

15 Waste Management

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15.1 Introduction

This chapter has been prepared by AWN Consulting Ltd.

This chapter of the EIAR comprises an assessment of the likely impact of the proposed development on the waste generated from the development as well as identifying proposed mitigation measures to minimise any impacts.

A site-specific Construction and Demolition Waste Management Plan (C&D WMP) has been prepared by AWN Consulting Ltd to deal with waste generation during the construction and demolition phases of the project and has been included as Appendix 15.1. 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 15.2 of this chapter.

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

15.2 Study 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 the C&D WMP and in the OWMP provided in Appendix 15.1 and 15.2.

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

- Legislative context;
- Demolition phase;
- Construction phase (including 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 the National Waste Reports and National Waste Statistics, data recorded from similar previous developments, Irish and US EPA waste generation research, other available research sources and waste collection data from the existing neighbouring development.

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 15.6.

A detailed review of the existing ground conditions on a regional, local site-specific scale are presented in Chapter 7 Land and Soil. Chapter 7 of the EIAR also discusses the environmental quality of any soils which will have to be excavated to facilitate construction of the proposed development.

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, DLRCC, Presentation and Collection of Household and Commercial Waste Bye-Laws (2009), Dún Laoghaire Rathdown (DLR) Refuse and Recycling Storage Guidelines, the EPA National Waste Database Reports 1998 – 2012 and the EPA National Waste Statistics Web Resource.

15.3 The Existing Receiving Environment (Baseline)

The subject site is located on lands known as “The Grange” at Stillorgan, Dublin 18.

In terms of waste management, the receiving environment is largely defined by Dún Laoghaire-Rathdown County Council (DLRCC) 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 out 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 July 2019 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 *Dún Laoghaire-Rathdown Development Plan 2016 - 2022* also sets policies and objectives for the DLRCC area which reflect those set out in the regional waste management plan.

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

15.4 Characteristics of the Proposed Development

In summary, the project provides for the demolition (total c.1,398 sq m GFA) of:

- The Grange Select Marketing Suite' (1 storey)
- 'Oaktree Business Centre' (2 storeys)
- 'The Lodge' (2 storeys)

and the construction of a new 'Build to Rent' residential scheme of 287 residential apartment units; residential tenant amenity space of 961.5 sq m; a crèche facility of 658 sq m; and a substation of 96.5 sq m in the form of 6 new blocks (Blocks H, J, M, N, P and Q) ranging in height from 1 - 11 storeys. The residential element of the scheme provides for the following development mix:

- 19 x Studio Units (6.6%)
- 125 x 1 Bedroom Units (43.6%)
- 143 x 2 Bedroom Units (49.8%)

A total of 100 no. car parking spaces, 596 no. cycle spaces and 5 no. motorcycle spaces are also proposed together with all associated site development works.

The characteristics of the development that are relevant in terms of waste management are summarised below.

The site is located to the west of the Stillorgan Road/N11 in Stillorgan at Brewery Road. The development will consist of demolition of some existing structures and the construction of a new residential scheme of 287 residential units in the form of 5 new blocks ranging from 3 storeys to 11 storeys. Each residential unit has associated private open space in the form of a balcony/terrace/roof terrace. Public open space is also proposed in the form of external residential amenity spaces, play areas, courtyards, gardens and trim trails. Basement areas (total c. 3,317.9 m²) are proposed below Blocks H, J & M at Level 00. A total of 100 car parking spaces (16 at surface level and 84 at basement level), 596 bicycle spaces (518 at basement level and 78 at surface level) and 5 motorcycle spaces (all at basement level) are proposed. Waste Management areas, ESB substations, switch rooms and plant areas are also located at basement level.

Demolition Phase

There will be waste materials generated from the demolition of the existing buildings and hardstanding areas on site, as well as from the excavation of the basement and building foundations. The volume of waste generated from demolition 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. plasterboard on timber ceiling joists, steel embedded in concrete etc.

Further detail on the waste materials likely to be generated during the demolition works are presented in the project-specific C&D WMP in Appendix 15.1. The C&D WMP provides an estimate of the main waste types likely to be generated during the C&D phase of the proposed development, while AWN has estimated the reuse, recycling/recovery and disposal rates using the EPA National Waste Reports and these are summarised in Table 15.1.

