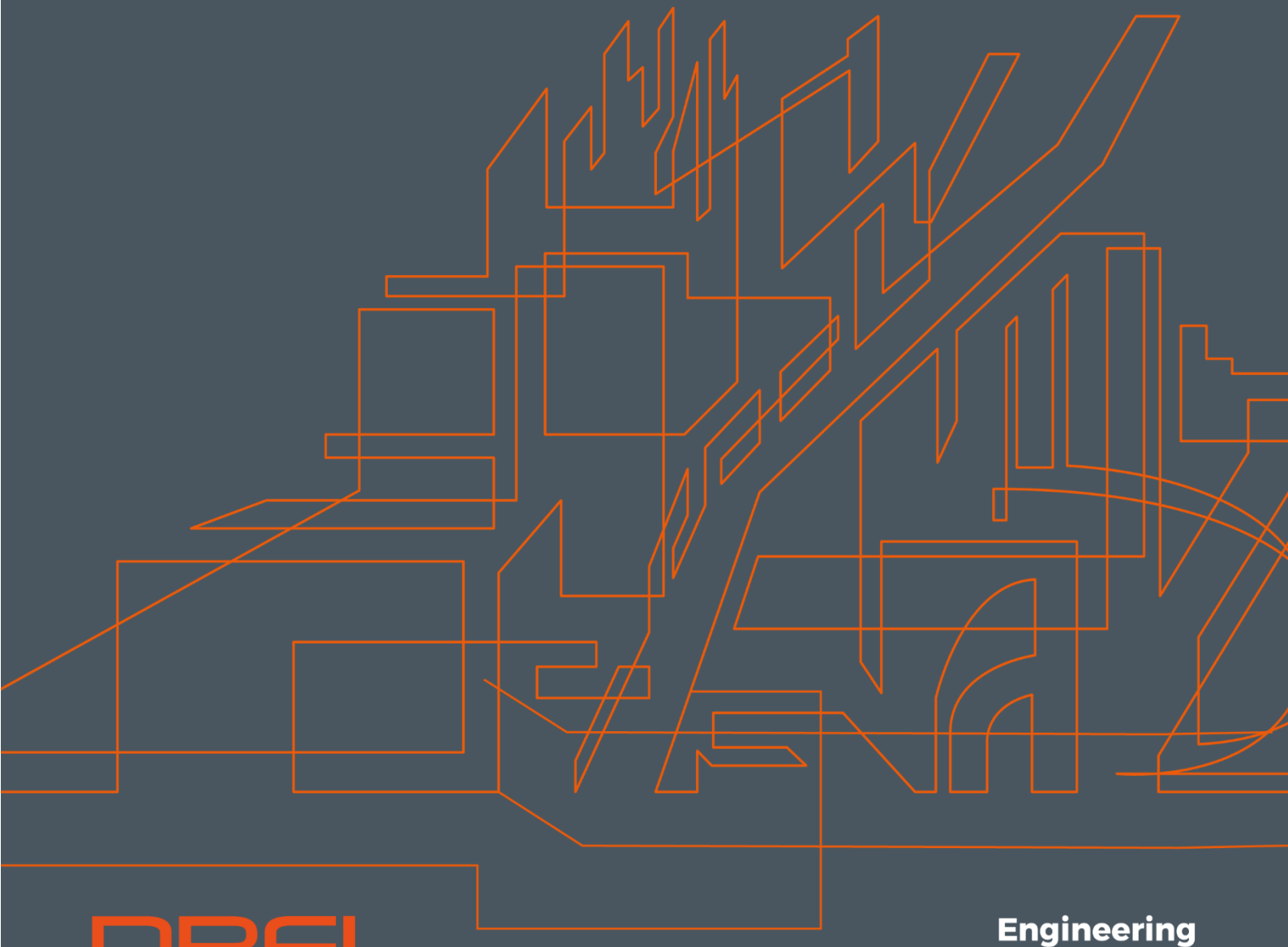
Royal Liver Phase 2

Construction and Environmental Management Plan

260024-X-X-XXX-RP-DBFL-CE-0005

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Engineering Sustainable Futures

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1 Works Proposal

On behalf of the Land Development Agency (LDA), this Construction & Environmental Management Plan (CEMP) is for the works associated with the construction of a proposed mixed development at Royal Liver Retail Park, Naas Road, Dublin 12.

This CEMP is based on the original CEMP submitted as the subject development site already benefits from the parent planning permission (DCC REG. REF. 4238/19; An Bord Pleanála (ABP) REF. 307804-20) and as amended by DCC Ref.:4436/23 & 5050/26) which includes the demolition of the existing Royal Liver Assurance Retail Park and its replacement with a mixed-use development across c. 9 No. buildings comprising a mix of residential apartments (including Build to Rent units and Shared Accommodation Bedrooms), Office, Crèche, Community, Retail, Café / Restaurant / Bar uses plus ancillary car / bicycle parking areas at ground and basement levels. The current scheme will be referenced throughout this CEMP as the "previously permitted scheme".

For a complete description of the proposed amendments please refer to the statutory notices including the full package of drawings and reports including civil engineering package lodged (DCC REG. REF. 4238/19; An Bord Pleanála (ABP) REF. 307804-20 and as amended by DCC Ref.:4436/23 & 5050/26) as part of the Original Planning Permission to which this application makes minor amendments to the previously granted infrastructure.

This CEMP will also incorporate the proposed amendments to the development site area. The proposed amendments relate solely to the permitted Blocks B1, B2, C1, C2, D1 and D2 (identified as Phase 2). No amendments are proposed to any other permitted blocks as part of this application.

All works will be carried out in accordance with the mitigation measures outlined in this document and with the construction mitigation measures from the EIAR. The construction stage mitigation measures from the EIAR are provided within Appendix A and are appropriate for all aspects of the works proposal including the proposed planning amendment.

This Construction & Environmental Management Plan shall be referenced in all tender and contract documentation for the proposed works and is to be read in conjunction with all relevant Engineering and Architectural documentation.



Figure 1-1 Site Location, Royal Liver Retail Park, Naas Road, Dublin 12

1.1 Phasing

Refer to Henry J. Lyon's Phasing Plan Layout (PRL-HJL-ZZ-DR-A-0050A) as submitted for Phasing Diagram.

It is proposed that Blocks B1, B2, C1, C2 D1 & D2 will all be delivered under a single phase. It is noted that temporary green space within Block A of Phase 3 lands (previously Phase 4 containing the office block) will be provided during Phase 1. Additionally , a small portion of Phase 1 works has been deferred and included within Phase 2 works:

- Temporary landscaping within Phase 3 Tower area
- Diagonal walkway between Block A (Phase 3) and Block B1
- 3 Parking Bays adjacent to the access off Old Naas Road serving Phase 2 basement

In summary, it is proposed that the development be constructed in three phases, with supplemental timelines as follows:

Phase 1 (Planned April 2027 to Dec 2029)

- Construction of Blocks E1,E2,F1 & F2
- Construction of public road infrastructure and services including:
- Upgrade of Kylemore Road and Naas Road
- Upgrade of Old Naas Road & Kylemore Road Junction
- Modification of Naas Road & Kylemore Road Junction
- Construction of open community area and landscaping areas between Phases 1 and 2

Phase 2 (Q4 2027 to Q4 2030)

- Construction of Blocks B1,B2, C1,C2,D1 & D2.
- Construction of the diagonal walkway that includes open community area and landscaping areas between Phases 2 and 3.
- Construction of remaining Old Naas Road infrastructure including 3 parallel parking bays

Phase 3 (Currently TBA)

- Construction of Royal Liver Tower

Refer to Figure 1-2 for further information.

