

11.0 MATERIAL ASSETS – WASTE MANAGEMENT

11.1 Introduction

AWN Consulting has prepared this chapter of the EiAR which assesses and evaluates the likely impact of the generation of waste materials arising during the construction and operational phases of the proposed development.

A site-specific Construction and Demolition Waste Management Plan (C&D WMP) has been prepared to deal with waste generation during the construction phase of the project and is included as Appendix 11.1. The C&D WMP was prepared in accordance with the 'Best Practice Guidelines for the Preparation of Waste Management Plans for Construction and Demolition Projects' document produced by the National Construction and Demolition Waste Council (NCDWC) in conjunction with the Department of the Environment, Heritage and Local Government in July 2006. A separate Operational Waste Management Plan (OWMP) has also been prepared for the operational phase of the development and is included as Appendix 11.2. These documents will ensure the sustainable management of wastes arising at the development in accordance with legislative requirements and best practice standards.

11.2 Methodology

The assessment of the impacts of the proposed development arising from the consumption of resources and the generation of waste materials, was carried out taking into account 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. A summary of the documents reviewed, and the relevant legislation is provided in Appendices 11.1 & 11.2.

This Chapter is based on the proposed development, as described in Chapter 3 and considers the following aspects:

- Legislative context;
- Construction phase (including site preparation and excavation); and,
- Operational phase.

A desk study was carried out which included the following:

- Review of applicable policy and legislation which creates the legal framework for resource and waste management in Ireland;

- Description of the typical waste materials that will be generated during the construction and operational phases; and
- Identification of mitigation measures to prevent waste generation and promote management of waste in accordance with the waste hierarchy.

Estimates of waste generation during the construction and operational phases of the proposed development have been calculated. The waste types and estimated quantities are based on published data by the EPA in the *National Waste Reports* and *National Waste Statistics*, data recorded from similar previous developments, Irish and US EPA waste generation research as well as other available research sources.

Mitigation measures are proposed to minimise the effect of the proposed development on the environment during the construction and operational phases, to promote efficient waste segregation and to reduce the quantity of waste requiring disposal. This information is presented in Section 11.6.

A detailed review of the existing ground conditions on a regional, local and site-specific scale are presented in Chapter 6 Land and Soils. Chapter 6 of the EIAR also discusses the environmental quality of any soils which will have to be excavated to facilitate construction of the proposed development.

11.2.1 Legislation and Guidance

Waste management in Ireland is subject to EU, national and regional waste legislation which defines how waste materials must be managed, transported and treated. The overarching EU legislation is the Waste Framework Directive (2008/98/EC) which is transposed into national legislation in Ireland. The cornerstone of Irish waste legislation is the Waste Management Act 1996 (as amended).

In addition, the Irish government issues policy documents which outline measures aimed to improve waste management practices in Ireland and help the country to achieve EU targets in respect of recycling and disposal of waste. The most recent policy document *A Resource Opportunity – Waste Management Policy in Ireland* was published in 2012 and stresses the environmental and economic benefits of better waste management, particularly in relation to waste prevention.

The strategy for the management of waste from the construction phase is in line with the requirements of the *Best Practice Guidelines for the Preparation of Waste Management Plans for Construction and Demolition Projects* published in 2006. The guidance document *Construction and Demolition Waste Management: A handbook for Contractors and Site Managers* was also consulted in the preparation of this assessment.

There are currently no Irish guidelines on the assessment of operational waste generation and guidance is taken from industry guidelines, plans and reports including the EMR Waste Management Plan 2015 – 2021, BS 5906:2005 Waste Management in Buildings – Code of Practice, the EPA National Waste Database Reports 1998 – 2012 and the EPA National Waste Statistics Web Resource.

11.3 Receiving Environment

In terms of waste management, the receiving environment is largely defined by Louth County Council (LCC) as the local authority responsible for setting and administering waste management activities in the area. This is governed by the requirements set out in the *Eastern-Midlands Region (EMR) Waste Management Plan 2015 – 2021*.

The waste management plan sets the following targets for waste management in the region:

- A 1% reduction per annum in the quantity of household waste generated per capita over the period of the plan;
- Achieve a recycling rate of 50% of managed municipal waste by 2020; and
- Reduce to 0% the direct disposal of unprocessed residual municipal waste to landfill (from 2016 onwards) in favour of higher value pre-treatment processes and indigenous recovery practices.

