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## **CONSTRUCTION PHASE ENVIRONMENTAL MANAGEMENT PLAN**

**FOR PROPOSED STRATEGIC HOUSING DEVELOPMENT**

**AT**

**SOMMERVILLE HOUSE, DUNDRUM ROAD, DUBLIN 14**

Report Ref. 29193-2

February 2022

Dr Imelda Shanahan

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## **1.0 INTRODUCTION**

This report presents a Construction Environmental Management Plan (CEMP) for a proposed Strategic Housing development at Sommerville House, Dundrum, Dublin 14. This CEMP has been prepared by TMS Environment Ltd on behalf of the Applicant, Eir. The purpose of the CEMP is to provide details of mitigation measures proposed during demolition, site clearance, enabling works and construction, including proposals for management of environmental impacts associated with the proposed development.

The CEMP is presented alongside the Construction Management Plan (CMP) which addresses issues such as traffic management, hours of working, delivery times, infrastructure reinstatements, parking and the general management of construction in order to minimise adverse impacts. There is also a Construction & Demolition Waste Management Plan (C&DWMP) presented which provides detail on the management of C&D waste associated with the proposed development. The CEMP is read alongside these documents and is more specific in terms of the mitigation measures that are set out for the protection of amenity and the environment.

This CEMP should be considered a living document that will be updated by the appointed Contractor throughout the construction period. The specific construction methodologies will be prepared by the appointed Contractor and will be reviewed throughout the duration of the works based on any changes to the works programme, the effectiveness of the mitigation measures as well as the results of the environmental monitoring programme.

## **2.0 PROJECT DESCRIPTION**

### **2.1 Project description**

The proposed development will consist of:

- Demolition of all existing structures on the site and site clearance works.
- The construction of 2 no. apartment blocks (Blocks A and B) providing 111 no. apartments in total. Block A (the Western block, fronting Dundrum Road) comprises a 6-storey block (5 levels over lower ground level / semi-basement) stepping down to the east to 4-storeys in height. Block B (Eastern block, towards the rear (east) of the site) is of part 2-, and part 3-storey height.

- A semi-basement / lower ground floor level is provided in Block A that will be accessed via a vehicular ramped access/egress onto/off Sommerville Road to the north.

A Stage 1 Construction Management Plan has been prepared by CS Consulting which estimates that the proposed development will be constructed over an 18-month period with the following details:

- Set up site perimeter hoarding, maintaining existing pedestrian and traffic routes around the site;
- Demolition works and Site Clearance;
- Lower Level Excavations;
- Site services installations (drainage, power, water);
- Construct Building Frame and Envelope; and
- Finish Interior and Exterior Landscaping.

## **2.2 Site Location**

The site of the proposed development is fully situated within the Dun Laoghaire Rathdown local authority area and consequently the proposed development must comply with the requirements of Dun Laoghaire Rathdown County Council as well as the relevant best practice environmental management requirements. The specific requirements set out in the *Guidance Notes for Environmental Management of Construction Projects, 2020* as published by Dun Laoghaire Rathdown County Council are considered in formulating this Plan.

The site is situated to the north of Dundrum town centre and in close proximity to the Luas green line. There are shops, restaurants, bars and cafes and several playing fields located close to the site which is bounded by Dundrum Road to the west, and by the rear gardens of existing housing estates located to the north (Sommerville), and the south and the east (Larchfield).

The site backs onto two-storey houses located to the north, east and south-east. Along the Dundrum Road to the west of the site is a mixed character of commercial and retail premises and cottages, bungalows and older houses. Dundrum Road is a narrow but busy road.

## **2.3 Working hours**

Construction operations on site will be limited to the following hours:

- 07:00 to 19:00 Monday to Friday;
- 08:00 to 14:00 on Saturdays;
- No works shall be carried out on Sundays or Bank Holidays.

However, it may be necessary for some construction operations or emergency works to be undertaken outside these. Such works will be agreed in advance with Dun Laoghaire-Rathdown County Council.

