

Project

Harold's Bridge Court SHD

Report Title

Construction & Environmental Management Plan

Client

The Adroit Company Ltd

INFRASTRUCTURE



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1. WORKS PROPOSAL

This Construction & Environmental Management Plan is for a strategic housing development on lands at *'Harold's Bridge Court'*, Harold's Cross Road & Greenmount Lane, Harold's Cross, Dublin 6W. The site is bounded to the north by the rear of existing residential and commercial development along Parnell Road, and by commercial development i.e. "Greenmount Office Park" and residential development i.e. "Boyne Court" to the south. The site is bounded to the east by Harold's Cross Road, to the west by Greenmount Lane and by Limekiln Lane to the south-west.

The proposed development provides for 194 no. dwellings comprised of studio, 1, 2 & 3 bed apartment units in 4 no. 4-9 storey blocks (Blocks A-D). The development also includes 1 no. commercial / retail unit (187.6m²) at ground floor level of Block A, 1 no. creche (142.2m²) at ground floor level of Block C and 22 no. work studios (1,930m²) at ground & 1st floor level of Block D, all on a site area of 1.01 ha.

Permission is sought for the demolition of all existing buildings on site (c. 5,356m²), i.e. (a) 4 no. 3 storey duplex residential buildings (i.e. 48 no. dwellings, c. 3,542m²) and 2 no. 1 storey residential buildings (c. 40m² & 41m²) all within Harold's' Bridge Court, (b) 3 no. 2 storey houses at Clare Villas (c. 331m²) and (c) an existing warehouse (c. 1,248m²) and ancillary structures (c.154m²) fronting onto Greenmount Lane.

Vehicular access to the proposed development will be via Harold's Cross Road, utilizing the existing entrance. Vehicular traffic only associated with Block D will be allowed enter the site from Greenmount Lane with no vehicular through traffic progressing further through the development. Pedestrian and cyclist access is proposed via Greenmount Lane and Harold's Cross Road. It is currently a brownfield site.

The proposed development also provides for all associated site development works above and below ground, bin & bicycle storage, plant (M&E), sub-stations, public lighting, servicing, signage, surface water attenuation facilities etc.

The construction management issues addressed within this plan include the following:

- Working Hours
- Traffic Management
- Stripping of Topsoil and Excavation of Subsoil
- Erosion and Sediment Control
- Accidental Spills and Leaks
- Biodiversity
- Waste Management
- Demolition
- Noise and Vibration
- Air, Dust & Climatic Factors
- Landscape and Visual Impact
- Archaeology
- Material Assets – Site Services
- Site Compound Facilities and Parking

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

All works must be carried out in accordance with the mitigation measures outlined in this document.

2. PROJECT RESPONSIBILITIES

The Contractor appointed to undertake the construction works, shall be responsible for developing, and managing, the project specific Construction Environmental Management Plan (CEMP) incorporating the methodologies described in this preliminary plan. The plan will be developed in consultation with Dublin City Council. The proposed methodologies described in this report are industry best practice. Logistical issues, such as traffic restrictions and available space for storage, manoeuvres etc. may necessitate certain revisions.

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.

To ensure the CEMP remains 'fit for purpose' for the duration of the project it will be reviewed and updated by the Project Manager during the life of the project to ensure that it remains suitable to facilitate efficient and effective delivery of the project environmental commitments. The environmental review will consider past performance from inspections, audit report and monitoring data, and plan actions required to mitigate forthcoming risks.

The Contractor shall designate a Site Engineer/Manager/Assistant Manager as the Construction Waste Manager and who will have overall responsibility for the implementation of the Project Waste Management Plan (WMP). The Waste Manager will have the authority to instruct all site personnel to comply with the specific provisions of the Plan. A technically competent person will also be required to assess waste arisings and determine classification in accordance with the Hazardous Waste List. The Project Manager will instruct all site personnel to comply with the CEMP.

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, SuDs/Landscaping, traffic management and the control of silt generation and fuel spills.

The Contractor shall employ the services of an approved Specialist Waste Management Sub-Contractor to assist with the safe management and disposal of contaminated waste materials. They shall specialise in the investigation of such material, the carrying out of sampling and testing of hazardous material and the preparation of treatment and disposal methodologies.

A report and method statement will to be prepared by the Contractor, in consultation with their approved Waste Management Specialist Sub-Contractor, for the safe removal and disposal of the identified hazardous materials. This must be agreed with the Employers Representative prior to commencement of any excavation activities.

Reporting

The Site Manager / Project Manager is responsible for collating and maintaining all reporting. This would include all environmental and compliance documentation.

