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CONSTRUCTION AND ENVIRONMENTAL MANAGEMENT PLAN

St Teresa's Strategic Housing Development
Temple Hill
Monkstown
Blackrock
Co. Dublin

Contents:

1.0 Introduction

This Construction and Environmental Management Plan (CEMP) has been prepared by JJ Campbell and Associates Consulting Engineers.

The CEMP identifies the manner in which the mitigation measures described below (which are designed to avoid, minimise or mitigate adverse construction effects on the environment prior to commencement on site) will be implemented.

This CEMP has been prepared to account for activities at the site during the demolition, excavation and construction phases of the project.

The main issues that have been considered within this document are as follows;

- Description of Works
- Construction programme and phasing
- Site logistics
- Workforce
- Public relations and community liaison
- Construction traffic and access and
- Safety, health and environmental management

The CEMP will be updated to include, inter alia, additional measures required pursuant to planning conditions.

2.0 Description of the Project

Oval Target Limited intend to apply to An Bord Pleanála for planning permission for a Strategic Housing Development on a site of c. 3.9 ha at 'St. Teresa's House' (A Protected Structure) and 'St. Teresa's Lodge' (A Protected Structure) Temple Hill, Monkstown, Blackrock, Co. Dublin.

The development will consist of a new residential and mixed use scheme of 493 residential units and associated residential amenities, a childcare facility and café in the form of (a) a combination of new apartment buildings (A1-C2 and D1 – E2); (b) the subdivision, conversion and re-use of 'St. Teresa's House' (Block H); and (c) the dismantling, relocation and change of use from residential to café of 'St. Teresa's Lodge' (Block G) within the site development area. A detailed development description is now set out as follows:

The proposal provides for the demolition (total c. 207 sq m GFA) of (a) a single storey return (approx. 20 sq m) along the boundary with The Alzheimer's Society of Ireland; (b) the ground floor switch room (approx. 24.9sq.m.), (c) ground floor structures northwest of St. Teresa's House (26.8sq.m), (d) basement boiler room northwest of St. Teresa's House (17.0 sq.m), (e) ground floor structures northeast of St. Teresa's house (22.0sq.m.) (f) basement stores northeast of St. Teresa's house (67.8 sq.m.) and (g) a non - original ground floor rear extension (approx. 28.5 sq m) associated with the Gate Lodge.

The new development will provide for the construction of a new mixed use scheme of 487 no. apartment units in the form of 11 no. new residential development blocks (Blocks A1-C2 and D1 – E2) as follows:

- Block A1 (5 storeys) comprising 37 no. apartments (33 no. 1 bed units and 4 no. 2 bed units)
- Block B1 (10 storeys) comprising 55 no. apartments (37 no. 1 bed units, 10 no. 2 bed units, 8 no. 3 bed units)
- Block B2 (8 storeys) comprising 42 no. apartments (28 no. 1 bed units, 9 no. 2 bed units and 5 no. 3 bed units)
- Block B3 (8 storeys) comprising 42 no. apartments (28 no. 1 bed units, 9 no. 2 bed units and 5 no. 3 bed units)
- Block B4 (5 storeys) comprising 41 no. apartments (4 no. studio units, 4 no. 1 bed units, 27 no. 2 bed units and 6 no. 3 bed units)
- Block C1 (3 storeys) comprising 10 no. apartments (1 no. studio units, 3 no. 1 bed units and 6 no. 2 beds)
- Block C2 (3 storeys) comprising 6 no. apartments (2 no. 1 bed units and 4 no. 2 bed units) together with a creche facility of 392 sq m at ground floor level and outdoor play area space of 302 sq m.
- Block C3 (1 storey over basement level) comprising residential amenity space of 451 sq m.
- Block D1 (6 storeys) comprising 134 no. apartments (12 no. studio units, 22 no. 1 bed units, 90 no. 2 bed units and 10 no. 3 bed units).
- Block E1 (6 storeys) comprising 70 no. apartment units (34 no. 1 bed units, 26 no. 2 bed units and 10 no. 3 bed units).

- Block E2 (6 storeys) comprising 50 units (1 no. studio units, 29 no. 1 bed units, 18 no. 2 bed units and 2 no. 3 bed units).

Each new residential unit has associated private open space in the form of a terrace / balcony.

The development also provides for Block H, which relates to the subdivision and conversion of 'St. Teresa's House' (3 storeys) into 6 no. apartments (5 no. 2 bed units and 1 no. 3 bed unit) including the demolition of non-original additions and partitions, removal and relocation of existing doors, re-instatement of blocked up windows, replacement of windows, repair and refurbishment of joinery throughout and the upgrade of roof finishes and rainwater goods where appropriate.

It is also proposed to dismantle and relocate 'St. Teresa's Lodge' (1 storey) from its current location to a new location, 180 m south west within the development adjacent to Rockfield Park. St. Teresa's Lodge (Block G) will be deconstructed in its original location and reconstructed in a new location using original roof timbers, decorative elements and rubble stonework, with original brickwork cleaned and re-used where appropriate.

It is also proposed to dismantle and relocate 'St. Teresa's Lodge' (1 storey - gross floor area 69.63sq m) from its current location to a new location, 180 m south west within the development adjacent to Rockfield Park. St. Teresa's Lodge (Block G) will be deconstructed in its original location and reconstructed in a new location using original roof timbers, decorative elements and rubble stonework, with original brickwork cleaned and re-used where appropriate. A non - original extension (approx. 28.5 sq m) is proposed for demolition. The current proposal seeks a new extension of this building (approx. 26.8 sq m) and a change of use from residential to café use to deliver a Part M compliant single storey building of approx. 67.4 sq m

Total Open space (approx. 15,099.7 sq m) is proposed as follows: (a) public open space (approx. 11,572.3 sq m) in the form of a central parkland, garden link, woodland parkland (incorporating an existing folly), a tree belt; and (b) residential communal open space (approx. 3,527.4 sq m) in the form of entrance gardens, plazas, terraces, gardens and roof terraces for Blocks B2 and B3. Provision is also made for new pedestrian connections to Rockfield Park on the southern site boundary and Temple Hill along the northern site boundary.

Basement areas are proposed below Blocks A1, B1 to B4 and D1 (c. 7,295 sq. m GFA). A total of 252 residential car parking spaces (161 at basement level and 91 at surface level); 1056 bicycle spaces (656 at basement level and 400 at surface level); and 20 motorcycle spaces at basement level are proposed. 8 no. car spaces for creche use are proposed at surface level.

The proposal also provides for further Bin Storage areas, Bike Storage areas, ESB substations and switch rooms with a combined floor area of 356.2 sq m at surface level.

The development also comprises works to the existing entrance to St. Teresa's; the adjoining property at 'Carmond'; and residential development at St. Vincent's Park from Temple Hill (N31/R113). Works include the realignment and upgrade of the existing signalised junction and associated footpaths to provide for improved and safer vehicular access/egress to the site and improved and safer access/egress for vehicular traffic to/from the property at 'Carmond' and the adjoining residential development at St Vincent's Park.

Emergency vehicular access and pedestrian/cyclist access is also proposed via a secondary long established existing access point along Temple Hill. There are no works proposed to the existing gates (Protected Structure) at this location.

The associated site and infrastructural works include provision for water services; foul and surface water drainage and connections; attenuation proposals; permeable paving; all landscaping works including tree protection; green roofs; boundary treatment; internal roads and footpaths; and electrical services including solar panels at roof level above Blocks A1, B1 - B4, C1-C3, D1, E1, E2.

