

**PROPOSED STRATEGIC HOUSING DEVELOPMENT
'THE CONNOLLY QUARTER'**

**CONSTRUCTION & ENVIRONMENTAL
MANAGEMENT PLAN**

PROJECT: 0635

13th SEPTEMBER 2019



OCSC

O'CONNOR | SUTTON | CRONIN

Multidisciplinary
Consulting Engineers



**PROPOSED STRATEGIC HOUSING DEVELOPMENT
'THE CONNOLLY QUARTER'**

**CONSTRUCTION & ENVIRONMENTAL
MANAGEMENT PLAN**

PROJECT: 0635

13th SEPTEMBER 2019



OCSC

O'CONNOR | SUTTON | CRONIN

**Multidisciplinary
Consulting Engineers**

**Proposed Strategic Housing
Development 'The Connolly Quarter'
Construction & Environmental Management
Plan**



OCSC

O'CONNOR | SUTTON | CRONIN

Multidisciplinary
Consulting Engineers

NOTICE

This document has been produced by O'Connor Sutton Cronin & Associates for its client Oxley Holdings Limited. It may not be used for any purpose other than that specified by any other person without the written permission of the authors.

DOCUMENT CONTROL & HISTORY

OCSC Job No.: O635	Project Code	Originator	Zone Volume	Level	File Type	Role Type	Number	Status / Suitability Code	Revision																																																
	O635	OCSC	XX	XX	RP	C	0005	A1	C01																																																
<table border="1"> <thead> <tr> <th>Rev.</th> <th>Status</th> <th>Authors</th> <th>Checked</th> <th>Authorised</th> <th>Issue Date</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>C01</td> <td>A1</td> <td>T Horan</td> <td>T Horan</td> <td>T Horan</td> <td>13/09/2019</td> </tr> <tr> <th>Rev</th> <th>Suitability Code</th> <th>Author</th> <th>Checker</th> <th>Authorised</th> <th>Issue Date</th> </tr> </tbody> </table>										Rev.	Status	Authors	Checked	Authorised	Issue Date																															C01	A1	T Horan	T Horan	T Horan	13/09/2019	Rev	Suitability Code	Author	Checker	Authorised	Issue Date
Rev.	Status	Authors	Checked	Authorised	Issue Date																																																				
C01	A1	T Horan	T Horan	T Horan	13/09/2019																																																				
Rev	Suitability Code	Author	Checker	Authorised	Issue Date																																																				

**PROPOSED STRATEGIC HOUSING DEVELOPMENT 'THE CONNOLLY
QUARTER'**

CONSTRUCTION & ENVIRONMENTAL MANAGEMENT PLAN

OXLEY HOLDINGS LIMITED

O'CONNOR SUTTON CRONIN & ASSOCIATES

MULTIDISCIPLINARY CONSULTING ENGINEERS

PROJECT NO. 0635

13th SEPTEMBER 2019

INDEX	PAGE
1. INTRODUCTION	1
2. SITE LOCATION & PROPOSED DEVELOPMENT OUTLINE	2
3. CONSTRUCTION PROGRAMME & PHASING	6
4. SITE ESTABLISHMENT	13
5. SITE MONITORING, SECURITY AND MANAGEMENT	19
6. BASEMENT & SUPERSTRUCTURE CONSTRUCTION	28
7. HEALTH AND SAFETY	32
8. CONSTRUCTION HAUL ROUTES	35
9. CONSTRUCTION STAGE COMMUNITY LIAISON	37

1. INTRODUCTION

OCSC were commissioned by Oxley Holdings Limited to prepare a Construction & Environmental Management Plan (CEMP) in respect of the proposed redevelopment of lands at Connolly Station, Dublin 1. The subject site is bounded by Sheriff Street Lower, Oriel Street Upper and Oriel Hall. The subject site is bounded by Sheriff Street Lower, Oriel Street Upper and Oriel Hall. The overall proposed masterplan development will comprise mixed residential, commercial, amenity and community use with basement level car parking and associated infrastructure. The site is currently in use as a car park for Connolly Station. Permission for this will be sought under separate applications. The first will be a Section 247 Strategic Housing Development (SHD) application to ABP for the mainly residential elements of the scheme along with the basement. The second will be a standard Section 34 application to DCC for the non-residential elements of the scheme. The site is currently in use as a car park for Connolly Rail Station.

This report is solely in respect of the SHD application and should be read in conjunction with a number of other supporting documents including the *Land & Soils* chapter of the Environmental Impact Assessment Report (EIAR), the *Construction & Demolition Waste Management Plan* (CDWMP), the *Environmental Site Assessment* (ESA), the *Transportation Assessment* (TA) and the *Mobility Management Plan* (MMP) all by O'Connor Sutton Cronin Multidisciplinary Consulting Engineers. The following are the main participants in the project:

Role	Name	Contact
Applicant	Oxley Holdings Limited	David Killion
Architect	RKD Architects	David Petherbridge
Consulting Engineer	O'Connor Sutton Cronin	Tony Horan
Planning Consultant	McCutcheon Halley & Company	James Keogan
Main Contractor	TBC	TBC

Table 1: Project Participants

2. SITE LOCATION & PROPOSED DEVELOPMENT OUTLINE

Site Location

As noted earlier, the site is bounded by Sheriff Street Lower to the south, Oriel Street Upper to the east and Oriel Hall and Seville Place to the north. The site abuts Connolly Railway Station on the west. The red line boundary for the SHD application is shown in Figure 1.

