5.14 Material Assets - Waste Management

5.14.1 Introduction

This Chapter of the EIAR has been prepared by AWN Consulting Limited (AWN) to assess the likely impacts associated with waste management during the demolition, construction and operational phases of the proposed development at Parnell Square Cultural Quarter, Dublin 1.

Parnell Square Cultural Quarter will be a mixed cultural facility and public realm works, anchored by a new City Library, provided in a combination of new building and renovated historic buildings at Parnell Square, Dublin 1.

A site-specific Construction and Demolition Waste Management Plan (C&D WMP) has been prepared to deal with waste generation during the construction and demolition phases of the project and is included in Volume 2, Appendix 5.14.1.

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 in Volume 2, Appendix 5.14.2.

These documents will ensure the sustainable management of wastes arising at the development is in accordance with legislative requirements and best practice standards.

5.14.2 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 Volume 2, Appendices 5.14.1 & 5.14.2.

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

- Legislative context;
- Demolition phase;
- Construction phase (including site preparation, excavation and levelling); 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 demolition, 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 demolition, 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 National Waste Reports, data recorded from similar previous developments, Irish and US EPA waste generation research, other available research sources and waste collection data from the current facilities on site.

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 5.14.6.

A detailed review of the existing ground conditions on a regional, local and site-specific scale are presented in Chapter 5.8: Soils and Geology (including Land) and Chapter 5.9 Water (Drainage supply, Flood Risk and Groundwater). Chapter 5.8 of this EIAR also discusses the environmental quality of soils which will have to be excavated to facilitate construction of the proposed development.

5.14.2.1 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, British Standards and other relevant studies and reports including BS 5906:2005 Waste Management in Buildings – Code of Practice, the Eastern-Midland Region Waste Management Plan 2015 – 2021, the EPA National Waste Database Reports 1998 – 2012 and the EPA National Waste Statistics Web Resource.

5.14.3 Receiving Environment (Baseline Situation)

The subject site is located at Parnell Square, Dublin 1.

In terms of waste management, the receiving environment is largely defined by Dublin City Council 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.

This plan replaces the previous plan for the Dublin region due to changing National policy as set out in A Resource Opportunity: Waste Management Policy in Ireland and changes being enacted by the Waste Framework Directive.

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.

The Dublin City Development Plan 2016 – 2022 also sets policies and objectives for the DCC area which reflect those set out in the regional waste management plan.

In terms of physical waste infrastructure, DCC no longer operates any municipal waste landfill in the area.

There are numerous 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.

5.14.4 Characteristics of the Proposed Development

The proposed development is described in detail in Chapter 3: Description of Proposed Development. The aspects relevant to this Chapter are described in the following sections.

5.14.4.1 Demolition Phase

As identified in the C&D WMP, waste will be generated from the demolition activities. The estimated quantum is set out in Table 5.14.1. It is anticipated that this material will be more difficult to segregate than waste generated from the construction phase, as many of the building materials will be bonded together or integrated, i.e. steel reinforcement in concrete and metal or timber stud partition walls.

Demolition wastes will typically include concrete, steel cladding, steel beams, gypsum, metals, plastic, wood, glass and waste electronic and electrical equipment (WEEE).

Asbestos Containing Materials (ACM's) are present in the existing buildings. Two asbestos surveys have been carried out to identify and characterise ACM's. ACM's will only be removed by competent persons and transferred offsite by a suitably permitted waste contractor and will be brought to a suitably authorised facility. The Health and Safety Authority (HSA) should be contacted in relation to the handling of asbestos and material should be dealt with in accordance with the Safety, Health and Welfare at Work (Exposure to Asbestos) Regulations 2006, as amended.

Lead paint may be present in the existing buildings. A lead paint survey will be carried out to identify lead paint (if present). Similar

to ACM's material coated in or containing lead-based paint will only be removed by competent persons and transferred offsite to a suitably permitted waste contractor and will be brought to a suitably authorised facility.

The estimated quantum of demolition waste and indicative reuse/ recovery /recycling/ disposal targets as detailed in the C&D WMP are presented in Table 5.14.1.

Table 5.14.1: Off-Site Reuse, Recycle and Disposal Rates for Demolition Waste*

		Reuse		Recycle/Recovery		Disposal	
Measurement and Percentage	**Tonnes**	**%**	**Tonnes**	**%**	**Tonnes**	**%**	**Tonnes**
Waste Type							
Glass	108	0	0	85	92	15	16
Concrete, Bricks, Tiles, Ceramics	2640	30	792	65	1716	5	132
Plasterboard	48	0	0	80	38	20	10
Asphalts	1320	0	0	25	330	75	990
Metal	32	5	2	80	25	15	5
Timber	5	10	1	40	2	50	3
Total	**4153**		**794**		**2203**		**1155**

*Figures supplied by project engineers ARUP. Density's used obtained from the following address https://www.reade.com/reade-resources/reference-educational/reade-reference-chart-particle-property-briefings/25-specific-gravity-table-metals-minerals-ceramics-substance

It should be noted that until a detailed survey of the buildings to be demolished is carried out, it is difficult to predict with a high level of accuracy the demolition waste that will be generated from the proposed works.