Environmental Targets and Objectives

Targets:

- Zero pollution incidents;
- Segregation of site waste to include timber, general waste and other materials;
- Completion of environmental checklists as required;
- Fuel spill kit to be present on each site at all times; and
- Maintain all waste licences and waste transfer notes for all waste movements including contractors.

Reporting Specific Objectives:

- Environmental incidences to be reported to Site Manager without delay.

The following documentation will be reported to DCC on a 4 weekly basis:

Environmental incidents and nonconformities raised, including nature, status, corrective and preventive actions and potential for statutory intervention;

- Key environmental issues raised by others;
- Significant environmental incidents;

- Complaints and the current status of those complaints; and
- Actions or interventions undertaken by enforcement organisations.

Site Specific Objectives:

- Reduce waste, water and energy use on the project including within all of the site offices;
- Ensure that everyone comply with the environmental requirements in the contract;
- Seek ways to incorporate environmental protection opportunities within the design;
- Seek ways to reduce the carbon footprint of the contract;
- Reduce the amount of construction waste and excavated material generated which goes to landfill;
- Zero pollution incidents onsite;
- Recycle construction waste where possible;
- Maximise beneficial reuse of the materials: and
- Ensure that all waste documentation (waste transfer docket, permits etc.) is available for inspection at the site office / in head office.

Environmental Complaints and Incidents

The site manager will develop and implement an appropriate queries / complaints procedure. Records will include full details of the concerns expressed and ensure that a formal assessment is commenced of the reported concern. The site manager will also discuss complaints with the Project Manager and oversee an initial response to the person who has submitted the complaint/concern confirming its receipt.

An investigation to assess the issue of concern will be carried out and decisions made to see what corrective and/or preventive action, or further investigation is necessary. With overall responsibility for complaints, the site manager will respond within a reasonable timescale and maintain records of all correspondence and actions taken. If significant corrective action and external

stakeholder involvement is required, the site manager / project manager will oversee all elements of the process.

Any complaints received will be logged, assessed and appropriate action taken as soon as practical. The construction company will be actively seeking liaison with all parties throughout the construction periods. It will be critical to the success of the project that key issues are properly addressed from the outset to create a good working relationship and an integrated team approach to identifying and resolving potential issues before they may cause environmental impacts.

The project team appreciates that occasionally incidents arise whereby it is impossible or impractical to comply with all the requirements. In these emergency situations, as much notice as possible about the works will be given to Dublin City Council (DCC).

In the event of spillages, or other incident, steps will be taken to prevent environmental pollution, for example through protection of drains by use of drain covers or booms, use absorbent granules following oil / chemical spill and turning off equipment or other sources of noise or dust.

Once the situation has been rectified, full details about the incident and remedial actions undertaken will be provided to the corporation and relevant authorities and recorded in the site environmental register. Feedback will be provided to all CEMP implementation personnel where required.

3. WORKING HOURS

For the duration of the proposed infrastructure works the maximum working hours shall be 07:00 to 18:00 Monday to Friday (excluding bank holidays) and 08:00 to 14:00 Saturdays, subject to the restrictions imposed by the local authority.

No working will be allowed on Sundays and Public Holidays.

Subject to the agreement of the local authority, out of hours working may be required for water main connections, foul drainage connections etc.

4. TRAFFIC AND TRANSPORTATION

A Traffic Management Plan (TMP) prior to construction will be prepared for the works in accordance with the principles outlined below and 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)

In general, the impact of the construction period will be temporary in nature and less significant than the operational stage of the proposed development (HGV vehicle movements not expected to exceed 4 vehicles per hour in one direction during the busiest period of construction works). Construction traffic will generally consist of heavy goods vehicles (HGVs), private owned vehicles, excavation plant and dumper trucks. All suitable material will be used for construction, landscaping, and fill activities where possible and appropriate. All spoil material will be removed to a registered landfill site which will be agreed in full with the Local Authority.

In addition to the traffic generated by the disposal of surplus subsoil from the site, there will be traffic generated from deliveries of construction materials and equipment. It should be pointed out that construction traffic generated during the development works tends to be outside of peak hours. Such trips would generally be spread out over the full working day

The proposed entrances to the site will be from the Harold's Cross road to the east of the subject site.

Construction traffic will continue to enter the site via the Harold's Cross road for the remaining construction phases of the development with construction traffic diverted to internal, temporary haul roads to access construction areas.

