulting.ie W | www.csconsulting.ie

# Stage 1 Construction and Waste Management Plan

## Proposed Residential Development Belmount, Academy Street, Navan, County Meath

Client: Coindale Limited

Job No. D061

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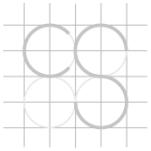
Limerick Office:
45 O'Connell Street
Limerick, V94 XE18
Ireland

T: 353 (0)61 594988
E: info@csconsulting.ie
W: www.csconsulting.ie

London Office:
45 Beech Street
London, EC2Y 8AD
UK

T: +44 (0) 207 070 3660
E: info@csconsultinguk.com
W: www.csconsultinguk.com



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# STAGE 1 CONSTRUCTION AND WASTE MANAGEMENT PLAN

## PROPOSED RESIDENTIAL DEVELOPMENT BELMOUNT, ACADEMY STREET, NAVAN, COUNTY MEATH

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|---|---|---|---|---|---|
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## 1.0 INTRODUCTION

Cronin & Sutton Consulting have been commissioned by Coindale Limited to prepare a Stage 1 Construction and Waste Management Plan to accompany a planning application for a development at Belmount, Academy Street, Navan, County Meath. The Stage 1 Construction and Waste Management Plan includes a description of the proposed works and how these works will be managed for the duration of the works on site. This plan will be updated by the Contractor and agreed with Meath County Council (by the appointed Contractor) in advance of the construction phase.

The project will be under the control of a main contractor who will be appointed after the approval is granted for the Project Application. Upon appointment and once familiar with the site and having developed a final detailed methodology for the construction of the Development Project, the contractor will prepare a Detailed Construction Management Plan. It is anticipated the detailed plan will be based upon this plan and associated Appendix A – Summary of EIAR Mitigation and Monitoring Measures. This stage 1 Construction and Waste Management Plan is a preliminary plan which has been prepared to give an outline of the processes to be employed during construction of this project. Prior to the on-site activities commencing, this plan will be revised by the contractor and expanded to provide a project specific site management plan, incorporating:

- Operational Health & Safety (OH&S) Management Plan;
- Environmental Management Plan including a Waste Management Plan;
- Pedestrian and Traffic Management Plan.

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

- That all site activities are effectively managed to minimise the generation of waste and to maximise the opportunities for on-site reuse and recycling of waste materials.
- To ensure that all waste materials generated by site activities, that cannot be reused on site, are removed from site by appropriately permitted waste haulage contractors and that all wastes are disposed of at approved waste licensed / permitted facilities in compliance with the Waste Management Act 1996, the Waste Management (Amendment) Act 2001 and the Protection of the Environment Act 2003.
- To manage and control any environmental impacts (noise, vibration, dust, water) that project construction work activities may have on receptors and properties that are located adjacent to project work areas and on the local receiving environment.
- To comply with planning conditions and requirements relating to waste management as required by Meath County Council.

The proposed stage 1 Construction and Waste Management Plan has been prepared to demonstrate how the appointed contractor and the appointed Project Supervisors will comply with the following relevant legislation, and relevant Best Practice Guidelines:

- Integrated Pollution Prevention and Control Directive (1996/61/EC)
- The Waste Framework Directive (Directive 2008/98/EC)
- Environmental Protection Agency Act 1992,
- Waste Management Act 1996, the Waste Management (Amendment) Act 2001 and the Protection of the Environment Act 2003.
- Waste Management (Collection Permit) (Amendment)(No.2) Regulations 2016.
- Waste Management (Permit) Regulations 1998 (SI No. 165 of 1998)
- Department of the Environment, Heritage and Local Government – Best Practice Guidelines on the Preparation of Waste Management Plans for Construction and Demolition Projects – June 2006

- Local Government Water Pollution Act 1977
- Guidelines on Protection of Fisheries During Construction Works in and adjacent to Waters (IFI, 2016)

This Stage 1 Construction and Waste Management Plan presents the potential environmental impacts and proposed management and monitoring methodologies based on the concept of Best Practice and the proposed mitigation measures to be implemented at the site.

## 2.0 SITE LOCATION AND PROPOSED DEVELOPMENT

### 2.1 Site Location

The site of the proposed development lies along the west of Academy Street and to the Dublin Road. The site has a total area of approx. 15.10ha and is located in the administrative jurisdiction of Meath County Council.

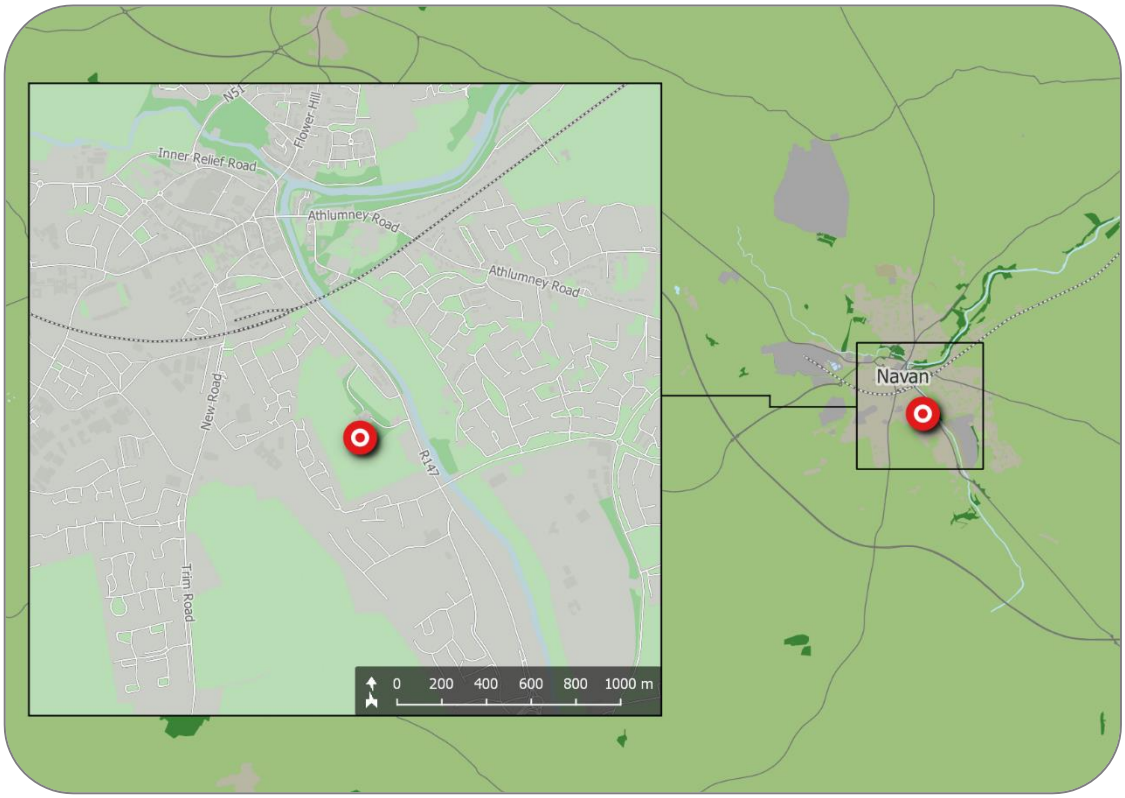


Figure 1 – Location of proposed development site
*(map data sources: EPA, OSM Contributors)*

