OUTLINE CONSTRUCTION MANAGEMENT PLAN

SANDYFORD CENTRAL RESIDENTIAL DEVELOPMENT,
SANDYFORD, DUBLIN 18

Sandyford GP Limited

Project No. R478

15th November 2019

OCSC
O'CONNOR | SUTTON | CRONIN
Multidisciplinary
Consulting Engineers

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NOTICE

DOCUMENT CONTROL & HISTORY

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1 INTRODUCTION

1.1 Appointment

O'Connor Sutton Cronin have been appointed by our client, Sandyford GP Limited (acting in its capacity as general partner for the Sandyford Central Partnership), to prepare an Outline Construction Management Plan in relation to the proposed strategic housing development at a 1.54 ha site at the former Aldi Site, Carmanhall Road, Sandyford Business District, Dublin 18.

1.2 Administrative Jurisdiction

The site is located within the administrative jurisdiction of Dún Laoghaire-Rathdown Council whose offices are located at Dún Laoghaire-Rathdown County Council (DLRCC), County Hall, Marine Road, Dún Laoghaire, Co. Dublin.

1.3 Site Location

The site is situated within the Sandyford Industrial Estate which is in jurisdiction of Dún Laoghaire Rathdown County Council (DLRCC). The site is in Dún Laoghaire Rathdown County Council (DLRCC) which is relatively flat coastal area with a rise of +160mAOD at the Sandyford Industrial Estate approximately 5.0km from the Sea. The administrate area is a highly urbanised area. The exact site location is highlighted in **Figure 1** following.

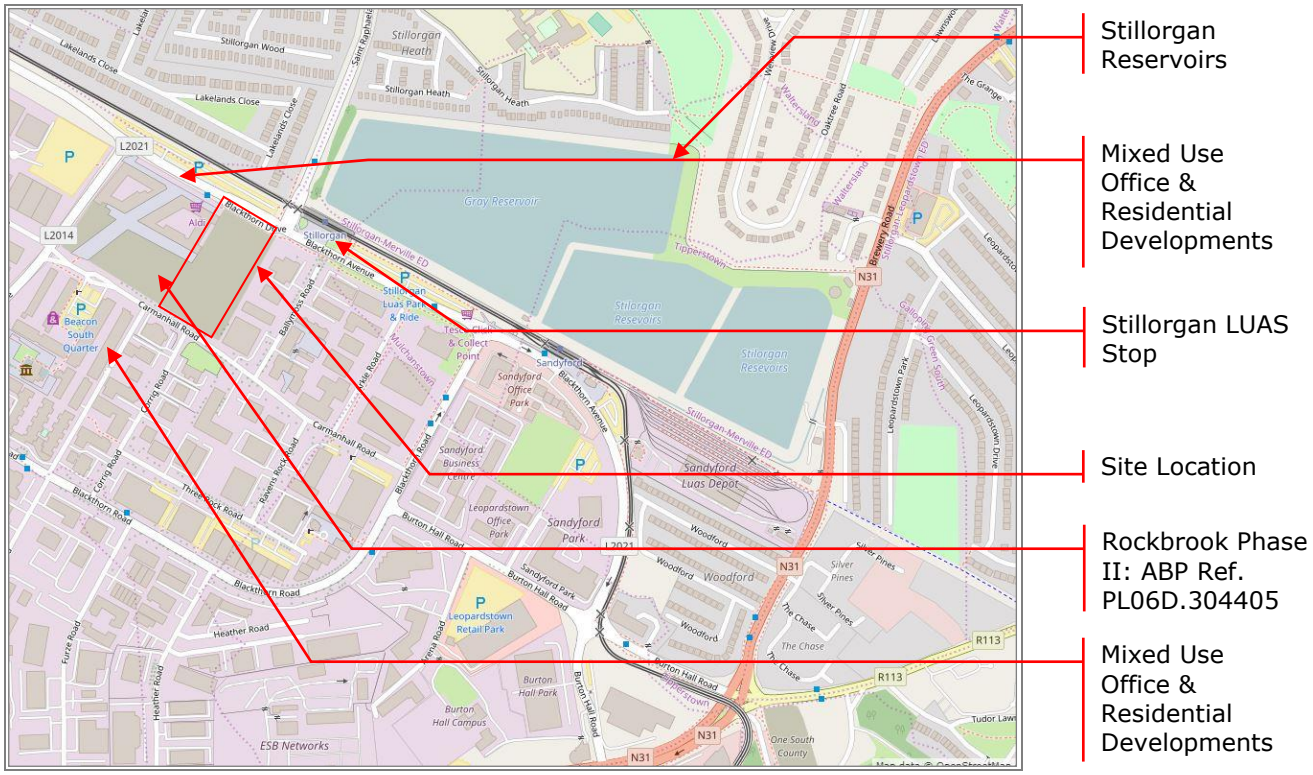


Figure 1: Site Location Map (Source Bing Maps)

As shown on Figure 1, the site's immediate surrounding area is mixed use in nature. The site is located south of the junction of Saint Raphaela's Road and Blackthorn Drive in Sandyford, Dublin 18.

1.4 Site Overview

The existing site is a brownfield site with almost 100% hardstanding. The total site is approximately 1.54 hectares (3.80 acres) and is currently an open yard in the northern and central section with a vacant commercial building located in the southern section. The site topography sees the existing ground levels raise from north to south resulting in a shallow fall in levels from Carmanhall Road to Blackthorn Drive of approximately 4.0m. A detailed topographical survey has been carried out for the site and has informed the design. The site topography is generally level with an existing concrete slab from a previous warehouse building at a level of approx. +81.30mAOD.

The site is bounded to the west by an existing apartment block and remaining vacant parcel of land forming part of the Rockbrook Development, the latter of

which has been granted permission under a separate planning application for Rockbrook Phase II (ABP Ref. PL06D.304405) for a residential development with ancillary retail, crèche and residential amenity elements. It is bound to the north by Blackthorn Drive, with the Luas Green Line, Stillorgan Reservoir and residential properties beyond. It is bound to the east by commercial developments zoned for "mixed use inner core" and to the southwest by Carmanhall Road.

1.5 Development Overview

The development, which will have a Gross Floor Area of 49,342 sq m will principally consist of: the demolition of the existing structures on site and the provision of a Build-to-Rent residential development comprising 564 No. apartments (46 No. studio apartments, 205 No. one bed apartments, 295 No. two bed apartments and 18 No. three bed apartments) in 6 No. blocks as follows: Block A (144 No. apartments) is part 10 to part 11 No. storeys over basement; Block B (68 No. apartments) is 8 No. storeys over basement; Block C (33 No. apartments) is 5 No. storeys over lower ground; Block D (103 No. apartments) is part 16 to part 17 No. storeys over lower ground; Block E (48 No. apartments) is 10 No. storeys over semi-basement; and Block F (168 No. apartments) is 14 No. storeys over semi basement.

The development provides resident amenity spaces (1,095 sq m) in Blocks A, C and D including concierge, gymnasium, lounges, games room and a panoramic function room at Roof Level of Block D; a crèche (354 sq m); café (141 sq m); a pedestrian thoroughfare from Carmanhall Road to Blackthorn Drive also connecting into the boulevard at Rockbrook to the west; principal vehicular access off Carmanhall Road with servicing and bicycle access also provided off Blackthorn Drive; 285 No. car parking spaces (254 No. at basement level and 31 No. at ground level); 21 No. motorcycle spaces; set-down areas; bicycle parking; bin storage; boundary treatments; hard and soft landscaping; lighting; plant; ESB substations and switchrooms; sedum roofs; and all other associated site works above and below ground.

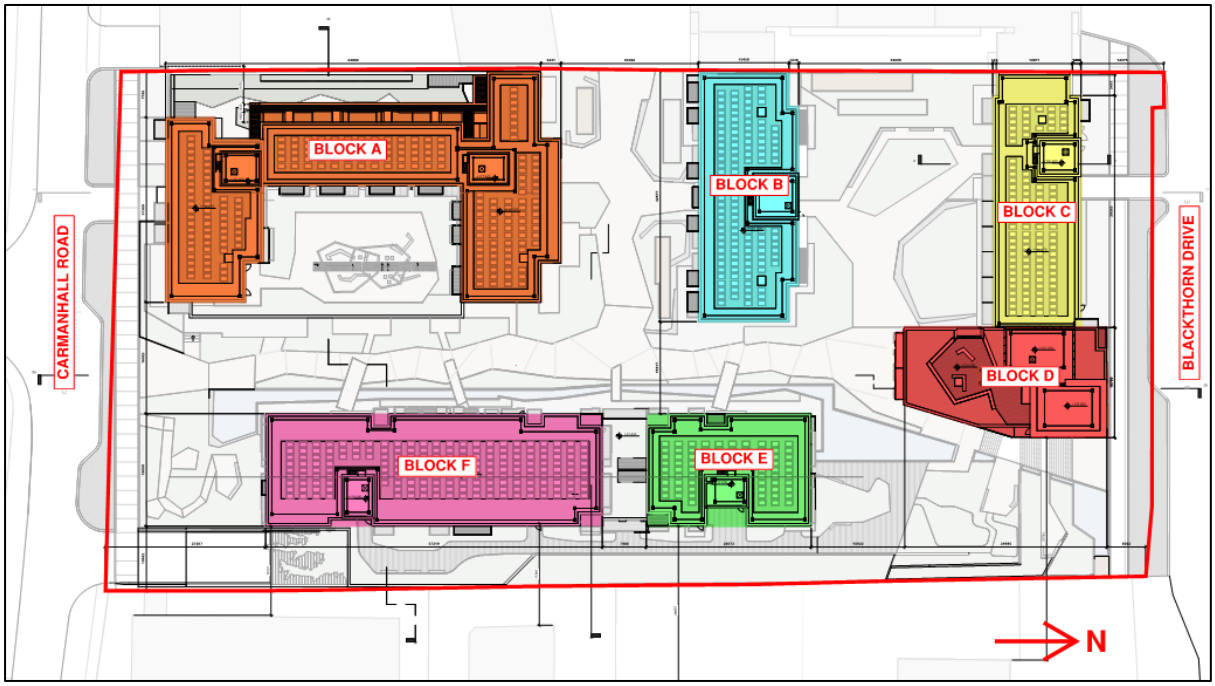


Figure 2: Proposed Site Plan

2 SCOPE OF REPORT

This report sets out the Outline Construction Management Plan (OCMP) for the proposed development as described in section 1 of this report.
This OCMP, is a preliminary plan written by OCSC multidisciplinary design engineers and will be subject to detailed development by the main contractor on appointment.