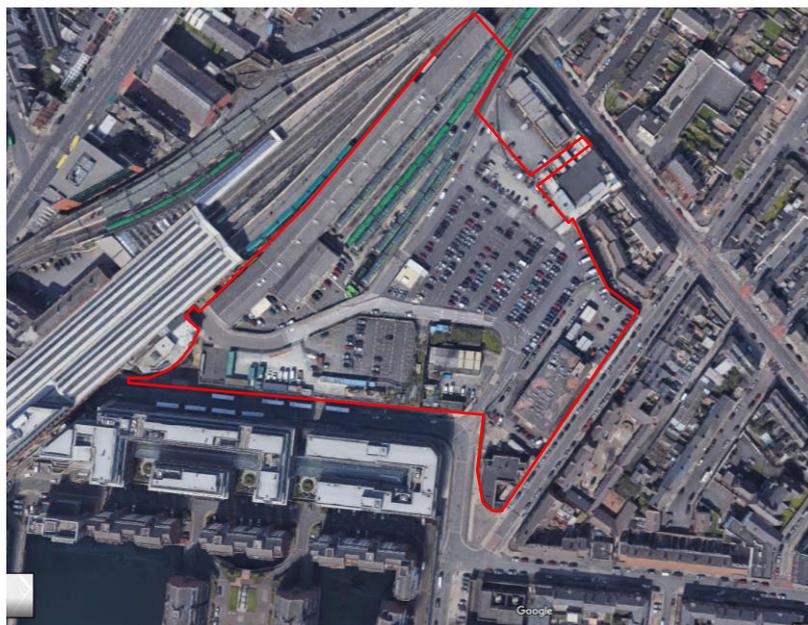


Figure 1: Site Location

Development Outline

The proposed Schedule of Accommodation for the Strategic Housing Development (SHD) application comprises the following:

- the demolition of 4 no. structures with a combined gross floor area of 3,028sq.m;
- the construction of 741 no. Build to Rent (BTR) residential units in 8 no. apartment blocks ranging in height from 4 storeys to 23 storeys with lower height buildings located adjacent to the northeast and east site boundaries, with a cumulative gross floor area of 68,535sq.m comprising;
 - Block B1 (maximum building height 54.917m, total gross internal floor area 11,260sq.m, Apartment Mix: Studio: 25, 1-bed: 37, 2-bed: 51);

- Block B2 (maximum building height 54.917m, total gross internal floor area 10,831sq.m, Apartment Mix: Studio: 20, 1-bed: 35, 2-bed: 51,);
- Block B3 (maximum building height 51.767m, total gross internal floor area 9,766sq.m, Apartment Mix: Studio: 22, 1-bed: 60, 2-bed: 27, 3-Bed: 1);
- Block C1 (maximum building height 79,450m, total gross internal floor area 12,705sq.m, Apartment Mix: Studio: 84, 1-bed: 40, 2-bed: 41);
- Block C2 (maximum building height 39,615 m, total gross internal floor area 4,890 sq.m, Apartment Mix: Studio: 9, 1-bed: 33, 2-bed: 3, 3-Bed: 4);
- Block C3 (maximum building height 39,650 m, total gross internal floor area 6,775sq.m, Apartment Mix: Studio: 40, 1-bed: 18, 2-bed: 23);
- Block D1 (maximum building height 53,392 m, total gross internal floor area 8,418 sq.m, Apartment Mix: Studio: 10, 1-bed: 25, 2-bed: 44, 3-Bed: 1);
- Block D2 (maximum building height 30,950 m, total gross internal floor area 3,890 sq.m, Apartment Mix: Studio: 18, 1-bed: 8, 2-bed: 11);
- residential support amenities including 1 no. gyms, a resident's lounge, work areas, meeting rooms, dining rooms, recreational areas with a combined GFA of 1,444 sq.m;
- change of use from club house to pedestrian passageway of the existing vault (137sq.m GFA) fronting Seville Place, a Protected Structure (RPS No. 130);
- a basement of 7,253.4 sq.m with vehicular access from Oriel Street Upper incorporating residents' car parking (58 no. spaces), residents cycle parking (640 no. spaces) 7 no. plant rooms (combined 2,228sq.m), waste management facilities (393 sq.m)
- 766 no. covered cycle parking spaces for residents and visitors, concierge office (233 sq.m) and waste management facilities (126 sq.m);

- 'other uses' including 10 no. units providing retail, commercial, and community use with a combined GFA of 3,142 sq.m;
- A total of 18,562 sq.m of hard and soft landscaping comprising both public, communal and private open space located throughout the development;
- A service and emergency vehicle only access ramp from the Oriel Street Upper site entrance to serve CIE's transport needs at Connolly Station;
- Enabling works of a non-material nature to safeguard the existing vaults (Protected Structures - RPS No. 130) that form part of the subject site fronting Sherriff Street Lower, Oriel Street Upper, and Seville Place during the construction phase;
- All associated ancillary development works including drainage, 6 no. electricity substations, pedestrian access; and
- Works to the Masonry wall fronting Oriel Street and the Vaults fronting Seville Place (both a Protected Structure) consisting of the creation of a new vehicular and pedestrian entrance.

An image of the proposed masterplan for the entire of the site (including the proposed Section 34 application to DCC) is shown in Figure 2.



Figure 2: Masterplan View

Proposed Planning Regime

It is proposed, as noted earlier, to submit separate planning applications in respect of the Residential and Commercial elements of the project. The apartment units, along with the minor ancillary retail, amenity, and community uses and the proposed basement, will be submitted via the Section 247 SHD process to An Bord Pleanála.

The commercial elements comprising the office, hotel and remaining retail uses will be submitted to DCC as a standard S34 application.

3. CONSTRUCTION PROGRAMME & PHASING

Phasing

It is expected that the proposed SHD development will be constructed in 4 no. phases based on the planning programme and on market requirements, with some phase overlap. Construction will commence with the basement excavation and associated piling (the basement lies entirely within the area of the SHD application). Following on from the construction of the basement work will commence on the C1, C2 and C3 residential blocks followed, in turn, by the B1, B2 and B3 residential blocks alongside and above the realigned railway sidings. The SHD element of the development will be completed with the construction of the smaller D1 residential block.

The various individual blocks forming the Masterplan are shown in Figure 3 with Figure 4 over showing the various phases against an aerial image background.

