

The Railyard Apartments

Construction, Environmental and Demolition Waste Management Plan

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1.0 Introduction

Progressive Commercial Construction Ltd intend to apply for planning application for a residential development at Albert Quay East in Cork City Centre. The Development will be known as The Railyard Apartments and will include 217 residential units over 24 stories.

Murphy Matson O’ Sullivan have been appointed as the Civil and Structural Engineers for the project.

2.0 Site Location and description

The proposed development is located at Albert Quay East on the Southern Channel of the River Lee at approximate Irish Transverse Mercator reference E: 568180, N:571835. The Site is bounded by Albert Street to the West and by Albert Road to the South. The site is also bounded by the Navigation Square Development to the East.

A topographical Survey has been undertaken on the site and indicates levels varying between 2.6m OD to 2.8 m OD at the North, 2.80 m OD to 3.10 m OD at the West and 3.10 m OD to 3.0 m OD at the South. The site has an area of approximately 0.2744 HA. The site structure consists of a number of single storey warehouse buildings (Park Facilities Management Ltd), a 2-storey office building and an open carparking area.



Figure 1 – Site Location Plan

3.0 Development Description

The Railyard Apartments proposed development comprises of the construction of 217 no. apartments comprising 25 no. studio units; 92 no. 1-bed units; 88no. 2-bed units; and 12no. 3-bed units apartments in a building that ranges in height from 8 to 11 to 24 storeys over ground floor at the former Carey Tool Hire site, currently principally occupied by Park Facilities Management Ltd, Albert Quay, Cork City.

The development site, measuring approximately 0.2744 hectares, is bounded by Albert Quay East to the north, Albert Street to the west, the former Blackrock and Passage Railway Terminus – Ticket Office, a Protected Structure, Ref. No. PS 1138, and which is also a Recorded Monument, CO074-119002, the two-storey former Cork, Blackrock and Passage Railway Offices, Protected Structure, Ref. No. PS 1137, and the Albert Road Post Box, which is also a Protected Structure Ref. No. PS942 and Albert Road to the south, and Navigation Square to the east. The site is accessed by Albert Quay East and Albert Street.

The proposed works include:

- The construction of 217no. apartments [25no. studio units; 92no. 1-bed units; 88no. 2-bed units; and 12no. 3-bed units] in a building that ranges in height from 8 to 11 to 24 storeys over ground floor.
- The provision of external balconies on the east, west and south elevations to the 12th floor on the east and west elevation, and to the 9th floor on the southern elevation.
- The provision of an external public realm area at ground level, an eastern laneway for servicing of the proposed development, in addition to its use as a pedestrian link.
- The provision of internal communal space areas at ground floor, 1st floor, and 2nd floor, and 2no. external rooftop terraces on the 9th floor and the 12th floor.
- The provision of a ground floor community/arts use, with external seating area and a ground floor creche with external covered play area.
- The provision of ground level plant, ancillary uses, and bin store.
- Bicycle spaces at lower ground floor and ground floor level; additional visitor bicycle spaces; and a set down delivery area at ground floor level on Albert Street.
- Set back of the eastern boundary wall to the north and south.
- All site development, public realm and landscaping works.
- The proposed development also involves the demolition of the existing two-storey Carey Tool Hire building, currently principally occupied by Park Facilities Management Ltd.

4.0 General Construction Works

4.1 Construction Sequence

The proposed works will be constructed in the following sequence.

- Demolition of existing building structures as listed above.
- The installation of the CFA piles from the existing ground level into the dense gravels, approx. 22m BGL.
- The local excavation of the lower ground floor and lift bases below ground level for the construction of the reinforced concrete pile caps, rafts and ground beams.
- The construction of the reinforced concrete pile caps and ground beams from the remaining of the substructure close to the existing ground level to allow for the raised ground floor level for passive flood protection.
- The construction of the underground drainage and services.
- The installation of the first level of the superstructure reinforced concrete walls and columns.
- The installation of the insulation and waterproofing below the ground floor slab.
- The construction of the ground floor reinforced concrete floor slab.
- Erection of Concrete stairs and lift cores to roof level. This core will be undertaken in concrete framed construction.
- Erection of the remaining reinforced concrete framed superstructure. The structure will consist of a concrete flat slab supported on internal/ perimeter columns and reinforced concrete cores.
- Construction of glazing and facades in accordance with the architect's drawings and specifications.
- Roof completions.
- Mechanical and electrical installations.
- Internal fitout works.
- The remaining tie in works to the substructure drainage.
- External works.