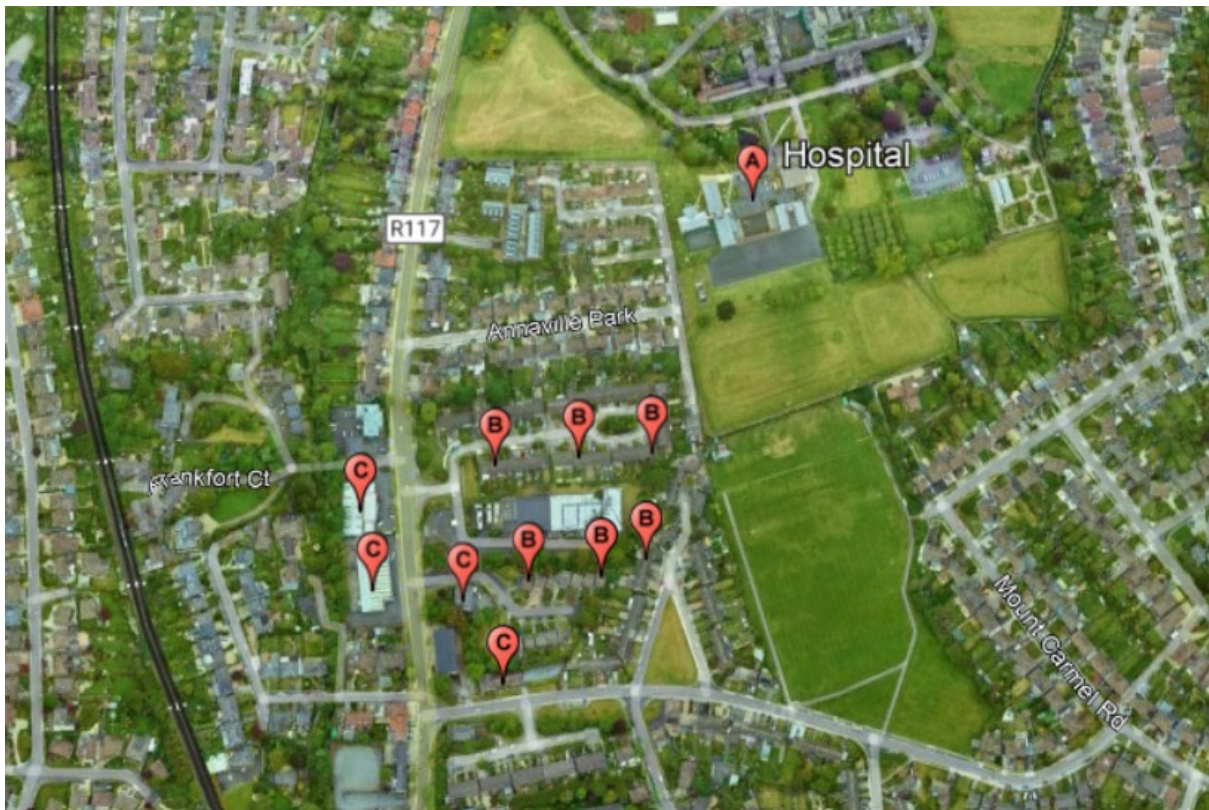
## **2.4 Sensitive Receptors**

The following locations have been identified as sensitive receptors in close proximity to the subject site:

- Central Mental Hospital (A);
- Private Residences (B);
- Businesses (C).

These locations, identified in Figure 2.1 by the ascribed letter shown above, are considered potentially sensitive to the effects of noise and vibration, air quality and traffic impacts associated with the construction phase of the proposed development. These are representative receptors of the type shown and also represent those that are closest to the site where potential impacts would be expected to be at a maximum. The closest receptors are identified as being those that will be exposed to the maximum potential impact whereas at further distances impacts are reduced.

**Figure 2.1** Sensitive Receptors in the immediate area of the site



### **3.0 SITE MANAGEMENT**

#### **3.1 Roles and responsibilities**

The appointed Contractor shall be responsible for all activities necessary to complete the works in accordance with the requirements of the Contract. This shall include demolition, construction, environmental monitoring, the implementation of mitigation measures and all associated management and supervision. The Contractor shall resource, plan, progress and deliver the project in such a manner that all management systems are fully transparent and auditable.

The Contractor shall be responsible for appointing suitably qualified site staff and environmental personnel to implement the commitments of this CEMP. In addition, if monitoring indicates higher than expected impacts at sensitive receptors, the Contractor shall implement additional mitigation measures to address the issue. The Contractor's Project Manager will be responsible for the overall implementation of the plan and associated procedures. The Project Manager will ensure that reporting and recording requirements are met and all necessary resources are in place to support the implementation of the plan. At operational level, a foreman from the Contractor and appropriate personnel from each sub-contractor on the site shall be assigned the direct responsibility to ensure that the operations stated in the CEMP are performed on an on-going basis. Key aspects would be waste management, dust control, minimising noise and vibration, chemical management, traffic management and the control of silt generation and fuel spills.

The site compound facilities including parking will be set up in such a manner as to facilitate maximum efficiency of construction works and in particular to minimise the potential impacts of the construction works both on-site and off-site. The following measures shall be implemented for the duration of the construction works:

- The entire construction site shall be fully secured with an adequate level of security fencing. There will be no unauthorised access into the site and all persons accessing the site shall be required to pass through security before entry into the site is permitted. A sign-in sign-out procedure shall be implemented for all site visitors;
- The site shall contain a construction compound area which will include adequate welfare facilities such as a wash-room, toilet, canteen and first aid room;

- A series of way finding signage will be provided to direct staff, visitors and deliveries as required;
- There shall be limited dedicated staff and visitor parking within the confines of the site;
- There shall be adequate materials drop-off and storage areas and the site will facilitate an internal turning-areas for trucks so that HGVs can safely enter and depart the site;
- It is considered unlikely that a wheel-wash facility will be required if the site layout, traffic routing and work scheduling is effectively managed to minimise trackout impacts. However, provision shall be made for a wheel-wash facility if it is deemed necessary during works;
- All potentially hazardous materials shall be securely stored on site;
- All oils, fuels, paints and other chemicals shall be stored in a secure bunded hardstand area;
- Refuelling and servicing of construction machinery shall take place in a designated hardstand area which is also remote from any surface water inlets;
- A response procedure shall be put in place to deal with any accidental pollution events and spillage kits shall be available and construction staff will be familiar with the emergency procedures and use of the equipment.

