3. DESCRIPTION

3.1 Introduction

This section of the Environmental Impact Assessment Report (EIAR) describes the proposed development and its component parts. The proposed development will consist of the following:

1. *Construction of 332 no. residential units:*
    - *93 no. 1 bed apartments*
    - *219 no. 2 bed apartments*
    - *20 no. 3 bed apartments*
2. *Provision of 2,667 sq.m of commercial floorspace.*
3. *Provision of 93 sq.m of community use facilities*
4. *Provision of 470 sq.m of tenant amenity accommodation including shared workspaces, shared dining and lounge facilities*
5. *Provision of 174sq.m creche facility including an external secure play area.*
6. *Provision of 85 no. car parking spaces and provision of realigned road between Gort na Bró and Gateway Retail Park Road.*
7. *Change of use of underground void to 181 bay underground car park*
8. *Provision of shared communal and private open space, car parking, bicycle parking, bin storage, public lighting, site landscaping, services, signage, substation and all associated site development works.*

In addition to the above it is proposed to realign an existing link road between Gort na Bró and the Gateway Retail Park and separately to upgrade the new junction between the application site and Gort na Bró. The road realignment is required to facilitate the proposed N6 Ring Road which is currently with An Bord Pleanála for their consideration.

3.2 Existing Site Description

3.2.1 Site Location & Layout

The site area comprises approximately 2.8 hectares of land located within the townland of Rahoon, to the west of Galway City. The site is bounded by Gort na mBro road to the east and the Gateway Retail Park link road to the west. The Western Distributor Road, an arterial route serving the city, is located to the south. The surrounding area is characterised by the established residential suburb of Knocknacarra. The lands adjoining the site to the west are the location of the Gateway Retail Park.

The landcover is a mixture of well-established vegetation along the road in the centre of site and to the north-west of site and areas of dereliction with scrub and spoil in the centres of the northern and southern parts of site and along the north-eastern site boundary. There is an active construction compound located on the southern portion of the site. The portion of the site located immediately to the north of the existing Knocknacarra shopping centre is currently an active construction site and comprises a partially completed underground car park with commercial space above.

The proposed development site is zoned as 'Enterprise, Light Industry and Commercial' within the Galway City Development Plan (CDP) and land bordering the site on the north, west and south-west has the same zoning. To the east and south the land is mainly zoned as 'Residential' and interspersed with 'Recreational and Amenity'.

There are also areas zoned as 'Community, Cultural and Institutional', 'Agriculture' 'Agricultural and High Amenity' and 'Low Density Residential' in the study area.

With regard to the topography of the site, the site is relatively flat with the levels ranging from approximately 27.50 m OD (Ordnance Datum) in the southern tip of the site to approximately 31.60 m in the northern part of the site. The road separating the northern and southern parts of the site is level at approximately 29 m OD with banks rising either side of the road. The overall topography of the development site undulates with several raised, landscaped areas. The greatest gradients are on the slopes of these raised banks at various locations around the site and are up to approximately 1 in 2 or 50%.

There are no protected structures or archaeological monuments located within the application site; however, there is a National Monument Record (Record number GA094-56) which is described as a Designated Landscape Feature located circa 70 m northeast of the proposed site.

The lands are not located in any Natura 2000 designated sites (European Ecologically designated sites). The site is located approximately 1.3 kilometres north of the Galway Bay Complex Special Area of Conservation (SAC) and Special Protection Area (SPA), approximately 2.5 kilometres to the southwest of the Lough Corrib Special Area of Conservation. In this regard, an Appropriate Assessment Screening has been undertaken and a Natura Impact Assessment prepared.

