CONSTRUCTION

WASTE MANAGEMENT PLAN (CWMP)

AT

PARKSIDE PHASE 4

CLONGRIFFIN

DUBLIN 13

Prepared for

Cairn Homes Properties Ltd.

Prepared by

Traynor Environmental Ltd

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This report refers, within the limitations stated, to the condition of the site at the time of the report. No warranty is given as to the possibility of future changes in the condition of the site. The report as presented is based on the information sources as detailed in this report, and hence maybe subject to review in the future if more information is obtained or scientific understanding changes.

1.0 INTRODUCTION

Traynor Environmental Ltd has prepared this Construction Waste Management Plan (CWMP) on behalf of Cairn Homes Properties Ltd. The proposed development will comprise of 282 no. apartments on lands measuring approximately 3.00 hectares at Parkside. The development also includes residential amenity facility, basement and surface car parking, bicycle parking; surface water attenuation, green roof, landscaping and all associated site development works.

The purpose of this plan is to provide information necessary to ensure that the management of construction waste at the site is undertaken in accordance with current legal and industry standards including the Waste Management Acts 1996 - 2011 and associated Regulations, Protection of the Environment Act 2003 as amended, Litter Pollution Act 1997 and the Eastern-Midlands Region Waste Management Plan 2015 – 2021. In particular, this Plan aims to ensure maximum recycling, reuse and recovery of waste with diversion from landfill, wherever possible. It also seeks to provide guidance on the appropriate collection and transport of waste from the site to prevent issues associated with litter or more serious environmental pollution (e.g. contamination of soil and/or water).

This CWMP includes information on the legal and policy framework for C&D waste management in Ireland, estimates of the type and quantity of C&D waste to be generated by the proposed development and makes recommendations for management of different waste streams.

1.1 Construction & Demolition Waste Management in Ireland

National Level

The Irish Government issued a policy statement in September 1998 known as *'Changing Our Ways'*, which identified objectives for the prevention, minimisation, reuse, recycling, recovery and disposal of waste in Ireland. The target for C&D waste in this report was to recycle at least 50% of C&D waste within a five-year period (by 2003), with a progressive increase to at least 85% over fifteen years (i.e. 2013).

In response to the *Changing Our Ways* report, a task force (Task Force B4) representing the waste sector of the already established Forum for the Construction Industry, released a report entitled '*Recycling of Construction and Demolition Waste'* concerning the development and implementation of a voluntary construction industry programme to meet the Government's objectives for the recovery of C&D waste.

The most recent national policy document was published in July 2012, entitled '*A Resource Opportunity - Waste Management Policy in Ireland*'. This document stresses the environmental and economic benefits of better waste management, particularly in relation to waste prevention. The document sets out a number of actions in relation to C&D waste and commits to undertake a review of specific producer responsibility requirements for C&D projects over a certain threshold.

The National Construction and Demolition Waste Council (NCDWC) was launched in June 2002, as one of the recommendations of the Forum for the Construction Industry, in the Task Force B4 final report. The NCDWC subsequently produced '*Best Practice Guidelines for the Preparation of Waste Management Plans for Construction and Demolition Projects*' in July 2006 in conjunction with the then Department of the Environment, Heritage and Local Government (DoEHLG). The guidelines outline the issues that need to be addressed at the pre-planning stage of a development all the way through to its completion. These guidelines have been followed in the preparation of this document and include the following elements:

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

Section 3 of the Guidelines identifies thresholds above which there is a requirement for the preparation of a C&D Waste Management Plan for developments. This development requires a C&D WMP under the following criterion:

- New residential development of 10 houses or more; and
- Demolition/renovation/refurbishment projects generating in excess of 100m^3 in volume, of waste.

Other guidelines followed in the preparation of this report include *'Construction and Demolition Waste Management – a handbook for Contractors and Site Managers'* published by FÁS and the Construction Industry Federation in 2002.

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

Regional Level

The proposed development is located in the Local Authority area of Dublin City Council.

The *Eastern-Midlands Region Waste Management Plan 2015 – 2021* is the regional waste management plan for the Dublin City Council area published in May 2015. This Plan replaces the previous Waste Management Plan due to changing National policy as set out in *A Resource Opportunity: Waste Management Policy in Ireland* and changes being enacted by the *Waste Framework Directive (WFD) (2008/98/EC)*. The Regional Plan sets out the strategic targets for waste management in the region but does not set a specific target for C&D waste. However, the *Waste Framework Directive* sets Member States a target of *"70% preparing for reuse, recycling and other recovery of construction and demolition waste"* (excluding natural soils and stones and hazardous wastes) to be achieved by 2020.

The *Dublin City Council Development Plan 2016-2022* sets out a number of policies for Dublin City area, in line with the objectives of the regional waste management plan. Waste objectives with a particular relevance to the proposed development are:

1.2 Policies

Waste Management Objectives

- **SI19** To support the principles of good waste management and the implementation of best international practice in relation to waste management in order for Dublin city and the region to become self-reliant in terms of waste management.
- **SI20** To prevent and minimise waste and to encourage and support material sorting and recycling.
- **SI21** To minimise the amount of waste which cannot be prevented and ensure it is managed and treated without causing environmental pollution.
- **SI22** To ensure that effect is given as far as possible to the 'polluter pays' principle.
- **SI015** To provide for municipal/public recycling and recovery facilities in accessible locations throughout the city.
- **SI016** To require the provision of adequately-sized recycling facilities in new commercial and large-scale residential developments, where appropriate.
- **SI017** To promote the re-use of building materials, recycling of demolition material and the use of materials from renewable sources. In all developments in excess of 10 housing units and commercial developments in excess of 1000 sq.m, a materials source and management plan showing type of materials/proportion of re-use/recycled materials to be used shall be implemented by the developer.
- **SI018** To implement the current Litter Management Plan through enforcement of the litter laws, street cleaning and education and awareness campaigns.
- **SI019** To implement the Eastern-Midlands Regional Waste Management Plan 2015–2021 and achieve the plan targets and objectives.