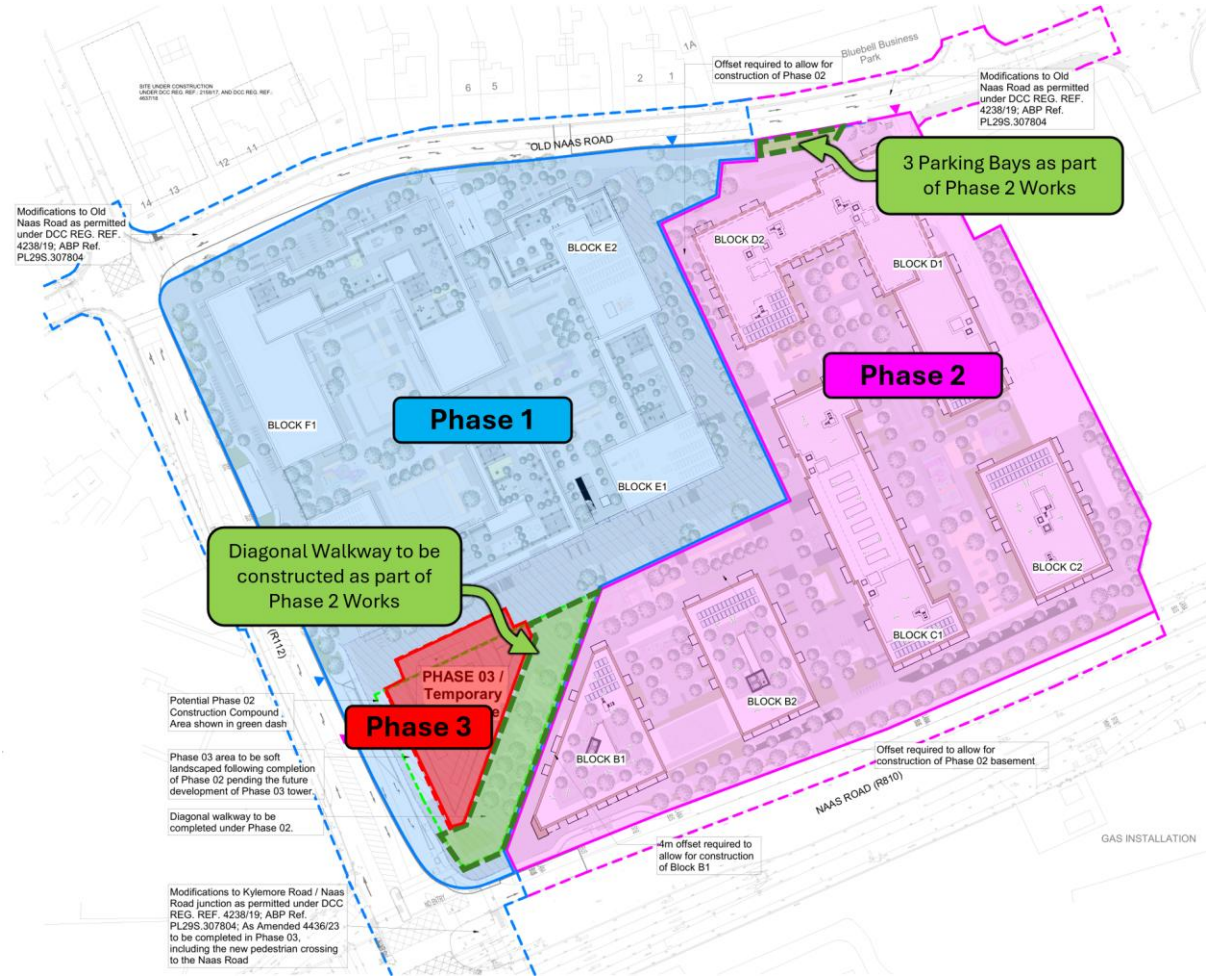


Figure 1-2: Proposed Phasing Plan

2 Compound Facilities

The proposed site compound for Phase 2 is proposed within Henry J. Lyon's Phasing Plan Layout (PRL-HJL-ZZ-DR-A-0050A) as submitted. The construction compound for the infrastructure works shall be entirely within the site boundary and enclosed with security fencing. Site accommodation to be provided will include suitable washing / 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 site will be able to accommodate employee and visitor parking throughout the construction period initially, hardstanding parking areas will be provided and as the development progresses, employees will use constructed car-parking spaces, as they become available. Staff parking will be separate from designated machinery / plant parking.

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 through the site and to designated compound / construction areas.

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.

3 Traffic Management

As part of Construction Stage Safety Plan for the works a Traffic Management Plan (TMP) will be prepared in accordance with the principles outlined below and shall comply at all times with the requirements of:

- Chapter 8 of the Department of the Environment Traffic Signs Manual, current edition, published by The Stationery Office, and available from the Government Publications Office.
- Guidance for the Control and Management of Traffic at Road Works (June 2010) prepared by the Local Government Management Services Board;
- Any additional requirements detailed in the Design Manual for Roads and Bridges & Design Manual for Urban Roads & Streets (DMURS)

The site will be accessed from the existing site entrances from Old Naas Road and Kylemore Road. Construction access from Naas Road is not permitted.

Traffic volumes are not anticipated to be significant and turning movements into the site shall be accommodated without delay. Warning signage will be provided for pedestrians and other road users on all approaches in accordance with Chapter 8 of the Traffic Signs Manual and the Contractor's Traffic Management Plan and construction 'goal posts' will be set up at either side of any overhead services.

Proposed improvement public road works on Kylemore Road, R810 Naas Road and Old Naas Road, will be as per the phasing proposals of the project (Section 1.1). A detailed traffic management plan and road opening licence will be agreed with DCC prior to commencement of these works. Initial roadworks will include the construction of the proposed accesses off of Old Naas Road and Kylemore Road. Upon completion of these works, this configuration will be used for all construction traffic accessing the site for the remainder (and majority) of the works duration.

In general, the impact of the construction period traffic will be temporary in nature and less significant than the final post development operational stage.

All construction activities will be governed by the Traffic Management Plan (TMP), the final details of which will be agreed with Dublin City Council prior to the commencement of construction activities on site. The principal objective of the TMP is to ensure that the impacts of all building activities generated during the construction phase upon the public (off-site), visitors to the subject

site (on-site) and internal (on-site) workers environments, are fully considered and proactively managed/programmed thereby ensuring that safety is maintained at all times, disruption is minimised and undertaken within a controlled environment.

During the general excavation of the basement and foundations there will be additional HGV movements from the site. All suitable material will be used for construction and fill activities where possible and appropriate. All spoil material will be removed to a registered landfill site which will be agreed in full with Dublin City Council. The reuse of material will be confirmed on receipt of the WAC.

In addition to the traffic generated by the disposal of surplus subsoil from the site, there will be traffic generated from deliveries of construction materials and equipment. It should be pointed out that construction traffic generated during the development works tends to be at off-peak hours. Such trips would generally be spread out over the full working day and are unlikely to be higher than the peak hour predicted for the operational stage.

Construction traffic will consist of the following categories:

- Private vehicles owned and driven by site construction staff and by full time supervisory staff. On-site employees will generally arrive before 07:30, thus avoiding the morning peak hour traffic. It should be noted that a large proportion of construction workers would arrive in shared transport. The site is accessible by public transport with Dublin Bus and Luas services within nearby walking distance.
- 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.
- Deliveries would arrive at a steady rate during the course of the day. It is estimated that peak delivery rates would be in the region of 1 - 2 deliveries per hour throughout the day.

The final construction programme shall assess the exact impact during the construction period, and provide appropriate measures to reduce traffic impact including :

- Appropriate on-site parking and compounding will be provided to prevent overflow onto the local network.

- It is likely that some numbers of the construction team will be brought to/from the site in vans/minibuses, which will serve to reduce the trip generation potential.
- During the period of excavation and disposal off site, it is likely that up to 2 no. truck trips per hour will be generated by vehicles removing unsuitable spoil from the site to allow for the construction of the development and for the removal of demolition waste.

Site offices and compound will be located within the site boundary. The site will able to accommodate employee and visitor parking throughout the construction period. Initially, hard-standing parking areas will be provided and as the development progresses, employees will use constructed car-parking spaces, as they become available.

REDUCTIVE/MITIGATION MEASURES

Traffic Management during Construction

As part of the Original Parent Planning Permission, the Environmental Impact Assessment Report (EIAR) addressed impacts relating to Traffic within Chapter 14 the EIAR as submitted within the original planning package.

The construction stage mitigation measures specific to traffic are provided in full within Appendix A and is appropriate for all aspects of the works proposal including the proposed planning amendment.

A Traffic Management Plan will be prepared prior to the commencement of construction work on site. This plan will be prepared in consultation with Dublin City Council in order to agree on traffic management and monitoring measures are outlined below:

- During the pre-construction phase, the site will be securely fenced off from adjacent properties, public footpaths and roads.
- The surrounding road network will be signed to define the access and egress routes for the development.
- All road works will be adequately signposted and enclosed to ensure the safety of all road users and construction personnel.
- All employees and visitors vehicle parking demands will be accommodated on-site.
- A programme of street cleaning at the site frontage on Old Naas Road & Kylemore Road will be implemented.

4 Road Cleaning

Provision will be made for the cleaning by road sweeper etc. of all access routes to and from the site during the course of the works. Road cleaning shall be undertaken as required during the completion of the works.

All road sweeping vacuum vehicles will be emptied off site at a suitably licensed facility.

5 Working Hours

For the duration of the proposed infrastructure works the maximum working hours shall be 08:00 to 19:00 Monday to Friday (excluding bank holidays) and 08:00 to 14:00 Saturdays, subject to the restrictions imposed by the local authorities. No working will be allowed on Sundays and Public Holidays without prior written approval from Dublin City Council.

6 Construction Methodology

As part of the Original Parent Planning Permission, the Environmental Impact Assessment Report (EIAR) addressed impacts relating to Material Assets within Chapter 13 the EIAR as submitted within the original planning application.

The construction stage mitigation measures specific to material assets are provided in full within Appendix A and is appropriate for all aspects of the works proposal including the proposed planning amendment and shall be implemented in full.

Protection of Adjacent Areas

Work areas will be segregated from the adjacent public areas for the extent of the project by means of a suitable hoarding fence. All hoardings will be designed by a competent Structural Engineer to resist wind loads.

There is an existing 225mm diameter concrete surface water sewer in Naas Road to the south of the site, and a 225mm diameter concrete surface water pipe, ESB and Gas line in the Kylemore Road that runs along the western border of the site. An existing 225mm diameter concrete foul water sewer in the Old Naas Road to the north of the site. There is also existing surface water and foul sewage infrastructure within the proposed site. All services to be maintained will be protected by the setting up of exclusion zones so heavy plant cannot drive over it.

All materials being hoisted by crane or other means will be controlled using guide ropes where possible.

Excavation and Rock Breaking

A specialist ground works contractor will be appointed to carry out the excavation and rock breaking works. The appointed specialist contractor will carry out a full risk assessment prior to the commencement of work.

Boreholes have been carried out and the ground conditions are generally consistent across the site. Soil is generally described as follows :

- **Topsoil/Surfacing:** Topsoil and hardstanding were generally shallow, with topsoil up to 0.30 m BGL and tarmac/concrete surfacing up to 0.30 m BGL
- **Made Ground:** Encountered across the site to depths of typically 2.40 m BGL, increasing locally to 3.00 m BGL. Consisted mainly of gravelly clay and gravel containing anthropogenic materials such as concrete, brick, glass and plastic.

