

Project

SHD Development at Cooldown Commons Phase 3

Report Title

Construction Management Plan

Client

Cairn Homes Properties Limited

INFRASTRUCTURE



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TABLE OF CONTENTS

1.0 WORKS PROPOSAL.....	4
1.1 Proposed Development.....	4
2.0 SITE WORKS.....	5
2.1 General	5
2.2 Earthworks	5
2.3 Foundations.....	6
2.4 Material Hoisting	6
3.0 CONSTRUCTION TRAFFIC	8
3.1 Traffic Management Plan	8
3.2 Vehicular Access/Egress	10
4.0 WORKING HOURS	12
5.0 NOISE & VIBRATION.....	13
5.1 General Construction Site Management	13
5.2 Noise Mitigation Measures	13
5.3 Construction Phase Noise Control & Mitigation	14
5.4 Construction Works Noise Mitigation Measures.....	14
5.5 Construction Phase Vibration Control & Mitigation	16
5.6 Vibration Mitigation Measures	16
6.0 ECOLOGY	19
7.0 POLLUTION CONTROL.....	20
8.0 ARBORICULTURE	22
9.0 WORKS ADJACENT TO THE LUAS	23
9.1 Protection of Adjacent Areas.....	23
9.2 Construction of Basement, Roadway & Boundary Treatment adjacent to LUAS Line23	
10.0 AIR QUALITY & DUST CONTROL	25
11.0 WASTE MANAGEMENT PLAN	27
11.1 Programme of Waste Management for Construction Works.....	27
11.2 Construction Waste Disposal Management.....	28

11.3	On-Site Waste Reuse and Recycling Management	29
11.4	Waste Storage Compound	29
11.5	Soils	29
11.6	Contaminated Soils	30
12.0	WORKING ADJACENT TO THE LUAS LINE	31
12.1	Construction Works Adjacent to the Live LUAS Line	31
12.2	Works Access Permit	31
12.3	Induction and Training	31
12.4	Person in Charge of LUAS Works (PICLW)	32
12.5	Weekly Engineering Meetings	32
12.6	Dangers of Overhead Conductor System (OCS)	32
12.7	Noise, Vibration and Settlement	33
12.8	Urgent Works and Emergencies	34
13.0	COMPOUND FACILITIES / PARKING	35
14.0	CONCLUSION	37

1.0 WORKS PROPOSAL

This Construction Management Plan is for the works associated with the construction of the proposed mixed-use development at Cooldown Commons, Citywest, Dublin 24, as indicated in Figure 1 below. The construction management issues addressed in this plan include noise and vibration, traffic management, working hours, pollution control, archaeology, arboriculture, dust control, road cleaning, compound / public health facilities and staff parking.

1.1 Proposed Development

The proposed development will consist of the construction of 421 no. residential units within 9 no. blocks ranging in height from 1 – 13 storeys, retail/commercial/office units, residential amenity space, and open spaces along with all associated site development works and services provisions to facilitate the development including parking, bin storage, substations, landscaping and all services. A full description is provided in the statutory notices and in Chapter 3 of the EIAR.

There will be 289 no. car parking spaces (181 no. spaces in basement car park and 108 no. spaces at surface level) and 650 no. cycle parking spaces. A basement car park is proposed under Blocks D1, D2, D3 and D4. The development shall provide public open space at ground level including a new public plaza north of the Fortunestown Luas stop. The application is also for ESB substation, plant area, bin storage, surface water attenuation tank and all other site development works, and site services required to facilitate the proposed development.



Figure 1 Site Location (Google Earth)

2.0 SITE WORKS

2.1 General

The project is currently at planning stage and is therefore subject to approval and detailed design. It is anticipated that construction would start in Q1 2022, with an estimated construction programme of circa 48 months.

The proposed order of construction of key elements is subject to detailed review by the Contractor at construction stage and in general will be as follows:

- Site Setup.
- Service terminations and positive identification of any services on the site by the utility providers.
- Provision of temporary power, lighting and water services.
- Set up of site accommodation and welfare facilities.
- Identification of any hazardous materials on site
- Designation of exclusion zones for the demolition/dismantling.
- Demolition and site clearance.
- Earthworks, including cut and fill and disposal of excess material off site;
- External site works/ infrastructure;
- Construction of substructure/hardstand area;
- Construction of superstructure;

2.2 Earthworks

Earthworks will consist of reducing existing levels for the proposed sub-structure and foundations. Excess material will be disposed offsite to a suitably licensed facility in accordance with the construction waste management plan.

- Stripping of topsoil will 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) will be limited to the immediate vicinity of active work areas.
- Topsoil stockpiles will 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 will be located on site.
- Top and subsoils shall be re-used on-site for landscaping purposes to minimise the volume of soils to be exported off-site.
- The design of road levels and finished floor levels has been carried out to minimize cut and fill type earthworks operations.

- Disturbed subsoil layers will be stabilized as soon as practicable. Therefore, backfilling of service trenches, construction of road capping layers, construction of building foundations and completion of landscaping), will all be carried out promptly to minimise the duration that subsoil layers are exposed to the effects of weather.
- Stockpiles of excavated subsoil material will be protected for the duration of the works. Stockpiles of subsoil material will be located separately from topsoil stockpiles.
- Site Investigations indicate that bedrock is deeper than below circa 17m on site. Therefore, it is unlikely that bedrock will be exposed during construction works. Should bedrock be encountered, the extent of exposed bedrock will be limited to the immediate vicinity of active work areas. Where bedrock is encountered it will be crushed, screened and tested for use within the designed works to reduce the volume of material required to leave site. This will also reduce the volume of material to be imported to the site.

