Chapter 12

Material Assets - Waste

12.0 MATERIAL ASSETS – WASTE MANAGEMENT

12.1 INTRODUCTION

This Chapter of the Environmental Impact Assessment Report (EIAR) was prepared by Tom Ryan TMS Environment Ltd who has over 20 years professional experience in preparing assessments of this type for various different types of development. Tom has a BSc (Hons) in Chemistry from University College Cork and an MSc in Environmental Science.

This chapter considers the potential waste impacts associated with the proposed development. Impacts of the construction and operational phases are considered together with requirements for waste management and control to ensure the sustainable management of wastes arising at the development in accordance with legislative requirements and best practice standards.

12.2 STUDY METHODOLOGY

The assessment of the impacts of the generation of waste materials arising from the proposed development was completed with consideration of the methodology specified in relevant guidance documents, along with an extensive document review to assist in identifying current and future requirements for waste management including national and regional waste policy, waste strategies, management plans, legislative requirements and relevant reports.

The effects of the proposed project are described by considering the likely direct and indirect possible impacts that could occur as a result of the proposed project, the probability of their occurrence and the nature and significance of such impacts. The Environmental Protection Agency's (EPA's) draft Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (2017) take account of Directive 2014/52/EU which amended Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment and have been considered in this assessment. Impacts are described in the draft Guidance in terms of quality, significance, magnitude, probability, duration and type. A description of the significance of effects is presented in Table 12.1, and Table 12.2 presents the description of the duration of effects as shown in the Draft Guidelines.

Table 12.1 Describing the Significance of Effects

"Significance" is a concept that can have different meaning for different topics – in the absence of specific definitions for different topics the following definitions may be useful.	
Imperceptible	An effect capable of measurement but without noticeable consequences
Not significant	An effect which causes noticeable changes in the character of the environment but without noticeable consequences.
Slight Effects	An effect which causes noticeable changes in the character of the environment without affecting its sensitivities
Moderate Effects	An effect that alters the character of the environment in a manner that is consistent with existing and emerging trends.
Significant Effects	An effect which, by its character, magnitude, duration or intensity significantly alters the majority of a sensitive aspect of the environment.

Very Significant	An effect which, by its character, magnitude, duration or intensity significantly alters the majority of a sensitive aspect of the environment.
Profound Effects	An effect which obliterates sensitive characteristics

Table 12.2 Describing the Duration of Effects

'Duration' is a concept that can have different meanings for different topics – in the absence of specific definitions for different topics the following definitions may be useful.	
Momentary Effects	Effects lasting from seconds to minutes.
Brief Effects	Effects lasting less than a day.
Temporary Effects	Effects lasting less than a year.
Short-term Effects	Effects lasting one to seven years.
Medium-term Effects	Effects lasting seven to fifteen years.
Long-term Effects	Effects lasting fifteen to sixty years.
Permanent Effects	Effects lasting over sixty years.

In addition to the above, the methodologies presented in the following waste guidance documents were used to inform the impact assessment and to identify and assess all cumulative impacts with potential to impact upon the receiving environment and to propose mitigation and avoidance measures where required.

The Department of the Environment, Climate and Communications policy documents:

- A Waste Action Plan for a Circular Economy: Ireland's National Waste Policy 2020-2025; (2020).
- Whole of Government Circular Economy Strategy 2022 – 2023: Living More Using Less (2021)

The following waste guidance documents were also considered:

- The Eastern-Midlands Region Waste Management Plan 2015 – 2021 (2015);
- The National Hazardous Waste Management Plan 2021 – 2027 (2021);
- Best Practice Guidelines on the Preparation of Resource and Waste Management Plans for Construction and Demolition Projects (EPA 2021);
- The Circular Economy Programme – The Driving Force for Irelands Move to a Circular Economy (EPA 2021)
- British Standard 5906:2005 Waste Management in Buildings – Code of Practice (2005);

- The Voluntary Construction Industry Initiative to Prevent, Minimise and Recycle C&D Waste (2002);
- The National Waste Reports from the EPA (2012 to 2021);
- The Fingal County Development Plan 2017-2023 (2017);
- The Department of the Environment, Climate and Communications, Sustainable Urban Housing: Design Standards for New Apartments, Guidelines for Planning Authorities (2018);
- Fingal County Council Segregation, Storage and Presentation of Household and Commercial Waste Bye-Laws (2020);
- The EPA National Waste Statistics online resource.