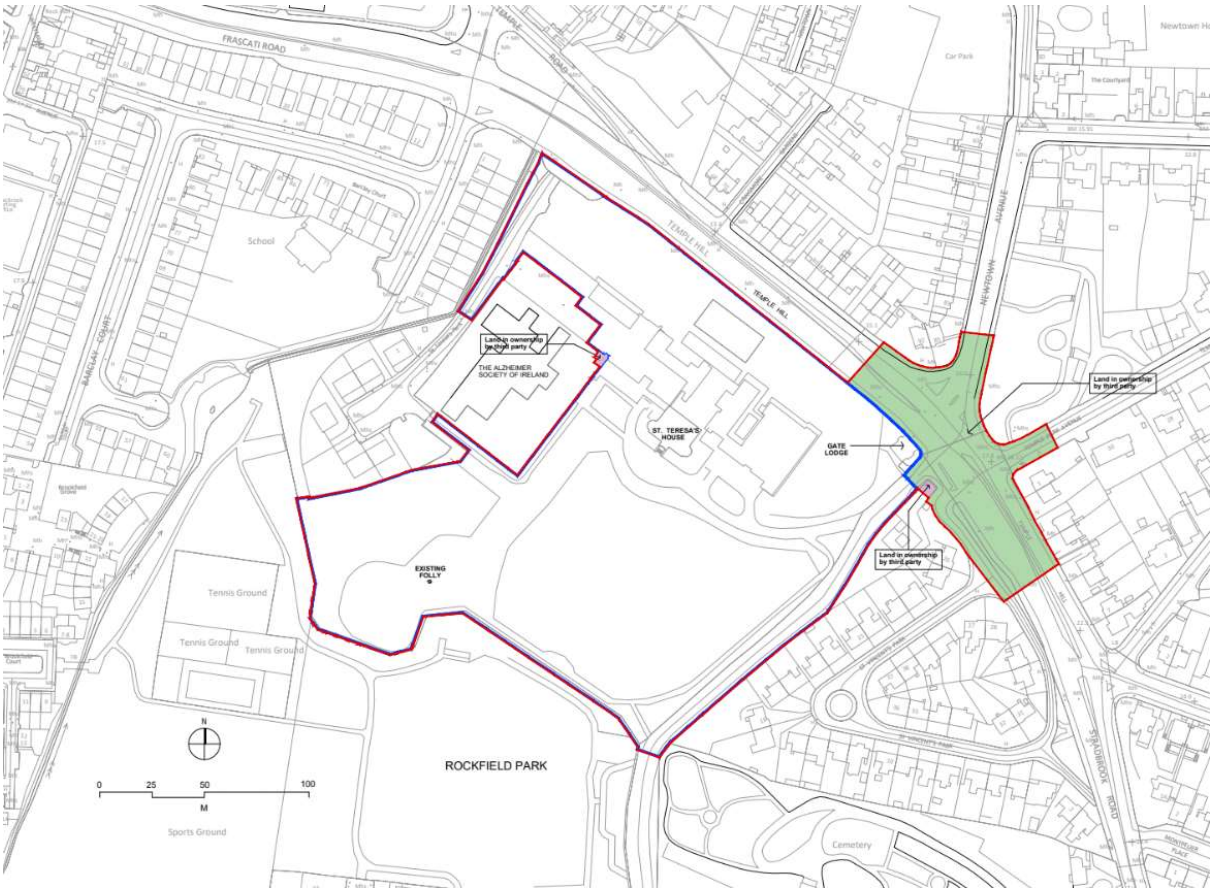

Figure 1 – Site Location (Extract from OMP drawing 1706A-OMP-00-00-DR-A-1001 - Applicant site Illustrated by red line)

Figure 2 - Layout of proposed development

Demolition works will be undertaken to prepare the site for the construction of the proposed St. Teresa's Strategic Housing Development [SHD]. The demolition works and main contract works (particularly piling/trench fill and bulk excavation) will be sequenced in a phased manner, so as to minimise construction phase impacts. The purpose of the demolition and enabling works phase is to prepare the site for construction, with below ground substructure and associated utilities.

3.0 Construction Programme and Phasing

The construction works associated with the proposed development will be undertaken in 3 phases.

There will also be demolition and excavation phases associated with removing demolition material, excavating the basement, along with re-profiling spoil onsite.

Subject to the grant of permission, the construction and demolition programme is intended to commence in the second half of 2022, with a 48-month programme, to be read in conjunction with JJ Campbell and Associates Phasing Drawing C12:

Demolitions: 9 months
Construction:

Phase 1 works:	18 months
Phase 2 & 3:	30 months
Total:	48 months

The construction compound, offices, staff parking and storage areas will be located at the locations provided in Figure 6.

Stage/Phase 1

Preliminary and enabling works.

- Establishment - offices, canteen, welfare, etc.
- Hoarding and fencing, including fencing of St Teresa's House.
- Install temporary wheel wash and silt traps.
- New water and gas connections to Alzheimer's Society
- New water and gas connections to St Teresa's house.
- Foul drainage from Temple Road to St Teresa's, including connection to Irish Water sewer.
- Demolition of remaining structures.
- Diversion of H.V. and M.V. ESB cables.
- Dismantling of Gate Lodge and reconstruction of Gate Lodge at new location.
- New junction layout at Temple Road.
- New watermain in avenue serving St. Catherine's.
- Divert 900mm diameter sewer at St. Louise's Park at the north west boundary.
- Install foul drainage system from St Teresa's to intercept the drain from St. Catherine's at S.W. boundary of site.
- Construct attenuation tank at building A1 and connect to IW sewer in Temple Road.
- Construct attenuation structure at centre of site and connection drainage to Temple Road and connect to IW sewer.
- Construct 2 no. ESB sub-stations.
- Install and connect drainage located under ESB feed cable ducts.
- Install ESB feed cables in ducts to sub-stations
- Complete S.W. and Foul drainage networks.

- Construct road sub-base and base for construction traffic.

Stage/Phase 2

Phase 2.A

- Install ducting and cables into roads from St Teresa's east to Temple Road.
- Construct basement structure for buildings A1, B1, B2, B3 and B4
- Construct superstructure for buildings A1, B1, B2, B3, B4, C1, C2 and C3
- Utility connections, Buildings A1, B1, B2, B3, B4, C1, C2 and C3
- Fit out, Buildings A1, B1, B2, B3, B4, C1, C2 and C3
- Landscaping, area east of St Teresa's
- Final surfacing of roads East of St. Teresa's.

Phase 2.B

- Install ducting and cables into roads from St Teresa's west to boundary with Rockfield Park.
- Construct basement structure for buildings D1
- Construct superstructure for buildings D1, E1 and E2
- Utility connections, Buildings D1, E1 and E2
- Fit out, Buildings D1, E1 and E2
- Landscaping, area west of St Teresa's
- Final surfacing of roads west of St. Teresa's.

Stage/Phase 3

- Install ducting and cables around St Teresa's.
- Conservation works, repairs and internal alterations to St. Teresa's
- Utility connections to St. Teresa's
- Fit out, St. Teresa's.
- Landscaping, around St Teresa's
- Final surfacing of roads around St. Teresa's.

No structural drawings exist for the existing buildings. A topographical survey of the buildings was carried out by Murphy Surveys and a utility survey of the grounds was carried out by Murphy Surveys.

The Demolition Contractor shall review the available drawings and information to confirm the nature of building components and construction as identified in the pre-development surveys.

The modern single story annex to the gate lodge to be demolished. The protected gate lodge structure which is constructed using stone is to be dismantled and stored on site in a waterproof container for rebuilding at a later date. Gate lodge is to be dismantled in accordance with the conservation architects report and methodology.

4.0 EXCAVATIONS

4.1 Archaeological and Architectural Heritage

The Demolition Contractor shall be required to co-ordinate and liaise with the appointed Project Archaeologist in relation to the timing of any and all sub-surface works.

The Main/Demolition Contractor shall be required to prepare its written methodology / method statement so as to implement all relevant Cultural Heritage mitigation measures set out in the application documentation (and set out in the Schedule of Mitigation Measures). The Main/Demolition Contractor shall be required to provide this methodology / method statement to the Project Archaeologist for review prior to the commencement of any works on the site. The written methodology / method statements will in turn be issued by the Client appointed Archaeologist to the planning authority.

