12.0 MATERIAL ASSETS - WASTE

12.1 INTRODUCTION

This chapter of the EIAR was prepared to assess the potential significant effects that construction and operational wastes associated with the proposed development may have on the receiving environment, and regional and national waste management infrastructure.

It should be read in conjunction with the site-specific Resource and Construction Waste Management Plan and the Operational Waste Management Plan. Both of these documents are submitted as part of the Planning Application.

This chapter of the EIAR has been prepared by Ian Byrne MSC, Principal Environmental Consultant of Byrne Environmental Consulting Ltd.

12.1.1 Statement of Authority

The Author of this Chapter, Ian Byrne, holds a Masters Degree in Environmental Protection and a Diploma in Environmental and Planning Law. Ian Byrne has prepared numerous Resource and Construction Waste Management Plans, Operational Management Plans and Waste Impact Assessment Chapters of EIAR'S for SHD's, LRD's, Mixed-Use Developments and Industrial and Commercial developments.

12.2 STUDY METHODOLOGY

This Chapter of the EIAR has been prepared with regard to the National Waste Management Plan for a Circular Economy 2024-2030 (NWMPCE). This is Ireland's national waste strategy published in March 2024 that will replaces the existing regional waste management plans across provincial and local regional authorities and places the emphasis on more waste prevention and increased recycling, reusing and repair practices.

The NWPCE intends to move Ireland toward a circular economy in which focus is shifted away from waste disposal, favouring circularity and sustainability by identifying and maximising the value of material through improved design, durability, repair and recycling. By extending the time resources are kept within the local economy, both environmental and economic benefits are foreseen.

The waste reduction and recycling targets set out in the WMPCE are as follows:

Municipal Waste

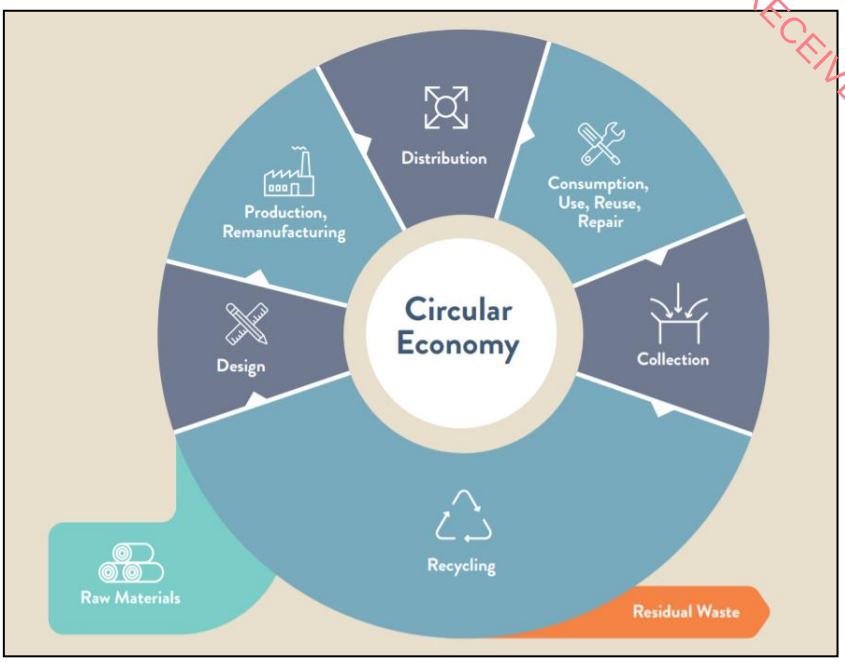
Target 1A	Achieve a 6% reduction in residual municipal waste by 2030
Target 2A	Achieve 90% compliance in the dry recycling bin by 2030
Target 2B	Achieve a 10% increase per annum in material compliance in the residual bin by 2030

Construction & Demolition Waste

Target 1B	Reduce Construction and Demolition Waste by 12% by 2030

The Waste Framework Directive as referenced in the WMPCE has set a recycling target of 70% of non-hazardous Construction & Demolition Waste.

Figure 12.1. The Circular Economy



The Waste Hierarchy

The foundation of EU waste management is the five-step “waste hierarchy”, established in the Waste Framework Directive. It establishes an order of preference for managing and disposing of waste. This Chapter of the EIAR demonstrates how the design, construction and operation of the development will comply with the waste hierarchy whereby waste prevention is the most preferred strategy. Where waste generation is unavoidable, re-use is the most preferred fate, followed by recycling and then energy recovery, with disposal (e.g. to landfill) being the least preferred fate. It is the Applicants Policy to comply with the Waste Hierarchy.