Air Emissions Objectives

- **SI24** To monitor and improve air quality in accordance with national and EU policy directives on air quality and, where appropriate, promote compliance with established targets.
- **SI020** To promote sustainable design and construction to help reduce emissions from the demolition and construction of buildings.
- **SI021** To encourage the use of internal ducting/ staircores within all new mixed-use developments, where appropriate, to facilitate air extraction/ventilation units and other associated plant and services.
- **SI022** To maintain and manage a Dublin ambient air quality monitoring network and to make available to the public the resulting air quality measurements.

Noise Pollution Objectives

- **SI25** To seek to preserve and maintain air and noise quality in the city in accordance with good practice and relevant legislation.

- **SI023** To implement the Dublin Agglomeration Environmental Noise Action Plan (2013–2018) in co-operation with the other local authorities in Dublin and the Irish Aviation Authority.
- **SI024** To protect the designated 'Quiet Areas' within the city from increased exposure to noise.
- **SI025** To support new technologies and practices as a power source in transport to reduce noise.
- **SI026** To protect residents of mixed-use developments from noise emanating from other uses such as shops, offices, nightclubs, late night busking, public houses and other night time uses through the planning system
- **SI027** To give careful consideration to the location of noise-sensitive developments, including the horizontal and vertical layout of apartment schemes, so as to ensure they are protected from major noise sources where practical.
- **SI028** To support and facilitate the monitoring and enforcement by the environmental health department of noise reduction measures in areas experiencing excess noise.

1.3 Legislative Requirements

The primary legislative instruments that govern waste management in Ireland and applicable to the project are:

- Waste Management Act 1996 (No. 10 of 1996) as amended. Sub-ordinate legislation includes:
    - European Communities (Waste Directive) Regulations 2011 (SI 126 of 2011) as amended
    - Waste Management (Collection Permit) Regulations (S.I No. 820 of 2007) as amended
    - Waste Management (Facility Permit and Registration) Regulations 2007, (S.I No. 821 of 2007) as amended
    - Waste Management (Licensing) Regulations 2004 (S.I. No. 395 of 2004) as amended
    - Waste Management (Packaging) Regulations 2014 (S.I. 282 of 2014) as amended
    - Waste Management (Planning) Regulations 1997 (S.I. No. 137 of 1997)
    - Waste Management (Landfill Levy) Regulations 2015 (S.I. No. 189 of 2015)
    - European Union (Waste Electrical and Electronic Equipment) Regulations 2014 (S.I. No. 149 of 2014)
    - European Union (Batteries and Accumulators) Regulations 2014 (S.I. No. 283 of 2014) as amended
    - Waste Management (Food Waste) Regulations 2009 (S.I. 508 of 2009), as amended
    - European Union (Household Food Waste and Bio-waste) Regulation 2015 (S.I. No. 191 of 2015)
    - Waste Management (Hazardous Waste) Regulations, 1998 (S.I. No. 163 of 1998) as amended
    - Waste Management (Shipments of Waste) Regulations, 2007 (S.I. No. 419 of 2007) as amended
    - Waste Management (Movement of Hazardous Waste) Regulations, 1998 (S.I. No. 147 of 1998)
    - European Communities (Transfrontier Shipment of Waste) Regulations 1994 (SI 121 of 1994)

  - European Union (Properties of Waste which Render it Hazardous) Regulations 2015 (S.I. No. 233 of 2015)
- Environmental Protection Act 1992 (No. 7 of 1992) as amended.
- Litter Pollution Act 1997 (No. 12 of 1997) as amended.
- Planning and Development Act 2000 (No. 30 of 2000) as amended.

One of the guiding principles of European waste legislation, which has in turn been incorporated into the *Waste Management Act 1996 - 2001* and subsequent Irish legislation, is the principle of *"Duty of Care"*. This implies that the waste producer is responsible for waste from the time it is generated through until its legal recycling, recovery or disposal (including its method of disposal). As it is not practical in most cases for the waste producer to physically transfer all waste from where it is produced to the final destination, waste contractors will be employed to physically transport waste to the final destination. Following on from this is the concept of *"Polluter Pays"* whereby the waste producer is liable to be prosecuted for pollution incidents, which may arise from the incorrect management of waste produced, including the actions of any contractors engaged e.g. for transportation and disposal/recovery/recycling of waste.

It is therefore imperative that the client ensures that the waste contractors engaged by construction contractors are legally compliant with respect to waste transportation, recycling, recovery and disposal. This includes the requirement that a contractor handle, transport and recycle/recover/dispose of waste in a manner that ensures that no adverse environmental impacts occur as a result of any of these activities.
A collection permit to transport waste must be held by each waste contractor which is issued by the National Waste Collection Permit Office (NWCPO). Waste receiving facilities must also be appropriately permitted or licensed. Operators of such facilities cannot receive any waste, unless in possession of a Certificate of Registration (COR) or Waste Facility Permit granted by the relevant Local Authority under the *Waste Management (Facility Permit & Registration) Regulations 2007 and Amendments* or a waste or IED licence granted by the EPA. The COR/permit/licence held will specify the type and quantity of waste able to be received, stored, sorted, recycled, recovered and/or disposed of at the specified site.