A programme of archaeological monitoring of the ground reduction associated with the proposed development will be carried out. This will be carried out by a suitably qualified archaeologist under licence and in accordance with the provisions of the National Monuments Acts.

Should archaeological features or material be uncovered during archaeological testing or any phase of construction, ground works will cease immediately and the National Monuments Service of the Department of Culture, Heritage and the Gaeltacht will be informed. Time must be allowed for a suitably qualified archaeologist to inspect and assess any material. If it is established that archaeologically significant material is present, the National Monuments Service may require that further archaeological mitigation be undertaken. A written report will be prepared detailing the results of all archaeological works.

4.2 Ground Conditions

Two preliminary geotechnical investigations have been carried out at the site by Ground Investigations Ireland Limited, in December 2018 and November 2020. These investigations indicate that the underlying rock is below formation level for the proposed basements and buildings. In the unlikely event that rock is encountered, rock can be excavated using ordinary excavation methods and rock ripping. It is confirmed that blasting will not be necessary on this site.

In the event that Asbestos containing materials (ACMs) are found, the removal will only be carried out by a suitably permitted waste contractor, in accordance with Safety, Health and Welfare at Work (Exposure to Asbestos) Regulations 2006, as amended. Any ACMs will be taken to a suitably licensed or permitted facility.

In the event that hazardous soil or historically deposited waste is encountered during the construction phase, the contractor will notify Dún Laoghaire-Rathdown County Council (DLRCC) and provide information, to include estimated tonnages, description of location, any relevant mitigation, destination for disposal/treatment, in addition to information on the authorised waste collector(s).

4.3 Foundations

The geotechnical design of any pile walls will be carried out in accordance with IS EN 1997-12005 Eurocode 7: Geotechnical Design – Part 1: General Rules and with respect to the Irish National Annex. It is expected to install piles wall to allow excavation of basements in blocks A1, B1, B2, B3, B4 and D1. The recommendations of CIRIA C760 are also considered.

Foundations for the blocks with basements (A1 B1 B2 B3 B4 and D1) will be a raft type foundation.

Blocks C1, C2 and C3 will have traditional strip foundations.

Blocks E1 and E2 will have piled foundations.

5.0 SITE LOGISTICS

5.1 Site Safety Compliance

The Contractor shall be responsible for overall management of the site for the duration of the proposed works and must progress their works with reasonable skill, care, diligence and to proactively manage the works in a manner most likely to ensure the safety and welfare of those carrying out construction works.

The Contractor shall comply with all relevant statutory requirements, including the Safety Health and Welfare at Work Act 2005, as amended, the Safety, Health and Welfare at Work (Construction) Regulations 2013, as amended, and the Safety, Health and Welfare at Work (General Application) Regulations 2007, as as amended.

5.2 Site Establishment and Security

The site is currently accessed from:

Temple Road at Newtown Avenue / Temple Park Avenue junction, (main access route).
Temple Road, adjacent to St Louise's Park.
Access to St. Catherine's convent and lands to the south of the site is via the main access route at the Temple Road/Newtown Avenue/Temple Park junction.

The first construction activities on site will be the proposed alterations to the Temple Road/Newtown Avenue/Temple Park junction.

For the duration of demolition and construction activities, all site traffic will enter the site from Temple Road (main entrance). Construction traffic will exit the site via the main entrance. Construction traffic movements will be organised in the manner set out in the

Traffic and Transport Assessment report submitted with the application for permission, as agreed with the planning authority and subject to any planning conditions attached to a grant of permission.

It is anticipated that site establishment works will take approximately four weeks. The site office and welfare facilities will be confirmed in advance of the commencement of site works and agreed with Dun Laoghaire Rathdown County Council.

Figure 3 shows the proposed locations of the site compound and staff parking.

Figure 3 - Proposed Site Compounds & Staff parking Locations

Site Compound/Site Office

Staff Parking

Site Exit/Entrance

All of the sub-contractors as well as the main contractor and project managers will occupy offices within the construction compounds. The site parking for all staff, contractors and visitors will also be located in this area.

5.3 Consents and Licences & Liaison

All statutory consents and licences required to commence on-site construction activities will be obtained ahead of works commencing, allowing for the appropriate notice period. These will include, but are not limited to:

- Site notices;
- Construction commencement notices; and
- Licence to connect to existing utilities and mains sewers, where required;

Also, the main contractor shall liaise with all adjoining / neighbouring landowners.
Key Neighbours include the following:

- The Alzheimer Society
- St Louise's
- The owners and occupiers of Barclay Court

5.4 Services and Utilities

Existing utility services which traverse the site will be diverted and rerouted during the course of the project to ensure that services are always maintained.

A Ground Penetrating Survey has been carried out to establish the locations of services, the results of which are shown on drawing C1. Any existing piped or cabled underground services will be verified on site and will be made safe and removed/rerouted where required.

An existing 900/1200mm diameter combined sewer at the St Louise's Park entrance will be diverted away from the footprint of Building A1. A feasibility enquiry to Irish Water indicates that this diversion is feasible.

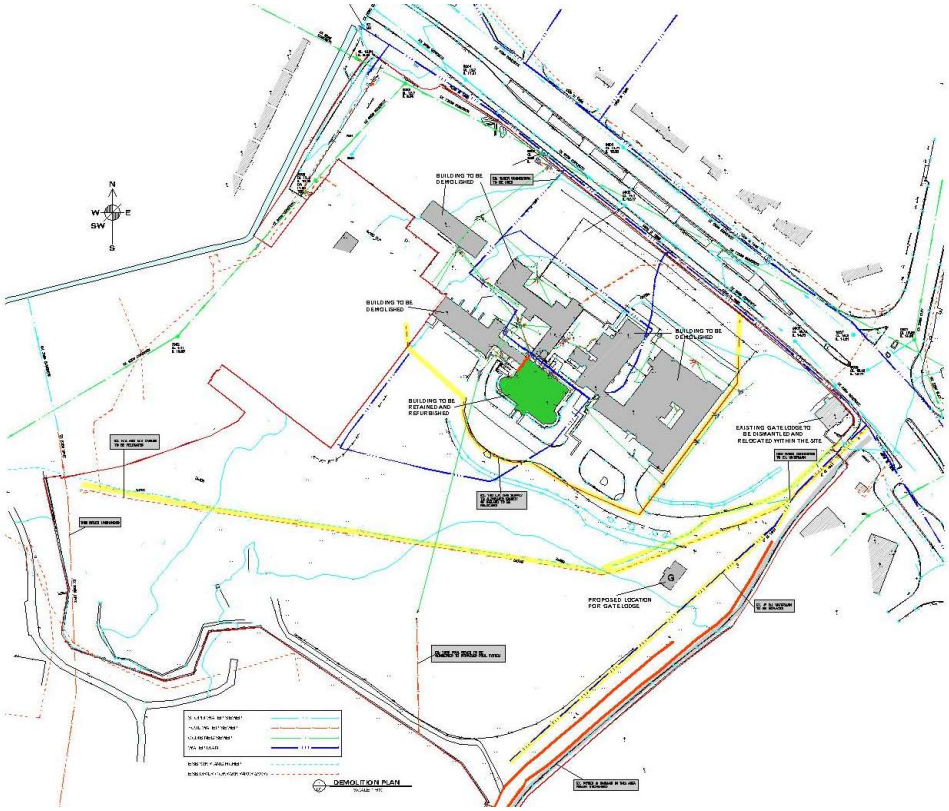

Figure 4 - Demolitions and diversion of services

Welfare facilities (canteens, toilets etc.) will be available within the construction compound and this will remain in place for the construction of the proposed development. The offices and site amenities will initially need to have their own power supply (generator), water deliveries and foul water collection until connections are made to the mains networks.

Electrical connections will be made by suitably qualified personnel following consultation with the relevant authorities and will be cognisant of subsequent construction works. High voltage connections will be established for heavy duty equipment and site facilities, as required.