Construction traffic will consist of the following categories:

- Private vehicles owned and driven by site staff and management

- Construction vehicles e.g. excavation plant, dump trucks and material delivery vehicles, involved in site development works

On-site employees will generally arrive before 08:00, thus avoiding morning peak hour traffic. These employees will generally depart after 16:00.

It should be noted that a large proportion of construction workers would arrive in shared transport.

Where feasible, excavated material will be reused as part of the site development works (e.g. use as fill material beneath houses and roads) in order to minimise truck movements to and from the site, however, some unsuitable excavated subsoil is expected and will have to be removed to an approved landfill.

5. SOILS AND GEOLOGY

Site development works will include stripping of topsoil and excavation of subsoil layers. These activities have potential to expose the soils and geological environment to pollution.

The contractor shall obtain approval of their proposed erosion and sediment control measures from Dublin City Council's Environment Section prior to commencing works on site. The contractor shall also agree the rock breaking methodology with Dublin City Council where required.

The following measures are to be implemented in order to mitigate against such risks.

Stripping of Topsoil

- Stripping of topsoil shall be carried out in a controlled and carefully managed way and coordinated with the proposed staging for the development.
- At any given time, the extent of topsoil strip (and consequent exposure of subsoil) shall be limited to the immediate vicinity of active work areas.
- Topsoil stockpiles shall be protected for the duration of the works and not located in areas where sediment laden runoff may enter existing surface water drains.
- Topsoil stockpiles shall also be located so as not to necessitate double handling.

Excavation of Subsoil Layers

- The design of road levels and finished floor levels has been carried out in such a way as to minimize cut/fill type earthworks operations.
- The duration that subsoil layers are exposed to the effects of weather shall be minimised. Disturbed subsoil layers will be stabilised as soon as practicable (e.g. backfill of service trenches, construction of road capping layers, construction of building foundations and completion of landscaping).

- Similar to comments regarding stripped topsoil, stockpiles of excavated subsoil material shall be protected for the duration of the works. Stockpiles of subsoil material shall be located separately from topsoil stockpiles. These stockpiles will be monitored throughout the construction phase. Monitoring of ground conditions and stability of excavations will be monitored on an on-going basis.
- Measures will be implemented to capture and treat sediment laden surface water runoff (e.g. sediment retention ponds, surface water inlet protection and earth bunding adjacent to open drainage ditches).

Weather Conditions

- Typical seasonal weather variations will also be taken account of when planning stripping of topsoil and excavations with an objective of minimising soil erosion and silt generation. The approach of extreme weather events will be monitored to inform near-term operational activities.

Surface Water Runoff

- Surface water runoff from areas stripped of topsoil and surface water collected in excavations will be directed to on-site settlement ponds where measures will be implemented to capture and treat sediment laden runoff prior to discharge of surface water at a controlled rate. Monitoring of these sediment control measures will be undertaken throughout the construction phase. Discharge from any vehicle wheel wash areas is to be directed to on-site settlement ponds.
- On-site settlement ponds are to include geotextile liners and riprapped inlets and outlets to prevent scour and erosion.
- Concrete batching will take place off site, wash down and wash out of concrete trucks will take place off site and any excess concrete is not to be disposed on site
- Surface water discharge points during the construction phase are to be agreed with Dublin City Council's Environment Section prior to commencing works on site

Water Pumped from Excavations

- Rainwater pumped from excavations is to be directed to on-site settlement ponds.
- Groundwater pumped from excavations is to be directed to on-site settlement ponds.
- On-site settlement ponds are to include geotextile liners and riprapped inlets and outlets to prevent scour and erosion. Monitoring of same will be undertaken.
- Surface water discharge points during the construction phase are to be agreed with Dublin City Council's Environment Section prior to commencing works on site

Construction Traffic

- Earthworks plant and vehicles delivering construction materials to site will be confined to predetermined haul routes around the site.
- Vehicle wheel wash facilities will be installed in the vicinity of any site entrances and road sweeping implemented as necessary in order to maintain the road network in the immediate vicinity of the site.
- Dust suppression measures (e.g. dampening down) will be implemented as necessary during dry periods.
- A construction traffic management plan will be prepared by the contractor prior to any works commencing on site.

Accidental Spills and Leaks

- 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 (when not possible to carry out such activities off site).
- 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.

- Monitoring of all fuel / oil storage areas will be undertaken and spill kits will be available on site.

6. WATER – HYDROGEOLOGY & HYDROGEOLOGY

The following measures are to be implemented during the construction phase in order to mitigate risks to the water and hydrogeological environment.