- **Cohesive Soils:** Predominantly firm to stiff becoming stiff sandy gravelly clay, with strength generally increasing with depth between 2.0 to 2.5m BGL. Variable cobble and boulder contents were recorded.
- **Bedrock:** Calp Limestone with interbedded mudstone/clay bands was encountered at depths ranging from 4.5 m to 13.3 m BGL. Bedrock was generally deepest in the centre of the site and shallower towards the east and west.

Excavations in the upper cohesive and weathered rock deposits are expected to be excavatable with conventional excavation equipment, with zones of more intact bedrock below this depth requiring rock breaking techniques.

Groundwater levels are likely to be above excavation levels required for basements and will most likely require dewatering.

The ground works operation will be carried out in order to ensure that material removed from the ground is taken away at regular intervals in order to reduce the amount of material that can be stored on site. Excavated material will be reused on site where possible subject to the WAC analysis.

Material Hoisting

It is envisaged that tower cranes will be erected to hoist materials on site in the construction of apartments. The cranes will be erected outside the building envelope. The cranes will be designed by a specialist to free stand full height without the need to be connected to the structure.

The crane will be founded on a concrete base foundation designed in consideration of the existing ground conditions and will most likely be seated on piled foundations. It is intended that the tower crane will be erected by a mobile crane from within the site boundary.

Careful consideration will be given to the recruitment of suitably qualified crane drivers and banksmen.

Waste Management Plan

Prior to the commencement of development, the contractor shall prepare a Construction and Demolition Resource Waste Management Plan (RWMP) as set out in the EPA “Best Practice Guidelines for the Preparation of Resource and Waste Management Plans for C&D Projects (2021)” including demonstration of proposals to adhere to best practice and protocols. The RWMP shall be submitted to and agreed with Dublin City Council.

The plan shall be implemented in order to improve waste management on site, increase segregation and minimise construction waste costs. Waste arising from the site will be considered in relation to the waste management hierarchy of prevention, reduce, reuse, recycle, energy recovery and disposal.

Hazardous Waste

Ground Investigations Ireland (GII) carried out a Waste Classification Report for the site as part of the Site Investigative works, material extracted from several window samples were classified as hazardous due to elevated levels of Total Petroleum Hydrocarbons (TPH) and asbestos.

If hazardous material across the site is encountered on site during excavation, it should be removed from site to an appropriate facility under either the List of Waste (LoW) codes 17 05 03* or 17 09 03*.

The Contractor shall prepare a plan of work for removal of the hazardous waste within the provided waste management plan to be submitted for approval.

Summary of the landfill waste acceptance criterium of all samples is detailed in Figure 6-1.

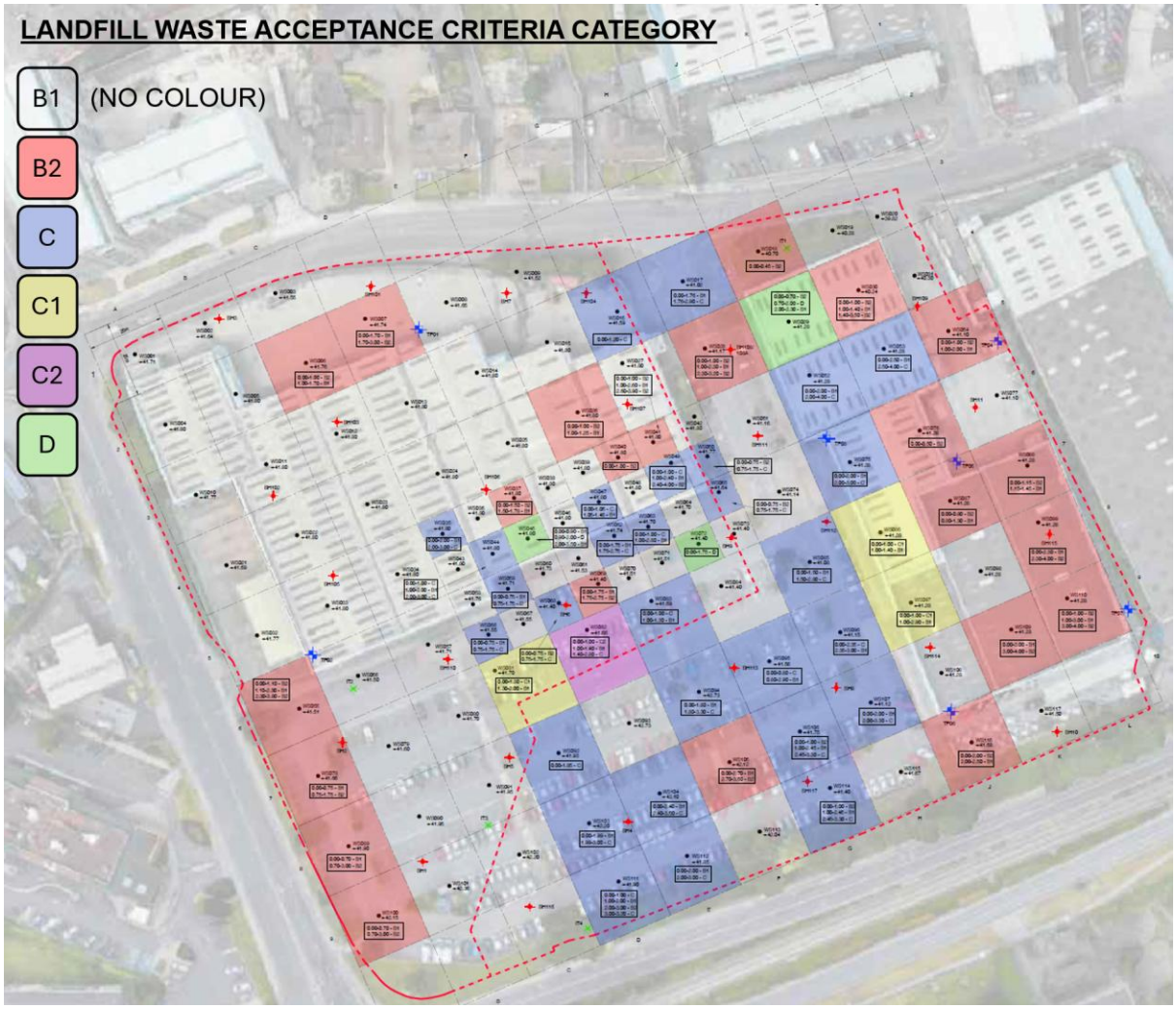


Figure 6-1: Waste Classification Summary

Asbestos

Asbestos fibres were detected in several samples. The laboratory did identify asbestos containing materials in several samples including ACM debris and asbestos insulating board.

The Contractor shall prepare a Plan of Work for removal of the asbestos. This Plan of Work shall take account of the requirements of the Safety, Health and Welfare at Work (Exposure to Asbestos) Regulations 2006 (S.I. No. 386 of 2006), Safety, Health and Welfare at Work (Exposure to Asbestos) (Amendment) Regulations 2010 (S.I. No 589 of 2010), Safety, Health and Welfare at Work (Exposure to Asbestos) (Amendment) Regulations 2025 (S.I. No. 632 of 2025) and all other relevant legislation and the HSA Publication titled Practical Guidelines on ACM Management and Abatement. Any further asbestos encountered during the works shall be dealt with as outlined above.

All waste classified in the waste classification report will be disposed of as per the agreed waste management plan with Dublin City Council.

Works Adjacent to Luas Line

Prior to the commencement of any works a detailed Photographic Condition Survey will be carried out of all adjoining properties as well as detailed liaisons with the RPT/TII due to the sites adjoining proximity to the Red Luas Line.

The proximity of the Luas light rail system must be considered during the design of the demolition and excavation works. The works will comply with the RPA/TII document "Code of Engineering Practice for Works on, near or adjacent to the LUAS Light Rail System"