Figure 12.2. The Waste Hierarchy

Source: Waste Framework Directive

12.2.1 Construction Phase Waste Assessment Methodology

The calculated construction waste tonnage has been derived from the Building Research Establishment Environmental Assessment Method (BREEAM) which specifies that 11.1 tonnes of construction waste is generated for every 100m^2 of development area.

12.2.2 Operational Phase Waste Assessment Methodology

The volume of waste that will be generated during the full occupancy of the development have been calculated with regard to *British Standard BS 5906:2005 Waste Management in Buildings-Code of Practice.*

12.2.3 Legislation & Guidance

12.2.3.1 Construction Phase

The construction waste management impact assessment has been prepared with regard to in accordance with the following relevant legislative instruments, policies and guidance:

- Waste Management Acts 1996-20232011
- European Union (Waste Directive) Regulations 2020 (SI No. 323/2020)
- The European Union Waste Framework Directive EU WFD (2018/8512008/98/EC)
- National Waste Management Plan for a Circular Economy 2024-2030
- Waste Management (Collection Permit) (Amendment) (No.2) Regulations 2023 (SI No. 104 of 2023)
- EPA (2022). Guidelines on the Information to be Contained in Environmental Impact Assessment Reports
- EPA (2020). A guide to by-products and submitting a notification under Article of the European Communities (Waste Directive) Regulations 2011 (S.I. No 126 of 2011)(Draft)
- EPA (2019). Guidance on Soil and Stone By-products in the context of article 27 of the European Communities (Waste Directive) Regulations 2011
- EPA (2021). Best Practice Guidelines for the preparation of resource and management plans for construction and demolition projects
- Dublin City Development Plan 2022-2028

The Dublin City Development Plan 2022-2028 includes specific Policies and Objectives relating to the management of Construction and Demolition Waste as follows:

DCC Policy S127
Sustainable Waste Management
To support the principles of the circular economy, good waste management and the implementation of best practice in relation to waste management in order for Dublin City and the Region to become self-sufficient in terms of resource and waste management and to provide a waste management infrastructure that supports this objective.

DCC Policy 128
Sustainable Waste Management
To prevent and minimise waste generation and disposal, and to prioritise prevention, recycling, preparation for reuse and recovery in order to safeguard against environmental pollution.

DCC Policy CA23
The Circular Economy
To support the shift towards the circular economy approach as set out in a Waste Action Plan for a Circular Economy 2020 to 2025, Ireland's National Waste Policy, as updated together with The Whole of Government Circular Economy Strategy 2022- 2023.

DCC Policy CA24
Waste Management Plans for Construction and Demolition Projects

To have regard to existing Best Practice Guidance on Waste Management Plans for Construction and Demolition Projects as well as any future updates to these guidelines in order to ensure the consistent application of planning requirements.

DCC Development Management Standards

Chapter 15.18.2 Waste Management details the following relating to construction of commercial developments.

All planning applications in excess of 30 or more residential units and / or 1,000 sq. m. of commercial development shall be accompanied by both and Construction and Operational Waste Management Plan.

The construction waste management plan may form part of the overall construction management plan and shall detail the strategy in relation to on-site waste storage, segregation and disposal. Development proposals shall recycle demolition material and re- use existing building materials where possible. In all developments of 30 or more housing units or commercial developments in excess of 1,000 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

12.2.3.2 Operational Phase

The operational waste management impact assessment has been prepared with regard to the following relevant legislative instruments, policies and best practice guidelines:

- Waste Management Acts 1996-201123
- Waste Management (Collection Permit) (Amendment)(No.2) Regulations 2023 (SI No. 104 of 2023)
- European Union (Waste Directive) Regulations 2020 (SI No. 323/2020)
- The European Union Waste Framework Directive EU WFD (2018/8512008/98/EC)
- National Waste Management Plan for a Circular Economy 2024-2030
- Department of Housing, Local Government and Heritage (2022). Sustainable Urban Housing: Design Standards for New Apartments. Guidelines for Planning Authorities
- Dublin City Development Plan 2022-2028

Relevant waste management Policies of the Dublin City Development Plan 2022-2028 are:

DCC Policy S127
Sustainable Waste Management
To support the principles of the circular economy, good waste management and the implementation of best practice in relation to waste management in order for Dublin City and the Region to become self-sufficient in terms of resource and waste management and to provide a waste management infrastructure that supports this objective.

DCC Policy 128
Sustainable Waste Management
To prevent and minimise waste generation and disposal, and to prioritise prevention, recycling, preparation for reuse and recovery in order to safeguard against environmental pollution.

DCC Policy 129
Segregated Storage and Collection of Waste Streams
To require new commercial and residential developments to include adequate and easily accessible storage space that supports the collection of as many waste and recycling streams as possible but at a minimum, general domestic waste, dry recyclable and food waste.