2.0 DESCRIPTION OF THE PROJECT

2.1 Location, Size and Scale of the Development

The proposed development consists of 282 no. apartments comprised of:

- 94 no. 1 bedroom apartments
- 175 no. 2 bedroom apartments
- 13 no. 3 bedroom apartments

The development also includes residential amenity facility, basement and surface car parking, bicycle parking; surface water attenuation, green roof, landscaping and all associated site development works on lands measuring approximately 3.00 hectares.

2.2 Objective

The objectives of the CWMP are as follows:

- Promote an integrated approach to waste management throughout the project construction stage and to set out appropriate responsibilities;
- Promote sustainable waste management in line with waste management hierarchy;
- Provide an outline for the management of wastes arising from construction works for the project in accordance with the relevant Irish and EU waste management legislation; and
- Provide a framework for the designers and the Principal Contractor to appropriately manage waste generated during the course of the project. Both the designers and the Principal Contractor will be responsible for implementing the findings and recommendations of the CWMP in their "Site Waste Management Plan" (SWMP).

The CWMP outlines methods to achieve waste prevention, maximum recycling and recovery of waste and provides recommendations for the management of the various anticipated waste streams. The plan also provides guidance on collection and transport of waste to prevent issues associated with litter or more serious environmental pollution (e.g. contamination of soil or water resources).

The CWMP describes the applicable legal and policy framework for C&D waste management in Ireland (both nationally and regionally).

2.3 Details of the Non-Hazardous Wastes to be produced

There will be topsoil and subsoil excavated to facilitate construction of the new building's foundations, installation of services and site levelling. The project engineers, DBFL Consulting Engineers, have estimated that the total volume of material to be excavated will be c. 38,900m^3. A fill quantity of 550m^3 is expected to be required. It will be expected that approximately 38,350m^3 will be removed to an approved landfill. Surplus material that requires removal from site and is deemed to be a waste, removal and reuse/recycling/recovery/disposal of the material will be carried out in accordance with the *Waste Management Act 1996* (as amended), the *Waste Management (Collection Permit) Regulations 2007* (as amended) and the *Waste Management (Facility Permit & Registration) Regulations 2007* (as amended). The

volume of waste requiring recovery/disposal will dictate whether a Certificate of Registration (COR), permit or license is required by the receiving facility.

During the construction phase there may be a surplus of building materials, such as timber off-cuts, broken concrete blocks, cladding, plastics, metals and tiles generated. There may also be excess concrete during construction which will need to be disposed of. Plastic and cardboard waste from packaging and oversupply of materials will also be generated. Waste will also be generated from construction workers e.g. organic/food waste, dry mixed recyclables (waste paper, newspaper, plastic bottles, packaging, aluminium cans, tins and Tetra Pak cartons), mixed non-recyclables and potentially sewage sludge from temporary welfare facilities provided onsite during the construction phase. Waste printer/toner cartridges, waste electrical and electronic equipment (WEEE) and waste batteries may also be generated infrequently from site offices.

2.4 Potentially Hazardous Wastes to be Produced

Contaminated Soil

In the event that any potentially contaminated material is encountered, it will need to be segregated from clean/inert material, tested and classified as either non-hazardous or hazardous in accordance with the EPA publication entitled *'Waste Classification: List of Waste & Determining if Waste is Hazardous or Non-Hazardous'* using the *HazWasteOnline* application (or similar approved classification method). The material will then need to be classified as clean, inert, non-hazardous or hazardous in accordance with the *EC Council Decision 2003/33/EC*, which establishes the criteria for the acceptance of waste at landfills.

Fuel/Oils

As fuels and oils are classed as hazardous materials, any on-site storage of fuel/oil, all storage tanks and all draw-off points will be bunded (or stored in double-skinned tanks) and located in a dedicated, secure area of the site. Provided that these requirements are adhered to and site crew are trained in the appropriate refuelling techniques, it is not expected that there will be any fuel/oil wastage at the site.

Other known Hazardous Substances

Paints, glues, adhesives and other known hazardous substances will be stored in designated areas. They will generally be present in small volumes only and associated waste volumes generated will be kept to a minimum. Wastes will be stored in appropriate receptacles pending collection by an authorised waste contractor. In addition, WEEE (containing hazardous components), printer toner/cartridges, batteries (Lead, Ni-Cd or Mercury) and/or fluorescent tubes and other mercury containing waste may be generated during C&D activities. These wastes (if encountered) will be stored in appropriate receptacles in designated areas of the site pending collection by an authorised waste contractor.

In the event that hazardous soil, or historically deposited hazardous waste is encountered during the work, the contractor must notify Dublin City Council, Environmental Enforcement Section, and provide a Hazardous/Contaminated Soil Management Plan.to include estimated tonnages, description of location, any

relevant mitigation, destination for authorised disposal/treatment, in addition to information on the authorised waste collectors

Main C&D Waste Categories

The main non-hazardous and hazardous waste streams that could be generated by the construction and demolition activities at a typical site are shown in Table 2.1. The selected waste streams are suggested under *"Best Practice Guidelines on the Preparation of Waste Management Plans for Construction and Demolition Projects – Appendix 3".* The List of Waste (LoW) code (as effected from 1st June 2015) (also referred to as the European Waste Code or EWC) for each waste stream is also shown.