4.2 Site Hoarding

A hoarding drawing will be prepared prior to the commencement of the works on site and agreed with Cork City Council. This drawing will indicate the layout of the proposed hoarding that will be required to construct the works. The hoarding on the public street will be subject to an agreement and or licence between the main contractor and Cork City Council. The following is however envisaged.

- A hoarding will be provided to the edge of the existing footpaths on Albert Street and Albert Quay East and pedestrian movements will be diverted in agreement with the Cork City Council.
- Construction access during the works will principally be from Albert Quay.
- A 3.0m high hoarding along Albert Quay and Albert Street.

Signage will be provided on all hoarding in conjunction with adjoining traders to direct pedestrian and to convey that “business as usual” will continue during the construction process.

Hoarding will be removed on completion of the building facades & external paving works.

4.3 Tower Crane

It is envisaged that at least one tower crane will be erected for the construction of the superstructure. The tower cranes will be required for the erection of the building frame and super structure and given the scale of the building a Heavy-Duty Tower Crane will be provided. It is noted that the location and operation of the tower cranes will be co-ordinated by the main contractor but are likely to be located centrally.

5.0 General Construction Works

5.1 Construction Sequence & Associated Works

The construction of the proposed development will be carried out in the following phases:

- Phase 1: Site Preparation & Enabling Works.
- Phase 2: Substructure Works.
- Phase 3: The RC Superstructure Works, including all associated works.
- Phase 4: Public Realm Works.

It is estimated that the proposed phases will take approximately 2 years.

5.1.1 Phase 1

The existing Park Facilities Management Ltd. warehouse (1,726m²) is to be demolished. The existing hardstanding areas are to be dug up, crushed and, where possible, recycled on site, in accordance with a Construction and Demolition Waste Management Plan to be finalised with the appointed contractor prior to the commencement of development.

5.1.2 Phase 2

The piling for the substructure will be carried out from the existing ground level that is current a concrete slab. Much of the substructure will be constructed at the existing ground level, reducing the volume of excavation and soil to be removed off site.

The partial lower ground floor area (c. 320m²) is to be constructed below the existing ground level, involving the excavation of the site to formation level, including the removal of approximately 1,280 m³ of soil from the site. The reinforcement concrete pile caps and the ground beams will be constructed below the lower ground floor level with RC retaining walls to ground floor level at the perimeter.

The lower ground floor will accommodate plant rooms bike storage. The site clearance and substructure works will facilitate the development of the proposed development scheme, and all associated ancillary works. This will involve the construction of the reinforced concrete pile caps and ground beams to support the ground floor slab and columns for the superstructure. The associated water proofing of the lower and upper ground floor slab will be installed followed by the ground floor slab and the erection of concrete stairs and lift cores to roof level.

5.1.3 Phase 3

The main structural Frame will be completed following from the completion of the substructure works and ground floor slab.

The cores will be undertaken in concrete framed construction; construction of concrete columns and upper floor concrete slabs; construction of glazing and stone facades in accordance with the architect's drawings and specifications; roof completions; mechanical and electrical installations; internal apartment fit out works and external drainage and services.

On completion of the building structure the building envelope will be completed and will include glazing and other façade elements, roof finishes and other completions.

5.1.4 Phase 4

The public realm and landscaping works, including boundary treatments, to the ground floor plaza are to be completed in this final phase, as is the upgrade of the public footpaths on Albert Quay and Albert Street in the immediate vicinity of the proposed development site. Cork City has given its consent to the works to the public footpaths on Albert Quay and Albert Street.

5.2 Construction Access

During the project site delivery traffic will access the site via Horgan's Quay or the South link. Site traffic entering via Horgan's Quay will turn left at Eamon De Valera bridge and access the site via the access gate on Albert Quay. Site Traffic entering via South city Link will continue onto Eglinton Road, turning right onto Albert Quay.

Site Traffic leaving site will proceed to end of Albert Quay onto Victoria Road and Albert Quay. From here traffic can proceed south to the South Link or North to Penrose Quay.

5.3 Signage

Signage will be erected in advance to warn other pedestrian and road users of a construction site ahead. These signs will be checked and cleaned regularly so that they are maintained in a good condition.

5.4 Site Compound

The location and operation of the site compound will be co-ordinated by the main contractor with details provided to the planning authority prior to commencement.

5.5 Services and utilities required during Construction.

The following services will be required on site during construction.

- Foul Sewer
- Water mains connection
- ESB Connection
- Telecoms

Foul Sewer, Watermain and Telecoms connections will be required within the site compound and where possible existing services will be utilised.