DCC Chapter 15.18.2 Waste Management
All planning applications in excess of 30 or more residential units and / or 1,000 sq.m. of commercial development shall be accompanied by both and Construction and Operational Waste Management Plan. The construction waste management plan may form part of the overall construction management plan and shall detail the strategy in relation to on-site waste storage, segregation and disposal. Development proposals shall recycle demolition material and re-use existing building materials where possible. In all developments of 30 or more housing units or commercial

developments in excess of 1,000 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.

The Dublin City Development Plan 2022-2028 includes waste management standards as follows: Appendix 7 1.0 Design Considerations - 1.2 Standards for Commercial/Industrial Developments which are reproduced below.

DCC Appendix 7 Standards for Commercial / Industrial Developments

The requirements set out in the Dublin City Council Waste Management (Storage, Presentation and Segregation of Household and Commercial Waste) Bye-Laws, 2018 (or any subsequent revision) must be adhered to and, in particular, the requirement to segregate waste into separate fractions to facilitate the collection of recyclables, organic waste and Guidelines for Waste Storage Facilities | Appendix 7298 residual waste in line with Waste Management (Food Waste) Regulations 2009 (S.I. 508/2009) and the Waste Management (Food Waste) (Amendment Regulations) S.I. 190/2015, and the Eastern-Midlands Region Waste Management Plan 2015–2021.

The following are also requirements:

- Receptacles that are designed for reuse, with the exception of in specific areas designated by a local authority as being only suitable for the collection of non-reusable receptacles such as bags, ideally of 1,100 Litre capacity, must be used.
- Adequate storage space for a minimum of one No. 1,100 Litre receptacle.
- Sufficient space must be provided to accommodate the collection of dry mixed recyclables and organic waste.
- Adequate space and height for a standard refuse collection vehicle (RCV) to access site.
- Sufficient access and egress must be provided to enable receptacles to be moved easily from the storage area to an appropriate collection point on the public street nearby.
- Receptacle storage areas must not be on a public street nor be visible or accessible from there.
- The receptacle storage areas should be designed so that each bin within the storage area is accessible to occupants/ employees of the development (including people with disabilities).
- Suitable wastewater drainage points should be installed in the bin storage area for cleaning and disinfecting purposes.
- Waste storage areas should not present any safety risks to users and should be well-lit.
- Adequate ventilation of waste storage areas so as to minimise odours and potential nuisance from vermin/flies.

BS 5906:2005 Waste Management in Buildings-Code of Practice

This Chapter of the EIAR has been prepared in accordance with regard to *British Standard BS 5906:2005 Waste Management in Buildings-Code of Practice* which provides guidance on methods of waste calculation, storage, collection, segregation for recycling and recovery for residential building.

LEED (Leadership in Energy and Environmental Design)

This Chapter has been prepared with regard to achieving LEED Credits for the management of waste in the development, the following is required.

1 Provide dedicated areas accessible to waste hauliers and building occupants for the collection and storage of recyclable materials for the entire building. Collection and storage areas may be separate locations.

2 Recyclable materials must include mixed paper, corrugated cardboard, glass, plastics and metals.

3 Take appropriate measures for the safe collection, storage and disposal of two of the following: batteries, mercury-containing lamps and electronic waste.

12.3 THE EXISTING RECEIVING ENVIRONMENT (BASELINE SCENARIO)

12.3.1 Description of the baseline environment

The baseline environment is characterised by the nature of the existing site and the local and regional waste management infrastructure that serves the Dublin City area in which the site is located. The Zone of Influence (ZOI) associated with waste generated by the construction and operational phases of the development relate to the impact that the site will have on Regional licenced and permitted facilities that will accept waste for recycling, re-use and disposal. With regard to the locations of these facilities which are located within the greater Dublin Area and with regard to the Indaver Waste Incinerator in Ringsend, waste facilities in the south Dublin area and hazardous waste acceptance facility in the Naul, Co. Dublin, the ZOI extends to approximately 30km.

12.3.2 Construction Phase

Soil samples from the subject site were analysed to determine the classification as non-hazardous or hazardous in previous site investigations conducted in 2018 by *Site Investigations Ltd.* The soil samples have been classified as hazardous in the *Site Investigations Ltd Report 200207-128.* Waste Classification was conducted in accordance with the EPA (2018) Waste Classification Guidance – List of Waste & Determining if Waste is Hazardous or Non-Hazardous by utilising the results of laboratory analysis and the *HazWasteOnLline* Classification Tool.

Soils were found to contain elevated levels of Lead and Zinc and trace amounts of Chrysotile (white asbestos).