The location of the proposed development site is shown in Figure 1 above; the indicative extents of the development site, as well as relevant elements of the surrounding road network, are shown in more detail in figure 2.

The site is bounded to the west and south by existing dwellings; to the east by existing dwellings and Academy Street and to the north by agricultural lands and Belmount House located in proximity to the centre of the subject site.


Figure 2 – Site extents and transport infrastructure
(map data and imagery sources: NTA, OSM Contributors, Google)

## 2.2 Existing Land Use

The subject site is greenfield and predominantly in agricultural use.

## 2.3 Description of Proposed Development

The proposal relates to a residential development of 544 no. dwellings on a site of c. 15.1 hectares comprising 260 no. houses (18 no. 2 bed, 207 no. 3 bed & 35 no. 4 bed) and 198 no. apartments (46 no. 1 bed, 152 no 2 bed), 30 no. duplex apartments (15 no. 2 bed & 15 no. 3 bed), and 56 no. dwellings in corner blocks (16 no. 1 bed, 24 no. 2 bed & 16 no. 3 bed) as well as the provision of two crèches (ground floor of apartment building [c. 195 sq. m] and single storey creche in housing area [c. 443 sq. m]) Open Space of c. 2.63 hectares 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; Provision of vehicular and pedestrian looped access through the site from 3 no. junctions located on Academy Street as well as pedestrian connection in south east of site to Dublin Road and upgrade works to junction onto the Dublin Road; along with 875 no. car parking spaces (including 4 no. car sharing spaces) and 581 cycle spaces; Surface water attenuation measures and underground attenuation systems as well as all ancillary site development works (reprofiling of site as required) as well as connection to existing public water supply and drainage services. All site development and landscape works.

The proposed development shall be constructed in five phases. Please refer the Figure 3 for the site layout phasing.

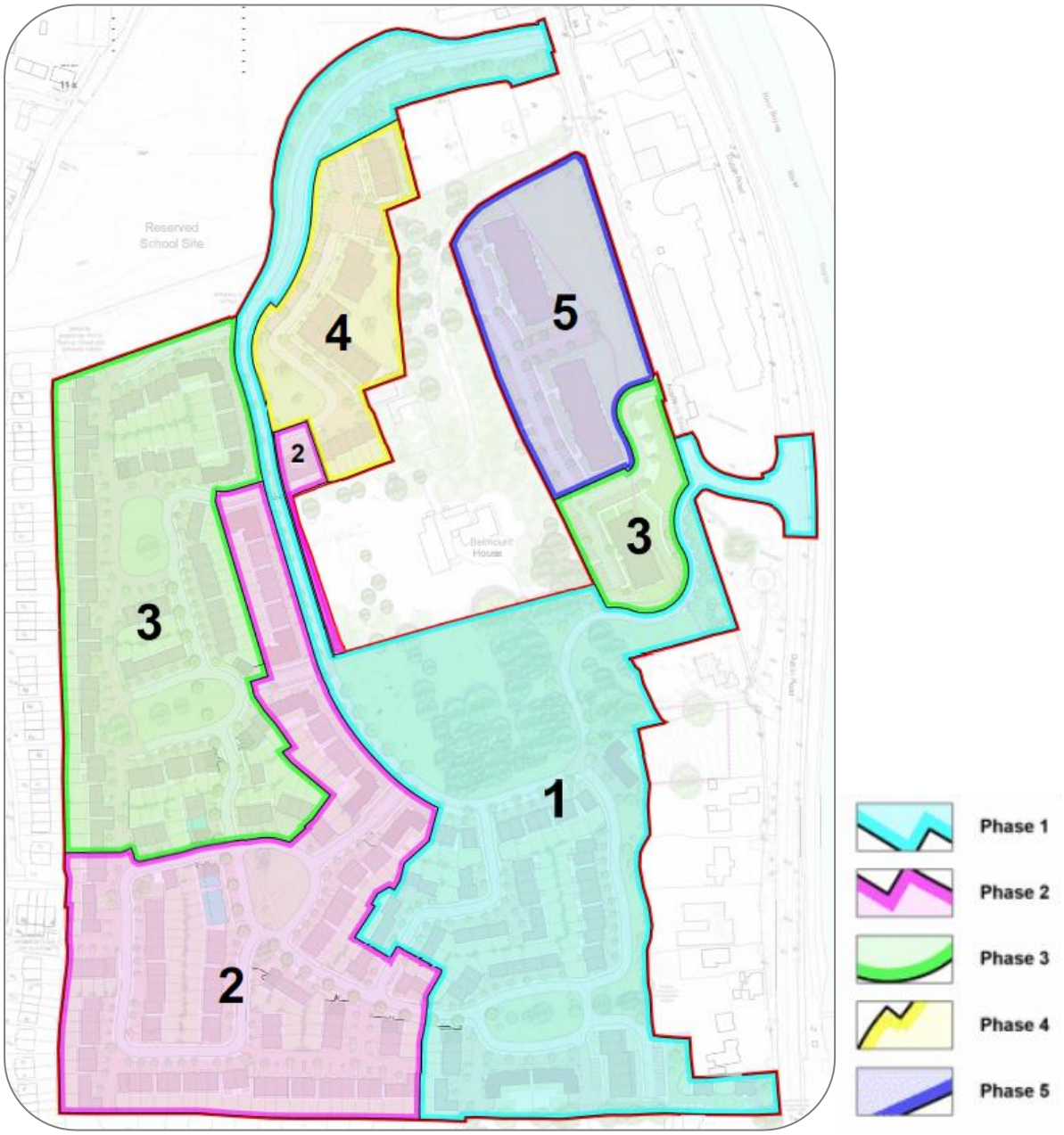


Figure 3 – Site Layout Phasing
*(imagery data: Conroy Crowe Kelly Architects)*

## 3.0 LOGISTICS

### 3.1 Construction Program & Phasing

Subject to a successful grant of planning, it is intended for the works to commence in Q2 2020. The proposed development is anticipated to be constructed over a 5-year period.