The Regional Plan sets out the strategic targets for waste management in the region and sets a specific target for C&D waste 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 National Waste Statistics update published by the EPA in December 2017 identifies that Ireland’s current progress against this C&D waste target is at 68% and our progress against ‘Preparing for reuse and recycling of 50% by weight of household derived paper, metal, plastic & glass (includes metal and plastic estimates from household WEEE)’ is at 45%. Both of these targets are required to be met by 12 December 2020 in accordance with the requirements of the Waste Framework Directive.

In terms of physical waste infrastructure, there are a number of waste permitted and licensed facilities located in the Eastern-Midlands Waste Region for management of waste from the construction industry as well as municipal sources. These include soil recovery facilities, inert C&D waste facilities, hazardous waste treatment facilities, municipal waste landfills, material recovery facilities, waste transfer stations and two waste-to-energy facilities.

There is a civic amenity centre at Mell Road, Drogheda, Co. Louth which accepts a wide range of wastes including cardboard, newspaper, glass (green, brown, clear), aluminium, drink cans, textiles (e.g. clothes), car batteries, scrap metal, wood, washing machines, fridges, cookers and electrical appliances. There are also 9 no. bring banks in Drogheda that take glass and cans.

11.4 Characteristics of the Proposed Development

A Full description of the development can be found in Chapter 3. The characteristics of the development that are relevant in terms of waste management are summarised below.

11.4.1 Construction Phase

During the construction phase, waste will be produced from surplus materials such as broken or off-cuts of timber, plasterboard, concrete, tiles, bricks, etc. Waste from packaging (cardboard, plastic, timber) and oversupply of materials may also be generated. The construction contractor will be required to ensure that oversupply of materials is kept to a minimum and opportunities for reuse of suitable materials is maximised.

In addition, soils and stones will require excavation to facilitate site preparation, construction of the under-croft basement, building foundations and access roads and the installation of underground services. The project engineers, Waterman Moylan, have estimated that c. 70,000m³ of surplus soils and stones will be generated from the excavations. These estimates will be refined prior to commencement of construction. The surplus excavated material will require removal from site for offsite reuse, recovery and/or disposal. If the surplus material that requires removal from site 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.

Site investigations were undertaken at the site in May-June 2018 and February 2019. Soil samples were collected during the 2018 site investigations for analysis for the Waste Acceptance Criteria (WAC) suite of analysis. Based on the samples collected, the soil would be classed as inert in accordance with the requirements for acceptance of waste at landfills (Council Decision 2003/33/EC). This legislation sets limit values for acceptance of waste material to landfills based on properties of the waste including potential pollutant concentrations and leachability. No samples were taken during the 2019 site investigations. Based on the sampling conducted, it is anticipated that the surplus material will be suitable for acceptance at inert soil recovery facilities/landfills in Ireland. In the unlikely event of hazardous material being encountered, it would need to be transported for treatment/recovery or exported abroad for disposal in suitable facilities. Additional sampling and analysis may be required prior to commencement of the excavations to provide further confirmation of the classification of the material prior to removal offsite. The density of the sampling and the range of analysis required are dependent on the requirements of the receiving facilities.

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.

Further detail on the waste materials likely to be generated during the excavation and construction works are presented in the project-specific C&D WMP included as Appendix 11.1. The C&D WMP provides an estimate of the main waste types likely to be generated during the construction phase of the proposed development and the targets for offsite reuse, recycling/recovery and disposal. These are summarised in Table 11.1.

Table 11.1 *Offsite Reuse, Recycle/Recovery and Disposal Rates for Construction Waste*

Waste Type	Tonnes	Reuse		Recycle/Recovery		Disposal	
		%	Tonnes	%	Tonnes	%	Tonnes
Mixed C&D	887	10	89	80	710	10	89
Timber	753	40	301	55	414	5	38
Plasterboard	269	30	81	60	161	10	27
Metals	215	5	11	90	194	5	11
Concrete	161	30	48	65	105	5	8
Other	403	20	81	60	242	20	81
Total	2688		610		1825		253

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 construction of the proposed development as the exact materials and quantities may be subject to some degree of change and variation during the construction process. However, the above estimates are considered to be the worst-case scenario.

11.4.2 Operational Phase

As noted in Section 11.1, an OWMP has been prepared for the development and is included as Appendix 11.2. The OWMP provides a strategy for segregation (at source), storage and collection of all wastes generated within the building during the operational phase including dry mixed recyclables, organic waste and mixed non-recyclable waste as well as providing a strategy for management of waste glass, batteries, WEEE, printer/toner cartridges, chemicals, textiles, waste cooking oil and furniture.

