CONSTRUCTION AND ENVIRONMENTAL MANAGEMENT PLAN

Proposed Development at Emmet Road

For DCC

PROJECT NO. B967

26 September 2022

OCSC
O'CONNOR | SUTTON | CRONIN
Multidisciplinary
Consulting Engineers

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NOTICE

DOCUMENT CONTROL & HISTORY

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CONSTRUCTION AND ENVIRONMENTAL MANAGEMENT PLAN

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1 INTRODUCTION

1.1 Appointment

O'Connor Sutton Cronin & Associates (OCSC) have been appointed by *DCC* as part of an integrated Design Team led by Bucholz McEvoy to undertake the Civil & Structural design for the proposed mixed-use development at Emmet Road, Inchicore, Dublin 8.

1.2 Administrative Jurisdiction

The proposed development is located in the jurisdiction of Dublin City Council.

1.3 Site Location

The site for the proposed development is located in the heart of Inchicore, as indicated in Figure 1.1 over.

Inchicore is a suburb of Dublin located approximately 4km to the west of Dublin city centre. Inchicore is primarily a residential area comprising predominantly of 2 storey early to mid 20th century housing stock with some medium rise apartments developments of both social and private built in more recent decades.

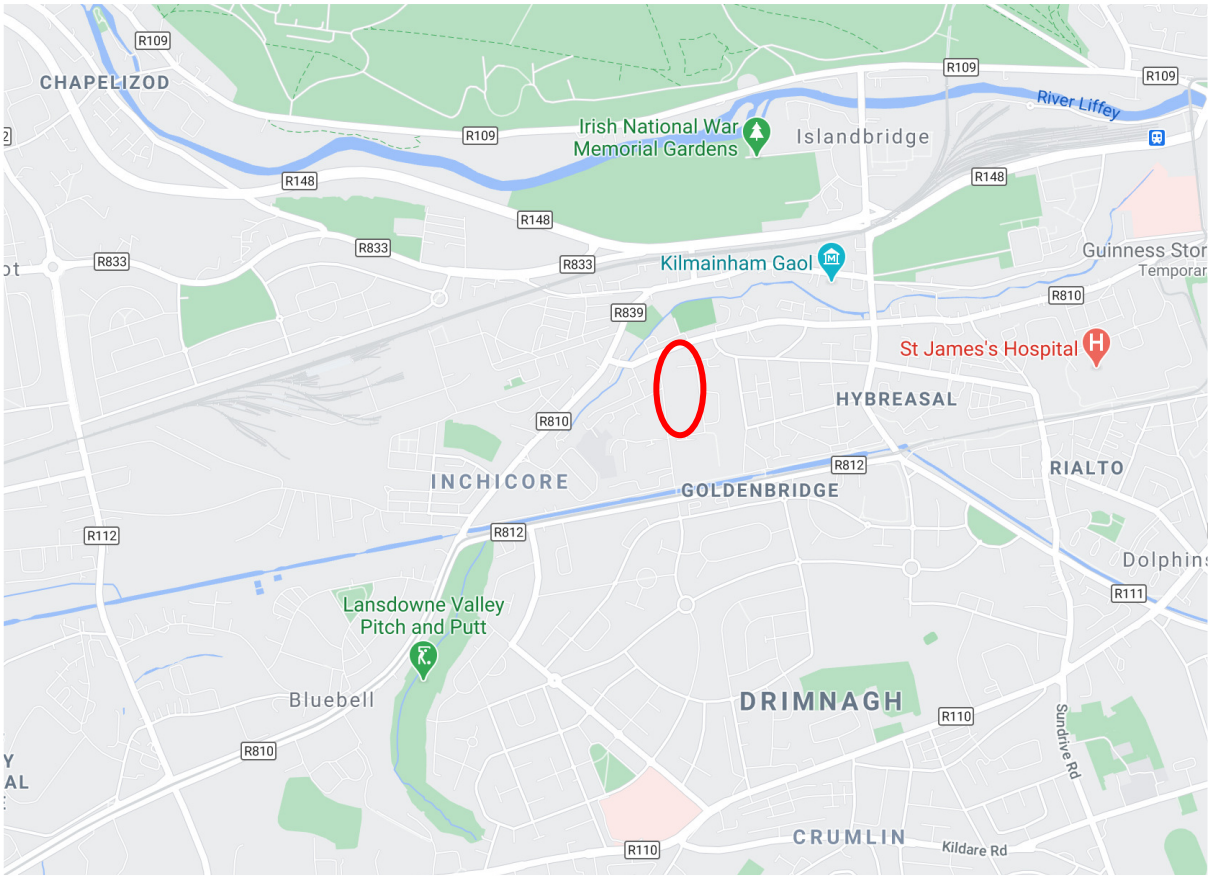

Figure 1.1 - Site Location (www.myplan.ie)

1.4 Existing Site Overview

The site covers an area of approximately 4.68 hectares (which includes water main upgrade works along emmet Road to the Junction with Tyrconnell Road/Grattan Crescent) and the main development site is c.3.8 hectares (9.4 acres) and is bounded by:

- Emmet Road to the north;
- St Vincent Street West to the western boundary;
- Goldenbridge Cemetery to the southern boundary;
- Patriots Path to the eastern boundary

The site currently comprises of a mixture of brownfield areas which previously housed the St Michaels Estate development together with the current existing buildings/structures:

- St Michael's Community Centre (to be demolished as part of permitted Part 8 Development 2221/21);
- Eve Tuiscint Health Centre (to be demolished as part of permitted Part 8 Development 2221/21);
- Inchicore Community Sports Centre (to be retained)
- Boundary wall to the north western corner of the site (some works to be undertaken but majority to be retained).

There are a number of existing structures outside of the site that are of importance. These include:

- Inchicore Primary Care Centre to the east of the site;
- Richmond Barracks to the east of the site.

The locations of the above buildings relative to the site are shown in Figure 1.2 over.

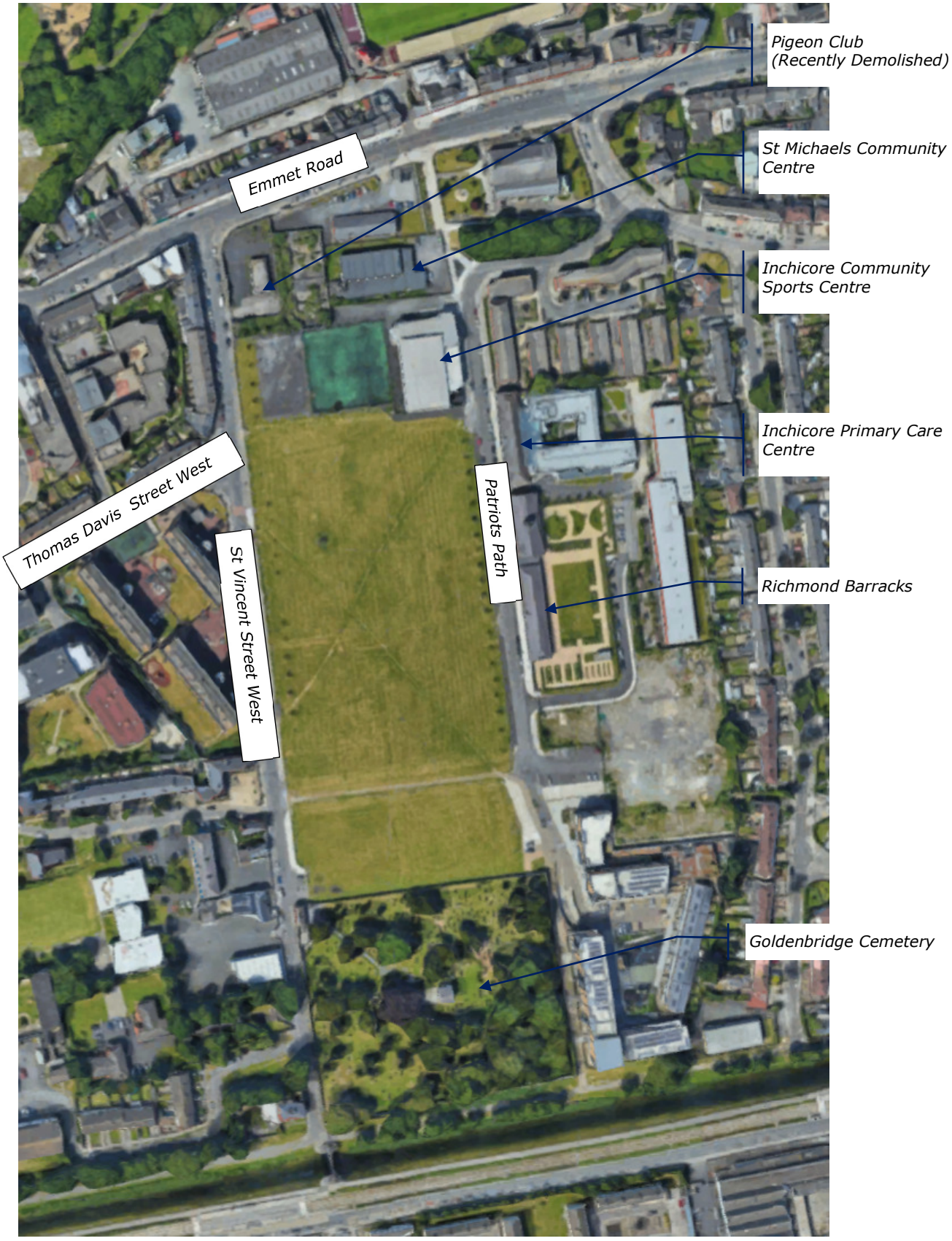

Figure 1.2 – Site Environs

1.5 Proposed Development Context

The proposed scheme consists of a mixed-use development with a strong emphasis on residential units in addition to commercial, retail and community facilities together with all associated infrastructure including roads, footpaths, services and landscaping.