Due to the increase power load required an application will be made to the ESB for a separate connection with ESB required to power activities such as the tower crane operation.

5.6 Plant/ persons Segregation.

Any works completed outside site boundary will be fully barriered with such work covered by a method statement and agreed in advance with the local authority. All plant driving on the public roads will be accompanied by a vehicle banksman. For works outside the boundary which may impede the traffic/pedestrians on the public road a separate traffic management plan will be completed.

Inside the site boundary a clear pedestrian access will be provided to the areas of work and appropriate signage placed. Pedestrian boundary will be delineated with pedestrian barriers.

Whether inside the site boundary or on the public road all plant will give way to pedestrians and will be carefully controlled by operatives and site banksman.

5.7 Cleaning of Roads

The roads will be monitored throughout the works and a road sweeper will be employed when required for the duration should the roads become dirty. The contractor will liaise with the local authority and all adjoining owners / residents in respect of the timing and movement of the road sweeper activity.

5.8 Deliveries

All deliveries must be notified to the site in advance so that the site will be organised, for the offloading and dictate which crane will be unloading. This is to ensure that delivery trucks, on entering the site, cannot block any of the public roads adjacent to the site. A banks man will be assigned to control all deliveries.

5.9 Main Gate & Pedestrian Gate

Due to the nature and location of the site the main gate will remain closed at all times. The foreman will have a key and a spare located at the site reception. The gate will be opened for deliveries and it will be closed again once unloaded. If the gate is to remain open for prolonged periods, such as large concrete pours, a flag man will be placed at the gate for the duration it remains open to ensure there is no unauthorised entries.

All pedestrian access will be initially via the gate to the site compound on Albert Road, and then via Albert Quay East.

5.10 Work on Public Roads

Any works on public roads outside the site will be co-ordinated and will be co-ordinated with Cork City Council and the adjoining businesses and residents.

Secure site hoarding will be employed around any works outside of the site, with controlled access points.

5.11 Hours of work

Working hours during site clearance and construction shall be restricted to 0800-1800 hours on Mondays to Fridays. Activities outside these hours shall require the prior approval of the CCC Housing Capital Section.

6.0 Recycling and Disposal off Site.

6.1 General

The contractor will be required to prepare a specific demolition waste plan & Construction waste management plan for the site and submit prior to commencement of the works. The following requirements are noted.

Details of the Wastes to Be Produced (Incl. Estimated C&D Surpluses/Deficits)

During construction of the proposed development, there will be construction waste generated, such as off-cuts of timber, oversupply of materials and damaged or broken concrete blocks and tiles, along with packaging materials such as cardboard, plastic and polystyrene.

Demolition waste will be produced by the demolition of the buildings currently on the site.

6.1.1 Main C&D Waste Categories

The main non-hazardous waste streams that will be generated by the construction and demolition activities at the site are:

- Stones/bedrock, topsoil and subsoil
- Concrete, brick, tiles and ceramics
- Asphalt, tar and tar products
- Plasterboard
- Scrap Metal
- Cardboard (packaging)
- Plastic (wrapping, packaging)
- Waste wood
- Paper

The hazardous waste streams may include the following;

- Asbestos
- Batteries
- Wood Preservatives
- Oils/Fuels from machinery & equipment

The European Waste Code (EWC) Classification for each waste stream is presented in Table 8.1.

Waste Material	EWC Code
<i>Non-Hazardous</i>	
Concrete bricks, tiles and ceramics	17 01 00
Wood	17 02 01
Glass	17 02 02
Plastic	17 02 03
Bituminous mixtures, coal tar and tarred products	17 03 00
Metals (including their alloys)	17 04 00
Soil, stones and dredging spoil	17 05 00
Insulation materials and asbestos-containing materials	17 06 00
Gypsum-based construction material	17 08 00
Other construction and demolition waste	17 09 00

Cardboard	15 01 01
<i>Hazardous</i>	
Asbestos	17 06 05
Batteries	16 06
Wood Preservatives	03 02
Liquid Fuels	13 07

Table 8.1: Waste types and EWC Classification

Some hazardous wastes may be produced at this stage of the development. There may be asbestos material in the existing buildings on the site. A full asbestos survey has not been carried out, but an asbestos inspection will take place prior to demolition work being carried out.

6.1.2 Estimated Waste Arising & Proposals for Reduce, Reuse & Recycle

The EPA has produced figures for the C&D waste recorded in the National Waste Database 7. This included a percentage breakdown of each waste type in the C&D stream.