Soils at the site are classified as 17 05 03* - Soils and stones containing hazardous substances

Construction wastes including soils arising from bulk excavation works can be accepted at a range of licenced facilities within approximately 30km of the subject site including *Integrated materials Solutions, The Naul, Co. Dublin.*

12.3.3 Operational Phase

Local waste management infrastructure in the Dublin City area has been reviewed and there are a range of commercial waste service providers operating in Dublin City and waste acceptance facilities within 30km of the subject site including:

Commercial waste acceptance facilities in the greater Dublin area include:

- Thorntons Recycling, Park West, Dublin 12
- Key Waste Management Ltd, Kilnamanagh, Dublin
- Greyhound Recycling, Clondalkin, Dublin 22

Commercial waste collection services in the Dublin City area include:

- Key Waste
- Greyhound Recycling
- Thorntons Recycling

12.4 DO NOTHING SCENARIO

Should the subject development not proceed, it is likely that another development may be applied for in the future as the subject site is zoned for commercial development.

Should the site remain undeveloped there is a likely risk that it could be subject to illegal fly-tipping and the effect would be locally negative with a significance ranging from imperceptible to profound, depending on the magnitude of fly-tipping, with a duration of temporary to short-term depending on the responsiveness of the relevant authorities to any such situation.

12.5 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

The proposed development comprises:

- Demolition of the existing buildings and structures (it is noted the structures or part thereof may be demolished in compliance with a Dangerous Buildings Notice prior to a decision being made);
- Construction of a mixed use building up to 14 storeys in height (c. 58 metres above ground) over a double basement;
- The offices are proposed from 1st to 13th floor (14th storey) with terraces at 6th, 9th and 12th floor levels;
- A co-working/café space (230 sqm) is proposed at ground floor level along the Moss Street elevation;
- The community/arts/cultural spaces are contained at ground and lower ground floor levels;
- The basement level (B1) provides for 9 no. car parking spaces;
- 330 no bicycle spaces will be provided. 314 no. long stay spaces will be provide at lower ground floor level and 16 no. short stay spaces will be provided at ground floor level on Moss Street.
- The overall gross floor area of the development comprises 28,543 sq.m. including 910 sq.m. community/arts/cultural space and 23,501 sq.m. offices;
- All ancillary and associated works and development including plant, temporary construction works, public realm, landscaping, utilities connections and infrastructure.

A detailed description of the proposed development is included in Chapter 2 of the EIAR.

12.5.1 Construction Phase

The demolition phase will include the removal of existing building and structures on-site and the removal of demolition waste off-site. It has been calculated that the demolition phase will generate c. 40,000 tonnes of soil and stone waste c. 432 tonnes of demolition waste comprising concrete, bricks, tiles and ceramics waste, wood, glass and plastic waste and mixed metal waste.

The construction phase will generate c. 2,122 tonnes of construction waste comprising concrete, bricks, tiles and ceramics waste, wood, glass and plastic waste mixed construction waste and mixed metal waste.

12.5.2 Operational Phase

The Operational Phase of the development will generate a range of waste materials from office spaces, canteens and from maintenance activities. It has been calculated that c. 80,540 litres of waste will be generated per week based on a full occupancy scenario.

12.6 POTENTIAL IMPACTS/EFFECTS OF THE PROPOSED DEVELOPMENT

12.6.1 Construction Phase

Construction wastes if not managed and segregated on-site will have the potential to be difficult to separate into different waste streams to allow for further processing, recovery, re-use or to be recycled.

The calculated construction waste tonnage with the exception of soils and stones has been derived from the *Building Research Establishment Environmental Assessment Method (BREEAM)* which specifies that 11.1 tonnes of construction waste is generated for every 100m^2 of development area. Based on the structures to be built with an area of c.19,121m^2 it has been calculated that c. 2,122 tonnes of construction waste shall be produced.

Table 12.1 details the EPA's most recently published (2022) % breakdown of Construction waste.

Table 12.1. Construction & Demolition Waste Composition

Waste Type	% Composition
Metal	15
Wood Plastic Glass	5
Bituminous Materials	10
Concrete Brick Gypsum	41
Mixed C & D	29

Source: EPA 2022, Waste Statistics

Tables 12.2 and 12.3 detail the breakdown of demolition and construction waste types respectively.