Figure 1.3 – Proposed Site Layout-to be updated to final redline

The development will comprise 578 no. apartments, consisting of 110 no. studio apartments, 172 no. 1 bedroom apartments, 250 no. 2 bedroom apartments (including 10 no. duplex apartments) and 46 no. 3 bedroom apartments (all apartments to have balconies or terraces), community facilities Library/Community Hub, Creche, Supermarket, 5 no. units (retail/café/restaurant/class 2 financial services floorspace) & 2 no. Café units), a public plaza fronting onto Emmet Road and the installation of a new watermain c 200m in length along Emmet Road to the junction with Tyrconnell Road/Grattan Crescent. The proposal includes works to a protected structure (8705 - Richmond/Keogh Barracks, relating to works to rubble stone boundary walls).

2 SCOPE OF CONSTRUCTION AND ENVIRONMENTAL MANAGEMENT PLAN

This report has been prepared as an outline construction strategy setting out construction method and activities required for the construction of the proposed residential and commercial development. This outline plan seeks to demonstrate how works can be achieved in a logical, sensible and safe sequence with the incorporation of specific measures to mitigate the potential impact on people and the environment. This methodology will be required to be interrogated and developed by the Main Contractor prior to commencing works on site. It is noted that this document should be viewed as an outline plan with the fully detailed Construction and Environmental Management Plan to be developed by the appointed main Contractor in consultation with Dublin City Council the Planning Authority (as required) prior to works commencing on site. The mitigation measures contained in the EIAR will form part of the Contractor CEMP.

Discussed in the following sections are:

- Construction Management issues;
- Pre-Construction Activities;
- Foundations & Substructure;
- Services;
- Superstructure.

3 CONSTRUCTION MANAGEMENT

3.1 Overview

The works outlined in this methodology narrative outline the potential methods of construction available to the Main Contractor. The narrative indicates the prospective progress and gives an explanation of the associated activities and their interdependencies and how the project will be delivered. There are a number of constraints and requirements which have been clearly considered by the Project Team throughout the design process-these will need to be further developed upon by the appointed Main Contractor prior to works commencing on site.

In broad terms, the project will be sequenced as follows:

- Pre-construction activities;
- Site Clearance including demolition;
- Piling;
- Ground Beams;
- Site services (including watermain upgrade works);
- Construction of superstructure;
- Completion of façade;
- Mechanical & electrical works;
- Internal fit-out;
- Hard and soft landscaping;
- Completion

3.2 Project Delivery

The project is proposed to be constructed in two separate tranches with each tranche to be procured under separate contracts. The main portion of the development will be delivered by the Applicant and will incorporate the southern two thirds of the site together with the library and community facilities located in the north-eastern corner of the site. The north-western portion of the site, consisting of the retail/commercial spaces and residential units above, will be delivered by a third party developer under a future development agreement between the applicant and future developer. Although both contracts will have different start and end dates, it is envisaged that works will be on-going on both contracts at the same time.

The portions of the development to be completed by the applicant are envisaged to be delivered under a single contract but completed in phases due to the scale of the development. Those phases are likely to follow those indicated in Figure 3.1 but subject to change when detailed design is carried out and contractor appointed.

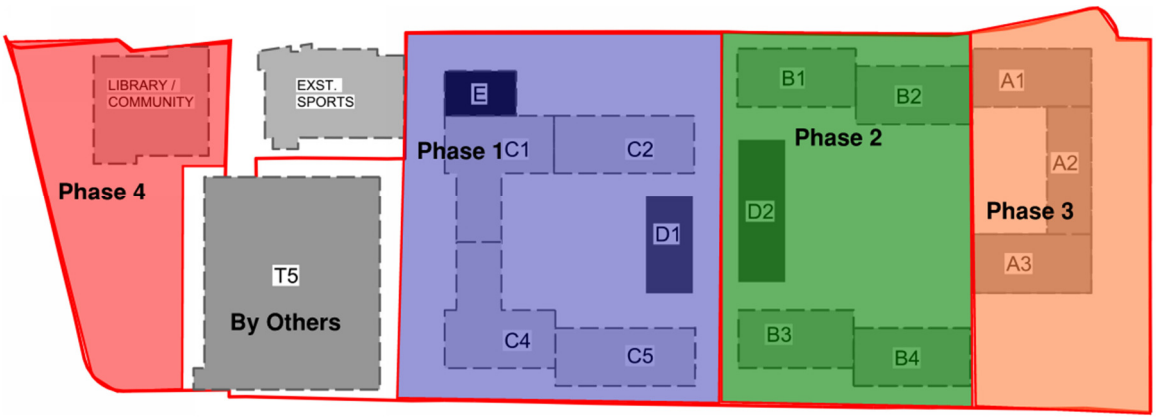

Figure 3.1 – Delivery of the Project

It is envisaged that the two contracts will be delivered by two different Main Contractors. The Main Contractors will be required to co-ordinate both their Construction Management Plans and their planned activities to ensure that the

more labour/deliveries intensive tasks are not being undertaken simultaneously on both site.

The items discussed in the following sections are relevant to both tranches of the overall development.

3.3 Site Management

The Main Contractor will be responsible for overall site management for the duration of the proposed works. Discussed below are a number of areas which the Main Contractor will be required to address within their Construction Environmental Management Plan and during the works.

3.3.1 Health & Safety

The Main Contractor must progress their works with reasonable skill, care, diligence and to, at all times, proactively manage the works in a manner most likely to ensure the safety and welfare of those carrying out construction works, interacting stakeholders, adjoining residents and the public. Contractors are further required to ensure that, as a minimum, all aspects of their works and project facilities comply with good industry practice, statutory instruments and all necessary consents. These will be further expanded and developed within the Main Contractor's Construction Management Plan in relation to Health & Safety requirements.

3.3.2 Hoarding & Site Security

The location of the site, adjacent to residential properties and public spaces, necessitates a prompt and detailed establishment of site compound and perimeter hoarding by the Main Contractor following possession of site. The overarching consideration in all elements of the site set-up will be to ensure the works can be undertaken in a safe manner for adjoining residents, members of the public, the Main Contractor and their staff.

The Main Contractor will commence by erecting a suitably robust hoarding around the site perimeter. This will typically take the form of a standard plywood hoarding up to a height of 3.6m with artwork or graphics embellishment. Appropriate access points will be provided to the site through the hoarding. Initially, this will be for personnel only but as works develop, vehicle access and egress routes through the hoarding will be developed.

The proposed hoarding alignment for the main construction phase of the works is indicatively shown orange below in Figure 3.2 below. It is noted that this plan layout may be altered locally during the works to facilitate different works such as piling, services tie ins etc. In addition, a further sub-division of the site will be required to facilitate the works to be undertaken to Tranche 5 under a separate development agreement as set out in Section 3.2.

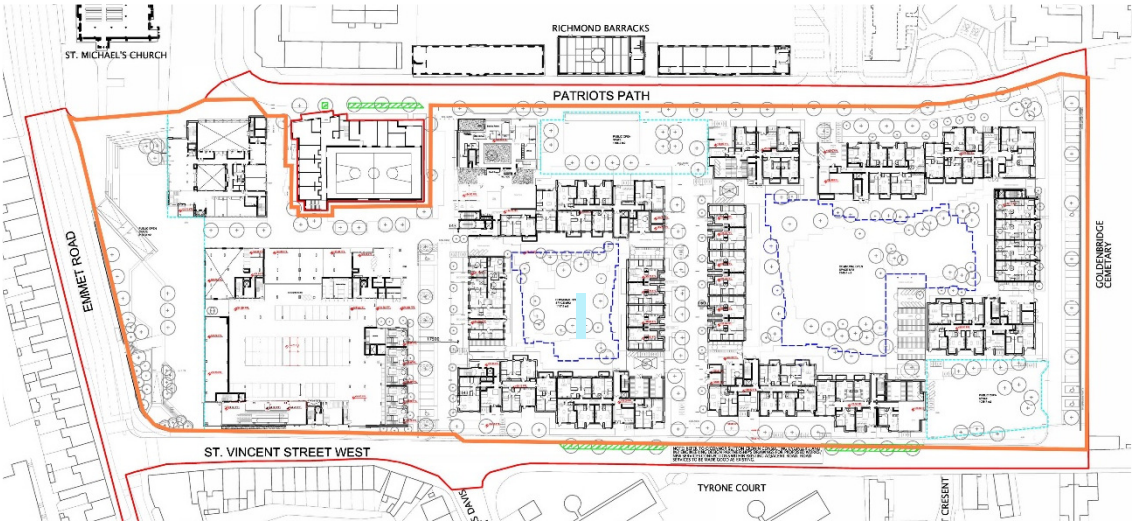

Figure 3.2 – Proposed Site Hoarding

The Main Contractor will be responsible for the security of the site for the duration of the works. The Main Contractor will be required to:

- Install and maintain adequate site hoarding to the site boundary with adequate controlled access and egress points;
- Maintain site security staff at all times;
- Install secure access in the form of turn-styles and gates for staff;
- Ensure restricted access is maintained to the works;
- Operate a site induction process for all site staff and visitors;
- Ensure all staff have current 'Safe Pass' and Construction Skills Cards;
- Monitor and record all deliveries to site and all material/waste taken off site for disposal to appropriate licences facility.