Waste Type	Tonnes	Reuse/Recovery		Recycle		Disposal	
		%	Tonnes	%	Tonnes	%	Tonnes
Glass	75	0	0	85	64	15	11
Concrete, Bricks, Tiles, Ceramics	428	30	128	65	278	5	21
Plasterboard	34	30	10	60	20	10	3
Asphalts	8	0	0	25	2	75	6
Metal	126	5	6	80	101	15	19
Timber	101	10	10	60	60	30	30
Total	772		155		526		91

Table 15.1 - Estimated off-site reuse, recycle and disposal rates for demolition waste

It should be noted that until a detailed survey of the areas 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.

A site-specific C&D WMP has been prepared by AWN Consulting Limited for the proposed development and is enclosed as an appendix to this chapter. The plan will be updated, or a demolition plan will be prepared and submitted prior to commencement of the demolition phase which may refine the demolition waste figures detailed in Table 15.1.

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, soil and stones will require excavation to facilitate basement completion and construction of foundations, and the installation of underground services. As per Table 15.1, KSN have estimated that c. 19,700 m³ of soil and stones will require excavation. These estimates will be refined prior to commencement of construction. This material will require removal from site for offsite reuse, recovery and/or disposal. If the 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 licence is required for the receiving facility.

In order to establish the appropriate reuse, recovery and/or disposal route for the soils and stones 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 removal of the material 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. It is anticipated that the surplus material will be suitable for acceptance at either inert or non-hazardous soil recovery facilities/landfills in Ireland or, in the unlikely event of hazardous material being encountered, be transported for treatment/recovery or exported abroad for disposal in suitable 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. The C&D WMP provides an estimate of the main waste types likely to be generated during the C&D phase of the proposed development and these are summarised in Table 15.2.

Waste Type	Tonnes	Reuse		Recycle/Recovery		Disposal	
		%	Tonnes	%	Tonnes	%	Tonnes
Mixed C&D	585.1	10	58.5	80	468.1	10	58.5
Timber	496.5	40	198.6	55	273.1	5	24.8
Plasterboard	177.3	30	53.2	60	106.4	10	17.7
Metals	141.8	5	7.1	90	127.7	5	7.1
Concrete	106.4	30	31.9	65	69.2	5	5.3
Other	266.0	20	53.2	60	159.6	20	53.2
Total	1773.1		402.5		1204.0		166.7

Table 15.2 - Estimated off-site reuse, recycle and disposal rates for construction waste

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 C&D 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.

Operational Phase

As noted in Section 15.1, an OWMP has been prepared for the development and is included as Appendix 15.2. 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 based on the AWN WGM is presented in Table 15.3 below and is based on the uses and areas as advised by the project architects (OMP Architects) August 2019.

Waste type	Waste Volume (m ³ /week)	
	Residential	Crèche
Organic Waste	4.10	0.07
Dry Mixed Recyclables	30.06	2.60
Glass	0.79	0.01
Mixed Municipal Waste	14.31	1.15
Total	49.27	3.82

Table 15.3 - Estimated Waste Generation for the main waste types (m³/week)

The DLR Pre-Planning Waste Management Form recommends calculating residential waste using Section 4.7 of BS5906:2005 *Waste Management in Buildings – Code of Practice*. The predicted total waste generated from the residential units based on the Code of Practice is c. 39m³ per week.

Pre-application consultation was undertaken with DLRCC. DLRCC Waste Department requested that the waste generation data for the existing Grange residential development was used as a basis for calculating the waste arisings from the proposed development. Waste collection data for the existing

Grange showed that c. 37 no. 1100L bins of mixed municipal waste and 37 no. 1100L bins of dry mixed recyclable waste are collected from the development per week. This equates to a total volume of c. 74m³ per week if it is assumed that each bin contains 1m³ of waste. (Note: This might be overly conservative as some of the bins may not be full when collected.) Based on the number and type of units and the current occupancy in the existing Grange, the proposed development is c. 96% of the size of the existing Grange residential development. Using the existing Grange residential waste generation as a basis, the proposed development would be predicted to generate c. 70.8m³ per week. This is significantly higher than the volumes predicted by the AWN WGM and almost twice the volume that would be predicted using BS5906:2005 Waste Management in Buildings – Code of Practice. (Note: The DLR Pre-Planning Waste Management Form recommends calculating waste arisings based on the Code of Practice, the estimates based on the existing Grange residential development have been used instead in this instance at the request of DLRCC.) While these estimates may be conservative, they have been used as a basis for devising a robust waste strategy in compliance with the DLRCC request.