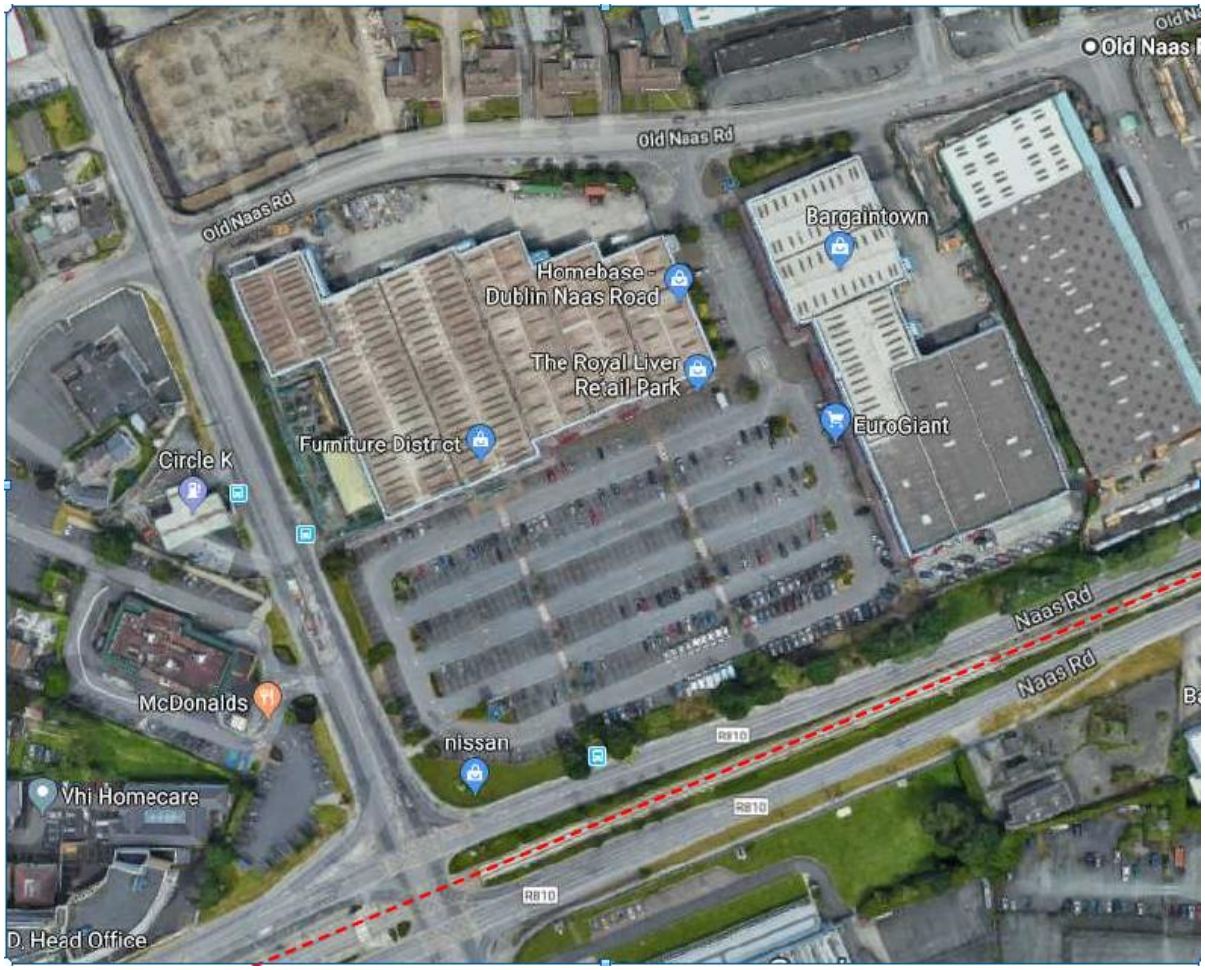


Figure 6-2: Indication of Luas Line Alongside Site

7 Noise and Vibration

As part of the Original Parent Planning Permission, the Environmental Impact Assessment Report (EIAR) addressed impacts relating to Noise and Vibration within Chapter 12 the EIAR as submitted within the original planning application.

The construction stage mitigation measures specific to noise and vibration are provided in full within Appendix A and is appropriate for all aspects of the works proposal including the proposed planning amendment and shall be implemented in full.

During the construction works the Contactor shall comply with:

- BS 5228: 2009 Code of Practice for Noise and Vibration Control on Construction and Open Sites, Part 1 and Part 2.
- Guidelines for the Treatment of Noise and Vibration in National Road Schemes (NRS, Revision 1, 2004)

The noise limits to be applied for the duration of the infrastructure works are those specified in the B Category of BS 5228. These limits are summarised below and will be applied at the nearest sensitive receptors to the works.

- Night (23:00-07:00) = 50dB
- Evening (19:00-23:00) = 60dB
- Day (07:00-19:00) = 70dB

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

A specialist ground works contractor will be appointed to carry out the excavation and rock breaking works. The appointed specialist contractor will carry out a full noise assessment prior to the commencement of works. Should the noise from these works be expected to exceed the above limits additional measures will be required to be provided and submitted in full by the contractor for approval, prior to proposed indicative works.

Vibration limits to be applied for the infrastructure works are those specified in the TII document Guidelines for the Treatment of Noise and Vibration in National Road Schemes (TII, Revision 1, 2004).

These limits are outlined below:

Allowable Vibration (in terms of peak particle velocity) at the closest part of sensitive property to the source of vibration, at a frequency of;

Less than 11Hz	**11 to 50 Hz**	**50 to 110 Hz (and above)**
3mm/s	3 to 8mm/s	8 to 11mm/s

All works on site shall comply with BS 5228 2009 which gives detailed guidance on the control of noise and vibration from construction activities.

In general the contractor shall implement the following mitigation measures during the proposed infrastructure works:

- Avoid unnecessary revving of engines and switch off equipment when not required.
- Keep internal haul roads well maintained and avoid steep gradients.
- Minimise drop height of materials.

More specifically the Contractor shall ensure that:

- In accordance with Best Practicable Means, plant and activities to be employed on site are reviewed to ensure that they are the quietest available for the required purpose.
- Where required, improved sound reduction methods are used e.g. enclosures.
- Site equipment is located away from noise sensitive areas, as much as physically possible.
- Regular and effective maintenance by trained personnel is carried out to reduce noise and / or vibration from plant and machinery.
- Hours are limited during which site activities likely to create high levels of noise and vibration are carried out.

A site representative responsible for matters relating to noise and vibration will be appointed prior to construction on site.

A noise and vibration monitoring specialist will be appointed to periodically carry out independent monitoring of noise and vibration during random intervals and at sensitive locations for

comparison with limits and background levels. It is proposed that noise and vibration levels be maintained below those outlined above as part of these infrastructure works.

All vehicles and mechanical plant used for the purpose of the works shall be fitted with effective exhaust silencers and shall be maintained in good and efficient working order. In addition, all diesel engine powered plant shall be fitted with effective air intake silencers. All compressors shall be "sound reduced" models fitted with properly lined and sealed acoustic covers which shall be kept closed whenever the machines are in use. All ancillary pneumatic percussive tools shall be fitted with mufflers or silences of the type recommended by the manufacturers, and where commercially available, dampened tools and accessories shall be used.

All ancillary plant, such as generators and pumps, shall be positioned so as to cause minimum noise disturbance. If operating outside the normal working week acoustic enclosures shall be provided.

Where construction activities are required in close proximity to neighbouring noise sensitive properties, a solid hoarding of approximately 2.5m in height should be erected to provide a degree of acoustic screening to the lower storeys.

Local screening may be required (refer to Original Parent Planning Risk Assessment if necessary) for stationary plant such as generators and compressors.

An acoustically screened area shall be provided on the site specifically for noisy operations such as grinding and cutting metal.

A designated environmental liaison officer will be appointed to site during construction works. Any noise complaints should be logged and followed up in a prompt fashion by the liaison officer. In addition, where a particularly noisy construction activity is planned or other works with the potential to generate high levels of noise, or where noisy works are expected to operate outside of normal working hours etc., the liaison officer will inform the nearest noise sensitive locations of the time and expected duration of the noisy works.

8 Sediment and Water Pollution Control Plan

As part of the Original Parent Planning Permission, the Environmental Impact Assessment Report addressed impacts relating to Land & Soils in Chapter 8 and Water in Chapter 10, all submitted as submitted within the original planning application.

The construction stage mitigation measures specific are provided within Appendix A and is appropriate for all aspects of the works proposal including the proposed planning amendment and shall be implemented in full.

As stated within the EIAR, all construction works carried out will comply with all applicable Statutory Legislation including the Local Government (Water Pollution) acts, 1977 and 1990, as amended. The contractor shall obtain approval of their proposed erosion and sediment control measures from Dublin City Council's Environment Section prior to commencing works on site.

As part of the overall construction methodology, the following issues have been identified as being of particular risk and/or concern to pollution.

Contamination of Groundwater

There is a risk that ground water could become contaminated with lime from cement which subsequently finds its way into the local adjacent watercourses. Appropriate additional preventative measures will be put in place to mitigate any potential damage from the effluent of contaminated ground water including:

- Sediment & Erosion – Similar to the above, any sedimentation and erosion due to direct surface water runoff generated onsite during the construction phase needs to be prevented. To prevent this from occurring surface water discharge from the site will be managed and controlled for the duration of the construction works until the permanently attenuated surface water drainage system of the proposed site is complete. A temporary positive drainage system shall be installed prior to the commencement of the construction works to collect surface water runoff by the site during construction. Alternatively, a 'silt buster' silt control unit can be used on the outfall. This temporary surface water management facility will throttle runoff and allow suspended solids to be settled out and removed before being discharged in a control manner to the agreed outfall. All inlets to the cascading settling basins will be riprapped to prevent scour and erosion in the vicinity of the inlet.

- Minimisation of site disturbance
- Implement sediment control (as outlined above)
- Minimise the potential for erosion
- Prevent sediment-contaminated water leaving the site

Such measures shall be agreed with DCC as part of the site's discharge licence.

Temporary mounding and sediment control would be implemented to ensure silts do not enter the existing ditch during the construction stage.

- Water quality monitoring – It is proposed to implement a programme for monitoring water quality at the outfall as part of the construction of this development, in agreement with Dublin City Council. This programme and locations of sampling will be agreed with Dublin City Council.
- Discharge Licences – It will not be permitted to discharge into any newly constructed storm water systems or watercourse without adhering to the conditions of the discharge licence and agreeing the same with the Site Manager and Local Authority Area Engineer.
- Over Ground Oil / Diesel Storage – Only approved storage system for oil / diesel within the site will be permitted, (i.e. all oil / diesel storage to be located within a designated area placed furthest away from adjacent watercourses and contained within constructed bunded areas e.g. placed on 150mm concrete slab with the perimeter constructed with 225mm solid blockwork rendered internally). The bunded area will accommodate the relevant oil / diesel storage capacity in case of accidental spillage. Any accidental spillages will be dealt with immediately on site however minor by containment /removal form site. Any accidental spillages will be dealt with immediately on site however minor by containment /removal form site.
- Disposal of Wastewater off Site – The Site Management Team will maintain a record of all receipts for the removal of toilet or interceptor waste off site to insure its disposal in a traceable manner. These will be available for inspection by the Environment Section of Dublin City Council at all times.

- Road Sweepers / Cleaning – The cleaning of public roads in and around the subject site will be undertaken to reduce environmental impacts and care will be taken to prevent any pollution of watercourses from this activity.

9 Biodiversity Protection Measures

As part of the Original Parent Planning Permission, the Environmental Impact Assessment Report (EIAR) addressed impacts relating to Noise and Vibration within Chapter 7 the EIAR as submitted as submitted within the original planning application.