An Outline Construction Management & Waste Management Plan has been prepared by Arup for the proposed development and accompanies the planning application. The plan will be updated and supplemented with the C&D WMP – Volume 2, Appendix 5.14.1 prior to commencement of the demolition phase which may refine the demolition waste figures detailed in Table 5.14.1.

5.14.4.2 Demolition and Construction Phase

During the Demolition and 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, excavations will be required to facilitate construction. The project engineers, Arup, have estimated that the total volume of material to be excavated will be c. 9,000m3 (approximately equivalent to c. 13,500 tonnes). Arup have advised that there are limited or no opportunities for reuse onsite and that it will require removal offsite for reuse, recovery and/or disposal, as appropriate.

As detailed in Chapter 5.8: Soil & Geology (including Land) previous site investigations in 2014 at 23-28 Parnell Square North have shown that asbestos is present at depths between 0.5 and 3 metres below ground level in three locations sampled. Slightly elevated levels of selenium and total organic carbon were also noted.

In order to establish the appropriate reuse, recovery and/or disposal route for the material to be removed off-site, it will first need to be classified.

Waste material will initially need to be classified as hazardous or non-hazardous in accordance with the EPA publication Waste Classification – List of Waste & Determining if Waste is Hazardous or Non-Hazardous.

Environmental soil analysis will be carried out prior to construction on a number of the soil samples in accordance with the requirements for acceptance of waste at landfills (Council Decision 2003/33/EC Waste Acceptance Criteria). This legislation sets limit values on landfills for acceptance of waste material based on properties of the waste including potential pollutant concentrations and leachability.

Surplus soils/stones may be suitable for acceptance at either inert or non-hazardous soil recovery facilities/landfills in Ireland or, in the event of hazardous material being encountered, be transported for treatment/recovery or exported abroad for disposal in suitable facilities.

Excavation works will be required to be carefully monitored by a suitably qualified person to ensure contaminated soil is identified

and segregated from any potentially uncontaminated soil, where encountered. Additional soil testing may be required in order to reclassify soil and the material will be required to be classified as hazardous or non-hazardous using the HazWasteOnline application (or other similar application) and then classified as inert, non-hazardous or hazardous in accordance with the EC Council Decision 2003/33/EC for acceptance of waste at landfills.

Discussions about the acceptance of the material should be undertaken with individual landfill operators before removal of any material from site is carried out and further investigation may be required to satisfy the operators requirements.

Contaminated material will be required to be removed from site for treatment or disposal as appropriate. The contaminated material may be suitable for recovery or disposal in Ireland depending on the limitations of the facilities licence. If not suitable, the material will require recovery or disposal abroad and will be exported in accordance with the requirements of Transfrontier Shipment of Wastes (TFS).

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 in Volume 2, Appendix 5.14.1. 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 these are summarised in Table 5.14.2.

Table 5.14.2: On and Off-Site Reuse, Recycle and Disposal Rates for Construction Waste

Measurement and Percentage		Reuse		Recycle/Recovery		Disposal	
		%	Tonnes	%	Tonnes	%	Tonnes
Waste Type	Tonnes						
Mixed C&D	109	10	11	80	88	10	11
Timber	93	40	37	55	51	5	5

Plasterboard	33	30	10	60	20	10	3
Metals	27	5	1	90	24	5	1
Concrete	20	30	6	65	13	5	1
Other	50	20	10	60	30	20	10
Total	**332**		**75**		**225**		**31**

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.

As noted in Section 5.14.4.1, an Outline Construction and Waste Management Plan has been prepared by Arup. The plan will be updated and supplemented with the C&D WMP – Volume 2, Appendix 5.14.1 prior to commencement of the demolition phase which may refine the above waste estimates.

5.14.4.3 Operational Phase

An Operational Waste Management Plan (OWMP) has been prepared for the proposed development and is included as Volume 2, Appendix 5.14.2. The plan will seek 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 in Section 5.14.6.

5.14.4.3.1 Segregation of Waste Material

All waste materials will be segregated into appropriate categories and will be stored in appropriate bins or other suitable receptacles in a designated, easily accessible areas of the site in accordance with the Dublin City Development Plan 2016 – 2022 (Policy SI20 and Objective SIO16).