A fire watch system will be implemented and appointed fire watch supervisors will inspect the site at the end of each shift. All staff will be made fully aware of their individual responsibilities with regards to security and will undertake their work in line with guidelines. All staff and operatives will be fully inducted into the security, health and safety and logistic requirements on site.

3.3.3 Site Compound

The extent of compound and facilities required by the Main Contractor will vary throughout the duration of the works. The initial phase of works involving site set-up, surveys, diversions of services and commencement of siteworks are likely to have limited requirements for Contractors facilities. As the works advance, the Main Contractor's compound and facilities will be required to be enhanced. It is envisaged that such facilities will be provided within the hard and soft landscaped portions of the development, with locations to be selected by the Main Contractor to best suit their works methodologies and sequencing. As the main building works near completion, the requirements for facilities will be reduced and thus will allow the Main Contractor to remove sections of the compound to be able to complete the hard and soft landscaping works. Indicative possible locations for the Contractors compounds are shown in Figure 3.3 below.

Figure 3.3 – Possible Site Compounds

3.3.4 Site Access & Egress

The key driver in the provision of site access and egress is to ensure that safety of the public and the Contractor's staff if maintained at all times. It is envisaged that a number of access and egress points will be provided to suit both the division in the overall development and also the size of the site. This will entail access points from both Patriots Path and St Vincent Street West. Indicative possible layouts of these points are shown in Figure 3.4 below but it is noted that the selected Main Contractor's may alter these locations to suit their own particular site set up.

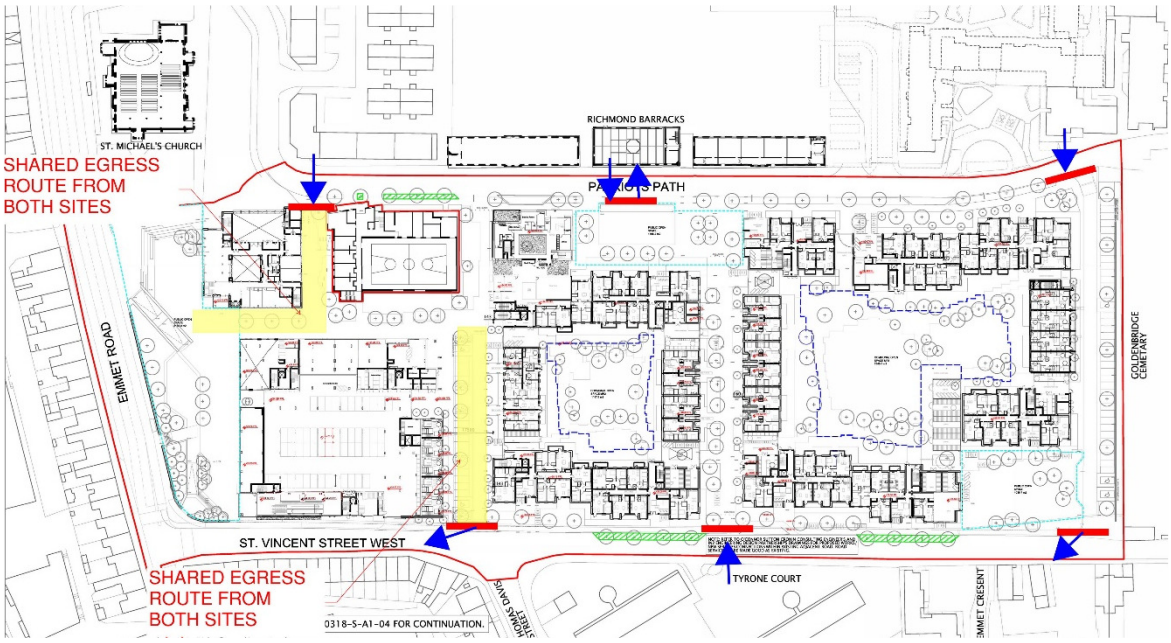

Figure 3.4 – Possible Site Access & Egress

3.3.5 Deliveries to Site

Construction deliveries to site will make use of the access and egress points indicated in Figure 3.4 above. A "just in time" approach will be generally be required for delivery of particular materials such as concrete formwork, reinforcement and prefabricated structural elements. That is to say that deliveries of materials will be planned, sequenced and programmed to ensure that materials as they are required on site. Works requiring multiple vehicle deliveries to site, such as large concrete pours, should be planned well in

advance with no queuing of trucks allowed or permitted on Emmet Road. It is envisaged that there may, from time to time, be a requirement for queuing of vehicles along Patriots Path or St Vincent Street West. The Main Contractor will be responsible for ensuring that this will not impact upon the movement of public pedestrians or vehicles along these routes. The Main Contractor will be required to provide a flagman to direct construction vehicles entering/exiting the site and manage the interaction between public and construction vehicle movements in a safe manner.

3.3.6 Storage of Materials on Site

There is scope for some storage of materials within the courtyard areas around the site. Any materials stored on site should be done so in a safe manner. Any fuels or chemicals on site should be stored within double sealed tanks with bunds to prevent any seepage of same into the groundwater. A fuel filling point should be set up on site with plant to be brought to this point for filling. All fuels and chemicals required to be stored on site should be clearly marked.

3.3.7 Removal of Materials from Site

The removal of materials from site will primarily be undertaken during the initial stages of the works. This will involve the removal of excavated material and pile arisings to facilitate the construction of the piled foundations and ground beams envisaged to be required. This phase of works will need to be managed effectively to ensure that no queuing of trucks occurs on public roadways. All trucks will have a built-on tarpaulin that will cover excavated material as it is being hauled off site and wheel wash facilities will be provided at all site egress points. All vehicles will make use of the access and egress points noted in Section 3.3.4 above. The Main Contractor will be required to provide a flagman to direct construction vehicles entering/exiting the site and manage the interaction between public and construction vehicle movements in a safe manner.

3.3.8 Craneage

It is envisaged that the works will require the use of multiple cranes on site. The final chosen structural form of the buildings will determine the likely type of cranes to be used, as discussed in Section 6 of this document. With a prefabricated solution-either precast concrete or timber frame-it is likely that mobile cranes would be used for the installation of same. If a cast in-situ concrete frame solution is adopted, then it is more likely that tower cranes would be used, with the layout of same to achieve maximum coverage of the site being determined by the Contractor. A mixed approach, with some tower cranes supplemented by mobile cranes, may also be adopted. The contractor will engage with and notify if necessary the Irish Aviation Authority in advance of the erection of tower cranes.

3.3.9 Water Supply

The Contractor will require a water source for the duration of the works. Water will be required for:

- Contractor's welfare facilities;
- Vehicle washdown (use recycled water where feasible);
- Dust suppression (as applicable);
- Curing of concrete in warm weather.

It is proposed that the Main Contractor will make use of existing water connections on the site for the purpose of water supply during the works.

3.3.10 Groundwater & Surface Water Control

The proposed development does not incorporate a full basement. There is a small section of below ground plant space provided under a portion of the residential Blocks. There will also be areas of excavations for foundations and below ground services. Any seepage of groundwater into these excavations or

surface ponding from rainfall events will be gathered locally to facilitate pumping with subsequent discharge, under licence, to the local drainage network. Prior to any discharge, the water will be passed through silt traps and hydrocarbon/oil interceptors within the site confines. This will result in the separation of sediment from the water prior to its discharge and will ensure that the water is of adequate quality before it enters the local authority sewerage drainage network.

The Contractor will be required to prepare and implement a Surface Water Management Plan (SWMP) that fully details all measures for groundwater and surface water control for agreement with the local authority prior to discharge of same from site. This SWMP will need to fully comply with all relevant mitigation measures as set out in the EIAR together with proposals within the Engineering Services Report.

3.3.11 Hours of Work

It is envisaged that the hours or work for the project will be as follows, unless conditioned otherwise:

- Monday to Friday 7.00am to 7.00pm
- Saturday 8.00am to 2.00pm
- Sundays and Bank Holidays No activity on site

We note that certain activities may be required, subject to prior agreement with Dublin City Council, to be undertaken outside of these working hours. It is acknowledged that special events such as large concrete pours, will require (in addition to the prior agreement with Dublin City Council) liaisons with the Local Authority, Garda and key stakeholders together with extensive pre-planning and programme management of site operations.

3.3.12 Public relations/Community Liaison

The site is located in the heart of Inchicore within a residential area. It is also adjacent to schools, a Primary Care Centre and other care settings. The Main Contractor will be required to ensure that all agents, sub-contractors and suppliers act in a manner to minimise disruption to the locality. Construction staff will be encouraged to remove all Personal Protective Equipment (PPE) and use wash down facilities before leaving the site.

The Project Team recognises the importance of the community liaison role in ensuring the smooth running of activities and in relation to residents and public welfare. Important key issues in ensuring good relations are:

- Regular community updates/leaflet drops/information briefings etc.;
- Correct points of contact, information and liaison;
- Responsiveness to contacts and information;
- Good housekeeping in all aspects of the operations.

Keeping people informed of site operations, through regular updates, mail drops & newsletters will help create good relationships and c co-operative atmosphere.

Due to the nature of construction works, it is essential to operate Good Neighbour Policies wherever possible. The key aspects of the Project Teams good neighbour policy include:

- Early implementation;
- Good client, Staff and Neighbourhood liaison;
- Reduction of nuisance factors;
- Clear access for neighbouring premises;
- Clear and concise information;
- Designated liaison officer.