12.3 THE EXISTING RECEIVING ENVIRONMENT

12.3.1 Introduction

The subject site is situated within the Fingal local authority area and consequently the proposed development must comply with the waste management requirements of Fingal County Council as well as the relevant National and Regional waste management requirements.

12.3.2 Relevant Legislation and Guidelines

12.3.2.1 National Waste Policy

The Department of the Environment, Climate and Communications (DECC) has primary responsibility for waste policy and legislation at a national level in Ireland. A significant proportion of national policy is governed by European Union (EU) initiatives. Such initiatives are usually enacted through European Directives which are then transposed into Irish law through our own legislation.

Ireland's national waste policy is *A Waste Action Plan for a Circular Economy – Ireland's National Waste Policy 2020–2025.* The policy, published in September 2020, is intended 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 policy document contains over 200 measures across various waste areas including Circular Economy, Municipal Waste, Consumer Protection and Citizen Engagement, Plastics and Packaging, Construction and Demolition, Textiles, Green Public Procurement and Waste Enforcement. This waste policy action plan is supported by the *All of Government Circular Economy Strategy* published by the DECC in 2021.The overall objectives of the current Action Plan are as follows:

- To shift the focus away from waste disposal and treatment by ensuring that the useful lifetime of materials and products is prolonged;
- To shift the burden of environmental responsibility for disposable goods to the producer;
- To ensure that measures for supporting sustainability are fostered.

The current legislative framework relies on the Waste Management Acts 1996-2021 and the Environment (Miscellaneous Provisions) Act 2011 as amended as the principal vehicles through which national waste policy is enacted.

12.3.2.2 Regional Waste Policy

The subject site is within the jurisdiction of Fingal County Council who have adopted the Eastern-Midlands Region Waste Management Plan 2015-2021. The Plan provides a framework for the prevention and management of waste in a sustainable manner in Fingal and the other local authority areas.

The strategic vision of the regional waste plan is to rethink the current approach to managing waste, by viewing waste streams as valuable material resources. It is hoped that making better use of available resources and reducing the leakage of materials as wastes will deliver benefits economically and environmentally to the region.

The plan contains a number of key measures that encourage a positive change in the attitudes and actions of householders, business and industry towards waste prevention. It also seeks to ensure that the Eastern-Midlands Region moves its management of waste from a traditional disposal model to a circular economy model so that waste becomes a future resource.

The Policy actions of the Plan include the following:

- A 1% reduction per annum in the quantity of household waste generated per capita over the six year period of the plan;
- A recycling rate of 50% of managed municipal waste by 2020;
- A reduction to 0% for the direct disposal of unprocessed residual municipal waste to landfill commencing in 2016;
- Deliver communication, awareness and on the ground activities which lead to a lasting change in the people's behaviour towards waste;
- Increase the level of source-segregated kerbside collections in the region, with a strong focus on ensuring that a three bin system becomes commonplace at household and commercial levels;
- Enforcement of the regulations related to household and commercial waste to tackle the problem of unmanaged waste;
- Ensure existing and future waste facilities do not negatively impact environmentally sensitive sites through proper assessments and siting;
- Grow the waste management sector into a prosperous and sustainable industry which creates and maintains healthy employment.

12.3.2.3 Local Waste Policy

The Fingal Development Plan 2017 to 2023 sets out the policies and objectives for the development of the County over the Plan period. A number of the Plan objectives and actions for the county are in line with the objectives of the Regional Waste Management Plan.

Section 7.5 of the Fingal County Development Plan 2017 – 2023 sets out the waste management policies and objectives in order to comply with the Development Management Standards set for the county with the aim to ensure orderly and sustainable development. There are a total of 26 waste management policy objectives set out in the County Development Plan supporting the implementation of the provisions of the Eastern Midlands Region Waste Management Plan 2015 – 2021. Relevant Policy Objectives are set out in Chapter 12 Development Management Standards and the principal relevant objectives are set out below.

Objective DMS36: Ensure all new residential schemes include appropriate design measures for refuse storage areas, details of which should be clearly shown at pre-planning and planning application stage. Ensure refuse storage areas are not situated immediately adjacent to the front door or ground floor window, unless adequate screened alcoves or other such mitigation measures are provided.

Objective DMS37: Ensure the maximum distance between the front door to a communal bin area does not exceed 50 metres.

Objective DMS146: Ensure all new large-scale residential and mixed use developments include appropriate facilities for the segregation and storage of waste.

Objective DMS147: Ensure all new developments include well-designed facilities to accommodate the three bin collection system.