Table 5.14.3 below summarises the anticipated management strategy to be used for typical wastes to be generated at the development.

Table 5.14.3 Anticipated Waste Management

Waste Type	Hazard Y/N	On-site Storage/Treatment Method (anticipated)	Method of treatment

			or disposal (offsite)
Organic Waste	N	Segregated bins	Composting
Mixed Dry Recyclables	N	Segregated bins	Recycle
Mixed Non-Recyclables	N	Segregated bins	Recovery
Glass	N	Segregated bins	Recycle
Waste Cooking Oil	N	Containers in kitchen areas	Recovery
Landscaping waste	N	Segregated bins	Composting
Waste Electrical and Electronic Equipment (WEEE) (non-hazardous and hazardous)	Y/N	Segregated cage for WEEE	Return to supplier or Recovery
Batteries	Y/N	Specialised container in waste storage area	Return to supplier or recovery
UV & Fluorescent Tubes	Y	Specialised container in waste storage area	Recovery
Cleaning Products	Y	Stored in cleaning equipment storage room	Disposal

5.14.4.3.2 Management of Wastes Moving Offsite

All waste leaving site will be recycled or recovered, with the exception of those waste streams where appropriate recycling/recovery facilities are currently not available.

All waste leaving the site will be transported by suitable permitted contractors and taken to suitably permitted or licenced facilities. All waste leaving the site will be recorded and copies of relevant documentation maintained.

5.14.4.3.3 Hazardous Waste

Hazardous waste may be generated from WEEE, batteries, fluorescent tubes, and cleaning products. Any waste classed as hazardous will be stored in designated area(s) and will be removed off site by suitably authorised waste contractor(s).

5.14.5 Potential Impacts of the Proposed Development

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

5.14.5.1 Demolition and Construction Phase

The proposed development will generate a range of non-hazardous and hazardous waste materials during demolition and construction phase. Construction activities will inevitably generate quantities of waste where materials are oversupplied, incorrect materials delivered, or materials are cut to size on-site. 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 need to 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 Dublin and Meath regions 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 recyclable and recoverable materials. The majority of demolition and 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 made ground and sub soil which will need to be excavated to facilitate the proposed development. The project engineers Arup have advised that it is unlikely that any of this material will be suitable for reuse onsite. Surplus excavated material will need to be removed off-site.

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 opportunities for waste materials to be reused off-site will provide positive impacts in the resourcing of materials for other developments and reduce the requirement for raw material extraction.

The potential effect of construction waste generated from the proposed development is considered to be likely short-term negative but one that is not significant.

5.14.5.2 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 an unavoidable impact. 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 in recycled products (e.g. paper mills and glass recycling).

The waste materials generated on a daily basis will be stored in dedicated waste storage area(s).

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 collection vehicles 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. An operational waste management plan has been included as an appendix to this chapter (Volume 2, Appendix 5.14.2).

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

5.14.6 Mitigation Measures

This Section outlines the measures that will be employed during demolition, construction and operational phase, 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.

5.14.6.1 Demolition and Construction Phase

A project specific C&D WMP has been prepared in line with the requirements of the guidance document issued by the Department of Environment Heritage and Local Government (DoEHLG) referred to in Section 5.14.1.

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 construction phase of the proposed development.

Prior to commencement of demolition, the contractor(s) will be required to refine/update this document 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.

An Outline Construction and Waste Management Plan has been prepared by Arup, located under Volume 2, Appendix 3.1 for the proposed development. The plan will be updated and supplemented prior to commencement of the demolition phase of the development.

Arup have estimated that c. 9,000m3 of excavated materials will be generated from the excavations required to facilitate construction.

It is anticipated that there will be limited or no opportunities for reuse of this material onsite and it will require removal 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 receptables (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.

Nearby sites requiring clean fill material will be contacted to investigate reuse opportunities for clean and inert material. 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 previously referred to Section 15.4 and detailed in the C&D WMP (Volume 2, Appendix 5.14.1).

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

5.14.6.2 Operational Phase

All waste materials during operational phase will be segregated into appropriate categories and will be stored in appropriate bins or other suitable receptacles in a designated, easily accessible areas of the site in accordance with the Dublin City Development Plan 2016 – 2022 (Policy SI20 and Objective SIO16).

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/catering waste (including garden waste from landscaping activities);
  - Dry Mixed Recyclables;

  - Mixed Non-Recyclable Waste;
  - Glass;
  - Waste electrical and electronic equipment (WEEE) including computers, printers and other ICT equipment;
  - Batteries (non-hazardous and hazardous)
  - Fluorescent bulb tubes and other mercury containing waste (if arising); and
  - Cleaning chemicals (pesticides, paints, adhesives, resins, detergents, etc.); and
- 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;
- All waste leaving the site will be transported by suitable permitted contractors and taken to suitably registered, permitted or licensed facilities; and
- All waste leaving the site will be recorded and copies of relevant documentation maintained.