Erosion and Sediment Control

- Measures shall be implemented to capture and treat sediment laden surface water runoff (e.g. sediment retention ponds, surface water inlet protection, fencing and signage around specific exclusion zones and earth bunding adjacent to open drainage ditches).
- Surface water runoff from areas stripped of topsoil and rainwater collected in excavations shall be directed to on-site settlement ponds where measures will be implemented to capture and treat sediment laden runoff prior to discharge of surface water at a controlled rate.
- Groundwater pumped from excavations is to be directed to on-site settlement ponds.
- Discharge from any vehicle wheel wash areas is to be directed to on-site settlement ponds.
- On-site settlement ponds are to include geotextile liners and riprapped inlets and outlets to prevent scour and erosion.
- Surface water discharge points during the construction phase are to be agreed with Dublin City Council's Environment Section prior to commencing works on site.
- Weather conditions and seasonal weather variations shall also be taken account of when planning stripping of topsoil and excavations, with an objective of minimizing soil erosion.

Accidental Spills and Leaks

- All oils, fuels, paints and other chemicals will 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 (when not possible to carry out such activities off site).
- Discharge from any vehicle wheel wash areas is to be directed to on-site settlement ponds.
- 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.

Concrete

- Concrete batching will take place off site, wash down and wash out of concrete trucks will take place off site and any excess concrete is not to be disposed on site.
- Pumped concrete will be monitored to ensure there is no accidental discharge.
- Mixer washings are not to be discharged into surface water drains.

7. WATER: WATER SUPPLY, DRAINAGE & UTILITIES

The following measures are to be implemented during the construction phase in order to mitigate risks to the water supply, drainage and utilities.

- Surface water runoff from areas stripped of topsoil and surface water collected in excavations shall be directed to on-site settlement ponds where measures will be implemented to capture and treat sediment laden runoff prior to discharge of surface water at a controlled rate.
- Foul drainage discharge from the construction compound will be tinkered off site to a licensed facility until a connection to the public foul drainage network has been established.
- The construction compound's potable water supply shall be located where it is protected from contamination by any construction activities or materials.
- Relocation of any overhead ESB lines shall be fully coordinated with ESB Networks to ensure interruption to the existing power network is minimized.
- Connections to the existing gas and telecommunications networks shall be coordinated with the relevant utility provider and carried out by approved contractors.

8. BIODIVERSITY

The following mitigation measures are to be implemented during the construction phase:

- High value hedgerows/treelines should be retained where feasible.
- The removal of vegetation will not take place between 1st March and 31st August as per section 40 of the Wildlife Act. Where this cannot be avoided, vegetation must first be inspected by a suitably qualified ecologist for signs of nesting. Where no nesting is observed, vegetation can be removed within 48 hours. Where nesting is underway, vegetation cannot be removed unless under licence from the NPWS.
- To avoid damage to trees the developer should follow the guidance from the National Road's Authority in establishing root protection areas (RPA) along hedgerows to be retained.

The NRA gives the following equation for calculating the root protection area (RPA) (NRA, unknown year):

$$\text{RPA(m}^2\text{)} = \pi(\text{stem diameter mm } 12)/1,000) \times 2$$

The RPA gives the area around which there should be no disturbance or compaction of soil. This will be calculated for the largest tree within each hedgerow. Prior to construction this area will be clearly labelled 'sensitive ecological zone', fenced off with durable materials and instruction given to construction personnel not to disturb this buffer zone. As a rule of thumb this buffer zone should extend at least to the canopy of the trees concerned. Prior to construction this area will be clearly labelled 'sensitive ecological zone', fenced off with durable materials and instruction given to construction personnel not to disturb this buffer zone.

- Nocturnal mammals are impacted by lighting. Therefore, it is important that temporary lighting installed within the proposed development site is completed with sensitivity for local wildlife while still providing the necessary lighting for human usage, if applicable to the site. The following principals should be followed if applicable:

1. Temporary lighting design should be flexible and be able to fully take into account the presence of protected species. Therefore, appropriate lighting, as detailed below, should be used within a proposed development and adjacent areas with more sensitive lighting regimes deployed in wildlife sensitive areas.
2. Dark buffer zones can be used as a good way to separate habitats or features from lighting by forming a dark perimeter around them. This could be used for habitat features noted as foraging areas for bats.
3. Buffer zones can be used to protect Dark buffer zones and rely on ensuring light levels (levels of illuminance measured in lux) within a certain distance of a feature do not exceed certain defined limits. The buffer zone can be further subdivided into zones of increasing illuminance limit radiating away from the feature or habitat that requires to be protected.
4. Luminaire design is extremely important to achieve an appropriate lighting regime. Luminaires come in a myriad of different styles, applications and specifications which a lighting professional can help to select. The following should be considered when choosing luminaires. This is taken from the most recent BCT Lighting Guidelines (BCT, 2018).
 - 1) All luminaires used should lack UV/IR elements to reduce impact.
 - 2) LED luminaires should be used due to the fact that they are highly directional, lower intensity, good colour rendition and dimming capability.
 - 3) A warm white spectrum (<2700 Kelvins is recommended to reduce the blue light component of the LED spectrum).
 - 4) Luminaires should feature peak wavelengths higher than 550nm to avoid the component of light most disturbing to bats.
 - 5) The use of specialist bollard or low-level downward directional luminaires should be considered in bat sensitive areas to retain darkness above.