### **3.2 Environmental Training and Awareness**

The Contractor shall ensure that all on-site staff undergo suitable training programmes in First Aid, Fire Control, Emergency Procedures, and Spill Awareness Training. Appropriate levels of environmental training and awareness shall be provided on the project through the following techniques:

- (i) **Environmental Induction.** All project personnel shall receive an environmental induction before commencing work on the project. The environmental induction shall be provided and delivered by the Contractor and be tailored to suit the tasks and responsibilities of site personnel from management and supervisory level through to site operatives. During the environmental induction the contents and requirements of the method statements and this CEMP shall be explained and



discussed as well as any additional environmental requirements.

- (ii) **Tool Box Talks.** The Contractor shall ensure that Tool Box Talks are given on a regular basis and shall be specific to a particular activity taking place. Regular tool box talks shall ensure site staff members are aware of the environmental impacts associated with their work and the appropriate control measures that are required to carry out their work in compliance with the method statements and this CEMP. Tool box talks shall be provided for the following as a minimum:
- Management of Dust Control
  - Management of Noise Control
  - Management of Waste Onsite
  - Spill Control and Refuelling
- (iii) **Environmental Labelling and Signage.** Environmental labelling and signage shall be used on site to inform personnel of key environmental requirements and restrictions relating to all construction and demolition activities and to provide information to assist environmental good practice across the site.

### **3.3 Environmental complaints and incidents**

In order to minimise the likelihood of complaints, the Contractor shall appoint a nominated contact for any communications in relation to public nuisance for the duration of the project and any queries, complaints or other formal correspondence regarding air quality, noise and vibration or other environmental matters shall be dealt with by them. Furthermore, the Contractor shall notify local sensitive receptors of upcoming works that could potentially impact on them.

The nominated contact will be the first point of contact for public enquiries and be responsible for the monitoring and management of any complaints received. Overall, a complaints procedure should be operated by the Contractor throughout the works. Once a complaint of an environmental nature is received it shall be immediately logged on the Environmental Complaints Register. The register shall include information regarding the complaint as follows:

- Name of complainant;
- Nature of complaint;

- Date and time of complaint and
- Action taken as a result of the complaint.

The Complaints Register shall include a log of any written complaints received relating to environmental matters. This register shall be made available for review by the Local Authority.

#### **4.0 ANALYSIS AND MANAGEMENT OF POTENTIAL ENVIRONMENTAL IMPACTS**

##### **4.1 Soils**

Local records suggest that the upper strata is boulder clay which typically has bearing capabilities, and that bedrock is deeper than any excavations necessary for the development. Therefore, excavation techniques would likely be limited to traditional excavators without a requirement for percussive techniques. The site is a developed industrial site, and while the use is predominantly around data transmission, there is often some risk of contamination with industrial sites. The excavations at the site will be executed carefully and excavated materials will be inspected to check for any evidence of contamination. If any wastes or evidence of contamination are discovered, the waste will be managed in accordance with legislative requirements and in accordance with the requirements of the Construction & Demolition Waste Management Plan presented separately with this application. Specifically, any wastes will only be disposed of using licenced and permitted contractors and facilities following review by the Contractor's Project Manager.

##### **4.2 Water**

The available information about the ground conditions in this area suggests that the water table is lower than the depth of excavations required for the site. If water is encountered during the excavations then appropriate management techniques will be identified by the Contractor's Project Manager and implemented on the site. There are no surface water bodies in the immediate area of the site so no specific risks to surface water have been identified.

Potential impacts on the water environment will be managed by a combination of design features and mitigation measures which include the following:

- There will be no new groundwater or surface water abstractions with water as required

coming from the town mains supply;

- Foul water will be diverted to public sewer and welfare facilities will include temporary self-contained facilities for domestic waste which shall be disposed of off-site;
- There will be no concrete batching carried out on site;
- Excavations will be kept open and exposed for as little time as possible in order to minimize the potential for any erosion and run-off;
- Stockpiles of excavated materials and / or topsoils will be continuously inspected to ensure that erosion potential and run-off is minimized;
- Refuelling and maintenance activities on construction vehicles, plant and machinery will take place in designated hard-stand impermeable areas on site using a mobile refuelling system with no bulk storage on site;
- Portable generators and any machinery containing oils and lubricating fluids will be placed on drip trays in designated areas on site;

#### **4.3 Biodiversity and ecology**

A tree survey has been prepared for the site which sets out recommendations at Section 4 of the Arboricultural Method Statement to ensure the protection and preservation of trees on the site and in close proximity to the boundaries of the site. An Ecological Impact Assessment Report has also been carried out by Wildlife Surveys which include a bird and bat survey. This report recommends minimising negative effects through avoidance (working away from Treelines and Scrub where possible) and mitigation (through the design of the project).

The following measures are recommended in the specialist reports and the Contractor shall comply with the requirements:

- If tree cutting, or removal is to be undertaken within the bird nesting season (March 1st to August 31st), an assessment of the site for nesting birds shall be carried out in advance of the commencement. Should nest sites be identified, the site containing nests shall be cordoned off to a distance of 20 metres from any nests and all plant and construction shall remain outside of this cordon until the young have fledged (left the

nest entirely).