The current electricity facilities on the site of the proposed development are supplied by the ESB through a ring network. All electrical works, including connection to the ESB network will be carried out by a suitably qualified contractor.
Water supply required for welfare facilities, dust suppression and general construction activities will be sourced from the existing public piped supplies running into the site.

However, before connections are established to the water supply it may need to be trucked onto site. As with electrical works, this will be carried out by a suitably qualified contractor. It will be necessary to service the site with a reliable and safe water supply.
Site welfare facilities will be established to provide sanitary facilities for construction workers on site. The main contractor will ensure that sufficient facilities are available at all times to accommodate the number of employees on site. Foul water from the offices and welfare facilities on the site will discharge into the existing foul sewer on site (the cabins may initially need to have the foul water collected by a licensed waste sewerage contractor before connection to the sewer line can be made).

5.5 Material Handling and Storage

When key materials are ordered, a 'Just in Time' delivery system will operate to minimise storage of materials, the quantities of which are unknown at this stage.

Where possible it is proposed to source general construction materials from the Dublin area to minimise transportation distances.

Aggregate materials such as sands and gravels will be stored in clearly marked receptacles in the compound area within the site. Liquid materials will be stored within temporary bunded areas, doubled skinned tanks or bunded containers (all bunds will conform to standard bunding specifications – BS EN 1992-3:2006) to prevent spillage.

Construction materials will be brought to site by road. Construction materials will be transported in clean vehicles. Lorries/trucks will be properly enclosed or covered during transportation of friable construction materials and spoil to prevent the escape material along the public roadway.

The majority of construction waste materials generated will be soil from excavation works. Material will be removed from site regularly to ensure there is minimal need for stockpiling.

5.6 Visitor Management

Visitors will only be allowed to enter the main site compound via the designated pedestrian access gate. A dedicated, secured footpath to the site office is established at the gate for registration and obtaining PPE prior to entering the site. A log will be maintained by security to control access to the site. Visitors will be required to attend a site-specific induction to allow access to the compound and/or construction site unless being accompanied by an inducted member of the site team.

Visitors will then be taken by an inducted member of the construction team to the required area of the site.

5.7 Site Working Hours

Site development and building works will only be carried out between the hours of 8am to 7pm Mondays to Fridays inclusive and between 8am and 2pm hours on Saturdays. There will be no construction works carried out on Sundays or public holidays. Deviation from these times will only take place when written approval is granted by DLRCC in exceptional circumstances.

In addition, the Contractor shall comply with all the reasonable safety requirements of the Client, the Project Supervisor for the Design Process and the Project Supervisor for the Construction Stage.

5.8 Employment and Management Workforce

It is estimated that there will initially be 50-70 staff on site on a typical day, however during peak construction periods this is expected to fluctuate up to 150 staff and contractors on site per day.

It is anticipated that the key project managers and main contractor representatives will maintain a presence on site for the whole duration of the project and the labour workforce will be determined by the specialist contractors required on site.

All employees working on the site will be required to have a Safe Pass Card (or similar approved Construction Health & Safety card), manual handling training, CIF COVID-19 training and the necessary certificates to operate machinery as required. The details of training required, records maintained, and induction procedures will be outlined in the Main Contractor's Health and Safety Plan(s).

6.0 CONSTRUCTION TRAFFIC AND SITE ACCESS

For the duration of demolition and construction activities, all site traffic will enter the site from Temple Road (main entrance). Construction traffic will exit the site via the main entrance. Construction traffic movements will be organised in the manner set out in the Traffic and Transport Assessment report submitted with the application for permission, as agreed with the planning authority and subject to any planning conditions attached to a grant of permission.

The heavy good vehicles (HGVs) routes to and from the site are set out below:

From the M50 HGV's will exit the motorway at junction 13 which is 6.9km from the development. HGV's will travel north east for 2.1km to the N11, from there the HGV's will travel North West for 2.5km to the N31 junction at Mount Merrion Avenue. HGV will then travel a further 2.3km north east along the N31 to the entrance into the site

Construction traffic and site access shall comply at all times with the requirements of:

- Department of Transport Traffic Signs Manual 2010 – Chapter 8 Temporary Traffic Measures and Signs for Roadworks
- Department of Transport Guidance for the Control and Management of Traffic at Road Works (2010)
- Any additional requirements detailed in the Design Manual for Roads and Bridges (DMRB) & Design Manual for Urban Roads & Streets (DMURS)

The contractor shall obtain all required road opening licenses from Dun Laoghaire Rathdown County Council.

Construction traffic operation will be limited to 7am to 7pm from Monday to Friday and 8am to 2pm on Saturday for the off-road construction. These times may vary to facilitate specific site requirements and/or construction activities associated with the site. Any variation will be agreed in advance with DLRCC.

HGV vehicle movements are not expected to exceed 5 vehicles per hour during the busiest period of construction works.

Excavated material will be reused as part of the site development works where possible to minimise truck movements to and from the site (e.g. use as non-structural fill under green areas).

6.1 Traffic Queueing

Material deliveries and collections from site will be planned, scheduled and staggered to avoid any unnecessary build-up of construction works related traffic.

Deliveries to site shall be booked in advance using a delivery schedule, so as to prevent lorry congestion on the road networks surrounding the site. Alternative safe routeways shall be established for traffic and pedestrians where existing routeways have to be altered, removed or worked on during the project.

6.2 Site Hoarding and Security Fencing

All areas of construction will be fenced / hoarded off to prevent unauthorized access. This fencing shall remain closed at all times during construction works and closed and locked after construction work hours / break times.

This fencing shall be erected in accordance with good practice and the requirements of the Safety, Health and Welfare at Work (Construction) Regulations 2013, as amended,. Fencing arrangements shall be reviewed as the life of the project progresses.
Access/Egress to site for site operatives and visitors shall be via biometric gates. Site security fencing/ Hoarding up to a height of 2.4 m will be erected that will clearly separate the work site from the surrounding public. It is not envisaged that the fencing will impinge upon the safe passage of pedestrians during the construction phase.

7.0 SAFETY, HEALTH AND ENVIRONMENTAL CONSIDERATIONS DURING CONSTRUCTION WORKS

The safety, health and environmental considerations which will be addressed include:

- Construction Health & Safety training requirements;
- Covid 19 guidelines;
- Induction procedures;
- Emergency protocols; and
- Details of welfare facilities.

7.1 Construction Lighting

Construction work will generally be confined to daylight hours and lighting will generally not be required for the construction phase. There will, however, be occasions where the provision of portable lighting will be required (works on roadways and power floating floors as examples). Where possible and without jeopardising site safety, lights will be pointed down at a 45-degree angle and away from sensitive receptors. The site compound will have external lights for safety and security. These lights will be pointed down at a 45-degree angle and away from sensitive receptors where possible.

7.2 Air Quality

This section describes the site policy with regard to dust management and the specific mitigation measures which will be put in place during construction works. The objective of dust control at the site is to ensure that no significant nuisance occurs at nearby sensitive receptors. In order to develop a workable and transparent dust control strategy, the measures set out below have been formulated by drawing on best practice guidance from Ireland, the UK and the US, such as:

- Department of Environment, Heritage and Local Government (DOEHLG), *Quarries and Ancillary Activities, Guidelines for Planning Authorities* (2004) [1];
- US Environment Protection Agency (USEPA), *Compilation of Air Pollutant Emission Factors, AP-42, Fifth Edition* (periodically updated) (1986) [2];
- The Scottish Office – Development Department, *Planning Advice Note PAN50 Controlling the Environmental Effects Of Surface Mineral Workings Annex B: The Control of Dust at Surface Mineral Workings* (1996) [3]; and
- Institute of Air Quality Management (IAQM), *Guidance on the Assessment of Dust from Demolition and Construction* (2014) [4].