2.3 Foundations

The single storey basement under Blocks D1, D2, D3 and D4 will be constructed by open excavation with the basement slab comprising a suspended slab on piled foundations extending into black boulder clay. Blocks E1 and E2 will be piled from close to existing ground level into black boulder clay, and the duplex units will comprise traditional strip foundations.

2.4 Material Hoisting

It is envisaged that circa 5 No. tower cranes would be erected on site to hoist materials. It is intended that the tower crane will be erected by a mobile crane from within the site boundary. Irish Aviation Authority and Casement Aerodrome will be notified at least 30 days prior to use of any cranes on site.

Careful consideration will be given to the recruitment of suitably qualified crane drivers and banksmen given the location of the site and the proximity of neighbouring properties and the LUAS line.

To control the risks associated with lifting operations beside the live LUAS tracks where there are overhead cables present, an electronic limiting system will be fitted to the cranes. This system will prevent the crane operator from deviating from the previously agreed operating environment.

2.5 Infrastructure Works

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.

- In the event of groundwater being encountered during the construction phase, mitigation measures will include dewatering by pumping to an appropriate treatment facility prior to discharge. Other measures would include excluding contaminating materials such as fuels and hydrocarbons from sensitive parts of the site i.e. highly vulnerable groundwater areas.
- In order to reduce the risk of defective or leaking sewers, all new sewers should be laid in accordance with the relevant standards, pressure tested, and CCTV surveyed to ascertain any possible defects.
- The construction compound will include adequate staff welfare facilities including foul drainage and potable water supply. Foul drainage discharge from the construction compound will be removed 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.
- Where possible backup network supply to any services will be provided should the need for relocation or diversion or existing services be required otherwise relocation or diversion works will be planned to incur minimal impact, with users notified in advance of any works.
- Connections to the existing gas and telecommunications networks will be coordinated with the relevant utility provider and carried out by approved contractors.

3.0 CONSTRUCTION TRAFFIC

3.1 Traffic Management Plan

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

- Chapter 8 of the Department of the Environment Traffic Signs Manual, current edition, published by The Stationery Office, and available from the Government Publications Office, Sun Alliance House, Molesworth Street, Dublin 2;
- Guidance for the Control and Management of Traffic at Road Works (June 2010) prepared by the Local Government Management Services Board;
- Any additional requirements detailed in the Design Manual for Roads and Bridges & Design Manual for Urban Roads & Streets (DMURS).

All construction activities will be governed by a Construction Traffic Management Plan (CTMP), the details of which will be agreed with South Dublin County Council prior to the commencement of construction activities on site. The principal objective of the CTMP is to ensure that the impacts of all building activities generated during the construction phase upon the public (off-site), visitors to the subject site (on-site) and internal (on-site) workers' environments, are fully considered and proactively managed/programmed, thereby ensuring that safety is maintained at all times, disruption is minimised and works are undertaken within a controlled hazard free/minimised environment.

Construction traffic will consist of the following categories:

- Private vehicles owned and driven by site construction staff and by full time supervisory staff. On-site employees will generally arrive before 08:00, thus avoiding the morning peak hour traffic. These employees will generally depart after 18:00.
- Excavation plant and dumper trucks involved in site development works and material delivery vehicles for the following: granular fill materials, concrete pipes, manholes, reinforcement steel, ready-mix concrete and mortar, concrete blocks, miscellaneous building materials, etc. Deliveries would arrive at a steady rate throughout the day. It is estimated that peak delivery rates would be in the region of 1-2 deliveries per hour throughout the day.

The following matters have been considered in respect of the construction period impacts:

- Appropriate on-site parking and compounding will be provided to prevent overflow onto the local network and to ensure that the site will be securely fenced off from adjacent properties, public footpaths and roads;
- The surrounding road network will be signed to define the access and egress routes for the development and to ensure the safety of all road users and construction personnel.
- It is likely that some numbers of the construction team will be brought to/from the site in vans/minibuses and public transport, which will serve to reduce the trip generation potential.
- Site offices and compound will be located within the site boundary. The site will be able to accommodate employee and visitor parking during the construction period. Initially, hard-standing parking areas will be provided and as the development progresses, employees will use constructed car-parking spaces, as they become available.
- The construction team will be encouraged to use public transport to access the site, with the site well located immediately north of Fortunestown LUAS stop.
- Truck wheel washes will be installed at construction entrances and any specific recommendations with regard to construction traffic management made by the Local Authority will be adhered to.

Construction vehicle movements and their impact will be minimised through;

- Consolidation of delivery loads to / from the site and management of large deliveries on site to occur outside of peak periods;
- Delivery of materials by HGV's will not be permitted to site during school drop off and pick-up times.
- Use of precast / prefabricated materials where possible;
- During general excavation of foundations there will be additional HGV movements from the site. All suitable excavated material will be used for construction and fill activities where possible and appropriate. All excess spoil material will be removed to a registered landfill site which will be agreed with South Dublin County Council.
- Adequate storage space on site to be provided;

The following measures will be taken to ensure that the site and surroundings are kept clean and tidy;

- A regular programme of site tidying to be established to ensure a safe and orderly site;

- Mud spillages on roads and footpaths outside the site to be cleaned regularly and will not be allowed to accumulate;
- Wheel-wash facilities or similar will be provided for vehicles exiting the site if deemed appropriate or when significant vehicle movements are planned (e.g. disposal of topsoil from site);
- Dedicated road sweeper will be put in place if site conditions require.

3.2 Vehicular Access/Egress

The site access and egress routes are shown in Figure 2. Access will be via the two existing access points (Citywest Avenue and Cooldown Commons Phase 2, currently under construction). Security personnel will ensure that vehicles will exit safely and without causing disruption to road users or pedestrians.