Objective DMS148: Ensure that all new developments make provision for bring bank facilities where appropriate.

Objective DMS149: Require that construction and demolition waste management plans be submitted as part of any planning application in excess of any of the following thresholds:

- New residential development of 10 units or more;
- New developments other than above, including institutional, educational, health and other public facilities with an aggregate floor area in excess of 1,250sqm.
- Demolition, renovation / refurbishment projects generating in excess of 100m^3 in volume of C&D waste;
- Civil engineering projects in excess of 500m^3 of waste materials sued for development of works on the site.

The Fingal County Council Segregation, Storage and Presentation of Household and Commercial Waste Bye-Laws were enacted in 2020 and they oblige consumers to participate in an authorized waste collection service or provide documentary proof on what alternative means they use to dispose of their waste and encourage greater segregation of waste to reduce volumes of residual waste collected.

12.3.3 Waste Management Data for Ireland

The most recent waste management data available for Ireland is presented in the *National Waste Statistics Summary Report for 2019* which was published by the EPA in December 2021 and suggests that Ireland is on course to meet the 2020 EU targets for both municipal and construction and demolition waste. A total of 1.57 million tonnes of household waste was managed in Ireland in 2019, an increase of 3% on 2018. Overall, there were small increases in the quantities of most waste

types generated by households. The largest increases were seen in household waste brought to Civic Amenity Sites and bulky skip waste collections. The quantity of household waste generated in Ireland in 2019 equates to 330 kilogrammes per person, up from 325 kg/person in 2018 and 321 kg/person in 2017.

The majority of household waste managed in Ireland in 2019 was collected at kerbside (66%), down from 70% in 2018. Increases were seen in the share of household waste collected at civic amenity sites (up from 11% in 2018 to 13% in 2019) and via skips (up from 9% in 2018 to 11% in 2019). The current proposed development is not materially different from the national profile which has been considered in the formulation of management plans for the proposed development.

12.4 CHARACTERISTICS OF THE PROJECT

12.4.1 Introduction

A full description of the proposed development is presented in Chapter 2 of the EIAR. The elements of the development that are relevant in terms of waste management are summarised as follows:

The proposed development entails 345 no. residential units comprising of 84 no. 1-bed units, 104 no. 2-bed units and 157 no. 3-bed units ranging in height from 2 no. – 4 no. storeys on a site of 6.7 hectares located at Hacketstown in the townlands of Milverton, Townparks and Hacketstown, Skerries, Co. Dublin. In addition the development will include a childcare and community facility, upgrades to the Golf Links Road and a new internal link road.

The potential impacts associated with waste generation and management are considered for both the construction phase and the operational phase of the proposed development.

12.4.2 Construction Phase

The work will generally consist of groundwork to include the excavation of soils and rock for site preparation and the construction of the residential units, the link road and the other infrastructural elements. There is no demolition work required as the proposed development is located on a greenfield site. The excavation materials for the proposed development will be composed of topsoil, clays, cobbles and boulders. The project engineers DBFL Consulting Engineers Ltd carried out a preliminary review of the existing survey data and proposed site levels and estimate that approximately 31,088m^3 of material will require excavation consisting of 10,702m^3 stripped topsoil and 20,386m^3 of excavated subsoil.

The project engineers estimate that the potential exists for reuse of all of the stripped topsoil and 10,523m^3 of excavated subsoil as part of the developments permanent landscaped works. They estimate that 9,863m3 of subsoil material may have to be transferred from the subject site during the initial work stages.

Excavated soils and subsoils will be required to be tested to determine their classification as hazardous or non-hazardous in accordance with EPA Waste Classification – List of Waste and Determining if Waste is Hazardous or Non-Hazardous. Where appropriate all subsoil material to be removed from site will be classed as a by-product under Article 27 classification (European Communities (Waste Directive) Regulations 2011, S.I. No. 126 of 2011).

Non-hazardous excavation material shall be re-used within the proposed scheme as engineering fill or in landscaping. This will be investigated by the contractor and is subject to appropriate testing to ensure material is suitable for its proposed end use. Where excavation material may not be re-used within the proposed scheme the Contractor will endeavour to send material for authorised recovery or

recycling so far as is reasonably practicable. All wastes generated from the proposed development will be delivered to authorised waste facilities granted a Waste Licence, Waste Facility Permit or Certificate of Registration

During the construction phase, waste will be produced from surplus materials such as broken or off-cuts of timber, plasterboard, concrete, tiles and waste from packaging such as cardboard, plastic and timber. The EPA and Galway-Mayo Institute of Technology Research Report *A Review of Design and Construction Waste Management Practices in Selected Case Studies – Lessons Learned* (2015) presents data for the breakdown of C&D waste types produced on construction sites similar to the one for the proposed development. Table 12.3 shows the typical waste materials generated on an Irish construction site based on the Research Report.