7.2.1 Site Management

The site activities will be undertaken with due consideration of the surrounding environment and the close proximity of sensitive receptors such as residents and pedestrians. Dust management during the construction phase will be the most important aspect in terms of minimising the impacts of the project on the surrounding air quality. The following measures will also be implemented to ensure impacts are minimised:

- Complaint registers will be kept detailing all telephone calls and letters of complaint received in connection with construction activities, together with details of any remedial actions carried out;
- Equipment and vehicles used on site will be in good condition such that emissions from diesel engines etc. are not excessive; and
- Pre-start checks will be carried out on equipment to ensure they are operating efficiently and that emission controls installed as part of the equipment are functional.

Dust deposition levels will be monitored on a regular basis in order to assess the impact that site activities may have on the local ambient air quality. The following procedure will be implemented:

- The dust deposition rate will be measured by positioning Bergerhoff Dust Deposit Gauges at strategic locations near the boundaries of the site for a period of 30 (+/- 2) days if required. Monitoring should be conducted as required during periods when the highest levels of dust are expected to be generated i.e., during site preparation works and soil stripping activities.
- The exact locations will be determined after consideration of the requirements of Method VDI 2119 with respect to the location of the samplers relative to obstructions, height above ground and sample collection and analysis procedures.
- After each 30 (+/- 2 days) exposure period, the gauges will be removed from the sampling location, sealed and the dust deposits in each gauge will be determined gravimetrically by an accredited laboratory and expressed as a dust deposition rate in $mg/m^2/day$ in accordance with the relevant standards.
- Technical monitoring reports detailing all measurement results, methodologies and assessment of results shall be subsequently prepared and maintained by the Site Manager.

A limit value of 350 $mg/m^2/day$ will be used in comparison with recorded values.

7.2.2 Dust Control Measures

The aim is to ensure good site management by avoiding dust becoming airborne at source. This will be done through good design, planning and effective control strategies. The siting of construction activities and the limiting of stockpiling will take note of the location of sensitive receptors and prevailing wind directions in order to minimise the potential for significant dust nuisance. In addition, good site management will include the ability to respond to adverse weather conditions by either restricting operations on-site or using effective control measures quickly before the potential for nuisance occurs.

- During working hours, technical staff will be available to monitor dust levels as appropriate; and
- At all times, the dust management procedures put in place will be strictly monitored and assessed.

The dust minimisation measures should be reviewed at regular intervals during the construction phase to ensure the effectiveness of the procedures in place and to maintain the goal of minimisation of dust generation. In the event of dust nuisance occurring outside the

site boundary, site activities should be reviewed, and procedures implemented to rectify the problem. Specific dust control measures to be employed are presented below.

7.2.3 Site Routes

Site access routes (particularly unpaved areas) can be a significant source of fugitive dust from construction sites if control measures are not in place. The most effective means of suppressing dust emissions from unpaved roads is to apply speed restrictions. Studies show that these measures can have a control efficiency ranging from 25% to 80% [5].

- A speed restriction of 20 km/h will be applied as an effective control measure for dust for on-site vehicles or delivery vehicles within the vicinity of the site;
- Bowsers will be available during periods of dry weather throughout the construction period. Research shown found that the effect of surface watering is to reduce dust emissions by 50% [6]. The bowser will operate during dry periods to ensure that unpaved areas are kept moist. The required application frequency will vary according to soil type, weather conditions and vehicular use; and
- Any hard surface roads will be swept to remove mud and aggregate materials from their surface while any unsurfaced areas shall be restricted to essential site traffic only.

7.2.4 Demolition/Excavation

Demolition and excavation works during periods of high winds and dry weather conditions can be a significant source of dust.

- During dry and windy periods, and when there is a likelihood of dust nuisance, watering shall be conducted to ensure moisture content of materials being moved is high enough to increase the stability of the soil and thus suppress dust;
- During periods of very high winds (gales), activities likely to generate significant dust emissions should be postponed until the gale has subsided.

The movement of truck containing materials with a potential for dust generation to an off-site location will be enclosed or covered.

7.2.5 Stockpiling

The location and moisture content of stockpiles are important factors which determine their potential for dust emissions. The following measures will be put in place:

- Overburden material will be protected from exposure to wind by storing the material in sheltered parts of the site, where possible;
- Regular watering will take place during dry/windy periods to ensure the moisture content is high enough to increase the stability of the soil and suppress dust;

7.2.6 Site Traffic on Public Roads

Spillage and blow-off of debris, aggregates and fine material onto public roads will be reduced to a minimum by employing the following measures:

- Vehicles delivering material with potential for dust emissions to an off-site location shall be enclosed or covered at all times to restrict the escape of dust;
- Any hard surface site roads will be swept to remove mud and aggregate materials from their surface while any unsurfaced roads shall be restricted to essential site traffic only.
- A power washing facility or wheel cleaning facility will be installed near to the site compound for use by vehicles exiting the site when appropriate, and an example of the washing equipment can be seen in insert 7.1 ; and
- Road sweepers will be employed to clean the site access route as required.

7.2.7 General

The pro-active control of fugitive dust will ensure that the prevention of significant emissions, rather than an inefficient attempt to control them once they have been released, will contribute towards the satisfactory management of dust by the construction contractor.

7.3 Ecology

The key strategies to be undertaken to minimise impact on the local ecology during site clearing and construction are as follows.

7.3.1 Mitigation Measures for Invasive Plant Species during Construction Stage

Non-native invasive plant species:
The following mitigation measures will ensure that there will be no impacts from non-native invasive species within habitats in the local area:

- The invasive species Hyacinthoides hispanica and Allium triquetrum will be re-surveyed and marked on the ground by the site ecologist prior to the commencement of construction works within the lands. This will be undertaken in late spring, when the plants are in their flowering and vegetative phase and clearly identifiable above ground;
- The areas of Hyacinthoides hispanica and Allium triquetrum will be removed from all habitats within the lands. The material will be removed from site by an appropriately qualified and licensed professional with experience in treatment of invasive species. Treatment of Hyacinthoides hispanica and Allium triquetrum may be by a combination of mechanical means (i.e. removal by trowel or shovel and transport to a licensed facility for treatment) and chemical means (i.e. application of herbicide to growing material). Both species are listed on the Third Schedule of the Birds and Habitats Regulations and are considered to be high-risk species. The requirement for further

treatment of both species will be determined based on ongoing monitoring of the lands following completion of initial clearance.

7.3.2 Mitigation Measures for Habitats during Construction Stage

Water quality

The following mitigation measures will ensure there are no impacts on water quality in the immediate vicinity of the proposed development from release of hydrocarbons, polluting chemicals, sediment/silt and contaminated waters control during the construction stage of the proposed development and therefore no potential impacts on the downstream receiving water courses, i.e. the Carysfort-Maretimo Stream:

- Specific measures to prevent the release of sediment over baseline conditions to the existing surface water drainage network, during the construction work, which will be implemented. These measures include, but are not limited to:
    - silt fences,
    - silt curtains,
    - settlement lagoons, and
    - filter materials.
- Provision of exclusion zones and barriers (e.g. silt fences) between earthworks, stockpiles and temporary surfaces to prevent sediment washing into the existing drainage systems and hence the downstream receiving water environment.
- Provision of temporary construction surface drainage and sediment control measures to be in place before earthworks commence.
- Weather conditions will be taken into account when planning construction activities to minimise risk of run-off from the site.
- Prevailing weather and environmental conditions will be taken into account prior to the pouring of cementitious materials for the works adjacent to any surface water drainage features, or drainage features connected to same. Pumped concrete will be monitored to ensure no accidental discharge. Mixer washings and excess concrete will not be discharged to existing surface water drainage systems. Washing out of any concrete trucks on site will be avoided (dry brush shoots will be used instead).
- Fuels and chemicals (including hydrocarbons or any polluting chemicals) will be stored in a designated, secure bunded area(s) to prevent any seepage of potential pollutants into the local surface water network. These designated areas will be clearly sign-posted and all personnel on site will be made aware of their locations and associated risks.
- All mobile fuel bowsers shall carry a spill kit and operatives must have spill response training. All fuel containing equipment such as portable generators shall be placed on drip trays. All fuels and chemicals required to be stored on-site will be clearly marked. Care and attention will be taken during refuelling and maintenance operations, with particular attention paid to gradient and ground conditions, which could increase risk of discharge to waters.
- A register of all hazardous substances, which will either be used on site or expected to be present (in the form of soil and/or groundwater contamination) will be established and maintained. This register will be available at all times and shall include as a minimum:
    - Valid Safety Data Sheets;