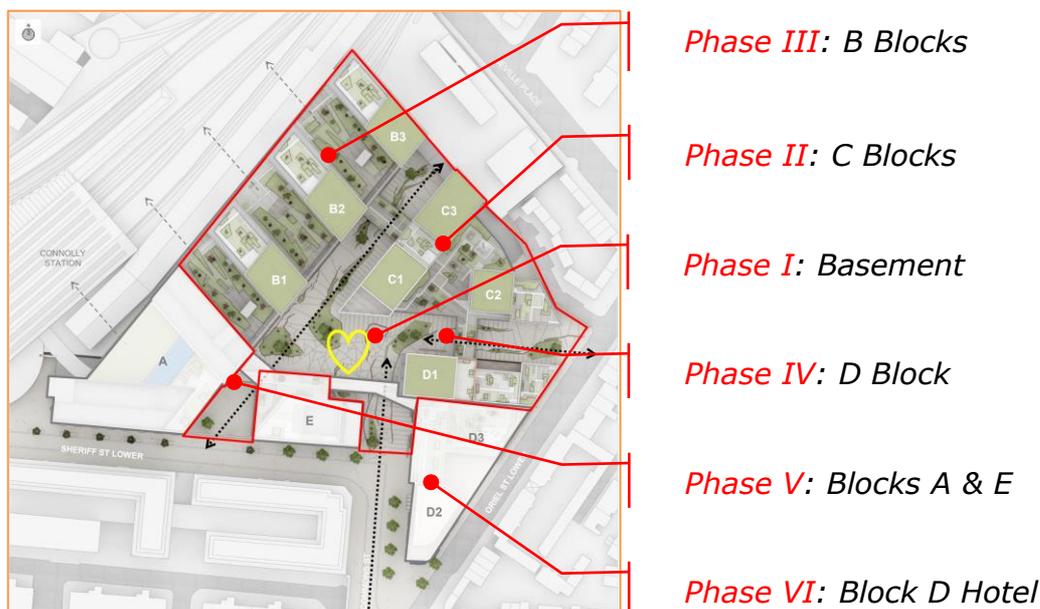


Figure 3: Indicative Phasing Diagram

The construction of the commercial elements of the development will, subject to planning, commence with Block A and continuing into Block E as a single phase, and ending finally, with Block D2 & D3, the Hotel.



Figure 4: Indicative Phasing Diagram

Programme

The development (construction) programme will be market driven to a large extent. Given the scale of the site and the number of residential units, it is expected that the SHD development will be rolled out over a 56 month period. Construction will commence following receipt of planning permission and this is expected to see the SHD Residential led scheme commence first followed later by the commercial S34 scheme subject to planning. A draft planning, design, procurement and construction programme has been developed for the scheme and is shown in Figure 5 over with further details in Table 2 following.