Waste Material	LoW Code
Concrete	17 01 01
bricks	17 01 02
Tiles and ceramics	17 01 03
Wood	17 02 01-03
Glass	17 02 02
Plastic	17 02 03
Bituminous mixtures, coal tar and tarred products	17 03 02
Copper, Bronze, Brass	17 04 01
Aluminium	17 04 02
Lead	17 04 03
zinc	17 04 04
Iron & steel	17 04 05
tin	17 04 06
Mixed metals	17 04 07
Soil and Stones	17 05 04
Gypsum-based construction material	17 08 02
Mixed C&D waste	17 09 04

Table 2.1 *Typical waste types generated and EWCs (individual waste types may contain hazardous substances)*

3.0 WASTE MANAGEMENT

3.1 Construction Waste Generation

Table 3.0 shows the breakdown of C&D waste types produced on a typical site based on data from the EPA *National Waste Reports* and research reports.

Waste Types	%
Mixed C&D	33
Timber	28
Plasterboard	10
Metals	8
Concrete	6
Other	15
Total	**100**

Table 3.0 *Waste materials generated on a typical Irish construction site*

Table 3.2 shows the predicted construction waste generation for the proposed development based on the information available to date along with the targets for management of the waste streams. The predicted waste amounts are based on an average large-scale development waste generation rate per 100m^2, using the waste breakdown rates shown in Table 3.2

Waste Types	Tonnes	Reuse		Recycle/Recover		Disposal	
		%	Tonnes	%	Tonnes	%	Tonnes
Mixed C&D	14257.98	10	1425.80	80	11406.38	10	1425.80
Timber	12097.68	40	4839.07	55	6653.72	5	604.88
Plasterboard	4320.6	30	1296.18	60	2592.36	10	432.06
Metals	3456.48	5	172.82	90	3110.83	5	172.82
Concrete	2592.36	30	777.71	65	1685.03	5	129.62
Other	6480.9	20	1296.18	60	3888.54	20	1296.18
Total	**43206**		**10080.76**		**30153.47**		**4174.41**

Table 3.2 *Estimated on and off-site reuse, recycle and disposal rates for construction waste based on floor area.*

It should be noted that until final materials and detailed construction methodologies have been confirmed, it is difficult to predict with a high level of accuracy the construction waste that will be generated from the proposed works as the exact materials and quantities may be subject to some degree of change and variation during the construction process.

Notwithstanding the information in Table 3.2, the quantity of excavated material generated has been estimated to be c.38,900 m^3, as the site will require excavation to allow basement construction, drainage and utility installation and provision of underground attenuation of surface water. Any suitable excavated material will be temporarily stockpiled for reuse as fill, where possible. It has been estimated that c. 38,350m^3 of fill will be removed to an approved landfill.

3.2 Soil Management

Project works will result in the excavation of soils as part of the site development in particular the excavation of the basement. The Principal Contractor will carry out the following as a minimum:

- Detail in-situ (prior to excavation) and ex-situ (post excavation) methodologies to classify waste soil for appropriate disposal, in accordance with relevant Irish and EU legislation and guidance,
- Identify reuse requirements and soils suitable for reuse on site in consultation with the design team, including assessment methodology to determine which soils are suitable for re-use onsite,
- Site management procedures, including waste minimisation, stockpile management, temporary storage procedures, waste licence requirements,

- Waste Management documentation, including waste generation record keeping, waste transfer notes and confirmation of appropriate disposal.

3.2.1 Excavated Soil & Materials

A Soil Waste Classification will be produced ahead of works. The Principal Contractor will detail relevant procedures, including further environmental sampling, testing and assessment requirements, sampling protocols and sample density targets. Where any hotspots of potential contamination are encountered, and prior to excavation, further assessment will be undertaken by a suitably qualified environmental scientist to determine the nature and extent of remediation required.

3.2.2 Soil for Reuse on Site

Where the Principal Contractor proposes to reuse excavated soil within the works e.g. as backfill, and where reuse is permitted in accordance with the relevant legislation and provided that the reuse meets the engineering requirements for material used within the works, the Principal Contractor shall set out their proposal for its management, documentation and reuse. This shall include:

- Delineation of areas where excavated soil is intended for disposal off-site as waste, and where it is intended for re-use on site;
- Identification and recording of the location from where the soil will be excavated and its proposed re-use location and function;
- Engineering assessment to confirm its suitability for re-use;
- Any proposed treatment or processing required enabling its reuse, as well as any associated treatment permits or licences; and
- Determination of by-product or end-of-waste status with the EPA under Article 27 or Article 28, where applicable (not anticipated).

3.2.3 Soil for Removal Off-site

Where appropriate, excavated soil and material intended for recovery or disposal off-site shall require Waste Assessment Criteria (WAC) testing and subsequent waste classification in order to select an appropriate receiving facility for the waste. It is noted that natural soil showing no visual or olfactory signs of impact may, in certain circumstances, be classified without testing, once this has been agreed with the waste receiving facility.

A log shall be maintained on site to record the haulier employed and gate receipts for all excavated waste removed from the site.

Assessment of the excavated material shall be carried out with regard to the following guidance and legislation:

- EU Council Decision 2003/33/EC establishing criteria and procedures for the acceptance of waste at landfills pursuant to Article 16 and Annex II of Directive 1999/31/EC (2002);

- Regulation (EC) No. 1272/2008: the classification, labelling and packaging of substances and mixtures (CLP);
- Environmental Protection Agency document entitled Waste Classification; List of waste and determining if waste is Hazardous or Non-Hazardous; and
- UK Environment Agency Technical Guidance WM3: Waste Classification - Guidance on the classification and assessment of waste.