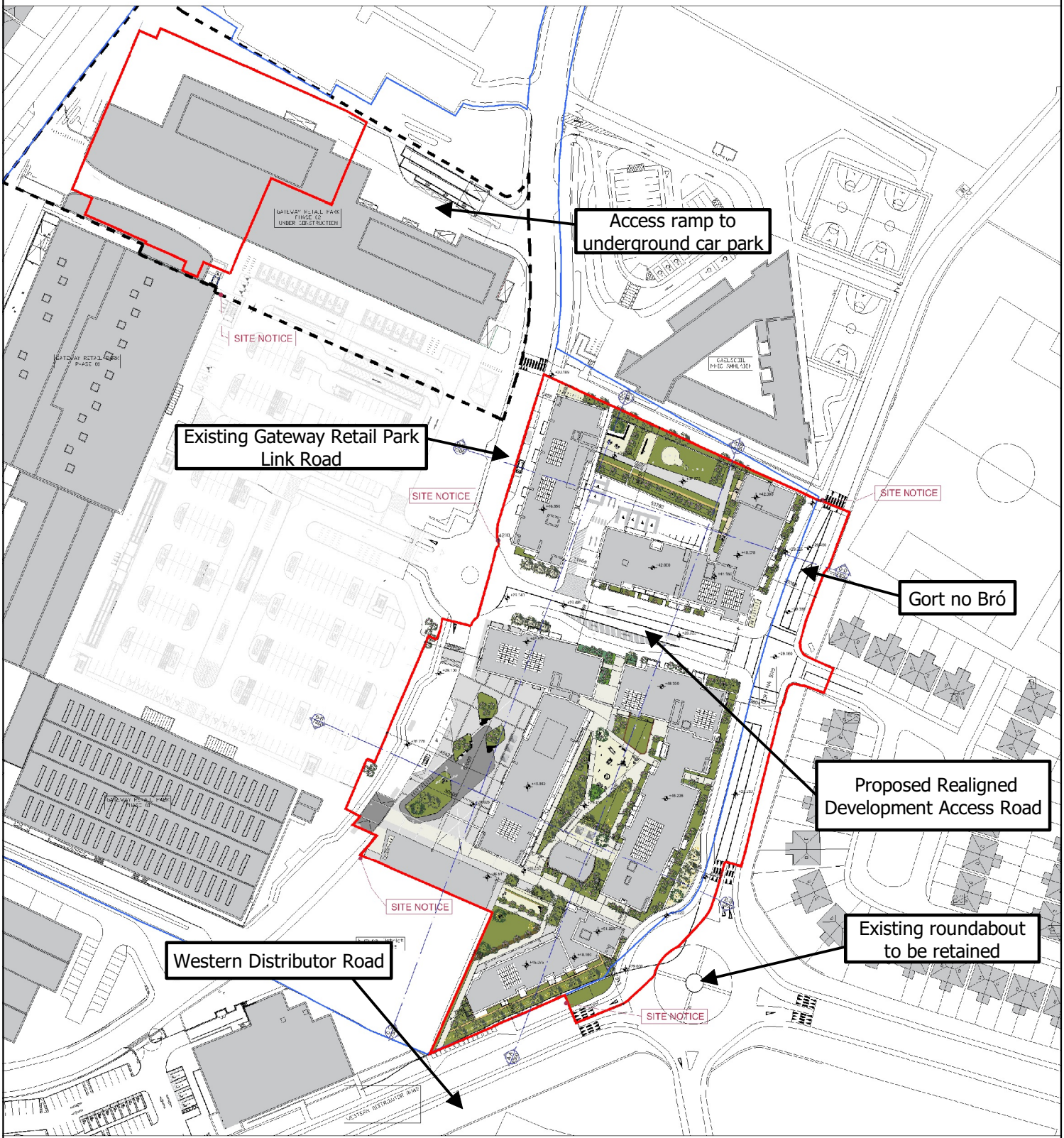
3.2.2 Site Access

The application is supported by a Traffic and Transport Assessment ('TTA') prepared by Atkins which was carried out in accordance with Transport Infrastructure Ireland (TII) guidance. A copy of the TTA report is included as Appendix 3-1 of this EIAR.

In terms of the existing public transport provision, there is a bus stop located along the southern boundary of the site which runs along the Western distributor Road. This bus stop is covered by two services with the 405 route and the 412 route accessed along the Western Distributor Road. The 405 connects the Ballybane Industrial estate in the east of the city with B&Q Retail Park which is adjacent to the site. The 412 connects Cappagh road in Knocknacarra to the west of the site to Eyre Square and operates from early morning to late evening allowing for usage both as a commuter and as a regular service to access the greater Galway City area. The site is approximately 3.3 kilometres from Ceannt Station in Galway city centre which provides train service to Dublin and Limerick, with connections to Cork and Waterford.

The Western Distributor Road connects the site to the Greater Galway City Centre area, the Western Distributor Road is sufficiently capable in accommodating pedestrians of all levels including walkers and cyclists. Existing footpaths are provided linking the site to the greater area.

Wider regional vehicular connections are easily accessed from this location. Connection to the M6 motorway is located east of Rahoon, 8km by car from the site. This motorway is direct to Dublin and has links to the M17/M18 serving Sligo & Limerick and the M4 serving the south of the country. The existing underground void will be used as an underground carpark for residents of the proposed residential units. This carpark will be accessed via a ramp from the Gateway Retail Park link road to the northwest of the main development site.



Map Legend

Site Boundary

N

Drawing Title: Road Network

Project Title: SHD at Knocknacarra District Centre

Drawn By	Checked By
TJB	MH
Project No. 180531-a	Drawing No. Figure 3.1
Scale 1:1900	Date 23.10.2019

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3.2.2.1 Pedestrian and Cyclist Access

Pedestrian foot paths are provided along both sites of all existing roads in the vicinity of the site, including Gort na Bró, the Western Distributor Road, and existing development and retail park access roads. Pedestrian crossings are provided at the roundabout at the junction of Gort na Bró and Western Distributor Road. Additional pedestrian access is provided via the pedestrian route located between the northern project boundary and the school.

There are dedicated cycle lanes and paths on both sides of the Western Distributor Road and Gort na Bró, as well as on both sides of the retail park road to the west of the proposed development site. There is currently no dedicated cycle lane on the existing development access road that crosses the site.

The proposed development will be constructed in two phases. The proposed access road realignment will be constructed as part of Phase 1. The existing access road to the existing retail park will be kept open to traffic until the proposed road diversion is complete. The existing access road will be decommissioned in Phase 2 after the new road diversion is complete. Specific control measures will be implemented to fully segregate construction traffic from external pedestrian traffic such as a site marshal.

3.3 Proposed Development Construction Operations

The detailed drawings for the proposed development can be seen as Appendix 3-2 to this EIAR. A Construction and Environmental Management Plan (CEMP) can be seen as Appendix 3-3. Details of the proposed site infrastructure are provided in the Infrastructure Design Report which is included as Appendix 3-4 of this EIAR. Electrical and heating details for the proposed development can be seen in the Mechanical and Electrical Services Basis of Design Report which is included as Appendix 3-5 of this EIAR.

3.3.1 Hoarding

The entire project site will be enclosed with a hoarding, details of which are to be agreed with Galway Co. Co. Hoarding panels will be maintained and kept clean for the duration of the project. Hoardings will be painted timber hoarding circa 2.4m high including supports and appropriate anchoring, external lighting and Safety signage. Site hoarding will include Health and Safety warnings at appropriate intervals.

3.3.2 Pedestrian and Cyclist Safety

Pedestrian and vehicular traffic will be segregated on site, including at access points/ entrances. Until such time as the construction of the first phase is complete, the new access road will not be open to members of the public. However, the general public will have right of way along the existing retail park access road until the new access road is opened. When vehicles are entering the site, leaving the site, or crossing the public footpath these movements will be supervised by road marshals. The construction site gates will be kept closed when not in use and monitored by security. Traffic cones and set-back signage will be put in place to warn and safely direct cyclists around obstructions.