The construction stage mitigation measures specific to biodiversity are provided in full within Appendix A and is appropriate for all aspects of the works proposal including the proposed planning amendment and shall be implemented in full.

In addition, the following protection measures shall be included

- Where practicable, the removal of trees and other features suitable for use by nesting birds shall be undertaken outside the bird nesting season (avoiding the period 1st March to 31st August). Should the construction programme require vegetation clearance between March and August bird nesting surveys shall be undertaken by suitably experienced ecologists. If no active nests are recorded, vegetation clearance shall take place within 24 hours. In the event that active nests are observed, an appropriately sized buffer zone shall be maintained around the nest until such time as all the eggs have hatched and the birds have fledged. Once it is confirmed that the birds have fledged and no further nests have been built or occupied, vegetation clearance may take place. Care must be taken during development to ensure that common lizards, common frogs and smooth newts (which are all protected under the *Wildlife Act* (1976) and subsequent amendments) are not harmed.
- All site clearance and landscaping works will comply with current legislative requirements and best practice as set out in the EIAR. All retained trees that are within or close to the working wayleave of the proposed development will be protected in accordance with the requirements of British Standard BS5837:2012 *Trees in Relation to Design, Demolition and Construction' – Recommendations*, with protective fencing being installed around all trees to be retained, prior to commencement of development.
- The planting plans and landscaping proposals will ensure that no invasive species are introduced, either deliberately or inadvertently, to the site.

10 Drainage Works

As part of the Original Parent Planning Permission, the Environmental Impact Assessment Report (EIAR) addressed impacts relating to Material Assets (Site Services) within Chapter 15 the EIAR as submitted within the original planning application.

The construction stage mitigation measures specific to material assets are provided in full within Appendix A and is appropriate for all aspects of the works proposal including the proposed planning amendment and shall be implemented in full.

In addition, due to the nature of phasing proposed within the high-density development of this nature, the drainage and watermain infrastructure will be needed to protected once constructed, therefore the following will apply:

- Hoarding or fencing to be provided to cordon-off completed infrastructure works and no further excavation works will be allowed within this area unless agreed with site management.
- Contractor to produce as-built construction records of drainage infrastructure. These records will be submitted to the engineer for approval in advance of handover. The as-built records will be reviewed and will need to be approved by the engineer before practical completion can be certified. The as-builts will be used by site personnel as a working record of where drainage infrastructure is located. The locations of these will be recorded on the as-built and will be marked out on the ground in advance of any works commencing in later stages. This methodology will be formally incorporated into a method statement to be completed by the groundworks sub-contractor before excavations commence.
- Marker tape to be provided on top of sewers running through live areas of site: As part of the methodology laying of drainage pipes, drainage works will have marker tape placed at a depth of 300mm above the pipe to warn the excavator and banksman of the service below. (It is noted that the placing of marker tape over drainage lines is not a standard construction detail).
- Site personnel to be informed of works already completed and commissioned: As part of the Safe System of Work Plan (SSWP), site personnel will be made aware of the drainage lines which are in operation. A site-specific method statement will be required in all cases where it is deemed that there is a risk of damaging such services.

Those involved in direct management and supervision of site-based excavations require relevant competencies to deliver safety standards on site. They will have health and safety training in order to design safe systems of work that are appropriate to specific site conditions. They will need to prepare clear and simple safety method statements that can be used and understood by site workers. Ongoing checks will be carried out to ensure that appropriate equipment has been provided and is being used correctly.

- Monitoring of excavation and prevention of undermining of infrastructure: Special care will be taken when digging above or close to the lines of services. The locations of these will be marked out on the ground in advance of any excavation being undertaken. In addition, careful consideration will be taken to ensure that any buildings and infrastructure are not undermined by excavation works. The general principles outlined in the Health and safety Authority document: 'Code of Practice for Avoiding Danger from Underground Services' will be followed to ensure the safety of workers and to minimise the risk of damage to any existing pipelines or buildings.
- Water quality control of discharges to watercourse or drainage network: As detailed within the previous section, adjacent watercourses/groundwater need to be protected from sedimentation and erosion due to direct surface water runoff generated onsite during the construction phase. This includes preventing any sediment laden water from entering the surface water outfalls. To prevent this from occurring surface water discharge from the site will be managed and controlled for the duration of the construction works until the permanently attenuated surface water drainage system of the proposed site is complete. Any manholes will need to be securely covered and gullies fitted with a geotextile filter to allow protection of the surface water within the pipe.
- Protection of services from breakage or crushing: All constructed drainage infrastructure will have to be protected from breaking or crushing. Consideration will be given to areas where heavy plant is going to be tracked across the existing drainage infrastructure. This may require construction of temporary protective concrete slabs to bridge across the existing lines where haul roads are required.

11 Dust Control

As part of the Original Parent Planning Permission, the Environmental Impact Assessment Report (EIAR) addressed impacts relating to Air & Climate within Chapter 11 the EIAR as submitted within the original planning application.

The construction stage mitigation measures specific to noise and vibration are provided in full within Appendix A and is appropriate for all aspects of the works proposal including the proposed planning amendment and shall be implemented in full.

The objective is to ensure that dust does not impact significantly at nearby receptors. Therefore, a dust management plan (DMP) will be formulated for the site, which will address the following:

- Specify a site policy on dust
- Identify site management of dust
- Develop documented systems for managing site practices and implementing management controls
- Outline how the DMP can be assessed

Site Management

The siting of construction activities and storage piles will consider the location of sensitive receptors and prevailing wind conditions to minimise the potential dust nuisance. Site management will include the ability to respond to adverse weather conditions by either restricting operations on site or using effective control measure in a timely manner before potential for nuisance occurs.

- During working hours the site agent or another competent appointed member of staff shall monitor dust control methods;
- A register shall be kept on site logging all correspondence and telephone / verbal complaints regarding construction activities outlining remedial actions if any;
- A competent site representative responsible for matters relating to dust management will be appointed prior to construction on site.
- The site representative responsible for dust management shall ensure that dust management procedures are followed and ensure monitoring and assessment of same;

Dust Control Measures

- Apply a speed limit of at least 20km/hr for on-site vehicles
- Provide water bowsers during periods of dry weather to ensure unpaved areas are kept moist. Spray exposed site haul roads during dry and / or windy weather.
- Ensure paved roads are kept clean and free of mud and other materials. Sweep hard surface roads, inside and outside the site, to ensure roads are kept clear of debris, soil or other material.
- Restrict un-surfaced roads to essential site traffic.
- Provide water bowsers during periods of high winds and dry weather conditions to ensure moisture content is high to increase the stability of the soil.
- During the proposed infrastructure works the following mitigation measures shall be implemented to minimise dust emissions:
- Construction techniques shall minimise dust release into the air.
- Protect overburden material from exposure to wind by storing the material in sheltered regions of the site.
- Regular watering of stockpiles during dry and windy periods.
- Located any stockpiles away from sensitive receptors, (i.e. receptors sensitive to dust release).
- Provide tarpaulins over all unacceptable excavated materials being carted off site.
- Control vehicle speeds and impose speed restrictions, (speed can mobilise dust).
- During dry spells and if deemed necessary monitoring of dust levels shall be carried out using the Bergerhoff Method i.e. analysis of dust collecting jars left on-site (German Standard VDI 2119, 1972). Results will be compared to the TA Luft guidelines (TA Luft, 1972). Should an exceedance of the TA Luft limit occur during, additional mitigation measures, for example more regular spraying of water, shall be implemented.

12 Conclusion

The construction management plan addresses construction activities on site that may result in noise, air quality, water quality, biodiversity or waste management issues, should the plan not be put in place and implemented.

These include procedures for monitoring and tracking construction activities and ensuring construction personnel are trained and educated as necessary. The construction & environmental management plan should be reviewed as the construction phase progresses to accommodate any changes in activities on site.

All works must be carried out in accordance with the mitigation measures outlined in this document and with the construction mitigation measures from the EIAR. The construction stage mitigation measures from the EIAR are provided within Appendix A and are appropriate for all aspects of the works proposal including the proposed planning amendment.

Appendix A : EIAR Construction Stage Mitigation Measures

also likely to temporarily reduce the overall diversity and abundance of birds that occur at the site.

The earthworks can potentially attract certain species e.g. Corvids (Corvidae) and Gulls (Laridae) to the site which will opportunistically forage and roost at the cleared site for a short period. If significant areas of pooled water occur during the construction phase it is possible that other waterbird species could be attracted to the site. If edible wastes are not disposed of appropriately during construction this has the potential to attract avian scavengers to the site.

Operational Phase

The proposed structures are larger and will accommodate a larger number of people. There will be a localised increase in the disturbance associated with human and vehicular traffic at the site post-construction. However, this is in the context of the wider urban landscape and the existing habitats at the site are not of especially high value for breeding or wintering birds. The breeding species are largely associated with the marginal trees/shrubs and many of these will continue to be present throughout and post-construction.

The newly built structures are likely to be used by loafing Corvids, Feral Pigeons and species such as Starling. There may also be some breeding opportunities for species such as House Martin, *Delichon urbica* and as already discussed roof-nesting Herring Gulls.

The higher above ground structures will present a marginally increased local collision risk for birds traversing the site. In the context of the urban built environment this increase is not likely to represent a significant increase in collision risk for any species of elevated conservation importance. EQ2LIGHT (2019) proposes facade lighting to illuminate key vertical elements of the scheme. This will further reduce the likelihood of collisions at night by making the proposed buildings clearly visible.

The maturing landscaping features are, in-time, likely to increase the local nesting potential for bird species in the area.