Waste Types	%
Bedrock, Soil & Stones	51
Concrete, Bricks, Tiles, Ceramics, Plasterboard	39
Asphalt, Tar and Tar products	2
Metals	2
Other	6
Total Waste	100

Table 8.2: Breakdown of Waste Materials generated at a typical site

As Table 8.2 shows, a large percentage of the waste at the site will be soil and stones. The excavated material from the site will be reused on site if possible. In the event of the material being used off site options include land remediation/infill on other sites in the area. Table 8.3 shows the targets for recycling, reuse and recovery during the construction phase of the development.

Waste Types	Reuse	Recycle	Disposal
	%	%	%
Soil & Stones	95	0	5
Concrete, Bricks, Tiles, Ceramics, Plasterboard	0	75	25
Asphalt, Tar and Tar products	0	25	75
Metals	5	80	15
Other	10	40	50
Total			

Table 8.3: Reuse & Recycle Targets for Construction Phase

There will be some demolition waste generated on site, as the existing buildings will be demolished prior to construction of the proposed development. It should be noted that

the existing stonework of the western gable of the existing western warehouse will be taken down and reused / integrated into the proposed design and as such it will be removed and housed off site until reuse in the new development.

6.1.3 Proposed Uses of Wastes and Surpluses/Deficits from the Site

A temporary segregation bay will be constructed at the site for the duration of the construction and demolition phase of the development. The bay will include segregated areas for recyclable waste streams, such as gypsum (plasterboard), cardboard, timber, concrete/blocks/tiles etc.

As extensive development is being carried out in the vicinity of the site, the possibility of reuse of materials on neighbouring sites will be investigated.

Cardboard

Cardboard will be segregated on site. The cardboard will be flattened and placed in a covered skip or tied and covered, to prevent the card getting wet. A recycling contractor will collect it as required.

Plasterboard

There will be a separate skip for plasterboard at the site. There are a number of specialist contractors that recycle plasterboard and they will be contracted to address this matter.

Reprocessed gypsum powder, which makes up to 94% of the plasterboard, can be reprocessed into new plasterboard or converted for use in soil conditioners for the agricultural industry. The paper, which makes up to 6% of the plasterboard can be reused in various industries.

Soil/Subsoil

Excess excavated soil will be disposed of off-site. Soil will be removed and disposed of by contractors licensed under the Waste Management Act of 1996, the Waste Management (Permit) Regulations of 1998 and the Waste Management (Collection Permit) Regulations of 2001. This material will be used for fill material on other sites, or capping purposes on site, e.g. at a landfill.

Environmental testing of the soil samples recovered during the site investigation process was undertaken as part of the SI. From a review of the environmental testing, we can conclude that no material encountered is classified as Hazardous and that all material is within the inert & stable non-hazardous limits. It was noted that there were some instances where the material exceed inert limit values and that a further extensive investigation will be undertaken and submitted to the planning authority prior to construction. All classifications for contaminations are in accordance with the European Directive for Waste.

Plastic

As plastic is now considered a highly recyclable material, much of the plastic generated during construction will be diverted from landfill and recycled. Clean plastic will be segregated at source and kept as clean as possible and stored in a dedicated covered skip.

Timber

There will be timber waste generated from the construction work as off-cuts or damaged pieces of timber or from the demolished building. Timber that is uncontaminated, i.e. free from paints, preservatives, glues etc, will all be recycled. It will be stored on site in a designated skip and collected by a recycling contractor. Such companies shred the timber and use it for manufacture of wood products or for landscaping (wood chips etc).

Scrap Metal

Steel is a highly recyclable material and there are numerous companies that will accept waste steel and other scrap metals. A segregated skip will be available for steel storage on site pending recycling.

Asbestos

If asbestos is found in existing structures on site, a specialised contractor will be employed to carry out an environmental clean-up to remove all traces of contaminated material from the site. This will be disposed of at a licensed asbestos disposal facility.

The roof of some of the warehouse structures is an asbestos cement roof. These will be removed and disposed of by an appropriately licensed contractor at an appropriately licensed facility.

6.1.4 Tracking and Documentation Procedures for Off-Site Waste

All waste will be documented prior to leaving the site.

Any contractor who takes waste materials from the site will be compliant with the Waste Management Act of 1996 & 2001 and also the Waste Management (Collection Permit) Regulations of 2001, i.e. any contractor removing waste from the site will have a waste collection permit issued by Cork City Council. The foreman on the site will have a copy of the waste collection permits.

All information will be entered in a waste management system kept on the site; this will be maintained by the appointed building contractor. This will maintain accurate records on the quantities of waste/surpluses arising and the real cost (including purchase) associated with waste generation and management, locations for disposal and recycling of waste and the permitted contractors used in the process. This will also be in accordance with Section 5 of this Appendix.