It is essential that the Good Neighbour Policy and any necessary procedures be in place before any works are commenced on site.

3.3.13 Environmental Management

The appointed Contractor will be required to be accredited with ISO 14001 Environmental Management Systems.

3.3.14 Dust

A Dust Minimisation Plan will be formulated for the construction phase of the project. Dust prevention measures shall be included for control of any site airborne particulate pollution. The Contractor shall put in place a regime for monitoring dust levels in the vicinity of the site during the works using the Bergerhoff Method. The minimum criteria to be maintained shall be the limit specified by the environmental Protection Agency (EPA) for licensed facilities in Ireland which is 350mg/m^2/day as a 30-day average. The Contractor shall continuously monitor dust over the variation of weather and material disposal to ensure the limits are not breached throughout the project.

The level of monitoring and adoption of mitigation measures will vary throughout the construction works depending on the type of activities being undertaken and the prevailing weather conditions at the time. Additional monitoring and mitigation such as damping down of earth mounds on site would be undertaken if the prevailing weather conditions are dry and windy. It is noted that the stockpiling of excavated material on site is to be minimised with an immediate removal of excavated materials envisaged for the majority of the works.

3.3.15 Dirt

Given the volumes of traffic generated by aspects of the construction works, particularly during the excavations and groundworks phase, it shall be a requirement that the Contractor shall ensure, where appropriate:

- A wheel wash facility shall be provided at each egress point form the site (the proposed nature of the access and egress points may necessitate the use of more than one wheel wash for some phases of the works)
- All vehicles shall be required to pass through the wheel wash facility before exiting the site to the public road network via Patriots Path or St Vincent Street West. The wheel wash must be kept in place and used throughout the critical dirt generating activities of the construction works.
- Road sweepers shall be retained for the duration of the construction works with an increase in cleaning during the critical dirt/dust generating works. Regular road drain clearing will be implemented.
- Water supplies shall be recycled for use in the wheel wash. All waters shall be drained through appropriate filter material prior to discharge from the site.

3.3.16 Noise

The Contractor shall be required to monitor baseline noise levels at the site prior to commencement of the project, with a noise monitoring regime being developed for the duration of the construction works on site. Variation of noise levels from those experienced as part of everyday life in the area can result in disruption. The Contractor shall implement measures to minimise and mitigate noise levels during construction. Specifically, noise levels shall be kept below levels identified in Table 3.1 over or if further limits as imposed by the Local Authority.

Period over which criterion applies		Noise Impact Criterion ($L_{Aeq, 1hr}$)
Monday to Friday	Day 07:00 to 19:00	75dB
	Evening: 19:00 to 22:00	60dB*
	Night 22:00 to 07:00	The higher of 45dB of the ambient level*
Saturday: Day 08:00 to 14:00 (work outside these hours no higher than 45dB of ambient noise level)		65dB
Sundays and Bank Holidays	Day 08:00 to 14:00	60dB*

Note-*Construction activity at these times, other than that required for emergency works, will require the explicit permission of the relevant local authority

Table 3.1 – Noise Limit Criteria

3.3.17 Condition Surveys

Condition surveys of properties and structures adjoining the works shall be undertaken by a specialist survey company engaged by the Main Contractor prior to any works commencing on site. The survey company will record, within a Condition Report using photographs and sketches, the current structural condition of the property. These reports will assist to inform any specific requirements in terms of potential locations for monitoring during the works. The surveys should be undertaken on the following as a minimum:

- Boundary Wall of Goldenbridge Cemetery;
- Gate house of Goldenbridge Cemetery;
- Richmond Barracks;
- Inchicore Primary Care Centre;
- Inchicore Community Sports Centre;
- External elevation of Bulfin Court Residences;
- External elevation of Tyrone Place;
- External elevation of residences along St Vincent Street West;
- Remnant of historic boundary wall to Richmond Barracks at junction of Emmet Road/St. Vincent Street West;

- Roads and footpaths to the entire perimeter of the site.

It is noted that phased nature of the delivery of the works will require either surveys to be undertaken on multiple occasions or may only be undertaken at certain locations for one phase of the works.

3.3.18 Vibrations

Vibration monitoring (as a minimum) of the following areas shall be carried out for the duration of the works:

- Boundary wall of Goldenbridge Cemetery;
- Richmond Barracks;
- Sports Centre;
- Remnant wall of Richmond Barracks at junction of Emmet Road;
- Other areas to be agreed with project team.

Vibration monitoring stations should continually log vibration levels (including associated frequency) using the Peak Particle Velocity parameter (PPV, mm/s) in the X, Y and Z directions, in accordance with BS ISO 4866: 2010: Mechanical vibration and shock – Vibration of fixed structures – Guidelines for the measurement of vibrations and evaluation of their effects on structures. Vibration monitors, of both aural and visual type, with real time outputs to be located at agreed points.

The mounting of the recording equipment to the vibrating structure (or surface supporting sensitive equipment) shall comply with BS ISO 5348: 1998: Mechanical vibration and shock – Mechanical mounting of accelerometers. In summary, the following ideal mounting conditions apply:

- The recording equipment and its mountings should be as rigid as possible;
- The mounting surfaces should be as clean and flat as possible;
- Simple symmetric mountings are best, and;

- The mass of the mounting should be small in comparison to that of the structure under test.

The vibration limits for the duration of the construction works shall be set in line with the vibration criteria to be adopted at nearby sensitive and residential properties to avoid cosmetic damage, as taken from the German Standard DIN 4150-3 (1999-02) *Structural Vibration – Effects of vibration on structure*.

Traffic light system to be in place consisting of:

- Green-vibrations below all threshold limits-OK to proceed;
- Amber-vibrations exceed first threshold limit (2/3^{rds} of limit)-Stop and check;
- Red-vibrations exceed second threshold-Stop and action.

3.3.19 Harmful Materials

Harmful materials will be stored on site for use in connection with the construction works only. The following mitigation measures will be included for the works to prevent any spillages of fuels and prevent any resulting soil and/or groundwater quality issues:

- Designation of bunded refuelling areas on site;
- Provision of spill kit facilities across the site;
- Where mobile fuel bowsers are used, the following measures will be taken:
    - Any flexible pipe, tap or valve will be fitted with a lock and will be secured when not in use;
    - The pump or valve will be fitted with a lock and secured when not in use;
    - All bowsers to carry a spill kit and operatives must have spill response training;
    - Portable generators or similar fuel containing equipment will be placed on drip trays.

In the case of drummed fuel or other potentially polluting substances which may be used during construction, the following measures will be adopted:

- Secure storage of all containers that contain potential polluting substances in a dedicated internally bunded chemical storage cabinet unit or inside a concrete bunded area;
- Clear labelling of containers so that appropriate remedial measures can be taken in the event of a spillage;
- All drums to be quality approved and manufactured to a recognised standard;
- If drums are to be moved around site, they should be done so secured and on spill pallets;
- Drums to be loaded and unloaded by competent and trained personnel using appropriate equipment.

3.4 Waste Management

3.4.1 Introduction

The appointed contractor will be responsible for the preparation of a detailed site-specific resource and waste management plan (RWMP) to be submitted to Dublin City Council prior to commencement of works. Discussed below are key areas that will be developed upon by the Main Contractor in their detailed plan. In addition, the RWMP will incorporate the measures contained in the EIAR and the RWMP prepared by Byrne Environmental as part of this application.

3.4.2 Waste Management in Ireland

Overarching Legislation

The overarching legislative instruments governing waste management in Ireland are as follows:

- Waste Management Act 1996 (S.I. No. 10 of 1996) as amended 2001 (No. 36 of 2001), 2003 (No. 27 of 2003) and 2001 (No. 20 of 2011)

- Sub-ordinate legislation includes:
  - European Communities (Waste Directive) Regulations 2011 (S.I. 126 of 2011) as amended 2011 (S.I. No. 323 of 2011) and 2016 (S.I. 315 of 2016);
  - Waste Management (Collection Permit) Regulations 2007 (S.I. No. 820 of 2007) as amended 2008 (S.I. No. 87 of 2008), 2015 (S.I. No. 197 of 2015) and 2016 (S.I. No. 24 and 346 of 2016);
  - Waste Management (Facility Permit and Registration) Regulations 2007 (S.I. No. 821 of 2007) as amended 2008 (S.I. No. 86 of 2008), 2014 (S.I. No, 320 and No. 546 of 2014) and 2015 (S.I. No. 198 of 2015);
  - Waste Management (Licensing) Regulations 2000 (S.I. No. 185 of 2000) as amended 2004 (S.I. No. 395 of 2004), 2010 and (S.I. No. 350 of 2010);
  - Waste Management (Packaging) Regulations 2014 (S.I. 282 of 2014) as amended 2003 (S.I. No. 61 of 2003) as amended 2004 (S.I. No. 871 of 2004), 2006 (S.I. No. 308 of 2006) and 2007 (S.I. No. 798 of 2007);
  - Waste Management (Planning) Regulations 1997 (S.I. No. 137 of 1997);
  - Waste Management (Landfill Levy) Regulations 2015 (S.I. No. 189 of 2015) as amended 2011 (S.I. No. 434 of 2011) as amended 2012 (S.I. No. 221 of 2012);
  - European Union (Waste Electrical and Electronic Equipment) Regulations 2014 (S.I. No. 149 of 2014);
  - European Union (Batteries and Accumulators) Regulations 2014 (S.I. No. 283 of 2014) as amended 2014 (S.I. No. 349 of 2014) and 2015 (S.I. No. 347 of 2015);
  - Waste Management (Food Waste) Regulations 2009 (S.I. 508 of 2009);
  - European Union (Household Food Waste and Bio-waste) Regulation 2015 (S.I. No. 191 of 2015);

  - Waste Management (Hazardous Waste) Regulations 1998 (S.I. No. 163 of 1998) as amended 2000 (S.I. No. 73 of 2000);
  - Waste Management (Shipments of Waste) Regulations 2007 (S.I. No. 419 of 2007) as amended;
  - Waste Management (Movement of Hazardous Waste) Regulations 1998 (S.I. No. 147 of 1998);
  - European Communities (Transfrontier Shipment of Waste) Regulations 1998 (S.I. No. 147 of 1998) as amended 1994 (SI 121 of 1994);
  - European Union (Properties of Waste which Render it Hazardous) Regulations 2015 (S.I. No. 233 of 2015).
- Litter Pollution Act 1997 (S.I. No. 12 of 1997) as amended by Protection of the Environment (amendment) Act 2003 as amended;
- Planning and Development Act 2000 as amended (S.I. No. 30 of 2010) and 2015 (S.I. No. 310 of 2015);
- Protection of the Environment Act 1992 as amended 2003 (S.I. No. 413 of 2003) and by Planning and Development Act 2000 as amended (S.I. No. 30 of 2010).