Other Taxa

During construction, any pooling of water in the early months of the year could be attractive to spawning Common Frog. Such temporary pools are especially vulnerable during the construction phase.

The loss of semi-natural habitats during construction is likely to lead to a temporary localised decrease in the diversity of Lepidoptera and other insect species. However, there is likely to be a poor diversity of these species at the site due to the depauperate biodiversity present. As the landscaping features mature there will be some potential for increased diversity of insect species to occur at the site.

7.5 Mitigation Measures

The following mitigation measures will be implemented as part of the proposed project in order to minimise the potential effects on the existing ecology as discussed above.

Mitigation Measures for Designated Sites

- No additional mitigation measures, above and beyond what is outlined in the CEMP (DBFL, 2019), are required for the protection of designated sites. The Client has advised that construction works will be carried out according to the CEMP (DBFL, 2019). The Client advises that measures outlined in the CEMP will be fully implemented.

Mitigation Measures for Habitats and Flora

- All measures outlined in the CEMP prepared by DBFL (2019) will be fully implemented.
- Tree protection measures will be implemented to protect existing trees which are to be retained. These will be determined in consultation with an Arborist.
- The landscaping plan for the proposed development will be fully implemented.

Mitigation Measures for Fauna

- In advance of work starting on site the works contractor will prepare and agree a Construction Methodology document building upon the outline CEMP prepared by DBFL.
- A pre-demolition survey of the existing structures will be carried out by a suitably qualified Ecologist to confirm that there are no day-roosting bats present. In the event that roosting bats are present or are discovered at any stage during the demolition process: no demolition work will proceed until a derogation licence is obtained from NPWS and the works are supervised by a bat specialist.
- All trees required to be felled will be inspected by a bat specialist prior to felling. While the buildings and trees referred to above, currently have no value to roosting bats, it is possible that this may change in the intervening period between survey and commencement of works.
- Gaps will be left (200mm minimum) at point along the base of the site security fencing to allow the free movement of mammal species through the site throughout the construction phase.
- In the event that the demolition and habitat clearance works are scheduled during the bird breeding season (March 1st to August 31st inclusive) the existing building (including rooftops) and trees will be inspected to identify any breeding birds present by a suitably qualified Ecologist. The project Ecologist will ensure that no active nests are removed until the conclusion of the particular nesting attempt.
- While there is no evidence of Swift (*Apus apus*) nesting at the existing site, Swift nesting boxes will be incorporated into the proposed design as an enhancement measure. A minimum of five concrete or concrete-composite next boxes will be installed at suitable locations which are to be decided with the Project Ecologist. Swifts are a migratory species that has suffered declines in recent decades and provision of nesting boxes is intended to be a positive measure in an urban setting.
- Any pooled surface water at the site (e.g. during construction) shall be checked in the period of February-March to record the presence of any breeding Frogs. If spawn and/or tadpoles are present in an area that may be disturbed by activity at the site then Frogs, spawn and tadpoles should be translocated (under licence) by a suitably qualified ecologist to suitable sites in the wider area to be agreed with NPWS.
- During construction, deep excavations or areas of pooled water will be assessed on an ongoing basis to either provide escape ramps for fauna or adequate mammal-proof fencing of a minimum of 1.2m in height. Any temporary excavations will be checked on a daily basis during working periods to minimise the risk of animals becoming trapped.

There will be no significant storage or use of hazardous materials during the operational phase that could adversely impact subsoil, groundwater or surface water in the vicinity of the site. Accidental losses of oil, petrol or diesel on roadways or in car parks could cause contamination if the oil, petrol or diesel entered the underlying soil and groundwater. However, the presence of surface hardstanding throughout these areas would render this unlikely.

In the absence of mitigation measures, should accidental losses of oil, diesel, or petrol to ground occur, they would be considered direct, negative impacts of temporary duration, given that they would be confined to one-off releases. This would be considered a medium impact to a medium sensitivity environment, and the significance of the impact would be moderate.

8.8.3 'Do Nothing' Scenario

Under the Do-Nothing scenario, the site will remain as a commercial retail park. Soils and geology will remain unchanged with no impact on either environment.

8.9 Mitigation Measures

8.9.1 Construction Phase

8.9.1.1 Excavation - Stripping of Topsoil/Subsoil removal

The potential impacts due to the removal of soils and subsoils can be mitigated in several ways. Controlling working practices to avoid repetitive handling of excavated made ground and subsoils, minimise vehicle movements and limit the size of stockpiles will reduce the compaction and erosion of material and generation of dust. The location of plant and materials will be planned as to avoid disturbance of bare soils. A construction traffic management plan should be implemented to minimise compaction and erosion of soil.

Soils and subsoils at the site have been classified as non-hazardous. However, excavation and transport off site will still require the material to be transported under appropriate licence to an appropriate facility under either the LoW (List of Waste) codes 17 05 04 or 17 09 04.

If temporary storage of excavated made ground and subsoils is required it will be carefully managed to prevent potential negative impact on the receiving environment, the stockpiled material will be covered and stored away from any surface water drains. It will be necessary to designate areas within the site where stockpiles will be established in order to facilitate the efficient transfer of material within the site. It will also be necessary to position spoil and temporary stockpiles in locations which are at least 15 m distant from drainage systems.

Excavation shall be restricted in times of high winds and heavy rainfall to minimise the potential for dust generation or uncontrolled sediment movement. Good construction practices will also be used during the construction phase, such as wheel washers and dust suppression at site access points.

8.9.1.2 Imported Fill

The source of aggregate, fill material and topsoil imported to site will be carefully selected and vetted in order to ensure that it is of a reputable origin and that it is "clean" (i.e. will not

contaminate the environment). Project contract and procurement procedures will be developed to ensure that aggregate, fill material and topsoil are acquired from reputable sources with suitable environmental management systems as well as regulatory and legal compliance.

8.9.1.3 Construction Traffic

A construction traffic management plan should be implemented in order to minimise the disturbance caused by large vehicles.

8.9.1.4 Accidental Spills and Leaks

Due to the presence of a locally important aquifer beneath the site, shallow groundwater, and adjacent surface water bodies, it will be necessary to employ mitigation measures at the construction site in order to prevent spillages to ground of fuels, and to prevent consequent soil or groundwater quality impacts. These measures are outlined in the Construction & Environmental Management Plan (CEMP), Appendix 4 of this EIAR, and are listed here as follows:

- Over Ground Oil / Diesel Storage – Only approved storage system for oil / diesel within the site will be permitted, (i.e. all oil / diesel storage to be located within a designated area placed furthest away from adjacent watercourses and contained within constructed bunded areas e.g. placed on 150mm concrete slab with the perimeter constructed with 225mm solid blockwork rendered internally);
- The bunded area will accommodate the relevant oil / diesel storage capacity in case of accidental spillage. Any accidental spillages will be dealt with immediately on site however minor by containment /removal form site;
- All hazardous substances on-site shall be controlled within enclosed storage compounds that shall be fenced-off and locked when not in use to prevent theft and vandalism;
- Fixed plant shall be self-bunded; mobile plant must be in good working order, kept clean, fitted with drip trays where appropriate and subject to regular inspection; water runoff from designated refuelling areas shall be channelled to an oil-water separator, or an alternative treatment system, prior to discharge; and,
- Spill kits and oil absorbent material shall be carried with mobile plant and located at vulnerable locations around the site to reduce risk of spillages entering the sub-surface or groundwater environment; booms shall be held on-site for works near drains or dewatering points.

8.9.1.5 Geological Environment

Removal of soils/subsoils from the proposed development footprint will result in a permanent alteration of the geological environment. There will be no removal of bedrock from the site during construction works. During extraction of soils/subsoils at the site, dust suppression measures will be implemented.

8.9.2 Operational Phase

The operational phase of the development is unlikely to have any significant adverse impacts on the local geological / hydrogeological environment due to the environmental

10.6 Mitigation Measures

10.6.1 Construction Phase

- A site-specific 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.
- Rain water pumped from excavations is to be directed to on-site settlement ponds.
- Surface water runoff from areas stripped of hardstanding 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 the site and excavations, with an objective of minimizing soil erosion.
- In order to mitigate against spillages contaminating the surrounding surface water and hydrogeological environments, all oils, fuels, paints and other chemicals shall be stored in a secure bunded hardstand area. Refuelling and servicing of construction machinery will take place in a designated hardstand area which is also remote from any surface water inlets (where not possible to carry out such activities off site).
- Concrete batching will take place off site and wash out of concrete trucks will take place off site.
- Discharge from any vehicle wheel wash areas is to be directed to on-site settlement ponds.
- Groundwater pumped from excavations is to be directed to on-site settlement ponds.
- It is proposed to implement a programme for monitoring water quality at the outfall as part of the construction of this development, in agreement with the Planning Authority.

10.6.2 Operational Phase

The design of proposed site levels (roads, plaza, finished floor levels etc.) has been carried out in such a way as to replicate existing surface contours, break lines etc., therefore replicating existing overland flow paths, and not concentrating additional surface water flow in a particular location.

Surface water runoff from the site will be attenuated to the greenfield runoff rate as outlined in the Greater Dublin Strategic Drainage Study (GDSDS). Surface water discharge rates will be controlled by a Hydrobrake type vortex control device in conjunction with attenuation storage.

The following methodologies are being implemented as part of a SuDS surface water treatment train approach:

- Permeable paving in podium areas.
- A significant portion of the surface water runoff from roofs will be routed to the proposed surface water pipe network via green roofs (intensive and extensive).