It sets out likely and anticipated construction methodology and phasing which will be developed by a main contractor prior to commencement of construction on site. The main contractor will then develop their own fully detailed construction management plan prior to commencement of works on site.

3 CONSTRUCTION PROGRAMME & PHASING

3.1 Key Activities

It is intended, that subject to a successful grant of planning permission, the proposed construction works will commence in Q3 2020. The construction phase is expected to be split over a number of phases.

It is intended that the proposed development will be constructed in the following sequence highlighting key activities;

- Secure site and set up boundary hoarding
- Clear site. Disconnect/divert services such as the water main and sub-station.
- Demolition of existing dwelling buildings and ancillary structures
- Foundation sub-structure works
- Basement construction including podium slab
- Construction of building frame of each block of varying heights
- Façade envelope construction
- Interior fit out and building services construction
- External landscape works

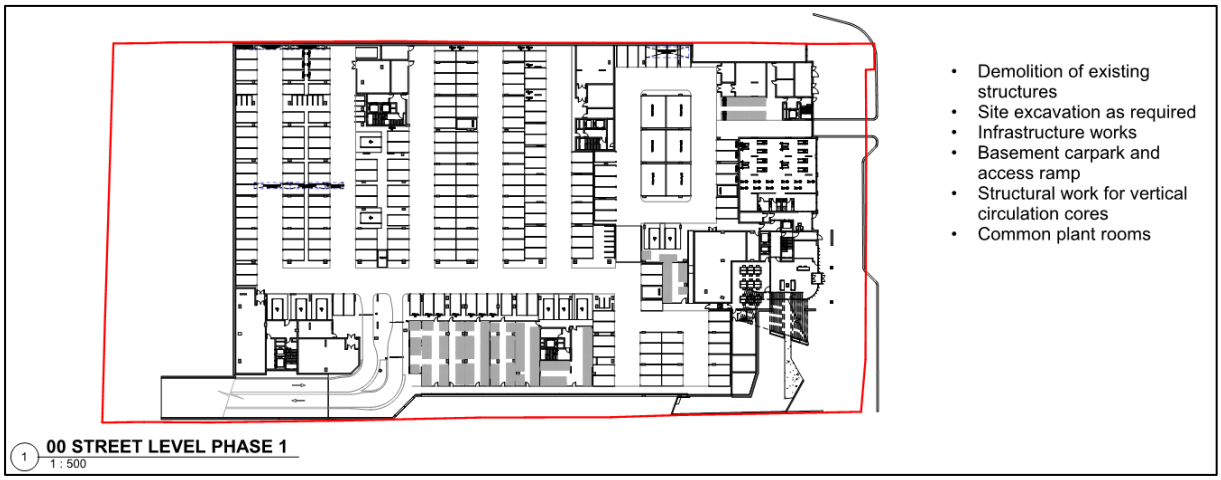
3.2 Phasing & Programme

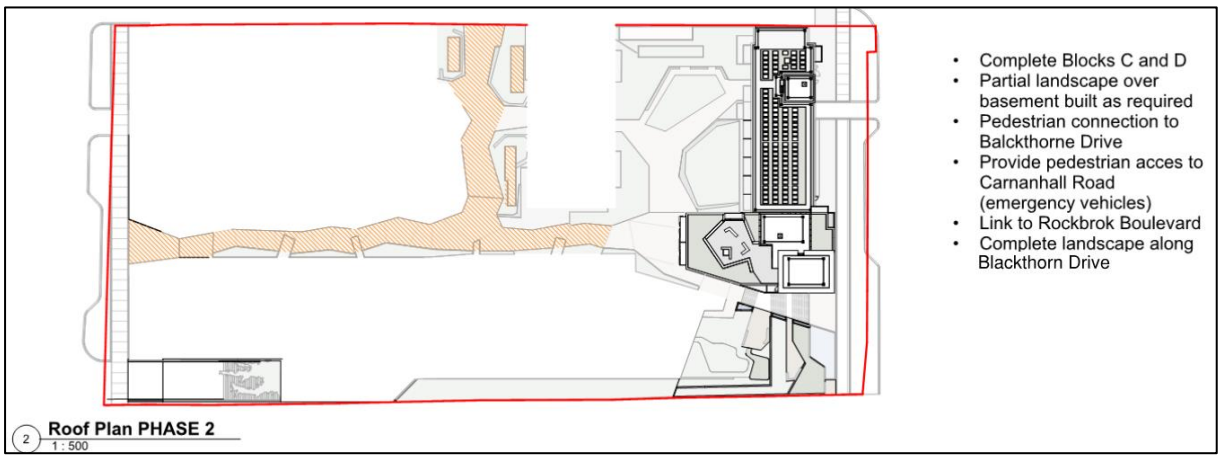
It is expected that the proposed SHD development will be constructed in 5 no. phases based on planning programme and market requirements. Phasing overlaps are anticipated which will be reviewed in further detail as the design progresses and a contractor appointed.

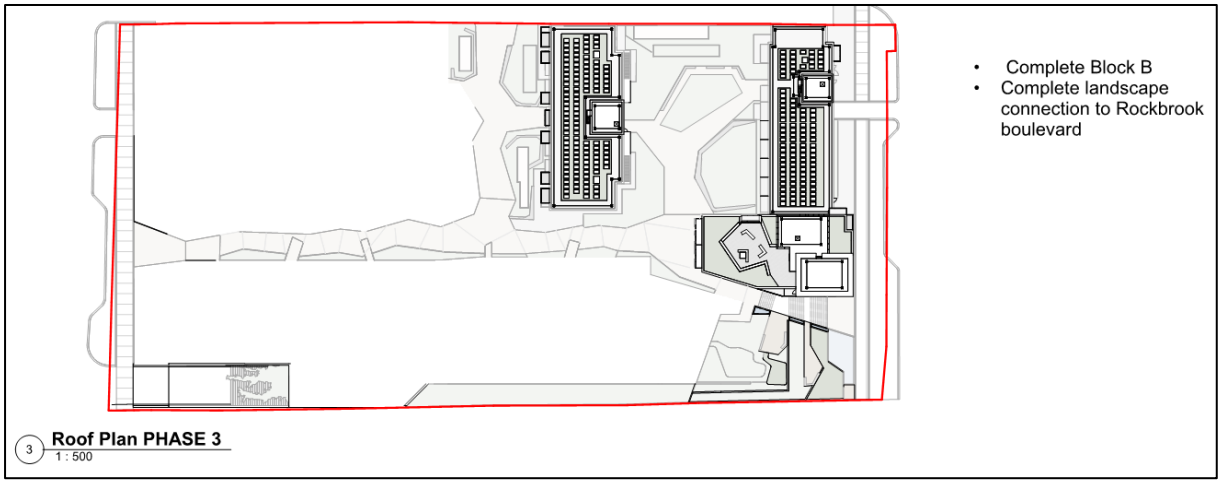
Phase 1 will comprise of the demolition of the existing structures on the site such as the vacant office building, water tanks, and rubble ramps. The existing live sub-station on the site will be decommissioned and demolished. The existing water main that transverses through the site will be diverted prior to excavation for the ground floor and foundation construction. The construction of the level 1 podium slab will mark the completion of Phase 1.

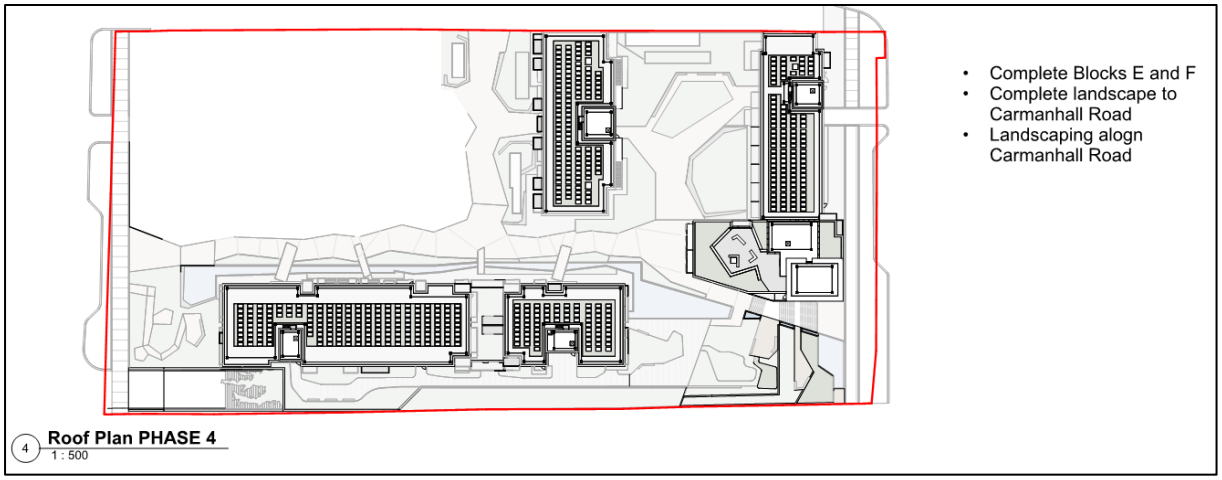
Following on from Phase 1, Phase 2 will comprise the construction of Block C & D along with sections of podium level landscaping. This will be followed by the construction of Block B (Phase 3), in turn by Blocks E & F (Phase 4), and finally by Block A (Phase 5). Throughout each phase, landscape areas around each building, links to Carmanhall Road and the Rockbrook development respectively, will be constructed.