Table 12.3 Typical C&D Waste Arisings

Waste Material	Percentage (%)
Mixed C & D	33
Timber	28
Plasterboard	10
Metals	8
Concrete	6
Other	15

The estimated quantities of Construction and Demolition (C&D) waste that may arise during the course of the project are presented below in Table 12.4.

Table 12.4 Estimated C&D Waste Arisings

Waste Material	Tonnes
Mixed C & D	513
Timber	435
Plasterboard	156
Metals	124
Concrete	93
Other	233
Total Arisings	1,554

It should be noted that precise figures for the total waste arisings for the proposed project are difficult to estimate until final materials and detailed construction methodologies have been confirmed. While the figures in Table 12.4 present a good indication of likely waste generation rates these figures may be subject to some degree of change and variation during the construction process.

The construction contractor will be required to employ a suitably qualified Resource Manager (RM) with expertise in waste and resource management to implement the requirements of the Resource and Waste Management Plan (RWMP) which will aim to prevent waste arising in the first place and then ensure that all other residual materials are reused or recycled where possible.

Concrete waste and general masonry waste will be source segregated and stored in dedicated skips with mixed C&D waste materials. This waste stream will be re-used onsite where possible or will be sent for subsequent separation and recovery to an authorised mixed C&D Waste Recovery Facility.

Waste wood will be re-used where possible on the site in the making of signs, storage boxes and temporary compounds. Where it cannot be reused it will be source segregated, stored in dedicated skips and will be sent off site to authorised facilities for recycling into other wood material products. If the waste wood is significantly damaged and beyond recycling it will be stored in the mixed C&D waste skip and be sent for recovery to authorised facilities.

All skips used onsite for the storage of waste will be located in a dedicated waste recycling area in a readily accessible location on the development site. Each skip will be clearly marked for the waste type to be contained within and this area will be routinely inspected by the C&D Waste Manager to ensure compliance with the waste segregation and storage procedures.

Materials purchased for use at the site will be ordered on an 'as needed' basis to prevent over supply. Additionally, a take-back or buy-back system will be set up with the suppliers of the construction materials which will prevent the unnecessary build-up of materials on site and will also provide a safeguard for waste prevention. Panelling, coverings and other raw materials will be ordered to size, shape and form to minimise excessive scrap waste. These materials will be handled on site through a centralised cutting operation, which will further prevent unnecessary waste arising. Construction materials will be handled and stored properly to prevent damage and all contractors working on site will have individual responsibility for the management of wastes arising from their own activities. Construction operations will be carried out in the correct sequence to prevent damage to other construction works and all material damage potential will be minimised.

All packaging waste will be returned to the supplier where possible or will be segregated and stored in skips for subsequent off-site recycling at authorised facilities.

All hazardous waste that could potentially arise on the site will be identified, stored safely and separately from all other waste materials and will be disposed of by an authorised contractor to an authorised facility. . Such wastes could include contaminated soils resulting from an oil spill, fluorescent tubes, acid batteries etc.

All wastes will require to be documented prior to leaving the site. Waste will be weighed by the contractor, either onsite or at the receiving facility. These waste records will be maintained on site by the RM.

All management of waste will be undertaken in accordance with the *Waste Management Acts 1996 – 2021 as amended*, *Waste Management (Collection Permit) Regulations 2007 and Amendments* and *Waste Management (Facility Permit & Registration) Regulations 2007 and Amendments*. All waste contractors will be required to have a valid waste collection permit and a copy of all permits for waste transporters will be obtained and maintained onsite.

For all waste leaving the site, a copy of the Local Authority Certificate of Registration, Waste Permit or EPA Waste Licence for the destination facility will be obtained and a copy will be maintained onsite.

12.4.3 Operational Phase

An Operational Waste Management Plan (OWMP) has been prepared for the development by TMS Environment Ltd. The OWMP provides a strategy for at source segregation, storage and collection of all wastes generated within the development during the operational phase. The wastes types that will be generated at the development include the following which will typically be discarded on a daily basis:

- Mixed Dry Recyclables is defined as a collection of solid waste materials that can be stored and collected in one bin or in separate bins to increase recycling value. These materials include cardboard, paper, newspaper, plastic film, plastic bottles, steel and aluminium cans.