Table 12.2. Calculated Demolition Waste Tonnage

LoW Code	Description	Volume Generated (Tonnes)	Prevention (Tonnes)	Re-Used (Tonnes)	Recycled (Tonnes)	Recovered (Tonnes)	Disposed (Tonnes)
17 01 01 17 01 02 17 01 03	Concrete Brick Tiles Ceramics	177	0	96	73	0	8
17 02 01 17 02 02 17 02 03	Wood Plastic Glass	22	0	0	17	4	1
17 03 02	Bituminous Material	43	0	19	24	0	0
17 04 07	Mixed Metals	65	0	0	65	0	0
17 05 04	Soil & Stones	40,000	0	0	0	0	40,000
17 09 04	Mixed C&D	125	0	39	46	23	17

Table 12.3. Calculated Construction Waste Tonnage

LoW Code	Description	Volume Generated (Tonnes)	Prevention (Tonnes)	Re-Used (Tonnes)	Recycled (Tonnes)	Recovered (Tonnes)	Disposed (Tonnes)
17 01 01 17 01 02 17 01 03	Concrete Brick Tiles Ceramics	870	0	470	357	0	43
17 02 01 17 02 02 17 02 03	Wood Plastic Glass	106	0	0	84	21	18
17 03 02	Bituminous Material	212	0	91	121	0	0
17 04 07	Mixed Metals	318	0	0	318	0	0
17 09 04	Mixed C&D	616	0	191	228	111	86
20 01 08	Biodegradable canteen waste	10	0	0	0	0	10
20 03 01B	Mixed Municipal Waste	10	0	0	0	0	10
20 01 01	Paper and Cardboard	1	0	0	1	0	0

12.6.2 Operational Phase

The volumes of waste that will be generated per week has been determined with reference to *British Standard BS 5906:2005 Waste Management in Buildings-Code of Practice*

The maximum occupancy of the building which is comprised of 18,211m2 of office space and 910m2 of a community arts and cultural floor has been considered for calculating the maximum quantity of waste that may be produced per week

Office Floor Area 1518 persons
Community Arts & Cultural Spaces 91 persons

BS 5906:2005 states that a figure of 50 litres per week per employee should be used to determine the expected volume of waste to be generated per week.

It is thus calculated that up to 80,450 litres of waste from the operation of the development shall be generated per week.

Table 12.4 details the range of waste types and their associated LoW Code from Chapter 20 of the *EPA 2018 Publication Waste Classification, List of Waste & determining if Waste is Hazardous or Non-hazardous* that shall be generated during the operation of the development.

Table 12.4. Office Waste Types

Chapter 20 Municipal wastes (Household waste and similar commercial, industrial and institutional wastes) including separately collected fractions	
20 01 01	Paper and Cardboard
20 01 02	Glass
20 01 08 A	Biodegradable kitchen and canteen waste
20 01 13*	Solvents
20 01 21*	Florescent tubes
20 01 25	Edible oil and fat
20 01 26*	Oils and fat other than those mentioned in 20 01 25
20 01 28	Paint, inks adhesives and resins
20 01 30	Detergents
20 01 33*	Batteries and accumulators
20 01 35* A, B C, D	Discarded electrical and electonic equipment containing hazardous components
20 01 36 A, B C, D	Discarded electrical and electonic equipment
20 01 38	Wood other than that mentioned in 20 01 37
20 01 39	Plastics
20 01 40 C	Metals
20 03 01 E	Non-household Mixed Dry Recyclables
20 03 01 B	Non-household Residual commercial waste

12.7 'WORST CASE' SCENARIO

A worst-case scenario would arise if the construction phase and operational phase wastes streams were not managed in accordance with the Resource and Waste Management Plan or the Operational Waste Management Plan. Unmanaged waste streams will reduce the ability to re-use and recycle waste fractions and result in the generation of unsegregated waste streams which will have an increased impact on the environment as a result of the energy required to dispose of them in landfill or by incineration.

12.7.1 Construction Phase

The worst-case scenario for the demolition and construction phases would be short-term, significant and negative.

12.7.2 Operational Phase

The worst-case scenario for the operational phase would be long-term, significant and negative.

12.8 AVOIDANCE, REMEDIAL AND MITIGATION MEASURES

The site-specific Resource and Construction Waste Management Plan (RWMP) includes specific details on how construction phase wastes and resources shall be controlled, managed and monitored throughout the construction phase.

The site-specific Operational Waste Management Plan (OWMP) includes specific details on how operational phase wastes shall be controlled, managed and monitored throughout the operational lifetime of the development.

12.8.1 Construction Phase Mitigation

The following construction phase mitigation measures will be implemented.

- From the outset of construction activities, a dedicated and secure compound containing bins, and/or skips, and storage areas, into which all waste materials generated by construction site activities, will be established within the active construction phase of the development site.