Source		Potential Distance for Significant Effects (Distance From Source)		
Scale	**Description**	**Soiling**	**PM_{10}**	**Vegetation Effects**
Major	Large construction sites, with high use of haul roads	100m	25m	25m
Moderate	Moderate sized construction sites, with moderate use of haul roads	50m	15m	15m
Minor	Minor construction sites, with limited use of haul roads	25m	10m	10m

Table 11.5: Assessment Criteria for the Impact of Dust from Construction, with Standard Mitigation in Place (TII 2011)

11.5.2 Operational Phase

11.5.2.1 Air Quality

There is the potential for a number of emissions to the atmosphere during the operational phase of the development. In particular, the traffic-related air emissions may generate quantities of air pollutants such as NO_2, CO, benzene and PM_{10}.

11.5.2.2 Climate

There is the potential for a number of greenhouse gas emissions to atmosphere during the operational phase of the development. Road traffic and space heating of buildings may give rise to CO_2 and N_2O emissions. There is the potential for a number of greenhouse gas emissions to atmosphere during the operational phase of the development. However, due to the size of the development the impact of the proposed development on national greenhouse gas emissions is predicted to be insignificant in terms of Ireland's obligations under the EU 2020 target.

11.6 Mitigation Measures

11.6.1 Construction Phase

11.6.1.1 Air Quality

The pro-active control of fugitive dust will ensure the prevention of significant emissions, rather than an inefficient attempt to control them once they have been released. The main contractor will be responsible for the coordination, implementation and ongoing monitoring of the dust management plan. The key aspects of controlling dust are listed below. Full details of the dust management plan can be found in Appendix 11.3 and as part of the Construction and Environmental Management Plan, which forms an appendix to this EIAR.

- The specification and circulation of a dust management plan for the site and the identification of persons responsible for managing dust control and any potential issues;
- The development of a documented system for managing site practices with regard to dust control;
- The development of a means by which the performance of the dust management plan can be monitored and assessed;
- The specification of effective measures to deal with any complaints received.

At all times, the procedures within the plan will be strictly monitored and assessed. In the event of dust nuisance occurring outside the site boundary, movements of materials likely to raise dust would be curtailed and satisfactory procedures implemented to rectify the problem before the resumption of construction operations.

11.6.1.2 Climate

Construction traffic and embodied energy of construction materials are expected to be the dominant source of greenhouse gas emissions as a result of the construction phase of the proposed development. Construction vehicles, generators etc., may give rise to some CO_2 and N_2O emissions. However, based on the short-term nature and moderate scale of the works, the impact on climate will not be significant.

Nevertheless, some site-specific mitigation measures can be implemented during the construction phase of the proposed development to ensure emissions are minimised. In particular the prevention of on-site or delivery vehicles from leaving engines idling, even over short periods. Minimising waste of materials due to poor timing or over ordering on site will aid to minimise the embodied carbon footprint of the site.

11.6.2 Operational Phase

No additional mitigation measures are required during the operational phase of the proposed development as it is predicted to have an imperceptible impact on ambient air quality and climate.

12.6.2 Operational Phase – Additional Traffic Impacts

The assessment carried out in Section 12.5.4 has found that no mitigation measures are required for the noise generated by additional traffic on public roads.

12.6.3 Operational Phase – Plant Noise

As part of the detailed design of the development, plant items with appropriate noise ratings and, where necessary, appropriately selected remedial measures (e.g. enclosures, silencers etc.) will be specified in order that the adopted plant noise criteria is achieved at the façades of noise sensitive properties, including those within the development itself.

12.6.4 Operational Phase – Retail Delivery Activities

The acoustic glazing and ventilation specified in Section 12.6.1 will mitigate any noise impacts on those facades within the development where noise from delivery vehicles is predicted to be elevated.

12.6.5 Construction Noise and Vibration

With regard to construction activities, best practice control measures for noise and vibration from construction sites are found within BS 5228 (2009 +A1 2014) *Code of Practice for Noise and Vibration Control on Construction and Open Sites Parts 1 and 2*. Predictions indicate that significant construction noise impacts are expected to occur during the demolition phase when work is ongoing at boundary locations adjacent to noise sensitive locations, hence the contractor will ensure that all best practice noise and vibration control methods will be used. In this regard, various mitigation measures can be considered and applied during the construction of the proposed development, such as:

- limiting the hours during which site activities likely to create high levels of noise or vibration are permitted;
- establishing channels of communication between the contractor/developer, Local Authority and residents;
- appointing a site representative responsible for matters relating to noise and vibration;
- monitoring typical levels of noise and vibration during critical periods and at sensitive locations;
- all site access roads will be kept even so as to mitigate the potential for vibration from lorries.

Furthermore, it is envisaged that a variety of practicable noise and vibration control measures will be employed. These may include:

- selection of plant with low inherent potential for generation of noise and/ or vibration;
- erection of barriers as necessary around noisy processes and items such as generators heavy mechanical plant or high duty compressors;
- placing of noisy / vibratory plant as far away from sensitive properties as permitted by site constraints and the use of vibration isolated support structures where necessary.

The potential impact of operational waste generation from the development is considered to be long-term, not significant and negative

13.6 Mitigation Measures

This section outlines the measures that will be employed in order to reduce the amount of waste produced, manage the wastes generated responsibly and handle the waste in such a manner as to minimise the effects on the environment.

13.6.1 Construction Phase

As previously stated, a project specific C&D WMP has been prepared in line with the requirements of the requirements of the guidance document issued by the DoEHLG and is included as Appendix 13.1. Adherence to the high-level strategy presented in this C&D WMP will ensure effective waste management and minimisation, reuse, recycling, recovery and disposal of waste material generated during the demolition, excavation and construction phases of the proposed development. Prior to commencement, the contractor(s) will be required to refine/update the C&D WMP or submit an addendum to C&D WMP to SDCC to detail specific measures to minimise waste generation and resource consumption and provide details of the proposed waste contractors and destinations of each waste stream.

A quantity of soil, stone, gravel and clay which will need to be excavated to facilitate the proposed development. Project Engineers have estimated that c. 52,700m^3 of excavated material will need to be removed offsite, however it is envisaged that c. 9,300m^3 excavated material will be reused onsite. Correct classification and segregation of the excavated material is required to ensure that any potentially contaminated materials are identified and handled in a way that will not impact negatively on workers as well as on water and soil environments, both on and off-site.

In addition, the following mitigation measures will be implemented:

- Building materials will be chosen with an aim to 'design out waste';
- On-site segregation of waste materials will be carried out to increase opportunities for off-site reuse, recycling and recovery – it is anticipated that the following waste types, at a minimum, will be segregated:
  - Concrete rubble (including ceramics, tiles and bricks);
  - Plasterboard;
  - Metals;
  - Glass; and
  - Timber.
- Left over materials (e.g. timber off-cuts, broken concrete blocks/bricks) and any suitable construction materials shall be re-used on-site, where possible;
- All waste materials will be stored in skips or other suitable receptacles in designated areas of the site;
- Any hazardous wastes generated (such as chemicals, solvents, glues, fuels, oils) will also be segregated and will be stored in appropriate receptacles (in suitably bunded areas, where required);
- A waste manager will be appointed by the main contractor(s) to ensure effective management of waste during the excavation and construction works;

- All construction staff will be provided with training regarding the waste management procedures;
- All waste leaving site will be reused, recycled or recovered where possible to avoid material designated for disposal;
- All waste leaving the site will be transported by suitable permitted contractors and taken to suitably registered, permitted or licenced facilities; and
- All waste leaving the site will be recorded and copies of relevant documentation maintained.

Nearby sites requiring clean fill material will be contacted to investigate reuse opportunities for clean and inert material, if required. If any of the material is to be reused on another site as by-product (and not as a waste), this will be done in accordance with Article 27 of the EC (Waste Directive) Regulations (2011). EPA approval will be obtained prior to moving material as a by-product. However, it is not currently anticipated that Article 27 will be used.

These mitigation measures will ensure that the waste arising from the construction phase of the development is dealt with in compliance with the provisions of the Waste Management Act 1996, as amended, associated Regulations and the Litter Pollution Act 1997, the EMR Waste Management Plan (2015-2021). It will also ensure optimum levels of waste reduction, reuse, recycling and recovery are achieved and will encourage sustainable consumption of resources

13.6.2 Operational Phase

As previously stated, a project specific OWMP has been prepared and is included as Appendix 13.2. Implementation of this OWMP will ensure a high level of recycling, reuse and recovery at the development. All recyclable materials will be segregated at source to reduce waste contractor costs and ensure maximum diversion of materials from landfill, thus achieving the targets set out in the EMR Waste Management Plan 2015 – 2021 and abiding by the DCC waste bye-laws.

In addition, the following mitigation measures will be implemented:

- On-site segregation of all waste materials into appropriate categories including (but not limited to):
  - Organic waste;
  - Dry Mixed Recyclables;
  - Mixed Non-Recyclable Waste;
  - Glass;
  - Waste electrical and electronic equipment (WEEE);
  - Batteries (non-hazardous and hazardous);
  - Cooking oil;
  - Light bulbs;
  - Cleaning chemicals (pesticides, paints, adhesives, resins, detergents, etc.);
  - Furniture (and from time to time other bulky waste); and
  - Abandoned bicycles.
- All waste materials will be stored in colour coded bins or other suitable receptacles in designated, easily accessible locations. Bins will be clearly identified with the approved waste type to ensure there is no cross contamination of waste materials;

- Figure 17 – 2037 Do Minimum (A3)
- Figure 14 – 2022 Do Something (B1)
- Figure 16 – 2027 Do Something (B2)
- Figure 18 – 2037 Do Something (B3)

14.5.2.8 Network Impact

The Institution of Highways and Transportation document *'Guidelines for Traffic Impact Assessments'* states that the impact of a proposed development upon the local road network is considered material when the level of traffic it generates surpasses 10% and 5% on normal and congested networks respectively. When such levels of impact are generated a more detailed assessment should be undertaken to ascertain the specific impact upon the network's operational performance. These same thresholds are reproduced in the NRA/TII document entitled *Traffic and Transport Assessment Guidelines* (2014).