6.1.5 Disposal of C&D Waste

There will be a general skip or receptacle for C&D waste not suitable for reuse or recovery. This skip will include polystyrene, contaminated cardboard, plastic etc. Workers on the site will be encouraged to recycle as much municipal waste as possible, i.e. cardboard, plastic, metals and glass. General wet waste will be presented separately for recovery. Food waste will be segregated with separate receptacles for collection and disposal.

Prior to removal, the municipal waste receptacle will be examined by either the foreman or a member of his team to determine that recyclable materials have not been placed

in there. If this is the case, efforts will be made to determine the cause of the waste not being segregated correctly.

6.2 C&D WASTE MANAGEMENT PROCEDURES

6.2.1 Sorting/Segregation Arrangements for Individual Materials

C&D waste materials will be stored separately on site, i.e. there will be a Central Waste Storage Area (CWSA) with specific receptacles or bays for each material taken from the demolition and construction phase.

Bins or skips used on site will be transportable to the CWSA. A forklift will be used to transport skips and containers around the site. By having segregated wastes at source, it can be arranged that a waste contractor/recycler will collect the materials as necessary.

6.2.2 Details of Transportation and Reception Arrangements for Movement of Materials to Other Sites

The waste materials will be stored in the specifically designated compound. All waste collected from the site will be by a permitted waste contractor, under the Waste Management (Collection Permit) Regulations 2001.

The contractor will provide the waste manager on site with documentation of the waste to be removed and a copy of the waste collection permit. Prior to the waste leaving the site, the waste manager will have documentation to show where the waste is being taken to, and that the facility is licensed to accept the particular waste. A receipt will be issued for each load that leaves the site.

Some wastes may be transported to another site for reuse on the site. The manager will be in contact with other sites to ensure that as much waste is reused as possible, such as concrete for fill purposes etc.

All wastes leaving the site will be placed in appropriate containers. Any concrete, soil, gravel, or broken stone transported off site will be covered to prevent dust or particle emissions from the load.

6.2.3 Training Provisions for Waste Manager and Site Crew

One of the construction team or the foreman will be appointed as a waste manager to ensure commitment, operational efficiency and accountability.

The waste manager will be given responsibility and authority to select a waste team if required, i.e. members of the site crew that will aid him/her in the organisation, operation and recording of the waste management system on the site.

The waste manager will have overall responsibility to oversee, record and provide feedback to the client on everyday waste management at the site. Authority will be given to the waste manager to delegate responsibility to sub-contractors where

necessary, and to coordinate with suppliers, service providers and sub-contractors to prioritise waste prevention and salvage on site.

The waste manager will be trained in how to set up and maintain a record keeping system, how to perform an audit and how to establish targets for the waste management on site.

He/she will be also trained in the best methods for segregation and storage of recyclable materials, have information on the materials that can be reused on site and know how to implement the construction and demolition waste management plan.

The training of the site crew is the responsibility of the waste manager. A waste training program will be organised. A basic awareness course will be held for all site crew to outline the C&D waste management plan and to detail the segregation of waste materials at source. This may be incorporated into the induction course, or safety-training course.

This basic course will describe the materials to be segregated, the storage methods and the location of the waste storage areas. A subsection on hazardous wastes will be incorporated and the particular dangers of each hazardous waste will be explained.

6.3 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 arising 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.

6.4 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. Ongoing consultation with waste contractors and the Cork City Council will be pursued in order to ensure that the best practicable option is being followed for waste management on site.

Upon completion of the project, an audit will be prepared, summarising the ongoing progress and the total recycling/reuse/recovery figures for the development. This audit may be reviewed by the Waste Management section of Cork City Council.

At least two audits will be carried out during construction to ascertain if measures in place are addressing demands and to allow for corrective measures in waste handling and management to be addressed with appropriate corrective measures.

References:

1. Waste Management Act, 1996. S.I. No. 10 of 1996
2. Cork City Waste Management Plan, 2004 – 2009, Cork City Council
3. Report on the Strategic Review of the Construction Industry, 1997.
4. Changing Our Ways; a Policy Statement on Waste Management. Mr. Noel Dempsey, Minister for the Environment and Local Government, Sept. 1998
5. Recycling of Construction and Demolition Waste, 5th March 2000. Forum for the Construction Industry
6. 1st Annual Report of the National Construction and Demolition Waste Council (NCDWC), 2003
7. National Waste Database, 2004. EPA and DoELG, 2003
8. Cork City Development Plan. Cork City Council
9. Best Practice Guidelines – Preparation of Waste Management Plans for C&D Waste, NCDWC on behalf of the Dept. Environment, July 2006.