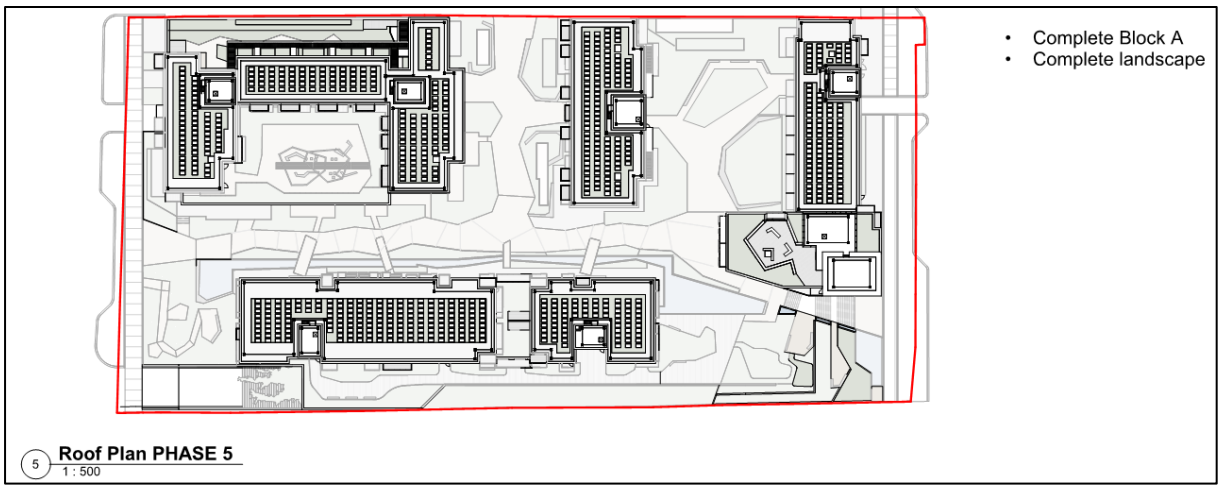
The outline phasing plan as illustrated on Henry J Lyons (HJL), architectural drawing, SFC-HJL-A-9100, is described in further detail below;











It is planned that the entire scheme is completed and handed over in two main sections as illustrated in Figure 3. The first section will comprise Blocks B, C and D along with a large section of the podium landscape works and passage through from Blackthorn Drive to Carmanhall Road.

The basement will be temporarily segregated as illustrated in Figure 4 to accommodate the sectioned project complete hand overs.

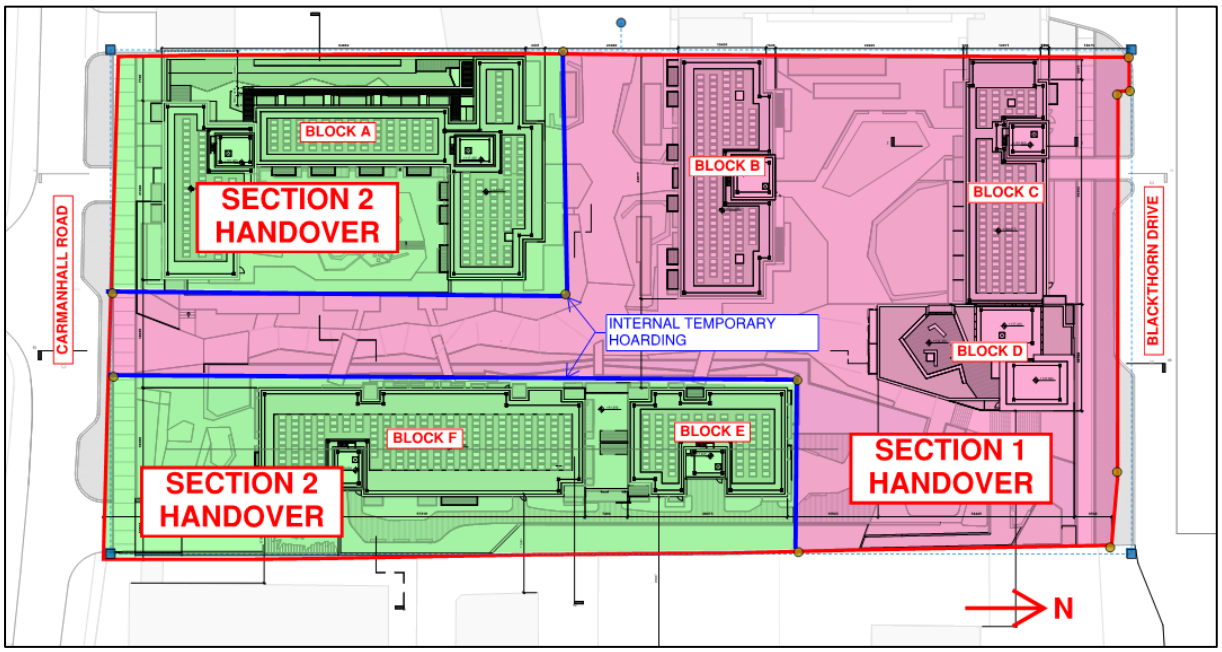


Figure 3: Project complete section handover areas

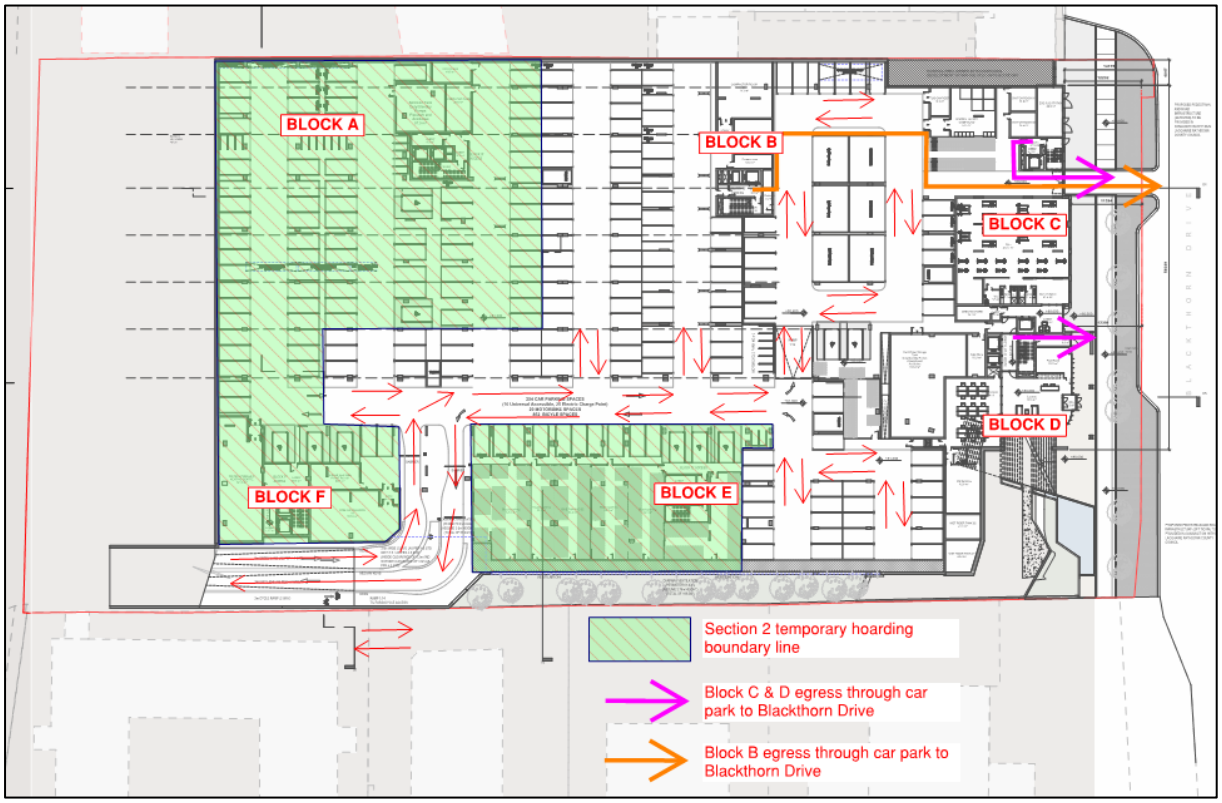


Figure 4: Temporary car park layout as part of Section 1 completion

4 SITE ESTABLISHMENT

4.1 Site Offices and Compound

Site offices and welfare compounds are to be provided on site for construction and management personnel. The main contractor will have to consider phased locations but it is anticipated that the main site compound area will be located outside the ground floor plan area at the south of the site for the majority of the project (Figure 5). The compound will have to be re-positioned as part of the final construction phase of Block A with possible alternative locations being areas of the ground floor car park serving Block A, or the Level 2 Block A podium slab.