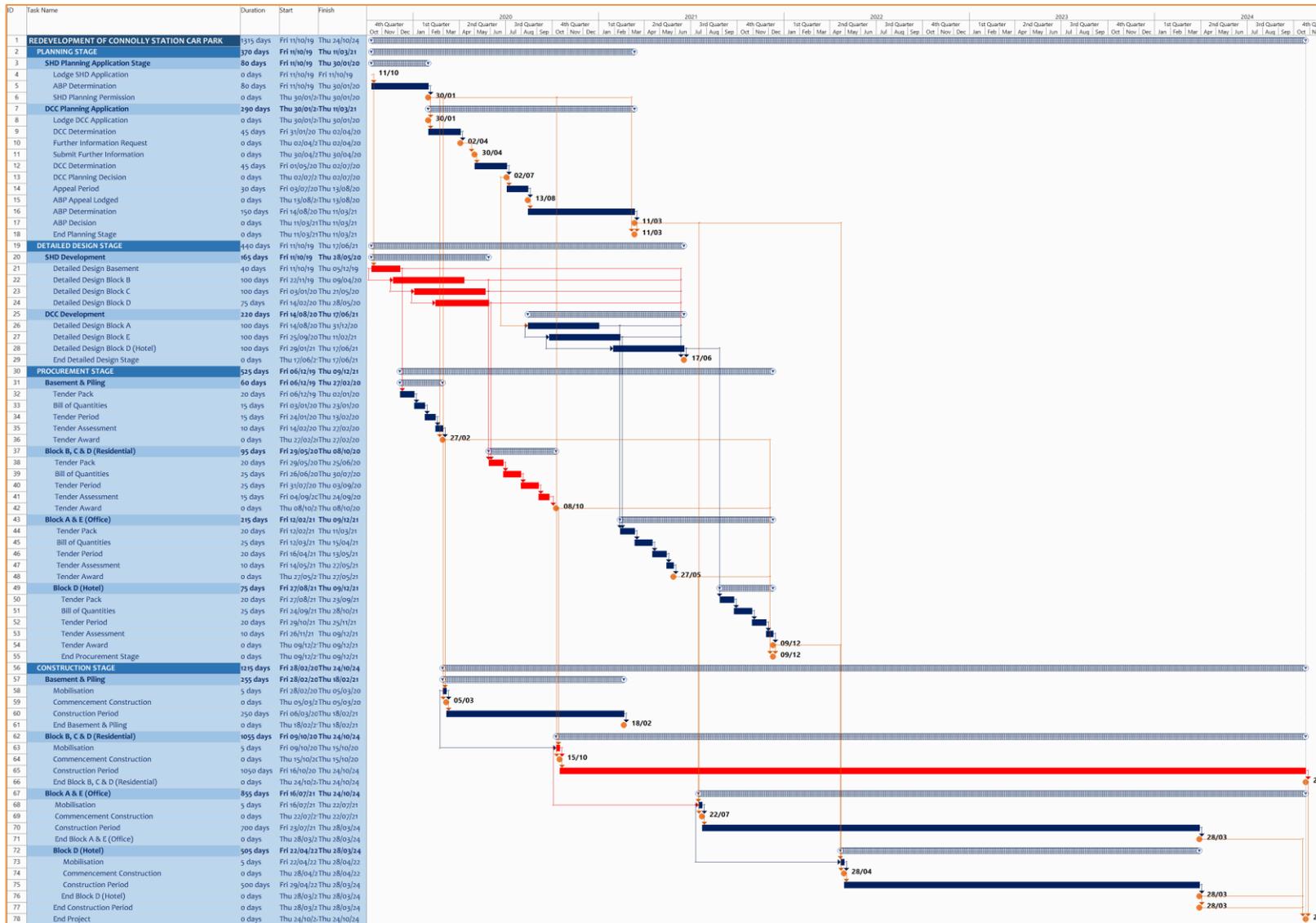


Figure 5: Indicative Development Programme

CONNOLLY STATION CAR PARK REDEVELOPMENT: PLANNING, DETAILED DESIGN & PROCUREMENT PROGRAMME				
Task Name	Duration	Start	Finish	Description
Programme Stage	1315 days	Fri 11/10/19	Thu 24/10/24	S247 SHD Planning for Basement and Blocks B, C & D (Residential)
PLANNING STAGE	370 days	Fri 11/10/19	Thu 11/03/21	
SHD Planning Application Stage	80 days	Fri 11/10/19	Thu 30/01/20	
Lodge SHD Application	0 days	Fri 11/10/19	Fri 11/10/19	
ABP Determination	80 days	Fri 11/10/19	Thu 30/01/20	
SHD Planning Permission	0 days	Thu 30/01/20	Thu 30/01/20	
DCC Planning Application	290 days	Thu 30/01/20	Thu 11/03/21	
Lodge DCC Application	0 days	Thu 30/01/20	Thu 30/01/20	
DCC Determination	45 days	Fri 31/01/20	Thu 02/04/20	
Further Information Request	0 days	Thu 02/04/20	Thu 02/04/20	
Submit Further Information	0 days	Thu 30/04/20	Thu 30/04/20	
DCC Determination	45 days	Fri 01/05/20	Thu 02/07/20	
DCC Planning Decision	0 days	Thu 02/07/20	Thu 02/07/20	
Appeal Period	30 days	Fri 03/07/20	Thu 13/08/20	
ABP Appeal Lodged	0 days	Thu 13/08/20	Thu 13/08/20	
ABP Determination	150 days	Fri 14/08/20	Thu 11/03/21	
ABP Decision	0 days	Thu 11/03/21	Thu 11/03/21	
End Planning Stage	0 days	Thu 11/03/21	Thu 11/03/21	
DETAILED DESIGN STAGE	440 days	Fri 11/10/19	Thu 17/06/21	
SHD Development	165 days	Fri 11/10/19	Thu 28/05/20	
Detailed Design Basement	40 days	Fri 11/10/19	Thu 05/12/19	
Detailed Design Block B	100 days	Fri 22/11/19	Thu 09/04/20	
Detailed Design Block C	100 days	Fri 03/01/20	Thu 21/05/20	
Detailed Design Block D	75 days	Fri 14/02/20	Thu 28/05/20	
				S34 Planning for Blocks A, E & D (Hotel)
				Detailed Design of Basement and Blocks B, C & D (Residential)

CONNOLLY STATION CAR PARK REDEVELOPMENT: PLANNING, DETAILED DESIGN & PROCUREMENT PROGRAMME				
Task Name	Duration	Start	Finish	Description
DCC Development	220 days	Fri 14/08/20	Thu 17/06/21	Detailed Design of Blocks A, E & D (Hotel)
Detailed Design Block A	100 days	Fri 14/08/20	Thu 31/12/20	
Detailed Design Block E	100 days	Fri 25/09/20	Thu 11/02/21	
Detailed Design Block D (Hotel)	100 days	Fri 29/01/21	Thu 17/06/21	
End Detailed Design Stage	0 days	Thu 17/06/21	Thu 17/06/21	
PROCUREMENT STAGE	525 days	Fri 06/12/19	Thu 09/12/21	Procurement of Basement and Piling
Basement & Piling	60 days	Fri 06/12/19	Thu 27/02/20	
Tender Pack	20 days	Fri 06/12/19	Thu 02/01/20	
Bill of Quantities	15 days	Fri 03/01/20	Thu 23/01/20	
Tender Period	15 days	Fri 24/01/20	Thu 13/02/20	
Tender Assessment	10 days	Fri 14/02/20	Thu 27/02/20	
Tender Award	0 days	Thu 27/02/20	Thu 27/02/20	Procurement of Blocks B, C & D (Residential)
Block B, C & D (Residential)	95 days	Fri 29/05/20	Thu 08/10/20	
Tender Pack	20 days	Fri 29/05/20	Thu 25/06/20	
Bill of Quantities	25 days	Fri 26/06/20	Thu 30/07/20	
Tender Period	25 days	Fri 31/07/20	Thu 03/09/20	
Tender Assessment	15 days	Fri 04/09/20	Thu 24/09/20	
Tender Award	0 days	Thu 08/10/20	Thu 08/10/20	Procurement of Blocks A & E Offices
Block A & E (Office)	215 days	Fri 12/02/21	Thu 09/12/21	
Tender Pack	20 days	Fri 12/02/21	Thu 11/03/21	
Bill of Quantities	25 days	Fri 12/03/21	Thu 15/04/21	
Tender Period	20 days	Fri 16/04/21	Thu 13/05/21	
Tender Assessment	10 days	Fri 14/05/21	Thu 27/05/21	
Tender Award	0 days	Thu 27/05/21	Thu 27/05/21	

CONNOLLY STATION CAR PARK REDEVELOPMENT: PLANNING, DETAILED DESIGN & PROCUREMENT PROGRAMME				
Task Name	Duration	Start	Finish	Description
Block D (Hotel)	75 days	Fri 27/08/21	Thu 09/12/21	Procurement of Block D (Hotel)
Tender Pack	20 days	Fri 27/08/21	Thu 23/09/21	
Bill of Quantities	25 days	Fri 24/09/21	Thu 28/10/21	
Tender Period	20 days	Fri 29/10/21	Thu 25/11/21	
Tender Assessment	10 days	Fri 26/11/21	Thu 09/12/21	
Tender Award	0 days	Thu 09/12/21	Thu 09/12/21	
End Procurement Stage	0 days	Thu 09/12/21	Thu 09/12/21	
CONSTRUCTION STAGE	1215 days	Fri 28/02/20	Thu 24/10/24	
Basement & Piling	255 days	Fri 28/02/20	Thu 18/02/21	
Mobilisation	5 days	Fri 28/02/20	Thu 05/03/20	
Commencement Construction	0 days	Thu 05/03/20	Thu 05/03/20	
Construction Period	250 days	Fri 06/03/20	Thu 18/02/21	
End Basement & Piling	0 days	Thu 18/02/21	Thu 18/02/21	Construction of Block B, C & D Residential
Block B, C & D (Residential)	1055 days	Fri 09/10/20	Thu 24/10/24	
Mobilisation	5 days	Fri 09/10/20	Thu 15/10/20	
Commencement Construction	0 days	Thu 15/10/20	Thu 15/10/20	
Construction Period	1050 days	Fri 16/10/20	Thu 24/10/24	
End Block B, C & D (Residential)	0 days	Thu 24/10/24	Thu 24/10/24	Construction of Block A & E Offices
Block A & E (Office)	855 days	Fri 16/07/21	Thu 24/10/24	
Mobilisation	5 days	Fri 16/07/21	Thu 22/07/21	
Commencement Construction	0 days	Thu 22/07/21	Thu 22/07/21	
Construction Period	700 days	Fri 23/07/21	Thu 28/03/24	
End Block A & E (Office)	0 days	Thu 28/03/24	Thu 28/03/24	Construction of Block D (Hotel)
Block D (Hotel)	505 days	Fri 22/04/22	Thu 28/03/24	
Mobilisation	5 days	Fri 22/04/22	Thu 28/04/22	
Commencement Construction	0 days	Thu 28/04/22	Thu 28/04/22	