- 6) Column heights should be carefully considered to minimise light spill. The shortest column height allowed should be used where possible.
 - 7) Only luminaires with an upward light ratio of 0% and with good optical control should be used.
 - 8) Luminaires should always be mounted on the horizontal, i.e. no upward tilt.
 - 9) Any external security lighting should be set on motion-sensors and short (1min) timers.
 - 10) As a last resort, accessories such as baffles, hoods or louvres can be used to reduce light spill and direct it only to where it is needed.
- The following recommendations from Inland Fisheries Ireland '*Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters*' (2016) should be considered, if applicable:
 1. When cast-in-place concrete is required, all works must be done in the dry and effectively isolated from any flowing water (or water that may enter streams and rivers) for a period sufficient to ensure no leachate from concrete.
 2. No direct discharges be made to waters where there is potential for cement or residues in discharge.
 3. The pH of any and all discharged made from and during construction works shall be in the range of 6.0 – 9.0 units and not alter the pH of any receiving fisheries waters by more than +/- 0.5 pH units.
 4. The level of suspended solids in any discharges to fisheries waters as a consequence of construction works shall not exceed 25 mg/l, nor result in the deposition of silts on gravels or any element of the aquatic flora or fauna.
 5. All oils and fuels shall be stored in secure bunded areas and care and attention taken during refuelling and maintenance operations.
 6. There shall be no visible oil film in any discharges from construction works to waters.

7. Water abstraction for dust suppression shall not take place from any water body containing or suspected to contain aquatic invasive species.
8. Abstraction for dust suppression is confined to only those larger waters identified and agreed as being of sufficient size and volume so as to allow abstraction without adverse impact.
9. Abstraction points shall be screened so as to ensure that fish and aquatic plants are not removed from waters in the abstraction process.

9. DEMOLITION

The demolition phase of the proposed development will involve removal of all existing structures within the site (i.e. existing structures / dwellings).

Any demolitions required will be carried out by a competent demolition contractor in accordance with the current best practice for demolition.

Buildings and mature trees shall be checked for bats immediately prior to demolition or felling by a bat specialist. If bats are found at this stage, a derogation must be sought from NPWS with any additional mitigation requirements. If bats are not found at this point but are found at any stage of the building work, NPWS must be contacted and any work that may affect bats (demolition, scaffolding etc.) must be halted until an agreed strategy with NPWS is in place. Work that would not affect bats must be agreed with a bat specialist as many operations that would not be considered harmful may have unexpected consequences.

The contractor shall prepare a detailed Construction Stage Demolition Waste Management Plan in accordance with the requirements of “Construction and Demolition Waste Management – A Handbook for Contractors and Site Managers (FAS / CIF)” and Best Practice Guidelines for the preparation of resource & waste management plans for construction & demolition projects (2021). The Construction Stage Demolition Waste Management Plan shall include details of;

- Contact details of the nominated Construction Waste Manager
- Sequence of demolition operations to be followed
- Expected waste types arising including estimates of waste generation (i.e. types and quantities of demolition waste generated)
- Proposals for segregation of demolition wastes at source
- Details of proposals for recycling, recovery or reuse of demolition waste (it is anticipated that the vast majority of the waste generated from demolitions will be segregated where possible for reuse or recycling in accordance with the relevant legislation and guidelines and the project’s Construction Waste Management Plan)

- Details of proposed demolition waste haulers (and destination of waste), the contractor will record the quantity in tonnes and types of waste and materials leaving the site during the demolition works. The name, address and authorisation details of all facilities and locations to which waste and materials are delivered will be recorded along with the quantity of waste in tonnes delivered to each facility. Records will show materials which are recovered and disposed of.