Waste soil and material intended for off-site disposal, recycling or recovery shall not be removed from site prior to appropriate waste classification and receiving written confirmation of acceptance from the selected waste receiving facility.

While waste classification and acceptance at a waste facility is pending, excavated soil for disposal shall be stockpiled in an appropriate manner, as follows:

- A suitable temporary storage area shall be identified and designated;
- All stockpiles shall be assigned a stockpile number;
- Non-hazardous and hazardous soil shall be stockpiled only on hard-standing or highgrade polythene sheeting to prevent cross-contamination of the soil below;
- Soil stockpiles shall be covered with high-grade polythene sheeting to prevent run-off of rainwater and leaching of potential contaminants from the stockpiled material generation and/or the generation of dust; and
- When a stockpile has been sampled for classification purposes, it shall be considered to be complete and no more soil shall be added to that stockpile prior to disposal.

An excavation/stockpile register shall be maintained on site showing at least the following information:

- Stockpile number;
- Origin (i.e. location and depth of excavation);
- Approximate volume of stockpile;
- Date of creation;
- Description and Classification of material;
- Date sampled;
- Date removed from site;
- Disposal/recovery destination; and
- Photograph.

3.3 Proposed Waste Management Options

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

or enclosed. The appointed waste contractor will collect and transfer the wastes as receptacles are filled. There are numerous waste contractors in the Dublin City region that provide this service.

All waste arising's will be handled by an approved waste contractor holding a current waste collection permit. All waste arising's requiring disposal off-site will be reused, recycled, recovered or disposed of at a facility holding the appropriate registration, permit or licence, as required.

Some of the sub-contractors on site will generate waste in relatively low quantities. The transportation of non-hazardous waste by persons who are not directly involved with the waste business, at weights less than or equal to 2 tonnes, and in vehicles not designed for the carriage of waste, are exempt from the requirement to have a waste collection permit (Ref. Article 30 (1) (b) of the Waste Collection Permit Regulations 2007 as amended). Any sub-contractors engaged that do not generate more than 2 tonnes of waste at any one time can transport this waste offsite in their work vehicles (which are not design for the carriage of waste). However, they are required to ensure that the receiving facility has the appropriate COR / permit / licence.

Written records will be maintained by the contractor(s) detailing the waste arising throughout the C&D phases, the classification of each waste type, waste collection permits for all waste contactors who collect waste from the site and COR/permit or licence for the receiving waste facility for all waste removed off site for appropriate reuse, recycling, recovery and/or disposal.

Dedicated bunded storage containers will be provided for hazardous wastes which may arise such as batteries, paints, oils, chemicals etc, if required.

The management of the main waste streams is outlined as follows:

Bedrock

It is not anticipated that bedrock will be encountered during the excavation phase of this development.

Silt & Sludge

During the construction phase, silt and petrochemical interception should be carried out on runoff and pumped water from site works, where required. Sludge and silt will then be collected by a suitably licensed contractor and removed offsite.

Concrete Blocks, Bricks, Tiles & Ceramics

The majority of concrete blocks, bricks, tiles and ceramics generated as part of the construction works are expected to be clean, inert material and should be recycled, where possible.

Hard Plastic

As hard plastic is a highly recyclable material, much of the plastic generated will be primarily from material off-cuts. All recyclable plastic will be segregated and recycled, where possible.

Timber

Timber that is uncontaminated, i.e. free from paints, preservatives, glues etc., will be disposed of in a separate skip and recycled off-site.

Metal

Metals will be segregated into mixed ferrous, aluminium cladding, high grade stainless steel, low grade stainless steel etc., where practical and stored in skips. Metal is highly recyclable and there are numerous companies that will accept these materials.

Plasterboard

There are currently a number of recycling services for plasterboard in Ireland. Plasterboard from the construction phases will be stored in a separate skip, pending collection for recycling. The site manager will ensure that oversupply of new plasterboard is carefully monitored to minimise waste.

Glass

Glass materials will be segregated for recycling, where possible.

Waste Electrical and Electronic Equipment (WEEE)

Any WEEE will be stored in dedicated covered cages/receptacles/pallets pending collection for recycling.

Other Recyclables

Where any other recyclable wastes such as cardboard and soft plastic are generated, these will be segregated at source into dedicated skips and removed off-site.

Non-Recyclable Waste

C&D waste which is not suitable for reuse or recovery, such as polystyrene, some plastics and some cardboards, will be placed in separate skips or other receptacles. Prior to removal from site, the non-recyclable waste skip/receptacle will be examined by a member of the waste team to determine if recyclable materials have been placed in there by mistake. If this is the case, efforts will be made to determine the cause of the waste not being segregated correctly and recyclable waste will be removed and placed into the appropriate receptacle.

Other Hazardous Wastes

On-site storage of any hazardous wastes produced (i.e. contaminated soil if encountered and/or waste fuels) will be kept to a minimum, with removal off-site organised on a regular basis. Storage of all hazardous wastes

on-site will be undertaken so as to minimise exposure to on-site personnel and the public and to also minimise potential for environmental impacts. Hazardous wastes will be recovered, wherever possible, and failing this, disposed of appropriately.

It should be noted that until a construction contractor is appointed it is not possible to provide information on the specific destinations of each construction waste stream. Prior to commencement of construction and removal of any construction waste offsite, details of the proposed destination of each waste stream will be provided to Dublin City Council by the project team.