Appropriate segregation will be employed on site to separate welfare facilities from construction works. Fenced off pedestrian walkways are to be provided along routes to the site offices.

A temporary electrical supply will be provided to the site from the existing local electrical supply network. The main contractor will make this application as part of the proposed works. Similarly the contractor will make and application to Irish Water for a temporary water supply connection and discharge of foul drainage from the site welfare facilities. It is be proposed that the contractor use one of the existing connections on site for these temporary works.

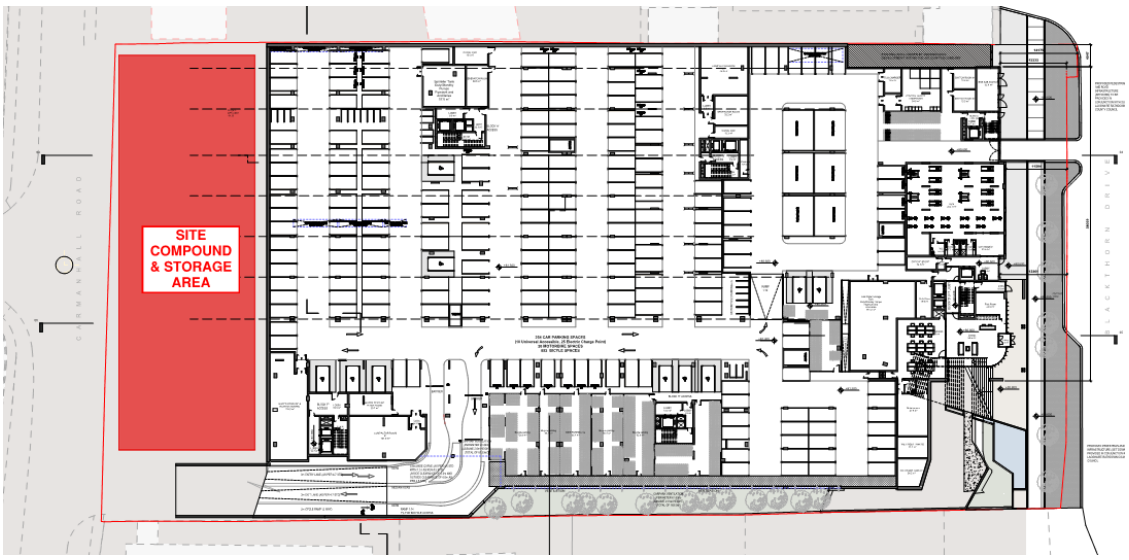


Figure 5: Proposed Site Compound Location Phase 1 to 4

4.2 Site Hoarding and Security

The entire site will require hoarding around the perimeter. This will prevent unauthorised access to the construction site and protect the public. Controlled access points (gates and/or turnstiles) will be provided with authorised access only and will be locked out of working hours. At the time of writing this report the client has installed and secured new hoarding around the entire site perimeter (Figures 6 & 7). Additional internal hoarding will be required within the site and will be installed by the contractor to separate phased building works from the public. This internal hoarding will be updated on a continuous basis by the contractor as each building phase is completed.

It is proposed that the main contractor employ a security company to monitor the site out of working hours through regular inspections and/or remote camera monitoring. During working hours the main contractor is to have a gates man permanently employed keeping record of all work personnel on site (holding valid SafePass accreditation), and visitors, entering and leaving the site.

Figure 6: Site hoarding along the eastern boundary

Figure 7: Site hoarding along Blackthorn Drive

4.3 Construction Personnel Numbers

Based on the size of the development and a 156 week construction period, it is estimated that 39,000 – 47,000 man weeks of onsite labour will be required for the project.

It is likely that an average of 250-300 construction personnel will be on site on a daily basis. However this figure may approach 350-400 during periods of peak activity such as basement works and fit out works etc.

4.4 Site Access

Prior to the commencement of the works on site the contractor is to prepare a detailed construction Traffic Management Plan which is to be agreed with the Local Planning Authority. Reference should also be made to OCSC's *Traffic Impact Assessment Report* ***SFC-OCSC-00-XX-RP-C-0003*** which has been submitted as part of this SHD scheme.

The site is currently accessed off Carmanhall Road at the south of the site. A secondary site entrance located at the north of the site on Blackthorn Drive has been sealed off.

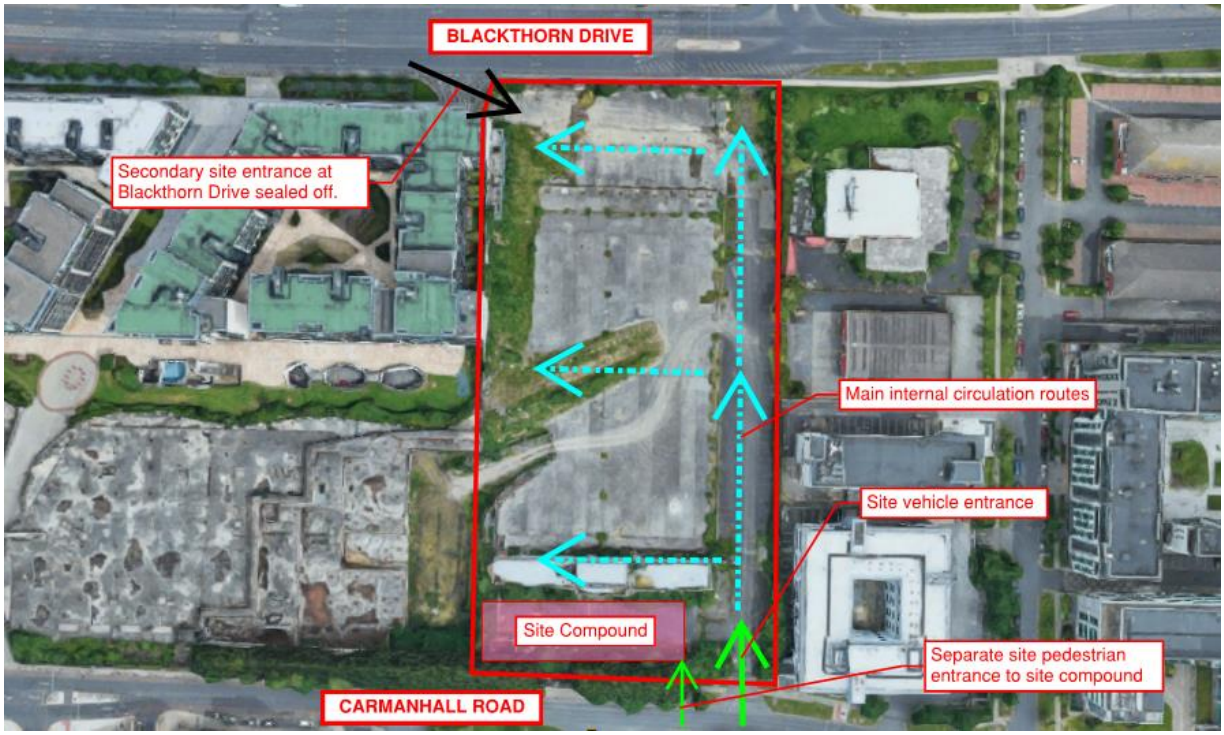


Figure 8: Site access and main circulation routes

4.4.1 Pedestrian Access

The main site pedestrian access will be strictly controlled via a manned turnstile system or similar. The main pedestrian entrance is to be segregated from the vehicle entrance and be located at a safe location on the site. Refer to Figure 8 for outline access proposal.

We anticipate that the contractor will stipulate that only *Safepass* accredited *or equal and approved* personnel will be permitted on site. A record of all personnel on site, including visitors, with the time of entry and exit is to be kept on site by the main contractor.

4.4.2 Vehicle Access

Vehicular access to the site will be via Carmanhall Road. All vehicular access will be controlled at the gate where all access and egress movements will be recorded. All site personnel and delivery drivers will have to undergo site induction prior to entering the site. Refer to Figure 8 for outline access proposal.

The construction period will be temporary in nature and is expected to consist of;

- Vehicles owned and driven by site construction staff and by full time site supervisory staff and occasional professional supervisory staff i.e. design team members and supervisory staff from utility companies;
- Materials delivery and removal vehicles.

4.5 Construction Vehicle Numbers

It is difficult to assess the exact quantum of traffic that will be generated during the construction period. However, a number of preliminary estimates have been made based on the extent of excavation, type of development and estimated phasing. Peak numbers of construction vehicles are expected during the excavation for the foundations and ground floor however given the site topography this has been limited.

These are summarised as follows:

- 30 no. private vehicles per day from staff and site visitors i.e. 60 no. vehicle movements;
- 25 no. light goods vehicles per day from subcontract staff i.e. 50 no. vehicle movements;
- 60 no. heavy goods vehicles per day outside of the peak excavation periods i.e. 120 no. vehicle movements.

Construction vehicles travelling to and from the site will be spread across the course of the working day meaning the number of HGV's travelling during the peak hours will be relatively low. Given typical construction working hours, staff travelling in private vehicles will arrive and depart the site outside of the peak traffic hours. As a result it is not anticipated to significantly impact on the surrounding road network.