The total estimated waste generation for the development for the main waste types is presented in Table 11.2 below and is based on the uses and areas as advised by the project architects (PCOT Architects) February 2019.

Table 11.1 *Estimated waste generation for the main waste types*

Waste type	Waste Volume (m ³ /week)			
	Residential	Retail Units	Office block	Crèche
Organic Waste	4.45	1.27	0.21	0.09
Dry Mixed Recyclables	42.00	3.05	4.77	3.62
Confidential Paper			1.88	
Mixed Municipal Waste	21.18	2.91	1.82	1.61
Glass	0.86	0.85	0.04	0.01
Total	67.62	7.23	8.68	5.32

Residents in the houses will store bins either in their back garden or if they do not have access to the rear of their properties, they will have a screened bin area allocated at the front of their property. Dedicated communal Waste Storage Areas (WSAs) have been allocated within the development design for the waste arising from the apartment blocks and duplexes. Apartment Blocks 1 to 4 will have their own individual WSA's located in the under-croft car park. The remaining apartment blocks and duplex units will have dedicated communal WSA's strategically located at ground level. Residents will bring their segregated waste to their individual or communal WSA's and place their waste in the appropriate bins. The residential WSA locations are illustrated in the drawings submitted with the planning application. Residents in the houses will present their bins for collection to the front of their units. They will be positioned such that they don't obstruct pedestrian traffic on the footpath or obstruct the access roads. The bins in the apartment and duplex WSA's will be collected directly from the WSAs by the nominated waste contractor and once emptied they will be promptly returned to the appropriate WSA.

The retail units, office block and creche will have dedicated WSA's. They will bring their segregated waste to their WSA's and place their waste in the appropriate bins. The bins in the apartment and duplex WSA's will be collected directly from the WSAs by the nominated waste contractor(s) and once emptied they will be promptly returned to the appropriate WSA.

The OWMP seeks to ensure the development contributes to the targets outlined in the EMR Waste Management Plan 2015 – 2021.

Mitigation measures proposed to manage impacts arising from wastes generated during the operation of the proposed development are summarised below.

11.5 Potential Impacts of the Proposed Development

This section details the potential waste effects associated with the proposed development.

11.5.1 Construction Phase

The proposed development will generate a range of non-hazardous and hazardous waste materials during excavations and construction. General housekeeping and packaging will also generate waste materials as well as typical municipal wastes generated by construction employees including food waste.

Waste materials will be required to be temporarily stored on site pending collection by a waste contractor. Dedicated areas for waste skips and bins will be identified across the site. These areas will need to be easily accessible to waste collection vehicles.

If waste material is not managed and stored correctly, it is likely to lead to litter or pollution issues at the development and on adjacent developments. The knock-on effect of litter issues is the presence of vermin within the development and the surrounding areas.

The use of non-permitted waste contractors or unauthorised waste facilities could give rise to inappropriate management of waste and result in negative environmental impacts or pollution. It is essential that all waste materials are dealt with in accordance with regional and national legislation, as outlined previously, and that time and resources are dedicated to ensuring efficient waste management practices.

Wastes arising will need to be taken to suitably registered/permitted/licenced waste facilities for processing and segregation, reuse, recycling, recovery and/or disposal as appropriate. There are numerous licensed waste facilities in the Eastern Midlands region which can accept hazardous and non-hazardous waste materials and acceptance of waste from the proposed development would be in line with daily activities at these facilities. At present, there is sufficient capacity for the acceptance of the likely C&D waste arisings at facilities in the region. Where possible, waste will be segregated into reusable, recyclable and recoverable materials. The majority of construction materials are either recyclable or recoverable.

Recovery and recycling of C&D waste has a positive impact on sustainable resource consumption, for example where waste timber is mulched into a landscaping product or waste asphalt is recycled for use in new pavements. The use of recycled materials, where suitable, reduces the consumption of natural resources.

There is a quantity of soil and stone which will need to be excavated to facilitate the proposed development. Surplus soils and stones will require removal from site for offsite reuse, recovery and/or disposal. 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 as well as on water and soil environments, both on and off-site.

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

11.5.2 Operational Phase

The potential impacts on the environment of improper, or a lack of, waste management during the operational phase would be a diversion from the priorities of the waste hierarchy which would lead to small volumes of waste being sent unnecessarily to landfill.