The Construction and Environmental Management Plan (CMP) is a dynamic document which will be kept under review to ensure that the pedestrian and vehicular access points are located and maintained appropriately. The most suitable access routes should be picked for each phase to ensure the safety and convenience of its users, and other local residents.

Figure 3.2: Pedestrian Site Access details

3.3.3 Proposed Hours in which Vehicles will Arrive and Depart

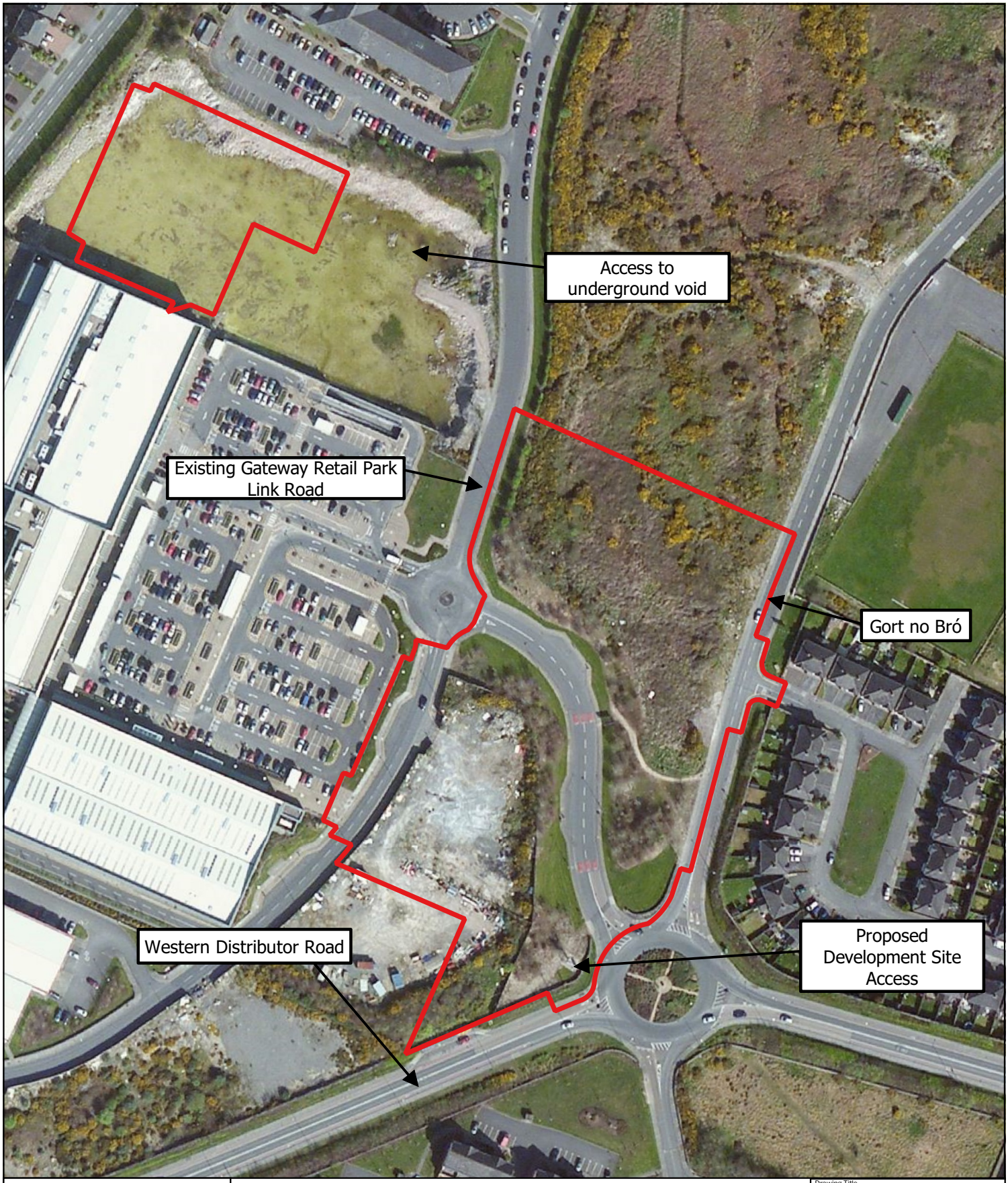
In general, the hours in which vehicles will arrive and depart will coincide with the expected site working hours of 7.00am to 7.00pm in the evening from Monday to Friday, and 8:00am to 5:00pm on Saturday. The construction phase of the proposed development is expected to last approximately 2 years in total.

3.3.4 Access Arrangements for Vehicles

The access arrangements will be as specified in the statutory publications with reference to the publications "Traffic Management Guidelines" manual and the "Traffic Signs Manual" and as agreed with Galway City Council.

All deliveries and vehicles into site will access the site from the proposed site access located at the roundabout to the east of the subject site on the Western Distributor Road as shown on Figure 3.3.

The location of the vehicular entrance and access will be regularly reviewed during the construction to ensure that the pedestrian and vehicular access points are located and maintained appropriately.



Map Legend

Site Boundary

N

Drawing Title

Construction Access

Project Title

SHD at Knocknacarra District Centre

Drawn By	Checked By
TJB	MH
Project No.	Drawing No.
180531-a	Figure 3.3
Scale	Date
1:1900	23.10.2019

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3.3.5 Exclusion Zones on Site

Identified risks include spillages into drainage systems and unprotected ground, allowing pollutants to enter watercourses or ground water. The measures proposed to be put in place to mitigate this risk would be the use of exclusion zones around drainage systems where practicable.

3.3.6 Size of Vehicles

It is anticipated that there will be numerous types of delivery vehicles used to bring material to and from the site. These include:

- Skip lorries. These will include roll on/roll off skips for major demolition works and standard yard skips for waste.
- Spoil excavation.
- Ready mix concrete lorries.
- Flatbed delivery vehicles for the delivery of various material.