10. WASTE MANAGEMENT

The principle of 'Duty of Care' in Waste Management Act 1996-2008 states that the waste producer is responsible for waste from the time it is generated through to its legal disposal (including its method of disposal). Waste materials generated by earthworks, demolition and construction activities will be managed according to the Department of the Environment, Heritage and Local Government's– Best Practice Guidelines for the preparation of resource & waste management plans for construction & demolition projects (2021).

The following measures are to be implemented during the construction phase 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:

This project is currently at planning stage and as such input from the contractor has not been incorporated into this document. On appointment of a contractor a detailed Construction Management Plan (CMP) shall be prepared. The detailed CMP shall incorporate the requirements of Best Practice Guidelines for the preparation of resource & waste management plans for construction & demolition projects (2021).

- Copies of final Construction Waste Management Plan will be made available to all relevant personnel on site. All site personnel and sub-contractors will be instructed on the objectives of the Construction Waste Management Plan and informed of their responsibilities.
- The nominated Construction Waste Manager responsible for implementation of this Construction Waste Management Plan will be identified prior to construction commencement and will arrange for a waste audit of the project once construction has fully commenced on site (and of any facilities to which waste from the project is delivered as required).
- Building materials should be chosen with an aim to 'design out waste'.
- On-site segregation of non-hazardous waste materials into appropriate categories. All waste material will be stored in skips or other suitable receptacles in a designated area of the site.
- On-site segregation of hazardous waste materials into appropriate categories. Hazardous waste will be separately stored in appropriate

lockable containers prior to removal from site by an appropriate waste collection licence holder.

- All wastes segregated at source where possible.
- Waste bins, containers, skip containers and storage areas will be clearly labelled with waste types which they should contain including photographs as appropriate.
- The site will be maintained to prevent litter and regular picking will take place throughout the site.
- Materials will be ordered on a 'just-in-time' basis to prevent over supply and site congestion (i.e. to minimise materials stored on site).
- Materials will be correctly stored and handled to minimise the generation of damaged materials
- All waste material will be correctly stored in skips or other suitable receptacles in a designated area of the site.
- Left over materials (e.g. timber off-cuts) 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.

11. NOISE AND VIBRATION

Noise-related mitigation methods are described below and will be implemented for the project in accordance with best practice. These methods include:

- No plant used on site will be permitted to cause an ongoing public nuisance due to noise;
- The best means practicable, including proper maintenance of plant, will be employed to minimise the noise produced by on site operations;
- All vehicles and mechanical plant will be fitted with effective exhaust silencers and maintained in good working order for the duration of the contract;
- All site access roads will be kept even to mitigate the potential for noise and vibration from lorries.
- Compressors will be attenuated models fitted with properly lined and sealed acoustic covers which will be kept closed whenever the machines are in use and all ancillary pneumatic tools shall be fitted with suitable silencers;
- Machinery that is used intermittently will be shut down or throttled back to a minimum during periods when not in use;
- Noise and vibration during the construction phase will be controlled with reference to the best practice control measures within BS 5228 (2009 +A1 2014) Code of Practice for Noise and Vibration Control on Construction and Open Sites Parts 1 and 2. The contractor will ensure that all best practice noise and vibration control methods will be used as necessary in order to ensure impacts to nearby residential noise sensitive locations are not significant. This will be particularly important during site preparation works and piling works.
- Limiting the hours during which site activities which are likely to create high levels of noise or vibration are permitted;
- Monitoring levels of noise and vibration during critical periods and at sensitive locations;

- Establishing channels of communication between the contractor/ developer, Dublin City Council and residents so that receptors are aware of the likely duration of activities likely to generate higher noise or vibration, and;
- The Contractor appointing a Site Environmental Manager (SEM) responsible for matters relating to noise and vibration.

Noise Limits

Whilst no specific construction noise limits are set by MCC with respect to noise, a common approach across the Dublin Agglomeration refers to the use of BS 5228 2009 +A1 2014 *Code of practice for noise and vibration control on construction and open sites* Parts 1 and 2 with respect to the controlling noise and vibration impacts. In this instance, appropriate criteria relating to permissible construction noise levels are taken from Part one of the standard *Noise*.

This document suggests an absolute construction noise limits depending on the receiving environment. The documents states:

- “Noise from construction and demolition sites should not exceed the level at which conversations in the nearest building would be difficult with windows shut.... Noise levels between 07:00 and 19:00hrs, outside the nearest window of the occupied room closest to the site boundary should not exceed:
- 70dB in rural, suburban and urban areas away from main road traffic and industrial noise;
- 75dB in urban areas near main roads in heavy industrial areas.