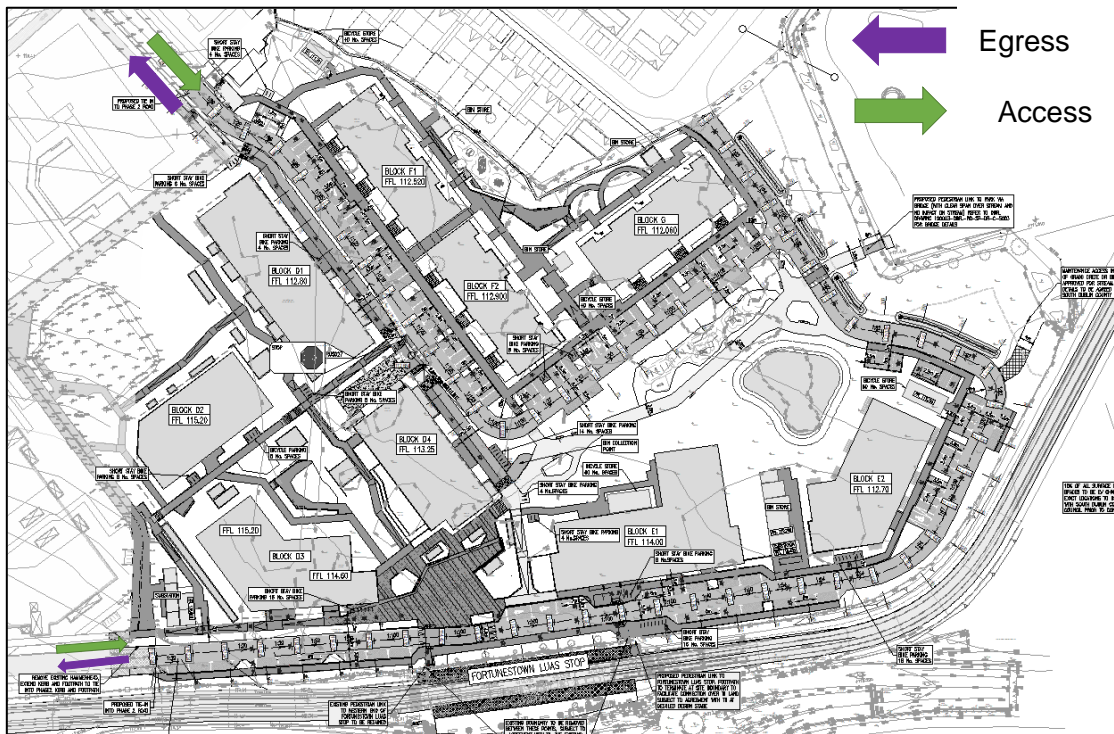


Figure 2 Subject Site Access and Egress Routes

Provision will be made for the cleaning by a road sweeper etc. of all access routes to and from the site, during the works, (i.e. Citywest Avenue and all roads within 500m of the site boundary). Road cleaning shall be undertaken daily during the completion of the works. A wheel wash facility will also be provided on site to clean site traffic leaving the site. Wastewater generated at this washing facility will be suitably treated on site and all settled silts will be disposed offsite to a licensed landfill.

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

5.0 NOISE & VIBRATION

During the construction works the Contactor shall comply with:

- BS 5228: 2009 Code of Practice for Noise and Vibration Control on Construction and Open Sites, Part 1 and Part 2.
- Guidelines for the Treatment of Noise and Vibration in National Road Schemes (NRS, Revision 1, 2004)
- Safety, Health and Welfare at Work (General Application) Regulations 2007, Part 5 Noise and Vibration.

5.1 General Construction Site Management

The following noise management measures shall be implemented at the site from the outset of site activities to control and manage noise levels during the construction phase of the proposed development:

5.2 Noise Mitigation Measures

An independent acoustic consultant shall be engaged by the contractor prior to the commencement of site activities to ensure that all noise mitigation measures as specified in the relevant section of the EIAR are implemented and to prepare a site specific Construction Management Plan. The Plan shall include all relevant noise and vibration control measures as specified in this report. The Plan shall be submitted to South Dublin County Council for approval as required.

The nominated contractor shall appoint a designated person to manage all environmental complaints including noise and vibration.

A noise complaint procedure shall be implemented in which the details of any noise related complaint are logged, investigated and where required, measures are taken to ameliorate the source of the noise complaint.

Appropriate signage shall be erected on all access roads in the vicinity of the site to inform HGV drivers that engines shall not be left idling for prolonged periods and that the use of horns shall be banned at all times.

HGV's queuing on any local or public road shall not be permitted and it shall be the responsibility of site management to ensure this policy is enforced.

Typical construction hours are:

07:00hrs – 19:00hrs Monday to Friday

08:00hrs – 14:00hrs Saturday

Closed on Sundays and Bank/Public Holidays

All onsite generator units (if required) used to supply electricity to the site shall be silenced models or enclosed and located away from any receptor. The use of generators during the night-time shall be avoided. Mains power shall be used to supply electricity to all site offices and site lighting at the earliest instance.

The site compound shall be located at a point on site furthest away from any residential development.

5.3 Construction Phase Noise Control & Mitigation

The following shall be implemented to mitigate construction noise impacts in order to ensure that the construction phase of the development does not have an unacceptable impact on sensitive receptors.