3.3.7 Parking and Loading Arrangements

A "Just in Time" approach will be implemented for the delivery of particular building materials such as concrete formwork and large structural steels. The location of this materials storage facility will be within the site boundary and highlighted within the Contractor's Construction Management Plan.

Materials will be stored within the boundary of the site. It is proposed to provide on-site car parking spaces for workers during the construction.

3.3.8 Site Compound and Facilities

Site accommodation will be provided including suitable washing and dry room facilities for construction staff, canteen, sanitary facilities, first aid room, office accommodation etc. Access to the compound will be security controlled and all site visitors will be required to sign in on arrival and sign out on departure. The compound will be constructed using a clean permeable stone finish and will be enclosed with security fencing. Any wastewater will be removed by vacuum tanker using an authorized waste collector.

3.3.9 Phasing

The project is currently at planning stage and subject to approval and detailed design. It is estimated that the works would be tendered in late 2019 with commencement in early 2020 and an estimated site programme of 24 months depending on construction phasing.

The proposed order of construction of key elements is as follows, however this is subject to detailed review by the Contractors at construction stage and specifics may require adjustment once the contractor has been appointed;

- Site Setup
- Earthworks, including removal of excess material off site to an authorised outlet
- Construction of substructure and services
- Super Structure Frame to buildings in sequence
- Roof and Façade finishes
- External hard and soft landscaping
- Internal fit out
- Site Landscaping

3.4 Construction Methodologies

This section describes the construction methodologies that will be used for the proposed housing development. Further details are also provided in the Construction and Environmental Management Plan (CEMP) included as Appendix 3-3 of this EIAR.

3.4.1 General Construction Measures

Prior to any works commencing, surveys will be conducted of the adjoining roads, footpaths and adjoining buildings, photographing and noting any existing damage or defects to structure or road surfaces. A copy of this survey will be retained on site and issued to Galway City Council if required.

Communication with the public, local residences and businesses adjacent the development will be an important responsibility of the Senior Project Manager and delegated persons. All parties will be kept up to date and informed both shortly prior and during the construction period at all times. Two to three weeks before any work commencing reasonable efforts will be made to inform all parties of the oncoming works.

A Traffic Management Plan (TMP) will be issued to Galway City Council for approval prior to works commencing on site. The approved TMP and any revisions thereof will be set up and implemented on site. All necessary signage will be erected in the weeks prior to any works commencing along and on adjacent roads to the proposed development giving advance warning to traffic, pedestrians / members of the public. Every effort will be made to minimise the impact of the above works on local residences and traffic.

- All personnel will be inducted and made familiar with Risk Assessments / Method Statements (RAMS) and Traffic Management Plans.
- All site-specific safety rules will be adhered to.
- All plant operators will have appropriate CSCS training.
- All personnel will have SOLAS Safe Pass training
- Fire extinguishers and first aid supplies will be available in the work area.
- All adjacent roadways will be maintained in clean condition at all times.
- Helmets, high visibility clothing and safety footwear will be worn at all times.
- Competent foremen will be on site at all times.
- Biometric turnstiles will be used to prevent unauthorised access to the site.

3.4.2 Soil Stripping & Temporary Stockpiling

Earthworks will consist of reducing existing levels for the proposed roads, sub-structure, foundations and services. The extent of earthworks will be minimal as no basement structures are proposed. Excess material including soil, peat and stone/rock will be sent offsite to a suitably authorised, permitted or licensed facility. During these works, any topsoil will be stripped and stored in a designated, on-site storage area for reuse. Excavation of made ground, subsoil and peat will be required for sub-structures, roads and services. Where these works occur, the following will apply:

- The area where excavations are planned will be surveyed and all existing services will be identified.
- All relevant bodies i.e. ESB, Bord Gáis, Eircom, Galway City Council etc. will be contacted and all drawings for all existing services sought.
- All plant operators and general operatives will be inducted and informed as to the location of any services.
- All plant operators and general operatives will be inducted and informed as to the identification of invasive species.

- A tracked 360-degree excavator will be used to excavate the material, and a dumper will be used to move the excavated materials to the temporary stockpile location.
- All excavated material which is not required for future landscaping works or for backfill of excavations will be removed to an authorised waste recovery facility. This will also apply to material which is not suitable for reuse on site.
- All stockpiles will be damped down or covered in a sheet of polythene, as required, which will prevent the creation of nuisance dust, and will also prevent sediment runoff in times of heavy precipitation.
- A silt filtration system will be used as appropriate to prevent contamination of any watercourse.

3.4.3 Temporary Site Compound

One temporary construction compound is proposed for the construction phase of the proposed development, located within the site boundary. The proposed temporary compound area will incorporate temporary site offices, staff facilities, material storage and car-parking areas.

A dedicated waste management area will be located within the compound, with waste to be sorted and collected from site by permitted collectors. Potable drinking water will be supplied via water coolers located within the staff facilities, which will be restocked on a regular basis as required during the construction phase. A supply contract will be set up with a water cooler supply company with water supplies delivered to site as required for the duration of the construction period.

Temporary port-a-loo toilets located within portacabins will be used during the construction phase. Wastewater from staff toilets will be directed to a sealed storage tank, with all wastewater being tankered off site by permitted waste collector to wastewater treatment plants. Power will be supplied by a diesel generator, located within the compound. The construction compound will be used for temporary storage of some construction materials, prior to their delivery to the required area of the site.

3.4.4 Road Realignment

The construction methodology for the proposed road realignment is outlined as follows:

- Excavation will take place until a competent stratum is reached. Any peat encountered will be removed.
- The competent stratum will be overlain with up to 500mm of granular fill.
- A layer of geogrid/geotextile may be required at the surface of the competent stratum.
- Site services and drainage will be installed.
- Kerbs, footpaths and road pavement will be installed.
- The existing road will remain operational until the road realignment is complete.