A detailed operational stage analysis of vehicle movements in OCSC's *Traffic Impact Assessment Report* ***SFC-OCSC-00-XX-RP-C-0003,*** has concluded that the temporary construction vehicle numbers will be considerable lower.

No HGV transit permits are required for construction vehicles accessing the site provided they do not cross the city centre restricted zone.

4.6 Onsite Construction Parking

An appropriate amount of on-site parking will be provided to encourage staff to car share and to travel by the numerous public transport options serving the locality. However, the provision will be adequate to prevent overspill parking in the local area.

The potential for construction staff to be brought to the site in vans/minibuses may be investigated by the main contractor, however this would not be deemed a requirement given the abundant amount of public transport options available in the locality.

4.7 Site Cranage

The site is approximately 175 x 85m in plan with five individual buildings of varying height to be constructed. It is evident that a number of tower cranes will be required to provide sufficient site coverage. The exact number will be dictated by the programme, phasing, contractor and the specific construction requirements. However it is estimated that five tower cranes will be required based on a 40-50m jib length (Figure 9). Luffing jib cranes will be reviewed if required in the event that over sailing restrictions apply. If is not anticipated that any restrictions on this site will apply.

In addition it is expected that separate mobile crane lifts will be required at localised times throughout the project for certain items such as the erection and dismantling of tower cranes. All crane lifts are to be planned by the contractor and coordinated with the onsite works. The contractor is to ensure any road closure licenses and agreements with surrounding stakeholders are in place prior to these works. Road closure licenses will be kept to a minimum particularly at Blackthorn Drive where they are to be avoided at all costs due to the proximity of the Stillorgan Luas stop and the busy roadway.

Designated loading bays within the site are to be provided for any deliveries that are then to be craned to different locations on site.

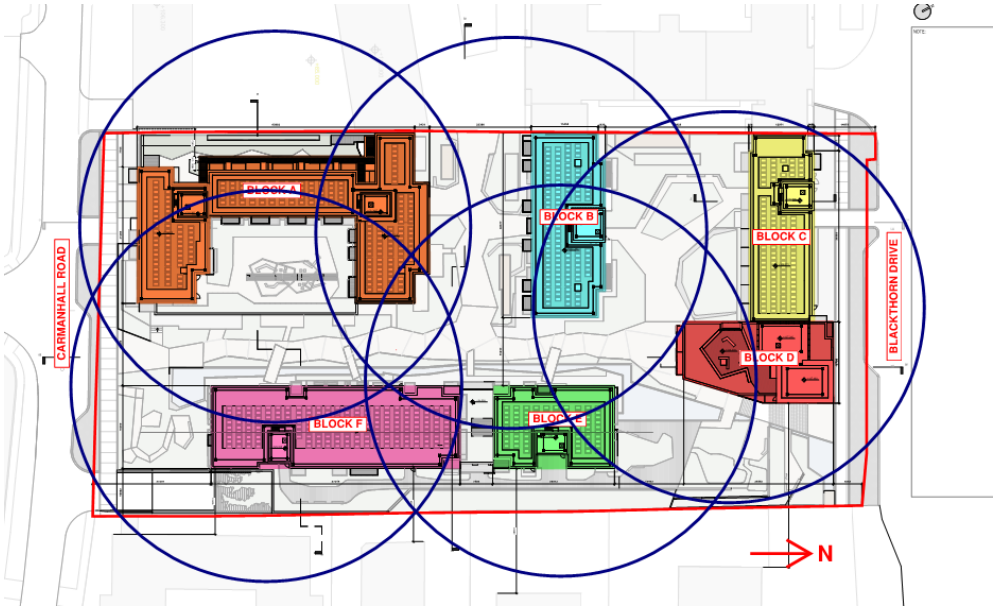


Figure 9: Outline Tower crane positions and lift radius (40-50m job length)

4.8 Logistics Planning

In relation to logistics planning the applicant has had regard to the subject site's location within the Sandyford Industrial Estate. This report puts forward some outline measures to deal with the site's constraints however it is expected that more detailed measures will be developed prior to commencement of the development and a more detailed *Material Logistics Plan* (MLP) will be prepared by the competent contractor appointed to the works. A major part of construction planning for the development will be the development of the MLP. This plan will stipulate that major deliveries of materials, plant and equipment times, will be properly coordinated by the contractor so that disturbance to adjoining sensitive receptors is kept to a minimum.

The Main Contractor will be required to prepare and adhere to a *Site Environmental Policy Plan* and all subcontractors will be required to buy into this document.

Main delivery times of materials to site are to be coordinated with adjacent stakeholders. No parking or waiting is allowed on the surrounding Carmanhall Road or Blackthorn Drive unless agreed in advance with the Local Authority. The contractor is to avoid at all cost any negative impacts to the operation of the busy Blackthorn Drive thoroughfare and Stillorgan Luas stop.

5 SITE MONITORING AND MANAGEMENT

5.1 Noise Monitoring

Noise monitoring will be established on site throughout the proposed works. The monitoring will be carried out in accordance with any ABP or DLRCC planning consent and also in accordance with *Safety, Health and Welfare at Work (Construction) Regulations* 2013 *Safety, Health and Welfare at Work Act* 2005, BS 6187:2011 - *Code of Practice for Full & Partial Demolition*, BS 5228:2009 *Code of Practice for Noise & Vibration Control on Construction & Open Sites*, *Environmental Protection Agency Act 1992*.

Measures will be implemented to minimise the impact of noise emissions at sensitive locations during the construction phase. Such measures will include the following:

- Construction contractors will be required to comply with the requirements of the European Communities (Construction Plant and Equipment) (Permissible Noise Levels) Regulations and the Safety, Health and Welfare at Work (Control of Noise at Work) Regulations;
- All plant items used during the construction phase should comply with standards outlined in the 'Safety, Health and Welfare at Work (Control of Noise at Work) Regulations' and the 'European Communities (Construction Plant and Equipment) (Permissible Noise Levels) Regulations'. Reference will be made to BS 5228: Part 1: 2009 (Noise Control on Construction and Open Sites - Part 1. Code of Practice for Basic Information and Procedures for Noise Control) and will include the following mitigation measures:
    - Training of site staff in the proper use and maintenance of tools and equipment;
    - The positioning of machinery on site to reduce the emission of noise and to site personnel;
    - Sources of significant noise will be enclosed where practicable;
    - Machines that could be in intermittent use will be shut down between work periods or will be throttled down to a minimum;
    - Plant known to emit noise strongly in one direction will, when possible, be orientated so that the noise is directed away from noise sensitive areas; and
    - Plant and/or methods of work causing significant levels of vibration at sensitive premises will be replaced by other less intrusive plant and/or methods of working where practicable.
- Inherently quiet plant will be selected where appropriate;
- Screening and enclosures will be utilised in areas where construction works are continuing in one area for a long period of time or around items such as generators or high duty compressors. For maximum effectiveness, a screen will be positioned as close as possible to either the noise source or receiver. The screen will be constructed of material

with a mass of >7kg/m^2 and should have no gaps or joints in the barrier material. This can be used to limit noise impact to any noise sensitive receptors;

- Operators of all mobile equipment will be instructed to avoid unnecessary revving of machinery and mobile equipment will be throttled down or switched off when not in use;
- Accordingly, where possible all construction traffic to be used on site will have effective well- maintained silencers; and
- All mobile plant will be maintained to a high standard to reduce any tonal or impulsive sounds.

5.2 Vibration Monitoring

Vibration monitoring will be carried out in accordance with BS 5228-1, 2009, *Code of Practice for Noise & Vibration Control on Construction & Open Sites*. Vibration max peak particle velocity (ppv) limits on site will be limited in accordance with BRE Digest 403 and the above mentioned industry standards. The main contractor is to consider the proximity of the existing developments surrounding the site, such as the Rookbrook development and the offices along the eastern boundary. The contractor is to allow for vibration and movement monitoring points to be set up at designated points. Construction works are to stop immediately if the vibration and movement limits noted above are reached.

5.3 Air Quality, Dust Control & Monitoring

Appropriate Air Quality and Dust monitoring will be carried out on a regular basis in accordance with ABP or DLRCC planning conditions, and records will be kept of all such monitoring for review by the Planning Authority. A dust minimisation plan has been prepared by AWN Consulting and is enclosed as appendix 11.3 of the Environmental Impact Assessment Report (EIAR) submitted as part of the SHD application.

The main activities that may give rise to dust emissions during construction include the following:

- Materials handling and storage; and
- Movement of vehicles (particularly HGV's) and mobile plant.

The following mitigation measures will be implemented on site during the construction phase, as required:

- Vehicles exiting site will use a wheel wash to ensure dust emissions are not generated from tyres. It will also prevent vehicles from carrying excess material onto public roads – see later;
- Covers will be employed on all vehicles leaving the site so as to minimise dust arising's off site;
- Site roads shall be regularly cleaned and maintained as appropriate;
- Hard surface roads shall be swept to remove mud and aggregate materials from their surface as a result of the development works;
- Any un-surfaced roads shall be restricted to essential site traffic only;
- Any road that has the potential to give rise to fugitive dust may be regularly watered, as appropriate, during extended dry and/or windy conditions;
- On-site speed limits will be stipulated to prevent unnecessary generation of fugitive dust emissions;
- Material handling systems and site stockpiling of materials shall be designed and laid out to minimise exposure to wind;
- A complaints register will be maintained on-site and any complaints relating to dust emissions will be immediately dealt with;
- In periods of dry weather when dust emissions would be greatest, a road sweeper, which would also dampen the road, will be employed in order to prevent the generation of dust;
- Water misting or sprays shall be used as required if particularly dusty activities are necessary during dry or windy periods – see later; and
- If appropriate, dust monitoring will be carried out during the construction phase of the scheme. If the level of dust is found to exceed 350mg/m^{2}day in the vicinity of the site, further mitigation measures will be adopted in the construction.