7.0 Managing water pollution from the Construction Site

7.1 General

Potential pollution from the site will be managed in accordance with the principals as set out in CIRIA guide *C532 Control of Water Pollution from Construction Sites – Guidance for consultants and contractors*. These procedures are set out as follows.

7.2 Planning Stage

At planning stage (as outlined in this report) the site history and types of soils and sub-soils have been established as well as the potential for pollutants within and external to the site. The type of construction technique is established in outline, particularly relating to the lower ground floor works. The procedures for the control of ground water is established and techniques that have been successfully used on similar sites are explored.

7.3 Pre-construction Stage

At pre-construction and tender stage, a full site investigation will be undertaken that includes environmental testing of the soils. The tendering contractors will be made aware of the proposed techniques required to manage and control ground water on site in accordance with good practice.

A full survey of all existing underground drainage services will be undertaken to identify the current sources of drainage from the site.

7.4 Site Establishment and Mobilisation

At site setup and mobilisation, the appointed contractor will be obliged to ensure that full procedures for the management of water pollution will be established and installed. These will include the protection of surface water sewers adjacent to the site and the establishment of closed loop system for onsite drainage where possible. Wheel wash facilities and pollutant collection sumps will be provided to deal with water run off during the demolition phase of the works. All sources of fuel will be bunded to prevent spillage in accordance with good practice.

7.5 Construction

The substructure works as outlined above will be established in advance of the excavation works and will manage the ground water run off during the excavation and construction works. Care will need to be taken by the contractor to also manage the runoff from the site during the demolition process.

8.0 Piling

The structure will be supported on reinforced concrete piles (CFA/Displacement) found in the dense gravels.

There is to be some limited dewatering works proposed for the lower ground floor of this development. The double basement previously permitted has been omitted from the scheme. The piles will be installed from the existing ground level using the concrete hardstanding as a piling matt for the scheme.

9.0 Excavation

The construction works will involve the excavation of approximately 1,280m³ of soil from the development site.

A thorough site investigation for the site will be undertaken during the planning or tender process. All excess soil arising from the excavation and construction works will be removed by a licenced contractor to an appropriately licenced facility.

Soils arising from the site are anticipated to be as follows.

- 0 - 2.2 m BGL Fill material or made ground of sandy gravelly clay material.
- 2.0 m – 4.0 m BGL Sandy Gravelly SILT layers that are generally weak in nature.
- 4.0 m – 11.0 m BGL - Medium Dense, becoming denser with depth, Sandy GRAVEL layers that are rounded in shape.

The site history suggests that the site was formerly used as a Rail Terminus to the South of the site, office use to the West of the suite and a Stock Yard to the East of the site.

Based on the site history as established above it is anticipated that the majority of material to be removed off site will likely be described as inert, however, the site investigation process will establish the classification of the material.

The site investigation as well as further testing to be undertaken post demolition will determine the final classification and removal of all material from the site. Any material that is found to be above the Inert limit will not be accepted at an Inert Landfill and will need to be segregated on site before being transported to a speciality designated landfill.

Final certification for all materials removed off site will require to be provided by the main contractor on completion of the excavation works.

10.0 Dust Minimisation

10.1 General

Dust emissions on site are to be managed through the implementation of a dust minimisation plan which is to be submitted for approval. It is the contractor's responsibility to formulate and submit the plan that relates to the type of construction activity and the environmental factors pertaining to the site. The following should be considered.

10.2 Construction Factors to be considered.

In order to ensure that no dust nuisance occurs, a series of measures will be implemented. Site access shall be regularly cleaned and maintained as appropriate. Hard surface areas shall be cleaned to remove mud and aggregate materials from their surface while any un-surfaced areas shall be restricted to essential site traffic only. Furthermore, any area that has the potential to give rise to fugitive dust must be regularly watered, as appropriate, during dry and/or windy conditions. Scaffolding, where required, will be erected around the site during construction along with hoardings at ground level. Mesh netting will be erected around the scaffolding during construction if necessary, as a mitigation measure to minimise dust emissions from the site.

Public roads outside the site shall be regularly inspected for cleanliness and cleaned as necessary. The roads will be monitored throughout the works and a road sweeper will be employed when required for the duration should the roads become dirty.

10.3 Monitoring.

At all times, the procedures put in place will be strictly monitored and assessed. In the event of dust nuisance occurring outside the site boundary, significant dust producing activities will be immediately terminated and satisfactory procedures implemented to rectify the problem before the resumption of the operations.