3.4.5 Excavation and Services Installation

Services will be required to each apartment block in the proposed development. Where these are located, the following will apply:

- The area where excavations are planned will be surveyed and all existing services will be identified.
- All relevant bodies i.e. ESB, Bord Gáis, Eircom, Galway County Council etc. will be contacted and all drawings for all existing services sought.
- A traffic management plan will be produced if required for connection works to the existing service network.
- A road opening licence will be obtained where required for connection to existing services.

- All plant operators and general operatives will be inducted and informed as to the location of any services.
- A tracked 360-degree excavator or similar will be used to excavate the trench to the required dimensions.
- All excavated material will be removed to an authorised waste recovery facility or, if suitable, stock piled and reused for backfilling and landscaping where appropriate.
- Once the trench has been excavated the ducting/pipework will then be placed in the trench as per specification.
- Once the service ducts/pipework has been installed couplers will be fitted as required and capped to prevent any dirt etc. entering the ducts/pipes.
- The as built location of the ducting/pipework will be surveyed using a total station/GPS.
- Backfill material will be carefully placed so as not to displace the ducting/pipework within the trench.
- The appropriate warning/marker tape will be installed above the ducts/pipes at the appropriate depths.
- The surface will be reinstated as per original specification or to the requirements of the site layout/Local Authority as appropriate.

3.4.5.1 Existing Underground Services

Any underground services encountered during the works will be surveyed for level and where possible will be left in place. If there is a requirement to move the service, then the appropriate body (ESB, Gas Networks Ireland, etc.) will be contacted, and the appropriate procedure put in place. Back fill around any utility services will be with dead sand/pea shingle where appropriate. All works will be in compliance with required specifications.

3.4.6 Building Construction

The buildings will be constructed by the following methodology:

- The area where excavations are planned will be surveyed and all existing services will be identified.
- The area of each building will be marked out using ranging rods or wooden posts and the soil and overburden stripped and removed to nearby storage area for later use in landscaping. Any excess material will be sent to an authorised recovery facility.
- All plant operators and general operatives will be inducted and informed as to the location of any services.
- A tracked 360-degree excavator or similar will be used to excavate the area down to the level indicated by the designer and appropriately shuttered reinforced concrete foundations and rising elements will be cast.
- On casting for the reinforced concrete ground floor slab, having first located any ducts or trenches required by the follow on mechanical and electrical contractors, the loadbearing blockwork and concrete walls will be constructed. Scaffold will be erected inside and around the outside of the buildings for this operation;
- The upper floor precast slabs will then be laid on internal and external loadbearing walls, lifted into position using an adequately sized mobile crane and a concrete screed applied.
- This sequence will be repeated up through the building to roof level at which point a precast concrete roof slab will be laid and a concrete screen laid to falls applied.
- The roof finish will then be applied and sealed against the weather.
- Windows, electrics, plumbing and all other building components and services will be installed in as timely a manner as is possible.
- Each building will be inspected and certified by an engineer at the appropriate stages of construction.

3.4.7 Construction Site Management Incorporated into Project Design

The following measures pertaining to water quality and invasive species have been incorporated into the design phase of the project to avoid effects on sensitive ecological receptors.

3.4.7.1 Prevention Pollution Control Measures

The Construction Industry Research and Information Association (CIRIA) provide guidance on the control and management of water pollution from construction sites ('Control of Water Pollution from Construction Sites, guidance for consultants and contractors', CIRIA, 2001), which provides guidance. This will ensure that surface water arising during the course of construction activities will contain minimum sediment. The following methods and best practice measures will ensure that sediment release and potential for pollution during the construction phase is minimised and reduced to imperceptable:

The proposed development site does not contain any surface watercourses. The culverted unnamed tributary to the Knocknacarra Stream forms part of the existing storm drainage infrastructure adjacent to the site and flows southwest away from the development to discharge into Rusheen Bay. Surface water and foul sewer drainage will be constructed for the development as works progress. Attenuation systems in will be constructed in conjunction with the drainage. Drainage in the road realignment will be constructed during the road construction. Connections to the public foul and surface water sewers will not be completed until approval has been received from the local authority and Irish Water. All drainage works will be constructed and tested in accordance with the local authority/ Irish Water requirements.

Adjacent drainage systems/groundwater will be protected from sedimentation and erosion during the construction phase. Surface water discharge from site will be managed and controlled for the duration of the construction works until the permanently surface water drainage system of the proposed site is complete. The following measures will be put in place to prevent the transportation of silt laden water or pollutants from entering the wider environments including downstream watercourses.

- There will be no release of suspended solids to any watercourse as a direct or indirect result of the proposed works. There is no open surface watercourse on the site of the proposed development.
- No open watercourse will be interfered with as part of the proposed works. No temporary instream crossings or temporary culverting will take place. Instream works will not take place.
- Any requirement for temporary fills or stockpiles will be damped down or covered with polyethylene sheeting as required to avoid sediment release associated with heavy rainfall.
- Drainage systems/groundwater will be protected from sedimentation and erosion due to direct surface water runoff generated onsite during the construction phase. Surface water discharge from site will be managed and controlled for the duration of the construction works until the permanent surface water drainage system of the proposed site is complete. A temporary drainage system shall be installed prior to the commencement of the construction works to collect surface water runoff by the site during construction.
- Accidental Spills and Leaks – All oils, fuels, paints and other chemicals will be stored in a secure bunded construction hardstand area. Refuelling and servicing of construction machinery will take place in a designated hardstand area which is also remote from any drainage systems. A response procedure will be put in place to deal with any accidental pollution events and spillage kits will be available and construction staff will be familiar with the emergency procedures and use of the equipment.
- Concrete – Concrete batching will take place off site, wash down and wash out of concrete trucks will take place off site and any excess concrete is not to be disposed of on

site. Pumped concrete will be monitored to ensure there is no accidental discharge. Mixer washings are not to be discharged into surface water drains.
- Disposal of Wastewater from Site – Discharge from any vehicle wheel wash areas is to be directed to on-site settlement tanks/ponds, debris and sediment captured by vehicle wheel washes are to be disposed off-site at a licensed facility.
- Foul drainage discharge from the construction compound will be tankered off site to a licensed facility until a connection to the public foul drainage network has been established.