- Organic Waste is defined as waste that is organic in nature and comprises mainly of food, be it cooked or uncooked, from kitchens and other catering establishments and is generally classified as putrescible.

- Mixed Non Recyclables is the residual waste that is the remaining waste material after separate diversion of waste components though reduction, reuse, recycling and food waste collections.

- Glass.

In addition to the above categories small quantities of the following wastes will also be generated but on a much lower frequency and volume but will also require appropriate management:

- Waste electrical and electronic equipment (WEEE) such as TVs, mobile phones, printers, radios batteries etc;

- Green Waste – organic materials generated from gardens and landscaping;

- Chemicals - paints, adhesives, detergents, etc;

- Lighting – including light bulbs;

- Metal – fixtures and fittings;

- Furniture and Textiles; and

- Bulky wastes – fridges, freezers, washing machines etc.

British Standard 5906:2005 Waste Management in Buildings – Code of Practice sets out typical weekly waste arisings for various types of buildings. The Code of Practice sets out an equation to estimate the weekly waste arisings for domestic or residential buildings as follows:

weekly waste (litres) = number of dwellings x [70 x average number of bedrooms + (30)]

For the purposes of the waste storage calculations the waste will be segregated and stored into four designated waste streams namely mixed dry recyclables, mixed non recyclables, organic waste and glass waste.

Based on professional experience from other projects, when using volume as the unit measurement for waste arisings, it is considered that a 60:25:10:5 split between mixed dry recyclables, mixed non recyclables, organic waste and glass waste is a best estimate fit for waste breakdown for the proposed development and typical residential living. The above equation can be used to estimate the

waste arisings for each of the different residential types based on the number of bedrooms present in the dwelling unit.

Assuming full occupancy rates for all units the total waste arisings for the entire residential development have been calculated as shown in Table 12.5 below.

Table 12.5 Estimated main waste generation volume for the residential development per week from BS5906:2005

Waste Stream	Waste Volume (litres/week)		
	1 bedroom units	2 bedroom units	3 bedroom units
DryR (60%)	5040	9486	24048
NonR (25%)	2100	3953	10020
Organic (10%)	840	1581	4008
Glass (5%)	420	791	2004
Total (100%)	**8,400**	**15,810**	**40,080**

In addition, the crèche is estimated to generate 945 litres of waste per week. It is therefore estimated that a total of 65m^3 of the main waste types will be generated by the proposed development on a weekly basis once full occupancy has been reached. The weekly waste generation for the fully occupied residential development will comprise 39m^3 of mixed dry recyclables, 16m^3 of mixed non recyclables, 7m^3 of organic waste and 3m^3 of glass waste.

12.5 POTENTIAL IMPACTS OF THE PROJECT

12.5.1 Construction Phase

The construction phase of the project will generate a range of waste and non-waste (by-product) materials. These wastes and by-product materials will be required to be separated, stored, managed and transported in an appropriate manner to ensure that waste materials and litter are not generated at the subject site that could cause public nuisance.

Excavation work will generate volumes of waste clay, subsoil and rock that will require appropriate management. Correct classification and segregation of the excavated material is required to ensure that any potentially contaminated materials are identified and managed in a way that will not impact negatively on the environment.

The contractor will be contractually required to ensure that all waste management is carried out in accordance with the site specific Resource and Waste Management Plan. This will prevent incorrect handling of wastes that could have a negative impact on the receiving environment. Wastes arising will need to be taken to authorised waste management facilities where they will be processed for reuse, recycling, recovery, and/or disposal as appropriate. There are a number of licensed waste facilities in the Eastern Midlands region which can accept hazardous and non-hazardous waste materials with sufficient capacity for the acceptance of the likely C&D waste arisings from the proposed project. For the most part waste will be segregated into reusable, recyclable and recoverable materials.

The potential effect of construction waste generated from the proposed development is considered to be not significant and short-term.

12.5.2 Operational Phase

The proposed development will provide for 345 residential units which has the potential to generate significant quantities of waste materials on a daily basis. The main potential impact of the operational phase on the environment would be, should there be no waste management procedures in place for the waste generated at the site, that the majority of the waste generated would end up in landfill. Also, the use of unlicensed waste contractors for the management of the waste could result in inappropriate handling and disposal of the waste and littering, environmental pollution and public nuisance could occur.