The nature of the development means the generation of waste materials during the operational phase is unavoidable. Networks of waste collection, treatment, recovery and disposal infrastructure are in place in the region to manage waste efficiently 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 of municipal recyclables which is typically exported for conversion into recycled products (e.g. paper mills and glass recycling).

If waste material is not managed and stored correctly, it is likely to lead to litter or pollution issues at the development and on adjacent developments. The knock-on effect of litter issues is the presence of vermin within the development and the surrounding areas.

Waste contractors will be required to service the development on a regular basis to remove waste. The use of non-permitted waste contractors or unauthorised facilities could give rise to inappropriate management of waste and result in negative environmental impacts or pollution. It is essential that all waste materials are dealt with in accordance with regional and national legislation, as outlined previously, and that time and resources are dedicated to ensuring efficient waste management practices.

The potential impact of operational waste generation from the development is considered to be ***long-term, not significant and negative.***

11.6 Mitigation Measures

This section outlines the measures that will be employed in order to reduce the amount of waste produced, manage the wastes generated responsibly and handle the waste in such a manner as to minimise the effects on the environment.

11.6.1 Construction Phase

As previously stated, a project specific C&D WMP has been prepared in line with the requirements of the guidance document issued by the DoEHLG and is included as Appendix 11.1. Adherence to the high-level strategy presented in this C&D WMP will ensure effective waste management and minimisation, reuse, recycling, recovery and disposal of waste material generated during the excavation and construction phases of the proposed development. Prior to commencement of construction the contractor(s) will be required to refine/update the C&D WMP or submit an addendum to C&D WMP to LCC to detail specific measures to

minimise waste generation and resource consumption and provide details of the proposed waste contractors and destinations of each waste stream.

The project engineers, Waterman Moylan, have estimated that c. 70,000m³ of surplus soils and stones will be generated from the excavations required to facilitate site preparation, construction of the undercroft basement, building foundations and access roads and the installation of underground services. It is anticipated that this surplus material will require removal from site for offsite reuse, recovery, recycling and/or disposal. The contractor(s) will endeavor to ensure that material is reused or recovered off-site insofar as is reasonably practicable or disposed of at authorized facility.

In addition, the following mitigation measures will be implemented:

- Building materials will be chosen with an aim to ‘design out waste’;
- On-site segregation of waste materials will be carried out to increase opportunities for off-site reuse, recycling and recovery – it is anticipated that the following waste types, at a minimum, will be segregated:
 - Concrete rubble (including ceramics, tiles and bricks);
 - Plasterboard;
 - Metals;
 - Glass; and
 - Timber.
- Left over materials (e.g. timber off-cuts, broken concrete blocks/bricks) and any suitable construction materials shall be re-used on-site, where possible;
- All waste materials will be stored in skips or other suitable receptacles in designated areas of the site;
- Any hazardous wastes generated (such as chemicals, solvents, glues, fuels, oils) will also be segregated and will be stored in appropriate receptacles (in suitably bunded areas, where required);
- A waste manager will be appointed by the main contractor(s) to ensure effective management of waste during the excavation and construction works;
- All construction staff will be provided with training regarding the waste management procedures;
- All waste leaving site will be reused, recycled or recovered where possible to avoid material designated for disposal;
- All waste leaving the site will be transported by suitable permitted contractors and taken to suitably registered, permitted or licenced facilities; and
- All waste leaving the site will be recorded and copies of relevant documentation maintained.

The mitigation measures outlined in the Natura Impact Statement (NIS) will be implemented including display of emergency contact numbers for the Local Authority Environment Section, Inland Fisheries Ireland, the Environmental Protection Agency and the National Parks and Wildlife Service in a prominent position within the site compound. These agencies will be notified immediately in the event of a pollution incident.

Nearby sites requiring clean fill material will be contacted to investigate reuse opportunities for clean and inert material, if required. If any of the material is to be reused on another site as by-product (and not as a waste), this will be done in accordance with Article 27 of the *EC (Waste Directive) Regulations (2011)* as detailed in the C&D WMP (Appendix 11.1). EPA approval will be obtained prior to moving material as a by-product.

These mitigation measures will ensure that the waste arising from the construction phase of the development is dealt with in compliance with the provisions of the *Waste Management Act 1996*, as amended, associated Regulations, the *Litter Pollution Act 1997* and the *EMR Waste Management Plan (2015 - 2021)*. It will also ensure optimum levels of waste reduction, reuse, recycling and recovery are achieved and will encourage sustainable consumption of resources.