3.4.8 Landscaping works

Prior to completion of works on the development site, the landscaping works will be carried out. The proposed landscaping plan is shown in the Landscape Report in Appendix 3-6 of this EIAR. The finishes include areas of play grounds, footpaths and tree planting. This work will be carried out before the completion of each phase in order to ensure that the development will be aesthetically pleasing place for residents to live. These works will involve the use of plant and machinery in order to carry out tasks such as earth moving. Materials which have been stockpiled for the task will be used as much as possible, and material will only be imported where it is required. Solid barriers will be erected around the site boundary for the duration of the construction works.

3.4.9 Invasive Species

The introduction and/or spread of invasive species such as Japanese Knotweed and Himalayan Knotweed for example, could result in the establishment of the species and this may have knock on effects on the surrounding environs.

Appropriate control measures will be incorporated into the design and construction phase of the development to ensure that the relevant measures (outlined in the following section below) will be implemented.

3.4.9.1 Control Measures for the Management of Invasive Species

Invasive species, such as Japanese Knotweed, Himalayan Knotweed, Himalayan Balsam, *Gunnera*, and Giant Hogweed pose a serious threat to biodiversity and the health of native vegetation types. Construction machinery can act as a vector for the spread of these plants. Machinery that has worked at an infected site is likely to cause the spread of such species by transferring their tiny seeds or plant fragments, in soil trapped in their tyre tread for instance. Equally, they can cause the spread of species within a site. The duration of the impact could be short-term or permanent depending on whether or not an eradication effort is made but once established, eradication is time-consuming and expensive. Himalayan Knotweed, for example, propagates vegetatively, forming a new plant from even very small plant fragments. Thus, there is a high risk of causing the spread of this species to other parts of the site. The UK Environment Agency's *'Japanese Knotweed Code of Practice'* provides guidance on managing Japanese Knotweed and Himalayan Knotweed on development sites. A number of control measures have been drawn up and included in the design and construction phase of the proposed works to avoid the introduction and spread of invasive plant species. The following project design elements have been devised to avoid such effects. The following measures address potential effects associated with the construction phase of the development:

- All earthworks machinery will be thoroughly pressure-washed prior to arrival on site and prior to their further use elsewhere.
- Care will be taken not to disturb or cause the movement of invasive species fragments, either intentionally or accidentally.
- There are not believed to be any existing stands of invasive species on site, but should any be found, they will be clearly demarcated by temporary fencing and tracking within

them will be strictly avoided. A minimum buffer of seven metres will be applied to avoid disturbance of lateral rhizomes.

- If any excavations must be carried out in areas of Japanese Knotweed, the excavated material will not be moved from the location. The machinery must be thoroughly pressure-washed in a designated area at least 25 metres from any watercourse before moving on to an area that is not yet infected.
- All contractors and staff will be briefed about the presence, identification and significance of Japanese Knotweed before commencement of works.
- Good construction site hygiene will be employed to prevent the spread of these species with vehicles thoroughly washed prior to leaving any site with the potential to have supported invasive species. All plant and equipment employed on the construction site (e.g. excavator, footwear, etc.) will be thoroughly cleaned down using a power washer unit prior to arrival on site to prevent the spread of invasive plant species such as Japanese Knotweed and Rhododendron. All washing must be undertaken in areas with no potential to result in the spread of invasive species.
- When working at locations in proximity to natural watercourses, a suitable barrier will be erected between the watercourse and the stand of invasive species. This will assist in preventing the spread of any invasive species into the watercourse during their removal. There are no watercourses on the proposed development site, but cognizance will be had of any watercourses on neighbouring sites.
- Any material that is imported onto any site will be verified by a suitably qualified ecologist to be free from any invasive species listed on the 'Third Schedule' of Regulations 49 & 50 of Regulations 49 and 50 of the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. 477 of 2011). This will be carried out by searching for rhizomes and plant material.
- Any soils or subsoils contaminated with invasive species will sent for disposal to an authorized waste facility.

The treatment and control of invasive alien species will follow guidelines issued by the National Roads Authority – *The Management of Noxious Weeds and Non-native Invasive Plant Species on National Roads* (NRA 2010) and the Environment Agency (2013) – *The Knotweed Code of Practice: Managing Japanese Knotweed on Development Sites* (Version 3, amended in 2013).

3.5 Other Site Details

3.5.1 Waste Management

The treatment of waste is to be employed by the contractor or a specialist waste management contractor as a trade package. This contractor is responsible for:

- Ensuring the site is kept clean and safe
- The collection of waste from a central point
- Segregation of waste on site.

The waste management contractor should ensure that all access routes, fire escapes and staircases are swept and kept clear of debris on a regular basis to maintain high standards of health and safety on the project. No fires will be permitted on site.

A Construction and Demolition Waste Management Plan (CDWMP) for the project has been developed 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 plan will ensure that the management of construction and demolition (C&D) waste at the site is undertaken in accordance with current legal and industry standards including the Waste Management Acts 1996 - 2011 and associated Regulations, Protection of the Environment Act 2003 as amended, Litter Pollution Act

1997 as amended and the Connacht - Ulster Region Waste Management Plan 2015 – 2021. In particular, this plan aims to ensure maximum recycling, reuse and recovery of waste with diversion from landfill, wherever possible. It also provides guidance on the appropriate collection and transport of waste from the site to prevent issues associated with litter or more serious environmental pollution (e.g. contamination of soil and/or water). A copy of the CDWMP is provided as Appendix 3-7 of this EIAR.

In order to ensure appropriate segregation of waste on site, a material storage zone will 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 and deliveries into the site and to designated compound or construction areas, as appropriate.