5.4 Pre-Commencement Condition Survey

A Visual Condition Survey (VCS) will be carried out of all surrounding streets and recorded prior to any site works commencing. The appointed Main Contractor will have to liaise with DLRCC Roads & Traffic Department to agree any changes to load restrictions and construction access routes for the site. Measures will be put in place as required to facilitate construction traffic whilst simultaneously protecting the built environment.

It is to be agreed with the main contractor and adjacent property owners if an internal condition survey of the existing surrounding buildings, such as the Rockbrook development, is to be carried out prior to construction commencing.

5.5 Site Management & Security

The site will be closely managed on a day to day basis by site management. Security and control will be provided at the main site access to record all personnel entering and leaving the site and to record and control all materials entering and leaving the site.

Appropriate manned security will be maintained at the site access gates in order to secure the site, to control vehicular access, and to monitor and record all deliveries and removals operations.

5.6 Wheel Washing Facilities, Covered Vehicles & Dust Suppression

During the basement excavation, a properly sized and designed wheel wash will be provided and maintained on site (or similar system). Appropriate water collection and filtering will take place prior to discharge to the public sewer system (subject to contractor gaining approval from DLRCC). Gate staff will be trained to inspect vehicles for cleanliness prior to egress to the public road network and any trucks that have been inadequately cleaned will be returned to site.

Cover systems will be used on all vehicles removing spoil from site so as to minimise dust arising on surrounding streets.

Trucks leaving the site will, as previously noted, pass through a wheel washing system (or similar). In addition these trucks will be watered down. This will be carried out in a dedicated wash down zone with dedicated site personnel.

The use of appropriate water based dust suppression systems will greatly reduce the amount of dust and windborne particulates as a result of the demolition and construction process. This system will be closely monitored by site management personnel particularly during extended dry periods.

6 DEMOLITION AND WASTE MANAGEMENT

6.1 Overview

In all cases the most efficient and environmentally sensitive methodologies will be used in the demolition process. The main demolition works will comprise the removal of the existing office building structure that was once part of the warehouse building that previously occupied the site. In addition the main concrete ground bearing slab from the warehouse building will be demolished along with ancillary structures such as concrete steps, tanks and rubble ramps (Figure 10).

The main building structure is two storeys high and it is expected that it will be demolished using plant machinery from ground level to avoid personnel working near, or within, the building during the demolition process. The contractor is to ensure that the removal of certain parts of the structure during demolition does not compromise the structural stability of the remaining structure and thus creating a health and safety hazard.

Waste materials will be grouped and segregated for removal off site to an approved licenced disposal/recycling facility. A full Construction and Demolition Waste Management Plan has been prepared by AWN Consulting and is enclosed as Appendix 15.1 of the EIAR submitted as part of the SHD submission.

Figure 10: Existing site demolition plan (items in orange to be demolished)

Two particular items that require utmost attention as part of the initial phases of the demolition planning is the decommissioning and demolition of the existing ESB substation on site and the Irish Water main that transverses through the site (Figure 11). OCSC have opened up formal dialogues with each of these bodies. It is expected that decommissioning and diversion agreements will be in place with the ESB and Irish Water respectively by the time a main contractor is appointed. These agreements will be handed over to the competent contractor, once appointed, to manage and implement on site.

The demolition will include the soft strip out and removal of any hazardous material. An Asbestos Survey Report has been prepared by Phoenix Environmental Safety Ltd (Report No. PE 19-881) dated 17th October 2019. No asbestos containing materials were identified during the asbestos survey of the existing office building on the Sandyford Central site.

Figure 11: Irish Water record drawing with water main within site boundary

6.2 Demolition Sequence

In terms of works sequence the following is proposed:

- Securing and establishing the site area (erection of site hoarding);
- Survey of existing services on site;
- Disconnecting/capping existing services;
- Decommissioning and demolition of the existing ESB substation
- Diverting of existing water main
- Removal of hazardous materials to a licenced facility;
- Soft strip out;
- Demolition of existing office building and ancillary structures
- Landscaping/surfacing removal including the warehouse concrete slab;
- Disposal of the arising's

6.3 Soil Waste Management

A ground investigation has been carried out on the site by Ground Investigations Ireland (GII). The findings from this investigation has been recorded in GII's Ground Investigation Report (8408-01-19) dated 30th August 2019. The results from soil samples taken for Laboratory Testing have been correlated into a Waste Classification Report produced by GII dated 7th August 2019. Laboratory Testing results have found that some of the soil material tested is above the inert limits as outlined within the European Council Directive 1999 131/EC Article 16 Annex II. Detailed dig plans have been produced in the Waste Classification Report for the varying depths of the planned excavation. No Asbestos was found in any of the samples.

Soil generated as part of the construction works will be managed in accordance with the Waste Classification Report. The contractor is to reference this report for management procedures to be implemented to ensure appropriate handling and disposal in accordance with Irish and EU legislative requirements.

6.4 Measures to Protect Groundwater

Specific measures to protect groundwater during the construction works on site if required will be put in place under the control of the Environmental Consultant. The contractor is to agree with DLRCC discharge licences prior to discharging any ground water into the public sewer network.

6.5 Removal of Hazardous Materials

An Asbestos Survey Report has been prepared by Phoenix Environmental Safety Ltd (Report No. PE 19-881) dated 17th October 2019. No asbestos containing materials were identified during the asbestos survey of the existing office building on the Sandyford Central site.

If asbestos is identified during the demolition, removal will be carried out by a specialist sub-contractor who will be responsible for the removal, transportation, and disposal, of all hazardous materials to an approved licenced disposal facility.

6.6 Segregation of Waste Material

Waste materials generated will be segregated on site where it is practical in accordance with the Construction and Demolition Waste Management Plan prepared by AWN Consulting and enclosed as Appendix 15.1 of the EIAR. Where the on-site segregation of certain wastes types is not practical, off-site segregation will be carried out. There will be skips and receptacles provided to facilitate segregation at source. All waste receptacles leaving site will be covered or enclosed. The appointed waste contractor will collect and transfer the wastes as receptacles are filled.

7 SUBSTRUCTURE AND SUPERSTRUCTURE CONSTRUCTION

7.1 Overview

The proposed construction sequence of the structure is to be traditional bottom up construction.

7.2 Substructure Construction Methodology

The ground floor forms a semi-basement construction and is to be formed with reinforced concrete (RC). The ground floor level has been set based on the existing site levels and footpath levels at Blackthorn Drive. This reduced the amount of excavation required with the southerly section of the site at Carmanhall Road requiring basement retaining walls (Figure 12).

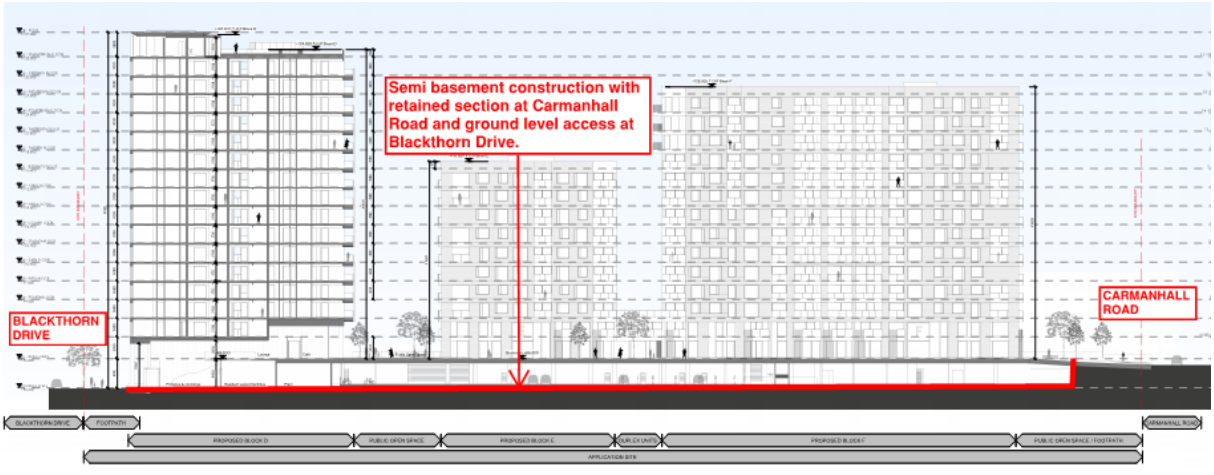


Figure 12: Semi basement cross section

Foundations will be designed accordingly using the results provided form the ground investigation for the site. Given the varying depths of the underlying Granite Bedrock it is anticipated that the foundations will comprise a combination RC foundation pads and piles founded on the rock (Figure 13).