- All equipment should be checked and washed before introduction to the site in order to prevent the introduction and spread of alien invasive plant species.
- Lighting shall be designed that will limit overspill from the required area for illumination and prevent light pollution.
- Bat boxes (3 x 2F Schwegler boxes) shall be erected within unlit areas away from traffic and likely disturbance. Mature trees would be very suitable with permission from landowners. These must be no less than 3 metres above ground in uncluttered areas facing in a southerly direction. Boxes may be attached to buildings, trees or poles.
- Planting of vegetation to include species to provide nectar for night-flying insects such as moths should be included in the planting mix. This could include species such as dog rose, night scented stock, honeysuckle and Clematis and other species attractive to moths and other nocturnal insects.

## **4.4 Air Quality**

### **4.4.1 Introduction**

The construction phase of the project has the potential to adversely impact on the nearest sensitive receptors, particularly the closest receptors shown on Figure 2.1 of this report. The potential air quality impacts during Construction are summarised as follows:

- a) Dust emissions associated with demolition, excavation and construction works
- b) Construction transport emissions

The most significant of the potential air quality impacts associated with the construction site is dust. Dust can be generated as a result of disturbance of materials, as a result of wind blowing across exposed surfaces and as a result of construction vehicle movements across exposed surfaces.

There are three potential impacts on air quality of the dust / particulate matter emissions. Dust deposition on surfaces is the main potential impact associated with the larger particles, nuisance effects such as reduced visibility could be associated with excessively high levels of suspended

particulate matter and respiratory effects could occur as a result of excessive levels of fine particles such as PM<sub>10</sub> and PM<sub>2.5</sub>.

Dust emissions associated with the construction and demolition works of the proposed development are expected to be predominantly in the 10 – 75µm particle size range so these particles, because of their size, will generally be deposited within 100m of the emission source. Only under exceptional meteorological conditions would the dusts be carried further downwind. The majority of the dust associated with construction activity is in the 10 – 75µm particle size range.

Suspended particulate matter (SPM) may also be released and this matter may remain suspended in the air. The main effect would be on visibility but this type of material could also be a respiratory nuisance if present at excessive levels. Emissions of dust in the form of fine particulate matter, PM<sub>10</sub> and PM<sub>2.5</sub>, may also occur, primarily as a result of materials handling and storage since the dominant particle size of the main construction materials is in the lower size ranges. There may also be some emissions of particles in these size ranges from the general site activities.

The following section presents the measures that shall be taken to ensure that air quality impacts are managed in accordance with best practice for developments of this type in urban locations.

#### **4.4.2 Impact Assessment Criteria**

The principal potential impact on air quality during demolition and construction works is dust. There are no national or European Union air quality standards with which dust deposition can be compared. However, a figure of 350 mg/m<sup>2</sup>-day based on the German Standard TA Luft Regulations is commonly applied by Local Authorities and the EPA (Environmental Protection Agency) to ensure that no nuisance effects will result from specified industrial activities.

#### **4.4.3 Impact Assessment**

Guidance on assessment of dust from demolition and construction was published in 2014 by the Institute of Air Quality Management (IAQM). This Guidance describes a five-step approach to the assessment which is summarised as follows:

- a) Screen the development to determine if there is a requirement for a more detailed assessment;
- b) Assess the risk of dust impacts for each of the four activities (demolition, earthworks, construction and construction traffic) and take account of the scale and nature of the works, and the sensitivity of the area;
- c) Determine the site-specific mitigation for each potential activity;
- d) Examine the residual effects and determine whether or not these are significant;
- e) Prepare the dust assessment report.

This approach has been applied to the development at the proposed site and is summarised below. A detailed assessment is required when there are human receptors within 350m of the boundary of the site and since the closest human receptors to the site boundary are within this distance, a detailed assessment is required. There are no European or designated sites within 50m of the site boundary which is the threshold distance for ecological sensitivity identified in the IAQM Guidance, so there are no significant construction impacts predicted for ecological sites. The Guidance advises that most projects will require a detailed assessment as the approach adopted is conservative.

The risk of dust being emitted in sufficient quantities to cause a nuisance or health impacts is evaluated by considering the scale of the works programme. The IAQM Guidance Note gives advice on classifying the magnitude of the potential dust impacts and using the advice and information derived from the Construction and Demolition Plan for the site, the magnitude of the dust emissions is estimated as shown in Table 4.1.

**Table 4.1** Assessment of Magnitude of dust emissions for Construction Programme

Activity	Magnitude of Dust Emission	Sensitivity of receptors and surrounding areas		
		Dust Soiling	Human Health	Ecological
Demolition	Small	High	High	Low
Excavations	Small	High	High	Low
Construction	Small	High	High	Low
Construction Traffic	Small	High	Low	Low

The proposed development consists of a construction and demolition programme as there are a number of structures on the site that require demolition. Excavation work is required at the site for the lower levels. The Construction programme is significant and therefore significant emissions could be expected.

The significance of the dust emissions and impacts is evaluated in terms of the sensitivity of the receptors in the area that could be affected by the emissions combined with the magnitude of the dust emission. In general, receptors located close to the construction site boundary are considered high sensitivity with sensitivity decreasing with increasing distance from the source reflecting the exponential decrease in dust levels as distance increases. The highest receptor sensitivity in the immediate vicinity of the proposed site is high for all activities due to the distance between activities and nearest receptors and also the screening effects of the existing infrastructure at the site.