The above Acts and Regulations transpose European Union policy and Directives into Irish law. The over-riding 'Duty of Care' principle implies that the producer is responsible for waste from the time it is generated through until its legal disposal (including its method of disposal.). As it is not practical in most cases for the waste producer to physically transfer all waste from where it is produced to the final disposal area, waste contractors will be employed to transport waste to the final waste disposal site.

A waste collection permit, issued by the National Waste Collection Permit Office (NWCPO), must be held by every waste contractor engaged on the project. Waste receiving facilities must also be appropriately permitted or licensed to accept waste. Operators of such facilities cannot receive any waste, unless in

possession of a waste permit granted by the relevant Local Authority under the Waste Management (Facility Permit & Registration) Regulations 2007 and Amendments or a waste licence granted by the Environmental Protection Agency (EPA). The permit/licence held will specify the type and quantity of waste able to be received, stored, sorted, recycled and/or disposed of at the specified site.

National Waste Management Policy

The 1998 '*Changing Our Ways*' policy document by the Irish Government identified objectives for the prevention, minimisation, reuse, recycling, recovery and disposal of waste in Ireland. The target for C&D waste in this report was to recycle at least 50% of C&D waste within an initial five-year period with incremental increases to at least 85% by 2013. A waste industry task force of the *Forum for the Construction Industry* released '*Recycling of Construction and Demolition Waste*' recommending the development of a voluntary construction industry programme to meet Government objectives for the recovery of C&D waste. '*A Resource Opportunity - Waste Management Policy in Ireland*' published in 2012 stresses the environmental and economic benefits of better waste management, particularly in relation to waste prevention. In respect of C&D waste, the report commits to undertaking a review of specific producer responsibility requirements for C&D projects above a certain threshold.

The National Construction and Demolition Waste Council (NCDWC) published '*Best Practice Guidelines for the Preparation of Waste Management Plans for Construction and Demolition Projects*' in 2006 in conjunction with the Department of the Environment, Heritage and Local Government (DoEHLG). The Guidelines outline the issues that need to be addressed at the pre-planning stage of a development all the way through to its completion. These Guidelines have been followed in the preparation of this document and include the following elements:

- Predicted C&D wastes and procedures to prevent, minimise, recycle and reuse wastes;
- Waste disposal/recycling of C&D wastes at the site;
- Provision of training for waste manager and site crew;
- Details of proposed record keeping system;
- Details of waste audit procedures and plan; and
- Details of consultation with relevant bodies i.e. waste recycling companies, Dublin County Council etc.

In accordance with Section 3 of the Guidelines Construction and Demolition Waste Management plans should be submitted as part of development proposals for projects in excess of any of the following thresholds:

- New residential development of 10 units or more;
- New developments other than above, including institutional, educational, health and other public facilities, with an aggregate floor area in excess of 1,000m^2;
- Demolition/renovation/refurbishment projects generating in excess of 100 cubic metres in volume of construction and demolition waste, and;
- Civil engineering projects in excess of 500 cubic metres of waste materials used for development works on the site.

A RWMP, as a minimum, should include provision for the management of all construction and demolition waste arising on site, and make provision for the re-use of said material and/or the recovery or disposal of this waste to authorised facilities by authorised collectors. Where appropriate, excavated material from development sites should be reused on the subject site.

The proposed development at Emmet Road requires a RWMP under the following two criteria:

- New residential development of 10 units or more;

- New developments other than above, including institutional, educational, health and other public facilities, with an aggregate floor area in excess of 1,000m^2.

These guidance documents are considered to define best practice for construction and demolition projects in Ireland and describe how construction and demolition projects are to be undertaken such that environmental impacts and risks are minimised and maximum levels of waste recycling are achieved.

Regional Waste Management Plans

The proposed development is located within the Dublin City Council (DCC) administrative area. A new Regional Waste Management Plan for the Eastern-Midland Region was launched in November 2014 which covers the four Dublin Councils (DCC, FCC, DRCC & SDCC) as well as Kildare, Laois, Longford, Louth, Meath. Offaly, Wicklow and Westmeath. The final Eastern-Midland Region Waste Management Plan (EMWR) was published in late May 2015 to replace the 'Waste Management Plan for the Dublin Region 2005 – 2010'. This was replaced due to changing National policy as set out in '*A Resource Opportunity: Waste Management Policy in Ireland*' and changes being enacted by the Waste Framework Directive (2008/98/EC). The Plan's implementation will be led by the new Eastern-Midlands Regional Waste Office based in Dublin City Council.

The three key objectives of the Eastern-Midlands Region Waste Management Plan are:

- Prevent waste: a reduction of one per cent per annum in the amount of household waste generated over the period of the plan.
- More recycling: increase the recycle rate of domestic and commercial waste from 40 to 50 per cent by 2020.
- Further reduce landfill: eliminate all unprocessed waste going to landfill from 2016.

The strategic approach of the new plan is to place a stronger emphasis on preventing waste and material reuse, instead focusing on increasing the collection of quality materials to improve recycling. The plan seeks to further reduce the role of landfill in favour of higher value recovery options. The objective Eastern Midlands Region Waste Management Plan is to achieve more sustainable waste management practices in the C&D sector. The recycling rates for C&D waste adopted by the EMWR are 82%. The EC (Waste Directive) Regulations, 2011 sets a 70% target for the re-use, recycling and recovery of man-made C&D waste in Ireland by December 2020. It is reported by the EPA that this has already been achieved with a 97% waste recovery rate.

The Dublin City Development Plan 2016-2022 and the Draft Dublin City Development Plan 2022-2028 provides policies and objectives in relation to waste management in the city which are reflective of overarching EU, National and Regional policy and legislation.

The main objective of DCC policies in the current development plan and draft development plan is to promote an increase in the amount of waste re-used and recycled consistent with the Regional Waste Management Plan and Waste Hierarchy and facilitate recycling of waste through adequate provision of facilities and good design in new developments.

3.4.3 Waste Categorisation

Typical non-hazardous and hazardous waste streams generated by construction and demolition activities at typical sites are shown in Table 3.2 along with their accompanying European Waste Code (EWC) Classification.

It is anticipated that the non-hazardous materials listed above will be encountered during the works on the Emmet Road development with the potential for some of the hazardous materials as discussed over.

Waste Materials Categorisation		
Category	Description	Code
Non-Hazardous	Metals	17 04
	Wood, glass, plastic	17 02
	Soil, stones, dredged soils	17 05
	Gypsum based materials	17 08
	Cardboard	15 01 01
	Glass	17 02 02
	Bituminous mixtures, coal tar, tar products	17 03
	Concrete, bricks, tiles, ceramics	17 01
Hazardous	Electrical and Electronic Components	16 02
	Liquid Fuels	13 07
	Wood Preservatives	03 02
	Batteries	16 06
	Soil and stones containing dangerous substances	17 05 03
	Waste construction material containing asbestos	17 06 05
	Other construction and demolition wastes containing dangerous substances	17 09 03

Table 3.2 – Waste Material Categorisation

Non-Hazardous Materials

The classification of materials as non-hazardous and/or hazardous will be based on the www.hazwasteonine.com web based system as well as classification using Waste Acceptance Criteria in accordance with the European Communities (EC) Council Decision 2003/33/EC, which establishes criteria for the acceptance of waste at landfills.

In addition, non-hazardous waste materials are likely to be generated during all phases of the construction works from casting of concrete, through to installation of face, mechanical and electrical services and internal fit-out.

Hazardous Materials

There is the potential for hazardous materials to be uncovered, particularly during the demolitions and excavations phases of the project as discussed below:

- ***Asbestos***

  A type 3 Asbestos Survey will be carried out by a certified company on behalf of the Main Contractor prior to any demolition works commencing on site. If any asbestos is uncovered, the removal of same must be carried out by a suitably qualified contractor in accordance with S.I. No. 386 of 2006 Safety, Health and Welfare at Work (Exposure to Asbestos) Regulations 2006-2010. All material to be taken to a suitably licensed or permitted facility.