For the key local junctions, it can be seen in **Table 14.13**, that the proposed development (1,102 No. residential units, 2,435 m^2 of retail (2 units), 17,002 m^2 office space and commercial / community uses) would have significant effects on the following junctions:

- **Junction 1** – Priority Control – Old Naas Road / Western Site Access;
- **Junction 2** – Priority Control – Old Naas Road / Eastern Site Access; and
- **Junction 3** – Signalised Control –Kylemore Road (R112)/ Old Naas Road.

Junction ID	Location	2022		2027		2037	
		AM Peak	PM Peak	AM Peak	PM Peak	AM Peak	PM Peak
1	Old Naas Road / Western Site Access	7.95%	-4.58%	41.39%	52.47%	77.16%	77.74%
2	Old Naas Road / Eastern Site Access	43.04%	79.05%	57.53%	99.54%	63.29%	102.05%
3	Kylemore Road (R112)/ Old Naas Road	4.13%	8.09%	7.10%	11.86%	12.44%	16.66%
4	Naas Road (R810) / Kylemore Road (R112) / Walkinstown Avenue (R112)	1.51%	2.85%	2.54%	4.24%	6.23%	6.08%
5	Naas Road (R810) / Old Naas Road / Muirfield Drive	2.11%	3.85%	3.64%	5.67%	4.54%	6.33%

Table 14.13: Network Impact Through Key Junctions (2022 DS, 2027 DS and 2037 DS)

For this proposed development's analysis, Junction 1, Junction 2, Junction 3, Junction 4 and Junction 5 have been analysed. As the junctions are at or exceed the 10% threshold for junction impact, Junctions 1, 2 and 3 are required to be analysed further.

14.6 Mitigation and Monitoring Measures

14.6.1 Construction Stage

14.6.1.1 Mitigation

A preliminary Construction and Environmental Management Plan has been prepared as part of the planning application with an associated Construction Traffic Management Plan (CTMP) which incorporates a range of integrated control measures and associated management activities with the objective of minimising the construction activities associated with the development. The following initiatives will be implemented to avoid, minimise and/or mitigate against the anticipated construction period impacts:

- During the pre-construction phase, the site will be securely fenced off from adjacent properties, public footpaths and roads;
- Appropriate on-site parking and compound area will be provided to prevent overflow onto the local network;
- It is likely that some numbers of the construction team will be brought to/from the site in vans/minibuses, which will serve to reduce the trip generation potential;
- Delivery vehicles to and from the site will be spread across the course of the working day, therefore, the number of HGVs travelling during the peak hours will be relatively low;
- Truck wheel washes will be installed at construction entrances and any specific recommendations with regard to construction traffic management made by Dublin City Council will be adhered to;
- Potential localised traffic disruptions during the construction phase will be mitigated through the implementation of industry standard traffic management measures. These traffic management measures shall be designed and implemented in accordance with the Department of Transport's Traffic Signs Manual "*Chapter 8 Temporary Traffic Measures and Signs for Roadworks*" and "*Guidance for the Control and Management of Traffic at Roads Works – 2nd Edition*" (2010); and
- Site entrance point/s from the public highway will be constructed with a bound, durable surface capable of withstanding heavy loads and with a sealed joint between the access and public highway. This durable bound surface will be constructed for a distance of 10m from the public highway.
- Material storage zones will be established in the compound area and will include material recycling areas and facilities;
- '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 Dublin City Council prior to commencement of activities on-site; and
- 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.

14.6.1.2 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; and
- Timing of construction activities.

14.6.2 Operational Stage

- Accidental oil or fuel spillages or leaks from construction activities also have the potential to find their way into the existing drainage network. Both increased silt and contaminant levels have the risk of reducing water quality in the adjoining water courses.
- There is potential short term interruption to ESB Networks, Gas Networks Ireland and Eir's Infrastructure while carrying out road works along Nass Road and Kylemore Road and while carrying out works to provide service connections to the proposed development. These works may also cause short term interruption to the grass verge, footpath and road traffic in the area of the works

15.4.2 Operational Phase

Potential operational phase impacts on the water infrastructure are noted below:

- Accidental hydrocarbon leaks and subsequent discharge into piped surface water drainage network (e.g. along roads and in driveway areas).
- Increased maximum discharge to public foul drainage network (Average Daily Foul Discharge Volume = 703 m^3).
- Increased potable water consumption (Average daily domestic demand = 657 m^3).
- Contamination of surface water runoff from foul sewer leaks.
- The surface water runoff from the development will be reduced to greenfield runoff rates which is less than the current brownfield runoff rate from the site.
- The development will add to the environmental and financial costs associated with treatment and disposal before final discharge at the WWTP.

These issues are discussed in greater detail in the Engineering Services Report prepared by DBFL.

15.4.3 'Do Noting Scenario'

There are no predicted impacts should the proposed development not proceed.

15.5 Ameliorative, Remedial or Reductive Measures

Remedial, mitigation and avoidance measures describe any corrective or mitigative measures that are either practicable or reasonable, having regard to the potential impacts. This includes avoidance, reduction and remedy measures as set out in Section 4.7 of the Development Management Guidelines 2007 to reduce or eliminate any significant adverse impacts identified.

15.5.1 Construction Phase

Mitigation measures proposed in relation to the drainage and water infrastructure include the following:

- A site-specific construction and environmental management plan, including traffic management, should be implemented by the contractor for the construction stage to protect local amenities and the integrity and operation of the local road network during the construction phase.

- The proposed development should comply with the provisions of the Construction and Operational Waste Management Plan with respect to construction waste.
- Provision of utilities should be carried out in accordance with the recommendations of the relevant statutory bodies (ESB, Gas Networks Ireland, Irish Water, EIR, DCC etc.)
- Water Metering should be included in each unit to record consumption.
- 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.
- 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 taken 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 located where it is protected from contamination by any construction activities or materials.
- Dewatering measures should only be employed where necessary.
- Basement excavations should be kept to a minimum to reduce impacts to the groundwater.
- 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.
- Mitigation measures should be put in place by the contractor in relation to storage of fuels and other materials and general maintenance of the site.
- Surface water collecting in excavations should be directed to on-site settlement ponds, where silt removal will be facilitated prior to discharge to the further reduce the possibility of contaminants entering the local water system.
- If concrete mixing is carried out on site, the mixing plant should be sited in a designated area with an impervious surface.
- When it is necessary to store diesel or oil fuels on site, they should be stored in appropriate containers in bunded storage areas.
- Any hazardous construction materials shall be stored appropriately.
- Contractor to prepare Method Statement, method statement to be agreed with PSDP.
- Contractor to locate and record all services on site prior to commencement of excavations.
- A GPR utility survey (and slit trench investigation as required) will be carried out along the Nass Road/Kylemore Road in advance of commencing road works to confirm the location of the power, gas and telecommunication infrastructure.
- Connections to the existing power, gas and telecommunications networks will be coordinated with the relevant utility provider and carried out by approved contractors.
- Contractor to comply with HSA Code of Practice for Avoiding Danger from Underground Services.
- Contractor to obtain utility company network plans and arrange observation as required.

- Contractor/PSCS to implement safe systems of construction including but not limited to battering the sides of trench excavations and installation of trench shoring systems.
- Contractor to prepare and implement a Construction Traffic Management Plan that will be agreed with the Design Team and local authority and which will ensure the safety of the public during construction.
- Contractor must supervise vehicle movements to and from the site during construction in order to ensure that this traffic management plan is fully implemented. Plan to include deliveries to the site, staff parking, and works outside the defined site such as utility connections.
- Public pedestrian routes to be established at site entrance as required.
- Contractor to prepare Method Statement for works in confined spaces, method statement to be agreed with PSDP. Contractor to comply with HAS Code of Practice for Working in Confined Spaces.
- All personnel using machinery/plant to have undergone training on the use of said machinery/plant. Ongoing site supervision to be undertaken to ensure all use of machinery/plant is in accordance with the training undertaken.

15.5.2 Operational Phase

Mitigation measures proposed in relation to the drainage and water infrastructure include the following:

- Please refer to Chapter 10.0 (Hydrology including Flood Risk Assessment) for mitigation measures associated with the surface water treatment.
- All new foul and surface water drainage lines will be pressure tested and will be subject to a CCTV survey in order to identify any possible defects prior to being made operational.
- All watermain will be tested in accordance with Irish Water Code of Practice to identify any possible defects prior to being made operational.
- Water conservation measures such as dual flush water cisterns and low flow taps will be included in the design.
- A properly designed surface water system incorporating SuDS and designed in accordance with the Greater Dublin Strategic Drainage Study (GDSDS) will minimise the overall impact of the development on the existing environment.
- Surface water discharge rates should be limited to existing Greenfield run-off rates to prevent increased flood risk.
- The use of SuDS measures will improve the quality of the runoff from the development.
- Ensure that the recommendations and mitigation measures outlined in the Site Specific Flood Risk Assessment (SSFRA) by DBFL, are implemented in full.
- Regular inspection of the hydro-brake, gullies and petrol interceptor will be required to prevent contamination and increased runoff from the site.
- It is envisaged that the development would take place and be occupied over a reasonable time period, and therefore the downstream foul sewerage system (foul sewer network and wastewater treatment facility) would be gradually loaded.

15.5.3 'Do Nothing Scenario'

There are no predicted impacts should the proposed development not proceed.

ENVIRONMENT
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& SAFETY
ISO 45001:2018
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QUALITY
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