The magnitude of the dust emissions is assessed as small for all four of the activities due to the size of the overall building(s)/infrastructure project, the construction methods that will be employed, the materials that will be used onsite and the duration of the build. The impact assessment of the dust emission risks for the proposed project using the IAQM Methodology are presented in Table 4.2.

**Table 4.2** Dust Risk Table

<b>Potential Impact</b>	<b>Risk</b>			
	<b>Demolition</b>	<b>Earthworks</b>	<b>Construction</b>	<b>Construction Traffic</b>
Dust Soiling	Low Risk	Low Risk	Low Risk	Low Risk
Human Health	Low Risk	Low Risk	Low Risk	Negligible
Ecology	Negligible	Negligible	Negligible	Negligible

The potential air quality impact arises from emissions of particulate matter and may result in deposition of dust around the site and trackout onto the roads in the vicinity of the site. The potential impacts of the four defined phases of construction works (demolition, earthworks, construction and construction traffic) have been assessed as either low risk or negligible risk as shown in Table 4.2. Mitigation measures as discussed below will be implemented at the site to ensure that dust impacts are prevented or minimized during the Construction Phase of the development.

#### **4.4.4 Mitigation Measures**

A Dust Management Plan (DMP) will be formulated for the construction phase of the project, as construction activities are likely to generate some dust emissions. The principal objective of the Plan is to ensure that dust emissions do not cause significant nuisance at receptors in the vicinity of the site. The appointed Contractor will be responsible for finalising and implementing the DMP and the most important features of the DMP are summarised as follows:

- A designated Site Agent will be assigned overall responsibility for Dust Management;
- The design of the site and Construction programme shall consider dust impact management and shall choose design approaches to minimise dust emissions;
- An effective training programme for site personnel will be implemented for the duration of the Construction Programme;
- A strategy for ensuring effective communication with the local community will be developed and implemented. This should be carried out in line with the communication protocols proposed for the noise and vibration impacts discussed above;
- A programme of dust minimisation and control measures will be implemented and regularly reviewed;



- A monitoring programme will be implemented.

The design of the construction programme and the storage of materials will be carefully planned to ensure that air quality impacts are minimised. The following is a summary of the main mitigation features of the project and the specific mitigation measures which will be employed in order to minimise emissions from the activity and the associated impacts of such emissions.

- Activities with potential for significant emissions will wherever possible be located at a position as far as possible removed from the nearest residential and commercial receptors;
- The areas on site which vehicles will be travelling on will generally be hard-surfaced or compressed ground thus significantly reducing the potential for dust emissions from the vehicles;
- The relatively coarse particle size (10 – 75µm) associated with the activity means that the particles will generally be deposited close to the emission source and will not travel significant distances away from the site.
- Fixed and mobile water sprays will be used to control dust emissions from exposed surfaces and road and yard surfaces as necessary in dry and/or windy weather.
- A daily inspection programme will be formulated and implemented in order to ensure that dust control measures are inspected to verify effective operation and management.
- A dust deposition monitoring programme will be implemented at the site boundaries for the duration of the construction phase in order to verify the continued compliance with relevant standards and limits.

#### **4.4.5 Monitoring**

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

The dust deposition rate will be measured by positioning Bergerhoff Dust Deposit Gauges at strategic locations near the boundaries of the site for a period of 28 to 30 days. Monitoring shall

be conducted on a continuous basis (every 28 to 30 days) during periods when the highest levels of dust are expected to be generated i.e., during demolition and site preparation works and soil stripping activities and on a quarterly basis thereafter.

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

After each monitoring interval, the gauges will be removed from the sampling locations, sealed and the dust deposits in each gauge will be determined gravimetrically by an accredited laboratory and expressed as a dust deposition rate in  $\text{mg/m}^2\text{-day}$  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 Project Manager. Monitoring reports shall be made available to the Local Authority as requested.

A dust deposition limit value of  $350 \text{ mg/m}^2\text{-day}$ , measured as per German Standard Method VDI 2119 (Measurement of Dustfall, Determination of Dustfall using Bergerhoff Instrument (Standard Method) German Institute) is commonly specified by Local Authorities and by the EPA to ensure that no nuisance effects will result from specified activities and it is to this Best Practice Standard Method that this programme of dust monitoring and control has been prepared.

The results of all dust deposition monitoring surveys shall be maintained by the Site Manager and shall be made available to the Local Authority.

## **4.5 Noise and vibration**

### **4.5.1 Introduction**

The construction phase of the project has the potential to generate noise and vibration emissions that could adversely impact on the nearest sensitive receptors, particularly the closest receptors shown on Figure 2.1 of this report.

Local records suggest upper strata is boulder clay which typically has bearing capabilities, and that bedrock is deeper than any excavations necessary for the development. Therefore, excavation techniques would likely be limited to traditional excavators without a requirement for percussive techniques. The proposed works adjacent to boundaries will require some form of temporary retaining structure so it is expected that some piling may be required as part of temporary works to enable the construction of the basement beneath Block A. It is noted that there are several root protection areas in place along the southern and eastern boundaries of the proposed development site in proximity to Block B. The proposed piling is proposed in the western section of the proposed development site. As such, the likelihood of interference / damage to roots of trees is very low and proposed piling is unlikely to impact on tree retention proposals.