The development is proposed to be constructed on the following basis;

- Setup of site perimeter hoarding, maintaining existing pedestrian and traffic routes around the site;
- Site clearance;
- Traditional house build foundations;
- Site services installations (drainage, power, water, etc.);
- Construction of building structures;
- Interior finishing and exterior landscaping/paving.

### 3.2 Vehicular Access to Site

Vehicular access will be served by 3No. junctions from Academy Street. It is anticipated that access for the early phase will be Via access No.3, later phase will be Via access No.1 for construction vehicles. It may also be beneficial to install a pedestrian only entrance to the site to segregate vehicular and pedestrian movements to and from the site.

Security personnel will be present at the entrance/exit of the site to ensure all exiting traffic will do so safely. A wheel wash will be installed at the exit from the site to prevent any dirt being carried out into the public road. If necessary, a road sweeper will be used to keep the public road around the site clean.

### 3.3 Protection of Public Areas from Construction Activity

Perimeter hoarding will be provided around the site compound to provide a barrier against unauthorised access from the public areas. Controlled access points to the site, in the form of gates or doors, will be kept locked for any time that these areas are not monitored (e.g. outside working hours).

The hoarding will be well-maintained and will be painted.

### 3.4 Site Security

Access to site will be controlled by means of an electronic access control system and camera remote monitoring system for out of hours.

During working hours, a gateman will control traffic movements and deliveries.

All personnel working on site must have a valid Safe Pass card.

### 3.5 Material Hoisting & Movement Throughout the Site

It is envisaged that mobile crane visits will be required from time to time in the course of construction works. These visits will be coordinated with the other site activities and crane operations to ensure all risks are correctly assessed and mitigated against.

Hoists and teleporters may also be utilised around the perimeter as required during the project to facilitate material movement into the structures and waste movements out of the buildings. With the commencement of the fit-out activities, hoists strategically positioned will play a key role for successful project delivery. They are also less susceptible to being affected by inclement weather conditions.

### 3.6 Deliveries & Storage Facilities

It is proposed that unloading bays are provided for deliveries to the site within the hoarding perimeter. They should be accessible by mobile crane and fork

lifts. Appropriately demarcated storage zones will be used to separate and segregate materials.

All deliveries to site will be scheduled to ensure their timely arrival and avoid need for storing large quantities of materials on site. Deliveries will be scheduled outside of rush hour periods to avoid disturbance to pedestrian and vehicular traffic in the vicinity of the site.

## 3.7 Site Accommodation

On-site facilities will consist of;

- Materials storage area;
- Site office & Meeting Room;
- Staff welfare facilities i.e. toilets, drying room, canteen, etc.

Electricity will be provided to the site via national grid.

Water supply to the site will be provided by means of a temporary connection to the public water main. Similarly, a temporary connection for foul water drainage will be made to the public network.

## 3.8 Site Parking

On-site carparking spaces will be provided within the site extents.

Construction staff will be encouraged to use public transport and information on local transportation will be published on site.

## 3.9 Site Working Hours

Construction operations on site will generally be subject to a planning permission and conditions. However, it may be necessary for some

construction operations to be undertaken outside these times, for example; service diversions and connections, concrete finishing and fit-out works, etc.

Deliveries of materials to site will generally be between the hours of 07:00 and 19:00, Monday to Friday, and 08:00 to 14:00 on Saturdays. There may be occasions where it is necessary to make certain deliveries outside these times, for example, where large loads are limited to road usage outside peak times.

## 4.0 ENVIRONMENTAL ISSUES

### 4.1 Noise

Noise monitoring will be established on site throughout the project. Noise monitoring shall be carried out for a period of at least 2 weeks prior to any works commencing, in order to establish a baseline, and the results communicated to Meath County Council in the form of baseline reports.

Variation of noise levels from those experienced as part of everyday life in an area can result in extreme disruption. The Contractor shall implement measures to eliminate where possible and reduce noise levels where not.

All construction activities will be carried out in compliance with the recommendations of BS 5228, "Noise Control on Construction and open sites part 1 and comply with BS 6187 Code of Practice for Demolition. These measures are employed to ensure compliance will include: -

- Noise monitoring stations, which will be monitored daily, will be located on site and at recommended locations in the vicinity of the site to record background and construction noise activity.
- The best means practical will be used to minimize the noise produced by all on site operations.
- Proper maintenance of all operating plant to ensure noise emission compliance.
- All operating plant will be selected on the basis of incorporating noise reducing systems, and at a minimum be fitted with effective exhaust silencers.
- Compressors will be fitted with acoustically lined covers, which will remain closed while the machines are in operation.
- Plant such as pumps and generators which are required to work outside of normal working hours will be enclosed with acoustic enclosures.

- There will be strict adherence to the site working hours stipulated in the Planning Conditions.

## 4.2 Air Quality & Dust Monitoring

Dust prevention measures shall be included for control of any site airborne particulate pollution. The Contractor shall monitor dust levels in the vicinity of the site using a Bergerhoff gauge instrument or in accordance with Meath County Council's Planning conditions. Records shall be kept of such monitoring for review by the Planning Authority. The minimum criteria to be maintained shall be the limit for Environmental Protection Agency (EPA) specification for licensed facilities in Ireland, which is 350mg/m$^2$/day.

The Contractor shall continuously monitor dust over the variation of weather and material disposal to ensure the limits are not breached throughout the project.

## 4.3 Migrating Dust & Dirt Pollution

The Contractor will ensure that all construction vehicles that exit the site onto the public roads will not transport dust and dirt to pollute the external roadways. This will be achieved through a combination of the following measures:

- Ensuring construction vehicles have a clean surface to travel on within the site (i.e. haul road)
- Ensuring all construction vehicles are inspected by the gateman for cleanliness prior to exiting the site
- Providing a "Full-Body Self Contained" wheel wash within the site confines
- Ensuring an appropriate wheel or road washing facility is provided as and when required throughout the various stages of construction on

site. If conditions require it then a manned power washer shall be put in place to assist the wheel wash system

- A dedicated road sweeper shall be retained for the duration of the haulage works; and water supplies shall be recycled for use in the wheel wash. All waters shall be drained through appropriate filter material prior to discharge from the site

The use of appropriate water-based dust suppression systems will greatly reduce the amount of dust and windborne particulates as a result of the construction process. This system will be closely monitored by site management personnel particularly during extended dry periods and in accordance with site management methods.