  - Health & Safety, Environmental controls to be implemented when storing, handling,
  - using and in the event of spillage of materials;
  - Emergency response procedures/precautions for each material; and,
  - The Personal Protective Equipment (PPE) required when using the material.
  - Implementation of response measures to potential pollution incidents.
- Robust and appropriate Spill Response and Environmental Emergency procedures will be communicated, resourced and implemented for the duration of the works.
- Emergency procedures/precautions and spillage kits will be available and construction staff will be trained and experienced in emergency procedures in the event of accidental fuel spillages.
- All trucks will have a built-on tarpaulin that will cover excavated material as it is being hauled off-site and wheel wash facilities will be provided at all site egress points.
- Water supplies shall be recycled for use in the wheel wash. All waters shall be drained through appropriate filter material prior to discharge from the construction sites.
- The removal of any made ground material, which may be contaminated, from the construction site and transportation to an appropriate licenced facility shall be carried out in accordance with the Waste Management Act, best practice and guidelines for same.
- Implementation of effective measures to minimise waste and ensure correct handling, storage and disposal of waste (most notably wet concrete, pile arisings and asphalt).
- All of the above measures implemented on site will be monitored throughout the duration of construction to ensure that they are working effectively, to implement maintenance measures if required and applicable, and to address any potential issues that may arise.

The aforementioned mitigation measures will also protect against potential accidental pollution events in downstream nationally designated sites, particularly South Dublin Bay pNHA.

7.3.3 Terrestrial Habitats

The following measures will be implemented to minimise the risk of accidental damage to hedgerows, treelines, woodland and parkland habitat (and individual trees) during the construction phase of the proposed development:

- A site ecologist will be appointed by the employer's representative to undertake an ecological clerk of works role over the construction phase of the proposed development. The site ecologist will be responsible for monitoring compliance with the proposed ecological mitigation measures. They will liaise with the site foreman and report to the local authority on a regular basis;
- All hedgerows, treelines and areas of woodland/parkland that are scheduled for retention will be fenced-off from construction traffic using Heras fencing or similar at the outset of works and for the duration of construction to avoid damage to the trunk, branches or root systems of the trees. Temporary fencing will be erected at a sufficient distance from trees so as to enclose the Root Protection Area (RPA) of the tree (National Roads Authority, 2005-2011). In general the RPA covers an area equivalent to a circle with a radius 12 times the stem diameter (measured at 1.5m above ground level for single stemmed trees);
- Where fencing is not feasible due to insufficient space, protection for the tree/hedgerow will be afforded by wrapping hessian sacking (or suitable equivalent) around the trunk of the tree and strapping stout buffer timbers around it. It will still be necessary to ensure

that the area within the RPA is not used for vehicle parking or the storage of materials (including oils and chemicals). This measure is considered secondary to fencing of retained habitats, and should only be undertaken as a last resort; and,

- Spoil materials such as rubble, topsoil, building goods and equipment, will not be placed within the RPA of trees or within 5m of hedgerows.

7.3.4 Mitigation Measures for Birds during Construction Stage

Vegetation clearance/demolition of a structure

The following mitigation measures are proposed to comply with the legal protection afforded to breeding birds and their nests under the Wildlife Acts:

- In order to avoid disturbance or harm to breeding birds, their nests, eggs and/or their unflown young, all works involving the removal of trees, hedgerows, grasslands or the demolition of the structure will be undertaken outside of the nesting season (i.e. 1 March to 31 August inclusive)

In circumstances where this seasonal restriction cannot be observed then:

- A breeding bird survey will be undertaken by a suitably experienced ecologist in order to assess whether birds are nesting within suitable habitat affected by or immediately adjacent to the proposed works. Should nesting birds be encountered during surveys, the removal of trees or hedgerows or the demolition of the buildings will be delayed until after the nesting season (i.e. 1 March to 31 August inclusive), or until the chicks have fully fledged.

7.3.5 Mitigation Measures for Bats during Construction Stage

Lighting

During construction, any external lighting to be installed, including facilitating night-time working or security lighting, on the site shall be sensitive to the presence of bats in the area, downlighting, and time limited where possible. Lighting of sensitive wildlife areas and primary ecological corridors (e.g. Grand Canal) and light pollution in general should be avoided.

Lighting of the site during construction is designed in accordance with the following guidance:

- Guidance Notes for the Reduction of Obtrusive Light GN01 (Institute of Lighting Professionals, 2020)
- Bats & Lighting - Guidance Notes for Planners, Engineers, Architects and Developers (Bat Conservation Ireland, December 2010)
- Bats and Lighting in the UK – Bats and the Built Environment Series (Bat Conservation Trust UK, January 2008).

Vegetation Clearance

The following mitigation measures are proposed in relation to those trees identified as having potential to support roosting bats, and particularly those which will be removed during the construction stage. Bats could occupy suitable roosting features at any time prior to the commencement of works. Therefore, there is an inherent risk that bats could be affected by felling works. The following mitigation procedures will be followed:

- Felling of potential tree roosts will be undertaken during the periods April to May or September to October as during this period bats are capable of flight and may avoid the risks from tree felling if proper measures are undertaken, but also are neither breeding nor in hibernation
- Use of detectors alone may not be sufficient to record bat emergence and re-entry in darkness. Therefore, prior to felling of confirmed and potential tree roosts, an emergence survey using infra-red illumination and video camera(s) and bat detectors will be carried out on the night immediately preceding the felling operation to determine if bats are present
- Where it is safe and appropriate to do so for both bats and humans, such trees may be felled using heavy plant to push over the tree. In order to ensure the optimum warning for any roosting bats that may still be present, the tree will be pushed lightly two to three times, with a pause of approximately 30 seconds between each nudge to allow bats to become active. The tree should then be pushed to the ground slowly and should remain in place until it is inspected by a bat specialist
- Trees should only be felled "in section" where the sections can be rigged to avoid sudden movements or jarring of the sections
- Where remedial works (e.g. pruning of limbs) is to be undertaken to trees deemed to be suitable for bats, the affected sections of the tree will be checked by a bat specialist (using endoscope under a separate derogation licence held by that individual) for potential roost features before removal. For limbs containing potential roost features high in the tree canopy, this will necessitate the rigging and lowering of the limb to the ground (with the potential roost feature intact) for inspection by the bat specialist before it is cut up or mulched. If bats are found to be present, they will be removed by a bat specialist licenced to handle bats and released in the area in the evening following capture
- If any bat tree roosts are confirmed, and will be removed by the proposed felling works, then a derogation licence will be required from the NPWS and appropriate alternative roosting sites will be provided in the form of bat boxes.

7.3.6 Mitigation Measures for Badgers during Construction Stage

Before works to clear any of the habitat features suitable to supporting badgers commence, checks will be undertaken of all mammal holes within the subject lands, in advance (approximately one month) of commencement of construction works. This will involve monitoring of holes by remote infra-red cameras for a period of 14 days each at minimum. This measure is proposed in order to account for potential changes to badger activity within the lands between granting of planning and commencement of construction activities. Monitoring will involve checks for signs of breeding activity at setts. This will require a licence from the NPWS permitting filming to assess locations of activity.