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.

5.14.7 Predicted Impact of the Proposed Development

The implementation of the mitigation measures outlined in Section 5.14.6 will ensure that a high rate of reuse, recovery and recycling is achieved at the development during the demolition 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.

5.14.7.1 Demolition and Construction Phase

A carefully planned approach to waste management as set out in Section 15.14.6.1 and adherence to the C&D WMP during the construction and demolition phase will ensure that the impact on

the environment will be a **likely, short-term, neutral** effect which is **imperceptible**

5.14.7.2 Operational Phase

During the operational phase, a structured approach to waste management as set out in Section 15.14.6.2 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 impact of the operational phase on the environment will be a **likely, long-term, neutral** and **imperceptible** effect.

5.14.7.3 Do-Nothing Scenario

If the proposed development was not to go ahead there would be no demolition and construction waste and operational waste generation at the site.

5.14.8 Monitoring Measures

5.14.8.1 Demolition and 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 construction and demolition phases where there is a potential for waste management to become secondary to progress and meeting construction schedule targets.

The C&D WMP will specify 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.

5.14.8.1 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 required where estimates have been too conservative. Reductions in

bin requirements will improve efficiency and reduce waste contractor costs.

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

5.14.9 Difficulties Encountered

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

5.14.10 Bibliography

Waste Management Act 1996 (No. 10 of 1996) as amended. Sub-ordinate and associated legislation includes:

- European Communities (Waste Directive) Regulations 2011 (S.I. No. 126 of 2011) as amended.
- Waste Management (Collection Permit) Regulations 2007 (S.I. No. 820 of 2007) as amended.
- Waste Management (Facility Permit and Registration) Regulations 2007 (S.I No. 821 of 2007) as amended.
- Waste Management (Licensing) Regulations 2000 (S.I No. 185 of 2000) as amended.
- European Union (Packaging) Regulations 2014 (S.I. No. 282 of 2014) as amended.
- Waste Management (Planning) Regulations 1997 (S.I. No. 137 of 1997) as amended.
- Waste Management (Landfill Levy) Regulations 2015 (S.I. No. 189 of 2015)
- European Union (Waste Electrical and Electronic Equipment) Regulations 2014 (S.I. No. 149 of 2014)
- European Union (Batteries and Accumulators) Regulations 2014 (S.I. No. 283 of 2014) as amended.
- Waste Management (Food Waste) Regulations 2009 (S.I. No. 508 of 2009) as amended.
- European Union (Household Food Waste and Bio-waste) Regulations 2015 (S.I. No. 191 of 2015)
- Waste Management (Hazardous Waste) Regulations 1998 (S.I. No. 163 of 1998) as amended.
- Waste Management (Shipments of Waste) Regulations 2007 (S.I. No. 419 of 2007) as amended.

- European Communities (Transfrontier Shipment of Waste) Regulations 1994 (SI 121 of 1994)
- European Communities (Shipments of Hazardous Waste exclusively within Ireland) Regulations 2011 (S.I. No. 324 of 2011)
- European Union (Properties of Waste which Render it Hazardous) Regulations 2015 (S.I. No. 233 of 2015)
- Protection of the Environment Act 2003, (No. 27 of 2003) as amended.
- Litter Pollution Act 1997 (S.I. No. 12 of 1997) as amended
- Eastern-Midlands Region Waste Management Plan 2015 – 2021 (2015).
- Department of Environment and Local Government (DoELG) Waste Management – Changing Our Ways, A Policy Statement (1998).
- Forum for the Construction Industry – Recycling of Construction and Demolition Waste.
- Department of Environment, Communities and Local Government (DoECLG), A Resource Opportunity - Waste Management Policy in Ireland (2012).
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- Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste and repealing certain Directives.
- Dublin City Council (DCC), Dublin City Develoment plan 2016-2022 (2016)
- Planning and Development Act 2000 (S.I. No. 30 of 2000) as amended.
- EPA, Waste Classification – List of Waste & Determining if Waste is Hazardous or Non-Hazardous (2015)
- Council Decision 2003/33/EC, establishing criteria and procedures for the acceptance of waste at landfills pursuant to Article 16 of and Annex II to Directive 1999/31/EC.
- Environmental Protection Agency (EPA), National Waste Database Reports 1998 – 2012.

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5.1.12 Consultations

Consultation was made with the Design Team at numerous stages during the drafting of this chapter. Reference has also been made to other EIAR chapters in the body of the text.