Depending on the site investigation results, piling may be required to resist foundation loads, but will not be known until detailed site investigations are undertaken. If piling is required, it is likely to be a very short term activity and will be managed to ensure that adverse noise or vibration impacts do not exert a significant adverse impact on the local communities and receptors.

Reinforced concrete walls will form retaining elements to the east and south of the Lower Ground Floor. The building frame will most likely consist of load bearing masonry walls with reinforced concrete cores. Floors will likely be constructed using hollow core precast slabs overlaid with structural screed but some localised elements of reinforced concrete slabs are also likely for transfer slabs and larger cantilevers. It is envisaged that all buildings could be constructed as combination masonry and reinforced concrete frame subject to change in detailed design stages. The façades may consist of a typical rendered block 100mm thick outer leaf. The most likely construction methods have been considered in formulating the environmental management plan for the construction works. The following section presents

the measures that shall be taken to ensure that noise and vibration impacts are managed in accordance with best practice for developments of this type in urban locations.

#### **4.5.2 Noise Criteria**

Construction noise is temporary in nature and is usually experienced over a short to mid-term period and this characteristic requires it to be considered differently to other longer-term noises. Construction activities on larger-scale construction projects will inevitably result in noise being generated.

British Standard 5228-1:2009+A1:2014 – *Code of Practice for Noise and Vibration Control on Construction and Open Sites Part 1: Noise* (BS 5228-1) is a commonly used Standard to assess the potential noise impacts associated with the construction phase of a project. This Standard states that noise complaints related to new industrial/commercial noise sources are more likely to arise as the difference between the industrial noise source and the existing background noise increases. Practical noise reduction measures are detailed in BS 5228-1 and these measures can be implemented in order to reduce the overall noise emissions from a construction site.

There is no Irish Guidance specifically published for the short to medium-term construction work such as that proposed for the subject site. Construction noise impacts are assessed in terms of the requirements of BS 5228-1. Annex E of this Standard details acceptable construction noise limits for differing scenarios. Annex E.2 looks at the significant of noise impacts based on fixed noise limits and states:

*“noise levels, between say 07.00 and 19.00 hours, outside the nearest window of the occupied room closest to the site boundary should not exceed:*

*70 decibels (dBA) in rural, suburban and urban areas away from main road traffic and industrial noise;*

*75 decibels (dBA) in urban areas near main roads in heavy industrial areas.*

*These limits are for daytime working outside living rooms and offices. In noise-sensitive situations, for example, near hospitals and educational establishments – and when working outside the normal hours say between 19.00 and 22.00 hours – the allowable noise levels from building sites will be less: such as the reduced values given in the contract specification or as advised by the Environmental Health Officer (a reduction*

*of 10 dB(A) may often be appropriate). Noisy work likely to cause annoyance locally should not be permitted between 22.00 hours and 07.00 hours.”*

International best practice dictates that noise limits in the range 65dB  $L_{Aeq,1hr}$  to 75dB  $L_{Aeq,1hr}$  are generally acceptable in the community during daytime construction activities.

Transport Infrastructure Ireland (TII) (formerly the National Roads Authority (NRA)) is the only government body in Ireland to publish construction noise limits which are presented in their document *‘Guidelines for the Treatment of Noise and Vibration in National Road Schemes (NRA 2004)*.

The guidelines are not mandatory but are recommended to achieve appropriate consistency with respect to the treatment of noise and vibration. The NRA points out that there is no published Irish guidance relating to the maximum permissible noise level that may be generated during the construction phase of a project. However, they say that Local Authorities, where appropriate, should control construction activities by imposing limits on the hours of operation and consider noise limits at their discretion. The NRA Guidance presents indicative noise levels that are typically deemed acceptable during construction phase of road developments. These are presented below in Table 4.3

**Table 4.3** NRA Maximum Permissible Construction Phase Noise Levels at the façade of dwellings

<b>Days &amp; Times</b>	<b>L<sub>Aeq</sub>, (1hr) dB</b>	<b>L<sub>pA(max)</sub> slow dB</b>
Monday to Friday - 07:00 to 19:00hrs	70	80
Monday to Friday - 19:00 to 22:00hrs	60 <sup>2</sup>	65 <sup>2</sup>
Saturday - 08:00 to 16:30hrs	65	75
Sundays and Bank Holidays - 08:00 to 16:30hrs	60 <sup>2</sup>	65 <sup>2</sup>

**Note**

- 1: Noise levels measured at facade of dwellings.
- 2: Construction activity at these times, other than that required in respect of emergency works, will normally require the explicit permission of the relevant local authority.

The Dublin Agglomeration Environmental Noise Action Plan 2019 - 2023 states that there are no specific noise limits in place within each local authority except for those in the recommended guidelines. The NRA Guidance is presented in the Noise Action Plan and therefore, the noise limits set out in Table 4.3 above represent a good compromise between the practical limitations in a construction project such as this one and the requirement to ensure acceptable noise levels at the nearest noise sensitive receptor locations.

For this development project it is considered appropriate to adopt the construction noise criteria presented in Table 4.3 above for all sensitive receptor locations.

**4.5.3 Vibration Criteria**

Vibration standards are concerned with those dealing with human comfort, and those dealing with structural or cosmetic damage to buildings. In both instances, it is appropriate to consider the magnitude of vibration in terms of Peak Particle Velocity (PPV).