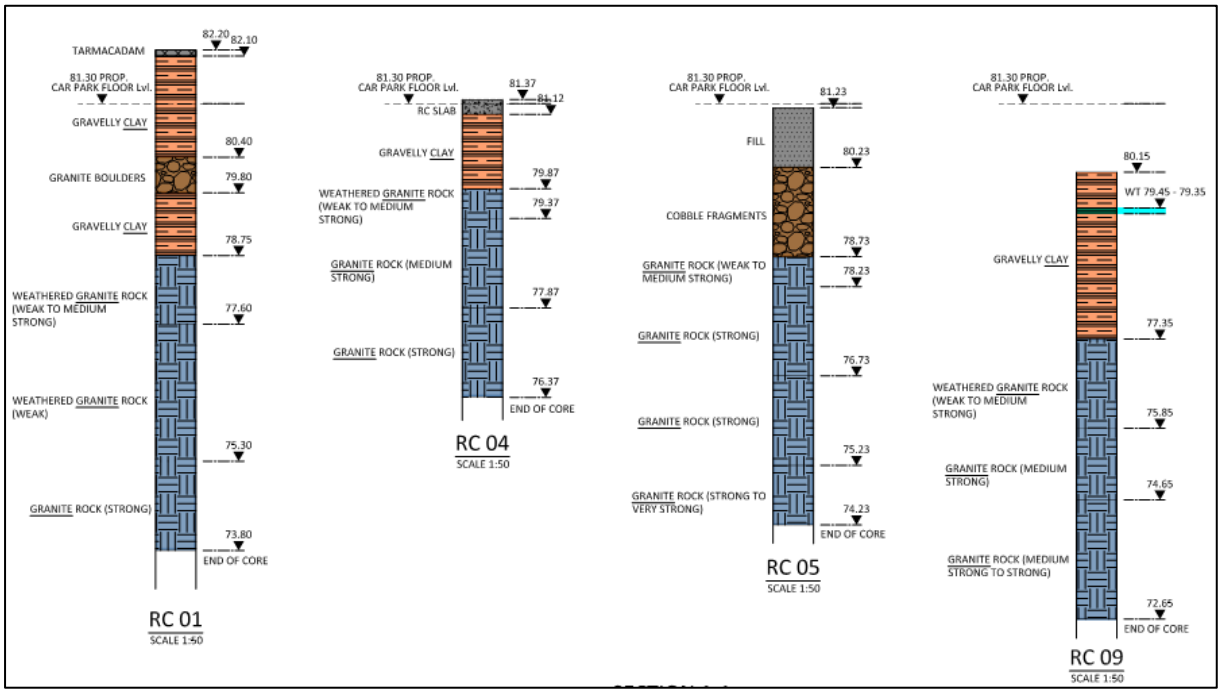


Figure 13: Site borehole logs showing varying Granite Rock level through a section of the site

The basement wall is subject to detailed design but is to form a semi basement box as described previously and shown in Figure 12. The basement wall is set back from the boundary with the footpath at Carmanhall Road to allow for batter back construction to be viable (Figure 14). Where this cannot be achieved closer to site boundaries, temporary retaining options such as sheet piles, king post and contiguous piles will be studied as part of the detailed design.

Figure 14: Typical batter back excavation and RC retaining wall construction

Ground water was encountered during the site investigation works and is found to be below the ground floor car park level. As a result of this, and the semi-basement nature of the construction, a tarmacadam and/or concrete ground bearing slab is envisaged for the ground floor construction. A pour plan will be proposed by the main contractor and agreed with the Engineer ahead of casting. This will outline the location of construction joints and the specific detailing of all water tightness installations.

Construction will be by traditional formwork and falsework methods with all temporary works being fully designed by a qualified chartered structural engineer acting as the contractor's temporary works engineer. Formwork and rebar will be handled by tower cranes and mobile plant equipment around the site.

Planning restrictions on working times will be strictly adhered to in the basement construction operation. In this regard it will be important for the Main Contractor to schedule sufficient time to allow for any power floating required after concrete pouring.

7.3 Superstructure Construction Methodology

The superstructure is subject to detailed design, however given the nature and the height of the buildings (tallest Block D 57m), it will involve conventional

construction methodologies, personnel, plant and equipment. The construction is to be phased as described in section 3. It is to be agreed with the main contractor weather slip form cores construction techniques will be used particular for some of the higher blocks. At this stage of the design it is anticipated that a concrete frame solution will be utilised for the scheme which provides inherent acoustic and fire resisting properties.

Once the superstructure reaches a number of storeys high, the lower levels can commence with external envelope and internal fit out works. Subject to detailed design, scaffold works will be required to construct the façade which the contractor is to coordinate with other construction works and vehicle/personnel routes within the site.

8 CONSTRUCTION HAUL ROUTES

As part of the planning process, representatives of the developer have had a number of meetings with the Planning Authority including the Roads & Traffic Department. A number of documents have been produced in relation to *Traffic Impact Assessment*, *Mobility Management Planning* and this document. All of these have been produced with the aim of minimising the construction and operational phase impacts of the development.

Notwithstanding the above it is evident that the construction of the development, will generate significant traffic movements including movements of heavy goods vehicles. These vehicles will be involved in bringing deliveries to the site and removing waste and spoil from the site during the construction phase.

It is important that the most appropriate construction routes be identified in order to bring materials to and from the site in the most efficient and environmentally sensitive manner. It is noted that specific haul routes will be agreed and licensed between the Main Contractor and DLRCC.

The site is located in south Dublin within the Sandyford Industrial Estate and is approximately 1km from junction 14 and 2.5km from junction 13 on the M50.

8.4 Construction Route Options

It is anticipated that construction haul routes will predominately use the M50 motorway to access the site. The following options are put forward for discussion:

- **Option 1:** this route runs directly from the site along Carmanhall Road eastbound towards Blackthorn Road and Blackthorn Avenue heading south towards the N31 and entering the M50 northbound at Junction 14;

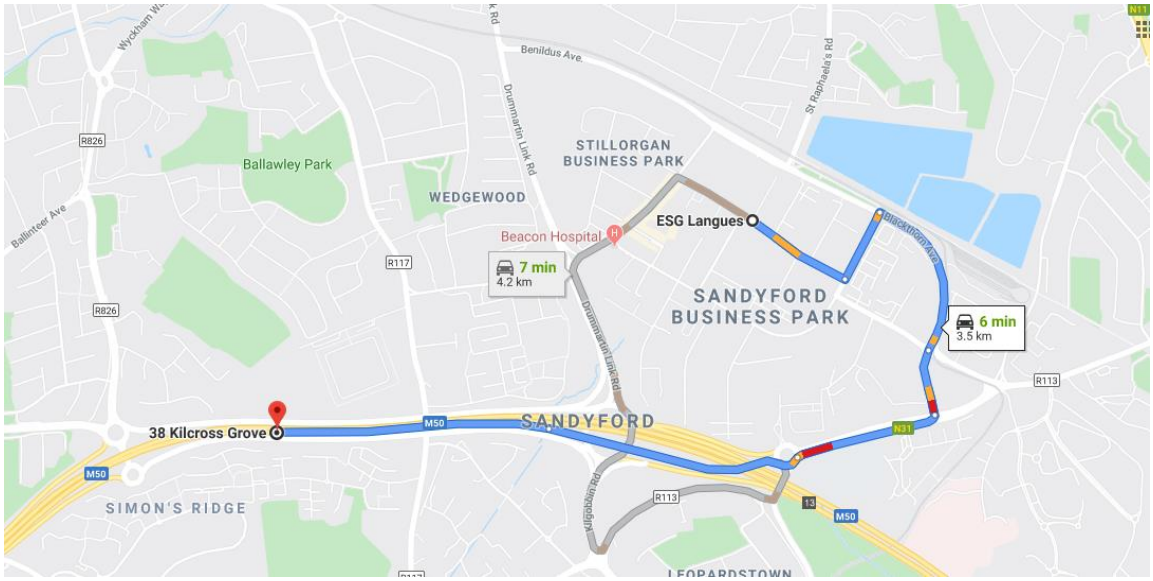


Figure 15: Haulage route Option 1

- **Option 2:** this route runs directly from the site along Carmanhall Road westbound towards Blackthorn Drive and merging onto the Drummartin Link Road and entering the M50 northbound at Junction 13;

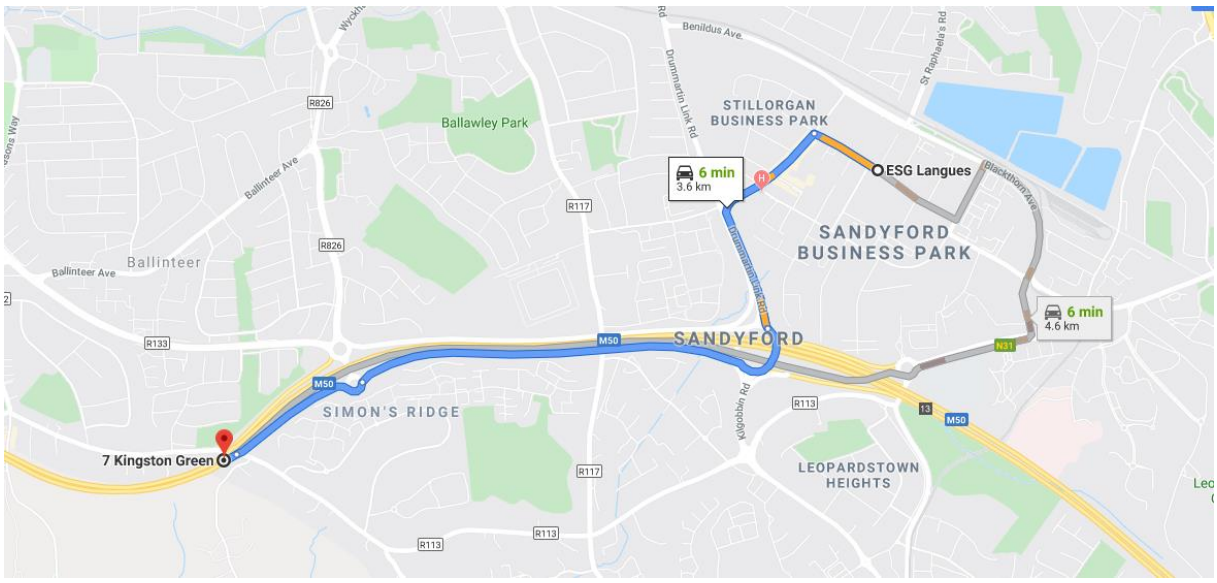


Figure 16: Haulage route Option 2

- **Option 3**: this route runs directly from the site along Carmanhall Road eastbound towards Blackthorn Road and Blackthorn Avenue heading south towards the N31 and entering the M50 southbound at Junction 14. Similarly construction vehicles could enter the M50 southbound at Junction 13 using the same route described in Option 2.