3.5.2 Dust

Dust prevention measures will be included for control of any site airborne particulate pollution. The Contractor shall put in place a regime for monitoring dust levels in the vicinity of the site during the works. The level of monitoring and adoptions of mitigation measures will vary throughout the construction works depending on the type of activities being undertaken and the prevailing weather conditions at the time. The minimum criteria to be maintained will be the limit for Environmental Protection Agency (EPA) specification for licensed facilities in Ireland, which is 350mg/m2/day. The Construction team will monitor the contractor's regime on an ongoing basis throughout the project to endeavour to minimise impact on a surrounding community.

If dust levels become an issue, then all dust generating activities on site will cease until such time as weather conditions improve (e.g. wind levels drop or rain falls) or mitigation measures such as damping down of the ground are completed.

Dust control will be achieved by:

- 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 shall be covered with tarpaulins.
- Aggregates will be transported to and from the site in covered trucks.
- 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 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.
- During peak vehicle movements, where there is a likelihood of dirt on construction vehicles exiting the site, a dedicated road sweeper will be put in place until these works are competed.
- If dirt generation extends onto public roads, road sweeping will be carried out as well, including if necessary, cleaning of silt from road gullies.
- Site road ways will be maintained in a stoned hard core condition not allowing soil to accumulate which when dry can create dust.
- Wheel wash equipment will be set up at the site exit gate for all construction vehicles to pass through prior to leaving the site thus ensuring that no dirt etc. is transported outside the site onto the roadways.

3.5.3 Noise and Vibration

It is not envisaged that any significant prolonged noise and vibration producing activities will be carried out on site.

The Contractor will be required to ensure that the level of noise and vibration resulting from the construction of the works does not constitute a nuisance, and that noise and vibration emissions conform to the requirements of BS 5228: 2009 Code of Practice for Noise and Vibration Control on Construction Sites, Part 1 and Part 2. All plant shall be adequately silenced to conform to the requirements of BS 5228.

Short-term vibration levels and continuous vibration guideline levels as measured in buildings shall be less that the guideline values in BS 5228.

Vibration limits to be applied for infrastructure works are those specified in the NRA document Guidelines for the Treatment of Noise and Vibration in National Road Schemes (NRA, Revision 1, 2004). Allowable vibration (in terms of peak particle velocity) at the closest part of sensitive property are given in Table 3-1 below.

Table 3-1 Allowable vibration during road construction in order to minimise the risk of building damage

Allowable vibration velocity (Peak Particle Velocity) at the closest part of any sensitive property to the source of vibration, at a frequency of		
Less than 10Hz	10 to 50Hz	50 to 100Hz (and above)
8 mm/s	12.5 mm/s	20 mm/s

If significant noise and vibration activities are to be carried out on site, the contractor will ensure that there is prior liaison with other resident / local business etc. with a view to ensuring that excess noise is not generated by the works beyond the site curtilage and that contract details are available along with agreed protocols.

Best Management Practice and mitigation measures will be put in place to prevent or minimise noise levels from the works through the provision and proper maintenance, use and operation of all machinery. Site construction shall operate in accordance with the Safety, Health and Welfare at Work (General Application) Regulations 2007, part 5 Noise and Vibration.

A designated person will be appointed to manage all environmental complaints including noise. 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. A strictly enforced noise management programme shall be implemented at the site from the outset of construction activities.

Appropriate signage shall be erected 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.

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

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.

No other specific mitigation measures are warranted. Several general measures are proposed as follows:

- Construction operations will in general be confined to the period Monday-Friday 0700-1900 h, and Saturday 08:00-17:00 h.
- Plant used onsite during the construction phase will be maintained in a satisfactory condition and in accordance with manufacturer recommendations. In particular, exhaust silencers will be fitted and operating correctly at all times. Defective silencers will be immediately replaced.
- Where it is proposed to operate plant during the period 0700-0800 h, standard 'beeper' reversing alarms will be replaced with flat spectrum alarms.
- Erection of solid barriers (hoarding) to site boundary

3.5.4 Road Cleaning and Wheel Washing

The Contractor will make provision for the cleaning by road sweeper etc. of all access routes to and from the site during the course of the works as required. It is intended that cleaning will be undertaken on a daily basis during the excavation works and as required thereafter. A wheel wash facility will be provided on site to clean site traffic leaving the site. Waste water generated at this washing facility will be suitably treated on site and all settled silts disposed offsite to licensed landfill. All road sweeping vehicles will be emptied off site at a suitably licensed facility as per our construction stage environmental waste management document.

3.5.5 Water Supply

Water will be supplied on site by water tankers for general use. Potable water will be provided in the form of bottled water for staff use.

3.5.6 Wastewater Management

Portable toilets will be provided for the working on the construction site. Wastewater arising on-site from these toilets is stored in a sealed tank located within the portable toilets, and these will be emptied periodically (as required) by permitted waste contractors and transported to municipal wastewater treatment plants for treatment.

Any sewage or greywater generated during the operational phase of the proposed development will be directed to the local municipal wastewater treatment plants for treatment via the sewage collection network.

3.5.7 Aggregates

The aggregates required for the construction of the proposed development will be sourced, as much as is possible and practicable, from quarries and suppliers located as near as possible to the proposed development. This will reduce the potential for any negative impacts associated with the haulage of the materials to the site of the proposed development. Existing soils and subsoils located on the site will be used where possible to reduce the amount of such materials required for import onto the site.

3.5.8 Construction Traffic/Plant

The following mitigation measures will be implemented in relation to construction traffic and plant/machinery:

- All vehicles to switch off engines when not in use – no idling vehicles

- Effective vehicle cleaning and wheel washing on leaving site and damping down of haul routes
- No site runoff of water or mud.
- On-road vehicles to comply to set emission standards.
- All non-road mobile machinery (NRMM) to be fitted with appropriate exhaust system and be regularly serviced.
- Hard surfacing and effective cleaning of haul routes and appropriate speed limit around site.