- Spill kits shall be located within the site compound with clearly labelled instructions on how they shall be used to clean up fuel/oil spills to minimise the potential for ground contamination.
- All vehicle and plant oils and liquid construction materials shall be stored in secure impermeable storage units.
- All diesel-powered generators shall be inspected on at least a weekly basis by a delegate of the project manager to ensure it is not leaking diesel or oils.
- All empty containers containing residual quantities of oils, greases and hydrocarbon-based liquids shall be stored in a dedicated, clearly labelled impermeable container.
- In order to ensure that the construction contractor correctly segregate waste materials, it is the responsibility of the site construction manager to ensure all staff are informed by means of clear signage and verbal instruction and made responsible for ensuring site housekeeping and the proper segregation of construction waste materials.
- It will be the responsibility of the Resource and Waste Manager (RWM) to ensure that a written record of all quantities and natures of wastes exported off-site are maintained on-site in a Waste File at the Project office.
- It is the responsibility of the RWM that all contracted waste haulage drivers hold an appropriate Waste Collection Permit for the transport of waste loads and that all waste materials are delivered to an appropriately licenced or permitted waste facility in compliance with the following relevant Regulations:
    - Waste Management (Collection Permit) Regulations 2007 – 2023 (as amended) (SI No.820 of 2007)
    - Waste Management (Collection Permit) Amendment Regulations 2016 (SI No.247 of 2016)
    - Waste Management (Collection Permit) Amendment No. 2 Regulations 2023 (SI No.104 of 2023)
    - Waste Management (Facility Permit and Registration) Regulations S.I.821 of 2007 and the Waste Facility Permit under the Waste Management (Facility Permit and Registration) (Amendment) Regulations S.I.250 of 2019.2007 to 2023 (as amended).
    - Waste Management Acts 1996 (Revised 1st July 2023).- 2011.
- Prior to the commencement of the Project, the Resource and Waste Manager (RWM) shall identify a permitted Waste Contractor(s) who shall be engaged to collect and dispose of all inert and hazardous wastes arising from the project works.
- The RWM shall maintain copies of all Waste Collection Permits and copies of the Waste Facility Permit or Waste Licence to which waste materials are exported to. The RWM shall ensure that all Permits/Licences are within date.
- All waste soils prior to being exported off-site, shall be classified as inert, non-hazardous or hazardous in accordance with the EPA (2018) Waste Classification Guidance – List of Waste & Determining if Waste is Hazardous or Non-Hazardous document to ensure that the waste material is transferred by an appropriately permitted waste collection permit holder and brought to an appropriately permitted or licensed waste facility.

12.8.2 Resource Management

Resources shall be managed to reduce the volume of waste material generated and to increase opportunities to re-use and recycle materials at the site as follows:

- Demolition waste shall be segregated to allow the recovery, recycling and re-use of waste streams to be conducted.
- Bricks that are suitable for re-use may be re-used on-site for the construction of decorative features.
- Materials shall be ordered on an “as needed” basis to prevent over supply and preventing damage to bulk orders stored on-site.
- Materials shall be stored and handled in a manner that minimises the generation of damaged materials

- Materials shall be ordered in appropriate sequence to minimise materials stored on site
- All staff and Sub contractors shall be advised through inductions and tool box talks on how to dispose of their waste correctly on-site.
- Broken concrete blocks and excess aggregate materials shall be segregated and stored off-site for use as hard standing material on future projects. This will result in the following positive impacts:
    - Reduction in the requirement for virgin aggregate materials from quarries
    - Reduction in energy required to extract, process and transport virgin aggregates
    - Reduced HGV movements associated with the delivery of imported aggregates to the site
    - Reduction in the amount of landfill space required to accept C&D waste
- Excess wood will be segregated in separate skips and sent for recycling.
- Plastic arising from general waste or packaging will be segregated and stored in separate skips.
- Metals waste shall be stored in dedicated skips
- Any hazardous material (e.g., unknown hotspot, underground tanks) discovered during the course of the construction phase shall be isolated and the removal of contaminated materials shall be managed by the sites Resource and Waste Manager.

12.8.3 Operational Phase

In order to ensure that the office development is designed and operated to maximise the opportunities for maximising recycling waste streams and minimising the generation of unrecyclable mixed waste streams, the following key design aspects shall be implemented.

- All Tenants of the development shall be provided with training by the Facility Management Company on how the wastes that they produce shall be managed in accordance with the OWMP.
- All Tenants of the development shall be provided with information by the Facility Management Company on the segregation of waste at source and how to reduce the generation of un- segregated wastes.
- All Canteens / Kitchenettes shall include 4-bin waste system to facilitate the segregation of waste at source for

  Organic compostable waste
  Dry recyclable waste
  Non-recyclable mixed waste
  Glass

- Each floor will contain an interim Waste Storage Area in which Tenants of that floor will deposit their waste types into the 7-bin system.

  Organic compostable waste
  Dry recyclable waste
  Non-recyclable mixed waste
  Glass
  WEEE

- The Facility Management Company shall transfer the contents of the intermediate waste bins to the buildings Waste Management Area.

12.8.3.1 Methods of waste reduction in canteens / kitchenettes

The following measures will be implemented to reduce the amount of waste generated by the operation of the Canteen / Kitchenettes

- Bulk purchasing of food such as jams/sugars, condiments, cakes/biscuits shall minimise packaging waste.