5.4 Construction Works Noise Mitigation Measures

The following noise mitigation measures will be implemented during the construction stage:

- A strictly enforced noise management programme shall be implemented at the site from the outset of construction activities.
- The Construction Project Manager shall appoint an acoustic consultant to conduct continuous noise surveys which shall be conducted at the baseline noise monitoring locations throughout the construction phase of the development to assess compliance with the construction noise limit criteria detailed in BS 5228: 2009 (Code of Practice for Noise and Vibration Control on Construction and Open Sites, Part 1 and Part 2) and to assess the effectiveness and implementation of the specific Construction Phase noise mitigation measures detailed in this document.
- The principal of controlling noise at source shall be implemented at the site. Best practice mitigation techniques as specified in BS 5228:2009+A1 2014 – Noise and Vibration Control on Construction and Open Sites shall be implemented during the construction phase and are detailed in this Section.

- Noisy stationary equipment shall be sited away from sensitive site boundaries as far as practicable.
- Where reasonable practicable, noisy plant or activities shall be replaced by less noisy alternatives if noise breaches and/or complaints occur.
- Proper use of plant with respect to minimising noise emissions and regular maintenance will be required.
- All vehicles and mechanical plant will be fitted with effective exhaust silencers and will be maintained in good efficient order.
- Where noisy plant is required to operate in works areas next to residential houses low noise plant options will be used wherever practicable.
- Dumpers and any plant used for moving materials around the site will have high performance exhaust silencers.
- Selected use of rubber-tyred equipment over steel track equipment where practicable.
- The use of inherently quiet plant is required where appropriate – all compressors and generators will be “sound reduced” or “super silent” models fitted with properly lined and sealed acoustic covers, which will be kept closed whenever the machines are in use, and all ancillary pneumatic percussive tools will be fitted with mufflers or silencers of the type recommended by the manufacturers.
- All compressors, generators and pumps shall be silenced models fitted with properly lined and sealed acoustic covers or enclosures, which will be kept closed whenever the machines are in use.
- All pneumatic percussive tools such as pneumatic hammers shall be fitted with dampers, mufflers or silencers of the type recommended by the manufacturer.
- Fixed items of plant shall be electrically powered in preference to being diesel or petrol driven.
- Vehicles and mechanical plant utilised on site for any activity associated with the works shall be fitted with effective exhaust silencers and shall be maintained in good working order and operated in a manner such that noise emissions are controlled and limited as far as reasonably practicable.
- Any plant, equipment or items fitted with noise control equipment found to be defective in shall not be operated until repaired / replaced.
- Machines in intermittent use shall be shut down in the intervening periods between works or throttled down to a minimum during periods when not in use.
- Static noise emitting equipment operating continuously shall be housed within suitable acoustic enclosure, where appropriate.
- All excavator mounted pneumatic breakers used for demolition and ground breaking activities shall be fitted with effective dampeners and /or enclosed within a noise adsorbing blanket structure to minimise noise emissions.

- Site activities shall be staggered when working in proximity to any receptor, that is concrete cutting and rock breaking should where possible. This proposed method of working will provide effective noise management of site activities to ensure that any receptor is not exposed to unacceptably high levels of noise over extended periods.
- Excessive reviving of all vehicles shall be avoided.
- Unnecessary dropping of heavy items onto ground surfaces shall be banned.
- The use of an excavator bucket to break up slabs of concrete or tarmacadam shall not be permitted.
- The dragging of materials such as steel covers, plant or excavated materials along ground surfaces shall not be permitted.
- The use of acoustic screens to attenuate noise at source shall be implemented as deemed necessary.
- Plant Reversing Alarms: Where reasonably practicable and deemed safe by risk assessment, taking into account onsite hazards and working environment, the tonal reversing alarms of mobile plant shall be replaced with broadband alarms.
- A nominated person from the Project Management team will be appointed to liaise with local residents and businesses regarding noise nuisance events.
- In the event of the requirement for out of hours work to occur which will involve the generation of noise levels that are predicted to exceed out of hours noise limit criteria, South Dublin County Council shall be immediately notified prior to the works commencing.
- A nominated person from the Project Management team will be appointed to liaise with and inform local residents and South Dublin County Council regarding out of hours works.
- An independent acoustic consultant shall review the implementation of the recommended mitigation measures on a monthly basis.
- It is recommended that high performing acoustic barriers are utilised such as Echo Barrier products or Ventac products.

5.5 Construction Phase Vibration Control & Mitigation

The following specific vibration mitigation and control measures shall be considered during the construction phase:

5.6 Vibration Mitigation Measures

The following vibration mitigation measures will be implemented:

- Breaking out concrete elements using low vibration tools;

- Choosing alternative, lower-impact equipment or methods wherever possible;
- Scheduling the use of vibration-causing equipment, such as jackhammers, at the least sensitive time of day;
- Routing, operating or locating high vibration sources as far away from sensitive areas as possible;
- Sequencing operations so that vibration causing activities do not occur simultaneously;
- Isolating the equipment causing the vibration on resilient mounts;
- Keeping equipment well maintained;
- Confining vibration-generating operations to the least vibration-sensitive part of the day which could be when the background disturbance is highest;
- A nominated person from the Project Management team will be appointed to liaise with local residents and businesses regarding vibrational nuisance events.
- An independent acoustic consultant shall review the implementation of the recommended mitigation measures on a monthly basis.

In order to ensure that site construction activities are conducted to minimise the vibration impacts on the receiving environment, structural vibration monitoring shall be conducted during the course of the project works if required.

It is proposed that vibration monitoring will be conducted at properties adjacent to or within 20m of the site as required using calibrated vibration monitors and geophones capable of transmitting live text and email alerts to ensure that if vibration levels approach or exceed specified warning and limit values, site personnel will be alerted to cease at the earliest instance and appropriate mitigation measures may then be implemented to minimise the vibrational impacts of protected structures.