## 4.4 Harmful Materials

Harmful material will be stored on site for use in connection with the construction works only. These materials will be stored in a controlled manner. Where on-site facilities are used there will be a bunded filling area using double bunded steel tank at a minimum.

## 4.5 Vibration

The Contractor will be required to carry out the works such that the effect of vibration on the adjoining buildings and surroundings is minimised and does not cause any damage.

The Contractor shall be required to comply with the requirements of the planning permission for any vibration limits for the works. In the absence of any Local Authority requirements, the following table shall set the limitations:

Table 1 – Trigger values for vibration

| Trigger | Peak Particle Velocity (PPV) | |
|---|---|---|
| | 50Hz and below | Above 50Hz |
| 1 | 10 mm/s | 10 mm/s |
| 2 | 10 mm/s | 12 mm/s |
| 3 | 10 mm/s | 15mm/s |

Background vibrations shall be established prior to commencement.

A vibration monitoring system is to be put in place prior to any works taking place. This system is to raise an alarm if an agreed limit is exceeded at which time the working methods are to be adjusted so as to reduce vibrations generated.

### 4.6 Water

Detailed measures to prevent pollution in nearby river waters are proposed. This will include measures to prevent silt from entering the River Boyne. Water leaving the site must first pass through suitably designed silt traps or settlement ponds. The Contractor will be responsible for ensuring that pollution does not occur.

The following site-specific measures are proposed:

- Works will be in accordance with the requirements of the Office of Public Works (OPW) and Inland Fisheries Ireland (IFI).
- Pollution prevention measures in accordance with guidance from Inland Fisheries Ireland (2016) or as otherwise agreed with the IFI. This will include the installation sediment traps and culverting of drainage ditches 'in the dry', where required.
- No direct discharges made to waters where there is potential for cement or residues in discharge;
- Designated impermeable cement washout areas must be provided;

- Any in-situ concrete work to be lined and areas bunded (where possible) to stop any accidental spillage
- Any spoil or waste material generated from the construction process is to be temporarily stored at an approved location on site, before being removed to an accepting licensed waste disposal facility;
- All new infrastructure is to be installed and constructed to the relevant codes of practice and guidelines;
- All surface water infrastructure is to be pressure tested by an approved method during the construction phase and prior to connection to the public networks, all in accordance with Local Authority Requirements;
- Connections to the public network are be carried out to the approval and / or under the supervision of the Local Authority prior to commissioning;
- All new sewers are to be inspected by CCTV survey post construction; to identify any possible physical defects for rectification prior to operational phase;
- Care will be required for the environmental management of the site to ensure that no potential contamination issues are experienced which may impact on the overall surface water quality.
- Potential issues can be mitigated against by ensuring that the development's environmental management plan is adhered to prevent accidental onsite oil spillages and the regular maintenance of onsite plant to eliminate potential risks.
- Implement best practice construction methods and practices complying with relevant legislation to avoid or reduce the risk of contamination of watercourses or groundwater.
- A Site Specific Construction and Environment Management Plan will be developed and implemented during the construction phase. Site inductions will include reference to the procedures and best practice.
- 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.

- Weather conditions and seasonal weather variations will also be taken account of when planning stripping of topsoil and excavations, with an objective of minimizing soil erosion.
- The extent of sub-soil and topsoil stripping to be minimised to reduce the rate and volume of the run-off during construction until the topsoil and vegetation are replaced.
- Concrete batching will take place off site or in a designed area with an impermeable surface.
- Concrete wash down and wash out of concrete trucks will take place off site or in an appropriate facility.
- Discharge from any vehicle wheel wash areas is to be directed to onsite settlement ponds.
- Oil and fuel stored on site for construction should be stored in designated areas. These areas shall be bunded and should be located away from surface water drainage and features.
- Refuelling of construction machinery shall be undertaken in designated areas away from surface water drainage in order to minimise potential contamination of the water environment. Spill kits shall be kept in these areas in the event of spillages.
- Hazardous construction materials shall be stored appropriately to prevent contamination of watercourses or groundwater.
- Spill kits should be kept in designated areas for re-fuelling of construction machinery.
- Dewatering measures should only be employed where necessary.

## 5.0 WASTE MANAGEMENT

A Construction and Operational Waste Management Statement has been prepared by Byrne Environmental as part of this application. Please refer to this report for details on waste management during the construction and operational phases of the project.

## 6.0 PROVISIONS FOR CONSTRUCTION

### 6.1 Hoarding, Set-up of Site & Access/Egress Points

The site compound D will be enclosed with hoarding, the details of which are to be agreed with Meath County Council. Hoarding panels will be maintained and kept clean for the duration of the project.

### 6.2 Removal of Services

A utility survey will be carried out to identify existing services. All services on site will be disconnected, diverted or removed as agreed with service providers.

### 6.3 Site Clearance

The site is greenfield and largely in agricultural use. The following is a high-level method statement for the clearance of the site:

- Establish a site set-up and welfare facilities;
- Carry out an invasive species survey using a qualified and approved surveyor;
- Carry out a detailed services survey of the site to identify all buried services, determine what services are live, redundant and potentially serve neighbouring properties.
- Carry out any necessary services diversions and decommissioning works;
- Dig to underside of topsoil level and safely store topsoil in stockpile heap within the site extents for re-use in landscaping works.

## 6.4 Piling Works

Piling works are not proposed for this project.

## 6.5 Excavation

The proposed development allows for the reduced level excavation to be undertaken without the requirement for temporary soil retention. It is proposed to batter back embankments adjacent to the road infrastructure.

The Contractor must prepare a Construction and Waste Management Plan in accordance with the "Best Practice Guidelines on the Preparation of Waste Management Plans for Construction *and Demolition Projects*" (Department of Environment, Heritage and Local Government, 2006) and ensure that all material is disposed of at an appropriately licensed land fill site. The Contractor must also outline detailed proposals within the Construction Management Plan to accommodate construction traffic.