3.4 Waste Minimisation

The following waste minimisation measures will be implemented during the course of the construction works:

- Facilitate recycling and appropriate disposal by on site segregation of all waste materials generated during construction into appropriate categories, including:
    - Top-soil, subsoil, gravel hard-core
    - Concrete, bricks, tile, ceramics, plasterboard
    - Asphalt, tar and tar products
    - Metals
    - Dry Recyclables e.g. cardboard, plastic, timber
- All waste assessed by the Waste Manager as 'not suitable for reuse' will be stored in skips or other suitable receptacles in a designated area of the site, to prevent cross contamination between waste streams;
- Wherever possible, leftover materials (e.g. timber off cuts)
- Uncontaminated excavated material (top-soil, sub soil, etc.) will be segregated, stockpiled and re-used on site in preference to importation of clean fill, where possible; and
- Where possible, the Waste Manager will ensure that all waste leaving site will be recycled or recovered.
- Identification of potential for reuse of Inert Wasters

3.5 Waste Compound

- Details of the provision of a dedicated and secure compound, containing bins and skips into which all waste generated by construction site activities will be placed
- Responsibility for provision of signage and verbal instruction to ensure proper housekeeping and segregation of construction waste materials
- Responsibility for identification of Permitted Waste Contractors who shall be employed to collect and dispose of waste arising from the construction works

3.5.1 Waste Handling / Segregation and Storage

Wastes generated during works will be segregated and temporarily stored on site (pending collection or for re-use on site) in accordance with a pre-determined segregation and storage strategy (to be developed by the Principal Contractor as part of their SWMP).

The following minimum segregation and storage strategy requirements will be required:

- Waste streams will be individually segregated; and all segregation, storage & stockpiling locations will be clearly delineated on site drawings;
- Waste storage, fuel storage and stockpiling and movement are to be undertaken with a view to protecting any essential services (electricity, water etc.) and with a view to protecting existing surface water drains and groundwater quality boreholes (if applicable);
- Roles and responsibilities of those managing the segregation and storage areas will be identified;
- The waste storage area should contain suitably sized containers for each waste stream and will be agreed with the waste contractors in advance of the commencement of the project;
- All segregation and waste storage areas will be inspected regularly by the appointed Waste Manager;
- Waste will be stored on site, including metals, asphalt and soil stockpiles, in such a manner as to:
    - Prevent environmental pollution (bunded and/or covered storage, minimise noise generation and implement dust/odour control measures, as may be required);
    - Maximise waste segregation to minimise potential cross contamination of waste streams and facilitate subsequent re-use, recycling and recovery; and
    - Prevent hazards to site workers and the general public during construction phase (largely noise, vibration and dust).

3.6 Tracking and Documentation Procedures for Off-Site Waste

All waste will be documented prior to leaving the site. Waste will be weighed by the contractor, either by weighing mechanism on the truck or at the receiving facility. These waste records will be maintained on site by the nominated project Waste Manager.

All movement of waste and the use of waste contractors will be undertaken in accordance with the *Waste Management Acts 1996 – 2011*. This includes the requirement for all waste contractors to have a waste collection permit issued by the NWCPO. The nominated project waste manager will maintain a copy of all waste collection permits on-site.

If the waste is being transported to another site, a copy of the Local Authority waste COR/permit or EPA Waste/IED Licence for that site will be provided to the nominated project waste manager. If the waste is being shipped abroad, a copy of the Transfrontier Shipping (TFS) notification document will be obtained from Dublin City Council (as the relevant authority on behalf of all local authorities in Ireland) and kept on-site along with details of the final destination (COR, permits, licences etc.). A receipt from the final destination of the material will be kept as part of the on-site waste management records. All information will be entered in a waste management recording system to be maintained on site.

4.0 WASTE IDENTIFICATION, CLASSIFICATION, QUANTIFICATION AND HANDLING

During the construction phase, there will be some building material and packaging waste generated. This will mainly include excess ready-mix concrete and mortar, timber off cuts, plastics, metal off cuts, cladding and tile offcuts, as well as plastic and cardboard waste from packaging and potential oversupply of materials. Where possible, individual waste arisings shall be identified, classified and quantified (volume, weight) as early in the project lifecycle as is possible but, inevitably, unanticipated waste arisings may occur as site work progresses, necessitating the need for a procedure to provide for waste classification as the site work proceeds.

It is anticipated that the majority of non-hazardous and inert waste generated will be suitable for reuse, recovery or recycling and will be segregated to facilitate the reuse, recovery and/or recycling, where possible. A non-exhaustive list of anticipated wastes from the construction phase and preliminary classification as either hazardous or non-hazardous is presented in Table 4.0.

Hazardous Waste	Non Hazardous Waste
• Excess Electrical & Electronic Components • Liquid Fuels • Batteries • Concrete (contaminated with dangerous substances) • Excavated Soil (contaminated with dangerous substances) • Other construction wastes containing dangerous substances	• Asphalt • Metals (stainless steel, mild steel, copper, aluminium) • Wood (Clean), glass, plastic, paper and cardboard • Concrete (not contaminated with dangerous substances) • Excavated soil/fill (not contaminated with dangerous substances) • Municipal waste

Table 4.0 *Potential Non Hazardous and Hazardous Waste Classification*

Wastes arising for the project will be segregated, identified and classified by the Principal Contractor in accordance with applicable waste regulations.