Given the suburban location of the facility, a limit value of 70dB $L_{Aeq,T}$ during daytime periods for construction is considered to be reasonable. Construction machinery should be kept a minimum of 25m from noise sensitive areas when practicable to minimise noise to existing residents.

This limit value is also in agreement with those set by Transport Infrastructure Ireland (TII) for construction projects. Their 2014 document *Good Practice Guidance for the Treatment of Noise during the planning of National Road Schemes* recommends the following construction noise limit values.

Days & Times	L _{Aeq}	L _{AFmax}
Monday to Friday (07:00 to 19:00hrs)	70	80
Monday to Friday 19:00 to 22:00hrs	60	65
Saturday 08:00 to 16:30hrs	65	75
Sundays and Bank Holidays 08:00 to 16:30hrs	60	65

Table 9.1. TII Maximum Recommended Noise Levels at the Façade of Nearby Dwellings during Construction

Vibration Limits

Guidance relevant to acceptable vibration within buildings during construction works is contained in the following documents:

- British Standard BS 7385: 1993: Evaluation and measurement for vibration in buildings Part 2: Guide to damage levels from ground borne vibration, and;
- British Standard BS 5228: 2009: Code of practice for noise and vibration control on construction and open sites – Part 2: Vibration.

BS 7385 states that there should typically be no cosmetic damage if transient vibration does not exceed 15mm/s at low frequencies rising to 20mm/s at 15Hz and 50mm/s at 40Hz and above. These guidelines relate to relatively modern buildings and should be reduced to 50% or less for more critical buildings.

BS 5228 recommends that, for soundly constructed residential property and similar structures that are generally in good repair, a threshold for minor or cosmetic (i.e. non-structural) damage should be taken as a peak component particle velocity (in frequency range of predominant pulse) of 15mm/s at 4Hz increasing to 20mm/s at 15Hz and 50mm/s at 40Hz and above. The standard also notes that below 12.5 mm/s PPV the risk of damage tends to zero. It is therefore common, on a cautious basis to use this lower value. Where continuous vibration is such as to give rise to dynamic magnification due to resonance, the guide values may need to be reduced by up to 50%.

Both standards note that important buildings that are difficult to repair might require special consideration on a case by case basis but building of historical importance should not (unless it is structurally unsound) be assumed to be more sensitive. If a building is in a very unstable state, then it will tend to be more vulnerable to the possibility of damage arising from vibration or any other ground

borne disturbance. Taking the above into consideration the vibration criteria in Table 9.2 is recommended as the maximum allowable vibration.

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 15Hz	15 to 40Hz	40Hz and above
12 mm/s	20 mm/s	50 mm/s

Table 9.2. Maximum Allowable Vibration Criteria during Construction Phase

12. AIR, DUST & CLIMATE FACTORS

The Principal Contractor or equivalent must monitor the contractors' performance to ensure that the proposed construction phase mitigation measures are implemented, and that construction impacts and nuisance are minimised. The following mitigation measures are to be implemented during the construction phase:

- During working hours, dust control methods shall be monitored as appropriate, depending on the prevailing meteorological conditions;
- The name and contact details of a person to contact regarding air quality and dust issues shall be displayed on the site boundary, this notice board should also include head/regional office contact details;
- Community engagement shall be undertaken before works commence on site explaining the nature and duration of the works to local residents and businesses;
- A complaints register shall be kept on site detailing all telephone calls and letters of complaint received in connection with construction activities, together with details of any remedial actions carried out.
- The contractor must demonstrate full compliance with the dust control conditions;
- At all times the procedures put in place are to be strictly monitored and assessed;
- Dust minimisation measures shall be reviewed at regular intervals during the works to ensure the effectiveness of the procedures in place and to maintain the goal of minimisation of dust through the use of best practice and procedures. In the event of dust nuisance occurring outside the site boundary, site activities will be reviewed, and satisfactory procedures implemented to rectify the problem;
- A speed restriction of 20 km/hr shall be applied as an effective control measure for dust for on-site vehicles using unpaved haul roads;
- Construction access to the site will be directly from the Harolds Cross Road to the east of the site and is located >10m away from sensitive receptors.