Live vibration monitoring systems shall be installed for the duration of the construction phase in cooperation with TII in proximity to the inbound Citywest LUAS track which runs adjacent to the southern and south-eastern site boundaries.

The transient vibration guide values for cosmetic damage as specified in British Standard BS 7385: Evaluation and measurement for vibration in buildings, Part 2 1993 Guide to damage levels arising from ground borne vibration is 15 mm/sec Peak Component Particle Velocity at 4 Hz increasing to 20 mm/sec at 15 Hz. This limit value rises to 50 mm/sec at frequencies of 40 Hz and greater. The applied conservative limit of 12.5 mm/sec PPV (peak particle velocity) applied for this assessment is significantly lower than these levels.

In order to protect the amenities enjoyed by nearby residents and commercial premises, a full Construction Management Plan (including traffic management) shall be put in place prior to the commencement of development.

6.0 ECOLOGY

An ecological assessment has been carried out of the subject site by '*Openfield Ecological Services*'. Reference should be made to this specialist report and to Chapter 5 of the EIAR and all construction works proposed shall take account of any recommendations included in the ecological assessment and EIAR chapter.

7.0 POLLUTION CONTROL

All works carried out will comply with all Statutory Legislation including the Local Government (Water Pollution) acts, 1977 and 1990 and the contractor will be required to co-operate fully with the Environmental Section of South Dublin County Council. Works should also be carried out in accordance with Inland Fisheries Ireland "Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters".

As part of the overall construction methodology, the following issues have been identified as being of risk and/or concern to pollution and will be addressed;

- Contamination of Groundwater – There is a risk that ground water could become contaminated with lime from cement which could subsequently find its way into the local adjacent watercourses. To mitigate any potential damage from the effluent of contaminated ground water would be to create an exclusion zone, as far as reasonably practicable.
- Sediment & Erosion – Similar to the above, groundwater needs to be protected from sedimentation and erosion due to direct surface water runoff generated onsite during the construction phase. To prevent this from occurring, surface water discharge from the site will be managed and controlled for the duration of the construction works until the permanently attenuated surface water drainage system of the proposed site is complete. A temporary positive drainage system shall be installed prior to the commencement of the construction works to collect surface water runoff by the site during construction. A series of geotextile lined cascading, high level outfall, settling basins will be installed upstream of the agreed discharge point. This temporary surface water management facility will throttle runoff and allow suspended solids to be settled out and removed before being discharged in a controlled manner to the agreed outfall. All inlets to the cascading settling basins will be riprapped to prevent scour and erosion near the inlet.
- Discharge Licences – It will not be permitted to discharge into any newly constructed storm water systems or watercourse without adhering to the conditions of the discharge licence and agreeing the same with the Site Manager and Local Authority Area Engineer.
- Over Ground Oil / Diesel Storage – Only approved storage system for oil / diesel within the site will be permitted, (i.e. all oil / diesel storage to be located within a designated area placed furthest away from adjacent watercourses and contained within constructed bunded areas e.g. placed on 150mm concrete slab with the perimeter constructed with 225mm solid blockwork rendered internally). The bunded area will accommodate the

relevant oil / diesel storage capacity in case of accidental spillage. Any accidental spillages will be dealt with immediately on site by containment /removal from site.

- Concrete Washout – The washing out of concrete trucks on site will not be permitted as they are a potential source of high alkaline discharges to watercourses. Consequently, it is a requirement that all concrete truck washout takes place back in the ready-mix depot.
- Disposal of Wastewater off Site – The Site Management Team will maintain a record of all receipts for the removal of toilet or interceptor waste off site to insure its disposal in a traceable manner. These will be available for inspection at all times by the Environmental Section of South Dublin County Council.
- Road Sweepers / Cleaning – The cleaning of public roads in and around the subject site will be undertaken to reduce environmental impacts and care will be taken to prevent any pollution of watercourses from this activity.

8.0 ARBORICULTURE

A tree protection strategy / requirements report was prepared by '*The Tree File Ltd*' and should be referenced with this Construction Management Plan for the proposed development.

9.0 WORKS ADJACENT TO THE LUAS

9.1 Protection of Adjacent Areas

Work areas will be segregated from the adjacent public areas for the extent of the project by means of a suitable hoarding fence. In order to provide an additional level of safety to the public, the height of the hoarding along the site interface with the LUAS will be agreed with the LUAS operator prior to the works.

The installation of the hoarding along the LUAS platform will be carried out before any construction commences. The installation will be carried out at night between 2am and 4am during the period of LUAS line maintenance shut down. The hoarding panels will be prefabricated of high quality plywood with dimensions of 3.6m wide x 2.4m high x 15mm thick. The hoard will be painted in advance of installation. The panels will be lifted by hand and fixed into position. All hoardings will be designed by a competent structural engineer to resist wind loads. The foot of the hoarding will be sealed to the ground to prevent dust and soil transferring beneath the hoarding onto the adjacent footpaths and LUAS tracks.

Nets and screens will be used along the site perimeter to prevent any debris falling from the site.

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

9.2 Construction of Basement, Roadway & Boundary Treatment adjacent to LUAS Line

The single storey basement under Blocks D1, D2, D3 and D4 will be constructed by open excavation with the basement slab comprising a suspended slab on piled foundations.

The basement will be excavated to a maximum depth of circa 5m below existing ground level. Therefore, the 45° zone of influence for the construction of the basement is 5.0m from the basement extents. The LUAS line is approximately 22m from the basement extents and is therefore outside the zone of influence.

The excavation for the construction of the roadway / street between the basement and the LUAS line would be approximately 1.8 to 2m at the deepest point, with a 45° zone of influence of 1.8 to 2m. The LUAS line is approximately 8m from the extent of the road and is therefore outside of the zone of influence.