The dust minimisation plan shall be reviewed at regular intervals during the construction phase to ensure the effectiveness of the procedures in place and to maintain the goal of minimisation of dust through the use of best practise and procedures.

Dust monitoring will be carried out using a Microdust Pro – Automatic dust monitoring unit. The measure will continue for the duration of the enabling works and the bulk dig which are the periods in which the most dust would be created on site.

Any additional information referring to the site during the survey period will be noted. A note will also be made if the site is operational or dormant. In addition, the wind direction and weather for the day will be recorded.

11.0 Noise and Vibration

11.1 Demolition Noise

Due to the nature of the activities undertaken on a large construction site, there is potential for noise generation. The flow of vehicular traffic to and from a construction site is also a potential source of noise levels

Noise levels as set out by Cork City Council will be adhered to.

Construction activity at these times, other than the required for emergency works, will normally require the explicit permission of the relevant local authority.

11.2 Vibration

The potential for vibration at neighbouring sensitive locations during construction is typically limited to piling, demolition works and lorry movements on uneven road surfaces. The more significant of these is the potential for vibration from demolition operations. The method of demolition will need to be selected and controlled to ensure there is no likelihood of structural or even cosmetic damage to existing neighbouring properties; in vibration sensitive locations demolition will have to be done by hand to protect adjoining structures.

Demolition Works are required to comply with BS5228 (2009): *Code of practice for noise and vibration control on construction and open sites- Part 2: Vibration*: Noise control on construction and open sites, which offers detailed guidance on the control of noise & vibration from demolition and construction activities.

A variety of practicable noise control measures will be employed. These shall include where necessary:

- selection of plant with low inherent potential for generation of noise and/ or vibration;
- erection of barriers as necessary around items such as generators or high duty compressors;
- situate noisy / vibratory plant as far away from sensitive properties as permitted by site constraints and the use of vibration isolated support structures where necessary.

The allowable transient vibration during the works (in terms of peak particle velocity in mm/s) at the closest foundation of any building structure shall be limited to the values set out in the table below.

Type of Building	Peak Component Particle Velocity in Frequency Range of Predominant Pulse	
	4 Hz to 15 Hz	15 Hz and Above
Reinforced or Framed Structure	50 mm/s at 4 Hz and above	50 mm/s at 4 Hz and above
Industrial and Heavy Commercial Buildings		

Unreinforced or Light Framed Structures	15 mm/s at 4 Hz increasing to 20 mm/s at 15 Hz	20 mm/s at 15 Hz increasing to 50 mm/s at 40 Hz and above
Residential or Light Commercial Buildings		

Table 11.1 Peak Particle Velocities (ppv in mm/s) Below Which Transient Vibration Should Not Cause Cosmetic Building Damage

12.0 Demolition Waste Generation

An Asbestos Survey report of the buildings at the Carey Tools Building now occupied by Park Facilities, Albert Quay Build to Rent SHD Site, Albert Quay, Cork was carried out by Pheonix Environmental Safety Ltd with the aim of finding asbestos containing materials within the site. Shown in Figure 13.1 are the findings from the survey.

During the asbestos survey of the Carey Tools building, the following asbestos containing materials were detected:

- Asbestos cement sheeting was identified on the main pitched roof over the retail area (525 m² approx. floor area). Asbestos cement side sheeting was also identified adjacent to this roof.
- Asbestos cement sheeting was identified on the roof and gable at the rear left-hand side (50 m² approx. floor area)
- Asbestos containing felt was identified on the main pitched roof over the building warehouse (680 m² approx. floor area)
- Asbestos containing floor tiles and bitumen adhesive was identified on the floor under the slated roof in the warehouse (40 m² approx.)
- Asbestos cement slate debris was identified in the attic in the house / office building. Some areas of the roof may contain asbestos cement slates mixed through the natural slates
- An asbestos cement pipes were identified outside the 1st floor W/C on the house / office building (10 linear meters total approx.)

See Appendix C & F for more details

Figure 13.1: Asbestos Survey from Carey Tools

The asbestos report will be made available to the contractor to review. A full and detailed method statement should be put in place outlining the procedure for removing each element of asbestos outlined in the report. The asbestos removal needs to be carried out by a suitably qualified contractor.

Table 13.1 shows the estimated volume of waste/asbestos from the proposed demolition at the Carey Tools retail building and office building which are due for demolition.