## 6.6 Structure

The superstructures for the proposed houses will the constructed in traditional masonry blockwork with precast concrete slabs and prefabricated truss roofs. This will require the minimal use of a concrete pump and the delivery of concrete by concrete wagon. Any craneage required will be carried out by appropriately qualified and experienced crane operators with the assistance and guidance of skilled banksmen. Lifting will take place only in light wind conditions and the items will be steered using guide ropes.

The superstructure of the apartment buildings will also be constructed using traditional masonry blockwork and precast concrete slabs.

Scaffolding for the building structure will be erected gradually with progress of the building. It will be covered with a light debris netting only. It is not envisaged to cover the scaffold in a solid facing. The use of a mesh netting provides an

effective screen for falling debris, acts as a useful noise damper and dust barrier and provides a more acceptable finish on the working scaffold. The scaffold will generally be lifted in line with the structure programme and once erected, will remain in place until completion of the façade and glazing works.

**Appendix A:**

Summary of EIA Mitigation and Monitoring Measures

# 1.0 SUMMARY OF EIA MITIGATION AND MONITORING MEASURES

## 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 a 48-54 week period. Given the nature of the project and the need for flexibility to respond to market demand, the development phases are indicative. An Outline Construction Environment Plan has been prepared by Stutec Consulting Engineers, has been reviewed by the relevant EIAR consultants and is included in the SHD application.

**Construction Traffic Management Plan**
A Construction Traffic Management Plan (CTMP) will be prepared by the main contractor and agreed with the Planning Authority prior to commencement of development in the event of a grant of permission.

## 1.2 Population and Human Health

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 full Construction Management Plan (including traffic management) should be prepared 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 CS Consulting 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.

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 CS Consulting. 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.

## 1.3 Biodiversity

### 1.3.1 Mitigation Measures Proposed

The following mitigation measures are proposed for the development

Recommendation 1: The loss of mature trees or hedgerows has been avoided to the greatest extent possible. Where the road passes through the woodland this route has been designed to minimise the loss of trees (19 in total). Acknowledging this, the landscaping scheme has been designed to compensate for the loss of habitat. This includes biodiversity friendly planting of natural meadow areas and clusters of native trees. Species have been chosen to be pollinator and wildlife friendly. There will be approximately 1,250m of new hedgerow and linear woodland in addition to trees and shrubs scattered throughout the development and areas of meadow grassland. These features can be seen in figure 4.3. Although direct replacement of lost habitat is not possible, in time these new features will mature and will provide habitat for much of the biodiversity which is on site at present. The retention of hedgerows and establishment of new meadow areas may allow for Yellowhammer to remain on the site.

Recommendation 2: The removal of vegetation should not take place between March and July as per section 40 of the Wildlife Act. Where this cannot be avoided, vegetation must first be inspected by a suitably qualified ecologist for signs of nesting. Where no nesting is observed, vegetation can be removed within 48 hours. Where nesting is underway, vegetation cannot be removed unless under licence from the NPWS.

The following measure is taken from the bat survey report:

“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).

An assessment of trees according to their PBR [potential bat roost] value determines the methodology of felling. Trees with PBR Category 1 are highly suitable for roosting bats and require more intensive procedures prior to felling.”

Recommendation 3: A Construction Management Plan has been prepared as part of the planning application with regard to guidelines on the protection of fish habitat from Inland Fisheries Ireland. This include detailed measures for the prevention of pollution. In particular this will include measures to prevent silt from entering the River Boyne. Under no circumstances should silt-laden water enter the River Boyne. Water leaving the site must first pass through suitably designed silt traps or settlement ponds. These shall be inspected on at least a daily basis, and more frequently during periods of heavy rainfall. The site manager shall be responsible for ensuring that pollution does not occur.

Recommendation 4: The following measures are taken from the bat report:

*“The following principles will be followed especially in relation to the general residential area and will also be implemented for the greenway and the active open area: - Artificial lights shining on bat roosts, their access points and the flight paths away from the roost must always be avoided. This includes alternative roosting sites such as bat boxes.*
*- Lighting design should be flexible and be able to fully take into account the presence of protected species. Therefore, appropriate lighting should be used within a proposed development and adjacent areas with more sensitive lighting regimes deployed in wildlife sensitive areas.*
*- Dark buffer zones can be used as a good way to separate habitats or features from lighting by forming a dark perimeter around them. This should be used for habitat features noted as foraging areas for bats.*
*- Buffer zones can be used to protect Dark buffer zones and rely on ensuring light levels (levels of illuminance measured in lux) within a certain distance of a feature do not exceed certain defined limits. The buffer zone can be further subdivided in to zones of increasing illuminance limit radiating away from the feature or habitat that requires to be protected.*

*- Luminaire design is extremely important to achieve an appropriate lighting regime. Luminaires come in a myriad of different styles, applications and specifications which a lighting professional can help to select. The following should be considered when choosing luminaires. This is taken from the most recent BCT Lighting Guidelines (BCT, 2018).*

*o All luminaires used will lack UV/IR elements to reduce impact.*
*o LED luminaires will be used due to the fact that they are highly directional, lower intensity, good colour rendition and dimming capability.*
*o A warm white spectrum (<2700 Kelvins will be used to reduce the blue light component of the LED spectrum).*
*o Luminaires will feature peak wavelengths higher than 550nm to avoid the component of light most disturbing to bats.*
*o Column heights should be carefully considered to minimise light spill. The shortest column height allowed should be used where possible.*
*o Only luminaires with an upward light ratio of 0% and with good optical control will be used.*
*o Luminaires will be mounted on the horizontal, i.e. no upward tilt.*
*o Any external security lighting will be set on motion-sensors and short (1min) timers.*
*o As a last resort, accessories such as baffles, hoods or louvres will be used to reduce light spill and direct it only to where it is needed.*
*Planting of screening will also be effectively used to prevent lighting spillage areas where bat foraging is recorded. In particular, lighting will not shine onto important commuting and foraging areas identified for local bat populations."*

Recommendation 5: Disruption to ecological corridors

The landscaping design has maintained ecological connectivity by establishing/strengthening native woodland/hedgerows along external boundaries (see figure 4.3). This will take time to mature but will ensure continued foraging/commuting ability by biodiversity through and across the site.

## 1.4 Land and Soils

### 1.4.1 Incorporated Design Mitigation

The proposed development and planning drawings submitted have taken into account potential contamination issues and upon completion the development has a system in place to ensure rainwater runoff from the site passes through an oil separator prior to out falling into the proposed storm water drainage system.