Based on a total volume of 70.8m³ per week, the estimated breakdown of the main waste types is presented in Table 15.4.

Waste type	Waste Volume (m ³ /week)	
	Residential	Crèche
Organic Waste	5.90	0.07
Dry Mixed Recyclables	43.22	2.60
Glass	1.14	0.01
Mixed Municipal Waste	20.57	1.15
Total	70.83	3.82

Table 15.4 - Estimated Waste Generation for the main waste types (m³/week) based on data for the existing Grange development.

The residents will be required to provide and maintain appropriate waste receptacles within their units to facilitate segregation at source of these waste types. The location of the bins within the units will be at the discretion of the residents. As required, the residents will need to bring these segregated wastes from their apartments to the main residential Waste Storage Area (WSA) located on Level 01. An additional satellite WSA will be located at Block N at Level 01 for use by residents of Block N. Waste will be brought from the Block N satellite WSA to the communal residential WSA by personnel nominated by the building management company.

The crèche unit will store their waste within their own unit. Suitably sized bins should be strategically located within the unit as required by the tenant to facilitate segregation at source of these waste types.

The OWMP seeks to ensure the development contributes to the targets outlined in the EMR Waste Management Plan 2015 – 2021 and DLR Refuse and Recycling Storage Guidelines.

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

15.5 Potential Impact of the Proposed Development

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

Construction Phase

The proposed development will generate a range of non-hazardous and hazardous waste materials during demolition, excavation 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 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 soil and stone which will need to be excavated to facilitate the proposed development. It is anticipated that there will be limited or no opportunities for reuse of the excavated material on site and so it 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**.

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 in 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**.

15.6 Potential Cumulative Impacts

There are similar existing residential and commercial developments close by, along with the neighbouring residential site and these developments will generate similar waste types during their operational phases. Authorised waste contractors will be required to collect waste materials segregated, at a minimum, into recyclables, organic waste and non-recyclables. An increased density of development in the area is likely to improve the efficiencies of waste collections in the area.

Other developments in the area will be required to manage waste in compliance with national and local legislation, policies and plans which will minimise/mitigate any potential cumulative impacts associated with waste generation and waste management. As such the effect will be a **long-term, imperceptible and neutral**.

Future Phase 2 Development

Evidently, the applicant does not control the entirety of remaining lands to provide consolidated development to the N11 frontage. This current application therefore relates to a Phase 1 development on lands that can deliver critically required residential units. OMP Architects have developed a phased Masterplan approach to provide an indicative future context for consideration by An Bord Pleanála, which is enclosed herewith. There has been a carefully considered design approach to development to ensure that the subject application can be delivered without compromising existing amenity or the future potential for development addressing the N11.

The Masterplan successfully integrates this new phase of development with the existing built fabric of The Grange. The approach has been to set the blocks around a central garden, which complements the existing scheme and delivers significant enhancements to the public realm.

Overall, it is estimated that there is potential for a further c. 250 units as part of a Phase 2 development.

15.7 Do Nothing Scenario

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

15.8 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.

Construction Stage

As previously stated, a project specific C&D WMP has been prepared in line with the requirements of the requirements of the guidance document issued by the DoEHLG and is included as Appendix 15.1. 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 demolition, excavation and construction phases of the proposed development. Prior to commencement, the contractor(s) will be required to refine/update the C&D WMP or submit an addendum to C&D WMP to DLRCC 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.

Project Engineers have estimated that c. 19,700 tonnes of soil and stones will be generated from the excavations required to facilitate basement completion and construction of new foundations, the installation of underground services. It is anticipated that all of this material will require removal from the site for offsite reuse, recovery, recycling and/or disposal. The contractor(s) will endeavour to ensure that material is reused or recovered off-site insofar as is reasonably practicable or disposed of at authorised 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);
 - Tarmac;
 - 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 banded 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 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). 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 and the *Litter Pollution Act 1997, 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.