Table 13.1: Estimated volume of waste/asbestos from demolition

Non-Hazardous		
Material	Volume (m ³)	Code
Timber	292.80	17 02 01
Plasterboard	2.21	17 08 00
Metals	287.23	17 04 00
Concrete	811.83	17 01 00
Others	209.10	17 09 00
Total =	1603.17	
Hazardous		
Material	Volume (m ³)	Code
Asbestos Cement Sheeting	3.45	17 06 05
Asbestos containing felt	2.04	17 06 05
Asbestos containing floor tiles	0.40	17 06 05
Asbestos cement pipes	0.12	17 06 05
Total =	6.01	

Figure 13.2 highlights the site boundary as well as the area of the office building, retail building and yard set for demolition.

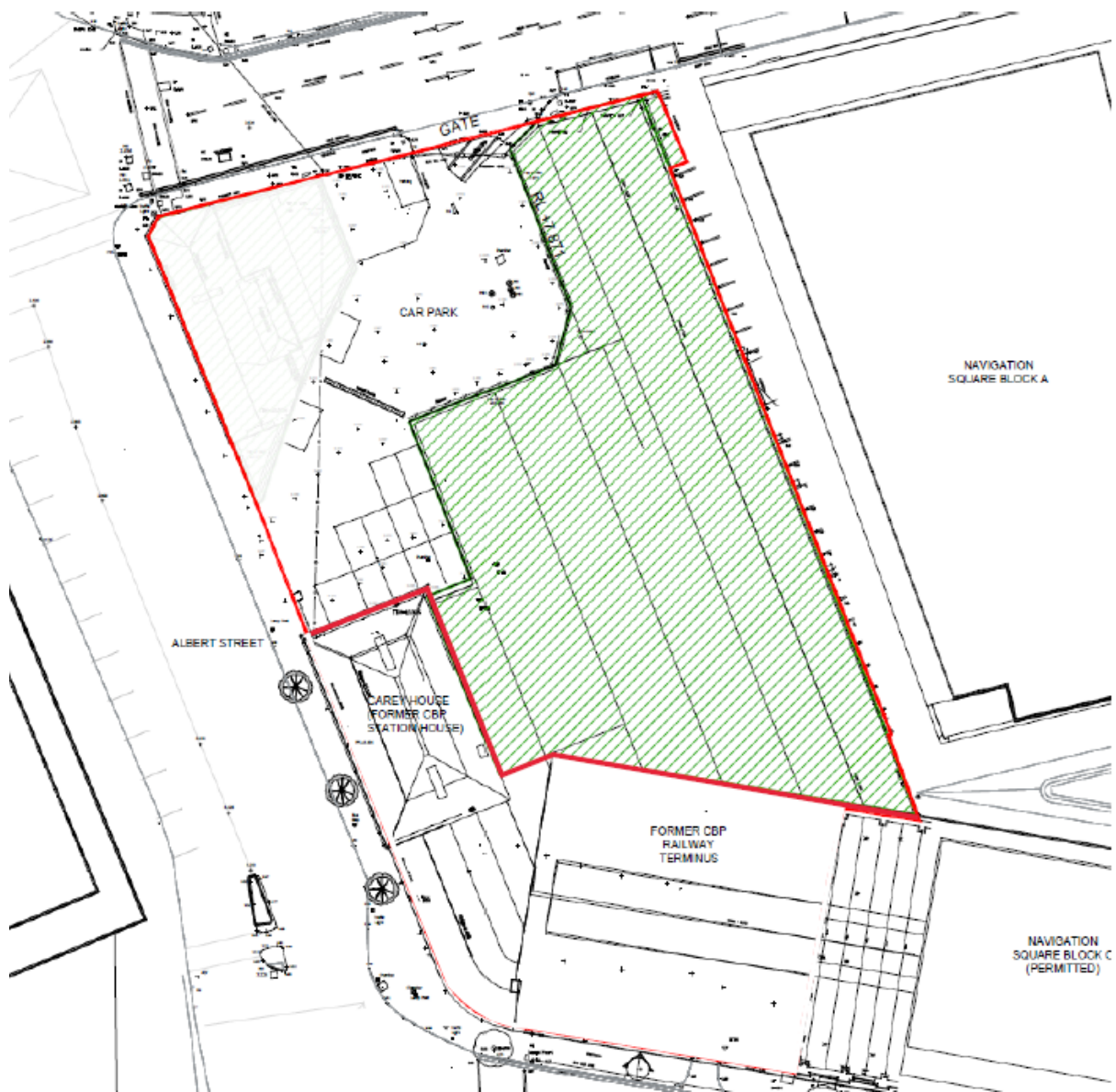


Figure 13.2: Demolition Site Plan