Wastes shall not be removed from the site until properly classified, assigned a correct LoW code and all appropriate tracking and disposal documentation is in place. For each waste stream identified and classified, and for each waste stream that may arise during the course of the works, the following shall be identified and documented by the Principal Contractor in their SWMP:

- An appropriate waste classification and correct LoW code; Where a waste type is considered a mirror entry, the classification of materials as non-hazardous and/or hazardous waste will be determined based on the www.hazwasteonline.com web-based waste assessment system (as recognized by the Environmental Protection Agency) and using Waste Acceptance Criteria in accordance with the European Communities (EC) Council Decision 2003/33/EC, which establishes criteria for the acceptance of waste at landfills;

- A suitable Waste Collection Contractor in possession of a valid Waste Collection Permit for the collection of waste within the Dublin City Council area;
- Appropriate waste recovery, recycling or disposal facilities, including any required transfer stations whereupon the said facilities shall be in possession of a valid Waste Facility Certificate of Registration, permit or Waste Licence, as appropriate;
- A recovery, recycling or disposal plan for the waste, where applicable. Where any material is being recovered onsite or offsite for reuse; the Principal Contractor will provide confirmation of any application to EPA under Article 276 or Article 287 to classify material as a by-product or as end of life waste respectively; and
- Final reconciled waste quantities generated, including details of waste disposal, reuse and recovery quantities.

5.0 ESTIMATED COST OF WASTE MANAGEMENT

An outline of the costs associated with different aspects of waste management is provided below. The total cost of C&D waste management will be measured and will take into account handling costs, storage costs, transportation costs, revenue from rebates and disposal costs.

5.1 Reuse

By reusing materials on site, there will be a reduction in the transport and recycle/recovery/disposal costs associated with the requirement for a waste contractor to take the material off-site**.** Clean and inert soils, gravel, stones etc. which cannot be reused on site may be used as capping material for landfill sites, or for the reinstatement of quarries etc. This material is often taken free of charge or a reduced fee for such purposes, reducing final waste disposal costs**.**

5.2 Recycling

Salvageable metals will earn a rebate which can be offset against the costs of collection and transportation of the skips. Clean uncontaminated cardboard and certain hard plastics can also be recycled. Waste contractors will charge considerably less to take segregated wastes, such as recyclable waste, from a site than mixed waste. Timber can be recycled as chipboard. Again, waste contractors will charge considerably less to take segregated wastes such as timber from a site than mixed waste.

5.3 Disposal

Landfill charges in the Leinster region are currently at around €130-150 per tonne which includes a €75 per tonne landfill levy specified in the *Waste Management (Landfill Levy) Regulations 2015*. In addition to disposal costs, waste contractors will also charge a collection fee for skips.Collection of segregated C&D waste usually costs less than municipal waste. Specific C&D waste contractors take the waste off-site to a licensed or permitted facility and, where possible, remove salvageable items from the waste stream before disposing of the remainder to landfill. Clean soil, rubble, etc. is also used as fill/capping material, wherever possible.

6.0 ROLES & RESPONSIBILITIES

All parties involved in the Project will have responsibility for waste management. Responsibility will vary at different stages of the project lifecycle. Key responsibilities are set out in Table 6.1. Some responsibility assignments indicated in Table 6.1 may change, depending on the agreed project contractual arrangements and project design requirements. The appointed Principal Contractor will be responsible for refining and implementing the findings of the outline CWMP within their own over-arching Site Waste Management Plan (SWMP).

sponsible Party	Responsibility	Project Stage
Client	Appointment of competent Principal Contractor and Design Team Responsibility of waste management from 'cradle to grave', including documentation of same.	Project initiation and subsequent tendering phases All project stages
Principal Contractor	Construction Waste Management Plan implementation Refinement and implementation of the outline CWMP within their own over-arching Site Waste Management Plan (SWMP) Appoint competent and authorized waste management contractor(s) Appoint trained, competent Waste Manager	Project Implementation Project Implementation Project tendering phase Construction phase
Waste Manager	SWMP implementation Ensure that's the objectives of both the CWMP and the contractors SWMP are put in place. Waste characterisation. Selection of techniques and design to minimise waste and to maximise recovery and recycling of waste during the project. Maintenance of Waste Documentation for 3 years. Completion of Final Waste Management Report Educate colleagues, site staff, external contractors and suppliers about alternatives to conventional construction waste disposal	Project Implementation Construction stage Construction stage Project Design Phase and during project implementation Post-construction stage Construction stage
Design Team	Identification of Key Waste Streams Design to minimise waste generation in lifecycle of completed construction. Design of Soil Excavation Plan Adequately provide for waste management in tender documents and declare all relevant information & data.	Project Design Phase Project Design Phase Project Design Phase Project Procurement Phase
Subcontractors	Comply with CWMP and Contractors SWMP, where relevant	Project Implementation

Table 6.1. *Construction Stage Waste Management – Key Responsibilities*

7.0 WASTE MANAGEMENT PLAN AWARENESS & TRAINING

Copies of the CWMP and the Principal Contractor's Site Waste Management Plan will be made available to all personnel on site.

All site personnel and sub-contractors will be instructed about the objectives of these plans and informed of the responsibilities which fall upon them as a consequence of its provisions. Where source segregation and selective material reuse techniques apply, each member of staff will be given instructions on how to comply with the CWMP.

Posters will be designed to reinforce the key messages within the CWMP and will be displayed prominently for the benefit of site staff. Specialist training as may be required (e.g., asbestos containing materials handling) will be assessed or provided as required.

8.0 ENVIRONMENTAL MANAGEMENT

8.1 Work hours

Site development and building works shall be carried out only between 0800 to 1800 hours Mondays to Fridays Inclusive, between 0800 to 1400 hours on Saturdays and not at all on Sundays and public holidays. Deviation from these times will only be allowed in exceptional circumstances where prior written approval has been received from the planning authority.