Operational Stage

As previously stated, a project specific OWMP has been prepared and is included as Appendix 15.2. 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 and the DLR Refuse and Recycling Storage Guidelines.

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.);
 - Furniture (and from time to time other bulky waste); and
 - Abandoned bicycles.
- 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

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*, the *EMR Waste Management Plan (2015 - 2021)* and the *DLR Refuse and Recycling Storage Guidelines*. It will also ensure optimum levels of waste reduction, reuse, recycling and recovery are achieved.

15.9 Risks to Human Health

The potential impacts on human beings in relation to the generation of waste during the construction and operational phases are that incorrect management of waste could result in littering which could cause a nuisance to the public and attract vermin. A carefully planned approach to waste management and adherence to the project specific C&DWMP and OWMP, will ensure appropriate management of waste and avoid any negative impacts on the local population. The predicted effect of the generation of waste during the construction and operational phases on human health will be **long-term, imperceptible and neutral**.

15.10 Predicted Impacts of the Proposed Development

The implementation of the mitigation measures outlined in Section 15.9 will ensure that the high rate of reuse, recovery and recycling is achieved at the development during the demolition, 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.

Construction Stage

A carefully planned approach to waste management as set out in Section 15.9 and adherence to the C&D WMP during the construction and demolition phase will ensure that the effect on the environment will be **short-term, imperceptible and neutral**.

Operational Stage

During the operational phase, a structured approach to waste management as set out in Section 15.9 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**.

15.11 Residual Impacts

Adherence to the mitigation measures outlined in Section 15.8 will ensure that there are no significant impacts on resource or waste management from the proposed development. The management of waste during the construction phase in accordance with the Construction & Demolition Waste Management Plan (C&D WMP) and during the operational phase in accordance with the Operational Waste Management Plan (OWMP) will ensure the development meets the requirements of regional and national waste legislation and promote the management of waste in line with the priorities of the waste hierarchy. The residual impact will be **neutral and imperceptible**.

15.12 Monitoring

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).

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 demolition, 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 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.

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 WSA where estimates have been too conservative. Reductions in bin and equipment requirements will improve efficiency and reduce waste contactor costs.

15.13 Interactions

Adherence to the mitigation measures outlined in Section 15.9 will ensure that there are no significant impacts on resource or waste management from the proposed development. The management of waste during the construction phase in accordance with the C&D WMP and during the operational phase in accordance with the OWMP will meet the requirements of regional and national waste legislation and promote the management of waste in line with the priorities of the waste hierarchy.

Land and Soils

During the construction phase excavated soil and stone (c. 19,700 m³) will be generated from the excavations required to facilitate construction of facilitate basement completion and construction of new foundations, the installation of underground services and attenuation tank. It is envisaged that all of this material will be taken offsite for reuse or recovery, where practical, with disposal as last resort. Adherence to the mitigation measures in Chapter 15 and the requirements of the C&D WMP, will ensure the effect is **long-term, imperceptible** and **neutral**.

Traffic and Transportation

Local traffic and transportation will be impacted by the additional vehicle movements generated by removal of waste from the site during the construction and operational phases of the development. The increase in vehicle movements as a result of waste generated during the construction phase will be temporary in duration. There will be an increase in vehicle movements in the area as a result of waste collections during the operational phase but these movement will be imperceptible in the context of the overall traffic and transportation increase and has been addressed in Chapter 13 Traffic and Transportation. Provided the mitigation measures detailed in Chapter 13 and the requirements of the OWMP (included as Appendix 15.2) are adhered to, the effects should be **short to long-term, imperceptible** and **neutral**.

15.14 Difficulties Encountered

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

APPENDIX 15.1
CONSTRUCTION AND DEMOLITION WASTE MANAGEMENT PLAN

APPENDIX 15.2
OPERATIONAL WASTE MANAGEMENT PLAN

APPENDIX 15.3 DLR WASTE MANAGEMENT FORM