Guidelines for the treatment of badgers prior to the construction of national road schemes (National Roads Authority, 2009) recommends against the use of heavy machinery within 30m of badger sett entrances, and the exclusion of light machinery (generally wheeled vehicles) from within 20m of a badger sett entrance. This is not feasible in this instance in light of the location of blocks E1 and E2, which are within 20m of the badger sett entrance. Accoridngly, it is proposed that the northernmost of the six sett entrances, which is inactive, will be closed permanently, and that the remaining sett entrances in the lands will be closed temporarily for the duration of the construction phase of the proposed development.

The closure of sett entrances will be undertaken between July and November inclusive, in order to avoid the peak breeding season for badger (December to June), and therefore avoid the risk of disturbance or mortality of cubs. Works may proceed during the breeding season for badger following the successful closure of the sett entrances.

In order to close each sett entrance, a one-way badger gate (or a similar device) will be installed at each sett entrance. The gates will be soft blocked with stones after their installation and will be monitored for a 21-day period for signs of activity. Where no activity takes place, further stones or similar materials will be used to reinforce the closure of the sett entrance. The sett entrance will be monitored for activity throughout construction. The sett entrances may need to be closed several times over the duration of the project if badgers reopen the sett entrances. All sett entrances, with the exception of the northernmost sett entrance will be reopened following the completion of works by removal of badger gates.

At the landscaping stage of the proposed development, a dense planting of evergreen ground cover species such as Luzula sylvatica and native evergreen woodland shrubs/trees such as Ilex aquifolium, Euonymus europaeus, Crataegus monogyna and Viburnum opulus will be established around the badger sett entrances. The intention of this planting is to minimise the requirement maintenance machinery (i.e. lawnmowers) within the vicinity of sett entrances, and to provide a level of screening of them from residential dwellings. These measures are intended to reduce the levels of disturbance to badgers and their setts at the operational phase of the proposed development.

In addition, to protect individual badgers from direct harm, all open excavations on site will be covered when not in use and backfilled as soon as possible. Excavations will also be covered at night and any deep excavations left open will have appropriate egress ramps in place to allow mammals to safely exit excavations should they fall in.

7.4 Noise and Vibration

Noise impacts arising from demolition, earthworks and construction activities have the potential to cause annoyance or nuisance to local residents and businesses in the area.

The earthworks will generate typical construction activity related noise and vibration sources from use of a variety of plant and machinery such as rock breakers, excavators, lifting equipment, dumper trucks, compressors and generators.

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

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

The total noise (LAeq) which should not be exceeded during daytime is therefore 70dB. 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 - 3mm/s
- 11 to 50 Hz - 3 to 8mm/s
- 50 to 110 Hz (and above) - 8 to 11mm/s

Any noise complaints related to activities at the site will be logged and investigated and, where required, measures taken to ameliorate the source of the noise complaint.

A designated noise officer should be appointed to site during construction works. Any complaints should be logged and followed up in a prompt fashion. In addition, prior to particularly noisy construction activity, e.g. excavation close to a property, etc., the site contact should inform the nearest noise sensitive locations of the time and expected duration of the works.

All works on site shall comply with BS 5228 2009+ A1 2014 (Parts 1 & 2) which gives detailed guidance on the control of noise and vibration from construction activities. In general, the following mitigation measures shall be implemented during the proposed construction works:

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

External noise and vibration monitoring will be undertaken at locations on the site boundary closest to sensitive locations. Monitors may be added, removed or relocated as necessary.

The noise monitoring terminals should provide the following at minimum:

- Logging at hourly intervals; and
- Daily CIC automated calibrations.

Vibration monitoring terminals should continually log vibration levels using the Peak Particle Velocity parameter (PPV, mm/s) in the X, Y and Z directions, in accordance with BS ISO 4866: 2010: *Mechanical vibration and shock – Vibration of fixed structures – Guidelines for the measurement of vibrations and evaluation of their effects on structures.*

The mounting of the transducer to the vibrating structure, by way of resin fixings only, will need to comply with BS EN ISO 5348: 1998: *Mechanical vibration and shock – Mechanical mounting of accelerometers*. In summary, the following ideal mounting conditions apply:

- The transducer and its mountings should be as rigid as possible;
- The mounting surfaces should be as clean and flat as possible;
- Simple symmetric mountings are best, and;
- The mass of the mounting should be small in comparison to that of the structure under test.

Rock breaking and Piling

Piling / coring through rock may be required to allow excavation of the basements in the strata above the rock in accordance with the proposed design. Excavation in rock is not envisaged.

Further site investigations are required once the existing buildings on site are demolished.

During this phase additional noise reductions / mitigation measures will be implemented to limit the impact on the surrounding environment and population.

- Solid boundary hoarding providing acoustic barrier.
- Acoustic screen to the rock breaking area if required to meet the noise limit requirements.
- Noise and vibration will also be attenuated by the depth of the rock excavation at more than 3m below surrounding ground.

The methods of rock extraction, the depth, together with the proposed location of the building basement will reduce off-site noise effects from much of the surrounding area.

7.5 Waste Management

This section outlines the measures that will be undertaken to minimise the quantity of waste produced at the site and the measures to handle the waste in such a manner as to minimise the effects on the environment.

Adherence to the C&D WMP prepared for the construction works will ensure that the management of waste arising is dealt with in compliance with the provisions of the Waste Management Acts, and Regulations made thereunder, the Litter Pollution Acts and the Eastern-Midlands Region Waste Management Plan 2015 – 2021, and that it will achieve optimum levels of waste reduction, re-use and recycling.

Typical waste materials that will be generated from the construction works will include:

- Soil and stones;

- Concrete, bricks, tiles and ceramics;
- Wood, glass and plastics;
- Metals;
- Gypsum-based construction material;
- Paper and cardboard;
- Mixed C&D waste;
- Chemicals (solvents, paints, adhesives, detergents etc.)

Hazardous wastes will be identified if present, removed and kept separate from other C&D Waste materials in order to avoid further contamination.

The management of all hazardous waste arisings, if they occur, shall be coordinated in liaison with Health and Safety Management.

Soil:

Soil sampling for environmental testing will be undertaken after the demolition phase of the development and prior to the removal of any soil offsite. All soil arisings will be tested and classified as either non-hazardous or hazardous in accordance with the EPA publication entitled 'Waste Classification: List of Waste & Determining if Waste is Hazardous or Non-Hazardous' 12 using the HazWasteOnline application (or similar approved classification method). The material will then need to be classified as clean, inert, non-hazardous or hazardous in accordance with the EC Council Decision 2003/33/EC 13 . If Asbestos or Asbestos Containing Material (ACMs) are identified in soil samples, the removal will only be carried out by a suitably permitted waste contractor, in accordance with S.I. No. 386 of 2006 Safety, Health and Welfare at Work (Exposure to Asbestos) Regulations 2006-2010. All asbestos will be taken to a suitably licensed or permitted facility.

Asbestos:

Removal of asbestos or ACMs will be carried out by a suitably qualified contractor and ACM's will only be removed from site by a suitably permitted/licenced waste contractor in accordance with S.I. No. 386 of 2006 Safety, Health and Welfare at Work (Exposure to Asbestos) Regulations 2006-2010. All material will be taken to a suitably licensed or permitted facility.

Other Hazardous Materials:
Paints, glues, adhesives and other known hazardous substances will be stored in designated areas separate from other C&D waste. They will generally be present in small volumes only and associated waste volumes generated will be kept to a minimum. Wastes will be stored in appropriate receptacles pending collection by an authorised waste contractor. In addition, WEEE (containing hazardous components), printer toner/cartridges, batteries (Lead, Ni-Cd or Mercury) and/or fluorescent tubes and other mercury containing waste may be generated from during C&D activities or temporary site offices. These wastes (if encountered) will be stored in appropriate receptacles in designated areas of the site pending collection by an authorised waste contractor.