- ***Contaminated Soil***

  The building works will require excavations to facilitate foundation construction, together with installation of below ground services and the section of lower ground floor plant space. Given the brownfield nature of the site, there is potential for the soil to have elements of contaminant contained within it. An initial assessment of the site has been undertaken by OCSC to classify the materials to be encountered on site from a waste soils perspective. The Main Contractor will be responsible for the classification of all material to be removed from site and compliant disposal in accordance with the Wate Management Act 1996 as amended and all relevant Regulations.

- ***Fuels/Oils***

  In the event that there is to be any on site storage of fuels or oils during the demolition, piling, excavation or basement construction phases of the project, then all storage tanks and draw-off points will be bunded and located in a dedicated, secure are of the site. Provided that these requirements are adhered to, and site crew are trained in the appropriate refuelling techniques, it is note expected that there will be any fuel/oil wastage at the site.

3.4.4 Waste Arisings

The Environmental Protection Agency (EPA) produce figures on the amounts of waste generated by various developments. These figures are contained in EPA databases. The split between individual C&D waste categories is shown in Table 3.4.

Waste Types	%
Metals	2.2
Concrete, Brick, Tile, Gypsum	7.2
Bituminous mixtures	1.3
Mixed C&D waste	4.5
Soils & Stones	84.8
Total	100

Table 3.4 – Waste Generation

Further figures are available for typical overall waste generation figures for construction sites based on the type and scale of development. Therefore, by using the EPA category split figures and the industry standard overall waste generation figures, the C&D waste arising's for the subject site can be estimated.

It should be noted that until final materials and methods of construction have been determined it is not possible to predict with a high level of accuracy the construction waste that will be generated. These details will be required to be included by the Main Contractor in their RWMP to be prepared and agreed with DCC in advance of works commencing on site.

<u>Site Waste Management Operations</u>

Waste materials generated will be segregated on site where it is practical. Where the on-site segregation of certain wastes types is not practical, off-site segregation will be carried out. There will be skips and receptacles provided to

facilitate segregation at source. All waste receptacles leaving site will be covered or enclosed. The appointed waste contractor will collect and transfer the wastes as receptacles are filled.

Any soil removed off-site will be carried by contractors licensed under the Waste Management Acts 1996 - 2008, the Waste Management (Collection Permit) Regulations 2007 and Amendments and the Waste Management (Facility Permit & Registration) Regulations 2007 and Amendments. Waste arising shall be handled by an approved waste contractor holding a current waste collection permit. All waste arising requiring disposal off-site will be disposed of at a facility holding the appropriate licence or permit, as required.

Written records will be maintained by the contractor(s) detailing the waste arising throughout the construction and demolition phases, the classification of each waste type, the contact details and waste collection permit number of all waste contactors who collect waste from the site and the end destination and waste facility permit or licence number for all waste removed and disposed off-site. Dedicated bunded storage containers will be provided for hazardous wastes such as batteries, paints, oils, chemicals etc., if required.

3.4.5 Record Keeping, Auditing & Consultation

Record Keeping

Records will be kept for each waste material, which leaves the site, either for reuse on another site, recycling or disposal. A system will be put in place to record the construction waste arisings on site.

The Waste Manager or a member of his team will record the following:

- Waste taken for Reuse off-site (i.e. for capping of landfill cells or at another site);
- Waste taken for Recycling;
- Waste taken for Disposal;
- Reclaimed waste materials brought on-site for reuse.

For each movement of waste on- or off-site, the Waste Manager will obtain a signed docket from the contractor, detailing the weight and type of the material and the source and destination of the material. This will be carried out for each material type. This system will also be linked with the delivery records. In this way, the percentage of construction waste generated for each material can be determined.

The system will allow the comparison of these figures with the targets established for the recovery, reuse and recycling of construction waste and to highlight the successes or failures against these targets.

Outline Waste Audit Procedure

The appointed Waste Manager on site will be responsible for conducting a waste audit at the site. A review of all the records for the waste generated and transported on- or off-site will be undertaken. If waste movements are not accounted for, the reasons for this should be established in order to see if and why the record keeping system has not been maintained.

A Summary Report will be prepared and compared with the established recovery/reuse/recycling targets for the site. Each material type will be examined, in order to see where the largest percentage waste generation is occurring. The waste management methods for each material type will be reviewed in order to highlight how the targets can be achieved. Waste management costs will also be reviewed.

Consultation

Consultation with waste contractors and Dublin City Council through the construction phase will be pursued to ensure best practices for waste management are being followed on site.

3.5 Construction Traffic

The proposed development will have a certain amount of construction traffic associated with same to facilitate the works. As the site is located outside Dublin City Centre, the heavy vehicle restrictions imposed by Dublin City Council do not govern the traffic management proposals. However, the construction access strategy to serve the site will still need to be developed by the Main Contractor in a manner taking cognisance of the designated HGV routes in the city centre. These routes are indicated in Figure 3.5 below with approximate site outline included.

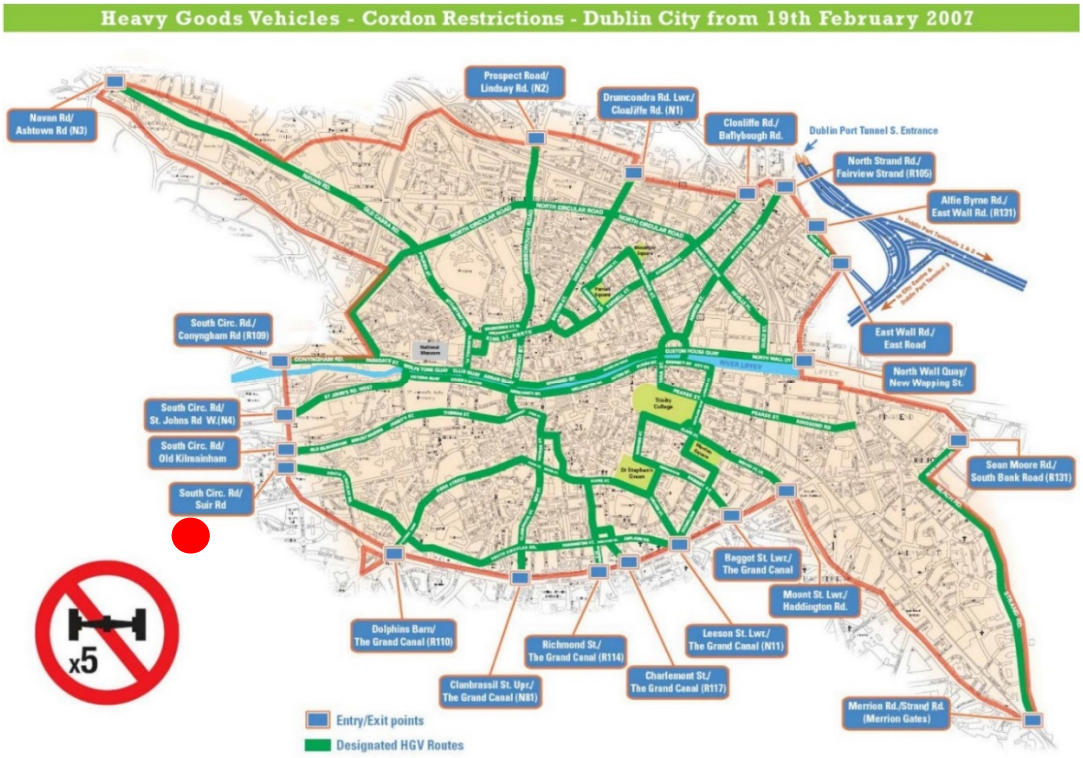

Figure 3.5 – Heavy Goods Vehicle Cordon Restrictions (with site location)

3.5.1 Traffic Generation

It is envisaged that traffic will be generated for the duration of the works by the proposed development. This will be from a number of sources:

- Hauling of excavated material off site;

- Concrete deliveries;
- Deliveries of reinforcement & formwork to site;
- Deliveries of prefabricated structural elements;
- Deliveries of glazing and precast panels for façade;
- Deliveries of building services equipment to site;
- Construction Workers.

It is noted that there will be no designated parking for construction workers on or around the site.

The levels of construction traffic will vary during the weeks with peak volumes predicted to be during the following activities:

- **Piling & Foundations**

  The piling and excavation works will require hauling of spoil off site. This will occur in tandem with deliveries for concrete and reinforcement for the piled foundations and ground beams.
- **Concrete pours**

  Concrete pours will be required throughout the works, with the size/volume of same dependant on the final structural form selected. In addition to the foundations/ground beams, concrete pours will be required to the library/community building as well as to the commercial spaces. All concrete works will require continued supply of concrete to site with deliveries for the duration of the period of the pour. The concrete works will be required to be carefully planned, sequenced and managed by the Main Contractor to ensure that works can be undertaken without undue disruption to the neighbourhood.
- **Deliveries of Prefabricated structural elements**

  The selection of the chosen structural form for the residential blocks may necessitate the delivery of precast concrete elements. These deliveries will need to be carefully planned, sequenced and managed by the Main Contractor to ensure that they are undertaken at the

appropriate time in the works sequence so as not to cause undue disruption to the neighbourhood.

3.5.2 Contents of Traffic Management Plan

The Construction Phase Traffic Management Plan will be prepared by the appointed Contractor and shall identify:

- Primary Contact Name;
- Primary Contact Mobile Phone Number;
- Secondary Contact Name;
- Secondary Contact Mobile Phone Number.

The primary contact shall act as a Liaison Officer with the Local Authority, Gardai, local residents and businesses.