CONNOLLY STATION CAR PARK REDEVELOPMENT: PLANNING, DETAILED DESIGN & PROCUREMENT PROGRAMME				
Task Name	Duration	Start	Finish	Description
Construction Period	500 days	Fri 29/04/22	Thu 28/03/24	
End Block D (Hotel)	0 days	Thu 28/03/24	Thu 28/03/24	
End Construction Period	0 days	Thu 28/03/24	Thu 28/03/24	
End Project	0 days	Thu 24/10/24	Thu 24/10/24	

Table 2: Planning, Detailed Design, Procurement & Construction Programme

4. SITE ESTABLISHMENT

Site Access: Phases I, II & III

The site is currently accessed off Sheriff Street Lower. It is intended to open up a new construction access off Oriel Street close to its junction with Seville Place. This will provide the shortest possible distance for construction traffic entering and leaving the site to travel to accepted construction haul routes through the Dublin Port Tunnel – see later.



Figure 6: Site Set Up Phase I, II & III

The general site set up arrangement is shown in Figure 7 above. This is for the first three phases of construction i.e. the basement and the C & B residential blocks. A new construction access (shown with brown arrow) will be provided off Oriel Street close to Seville Place. A second, temporary Connolly Station Car Park access (shown green arrow), will be also be provided, again off Oriel Street, but close to the Commons Road junction. This will provide access to a temporary 180 space car park to serve Connolly Railway Station during the early phase construction works so as to maintain station operational viability.

The arrangement has the benefit of allowing for the segregation of construction and railway station traffic streams.

Site Access: Phases IV, V & VI

The site set up for the final phases of construction are shown in Figure 7.



Figure 7: Site Set Up Phase IV, V & VI

A new construction access (brown arrow) will be provided off Sheriff Street Lower close to the current station car park access. This will serve the construction of the commercial blocks i.e. Block A & E and the Block D hotel. The site compound will be relocated closer to the new construction access. Access will be provided to the 180 Connolly Station Car Park (green arrow) situated beneath the Block B apartments, via the permanent site access off Oriel Street. This will provide access to a temporary 180 space car park to serve Connolly Railway Station. This will allow for the ongoing operational viability of Connolly Station. The arrangement again has the benefit of allowing for the segregation of construction and railway station traffic streams.

Internal turning areas will be provided, in each site set up scenario, for all construction traffic to turn within the site.

Site Offices & Compound

It is proposed to set up the Site Compound in the southeast quadrant of the site as shown in Figures 6 & 7 in line with the proposed construction phasing plan. Offices will be provided on site for construction and management

personnel. Appropriate segregation will be employed to separate pedestrians from heavy construction equipment. Fenced off pedestrian walkways will be provided close to the site offices.

Hoarding Lines

The site will be hoarded off along its external perimeter. Openings will be provided to the hoarding line to accommodate personnel and vehicular access points to the construction site. A Hoarding Licence will be obtained from Dublin City Council. Temporary hoarding will be provided as necessary within the site as a safety restriction to prevent public access and, in particular, to segregate users of the temporary Connolly Station Car Park from the main construction site. The line of this temporary hoarding will vary as work progresses across the site.

Construction Personnel & Vehicle Numbers

Based on a construction contract value of €250 million over a 240 week construction period, it is estimated that 60,000 man weeks of onsite labour will be required for the project. Based again on industry standard figures it is likely that an average of 300 construction personnel will be employed on site on average but rising to 450 during periods of peak activity. It is further estimated that maximum construction vehicle numbers will be of the order of 120 movements per day – see *Transportation Assessment* for more information.

Logistics Planning

The limited site access and the location of the site within a busy City, combined with the proximity of the site to existing residents present very significant logistic, environmental and construction challenges. This document puts forward some initial outline measures to deal with these issues. However, it is expected that more detailed measures will be conditioned through the planning process and that 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 scheme will be the development of the MLP. This plan will stipulate that prior notice be given of major deliveries including materials, plant and equipment times.

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. Unscheduled deliveries will not be allowed access to the site.

Site Access

Pedestrian Access

Pedestrian access will be strictly controlled via a manned turnstile system. Only *Safepass* accredited personnel will be permitted on site.



Figure 8: Access Turnstiles

On Site Parking

No on-site provision will be made for car parking by site construction personnel – see *Mobility Management Plan* submitted under separate cover. Adequate numbers of cycle parking will be provided for site personnel and personnel will be encouraged to use public transport which is widely available in the surrounding area. A limited number of spaces will be provided for VIP visitors within the temporary Connolly Station Car Park area.

All visitor access will be controlled with access and egress movements recorded. All site personnel and delivery drivers will have to undergo site induction. A *Site Safety & Induction Room* will be provided as part of the site set up.

Site Craneage

Given the scale of the Oxley site (200m * 175m) it is evident that a number of tower cranes will be required in order to provide efficient site coverage. Whilst the exact number will be dictated by the programme and the specific construction requirements, it is likely that between five and eight cranes will be required. Based on a 60m crane jib dimension an outline tower crane layout is shown in Figure 9. This will be further developed by the appointed contractor.

