

Jacobs Island Strategic Housing Development

Construction & Environmental Management Plan

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1. Introduction

Murphy Matson O' Sullivan Consulting Engineers Ltd. (MMOS) have been engaged as Civil and Structural Engineers for the proposed strategic housing development by Hibernia Star Ltd at Jacobs Island.

We have prepared this document as an outline Construction & Environmental Management Plan (CEMP). This plan is prepared to planning stage only. The purpose of this CEMP is to present an outline construction sequence, methodology and programme for how the construction works are anticipated to be undertaken. The plan will include specific measures that will be undertaken to mitigate the potential impact to the wider environment as well as within the site boundaries.

We have extensive experience in the detailed design and construction stages of several similar developments in the Cork City area. Examples of such development sites are as follows:

- Jacobs Island Residential Development
- Mahon Point Retail Part
- City Gate Office Development
- City Gate Park Office Development

After planning stage, this CEMP will require to be adopted by the appointed main contractor whereby a construction stage CEMP will be developed and, if required, proposed within this outline CEMP submitted to the local authority in advance of construction works. The mitigation measures will be adopted into the construction stage CEMP.

1.1 Masterplan Context

Jacob's Island has a long planning history with the original masterplan prepared by Skidmore, Owings and Merrill in 1997 following a competitive tender. Both McCarthy Development and O'Callaghan Properties lodged applications to deliver mixed use development on Jacob's Island in accordance with the masterplan and to date approximately 330 residential homes have been constructed on Jacob's Island.

A new Masterplan has been developed for the lands which is consistent with the original ambitions to deliver a mixed use and sustainable community on the lands and updated to have full regard to the significant evolution in planning policy in the intervening period and the existing infrastructural benefits Jacob's Island has to offer in terms of connectivity and public amenities.

Hibernia Star Limited wish to deliver an office and hotel development as originally envisaged for the lands as far back as 2000 and which has been permitted twice in the intervening period. This in conjunction with the now proposed Strategic Housing Development on lands to the east and south and the recently permitted Strategic Housing Development (ABP-301991-18, as amended by ABP-310378-21) of 413 residential units on the adjacent lands further to the east will see the realisation of the Masterplan first developed for Jacob's Island over 20 years ago.

1.2 Site location and description

The development site is located within in Jacobs Island, Mahon which is located to the east

of Cork City and within the city environs. The site is located to the south of the N40 (South Ring Road) and to the north and west of the Longshore Avenue.



Figure 1 – Aerial Site View

The existing site comprises undeveloped lands within the overall Jacobs Island development.

The existing site levels slope from the north boundary of the site along the N40 South Link Road where levels are around +12.40 m OD and +13.10 m OD, to the south/eastern boundary along the residential access road, where levels fall from +8.10 m OD to +5.20 m OD. The lands to the south continue to slope towards the Lough Mahon Estuary. The road levels on Lough Mahon Drive are at approximately +5.0 m OD. The lands slope further to approximately +3.0 m OD at the foreshore to the estuary.

1.3 Description of the Proposed Works

The development will consist of The construction of a Strategic Housing Development of 489 no. apartments, creche and offices in 5 no. buildings ranging in height from part-1 to part-8 no. storeys over lower ground and semi-basement podium levels. The development will contain 1 no. studio, 162 no. 1 bedroom apartments and 327 no. 2 bedroom apartments. The proposed development also provides for hard and soft landscaping, boundary treatments, public realm works, car parking, bicycle parking, bin stores, signage, lighting, PV panels, sprinkler and water tank, substations, plant rooms and all ancillary site development works above and below ground.

2. General Works

2.1 Construction Phasing and Programme

The proposed development will be a 10-year permission. We envisage that the development will be constructed on a phased basis and on a block-by-block basis from North-East to South-West. We envisage that each individual block will be constructed in the following approximate timeline, we note however that this is very much dependent on contractor availability and on demand for the various uses within the development.