The Construction Stage Traffic Management Plan is to be formulated in the style as specified in the Dublin City Council Publication *"Directions for the Control and Management of Roadworks in Dublin City",* March 2005 with reference to the DTO publications *"Traffic Management Guidelines Manual"* and the Traffic Signs Manual". The document should contain information on the following issues:

- Temporary signage (type and location);
- Temporary road markings (type and location);
- Temporary changes to existing signage and markings required to enable a road closure, if applicable;
- Location of proposed temporary traffic signals, if applicable;
- Arrangements for local access and pedestrian access;
- Proposed lighting arrangements;
- Proposals for the use of flagmen;
- Proposals to erect barriers;
- Proposals to change street infrastructure to enable road works;

- Proposals for pedestrian movements including those of mobility impaired;
- Proposed changes to on-street parking;
- Arrangements that will apply during the road works.

4 PRE-CONSTRUCTION ACTIVITIES

4.1 Prior to Commencement of Development

It is noted that there are a number of existing buildings on site to be demolished to facilitate the proposed development as discussed under Section 1.4 of this document. The demolition of these buildings is envisaged to be undertaken in advance of the Emmet Road Development as part of permitted Part 8 Development 2221/21.

4.2 Site Set-Up

The location of the site adjacent to a residential area within the heart of Inchicore village increases the requirement for a prompt and detailed establishment of the site compound by the Contractor following possession of the site. The overarching consideration in all elements of the site set-up will be to ensure the works can be undertaken in a safe manner for adjoining residents, users of adjoining buildings, members of the public and the Contractor & their staff.

Please refer to section 3.3 of this document for additional detail on site set-up, hoarding and security etc.

4.3 Surveys

A number of surveys will be required prior to works commencing on site. This include:

- Condition Surveys of adjoining properties (refer to section 3.3.17)
- Targeted slit trench surveys are required supplement the GPR survey undertaken to date to establish location and detail of all existing services on site.
- Baseline readings for noise, vibration, dust etc in advance of the establishment of monitoring regime and action of same;

- Targeted slit trench investigations/trial pits at site boundaries to establish any constraints;
- Surveys to identify asbestos or toxic/hazardous materials which may be present on site.

4.4 Monitoring Regime

A full and detailed monitoring regime to assess potential impact of noise, vibration, dust etc. to a level agreed between the Main Contractor and the project team is to be implemented in advance of any works commencing on site.

5 FOUNDATION & SUB-STRUCTURE WORKS

5.1 Overview

A detailed site investigation of the entire site has been undertaken to inform the proposed foundation solution. The current envisaged piled foundation solutions are shown in Figure 5.1 below for the Community and Library Hub building-foundations to other buildings will be of a similar form. It is noted that these proposed foundation solutions will be interrogated further during the detailed design phase of the project and may be subject to development.

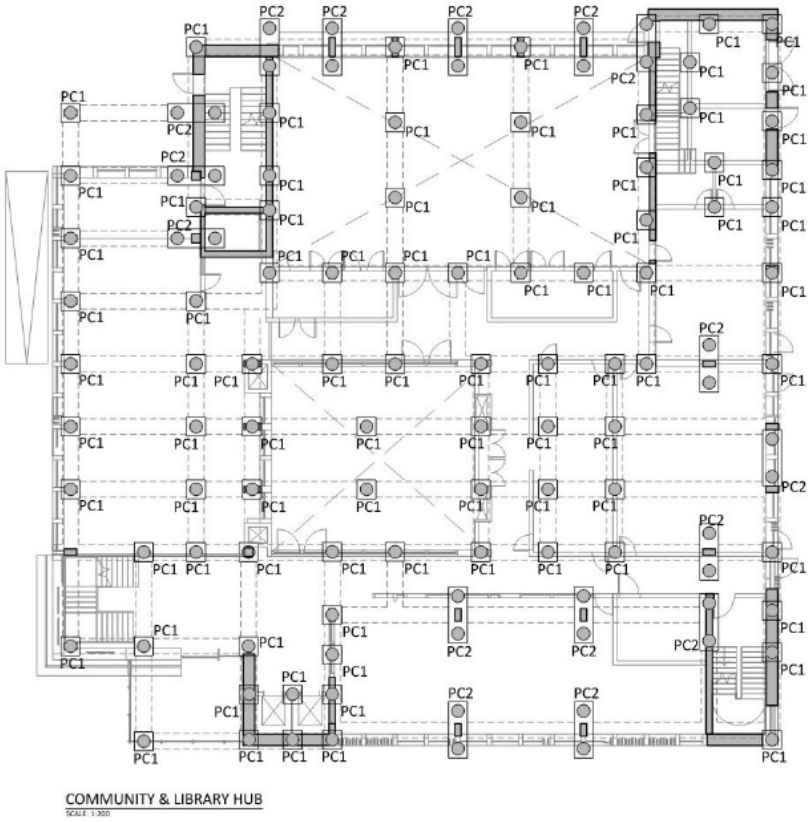

Figure 5.1 – Envisaged Foundation Solutions-Community and Library Hub

5.2 Piling

The proposed piled foundations will be constructed using rotary bored techniques. The piles will be constructed through the overburden soil with the

piles to be end bearing in the underlying bedrock. Due to the size of the site, it is envisaged that a number of piling rigs will be on site simultaneously to complete the necessary piling works. The rotary boring of the piles will generate spoil which will be hauled off site and disposed of at an appropriately licenced facility. The casting of the piles will require concrete deliveries and deliveries of reinforcement cages for the duration of this element of works.

In addition to the piled foundations, a small section of secant pile wall will be required to the perimeter of the lower ground floor plant space. This wall will be formed from a series of interlocking male and female bored piles along the c.115m perimeter of the lower ground floor space. The provision of a secant pile wall to facilitate excavations is a tried and trusted construction method, particularly within Dublin City. It has been adopted successfully on numerous projects for which O'Connor Sutton Cronin have acted as Structural Engineers- even in close proximity to existing buildings.

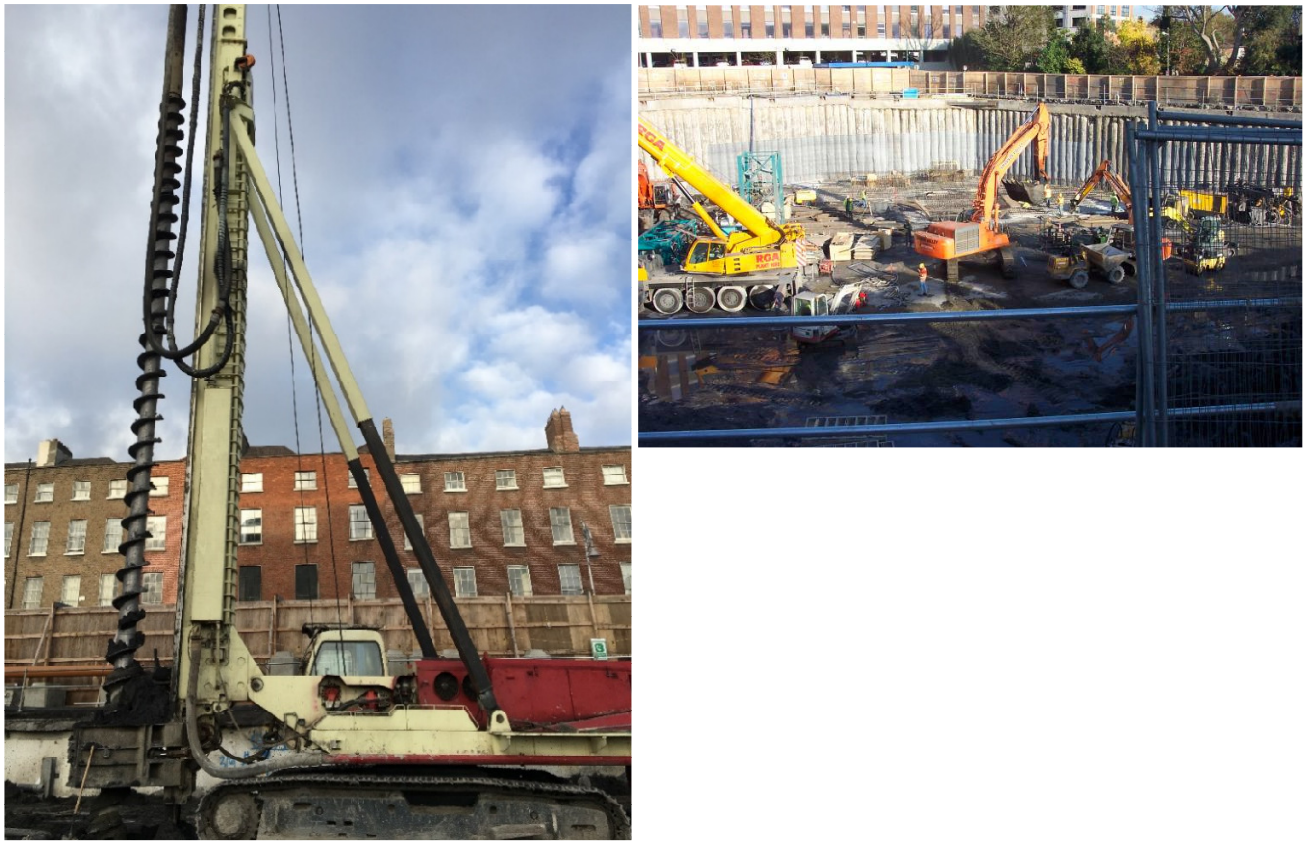

Figure 5.2 – Image of piling works and secant pile wall

5.3 Excavations

As the piling works advance on site, works will commence on excavations to form the ground beams. Excavations will commence with removal of topsoil from under the building footprint together with excavations along the lines of the ground beams-these will typically align with the perimeter of the proposed buildings together with the internal load bearing structural elements.