### 1.4.2 Construction Phase Mitigation

A Construction Management Plan (CMP) (prepared by CS Consulting) is included in the SHD application material. The CMP will be put in place by the Contractor to implement the mitigation measures and will be prepared and submitted to the planning authority and will be maintained by the contractor during the construction phase. The CMP includes a range of site-specific measures which will include the following mitigation measures:

In order to reduce the impacts on the soils, geology and hydrogeological environment a number of mitigation measures will be adopted as part of the construction works on site. The measures will address the main activities of potential impact which include:

- Control of Soil Excavation and Export from Site;
- Sources of fill and aggregates for the project;
- Fuel and Chemical handling, transport and storage; and
- Control of Water during Construction.

In advance of work starting on site, the appointed Contractor will prepare a Construction and Environmental Management Plan (CEMP). The Plan sets out the overarching vision of how the construction of the project will be managed in a safe and organised manner by the Contractor. The CEMP will set out requirements and standards which must be met during the construction stage and will include the relevant mitigation measures outlined in the EIAR and any subsequent conditions relevant to the project.

Care will be required for the environmental management of the site to ensure that no potential contamination issues are experienced which may impact on the overall groundwater quality.

Potential issues can be mitigated against by ensuring that the developments environmental management plan is adhered to prevent accidental onsite oil spillages and the regular maintenance of onsite plant to eliminate potential risks.

Soil stripping, earthworks and stockpiling of soil will be carried out during the works. Stockpiles have the potential to cause negative impacts on air and water quality. The effects of soil stripping and stockpiling will be mitigated through the implementation of an appropriate earthworks handling protocol during construction. It is anticipated that any stockpiles will be formed within the boundary of the excavation and there will be no direct link or pathway from this area to any surface water body. It is anticipated that only local/low level of stockpiling will occur as the bulk of the material will be excavated either straight into trucks for transport off site or will be reused in other areas of the site as fill.

Dust suppression measures (e.g. damping down during dry periods), vehicle wheel washes, road sweeping, and general housekeeping will ensure that the surrounding environment are free of nuisance dust and dirt on roads.

The following mitigation measures will be taken at the construction site in order to prevent any spillages to ground of fuels and prevent any resulting soil and/or groundwater quality impacts:

- Designation of bunded refuelling areas on the site (if required);
- Provision of spill kit facilities across the site;
- Where mobile fuel bowsers are used the following measures will be taken:
- Any flexible pipe, pump, tap or valve will be fitted with a lock and will be secured when not in use;
- All bowsers to carry a spill kit and operatives must have spill response training; and
- Portable generators or similar fuel containing equipment will be placed on suitable drip trays.

In the case of drummed fuel or other potentially polluting substances which may be used during construction the following measures will be adopted:

- Secure storage of all containers that contain potential polluting substances in a dedicated internally bunded chemical storage cabinet unit or inside concrete bunded areas;
- Clear labelling of containers so that appropriate remedial measures can be taken in the event of a spillage;
- All drums to be quality approved and manufactured to a recognised standard;
- If drums are to be moved around the site, they should be done so secured and on spill pallets; and
- Drums to be loaded and unloaded by competent and trained personnel using appropriate equipment.

### 1.4.3 Monitoring measures – construction

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

- Adherence to the "*Construction Management Plan (CMP)*". The developer will be responsible for ensuring adherence with the *"Construction Management Plan".* If construction works are not in accordance with the plan, then the developer will ensure that this is remedied.
- 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. If these are found to be sub-standard then the developer will ensure that they are made fit for purpose.
- Monitoring cleanliness of adjacent road network, implementation of dust suppression and provision of vehicle wheel wash facilities. If these measures are found to be inadequate and the adjacent road network is negatively impacted, the developer will ensure that this is remedied and will ensure that dust suppression measures are implemented more regularly and all vehicles exiting the site use vehicle wheel wash facilities provided.
- 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.). The developer is responsible for ensuring that these measures are fit for purpose. If they are found to be inadequate, then the development will ensure that they are made good and fully utilised.
- 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.

## 1.5 Water

### 1.5.1 Incorporated Design Mitigation

The proposed development and planning drawings submitted have taken into account potential contamination issues and upon completion the development has a system in place to ensure rainwater runoff from the site passes through an oil separator prior to outfalling into the proposed storm water drainage system.

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.

### 1.5.2 Construction Phase Mitigation

The following mitigation measures are recommended for the construction phase of the development:

- Works will be in accordance with the requirements of the Office of Public Works (OPW) and Inland Fisheries Ireland (IFI).
- Pollution prevention measures in accordance with guidance from Inland Fisheries Ireland (2016) or as otherwise agreed with the IFI. This will include the installation of sediment traps and culverting of drainage ditches 'in the dry', where required.
- No direct discharges made to waters where there is potential for cement or residues in discharge;
- Designated impermeable cement washout areas must be provided;
- Any in-situ concrete work to be lined and areas bunded (where possible) to stop any accidental spillage
- Any spoil or waste material generated from the construction process is to be temporarily stored at an approved location on site, before being removed to an accepting licensed waste disposal facility;
- All new infrastructure is to be installed and constructed to the relevant codes of practice and guidelines;
- All surface water infrastructure are to be pressure tested by an approved method during the construction phase and prior to connection to the public networks, all in accordance with Local Authority Requirements;
- Connections to the public network are be carried out to the approval and / or under the supervision of the Local Authority prior to commissioning;
- All new sewers are to be inspected by CCTV survey post construction; to identify any possible physical defects for rectification prior to operational phase;
- Care will be required for the environmental management of the site to ensure that no potential contamination issues are experienced which may impact on the overall surface water quality.
- Potential issues can be mitigated against by ensuring that the developments environmental management plan is adhered to prevent accidental onsite oil spillages and the regular maintenance of onsite plant to eliminate potential risks. As outlined in the Construction Management Plan submitted with the planning application.
- Implement best practice construction methods and practices complying with relevant legislation to avoid or reduce the risk of contamination of watercourses or groundwater.
- A Site Specific Construction and Environment 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 and Environment 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.
- Weather conditions and seasonal weather variations will also be taken account of when planning stripping of topsoil and excavations, with an objective of minimizing soil erosion.
- The extent of sub-soil and topsoil stripping to be minimised to reduce the rate and volume of the run-off during construction until the topsoil and vegetation are replaced.
- Precast concrete units fabricated off site will be specified for culvert and bridging structures with cast in-site requirements minimised.
- Concrete batching will take place off site or in a designed area with an impermeable surface.