3.6 Operational Phase

The proposed development will require periodic maintenance throughout the operational phase. The operation of a residential development is not a recognized source of environmental emissions or nuisance and so there will be no adverse effects associated with its operation.

It is proposed that surface water from the development will drain via gravity to existing public surface water drainage network. Surface water will pass through suitably sized attenuation facilities and petrol interceptors prior to discharge to the public surface water network.. The proposed on-site foul sewers will discharge by gravity to the existing public (Irish Water) foul sewer network.

3.6.1 Drainage Arrangement

3.6.1.1 Surface Water Drainage

It is proposed to divert the existing surface water sewers within the site to align the drainage layout with the proposed diversion of the existing access road to the Gateway Retail Park. A surface water drainage network will be provided to collect surface water flows from the apartment blocks and commercial units. Attenuated outflows from the drainage network in the northern portion of the site will connect with the existing 375mm diameter sewer to the north-west of the site. Storm drainage from the southern portion of the site will discharge attenuated outflows to the existing 450mm diameter sewer to the south-west of the site.

The surface water strategy incorporates attenuation of storm water to limit discharge from the site, although storage facilities and SUDs elements will be designed to allow infiltration or reduction of run-off volumes and rates where possible.

Run-off from roofs and any additional run-off from the landscaped courtyard podium slab is designed to be conveyed to the surface water drainage network at ground floor level. Two underground surface water attenuation tanks will be provided for the development to attenuate surface water flows for the 100 year critical storm + 10% allowance for climate change in accordance with the guidance and policies outlines in the Greater Dublin Strategic Drainage Study (GDSDS). One concrete attenuation tank will be located beneath the ground floor car park in Site 2, and one Stormtech attenuation system will be located beneath the civic plaza in Site 1.

The podium (landscaped courtyard) consists mainly of green areas, soft landscaped areas and raised planters providing interception storage and treatment. The hardstanding area of the podium, which is of a north-south pedestrian link will consist of impermeable paving. A number of gullies at podium slab level will drain any residual runoff from the landscaped courtyard to the surface water network at ground level.

As outlined in the Infrastructure Design Report (DBFL Consulting Engineers, 2019), all run-off from roofs and areas of hardstanding will be conveyed to the surface water drainage network at ground floor level. Sustainable urban drainage system (SUDS) elements will be incorporated in to the design and will include the following:

1. *Porous asphalt paving on part of civic plaza within Site 1 to provide treatment, storage and reduce run-off rates.*
2. *Green podium with landscaped areas and raised planters to reduce run-off rates and total impermeable area.*
3. *Two off-line attenuation storage systems for the attenuation of flood water up to the 100 year storm event + 10% allowance for climate change.*
4. *A Class 1 Bypass Separators to be provided on the outfall from each network.*

The incorporation of the above SUDS elements will provide a sustainable manner in which to disperse surface water from the site and provide treatment of run-off and subsequent improvement of discharge quality. A copy of the Infrastructure Design Report is included as Appendix 3-4 of this EIAR.

3.6.1.2 Foul Water Infrastructure

The proposed development will be provided with a foul drainage network to collect foul flows from the apartment blocks and commercial units. The foul drainage system will connect with the existing 225mm diameter sewers to the north-west and south west of the site.

Sewers are designed in accordance with the Building Regulations and Irish Water's Code of Practice for wastewater infrastructure and Standard Details for wastewater infrastructure.

An Irish Water Pre-Connection Enquiry form was submitted to Irish Water. An Irish Water Feedback form has been received outlining that wastewater is connecting to the public sewer system and confirming that has the system has capacity and capability to deal with it. Foul drainage from the site will ultimately be treated at the licenced Mutton Island Wastewater Treatment Plant.

3.6.2 Water Supply

As part of the proposed development it is proposed to divert the existing watermains within the site and utilise the existing 150mm diameter watermain to the north-west of the site to supply the development. The proposed watermain layout will connect to the existing 150mm watermain located in the 'Gort Ná Bró' road to the east of the site. The residential blocks will be pumped from a storage tank at ground floor level, while the commercial units will have individual connections. Hydrants will be located within the network

An Irish Water Pre-Connection Enquiry form has been submitted to Irish Water and an Irish Water Feedback form has been received outlining that a water connection can be facilitated for the proposed development.

3.6.3 Energy Use

The Ethos Engineering Energy Statement is included as Appendix B of the Mechanical & Electrcial Basis of Design Report in Appendix 3-5 of this EIAR. The report describes how the overall energy strategy of the proposed development has been approached in a holistic manner, striving to meet the highest standards of sustainable building design such as passive solar design, high efficiency systems and use of renewable energy technologies. The following are an example of the energy saving measures that are planned for the dwellings to assist in reducing costs for the occupants:

- A BER certificate will be provided for each dwelling in the proposed development which will provide detail of the energy performance of the dwellings. It is proposed to target an A2 rating for the apartments, equating to the following emissions:
- A2 - 25 to 50 kWh / m^2 /year with CO_2 emissions c. 10kg CO_2 / m^2 / year.
- The U-values of the building fabric will be in line with the requirements set out in the regulatory requirements of TGD Part L.
- Thermal bridging at junctions between construction elements and at other locations will be minimised in accordance with TGD Part L.

- Better performance air permeability than the backstop, adding to building air tightness and ventilation effectiveness •
- Balanced whole house mechanical ventilation with heat recovery •
- Heat Pump supplying Domestic Hot Water and direct acting electric heaters supplying space heating •
- Renewable Sources – 2no. PV Panels on rooftop

3.7 Decommissioning Phase

It is not intended that the proposed buildings will be removed, as permanent planning permission is being sought for this development. The proposed development will form an integral part of the local housing needs. Therefore, it is intended that the proposed development will be retained as permanent, and will not be decommissioned.