2.2 Construction Sequence

The proposed works envisage to be constructed in the following sequence.

- Phase 1 – Block 11 – 24 months, including the semi basement structure and associated site services.
- Phase 2 – Block 13 – 18 months, including the associated roads and services.
- Phase 3 – Block 14 – 24 months, including the semi basement structure and associated site services.
- Phase 4 – Block 15– 36 months, including the semi basement structure and associated site services.
- Phase 5 – Block 12– 18 months, including the semi basement structure and associated site services.

The phases as set out above are over the 10-year period, but we would also envisage an overlapping of phases. These details will be firmed up prior to commencement of the works on site. Our current estimates envisage a first occupation on the site in mid-2025.

2.3 Site Hoarding

It is noted that the location of hoarding on the public street will be subject to a separate agreement and or licence between the main contractor and Cork City Council. The following is however envisaged.

- A 2.4 m high decorative hoarding will be provided along the Longshore Avenue and N40 South Link Road. Lights will be provided to illuminate the hoarding. Note that the hoarding is likely to encompass the site within the Hotel & Office planning application (ref. no. 22/40809) as well as the subject site.
- Construction access during the works will principally be from Longshore Avenue.

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

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

2.4 Tower Crane

The construction works will require the erection of at least 4 no. tower cranes within the development site. The tower crane will be required for the erection of the building frame and super structure. 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 in each site phase.

3. Piling

All buildings structures will be supported on piled foundations, subject to further detailed design. Formation levels across the site will vary and they are anticipated to the various areas as 5.65m OD (Block 11), 7.0m OD (Block 12), 6.85m OD (Block 13), 6.8m OD (Block 14), 7.5m OD (Block 15).

It is proposed that the piling methodology will be continuous flight auger type piles (CFA Piles) so as to limit noise and vibration to the adjoining residential area.

During the piling installation works an independent specialist will be employed to monitor the noise levels at the site perimeter and vibration levels at specified locations.

4. Managing water pollution from the Construction Site

4.1 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.

The site is in close proximity to the Lough Mahon Estuary and construction works will require to be controlled, in particular, controlled surface water runoff procedures implemented. This will include best practice standards and environmental guideline to safeguard qualifying interests.

Specific details will be provided by the contractor on development of the detailed Construction Management Plan at construction stage to be agreed in full with the Council's Environmental Department where necessary.

4.2 Sources of Water on the Construction Site

The following are the sources of water that are likely or that may be encountered during the construction works.

- **Rainwater;** The primary source of water to the site is rainwater. The anticipated average annual rainfall at the site is anticipated to be in the region of between 800 and 1200 mm annually. The rainfall amounts vary by the season and can be as much as 50 mm over a 24-hour duration. Heavy rainfall can have a significant effect on the site and can cause flooding and the overwhelming of site drainage systems. Flooding can have an effect on stored site materials that would not normally pose a risk. The contractor will be required to ensure that materials are therefore properly stored on site and to plan site activities to ensure that works such as heavy excavation, drainage and foundation works are postponed during adverse weather conditions.
- **Surface Water;** Surface waters tend to include watercourses and waterbodies. In the case of the proposed development site, the large waterbody adjacent to the site is the adjacent Lough Mahon Estuary. Whilst the construction works do not require any works within the Lough Mahon estuary the works will be taking place in close proximity to the estuary and the contractor will need to have regard for this during the construction works.
- **Groundwater;** Construction works will include the construction of a basement under block 15. The basement floor level of 8.1 m OD is set above known ground water levels and therefore should not have a significant effect on ground water. The contractor will be required, in advance of and during site establishment, to undertake a series of trial holes to establish the ground water levels.
- **Mains Potable Water;** Jacobs Island is served by a large trunk public water main from 2 locations, at the entrance bridge and also at a point directly opposite the Mahon Shopping Centre, as identified on MMOS services drawings. The main infrastructure is complete, and each site is served by a branch of this public water main. The contractor will be required to specifically identify each of these mains and ensure that they are protected during the works.