The existing boundary treatment to the south of the subject site (with the LUAS line) will be retained with the exception of the area bounding Fortunestown LUAS Stop platform where the existing boundary will be removed to facilitate pedestrian access to the platform.

10.0 Air Quality & Dust Control

During the proposed infrastructure works the following mitigation measures shall be implemented to minimise dust emissions and to ensure that adverse air quality impacts are minimised.

- Avoid unnecessary vehicle movements and manoeuvring, and limit speeds on site to minimise the generation of airborne dust.
- Use of rubble chutes and receptor skips during construction activities.
- During dry periods, dust emissions from heavily trafficked locations (on and off site) will be controlled by spraying surfaces with water and wetting agents.
- 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 only.
- Re-suspension in the air of spillages material from trucks entering or leaving the site will be prevented by limiting the speed of vehicles within the site to 10kmh and by use of a mechanical road sweeper.
- The overloading of tipper trucks exiting the site shall not be permitted.
- Aggregates will be transported to and from the site in covered trucks.
- Where the likelihood of windblown fugitive dust emissions is high and during dry weather conditions, dusty site surfaces will be sprayed by a mobile tanker bowser.
- Wetting agents shall be utilised to provide a more effective surface wetting procedure.
- Exhaust emissions from vehicles operating within the construction site, including trucks, excavators, diesel generators or other plant equipment, will be controlled by the contractor by ensuring that emissions from vehicles are minimised by routine servicing of vehicles and plant, rather than just following breakdowns; the positioning of exhausts at a height to ensure adequate local dispersal of emissions, the avoidance of engines running unnecessarily and the use of low emission fuels.
- All plant not in operation shall be turned off and idling engines shall not be permitted for excessive periods.
- Material handling systems and site stockpiling of materials will be designed and laid out to minimise exposure to wind. Water misting or sprays will be used as required if particularly dusty activities are necessary during dry or windy periods.
- Material stockpiles containing fine or dusty elements including topsoils shall be covered with tarpaulins.
- Construction techniques shall minimise dust release into the air.
- Provide wheel washing facilities at all exit points.
- Provide tarpaulins over all unacceptable excavated materials being removed from site.
- Control vehicle speeds and impose speed restrictions, (speed can mobilise dust).

- Sweep hard surface roads, inside and outside the site, to ensure roads are kept clear of debris, soil or other material.
- Locate stockpiles away from sensitive receptors, (i.e. receptors sensitive to dust release).
- Where drilling or pavement cutting, grinding or similar types of stone finishing operations are taking place, measures to control dust emissions will be used to prevent unnecessary dust emissions by the erection of wind breaks or barriers.
- Concrete cutting equipment shall be fitted with a water dampening system.
- A programme of air quality monitoring shall be implemented at the site boundaries for the duration of construction phase activities to ensure that the air quality standards relating to dust deposition are not exceeded. Where levels exceed specified air quality limit values, dust generating activities shall immediately cease and alternative working methods shall be implemented.
- A complaints log shall be maintained by the construction site manager and in the event of a complaint relating to dust nuisance, an investigation shall be initiated.

During dry spells and if deemed necessary, monitoring of dust levels shall be carried out using the Bergerhoff Method i.e. analysis of dust collecting jars left on-site (German Standard VDI 2119, 1972). Results will be compared to the TA Luft guidelines (TA Luft, 1972). Should an exceedance of the TA Luft limit occur during, additional mitigation measures, for example more regular spraying of water, shall be implemented.

11.0 Waste Management Plan

A "*Construction & Demolition Waste and By-Product Management Plan*", has been completed by Byrne Environmental and should be referenced with this Construction Management Plan for the proposed development.

The Construction & Demolition Waste and By-Product Management Plan specifically addresses the following points:

Waste materials generated by construction activities will be managed according to the Department of the Environment, Heritage and Local Government's 2006 Publication - Best Practice Guidelines on the Preparation of Waste Management Plans for Construction and Demolition Projects.

- Analysis of waste arisings / material surpluses
- Specific Waste Management objectives for the Project including the potential to re-use existing on-site materials for further use in the construction phase.
- Methods proposed for Prevention, Reuse and Recycling
- Waste Handling Procedures
- Waste Storage Procedures
- Waste Disposal Procedures
- Record Keeping

Waste minimisation and prevention shall be the primary responsibilities of the Construction Project Manager who shall ensure the following:

- Materials will be ordered on an "as needed" basis to prevent over supply;
- Materials shall be correctly stored and handled to minimise the generation of damaged materials;
- Materials shall be ordered in appropriate sequence to minimise materials stored on site;
- Sub contractors will be responsible for similarly managing their wastes;

11.1 Programme of Waste Management for Construction Works

It is proposed that the construction Contractor as part of regular site inspection audits will determine the effectiveness of the waste management statement and will assist the project manager in determining the best methods for waste minimisation, reduction, re-use, recycling and disposal as the construction phase progresses and waste materials are generated.

11.2 Construction Waste Disposal Management

It is proposed that from the outset of construction activities, a dedicated and secure compound containing bins, and/or skips, and storage areas, into which all waste materials generated by construction site activities, will be established within the active construction phase of the development site.

In order to ensure that the construction contractor correctly segregate waste materials, it is the responsibility of the site construction manager to ensure all staff are informed by means of clear signage and verbal instruction and made responsible for ensuring site housekeeping and the proper segregation of construction waste materials.

It will be the responsibility of the Project Construction Manager to ensure that a written record of all quantities and natures of wastes exported -off site are maintained on-site in a Waste File at the Project office.