There is a significant volume of waste collection, treatment, recovery and disposal infrastructure in place in the area and wider region to effectively manage waste from this type of development. Waste which is not suitable for recycling is typically sent for energy recovery. There are also facilities in the region for segregation and management of municipal recyclables.

The potential effect of operational waste generated from the proposed development is considered to be not significant and long term.

12.6 POTENTIAL CUMULATIVE IMPACTS

The cumulative impacts of the proposed project in conjunction with current and future developments in the vicinity of the subject site are considered in this section. Guidance published by the European Commission (1999, Guidelines for the Assessment of Indirect and Cumulative Effects as well as Impact Interactions) was considered in carrying out this element of the assessment.

A review of other existing and / or approved projects in the vicinity of the site was carried out as reported in Chapter 2 of the EIAR and these projects were considered to determine whether any of these existing / approved projects will likely have significant cumulative effects in combination with the proposed project. The assessment also considers whether all of the existing / approved projects if they all occurred simultaneously will likely have significant cumulative effects in combination with the proposed development.

At the time of writing there were three proposed developments in the vicinity of the subject site with the potential to generate significant cumulative effects in combination with the proposed project. The following three developments that were considered for potential cumulative impacts:

- Advance Infrastructure Application (An Bord Pleanála Reference Number. ABP-312189-21). The proposed development consists of advance infrastructure works on a 2.5 hectare site at Hackettstown, Skerries to facilitate future residential development on lands zoned for residential use to the north and south of subject site. These infrastructural works include (1) construction of a new Link Road; (2) construction of Regional Drainage Facility; (3) foul, surface water and water supply services; (4) planting & landscaping of open space areas; (5) diversion and undergrounding of existing overhead power lines and (6) utilisation of existing field gate on Golf Links Road as a temporary access road for construction traffic.

- Ballygossan Park (Phase 2) Application (An Bord Pleanála Reference Number ABP-308583-20). The proposed development will consist of Phase 2 of Ballygossan Park and will provide for the construction of 149 no. residential units, creche, parkland, and two playing pitches on a 4.8 hectare site located to the south and west of Ballygossan Park, Skerries, Co. Dublin.

- Off-site Road Improvement Works Application (An Bord Pleanala Reference Number ABP-309409-21). The proposed development consists of (1) reconstruction of the Miller's Lane/Shenick Road/Golf Links Road junction to provide for a four armed mini roundabout; Upgrading and extension of the two-lane flared approach to the junction on both the northern (Dublin Road) and south-eastern (Miller's Lane) arms of the existing three-arm roundabout junction; (2) new street lighting system covering both junctions; (3) upgrades to the junction of Downside Heights/Golf Links Road and a new cycle path along the Golf Links Road; (4) new footpaths, cycle and pedestrian facilities, road gully's, road marking, signal and carriageway surfacing works;

In the event that the construction phase of the proposed development coincides with the construction of any of the other identified developments there is the potential for cumulative impacts to arise. All cumulative construction phase impacts to be addressed are the same as the impacts addressed in this report. The mitigation measures outlined in this chapter will be applied throughout the construction phase of the proposed development and with similar mitigation measures applied for the other permitted developments in accordance with best practice guidance then this will prevent any significant cumulative impacts on waste management. Due to the high number of waste contractors in the Dublin region there would be sufficient contractors available to handle waste generated from these sites simultaneously, if so required.

The operational phase of the proposed development is likely to coincide with the operational phase of the Ballygossan Park (Phase 2). Authorised waste contractors will be required to collect segregated waste materials from these and any other residential developments in the area. There are sufficient authorised waste collection companies operating in the area to manage all the waste generated from these developments.

All developments in the area will be required to manage waste in compliance with national and local legislation, policies and plans which will minimise any potential cumulative impacts associated with waste generation and waste management. The impact will be imperceptible and long term.

12.7 'DO NOTHING' IMPACT

There will be no change in the waste management impacts if no change takes place.

12.8 AVOIDANCE, REMEDIAL & MITIGATION MEASURES

12.8.1 Construction Phase

Prior to commencement, the contractor(s) will be required to prepare a site-specific Resource and Waste Management Plan (RWMP) The RWMP will be prepared in accordance with the "*Best Practice Guidelines on the Preparation of Resource and Waste Management Plans for Construction and Development Projects*" and shall set out the proposed mechanisms for the proper handling, segregation, storage, recycling and/or disposal of all wastes and by-products associated with the proposed development at the subject site.