It is noted that additional excavations will be required to facilitate the lower ground floor plant space. The footprint of this space only constitutes a very small portion of the overall site and excavation volumes will be c. 1,800m^3 of material to be removed off site.

5.4 Lower Ground Floor Slab

The lower ground floor slab consists of a cast in-situ RC slab supported on a series of piled foundations and will be constructed in a sequence as follows:

- Completion of overburden excavation;
- Breaking down of piles;
- Immediate placing of a concrete blinding layer to protect the foundation formation;
- Installation and placing of waterproofing membrane & drainage;
- Placing of reinforcement;
- Casting & curing of concrete.

5.5 Ground Beams

The actions required to form the ground beams will consist of:

- Breaking down of piles to correct levels;
- Completion of excavations;
- Fixing of reinforcement;
- Casting of concrete.

Once the concrete has cured sufficiently, works can proceed on the follow on works.

5.6 Below slab services

The variety of building uses at ground floor will require the provision of services below slab. These will include foul drainage and water supply. These services will be provided in tandem with the construction of the ground beams.

5.7 Ground floor slab

The nature of the ground conditions on site necessitate that the ground floor slabs be suspended in all instances. Thus, a precast concrete ground floor slab will be provided to span between ground beams. An indicative detail of the suspended ground floor slab and build-up is shown in figure 5.3 below. It is noted that the precast slab and structural screed will be provided first to facilitate the construction of the superstructure-the insulation, build-up and finishes can be progressed as the works proceed on the upper levels.

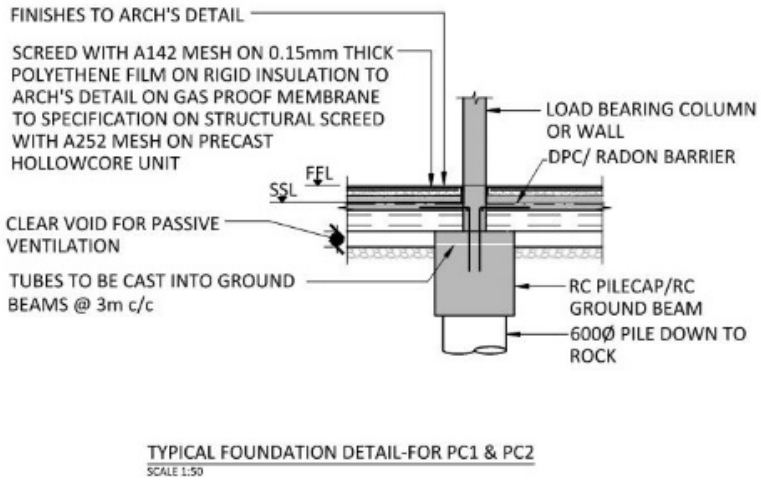

Figure 5.3 – Image of typical ground floor detail

6 SUPERSTRUCTURE

6.1 Overview

The proposed development is as described in Section 1.5 of this document and as per Figure 6.1 below.

Figure 6.1 – Image of overall development

6.2 Structural Works

A number of different possible structural forms are being considered for the proposed development. The forms of structure will be evaluated throughout the detailed design phase of the project with the possibility that a combination of a number of options will ultimately be chosen to be brought forward to construction stage as the final design solutions.

Discussed below is a brief description of the forms of structure and how they could be adopted within the proposed development.

6.2.1 Structural Options

Cast In-Situ Frame

A cast in-situ concrete frame is arguably the most commonly used form of multi-storey residential developments currently on the Irish market. It generally consists of a series of columns-either rectangular or rectilinear-aligned with dividing walls between residential units or internal partition walls which support a flat slab at each level. This flat slab soffit provides an uninterrupted route for services distribution at each level.

Figure 6.2 – Example of In-situ Flat Slab Construction

If a cast in-situ frame solution were to be adopted, the construction sequence would follow:

- Completion of ground beams;
- Fixing of reinforcement for rising elements (columns and walls) from ground to underside of first;
- Placing of formwork to rising elements and casting of same;
- Placing of formwork and propping to underside of first floor slab;
- Fixing of reinforcement to first floor slab;
- Casting of first floor slab;
- Fixing of reinforcement for rising elements (columns and walls) from first to underside of second and repeat.

Precast Concrete Frame

Precast concrete frames can consist of a number of differing forms. With residential buildings, the general layouts give rises to cross walls which allow

for a logical layout of precast elements. These precast walls can be twin wall construction which would allow for a high quality finish to both exposed faces or of solid precast construction. The walls would support a precast slab (either wideslab or hollowcore) with a structural screed topping. An example of this form of structure is shown in Figure 6.3 below.

Figure 6.3 – Precast Concrete Frame Construction

If a precast solution were to be adopted, the construction sequence would follow:

- Completion of ground beams;
- Erection of precast twinwalls from ground to underside of first;
- Casting of in-situ element within twinwall;
- Placing of precast floor slabs at first floor level;
- Casting of structural screed topping;
- Erection of precast first to underside of second and repeat.

Timber Frame Construction

It is envisaged that timber will be used in the structure of a number of buildings on site. These include the duplex units within the main residential spaces and also the Community Hub and Library Building. The timber form of construction will differ given the different building uses with a timber joist and timber stud

walling solution for the residential spaces but a combination of glulam and cross laminated timber for the Community Hub and Library Building.

If a timber frame solution were to be adopted, the construction sequence would follow:

- Completion of ground beams;
- Erection of rising elements (walls and columns) from ground to first;
- Installation of first floor (timber joists or glulam beams & CLT flooring)
- Casting of first floor slab;
- Erection of rising elements (walls and columns) from first to underside of second and repeat.

6.3 Façade Works

Throughout the design, a strong emphasis has been placed on durability and robustness of materials as an integral aspect of long term sustainability of low maintenance and the use of natural materials such as clay bricks, clay blocks, timber and lime-based render is maximised.

A variety of façade types are proposed throughout the development including:

- Brick;
- Glazing;
- White lime render;
- Terracotta tiles;
- Curtain walling;
- Hardwood timber cladding;

6.4 Internal Fit-Out

The internal fit out works will follow on once the building has been made weather tight by the façade. The nature of the fit out works will vary between the Residential and Commercial spaces but would generally follow a sequence such as:

- Installation of any stud walls or internal partitions as well as any areas of raised access floors;
- Installation of flooring and wall finishes
- Installation of ceilings (following completion of M & E fit-out noted below);
- Installation of kitchens and bathrooms;
- Installation of equipment and associated connections to services;
- Completion of finishes

6.5 M & E Fit-Out/Commissioning

The Mechanical and Electrical works/commissioning will follow the completion of the superstructure and façade. The works will involve:

- M & E first fix will be progressed in tandem with the ground works and structure and will include all underground services and the installation of primary mechanical and electrical services distribution including pipework, cable trays, bracketing and ductwork;
- M & E second fix will commence once the buildings are weathertight and will included the installation of sensitive equipment as well as the secondary distribution of pipework and cables within the buildings;
- M & E third fix will follow the installation of walls and ceilings within the buildings and includes the final installation of sanitary ware, lights, switches, sockets etc.
- Commissioning and testing to be completed.

7 SITEWORKS

7.1 Overview

The siteworks for the proposed development will entail the installation of all below ground services distribution around the site as well as the proposed landscaping works.

7.2 Site Services

A large variety of services are required to be constructed to provide functionality to the proposed development. These services include items such as storm drainage, foul drainage, water supply, power supply, gas supply etc.

The site services works are likely to proceed following completion of the foundations of the main buildings and will continue throughout the superstructure works.

The site services works will generally involve:

- Excavation of services trench;
- Placing of bedding as required for each service;
- Placing of service pipe/conduit within the trench;
- Placing of warning tape as required by each utility;
- Backfilling of trench.

It is noted that certain portions of the site services works will require connections to the public utilities outside of the site boundaries, with works to be undertaken in public spaces. These works will be undertaken under agreement with both the relevant departments of Dublin City Council and the utility provider. Appropriate method statements will be required to be prepared for each element of work including appropriate protection measures to be put in place to facilitate the works.

7.3 Hard & Soft Landscaping

The externals to the site are made up of a number of differing soft and hard landscaping finishes.

The soft finishes include:

- Private gardens;
- Public gardens;
- Internal courtyards.

The hard landscaping includes:

- Pathways;
- Access roads;
- Carparking;
- Communal areas;
- Plaza areas.

The hard landscaping works for the site are there to enhance the overall design, compliment the soft finishes and allow for pedestrian and vehicular traffic to and around the site. The hard and soft landscaping works will be undertaken following the completion of the main elements of construction.

The soft landscaping works will involve:

- Placing of topsoil;
- Planting of tress and shrubs;
- Seeding of grass;
- Placing of furniture and fittings.

The hard landscaping works will involve:

- Placing and compacting of hardcore sub-base;
- Casting of concrete kerbs and footpaths;
- Laying of road surfacing;
- Installation of paving;
- Placing of furniture and fittings.

8 OUTLINE CONSTRUCTION PROGRAMME

8.1 Overview

It is envisaged that construction works would commence in early summer 2024 with a completion date of summer 2027, subject to successful grant of planning, completion of detailed design and tendering prior to spring 2024.

IAN CREHAN (BE, CEng, MIStructE, MIEI, RConsEI)

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