- Sugar / condiments shall not be provided in single servings.
- Sauces shall be provided in plastic containers instead of individual single servings.
- Paper and Plastic Plates, Cups and Plastic cutlery will not be available.
- Drinks in glass bottles will not be stocked.

12.8.3.2 Methods of waste reduction in offices

The principal types of waste generated in an office environment are:

- Paper & Cardboard
- Ink and Toner Cartridges
- WEEE
- Bulky Waste (e.g., Furniture)
- Plastic packaging

In order to reduce the generation of office waste and to maximise the opportunities to recycle office waste, the following Best Practices shall be adopted by the Tenants of the Office Spaces:

- Remove individual desk bins, consolidating collection in common areas with labelled waste containers using example pictures and colour coding.
- Single use cups, plates and tableware including plastic water cups shall not be permitted as part of Tenant lease agreement.
- Company branded promotional materials can be a significant source of waste. Consider reducing or eliminating paper brochures and leaflets, plastic pens, and other single use or non-recyclable items.
- Avoid unnecessary printing
- Avoid unnecessary colour printing
- Print on both sides of the page
- Reduce font size to reduce paper
- Implement a Green Purchasing Policy

12.8.3.3 Waste Storage Area

The development shall include a bulk waste storage area where all wastes generated shall be stored prior to removal off-site.

The purpose of the waste storage area is:

- To provide receptacles so that all wastes can be segregated thus minimising unrecyclable mixed waste streams.
- To provide mechanical systems i.e., Mobile Compactors and Bailing Units to reduce the volume of waste generated thus reducing the frequency that waste collection vehicles attend site, thus reducing fuel and energy use required for off-site processing.
- To integrate a streamlined waste reduction, segregation and recycling Policy into the design and operation of the development.

The waste storage area may include the following waste receptacles and mechanical plant:

- Mobile compactor / bailing units for paper/cardboard and plastics
- Food waste Biodigester unit
- WEEE/ Battery recycling cage

- Fluorescent Lamp boxes
- Hazardous waste bunded container for oils, plant maintenance fluids and water treatment chemicals
- Bulk 1100 litre Bins for non-recyclable materials
- Bulk 1100 litre Bins for dry recyclable materials
- Bulk 1100 litre Bins for metal waste
- Bulk 1100 litre Bins for wood waste
- 240 litre Bins for glass waste

12.9 PREDICTED IMPACTS OF THE PROPOSED DEVELOPMENT

This section assesses potential significant environmental impacts which remain after mitigation measures are implemented.

12.9.1 Construction Phase

The potential likely impacts of construction waste will be negative, not significant and short--term. This conclusion is based on the implementation of the Resource and Construction Waste Management Plan through the construction phase of the development.

Construction phase wastes will be managed through design, management and waste reduction and recycling initiatives at the proposed development, it is predicted that the impact of the construction phase of the development is not likely to have a significant effect will not have a significant adverse impact on the receiving environment, or on local and regional waste management services or infrastructure and the development shall be managed shall to comply with Local Authority objectives for construction waste management.

Table 12.5. Summary Construction Phase Impacts Post Mitigation

Likely Significant Effect	Quality	Significance	Extent	Probability	Duration	Type
Regional Construction Waste Infrastructure	Negative	Not Significant	Regional	Likely	Short-Term	Residual
Receiving Environment	Neutral	Not Significant	Regional	Unlikely	Short-Term	Residual

12.9.2 Operational Phase

The potential likely impacts of operational waste will be negative, not significant and long-term. This conclusion is based on the implementation of the Operational Waste Management Plan through the lifetime of the development.

The development shall be designed to provide adequate domestic waste infrastructure and storage areas for all apartments. This will promote the appropriate segregation at source of domestic generated waste from all residential units at the development and thus reduce the potential for the generation of mixed un-recyclable waste streams. The operational phase of the development is not likely to have a significant effect on Regional waste infrastructure and the operation of the development shall be managed to comply with Local Authority objectives for domestic waste management.

Table 12.6: Summary Operational Phase Impacts Post Mitigation

Likely Significant Effect	Quality	Significance	Extent	Probability	Duration	Type
Regional Domestic Waste Infrastructure	Negative	Not Significant	Regional	Likely	Long Term	Residual
Receiving Environment	Neutral	Not Significant	Regional	Unlikely	Long-Term	Residual

12.10 MONITORING

12.10.1 Construction Phase

The Resource and Waste Manager (RWM) will maintain a written record of all quantities and types of construction wastes generated, reused / recycled and exported off-site during the construction phase.