Refer to DBFL drawing 200029-DBFL-RD-SP-DR-C-1201 for further information;

- Bowers or suitable watering equipment will be available during periods of dry weather throughout the construction period;
- Hard surface roads will be swept to remove mud and aggregate materials from their surface while any un-surfaced roads will be restricted to essential site traffic;
- Furthermore, any road that has the potential to give rise to fugitive dust must be regularly watered, as appropriate, during dry and/or windy conditions;
- During periods of very high winds (gales), construction activities likely to generate significant dust emissions should be postponed until the gale has subsided;
- Overburden material will be protected from exposure to wind by storing the material in sheltered regions of the site. Where possible storage piles should be located downwind of sensitive receptors;
- Where feasible, hoarding will be erected around site boundaries. This will have the benefit of reducing the impact of larger particles on nearby sensitive receptors;
- Material handling systems and site stockpiling of materials will be designed and laid out to minimise exposure to wind. Water misting or sprays will be used as required if particularly dusty activities such as rock blasting or earthworks are necessary during dry or windy periods; and
- Before entrance onto public roads, trucks will be adequately inspected to ensure there is no potential for dust emissions and will be cleaned as necessary;
- It is recommended that dust deposition monitoring be put in place to ensure dust mitigation measures are adequately controlling emissions. Dust monitoring should be conducted using the Bergerhoff method in accordance with the requirements of the German Standard VDI 2119;
- In the event of dust nuisance occurring outside the site boundary, movements of materials likely to raise dust will be curtailed and satisfactory

procedures implemented to rectify the problem before the resumption of construction operations;

- Vehicles delivering or collecting material with potential for dust emissions shall be enclosed or covered with tarpaulin at all times when practicable to restrict the escape of dust;
- At the main site traffic exit, a wheel wash facility will be installed. All trucks leaving the site must pass through the wheel wash. In addition, public roads outside the site shall be regularly inspected for cleanliness, as a minimum on a daily basis, and cleaned as necessary;

13. LANDSCAPE AND VISUAL IMPACT ASSESSMENT

Proposed construction phase mitigation measures are summarised below:

- Site fencing/hoarding shall be erected to restrict views of the construction activity e.g. standard 2.4m high
- Establishment of tree protection measures (no-dig construction zones, tree protection fencing and existing hedgerow retention).
- Appointment of an Arborist to oversee all works relevant to trees
- Monitoring of tree protection measures, e.g. maintenance of protective fencing to the satisfaction of the Arborist
- Hand dig excavation under supervision of an arborist is required should excavation be necessary in a tree protection area
- Tree protection fences are to be constructed in accordance with BS 5837:2012 "Trees in Relation to Design, Demolition and Construction - Recommendations"
- A 'Construction Exclusion Zone' notice shall be placed on tree protection fencing at regular intervals
- Tree Protection Zones are not to be used for car parking, storage of plant, equipment or materials
- A post construction re-assessment of retained trees shall be carried out

14. ARCHAEOLOGY & CULTURAL HERITAGE

- All topsoil stripping of previously undisturbed areas that is associated with the proposed development will be monitored by a suitably qualified archaeologist.
- If any features of archaeological potential are discovered during the course of the works further archaeological mitigation may be required, such as preservation in-situ or by record. Any further mitigation will require approval from the National Monuments Service of the DoCHG.
- All recommendations are subject to approval by the National Monuments Service of the Heritage and Planning Division, Department of Culture, Heritage and the Gaeltacht.

15. SITE COMPOUND FACILITIES AND PARKING

There will be 1Nr construction compound. Refer to Figure 1 below for the proposed compound location. The compound for the site will be approximately 60m long and 50m wide. The compound, as per Figure 1 below, is considered a suitable location as it will provide easy access from Harold's Cross Road to the site. Exact location to be agreed in writing Dublin City Council prior to the commencement of works by the Contractor. Refer to figure 1 for proposed compound location.

The location of the construction compound is likely to be relocated during the course of the works, in line with the phasing of the development.



Figure 1 – Proposed Site Compound Location

- The construction compounds will include adequate welfare facilities such as washrooms, drying rooms, canteen and first aid room as well as foul drainage and potable water supply.
- Foul drainage from the construction compound will be discharged to temporary holding tank(s) the contents of which will periodically be tankered off site to a licensed facility until a connection to the public foul drainage network has been established.

- The construction compound's potable water supply shall be protected from contamination by any construction activities or materials.
- The construction compound will be enclosed by a security fence.
- Access to the compound will be security controlled and all site visitors will be required to sign in on arrival and sign out on departure.
- Permeable hardstanding area's will be provided for staff car parking.
- Separate permeable hardstanding area's will be provided for construction machinery and plant.
- The construction compound will include designated construction material recycling areas.
- A series of way finding signage will be provided to direct staff, visitors and deliveries as required.
- All construction materials, debris, temporary hardstands etc. in the vicinity of the site compound will be removed off-site on completion of the works.
- Low level lighting will be provided for both construction compound and motion detectors will be used where appropriate for lighting to ensure the impact on fauna is minimised.