Humans are particularly sensitive to vibration and can detect vibration levels as low as 0.3 mm/sec PPV and levels above this may cause annoyance. However, significantly higher levels than this are tolerated for single short-term events and do not cause annoyance or disturbance to humans. British Standard BS 5228-2:2009+A1:2014 *Code of Practice for Noise and*

*Vibration Control on Construction and Open Sites* provides guidance on vibration and its control and management on various site types. If vibration levels are kept below 1.0mm/sec it is unlikely that complaint would arise and higher levels can be tolerated with advance warning and when they are not continuous.

The response of a building to groundborne vibration is affected by numerous factors including the type of foundation, underlying ground conditions, the building construction and the state of repair of the building. British Standard 7385 *Evaluation and Measurement for Vibration in Buildings* provides guidance on vibration measurement, data analysis and reporting as well as building classification and guide values for building damage. The damage threshold criteria presented in BS 7385-2 are based upon systematic studies using a carefully controlled vibration source in the vicinity of buildings. The Standard states that there should be no cosmetic damage to buildings if transient vibration levels do not exceed 15 mm/sec in the low frequency range and this rises to 20 mm/sec at frequencies of 15 Hz and 50 mm/sec at 40 Hz and above. These guidelines should be reduced by up to 50% for listed structures or similar. It is also noted that the probability of damage to buildings tends towards zero at 12.5 mm/sec at component PPV. The NRA in their Guidance Document recommends vibration levels to ensure that there is no potential for vibration damage during road construction activities. These values have been derived through consideration of various European standards and compliance with their guidance should ensure that there is little to no risk of even cosmetic damage to buildings. The guide values are presented below in Table 4.4.

**Table 4.4** NRA Maximum Permissible Construction Phase Vibration Levels

<b>Vibration Level – Peak Particle Velocity at the closest part of any sensitive property to the source of vibration at a frequency of</b>		
<b>Less than 10Hz</b>	<b>10 to 50Hz</b>	<b>50 to 100Hz (and above)</b>
8 mm/s	12.5 mm/s	20 mm/s

#### **4.5.4 Mitigation Measures**

The construction works shall be managed through the use of construction noise limits as detailed above which the appointed contractor will work within. Best practice control measures, including choice of plant, scheduling of works on-site, on-site noise monitoring and other measures, will be employed in order to ensure noise limits are not exceeded.

Best practice noise management procedures for the control of noise and vibration from construction activities as presented in BS5228-1 will be followed. Such measures include the following:

##### **(i) On-Site Work Practices**

- Avoid unnecessary revving of engines and switch off equipment when not required;
- Keep internal haul routes well maintained and avoid steep gradients;
- Use rubber linings in chutes and dumpers to reduce impact noise;
- Minimise drop height of materials;
- Start-up plant and vehicles sequentially rather than all together;
- Site equipment should be located away from noise sensitive areas, as much as is feasible;
- Regular and effective maintenance by trained personnel should be carried out to reduce noise and/or vibration from plant and machinery; and
- Limit noisy construction works to 07:00 to 18:00 weekdays with Saturday working from 08:00 to 16:30 unless otherwise agreed with the Local Authority.

##### **(ii) Selection of Quiet Plant**

In accordance with best practicable means, plant and activities to be employed on the proposed project will be reviewed to ensure that they are the quietest available for the required purpose.

##### **(iii) Noise Control**

Noise reducing technologies, such as attenuators or enclosures, shall be used where practicable:

- Ensure that noise control measures are maintained as per the manufacturers requirements;



- Minimise the number of vehicles/heavy plant on the Proposed Project sites at any one time;
- Maintain vehicles in good order and employ the principles of preventive maintenance;
- Ensure that noisy vehicles are parked as far as possible from noise sensitive areas;
- Ensure that drivers are aware of the potential for noise to cause annoyance/disturbance to local residents and they shall show due regard to this, particularly when entering and leaving the Proposed Project (e.g. no unnecessary horn blowing); and
- Consider the use of alternative varieties of reversing alarm with reduced noise output, such as ambient noise sensing alarms with variable volume or directional modulated alarms – these must be evaluated on a case-by-case basis and regard must be had to any health and safety issues that may arise.

**(iv) Communications**

A dedicated contact shall be appointed by the appointed contractor for all communications in relation to noise and vibration for the duration of the project construction works and any queries, complaints or other formal correspondence regarding noise and vibration.

The appointed contractor shall ensure good communication and engagement with local residents and stakeholders and will notify them before the commencement of any works forecast to generate appreciable levels of noise or vibration, explaining the nature and duration of the works.

Any complaints relating to Construction Phase noise and vibration for the proposed project from local residents or other stakeholders shall be recorded, immediately addressed and notified to the Local Authority. A record of how the complaint was addressed, the follow-up actions and outcome shall be maintained.

**(v) Monitoring**

A baseline noise and vibration monitoring survey shall be completed in the area prior to the commencement of any construction works in order to ascertain the existing

baseline environment against which the impact of construction activities can be assessed.

Attended noise and vibration monitoring shall be carried out at nominated sensitive receptor locations in the vicinity of the site during construction phase works to identify the impact of the proposed project on the local receptors and to ascertain if the proposed noise and vibration limits are being achieved. The attended noise measurements shall be completed on a weekly basis for the most sensitive works and monthly thereafter.