- Concrete wash down and wash out of concrete trucks will take place off site or in an appropriate facility.
- Discharge from any vehicle wheel wash areas is to be directed to on-site settlement ponds.
- Oil and fuel stored on site for construction should be stored in designated areas. These areas shall be bunded and should be located away from surface water drainage and features.
- Refuelling of construction machinery shall be undertaken in designated areas away from surface water drainage in order to minimise potential contamination of the water environment. Spill kits shall be kept in these areas in the event of spillages.
- Hazardous construction materials shall be stored appropriately to prevent contamination of watercourses or groundwater.
- Spill kits should be kept in designated areas for re-fuelling of construction machinery.
- Dewatering measures should only be employed where necessary.

## 1.6 Air Quality and 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.

### 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 proposed monitoring locations (D1 – D4) are presented below in Figure 7.4.

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 Construction 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 Meath County Council.

**Figure 7.4** Construction Phase dust monitoring (D1-D4) Monitoring Locations


**$NO_2$ 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 as shown above in Figure 7.3. 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.

Typical construction hours are:

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 Construction Project Manager shall appoint an acoustic consultant to conduct continuous noise 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 detailed in Table 8.1 above 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, Meath 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 Meath 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 8.7 of this document.

### 1.7.2 Monitoring

#### 1.7.2.1 Construction Phase

**Proposed Noise Monitoring Programme During Site Construction**

This section describes the noise and vibration monitoring methodologies that shall be implemented at the site to ensure that construction site activities do not cause excessive nuisance or cause cosmetic or structural damage to properties or structures in the vicinity of the site.

On commencement of the site construction activities, continuous noise monitoring systems shall be installed at site boundary locations to measures and assess the impact that site activities may have on ambient noise levels at local receptors.

The environmental noise measurements will be completed in accordance with the requirements of *ISO 1996-1: 2017*: *Acoustics – Description, measurement and assessment of environmental noise* and with regard to the EPA's 2016 *Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4*). The measurement parameters to be recorded include wind speed, temperature, $L_{Aeq}$, $L_{A90}$, $L_{A10}$ and $L_{Amax}$ , 1/3 Octave Frequency analysis and impact noise analysis.

**Noise Monitoring Locations**

The monitoring locations selected for the noise monitoring survey will be at residential noise sensitive receptors adjacent to the site boundaries and as identified in the baseline noise assessment.

**Proposed Vibration Monitoring Programme During Site Construction**

In order to ensure that site construction activities are conducted to minimise the vibration impacts on the receiving environment, it is proposed that structural vibration monitoring may be implemented during the course of the construction phase if and as required. It is proposed that vibration monitoring will be conducted at adjacent properties opposite the site boundaries as required using calibrated vibration monitors and geophones with live text and email alert functionality 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.

**Vibration Monitoring Locations**

The monitoring points chosen for locating the geophone of the vibration measuring instrument will be chosen according to the guidelines in British Standard *BS 7385:, Evaluation and measurement for vibration in buildings, Part1 1990 Guide for measurement of vibrations and evaluation of their effects on buildings* and *Part 2 1993 Guide to damage levels arising from groundborne vibration.*

## 1.8 Landscape and Visual

### 1.8.1 Construction Phase

During construction there will be a change to the landscape and there will be negative visual impacts for residents and visitors to the areas adjacent to the site associated with construction activity.

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.

Existing trees and woodlands to be retained and are shown in the CSR Design Statement and 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.

Adverse impacts both during construction and at operation phases could be mitigated through undertaking the following site works early on in the construction process in order to soften and screen views as early on as possible.

In areas not subject to the construction of buildings, – Academy Park, the school approach road and around the electrical sub-station, advance planting can take place to build landscape capacity and establish and mature during development and ahead of occupation. Where feasible and sensible, planting larger sized specimen trees (c 18-20 girth) to the north-east of the site.

Reducing the footprint of all construction works wherever feasible and ensuring the remainder of the land is retained as green field will also limit any adverse effects during the construction phase

### 1.8.2 Monitoring

#### 1.8.2.1 Construction Phase

Landscape tender drawings and specifications will be produced to ensure that the landscape work is implemented in accordance with best practice. This document will include tree work procedures, soil handling, planting and maintenance. The contract works will be supervised by a suitably qualified landscape architect.

The planting works will be undertaken in the next available planting season after completion of the main civil engineering and building work.

## 1.9 Material Assets – Traffic

### 1.9.1 Construction phase

The Construction Management Plan incorporates a range of integrated control measures and associated management initiatives with the objective of mitigating the impact of the proposed developments on-site construction activities.

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 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 deemed necessary and any specific recommendations with regard to construction traffic management made by the Local Authority will be adhered to.

- On completion of the works all construction materials, debris, temporary hardstands etc. from the site compound will be removed off site and the site compound area reinstated in full on completion of the works.

All construction related parking will be provided on site. Construction traffic will consist of the following two principal categories:

- Private vehicles owned and driven by site construction staff and by full time supervisory staff;
- Excavation plant and dumper trucks involved in site development works and material delivery vehicles for the following: granular fill materials, concrete pipes, manholes, reinforcement steel, ready mix concrete and mortar, concrete blocks, miscellaneous building materials, etc.

It is anticipated that the generation of HGV's during the construction period will be evenly spread throughout the day and as such will not impact significantly during the peak traffic periods.

### 1.9.2 Monitoring

During the construction stage, the following monitoring exercises are proposed;

- Compliance with construction vehicle routing practices,
- Compliance with construction vehicle parking practices,
- Internal and External road conditions,
- Timings of construction activities.

A MMP will be prepared for both residents within the apartment units and staff within the creche in order to guide the delivery and management of coordinated initiatives post construction. The MMP ultimately seeks to encourage sustainable travel practices for all journeys to and from the proposed development. In order to minimise the impacts of the development and to encourage sustainable modes of transport the MMP will address the following items in order to achieve this:

- Introduction of appropriate parking management;
- Optimise links with public transport;
- Provide and enhance cyclist and pedestrian facilities;
- Encourage modes of transport other than single than car trips.

Post occupancy surveys are to be carried out in order to determine the success of the measures and initiatives as set out in the proposed MMP document. The information obtained from the monitoring surveys will be used to identify ways in which the MMP measures and initiatives should be taken forward in order to maintain and further encourage sustainable travel characteristics.