The RWMP will develop as the project progresses from design though to construction. The structure of the plan shall be flexible and proportionate with the waste management approach based on the international principles of optimising resources and reducing waste on construction projects through Prevention, Reuse, Recycling, Green Procurement Principles, Off-Site Construction, Materials Optimisation and Flexibility and Deconstruction.

The construction contractor will be required to employ a suitably qualified Resource Manager (RM) with expertise in waste and resource management to implement the requirements of the RWMP.

Excavation works will be required to facilitate the development. The project engineers estimate that 10,702m^3 of stripped topsoil and 20,386m^3 of excavated subsoil will be generated. All of the stripped topsoil and 10,523m^3 of excavated subsoil will be reused as part of the developments permanent landscaped works while 9,863m3 of subsoil will need to be moved offsite. Correct classification and segregation of the excavated material is required to ensure that any potentially contaminated materials are identified and handled in a way that will not impact negatively on workers or on the receiving environment.

The following mitigation measures will be implemented at the site:

- Materials will be ordered on an 'as needed' basis to prevent over supply;
- A take back/buy back system will be set up with the supplier of the construction materials;
- Panelling, coverings and other raw materials will be ordered to size, shape and form to minimise excessive scrap waste and handled through centralised cutting operations on site;
- Construction materials will be handled and stored properly to prevent damage;
- Construction operations will be carried out in the correct sequence to prevent damage to other construction works;
- Individual responsibility will be assigned to all contractors working on site for the management of wastes arising from their activities;
- Excavated soils will be used in the landscaping of the development;
- Waste wood will be reused in the making of site signs or storage compounds;

Recycling of waste will be achieved by segregating wastes such as spoiled timber and hoarding, concrete, asphalt and bitmac and sending them off-site to licensed waste management facilities for further processing and recycling. All packaging waste will be returned to the supplier where possible. Where this is not possible the packaging materials will be segregated and stored in skips for subsequent off-site recycling.

All management of waste at the subject site will be undertaken in accordance with the *Waste Management Act 1996 as amended*, *Waste Management (Collection Permit) Regulations 2007 and Amendments* and *Waste Management (Facility Permit & Registration) Regulations 2007 as amended*.

These mitigation measures will ensure that waste generation rates at the site are minimised and that all wastes generated will be managed in an environmentally sound manner and in compliance with the relevant waste legislation.

12.8.2 Operational Phase

An Operational Waste Management Plan (OWMP) has been prepared as a stand-alone report to accompany this planning application. The OWMP has been prepared to demonstrate how the required infrastructure will be incorporated into the design and operational management of the development to ensure that domestic wastes will be managed and monitored with the objective of maximising the quantity of waste segregated at source and maximising the volume of clean recyclable materials generated by the residents of the development.

Each residential unit will provide sufficient internal storage space for the storage of mixed dry recyclables, mixed non-recyclables, organic waste and glass. Each unit shall include waste storage bins which will be of such a size that will allow easy manual handling of them to be brought to the private bin stores.

Each residential unit will have its own external private bin stores that will house three separate bins to provide full segregation for maximum recycling. Each bin in the bin store will be clearly labelled and colour coded to avoid cross-contamination of the different waste streams. Signage will be posted above or on the bins to show exactly which waste types can be placed in each bin. The bin stores will comprise a galvanised metal frame and will be formed using timber composite panels. Each unit will be lockable and will have a hinge lid and a pair of front doors for full access. All bins will be securely stored in the locked unit and will be wheeled to kerbside on bin collection day and returned to the locked unit after waste collection.

Communal waste storage facilities will be provided for a total of 76 residential units across four of the residential blocks where private bins stores were identified as not practical for these residents. The residential units where communal waste facilities will be provided are the following:

- the lower ground level units in in Block A1 comprising of 13 no 2-bedroom apartments;
- the lower ground level units in in Block A2 comprising of 11 no 2-bedroom apartments;
- the Block E units which are entered via the courtyard comprising of 24 no 1-bedroom duplexes and 1 no 3-bedroom duplexe; and
- the Block F units which are entered via the courtyard comprising of 16 no 1-bedroom duplexes and 11 no 2-bedroom duplexes.