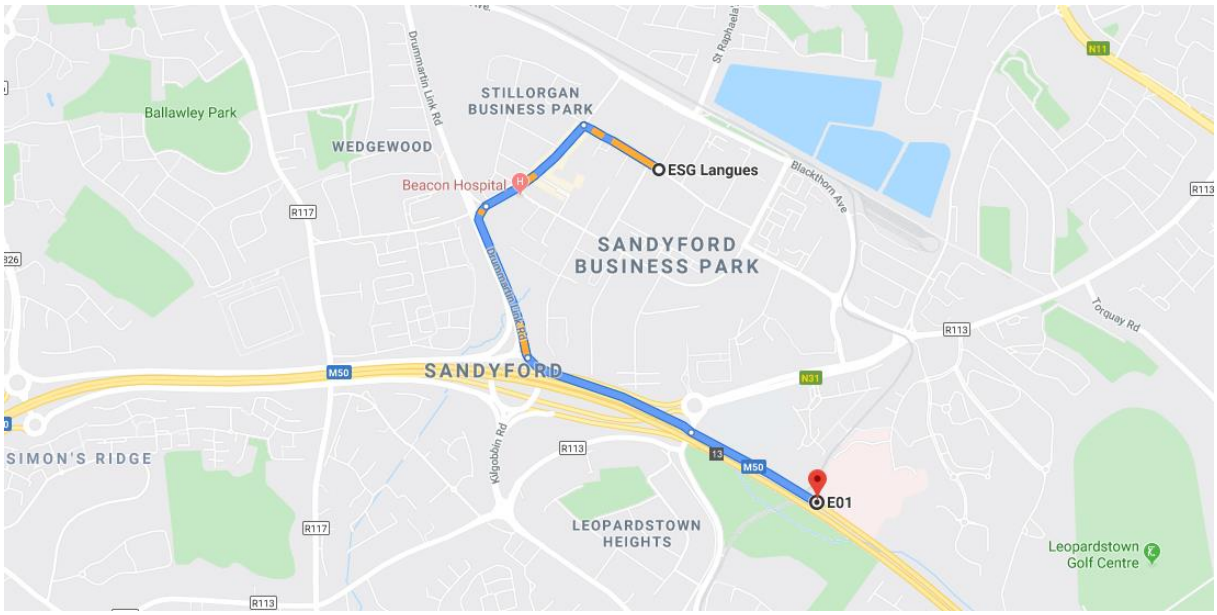


Figure 17: Haulage route Option 3

9 HEALTH & SAFETY

9.1 General Health, Safety and Environmental Consideration

Construction and demolition works will be carried out in such a way as to limit, as far as practicable, adverse environmental impact. Works will be carried out in accordance with the following general provisions:

- Planning approvals from the Local Authority;
- Requirements of the Local Authority.

As part of the Construction Method Statement, the process will ensure that construction techniques and materials used are a fundamental consideration of the design and intended long-term use, the aim below is achieved:

- Design for durability and low maintenance;
- Design for flexibility and adaptability;
- Use of materials from sustainable sources;
- Use of local materials where possible.

Safety, health and environmental issues on the development will be a primary consideration in the construction methods adopted. The construction team will develop detailed *Health & Safety Plans*, specific environmental, fire and accident procedures to suit the construction sequence and methodology of the development.

OCSC have produced detailed Design Risk Assessments as part of our design considerations for the SHD planning scheme. These DRA's are live documents that OCSC will continuously update at major milestones as the project design progresses. The DRA's will be available to the contractor when producing *Health & Safety Plans* highlighting site specific hazards and risk with associated mitigation actions that may not be entirely clear to a competent contractor.

Contractors involved in the development will ensure that all non-English speaking employees are provided with relevant Health & Safety information in their national language. All contractors will be required to adopt the relevant

skills certification required for that element of the works. A *Site Specific Safety Statement* and a detailed *Construction Stage Safety & Health Plan* will be compiled prior to any works on site and will be in accordance with the Health & Safety Authority and Local Authority guidelines.

9.2 Control of Substances Hazardous to Health

The strategy for controlling all substances and all work processes that may generate hazardous substances will be to address and have control measures put in place. Some of the control measures to be employed include the following:

- All fuel and chemicals to be stored in designated areas, with deliveries of hazardous materials supervised.
- Storage tanks and container facilities will be appropriately bunded.
- In the case of spills or discharges, remedial action will be taken as soon as possible in accordance with company procedures.
- Personal protective equipment (PPE) suitable to the pertaining conditions will be used by all site personnel.

9.3 Environmental, Emergency and Accident Procedure

Measures will be carried out to avoid environmental incidents, however if these occur then the following types must be reported to the responsible person in the construction team as per the *Site Accident & Emergency Procedure*. The overall strategy in the event of a spillage will be to '*Stop-Contain-Notify*' in the event of:

- Spills or discharge to the atmosphere , water supplies, sewage systems, rivers and other watercourses, or to the ground:
    - Any chemical products
    - Oils or fuels
    - Effluent/fumes and gases
    - Waste or contaminated materials
- Damage to existing:
    - Trees and wildlife

    - Flora and existing local habitats
- Any environmental incidents that could lead to:
    - Local Authority or regulatory enforcement
    - Public complaint

Emergency routes and procedures will be continuously adapted to suit the construction sequence and stage of the Development. An *Emergency & Evacuation Plan* will be prepared following the guidelines detailed below and updated on a regular basis during construction:

- Definition of the management organisation and responsibility for safety
- Definition of appropriate fire prevention measures, including good housekeeping of site, welfare facilities and offices.
- Adequate provision of fire extinguishers across the site.
- Use of non-flammable/fire retardant materials for protection of finished works.
- Safe use and safe storage of flammable materials of all categories, whether solid, liquid or gas.
- Appropriate waste management procedures.
- Monitoring the type and frequency of fire inspections/audits.
- Development of evacuation plans, to include escape routes, muster stations, means of sounding alarms and general emergency procedures.
- Site safety inductions and fire drills.
- The application of permit systems for Hot works, Confined Space Entry and Electrical Access Control.
- The provision of first aiders. Checking of emergency routes are available and unobstructed at all times.
- Liaison with the emergency services and occupants of the adjacent buildings.

First aid facilities will be established and at least one trained first aider will be present on-site at all times. In addition, trained Fire Wardens / Fire Marshalls will be in place on-site to address fire safety.

10 CONSTRUCTION STAGE COMMUNITY LIAISON

10.4 Overview

The appointed Main Contractor will be required to follow best practice '*Considerate Constructor*' guidelines. The Considerate Constructor experience in Ireland and the U.K. has been that early positive and proactive engagement with businesses and residents impacted by building works is the best approach.

10.5 Code of Practice

Considerate Constructors seek to improve the image of the construction industry by striving to promote and achieve best practice under the Code. The *Code of Considerate Practice* outlines the Scheme's expectations and describes those areas that are considered fundamental for registration with the Scheme. The Code is in five parts and contains a series of bullet points. Each section of the Code contains an aspirational supporting statement and four bullet points which represent the basic expectations of registration with the Scheme. The Code of Considerate Practice applies to all registered sites, companies and suppliers regardless of size, type or location.

10.6 Respect the Community

Constructors should give utmost consideration to their impact on neighbours and the public by informing, respecting and showing courtesy to those affected by the work. This shows itself in minimising the impact of deliveries, parking and work on the public highway. It also contributes to and supports the local community and economy. Finally it works to create a positive and enduring impression, and promoting the Code.

10.7 Community Liaison Manager

A Community Liaison Officer (CLO) will be appointed by the Main Contractor to lead and manage all community related issues. The CLO will initially host and attend regular community meetings. Following the initial meetings the CLO will compile a list of stakeholders in the area. These stakeholders will be kept informed of progress and planned works on the site through the publication and distribution of a Monthly Progress Newsletter.

Follow through is a vital attribute for successful community liaison so it will be a fundamental element of the CLO's job description that they continually engage with the community, follow through on promises and deliver results.

10.8 Construction Programme

An important element of community liaison will be the provision of updates to the community on the construction programme

In this regard each edition of the Community Newsletter will feature an update to the construction programme along with details of any upcoming Exceptional Activities which may impact on traffic, short term accessibility for businesses or residents or have the potential to be disruptive. It is intended that by implementing a strong community liaison relationship that the environmental impacts of the proposed development on the community can be minimised and the social impacts, by way of local employment or business opportunities may be maximised.

11 CONCLUSION

This Outline Construction Management Plan sets out likely and anticipated construction methodology and phasing which will be developed by a main contractor prior to commencement of construction on site. The main contractor will then develop their own fully detailed construction management plan prior to commencement of works on site.

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