The following information shall be recorded for each load of waste exported off-site:

- Waste Type EWC Code and description.
- Volume of waste collected.
- Waste collection contractor's Waste Collection Permit Number and collection receipt including vehicle registration number.
- Destination of waste load including Waste Permit / Licence number of facility.
- Description of how waste at facility shall be treated i.e. disposal / recovery / export
- Construction Phase Waste Auditing

In order to ensure that construction wastes generated during the course of the development are being effectively managed and recorded, a waste management audit shall be conducted on a routine basis to determine compliance with the RWMP.

The effectiveness of a Resource and Waste Management Plan and its implementation, will be subject to quarterly audits by the RWM throughout the duration of the construction phase.

Audits will focus on materials inputs to the project and the waste outputs identifying:

Resources

- How resource management was integrated into the design of project buildings and areas
- Re-use, recycling of existing on-site materials prior to development including soils, buildings, structures.
- Re-using surplus materials from previous development projects e.g. office cabins, fencing, aggregates, concrete products.
- Additional opportunities for future resource management.

Waste

The audits will also investigate the operational factors and management policies that contribute to the generation of waste and identify appropriate corrective actions, where necessary.

- Performance targets will be developed, e.g. an 85% overall recycling target, successes and failures will be recorded and Action Plans will be developed to address any issue which arise.
- Inspections of the waste storage areas will be undertaken and recorded on a weekly basis, issues relating to housekeeping, inappropriate storage and segregation of wastes.
- The RWM will record the findings of the audits, including types and quantities of waste arising, final treatments and costs, in a quarterly audit report.
- The Final Waste Audit will examine the manner of how resources were managed and how and where the waste was produced and how waste generation can be reduced in future projects.

12.10.2 Operational Phase

The Facility Management Company shall prepare an annual report for the Local Authority and Tenants of the development on the quantities of waste generated within the development to demonstrate how waste reduction and

recycling targets are being achieved with regard to the targets defined in the National Waste Management Plan for a Circular Economy 2024-2030.

12.11 CUMULATIVE IMPACT ASSESSMENT

The local area in which the subject development is located has a number of existing and permitted developments which together with the proposed development will have a cumulative short-term construction impact and a long-term operational impact.

Should other local sites be constructed during the construction phase of the subject site, there will be an increased demand on Regional Waste Management Infrastructure including Waste Recovery and Waste Recycling Facilities to process construction wastes.

If all local permitted developments are constructed and become operation in the future, there will be an increased demand on Regional Waste Management Infrastructure including Waste Recovery, Waste Recycling Facilities and Waste Disposal to process operational wastes.

Table 12.8 details the cumulative Likely Significant Effects associated with construction and operational wastes. These effects have been determined with regard to how construction and operational wastes must be managed on developments in accordance with the Waste Legislation and Guidance detailed above in Section 12.2.3 of this Chapter of the EIAR.

Table 12.6. Summary of cumulative residual construction and operational waste effects

Likely Significant Effect	Quality	Significance	Extent	Probability	Duration	Type
Construction Waste	Negative	Not Significant	Regional	Likely	Short-Term	Residual
Operational Waste	Negative	Not Significant	Regional	Likely	Long-Term Permanent	Residual

12.12 REINSTATEMENT

Reinstatement is not a relevant aspect to this Chapter of the EIAR.

12.13 INTERACTIONS

The identified interactions between the management of waste arisings during both the construction and operational stages are as follows;

- Human Health & Population (Chapter 4): management of waste in the construction and operational phase to mitigate nuisance, vermin, litter, etc.
- Land & Soil (Chapter 5): excavation to facilitate the development.
- Traffic & Transportation (Chapter 11): specifically, movement of waste associated with the construction stage.

These have been addressed herein and / or in the corresponding other specialist chapters, where appropriate.

12.14 DIFFICULTIES ENCOUNTERED IN COMPILING

There were no difficulties encountered in the preparation of this Chapter of the EIAR.

12.15 REFERENCES

- Waste Management Act 1996-2011

- The European Waste Framework Directive (2008/98/EC)
- The National Waste Management Plan for a Circular Economy 2024-2030
- Waste Management (Collection Permit) (Amendment) (No.2) Regulations 2023 (SI No. 104 of 2023);
- **EPA (2022).** Guidelines on the Information to be Contained in Environmental Impact Assessment Reports;
- **EPA (2020).** A guide to by-products and submitting a notification under Article of the European Communities (Waste Directive) Regulations 2011 (S.I. No 126 of 2011)(Draft);
- **EPA (2019).** Guidance on Soil and Stone By-products in the context of article 27 of the European Communities (Waste Directive) Regulations 2011;
- **EPA (2021).** Best Practice Guidelines for the preparation of resource and management plans for construction and demolition projects8
- **Dublin City Council.** Dublin City Development Plan 2022-2029
- Building Research Establishment Environmental Assessment Method (BREEAM)
- British Standard BS 5906:2005 Waste Management in Buildings-Code of Practice.