4.3 Potential Sources of Water Pollution

The following are a list of potential water pollutions that could arise on the construction site.

- **Suspended Solids;** The contractor is to employ measures to ensure that water pollution does not arise as a result of suspended solid pollution. Sources of suspended solid pollution include, excavation, earth stockpiles, plant and wheel washing, build-up of mud on site roads. Good practice construction measures are proposed in the following sections that the contractor will be required to employ to ensure that suspended sediments from the above potential sources do not enter the watercourse.
- **Oils and Hydrocarbons;** Oils are a potential source of pollutants on a construction site. Diesel, lubricating oil, fuel, petrol, and hydraulic fluids are used quite readily on construction sites for various types of machinery and refuelling and maintenance are required regularly on sites. The contractor will need to employ good practice measures to prevent these potential pollutants entering the water course. These measures will include bunded areas for the storage of fuels, regular maintenance of machinery to ensure that no leakages occur, measures to protect the site from vandalism and the provision of a designated refuelling area on site or refuelling off site.
- **Concrete and Cement Products;** It is important the cement products are carefully stored to withstand various weather conditions such as heavy rainfall and high winds to prevent run off and dust pollution. Concrete products can cause contamination during wash down of the trucks which can cause a large volume of uncontrolled runoff. Good practice measures can be employed on site to prevent such uncontrolled runoff by the use of a special impermeable bunded slab with a collection point and siltation for such operations.

4.4 Surface Water Management Techniques

The contractor will be required to submit proposed methods for managing surface water runoff from the site during the construction operations. The following operations will require particular attention.

A designated fuel transfer area should be provided on site, and this is typically a good practice on well managed construction sites. The contractor will be required to install an impermeable paved and bunded area that is capable of handling and intercepting a fuel spillage. All tanks should be fully bunded and placed on a firm and secure foundation as per the following sketch from CIRIA C532.

Concrete should always be placed in a controlled method to prevent spillages as is good construction practice. Where possible concrete should be placed using a concrete pump. As noted above it is important that the machinery is well maintained.

At the delivery and wash down point it is important that measures are employed to prevent spillages from concrete delivery trucks contaminating the ground.

5. Construction works

The control measures for the construction stage of the proposed development will follow the following current best practice guidelines:

- H. Masters-Williams et al (2001) Control of water pollution from construction sites. Guidance for consultants and contractors (C532). CIRIA;
- IFI (2016) Guidelines on Protection of Fisheries during Construction Works in and Adjacent to Waters. Inland Fisheries Ireland, Dublin;
- Murnane et al (2002) Control of Water Pollution from Construction Sites- Guide to Good Practice. SP156; and
- Murphy, D. (2004) Requirements for the Protection of Fisheries Habitat during Construction and Development Works at River Sites. Eastern Regional Fisheries Board, Dublin.

It was recorded a presence of high impact invasive species, such as Japanese knotweed and Bohemian knotweed, within the masterplan site area. O'Donovan Agri Environmental has been employed to carry out treatment of these invasive plants on site, and the following measures are recommended:

- The medium impact plant Butterfly Bush was observed within the present site. These plants shall be grubbed and either chipped or removed from site. The site will be monitored for re-growth and any saplings will be pulled and disposed of appropriately or treated by an application of a suitable herbicide;
- In the event that further invasive species are identified an Invasive Species Management Plan shall be prepared and implemented by the Contractor. This shall include plant specific control measures for any invasive species identified; and
- Biosecurity measures will be undertaken to prevent the importation of invasive species from contaminated areas into the study area.
- For any material entering the site, the supplier must provide an assurance that it is free of invasive species.
- Machinery or plant to be inspected upon arrival and departure from site and cleaned when necessary.
- Ensure all site users are aware of invasive species management plan and treatment methodologies. This can be achieved through “toolbox talks” before works begin on the site.
- Adequate site hygiene signage should be erected in relation to the management of non-native invasive species material.