It is the responsibility of the Project Construction Manager or his/her delegate that all contracted waste haulage drivers hold an appropriate Waste Collection Permit for the transport of waste loads and that all waste materials are delivered to an appropriately licenced or permitted waste facility in compliance with the following relevant Regulations:

- Waste Management (Collection Permit) Regulations 2007 (SI No. 820 of 2007)
- Waste Management (Collection Permit) Amendment Regulations 2008 (SI No. 87 of 2008)
- Waste Management (Facility Permit and Registration) Regulations S.I.821 of 2007 and the Waste Facility Permit under the Waste Management (Facility Permit and Registration) Amendment Regulations S.I.86 of 2008.

Prior to the commencement of the project, the Project Construction Manager shall identify a permitted Waste Contractor who shall be employed to collect and dispose of all wastes arising from the project works. In addition, the Project Construction Manager shall identify and all waste licensed / permitted facilities that will accept all expected waste exported off-site and will maintain copies of all relevant Waste Permits / Licences as required.

All waste soils prior to being exported off-site, shall be classified as inert, non-hazardous or hazardous in accordance with the EPA's Waste Classification Guidance – List of Waste & Determining if Waste is Hazardous or Non-Hazardous document dated 1st June 2015 to ensure

that the waste material is transferred by an appropriately permitted waste collection permit holder and brought to an appropriately permitted or licensed waste facility.

11.3 On-Site Waste Reuse and Recycling Management

Construction waste material such as soils, damaged or broken concrete slabs, blocks, bricks and tiles generated that is deemed by the Project Engineer to be suitable for reuse on the Project site for ground-fill material and landscaping. This initiative shall provide a positive environmental impact to the construction phase as follows:

- Reduction in the requirement for virgin aggregate materials from quarries
- Reduction in energy required to extract, process and transport virgin aggregates
- Reduced HGV movements associated with the delivery of imported aggregates to the site
- Reduced noise levels associated with reduced HGV movements
- Reduction in the amount of landfill space required to accept C&D waste
- Reduction in the volume of soils to be exported off-site

11.4 Waste Storage Compound

A waste storage compound shall be set up on-site from the commencement of site activities. The compound shall include the following:

- Separate waste skips labelled with signage stating the nature of waste materials that can only be placed in the skips
- Waste oils / containers shall be placed in dedicated mobile bunds units.
- Soils contaminated by accidental on-site spillages of oils / construction hydrocarbons shall be stored in clearly identified hazardous waste storage containers.
- Spill kits with instructions shall be located in the waste storage compound.

11.5 Soils

The subject development site is currently greenfield and undeveloped with no evidence of historic dumping or industrial use.

Top and subsoils shall be re-used on-site for landscaping purposes to minimise the volume of soils to be exported off-site

Excess soils shall be exported to an appropriately waste permitted/licenced facility.

Excavated excess soils that are required to be exported off-site may be suitable for re-use in other construction sites and may be declared as a by-product in accordance with Article 27 of the European Communities (Waste Directive) Regulations 2011. Article 27 requires that the material classified not a waste but a by-product must meet specific criteria and that that a declaration of a material as a by-product is notified to the EPA.

11.6 **Contaminated Soils**

Where contaminated soils/materials are discovered or occur as a result of accidental spillages of oils or fuels during the construction phase, these areas of ground will be isolated and tested in accordance with the 2002 Landfill Directive (2003/33/EC) for contamination, and pending the results of laboratory WAC testing, will be excavated and exported off-site to an appropriately licenced facility for treatment/disposal.

12.0 WORKING ADJACENT TO THE LUAS LINE

12.1 Construction Works Adjacent to the Live LUAS Line

The proximity of the LUAS light rail system will be considered during the design of the excavation works and normal construction works. The works will comply with the RPA/TII document "Code of Engineering Practice for Works on, near or adjacent to the LUAS Light Rail System". The following section outlines the actions to be taken to address the following:

- safety of the public;
- the LUAS tracks remain active during the construction process;
- arcing of the overhead power lines.

12.2 Works Access Permit

Since the site is located immediately beside a live LUAS track it will be necessary to obtain a works access permit from the operator of the LUAS prior to the commencement of any work on the site. This works access permit is a written declaration issued by the operator detailing the conditions under which the works can be carried out. Under no circumstances will the contractor deviate from the conditions as set out in the works access permit.

12.3 Induction and Training

The LUAS operator will provide a specific safety course for any party working adjacent to the LUAS line. Additionally, the relevant party will undergo a 'Train the Trainer' course. On completion of this course the relevant party may, with the agreement of the LUAS operator, provide the training to their own personnel

Personal Protective Equipment (PPE) will be worn by all personnel working on the project. Any personnel working along the LUAS line will be required to wear PPE as agreed with the LUAS operator prior to the commencement of the project. This will include high visibility clothing, safety helmets and safety footwear as a minimum.

12.4 **Person in Charge of LUAS Works (PICLW)**

A Person in Charge of LUAS Works (PICLW) will be appointed for the duration of the project. The PICLW will be over 18 years of age and will have appropriate safety awareness training and will have sufficient technical knowledge or experience to avoid danger in the works that they are required to undertake. The PICLW will be obliged to have the written approval of the LUAS operator to work within the immediate vicinity of the LUAS track, to arrange protection and supervise the working parties, and to accept any safety documents required for the project.

If the PICLW is to be replaced, the outgoing PICLW will advise the incoming PICLW of the full details of the arrangements associated with project, hand over all relevant documentation to the incoming PICLW and advise the name of the incoming PICLW to the authorised person who will keep a record of all such details. The incoming PICLW will sign all the relevant documentation at the time of replacing the outgoing PICLW.