Noise monitoring shall be carried out for  $L_{Aeq}$ ,  $L_{A90}$  and  $L_{Amax}$  noise parameters over 15-minute and 1-hour measurement intervals at sensitive locations for comparison with limits and background levels.

Vibration monitoring shall be carried out for the vibration parameter PPV in mm/sec over 1-hour measurement intervals at sensitive locations for comparison with limits and background levels.

The following guidance regarding vibration monitoring should be followed; The instrumentation should monitor three orthogonal components of PPV and the trigger values / limits are set based on the maximum of these (the peak component particle velocity) as follows:

- Warning Level = 7.5 mm/s (Operatives should be notified if this level is reached; work may continue but with caution – review of working method should be considered).
- Stop Level = 10 mm/s: work should be stopped if this level is reached and working method reviewed; revised method of working to be agreed prior to works proceeding again; Site Foreman & Operatives to be notified immediately.

On-site noise and vibration monitoring during the actual construction works will be a key part in the mitigation programme for the proposed works. As discussed above, monitoring of the noise and vibration levels at sensitive receptor locations for comparison with the limits during the different construction works will be critical, and the live measurement results will be used by the appointed contractor to assist the scheduling of works to ensure that the noise and vibration emissions from the various works are kept within the limits.

**(vi) Noise Audits**

A noise audit shall be carried out by a suitably qualified auditor to ensure that the mitigation measures discussed above are being correctly implemented at the construction site, including operating hours, siting of plant items, scheduling of works, communications with stakeholders and noise control measures.

**5.0 MITIGATION AND MONITORING**

Environmental impacts during demolition and construction works will be managed and controlled by a combination of design features for the buildings and the works programme and mitigation and monitoring programmes. Detailed recommendations based on the site specific characteristics and the construction programme as currently known have been incorporated into this Plan and the appointed Contractor will be responsible for ensuring that the Works are managed in accordance with the Plan. The primary purpose of the plan is to ensure that the works are managed to minimize impacts and the recommendations are made to meet this objective.

A monitoring programme will be implemented to ensure that the management, mitigation and control measures are effective and to ensure that significant adverse environmental impacts or nuisance do not occur. In this respect the recommendations in the *Dun Laoghaire Rathdown Guidance Notes for Environmental Management of Construction Projects, 2020* have been considered in the formulation of the CEMP.

**6.0 TRAFFIC MANAGEMENT**

A detailed project specific traffic management plan will be developed by the Contractor and agreed with Dún Laoghaire-Rathdown County Council prior to works commencing on site. This plan will be updated as required throughout the project. Issues addressed in the Traffic Management Plan will include:

- Public safety;
  - Construction traffic routes;
  - Deliveries' schedule;

- Special deliveries (wide and long loads);
- Traffic flows;
- Signage and lighting;
- Road opening requirements;
- Road closures;
- Lighting.

The Plan will ensure that all deliveries to the site are co-ordinated to avoid multiple deliveries arriving on site at the same time. All orders placed with suppliers will refer to the Construction Traffic Management Plan and identify the agreed route to the drop off point.

Vehicle movement will need to be minimised on site due to the restricted areas in which the contractor will have to work. This will be minimised by management of the following:

- Provide car and van parking for the workforce and visitors away from the work area;
- Control entry to the work area;
- Plan storage areas so that delivery vehicles do not have to cross the site;
- Make sure that all drivers and pedestrians know and understand the routes and traffic rules on site;
- Use standard road signs where appropriate;
- Provide induction training for drivers, workers and visitors and send instructions out to visitors before their visit.

## **7.0 WASTE MANAGEMENT**

A Construction and demolition Waste Management Plan has been prepared for the proposed development and waste will be managed in accordance with that Plan. The Plan specifies how all wastes generated at the site will be managed. In general terms the following measures should be implemented during the construction phase where possible in order to reduce the amount of waste produced, manage the wastes generated responsibly and handle waste in such a manner as to minimise the effect on the environment:

- Building materials should be chosen to minimise waste generation;
- All wastes shall be segregated at source where possible and shall be separated into appropriate categories for both hazardous and non-hazardous wastes. All waste shall

stored in skips or other suitable receptacles in a designated area of the site;

- Left over materials shall be re-used on site where possible;
- All waste leaving the site will be recycled, recovered or reused where possible;
- All waste leaving the site will be transported by suitable permitted contractors and taken to suitably registered, permitted or licensed facilities;
- All waste leaving the site will be recorded and copies of relevant documentation maintained onsite for inspection.

## **8.0 EMERGENCY RESPONSE PROCEDURE**

The Contractor shall be required to prepare an Accident and Emergency Response Plan for the duration of works which will also adhere to all relevant mitigation measures specified in this CEMP.

## **9.0 CONCLUSIONS**

This CEMP is a living document that will be updated by the appointed Contractor to take account of any requirements specified in any permission, should approval be granted, as well as considering the final works programme detail developed for the final design. The Plan has identified the potential environmental impacts of the proposed works and has identified and specified appropriate standards against which the works should be managed and assessed as well as detailed mitigation, monitoring and management measures to ensure that environmental impacts are minimized.