7.5.1 Waste Minimisation

Waste minimisation measures proposed are summarised as follows:

- Materials will be ordered on an 'as needed' basis to prevent over supply;
- Materials will be correctly stored and handled to minimise the generation of damaged materials;
- Materials will be ordered in appropriate sequence to minimise materials stored on site;
- A waste tracking log will be established;
- Sub-contractors will be responsible for similarly managing their wastes; and
- All wood waste generated by site works will be inspected and examined and will be segregated as re-useable wood and scrap wood waste.

7.5.2 Waste Storage

The main waste storage area will be located in the site compound. A dedicated and secure area containing bins, and/or skips, and storage areas, into which all waste materials generated by construction site activities, will be established within the development.

Waste materials generated will be segregated on at the site compound, where it is practical. Where the on-site segregation of certain wastes types is not practical, off- site segregation will be carried out. There will be skips and receptacles provided to facilitate segregation at source. All waste receptacles leaving site will be covered or enclosed. The appointed waste contractor will collect and transfer the wastes as receptacles are filled. There are numerous waste contractors in the Dublin Region that provide this service.

The site construction manager will ensure that all staff are informed of the requirements for segregation of waste materials by means of clear signage and verbal instruction. Appointed employees will be made responsible for ensuring good site housekeeping.

7.5.3 Responsibility

It will be the responsibility of the construction manager to ensure that a written record of all quantities and natures of wastes removed from the site are maintained on-site in a waste file (in hardcopy or electronically).

It is the responsibility of the project manager or his/her delegate that all contracted waste haulage drivers hold an appropriate waste collection permit for the transport of waste loads and that all waste materials are delivered to an appropriately licensed or permitted waste facility in compliance with the relevant Regulations.

The contractor, as part of regular site inspection audits, will determine the effectiveness of the waste management strategy and will assist the project manager in implementing the measures under the C&D WMP and in determining the best methods for waste minimisation, reduction, re-use, recycling and disposal as the construction phase progresses and waste materials are generated.

Prior to commencement of the demolition, excavation and construction activity and removal of any waste off-site, details of the proposed destination of each waste stream will be provided to DLRCC, along with waste collection permit numbers.

7.6 Surface Water Management

Care will be taken to ensure that exposed soil surfaces are stable to minimise erosion. All exposed soil surfaces will be within the main excavation site which limits the potential for any offsite impacts. All run-off will be prevented from directly entering into any water courses as no construction will be undertaken directly adjacent to open water.

No significant dewatering will be required during the construction phase which would result in the localised lowering of the water table. There may be localised pumping of surface run-off from the excavations during and after heavy rainfall events to ensure that the excavation is kept relatively dry.

The following measures will be put in place during the construction phase to ensure protection of surface waterbodies. Construction works are informed by best practice guidance from Inland Fisheries Ireland on the prevention of pollution during development projects:

- Control of Water Pollution from construction Sites, Guidance for consultants and contractors (C532); and
- Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters (2016).
- Environmental Good Practice on Site Guide (4th edition) (C741).

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 drainage system shall be installed prior to the commencement of the construction works to collect surface water runoff by the site during construction.

It is envisaged that a number of geotextile lined settling basins and temporary mounding's and/or silt fences (See figure 5) will be installed to ensure silts do not flow off site during the construction stage. This temporary surface water management facility will throttle runoff and allow suspended solids to be settled out and removed. All inlets to the settling basins will be 'riprapped' to prevent scour and erosion in the vicinity of the inlet.

7.6.1 Pollution Control

Management of Suspended solids in run-off

Any temporary storage of spoil, hardcore, crushed concrete or similar material will be stored as far as possible from any surface water drains and also stored in receptacles where possible. In order to minimise the risk of contamination, the stockpiled material will be removed off-site as soon as possible. Surface water drain gratings in areas near or close to where stockpiles are located will be covered by appropriate durable polyurethane covers or similar.

There will be no direct pumping of silty water from the works to any watercourse. Sediment entrapment facilities will be installed to reduce sediment discharges to downstream properties and receiving waters. All run-off leaving a disturbed area will pass through a sediment entrapment facility before it exits the site and flows downstream such as straw bales, silt fencing, silt barriers.

The site falls from South to North towards Temple Road. A silt fence will be installed parallel to Temple Road to trap silt during storm events. Silt fence to be inspected and cleaned regularly.

Figure 5 – Typical silt fence

Concrete Run-off

Where concrete is delivered on site, only the chute is to be cleaned, using the smallest volume of water possible or brush cleaning only. No discharge of cement-contaminated waters to the construction phase drainage systems or directly to any artificial drain or watercourse will be allowed. Wash down of chute shall be at the bunded area in the site compound.

Accidental Spills and Leaks

No bulk chemicals will be stored within the active construction areas. Temporary oil and fuel storage tanks will be kept in the material storage area in suitable containers and will be

appropriately self-bunded as required. Refuelling of vehicles and the addition of hydraulic oils or lubricants to vehicles will take place in designated areas of the site compound, where possible, which will be kept away from surface water drains.

Spill protection equipment such as absorbent mats, socks and sand will be available to be used in the event of an accidental release during refuelling. Training will be given to appropriate site workers in how to manage a spill event.

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

- Refuelling will be undertaken off site where possible;
- Where mobile fuel bowsers are used the following measures will be taken:
  - Any flexible pipe, tap or valve will be fitted with a lock and will be secured when not in use;
  - The pump or valve will be fitted with a lock and will be secured when not in use;
  - All bowsers must carry a spill kit;
  - Operatives must have spill response training; and
  - Portable generators or similar fuel containing equipment will be placed on suitable drip trays.

Monitoring

Weekly checks will be carried out to ensure surface water drains are not blocked by silt, or other items, and that all storage is located at least 10m from surface water receptors. A regular log of inspections will be maintained, and any significant blockage or spill incidents will be recorded for root cause investigation purposes and updating procedures to ensure incidents do not reoccur.

8.0 SUMMARY

This CEMP sets out the overall management strategy for demolition, excavation and construction works for the proposed development. The CEMP aims to ensure the management of demolition and construction activity is carried out in a planned, structured and considered manner which minimises the impacts of the works on the local environment, residents and commercial activities in the vicinity of the site. The CEMP should be viewed as a live document that will be updated as the development progress and circumstances change, including any additional measures required pursuant to planning conditions.

9.0 REFERENCES

1. Department of Environment, Heritage and Local Government (DOEHLG), *Quarries and Ancillary Activities, Guidelines for Planning Authorities* (2004).
2. Department of Transport Traffic Signs Manual 2010 – Chapter 8 Temporary Traffic Measures and Signs for Roadworks (2010)
3. Department of Transport Guidance for the Control and Management of Traffic at Road Works (2010)
4. Design Manual for Roads and Bridges & Design Manual for Urban Roads & Streets (2019)
5. US Environment Protection Agency (USEPA), *Compilation of Air Pollutant Emission Factors, AP-42, Fifth Edition (periodically updated)* (1986).
6. The Scottish Office – Development Department, *Planning Advice Note PAN50 Controlling the Environmental Effects Of Surface Mineral Workings Annex B: The Control of Dust at Surface Mineral Workings* (1996).
7. Institute of Air Quality Management (IAQM), *Guidance on the Assessment of Dust from Demolition and Construction* (2014).
8. UK Office of Deputy Prime Minister, *Controlling the Environmental Effects of Recycled and Secondary Aggregates Production Good Practice Guidance* (2002).
9. USEPA, *Fugitive Dust Technical Information Document for the Best Available Control Measures* (1997).
10. *Waste Management Acts 1996 – 2011* Litter Pollution Act 1997 (No. 12 of 1997) as amended
11. *Eastern-Midlands Region Waste Management Plan 2015 – 2021* (2015)
12. Construction Industry Research and Information Association (CIRIA) *Control of Water Pollution from construction Sites, Guidance for consultants and contractors (C532)*.
13. CIRIA, *Environmental Good Practice on Site* (3rd edition) (C692).