12.5 **Weekly Engineering Meetings**

It is understood that the LUAS operator will hold a weekly engineering meeting to ensure there are no conflicts between the construction project and the operations of the LUAS. The meetings will discuss and resolve the current work request forms and the following week's programme. The Luas operator may request the presence of the relevant party to the weekly engineering meeting to reschedule the requested works to a different time as that requested on the works request form.

12.6 **Dangers of Overhead Conductor System (OCS)**

Contact to the OCS will be high risk to the construction process as well as to the general public and LUAS users. **The OCS shall be considered live at all times** unless expressed certified otherwise by the LUAS operator. To minimise the risk of contact with the OCS during the construction stage the following precautions will be taken:

- Complete a risk analysis of works in the vicinity of the OCS;
- Notify all relevant bodies;
- The risk will be considered at design stage;
- Out of hours working to minimise the effect on the operation of the LUAS;
- Goal post establishment;
- Tower crane zoning systems;
- Insulate the line.

A risk analysis will be carried out for the OCS in consultation with the LUAS operator. The analysis will outline the dangers associated with working within the close vicinity of a light railway system with OCS. All risks assessments will be accompanied by a list of control measures

to eliminate or manage the hazard. The risk assessment will be carried out prior to the commencement of works on site.

All contractors will be notified of the existence of the OCS. Each contractor will implement specific control measures to reduce the risk of contact with the OCS.

To reduce the risk of contact with the OCS when hoisting materials all lifts will be within 75% of the safe working load of the lifting device. A lifting plan will be implemented for each component to be lifted.

Goal posts will be established along the line of the hoarding to identify the proximity of the OCS to the operators of machinery.

An electronic limiting system will be incorporated onto any cranes working on the site. This system is a computerised device that will restrict the crane driver from deviating from a previously agreed lifting environment and ensuring that he crane will not enter the zone of the OCS.

It may be necessary to insulate portions of the power line which may not be in direct contact with the LUAS antenna. Such portions may include the support arms and stays and will reduce the risk of contact with the OCS.

12.7 Noise, Vibration and Settlement

The construction process will be the main concern with regard to noise, vibrations and settlement. Various measures will be taken to control these elements during the project.

Noise monitors may be erected, and data collected to assess sound levels. Ear protection zones will be established, and all personnel will be trained on ear protection procedures. Silent generators will also be used on site.

Vibration monitors will be erected prior to the works along the site perimeter to analyse the vibration emitted during the process. The data will be collated and changes to the work practices will be made should the vibrations exceed previously agreed limits.

The construction team will endeavour to minimise the effect of the works on the LUAS. Levels will be taken on a daily basis of the LUAS lines for two weeks prior to the commencement of the works in order to establish a datum level of the LUAS line. During the project, levels of the

LUAS line will be taken on a daily basis and the data collected will be submitted to the LUAS operator for review. Deviations from the datum level above a previously agreed limit may cause the works to cease and the relevant contractor to review their techniques involved.

Vibration and settlement monitoring will, at all times, comply with the RPA/TII document "Code of Engineering Practice for Works on, near, or adjacent the LUAS Light Rail System.

12.8 Urgent Works and Emergencies

While working along the LUAS line emergencies may arise. It may be the case that the contractor is the first person to be aware of the emergency and it is important that the right action is taken. The following procedures will apply:

1. Keep all personnel as far from the danger zone as possible and contact the LUAS operator as a priority. Do not leave the site unattended.
2. If necessary, call the emergency services on 999 or 112.
3. It may be necessary to stop the LUAS or make dead the OCS. This can be done by contacting the LUAS central control room on the emergency contact line 01-4673040. The person making the call to the central control room is to state that it is an emergency call and as accurately as possible provide the location of the emergency by means of providing the number of the nearest OCS support pole or naming the tram stop. This person will then remain at the telephone until told what to do.
4. If it is necessary to stop approaching LUAS trains this will be done so by facing the train and raising both hands above the head or by waving a red light at night or in poor visibility.
5. Under no circumstances will the any worker attempt to recover equipment or rescue people from contact with the OCS. If a casualty is in contact with the OCS, do not touch the person until the correct procedure has been followed and it is safe to attend to the person.
6. All personnel working in the vicinity of the OCS shall be familiar with the procedure for dealing with cases of electric shock.

13.0 COMPOUND FACILITIES / PARKING

The construction compound for the infrastructure works shall be generally located as per Figure 3 below. The compound shall be constructed using a clean permeable stone finish and will be enclosed with security fencing. Site accommodation to be provided will include suitable washing / dry room facilities for construction staff, canteen, sanitary facilities, first aid room, office accommodation etc. Access to the compound will be security controlled and all site visitors will be required to sign in on arrival and sign out on departure.



Figure 3 Indicative Site Compound Location

A permeable hardstand area will be provided for staff parking and these areas will be separate from designated machinery / plant parking.

The contractor will strive to maintain a tidy site and to operate a “just in time” policy for the delivery and the supply of materials for the works, particularly the final phase of the works when on site storage will be at a minimum.

A material storage zone will also be provided in the compound area. This storage zone will include material recycling areas and facilities.

A series of 'way finding' signage will be provided to route staff / deliveries into the site and to designated compound / construction areas.

On completion of the works all construction materials, debris, temporary hardstands etc. from the site compound will be removed off site and the site compound area

A teleporter will be used for general unloading during the structural and envelope works. Unloading over the public roadway and path will be avoided.

14.0 CONCLUSION

A "construction stage" Construction Management Plan will be prepared and agreed with South Dublin County Council prior to commencement on site and will incorporate recommendations of all specialist reports, the recommendations included in this planning report and any planning conditions relating to construction activity.