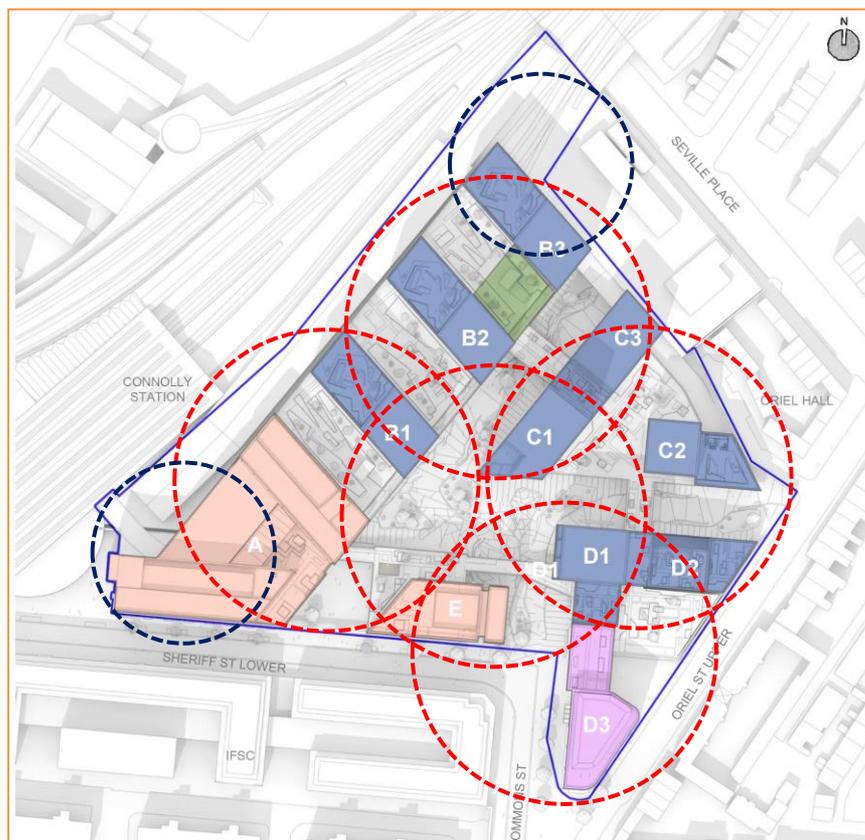


Figure 9: Outline Tower Crane Locations

It may be necessary to use a luffing jib in some locations in the event that over sailing restrictions apply. In addition to the above fixed tower cranes, it is likely that a number of mobile cranes will be required on short term basis throughout the construction works.

A photograph of a typical tower crane layout in operation is shown in Figure 10 over.



Figure 10: Tower Crane Site Arrangement

Hours of Working

Construction operations will be carried out in accordance with any granted planning conditions. It is expected that normal working hours will be from 07:00 – 19:00 Monday to Friday and from 08:00 – 14:00 on Saturdays.

It may be necessary for some specific construction activities to take place outside of these times and in those case, a specific derogation will be sought from the Planning Authority, An Bord Pleanála/Dublin City Council.

Deliveries to site will be arranged to arrive within normal working hours as set out above. There may, again, be specific deliveries which need to arrive outside of these hours e.g. in respect of wide loads. In all such cases the applicant will again liaise and agree any necessary derogations with the Planning Authority.

5. SITE MONITORING, SECURITY & MANAGEMENT

Noise Control & Monitoring

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 $>7\text{kg/m}^2$ 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.

Noise monitoring will be carried out in accordance with any ABP or DCC planning consent and also in accordance with *Safety, Health and Welfare at Work (Construction) Regulations 2006 – 2012 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*.



Figure 11: Noise Monitoring

Vibration Control & Monitoring

Any construction works that have the potential to cause vibration at sensitive receptors will be carried out in accordance with the limit values in Table 3 hereunder, at the most affected sensitive receptor.

Allowable PPV (mm/s) at Sensitive Receptors at Given Frequencies (Hz)		
<10 Hz	10 – 15 Hz	50 Hz and above
8 mm/s	12.5 mm/s	20 mm/s

Table 3: Vibration Limits

Monitoring will be carried out in accordance with BS 5228-1, 2009, *Code of Practice for Noise & Vibration Control on Construction & Open Sites*.

Dust Control & Monitoring

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 wheelwash 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 arisings off site – see later;
- 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/m²day in the vicinity of the site, further mitigation measures will be adopted in the construction.

Wheel Washing Facilities, Covered Vehicles & Dust Suppression Systems

A properly sized and designed wheel wash will be provided and maintained on site for the full duration of construction. Appropriate water collection and filtering will take place prior to discharge to the public sewer system. 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.



Figure 12: Truck Wheelwash

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



Figure 13: Truck Covering System

Trucks leaving the site will, as previously noted, pass through a wheel washing system. In addition, these trucks will be watered down and covered as shown. 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 process. This system will be closely monitored by site management personnel particularly during extended dry periods and in accordance with site management methods discussed earlier.



Figure 14: Dust Suppression System

Concrete Breaking

In all cases the most efficient and environmentally sensitive methodologies will be used in the demolition process. Concrete munchers will be used instead of a rock breaker. This is a much quieter piece of equipment and generates significantly less noise – Figure 15. Where munchers cannot be used i.e. for in-situ reinforced slabs, then multi-head concrete breakers will be used.



Figure 15: Concrete Muncher

Appropriate Air Quality and Dust monitoring will be carried out on a regular basis in accordance with either ABP or DCC planning conditions and records will be kept of all such monitoring for review by the Planning Authority.



Figure 16: Air Quality Monitoring Station

Pre Commencement Condition Surveys

A Visual Condition Survey (VCS) will be carried out of all surrounding streets and recorded with the City Council prior to any site works commencing. The appointed Main Contractor will liaise with DCC 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.

Site Security & Management

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 control 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 (as noted earlier) and to monitor and record all deliveries and removals operations.



Figure 17: Manned Security Gates

Measure to Protect Groundwater

Specific measures to protect groundwater during the construction works on site will be put in place under the control of the site Environmental Consultant.