11.6.2 Operational Phase

As previously stated, a project specific OWMP has been prepared and is included as Appendix 11.2. Implementation of this OWMP will ensure a high level of recycling, reuse and recovery at the development. All recyclable materials will be segregated at source to reduce waste contractor costs and ensure maximum diversion of materials from landfill, thus achieving the targets set out in the EMR Waste Management Plan 2015 – 2021.

In addition, the following mitigation measures will be implemented:

- On-site segregation of all waste materials into appropriate categories including (but not limited to):
 - Organic waste;
 - Dry Mixed Recyclables;
 - Mixed Non-Recyclable Waste;
 - Glass;
 - Waste electrical and electronic equipment (WEEE);
 - Batteries (non-hazardous and hazardous);
 - Cooking oil;
 - Light bulbs;
 - Cleaning chemicals (pesticides, paints, adhesives, resins, detergents, etc.); and
 - Furniture (and from time to time other bulky waste).

- All waste materials will be stored in colour coded bins or other suitable receptacles in designated, easily accessible locations. Bins will be clearly identified with the approved waste type to ensure there is no cross contamination of waste materials;
- All waste collected from the development will be reused, recycled or recovered where possible, with the exception of those waste streams where appropriate facilities are currently not available; and
- All waste leaving the site will be transported by suitable permitted contractors and taken to suitably registered, permitted or licensed facilities.

These mitigation measures will ensure the waste arising from the development is dealt with in compliance with the provisions of the *Waste Management Act 1996*, as amended, associated Regulations, the *Litter Pollution Act 1997* and the *EMR Waste Management Plan (2015 - 2021)*. It will also ensure optimum levels of waste reduction, reuse, recycling and recovery are achieved.

11.7 Predicted Impact of the Proposed Development

The implementation of the mitigation measures outlined in Section 11.6 will ensure that a high rate of reuse, recovery and recycling is achieved at the development during the excavation and construction phases as well as during the operational phase. It will also ensure that European, National and Regional legislative waste requirements with regard to waste are met and that associated targets for the management of waste are achieved.

11.7.1 Construction Phase

A carefully planned approach to waste management as set out in Section 11.6.1 and adherence to the C&D WMP during the construction phase will ensure that the effect on the environment will be ***short-term, imperceptible and neutral***.

11.7.2 Operational Phase

During the operational phase, a structured approach to waste management as set out in Section 11.6.2 will promote resource efficiency and waste minimisation. Provided the mitigation measures are implemented and a high rate of reuse, recycling and recovery is achieved, the predicted effect of the operational phase on the environment will be ***long-term, imperceptible and neutral***.

11.7.3 Do-Nothing Scenario

If the proposed development was not to go ahead there would be no excavation or construction or operational waste generated at this site. There will be a neutral effect on the environment.

11.8 Monitoring Measures

The management of waste during the construction phase should be monitored to ensure compliance with relevant local authority requirements, and effective implementation of the C&D WMP including maintenance of waste documentation.

The management of waste during the operational phase should be monitored to ensure effective implementation of the OWMP by the building management company and the nominated waste contractor(s).

11.8.1 Construction Phase

The objective of setting targets for waste management is only achieved if the actual waste generation volumes are calculated and compared. This is particularly important during the excavation and construction phases where there is a potential for waste management to become secondary to progress and meeting construction schedule targets. The C&D WMP specifies the need for a waste manager to be appointed who will have responsibility to monitor the actual waste volumes being generated and to ensure that contractors and sub-contractors are segregating waste as required. Where targets are not being met, the waste manager should identify the reasons for targets not being achieved and work to resolve any issues. Recording of waste generation during the project will enable better management of waste contractor requirements and identify trends. The data should be maintained to advise on future projects.

11.8.2 Operational Phase

During the operational phase, waste generation volumes should be monitored against the predicted waste volumes outlined in the OWMP. There may be opportunities to reduce the number of bins and equipment required in the WSAs where estimates have been too conservative. Reductions in bin and equipment requirements will improve efficiency and reduce waste contractor costs.

Waste legislation should also be consulted on a regular basis in case of any changes which may impact on waste management procedures.

11.9 Difficulties Encountered

There were no difficulties encountered during the production of this chapter of the EIAR.