The following sections provide an outline of the construction works envisaged.

5.1 Basement construction

Block 15 is proposed to have a semi basement car parking area and as outlined above, the foundations for the building will likely consist of piled foundations. All basement drainage will be located beneath this slab and will be tanked to prevent future water ingress. The drainage will then connect to the main network in the public road by gravity.

The suspended podium slab will be formed in a concrete frame. This structure will also provide horizontal restraint to the perimeter retaining sheet piled walls and will facilitate the sequenced removal of any temporary propping as required.

The basement structure will require large concrete pour volumes, which will likely require works outside of normal construction hours to be agreed with Cork City Council in advance

and will require particular traffic management.

5.2 Super structure construction

The buildings will likely be constructed as a concrete framed flat slab type structure with columns in rectangular shapes to suit the party wall layouts and required sound resistance. The stair core walls will be reinforced concrete or precast concrete.

5.3 Building Façades

The building façades will vary depending on the building use. Where possibly an emphasis will be placed on off-site construction including modular unitised facades and precast panels. This will facilitate a swift form of construction and will also reduce site waste.

5.4 Fit out works

The internal fitout of each building will be on a phased basis and will be subject to final tenant requirements. The fitout works will include mechanical and electrical works, partitions, and finishes. The emphasis will be on lean construction to ensure minimal construction waste.

5.5 Landscaping works

Landscaping works will commence on the completion of the building facades. Landscaping works will be undertaken within the site perimeter, particularly to the north that is bounded by N40 South Ring Road.

6. Construction Traffic Plan

6.1 General

A construction stage traffic management plan will be provided by the main contractor in advance of the works and will be submitted to the planning authority in advance of the works commencing on site. The contractor will be required to provide detail in relation to construction access, delivery routes and times of delivery in the plan.

6.2 Construction Access

The following is an outline of the anticipated traffic access routes to the site.

During the project site delivery traffic will access the site via the Longshore Avenue.

6.3 Construction Traffic Volumes

Heavy goods vehicle truck movements into and out of the site are estimated in approximately 30 no. trips daily on average across the construction programme. These trips expected to peak during the semi-basement and lower ground excavation works and large concrete pours, estimated as 50 no. HGV movements daily. Note that the excavated material will be relocated internal within the site and will not necessitate external vehicular movements. Large concrete pours will be concentrated to within an individual 24-hour period.

People movement (in and out) and associated car trips during each construction stage will be circa 20no. during basement excavation stage and rising to circa 50 no. during construction with an increase to 60no. as the frame is being progressed. The numbers on site will maintain at this level during the façade construction but will increase to between 60-70 during internal M&E installation.

Typically, the trips to and from the site will be by private car and vans accommodating 1-2 workers. Some sub-contractors will use minibus transport when in larger crews, such as concrete contractors, M&E, and facades. Public transportation will also be availed of by individual workers. Typically, construction workers will remain on site from between morning start to evening time.

6.4 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.

6.5 Site Compound

It is anticipated that the location of the site compound will vary across the construction phases of the development. For the first two phases the compound is proposed to be located to the northwest portion of the site, in the proposed parking area adjacent to blocks 11 and 12. For the further phases, the compound will relocate to the southeast corner, where the proposed hotel under planning application 22/40809 (currently at RFI stage) is located. It is anticipated that the SHD will be built prior to the hotel building. The site compound will contain:

- Site offices, canteen and toilet / changing facilities c/w temporary water supplies and

wastewater treatment unit.

- Secure compound and containers for storage of materials and plant.
- Temporary vehicle parking areas.
- Contained area for machinery refuelling and construction chemical storage.
- Contained area for washing out of concrete and mortar trucks.
- An automatic wheel-washing unit shall be installed and maintained at the entrance to the site. This will be available for use at all times. Maintenance will include for cleaning out of the equipment and disposal of any material gathered within. The required equipment for supplying water and power to the wheel washing facility shall be made available and maintained in good working order. At the end of the construction phase, the wheel washing facilities shall be removed from site.