The common waste storage areas have been designed as covered buildings to ensure safe access for all users in a brightly lit area, spacious enough for easy manoeuvrability, good ventilation and ready access for the control of vermin if required. The communal bin stores also provides for sufficient access and egress to enable the bins to be easily moved from the stores to an appropriate collection point nearby. The bin stores all comply with the following requirements:

- A well-defined pedestrian route will be marked from the relevant residential units to the nearest waste storage area.
- A non-slip surface will be provided within the waste storage area.
- Adequate ventilation to avoid the creation of stagnant air or foul odours.
- Sensor controlled lighting.
- Appropriate wastewater drainage to allow for cleaning and disinfection.
- Provision of appropriate signage to inform residents of their obligation to reduce waste, segregate waste and to use the correct bins for each waste.
- The waste storage area will be designed to provide safe access from the apartment units by mobility impaired persons.

- All waste storage bins will be clearly labelled with exactly what type of waste materials may be deposited within them. Provision will be made for sufficient segregated storage of mixed dry recyclables, mixed non-recyclables, organic waste and glass at each bin store.

Waste glass will be stored in centrally located containers with easy access for all residents of the development. The development will generate approximately 3.3m^3 of glass waste per week and will be stored in 3 no 1,100L bins which will be colour coded to facilitate segregation according to glass colour of clear, green and brown.

12.9 RESIDUAL IMPACTS OF THE PROJECT

12.9.1 Construction Phase

The implementation of the RWMP for the construction phase of the development will ensure minimal rates of waste generation in the first instance and maximum prevention, recycling, reuse and recovery of the wastes that are generated during the construction phase. Effective implementation of the RWMP will minimise the amounts of waste that will require to be landfilled.

The predicted impacts on the receiving environment of the wastes generated during the construction phase are considered to be not significant and short term.

12.9.2 Operational Phase

The operational waste management measures that are proposed for the development and detailed in the Operational Waste Management Plan will ensure maximum waste prevention, recycling and recovery is achieved. Recycling and recovery rates are expected to be higher than the national average.

The predicted impacts on the receiving environment of the wastes generated during the operational phase are considered to be imperceptible and long-term. There is potential for a slight net-positive impact if the waste recovery rates at the development operate above the national average rates.

12.10 MONITORING

The RWMP will require that all waste generated during the construction phase is weighed and logged. Records will be kept detailing the quantities of each waste stream generated and how the waste was managed including onsite storage, removal from site and next and final destination.

The Facility Management Company for the residential development will maintain a register of all waste volumes and types collected from the development each year including a break-down of recyclable waste and where necessary, shall introduce initiatives to further encourage residents to maximise waste segregation at source and recycling.

12.11 REINSTATEMENT

Not applicable.

12.12 INTERACTIONS

Waste management impacts have the potential to interact with human beings and all aspects of the wider environment including flora and fauna, soil and water. Where wastes generated are not managed in the correct manner there is potential for littering and pollution of soils and waters.

The impact assessment shows that there will be no adverse impacts on the receiving environment or on human beings in the vicinity of the proposed development once the proposed mitigation measures are implemented and works for construction phase are completed in accordance with the requirements of the RWMP and the operation of the development is carried out in accordance with the requirements of the Operational Waste Management Plan.

12.13 REFERENCES

- Environmental Protection Agency (2017). Draft Guidelines on the Information to be Contained in Environmental Impact Assessment Reports.
- The Department of the Environment, Climate and Communications “A Waste Action Plan for a Circular Economy: Ireland’s National Waste Policy 2020-2025” (2020).
- Whole of Government Circular Economy Strategy 2022 – 2023: Living More Using Less (2021)
- The Eastern-Midlands Region Waste Management Plan 2015 – 2021 (2015);
- The National Hazardous Waste Management Plan 2021 – 2027 (2021);
- Best Practice Guidelines on the Preparation of Resource and Waste Management Plans for Construction and Demolition Projects (EPA 2021);
- The Circular Economy Programme – The Driving Force for Irelands Move to a Circular Economy (EPA 2021)
- British Standard 5906:2005 Waste Management in Buildings – Code of Practice (2005);
- The Voluntary Construction Industry Initiative to Prevent, Minimise and Recycle C&D Waste (2002);
- The National Waste Reports from the EPA (2012 to 2021);
- The Fingal County Development Plan 2017-2023 (2017).
- The Department of the Environment, Climate and Communications, Sustainable Urban Housing: Design Standards for New Apartments, Guidelines for Planning Authorities (2018).
- Fingal County Council Segregation, Storage and Presentation of Household and Commercial Waste Bye-Laws (2020)
- The EPA National Waste Statistics online resource
- Waste Management Act 1996 (No. 10 of 1996) as amended