8.2 Liaison with Local Community

Appointment of a Liaison Officer as a single point of contact to engage with the community and respond to concerns. A log shall be maintained on site of all complaints detailing:

- Name and address of complainant
- Time and date complaint was made
- Date, time and duration of noise
- Characteristics, such as rumble, clatters, intermittent, etc.
- Likely cause or source of noise
- Weather conditions, such as wind speed and direction
- Investigative and follow -up actions

8.3 Air Quality

A programme of air quality monitoring at the site boundaries for the duration of excavation and construction activities to ensure that the air quality standards as set out in The Air Quality Standards Regulations 2011 relating to dust deposition and specifically PM_{10} levels are not exceeded. (A dust limitation value of 350mg/sq.m day is generally considered appropriate)

Technical monitoring reports detailing all measurement results shall be subsequently prepared and maintained on site.

9.0 RECORD KEEPING

A Waste Documentation System will be prepared by the Principal Contractor and included in their SWMP. The Principal Contractor will be responsible for implementation and auditing the Waste Documentation System on a regular basis.

The documentation to be maintained, as a minimum, shall be the following:

- The names of the agent(s) and transporter(s) of the wastes;
- The name(s) of the person(s) responsible for the ultimate recycling, recovery or disposal of the wastes;
- The ultimate destination(s) of the wastes;
- Written confirmation of the acceptance and recovery, recycling or disposal of any waste consignments;
- The tonnages and LoW code for all waste materials;
- Details of any rejected waste consignments;
- Waste Transfer Forms (WTF) for hazardous wastes transferred from site and associated appendices;
- Completed Transfrontier Shipment Forms (TFS) for hazardous wastes transferred abroad
- Written documentation of waste classifications, including any related analyses; and
- Certificates of Recycling, Recovery, Re-Use or Disposal for all wastes transferred from the site.

All waste records will be maintained for at least a period of 3 years and must be subject to verification and validation.

All waste documentation will be maintained by the Principal Contractor in a safe place, preferably on site, during the project implementation phase. Electronic records will be placed on a secure server that is backed up regularly. Allowance of time and resources will be made to collate outstanding waste records once the project implementation phase has been completed.

10.0 OUTLINE WASTE AUDIT PROCEDURE

10.1 Responsibility for Waste Audit

The appointed Principal Contractor will be responsible for conducting a waste audit at the site during the C&D phase of the development.

This audit will identify the amount, nature and composition of the waste generated on the site. The Waste Audit will examine the manner in which the waste is produced and will provide a commentary highlighting how management policies and practices may inherently contribute to the production of waste.

The Principal Contractor will be responsible for undertaking regular waste auditing. The Design team may review the findings of the waste audits during the course of the construction stage.

10.2 Review of Records and Identification of Corrective Actions

A review of all the records for the waste generated and transported off-site should be undertaken mid-way through the project. 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. The waste records will be 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. Upon completion of the C & D phase, a final report will be prepared, summarising the outcomes of waste management processes adopted and the total recycling/reuse/recovery figures for the development.

11.0 CONSULTATION WITH RELEVANT BODIES

11.1 Local Authority

Once construction contractors have been appointed and prior to removal of any waste materials offsite, details of the proposed destination of each waste stream will be provided to Dublin City Council.

Dublin City Council will also be consulted, as required, throughout the excavation and construction phases in order to ensure that all available waste reduction, reuse and recycling opportunities are identified and utilised and that compliant waste management practices are carried out**.**

11.2 Waste Permitting, Licences & Documentation

Under the Waste Management (Collection Permit) Regulations 2007, as amended, a collection permit to transport waste, which is issued by the National Waste Collection Permit Office (NWCPO), must be held by each waste collection contractor. Waste may only be treated or disposed of at facilities that are licensed or permitted to carry out that specific activity (e.g. chemical treatment, landfill, incineration, etc.) for a specific waste type.

Operators of such facilities cannot receive any waste, unless they are in possession of a Certificate of Registration (COR) or waste permit granted by the relevant Local Authority under the Waste Management (Facility Permit & Registration) Regulations 2007 and Amendments or a waste licence granted by the EPA. The COR/permit/licence held will specify the type and quantity of waste permitted to be received, stored, sorted, recycled, recovered and/or disposed of at the specified site.

Records of all waste movements and associated documentation should be held at the site. Records management and maintenance will be the responsibility of the Principal Contractor.

12.0 INVASIVE SPECIES

12.1 Treatment of Japanese Knotweed

There is a small stand of Japanese Knotweed on the north western boundary of the site adjoining the stream bank. The Knotweed stand was first identified in January 2019, by consulting Ecologists Openfield whilst undertaking a site walkover survey. The Japanese Knotweed is located in a peripheral location a considerable distance from any proposed excavation works. In consideration of same it will be possible to treat the Japanese Knotweed in -situ by means of stem injection. Cairn havei appointed invasive species experts; Knotweed Control Ireland to undertake the in-situ treatment. The treatment process involves injecting the stems of each single plant with approved herbicides. The above ground vegetation is cut and disposed of to a suitably licensed facility. The cutting process exposes each stem for injection. In-situ treatment of a Japanese Knotweed stand of this scale is likely to take 2 years, with 2-3 treatments per growing season. The Japanese Knotweed stand will be protected with fencing and appropriate signage will be erected to inform the construction workers and later the public of the presence of the Japanese Knotweed. The environs of the Knotweed Stand will require monitoring for a further 2 years before the areas can be certified as Knotweed free. Whilst Japanese knotweed is listed as an invasive alien species, it does not pose any public health risk.

Location and extent of Knotweed stands as surveyed January 2019.	Photo of Knotweed stands as surveyed