6.6 Plan / 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.

6.7 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.

6.8 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.

6.9 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.

6.10 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.

6.11 Hours of Work

7:30 am to 6 pm Monday to Friday, 7.30 am to 4 pm on Saturdays, or as directed by Cork City Council. It is proposed that hours of work outside of these times will be by agreement with the local authority.

7. Dust Minimisation

7.1 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.

7.2 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. All environmentally significant raw materials are to be stored in certified containers and tanks which are fully secured with a 'no open lid policy' in place for materials in storage to prevent fugitive emissions and minimise losses from the installation. 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.

Vehicles using site roads will have their speed restricted, and this speed restriction must be enforced rigidly. On any un-surfaced site road, this will be <20kph, and on hard surfaced roads as site management dictates. Vehicles delivering or removing material with dust potential (soil, aggregates) will be enclosed or covered with tarpaulin at all times to restrict the escape of dust. All vehicles will be turned off when not in use.

7.3 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.

8. Noise and Vibration

8.1 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. In particular, it is proposed that various practices be adopted during construction, including:

- establishing channels of communication between the contractor/developer, local authority, and residents;
- appointing a site representative responsible for matters relating to noise;
- selection of plant with low inherent potential for generation of noise;
- siting of noisy plant as far away from sensitive properties as permitted by site constraints;
- continual monitoring of noise at the adjacent residential buildings in Jacobs Island.

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

8.2 Vibration

The potential for vibration at neighbouring sensitive locations during construction is typically limited to piling and lorry movements on uneven road surfaces.

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 Industrial and Heavy Commercial Buildings	50 mm/s at 4 Hz and above	50 mm/s at 4 Hz and above
Unreinforced or Light Framed Structures Residential or Light Commercial Buildings	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

Table 1 – Peak Particle Velocities (ppv in mm/s) Below Which Transient Vibration Should Not Cause Cosmetic Building Damage

The vibration monitoring locations should be in the same relative locations as those recommended for the noise monitoring. The vibration monitoring should be carried out by an independent and qualified consultant. The accelerometer should be attached directly to a building slab and set to record maximum vibration levels over the course of the construction phase.

9. Construction Waste Management

9.1 General

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

9.1.1 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.

9.1.2 Main C&D Waste Categories

The main non-hazardous waste streams that will be generated by the construction 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;

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

The European Waste Code (EWC) Classification for each waste stream is presented in Table 2 below.

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 2 - Waste types and EWC Classification

9.1.3 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 3 – Breakdown of Waste Material Generated at a Typical Site

As Table 3 shows, a large percentage of the waste at the site will be soil and stones. The excavated material from the site is unlikely to be reused on site. In the event of the material being used off site options include land remediation/infill on other sites in the area.

9.1.4 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 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 kept on site for future re-use.

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. 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.

9.1.5 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 & 2020 and also the Waste Management (Collection Permit) Regulations 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.

9.1.6 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 confirm 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.

9.2 C&D Waste Management Procedures

9.2.1 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 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.

9.2.2 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) Regulation.

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.

9.2.3 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,

9.2.4 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 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.

9.3 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.

9.4 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.

9.5 Mitigation and Monitoring

It is proposed to follow good construction practices to help reducing any impacts to the environment caused by construction water. The following is envisaged:

- Zero pollution incidents
- Segregation of site waste to include timber, general waste, and other materials
- Completion of environmental checklists
- Fuel spill kits to be present on site at all times
- Reduce waste, water and energy use on the project including within all of the site offices;
- Reduce the carbon footprint of the development;
- Reduce the amount of construction waste and excavated material generated which goes to landfill;
- Recycle construction waste where possible;
- Maximise beneficial reuse of the materials: and
- Ensure that all waste documentation (waste transfer docket, permits etc.) is available for inspection at the site office / in head office.

Appendix

- (i) Site Compound Layout
- (ii) Invasive Species Record Plan