Soil Waste Management

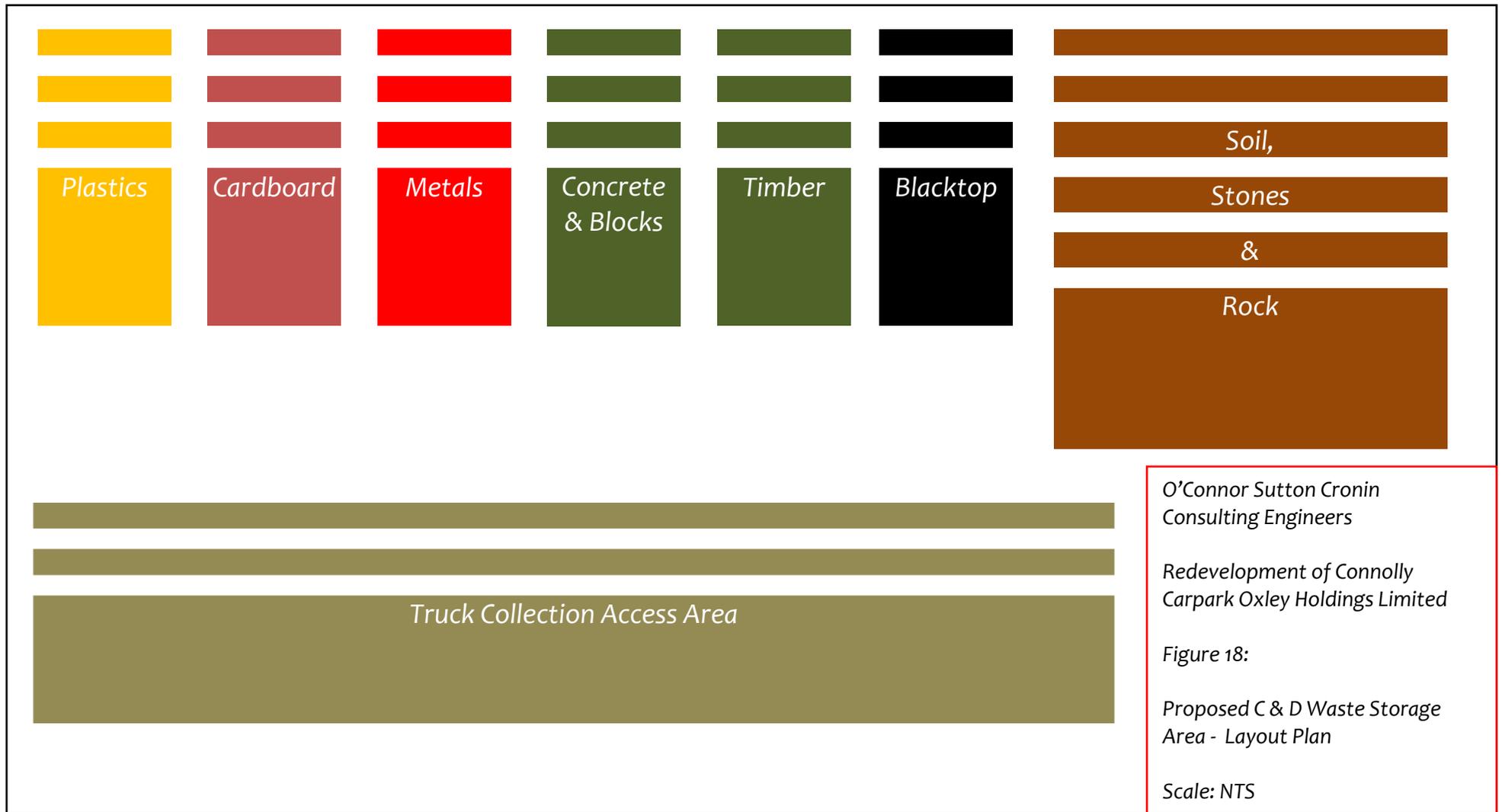
A site investigation specified by OCSC was carried by Ground Investigations Ireland Limited between in August/September 2019. The trial pit and borehole logs from this site investigation have been examined by OCSC Environmental. The results of this site investigation and testing regime will not however be available in advance of the SHD planning application. However, investigation results from prior testing for previous planning applications are available and have been referenced in the design of the scheme.

It is noted that soil generated as part of the construction works will be managed in accordance with a *Soil Waste Management Plan* to be produced by OCSC in advance of the construction stage. That report will identify the nature and classification of the soil waste and will detail management procedures to be implemented to ensure appropriate handling and disposal in accordance with Irish and EU legislative requirements.

Segregation of Waste Materials

Waste materials generated will be segregated on site where it is practical and in accordance with the OCSC *Construction & Demolition Waste Management Plan*. A Layout Plan for a site-based waste segregation compound is shown in Figure 18 over.

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.



6. BASEMENT & SUPERSTRUCTURE CONSTRUCTION

Construction Sequence

The proposed construction sequence has been detailed in Sections 3 & 4 earlier with specific reference to Figures 5, 6 & 7. The outline of the proposed basement is shown dashed red on the overall phasing plan in Figure 19.



Figure 19: Basement Phasing Sequence

As can be seen from the figure, the basement lies entirely within the SHD application boundary and generally within the curtilage of Block C.

Basement Construction Methodology

Prior to the excavation for the basement a line of secant piles will be laid along the outer line of the railway sidings. The sidings run parallel to and southeast of the main Connolly Depot building. This secant pile wall will be continued along the line of the CTC building which backs onto Seville Place. Following the installation of the secant pile walling the basement will be excavated from the secant pile wall inwards. The remaining faces of the basement backing onto Blocks A, E and D can be supported by berms as they are at a much shallower depth. Subject to detailed design, pile diameters will be of the order of 900 mm and pile lengths will be of the order of 20 – 30 m.

Detailed sample will take place on site of all excavated materials, including pile arisings, and all materials will be categorised and removed off site by licensed operators in accordance with the OCSC *Soil Management Plan*.

All basement concrete works will be designed and constructed as watertight structures in accordance with BS-8102. A pour plan will be agreed with the Engineer ahead of casting. This will outline the location of construction joints and the specific detailing of all watertightness installations. Construction will be by traditional formwork and falsework methods with all temporary works being fully designed by a qualified structural engineer. Formwork and rebar will be handled by mobile and tower craneage.



Figure 20: Rebar and Water Bar Installation

In general, large horizontal elements such as slabs will be pumped with vertical elements such as columns and walls being craned in skips. Specified finishing grades will determine pour sizes and schedules. 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 accommodate poor or cold weather limitations on working times.

Superstructure

The bulk of the development comprises medium rise buildings with the maximum building height (Block C1) being of the order of 81 m above ground level. In this regard it is not considered that any specialised construction techniques will need to be applied on the site. Block C1 in the heart of the site will be a tower and is likely to be constructed using either a slip form or jump form core construction technique. The superstructure may be precast subject to market conditions.