## 1.10 Material Assets – Waste Management

### 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 Construction 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 Project Construction 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 Project Construction 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 Construction Manager shall inform Meath 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 Record Keeping

It is the responsibility of the Project Construction 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 Meath County Council as required / requested.

#### 1.10.1.8 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.

### 1.10.2 Monitoring

The Facility Management Company shall prepare an annual report for the Local Authority and residents of the development on the quantities of waste generated within the development to demonstrate how waste reduction and recycling targets are being achieved with regard to the targets defined in *The Eastern-Midlands Region Waste Management Plan 2015-2021.*

## 1.11 Material Assets – Utilities

### 1.11.1 Construction Mitigation

The construction works contractor shall 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 shall 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.

### 1.11.2 Stormwater Infrastructure

In accordance with the Greater Dublin Regional Code of Practice for Drainage Works, all sites are required to develop a drainage system which separates storm & foul water on site.

In addition to improving overall storm water quality following Meath County Council sustainable urban drainage systems, SuDs protocols, there is also a requirement to reduce storm water runoff rates to pre-development levels. To achieve this the scheme will provide internal stormwater attenuation tanks to provide the storm water required for the predicated 1-in-100 year, increased by 10% for the predicated effects of climate change. The proposed attenuation volume to be provided for the development has been calculated at 4594m3. The proposed development will have three locations where it connects into the public stormwater system, before ultimate disposal into the Boyne River.

The proposed restriction of storm water flows from the site during extreme weather events will increase the capacity of the existing infrastructure to convey storm flows.

### 1.11.3 Foul Infrastructure

All foul water infrastructure is under the control of Irish Water. The proposed development will be serviced by a new separate internal foul network for the proposed development. The proposed development will have two connection locations from the development to the existing foul drainage infrastructure.

As required by the SHD process, Irish Water are required to review the schemes foul drainage proposal & to issue a letter of Design Acceptance, this has been received by the design team and is included as an appendix in the CS Consulting Engineering Service Report accompanying this submission.

A requirement from the Irish Water review for the development is to up-grade part of the local foul drainage network, as these works are located outside of the subject lands these works will be carried out by Irish Waters regional contractor, and agreement for same will form part of the Applicants connection agreement post planning.

### 1.11.4 Potable Water Infrastructure

All potable water infrastructure is under the control of Irish Water. The proposed development will be serviced by a new separate internal water network for the proposed development. The proposed development will have two connection locations from the development to the existing 250mm OD watermain located in Academy St.

As required by the SHD process Irish Water are required to review the schemes potable water proposal & to issue a letter of Design Acceptance, this has been received by the design team and is included as an appendix in the CS Consulting Engineering Service Report accompanying this submission.

A requirement from the Irish Water review for the development is to up-grade part of the local potable water network, as these works are located outside of the subject lands these works will be carried out by Irish Waters regional contractor, and agreement for same will form part of the Applicants connection agreement post planning.

### 1.11.5 ESB Infrastructure

ESB have been engaged at an early stage to ensure an potential issues with utility connections are reviewed and mitigated as early in the process as possible. ESB will not engage with design process until such time as planning has been approved and scheme name and numbering is approved. However, initial discussions and proposal have been positive.

The proximity to the existing ESB sub-station ensures access to MV network which avoids the need for extensive network upgrades and infrastructure.

## 1.12 Risk Management

The Construction Management Plan and the Health and Safety Plan, as well as good housekeeping practices will limit the risk of accidents during construction. Fire safety will be dealt with under the Fire Safety Code at design and construction stage. The estate management company will have responsibility for fire safety during operations. In relation to falls these have been dealt with during design.

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 Cronin & Sutton 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.

## 1.13 Archaeology, Architecture and Cultural Heritage

### 1.13.1 Construction Phase

#### 13.1.1.1 Archaeology

The geophysical survey and test trenching investigations undertaken as part of this assessment have identified two archaeological enclosures, with associated external features, within the proposed development site. It is proposed these enclosures will be preserved in record by a full systematic archaeological excavation under licence from the National Monuments Service. The extent, phasing and methodology of these excavations, and subsequent post-excavation specialist analyses, will be agreed in advance with the National Monuments Service and will be clearly detailed in a method statement submitted as part of the licence application process. A programme of licensed archaeological monitoring will be undertaken within all other areas of the proposed development site during the construction phase. In the event that any archaeological sites or features are uncovered, ground works will halt in that area, the sites/features will be cordoned off and recorded and the NMS will be consulted to determine appropriate mitigation measures.

There a number of obligatory processes to be undertaken as part of archaeological licence applications for excavation projects and these will allow for monitoring of the successful implementation of the archaeological mitigation measures. All archaeological excavations will be carried out under licence issued by the National Monuments Service following the approval of a submitted detailed method statement outlining all proposed archaeological strategies. A preliminary report presenting a summary of results will be compiled and submitted to the National Monuments Service and National Museum of Ireland within one month of the completion of the excavations. This will include details on all proposed specialist post-excavation analyses. A final detailed report, which will include the results of specialist post-excavation analyses, will be submitted within twelve months of the completion of excavations.

Subject to grant of planning permission, the following is an ***outline/indicative*** schedule for the implementation of the proposed archaeological mitigation measures:

- Appointment of the services of a suitably qualified archaeologist to co-ordinate the mitigation proposals
- Archaeological method statements shall be submitted to the Department of Culture, Heritage and the Gaeltacht for review and agreement
- Subject to approval by the Department of Culture, Heritage and the Gaeltacht, the following archaeological mitigation measures shall be undertaken under licence from the National Monument Service:

A. **Pre-development archaeological test excavations** in the field to the east of the Belmount House (referred to as "Area H" in the geophysical survey);
B. **A programme of archaeological excavation** ("preservation-by-record") of (a) two archaeological enclosures, with associated external features, identified during archaeological testing conducted in 2018 (Excavation Licence No. 18E0499) and (b) any features of archaeological interest that may be found during the testing of "Area H", and

C. **Archaeological monitoring of all site development works**. In the event of archaeological features being uncovered they shall, subject to agreement by National Monuments Service, be fully recorded and excavated. A report, containing the results of the archaeological monitoring and any associated excavations shall be submitted to the Department of Culture, Heritage and the Gaeltacht on completion of site development works.

#### 13.1.1.2 **Architectural Heritage**

No architectural heritage mitigation measures are required during the construction phase.