Health & Safety

Health & Safety issues will be a primary concern for the Main Contractor. This will apply in respect of persons working on the site and in respect of passing pedestrians, motorists or other transport carriers. In this regard the highest possible care will be taken in providing properly designed scaffolding – see Section 7 following.



Figure 21: Scaffolding Design

Given the location of the site in a live city environment, special care will be taken to provide suitable protection for passing pedestrians – Figure 22.

The following general principles will apply:

- Watertight toe boards will be provided;
- There will be no lifting of materials over live footpaths or roadways;
- A sloped fan will be provided at second floor level and will move upwards as construction advances;
- Debris netting will be provided for the full scaffolded perimeter;
- Fully recorded inspections will be carried out of the scaffolding for the full duration of construction.



Figure 22: Pedestrian Protection

Sequencing

The Main Contractor will engage with the professional design team to reach early agreement on an acceptable construction sequence. Buildings will be made watertight as soon as possible so as to allow the fit out of lower floors to progress as scheduled.

7. HEALTH & SAFETY

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. 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.

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.

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.

8. PROPOSED CONSTRUCTION HAUL ROUTES

Introduction

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, Construction & Demolition Waste Management, 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, in a city centre location, will generate very 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.

Construction Delivery & Haul Routes

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 DCC. The site is located on the north side of the city and is approximately 9 kilometres from the M1-M50 junction via the Dublin Port Tunnel. It is also located just over 2.5 kilometre from the Dublin Port Tunnel southern access.

Construction Route Options

The following options are put forward for discussion (with reference to Figure 23 over):

- **The Green Route:** this runs directly from the site to the Dublin Port Tunnel, through the tunnel and then along the old N1 to the M1-M50 junction;
- **The Red Route:** this route runs along Sheriff Street Upper and then East Wall Road to the old N1 at North Strand before turning right and running along the old

- N1 until it joins the green route beyond the Port Tunnel exit;
- **The Navy Route:** this runs along Seville Place and Portland Row before turning right onto Summerhill Parade and before joining the Red Route at the Ballybough Road East Wall Road junction.

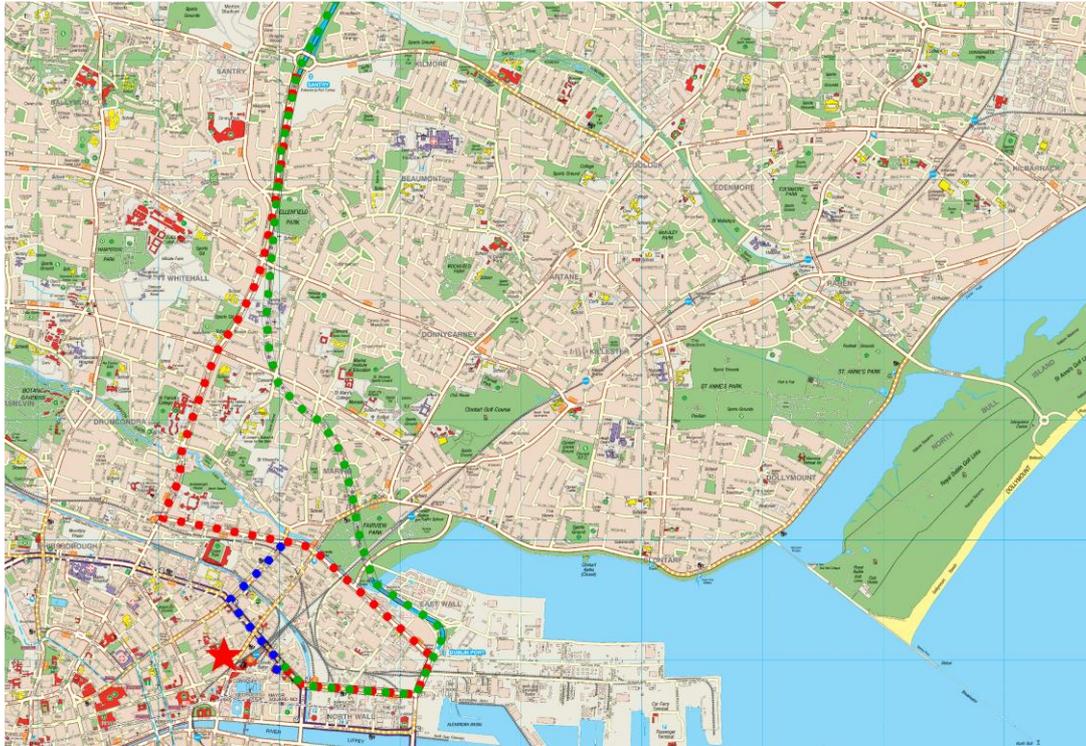


Figure 23: Construction Haul Routes

9. CONSTRUCTION STAGE COMMUNITY LIAISON

Introduction

It is important that discussions with local residents, businesses and the general public commence well in advance of work commencing on site. 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.

Code of Considerate 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.

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.

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.



Figure 24: Community 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.

Updated Construction Programme

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

Pole 3 timeline

KEY ACTIVITIES	2010				2011				2012			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Pole 3 Stage 1												
Consenting	Mar											
Civil/building/construction works at Haywards	Jan					July						
Major equipment delivery and installation					May		Nov					
Pole 3 commissioned									Feb	April		
Pole 1 Decommissioning												
Pole 1 switched off							Nov					
Pole 1 mercury arc valve removal							Nov			July		
Pole 1 building demolition commences										Aug	Dec	

Figure 25: Updated Programmes

In this regard each edition of the Community Newsletter will feature continuing updates 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.

Handwritten signature in blue ink, appearing to read 'M Horan'.

TONY HORAN F.I.E.I.

CHARTERED ENGINEER

OCSC

MULTIDISCIPLINARY CONSULTING ENGINEER



OCSC

O'CONNOR | SUTTON | CRONIN

Multidisciplinary
Consulting Engineers

9 Prussia Street
Dublin 7
Ireland

T | +353 (0)1 8682000
F | +353 (0)1 8682100
W | www.ocsc.ie

Dublin | London | Abu Dhabi | Belfast | Cork | Galway | Glasgow | Libya | Poland | Romania | Russia