PINNACLE
CONSULTING ENGINEERS

Outline Construction Demolition Waste Management Plan

Clonburris SDZ

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Prepared for:

Kelland Homes Ltd.

Kelland Homes

STRUCTURAL • CIVIL • DUE DILIGENCE • ENGINEERING MASTERPLANNING
FLOOD MANAGEMENT • INFRASTRUCTURE DESIGN
PRE-DEVELOPMENT ENGINEERING • BIM • TRANSPORTATION

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CONTENT

1 INTRODUCTION 2

1.1 Introduction 2

1.2 Background 2

1.3 Implementation 3

1.4 Scope 3

1.5 Consultation 3

2 CONSTRUCTION & DEMOLITION WASTE MANAGEMENT IN IRELAND 4

2.1 National Level 4

2.2 Regional Level 4

2.3 South Dublin County Council Policy 5

2.3.1 Introduction 5

2.3.2 Consultation with South Dublin County Council 6

2.3.3 Consultation with Recycling/Salvage Companies 6

2.4 Legislative Requirements 6

2.5 Regional Waste Management Service Providers and Facilities 6

3 DESCRIPTION OF PROJECT 8

3.1 Development Description 8

3.2 Project Scope 9

3.3 Waste Management Goal 10

3.4 Diversion and Waste Prevention 10

3.5 Recycling 10

3.6 Waste Collection 11

3.7 Communication Measures 11

4 WASTE ARISING & PROPOSALS FOR MANAGING WASTE 12

4.1 Introduction 12

4.2 Bedrock, Blocks and Concrete 12

4.3 Topsoil/ Subsoil 12

4.4 Soil , Stone & Made Ground – By Products 12

4.5 Tarmacadam 13

4.6 Silt & Sludge 13

4.7 Plastic 13

4.8 Cardboard 13
4.9 Timber 13
4.10 Metal 14
4.11 Plasterboard 14
4.12 Glass 14
4.13 Hazardous Materials 14
4.14 Fuel/Oils 14
4.15 Asbestos 14
4.16 Non-Recyclable Waste 14
4.17 Waste Management System 14
4.18 Areas 17
4.19 Predicted Waste Arising 17
4.20 Demolition Waste 17
4.21 Construction Waste Generation 17
4.22 Waste Management Packages 1
4.23 Tracking and Documentation Procedures for Off Site Waste 2
5 TRAINING 5
5.1 Introduction 5
5.2 Waste Manager Training and Responsibilities 5
5.3 Site Crew Training 5
5.4 Proforma 5
6 RECORDS 10
6.1 Introduction 10
7 AUDIT PROCEDURE 11
7.1 Responsibility for Waste Audit 11
7.2 Review of Records and Identification of Corrective Actions 11
References 12

Tables

Table 1 Proposed Land Uses 8
Table 2 Key Contacts..... 10
Table 3 Main Waste Types and Associated EWC Code..... 16
Table 4 Construction Waste Generated on a Typical Irish Construction Site 18
Table 5 Total Waste* 18
Table 6 On and Off-Site Reuse, Recycle and Recovery Target Rates for Construction Waste 19
Table 7 Waste Management Packages..... 2
Table 8 Waste Stream Destinations..... 4

Figures

Figure 1 Proposed Access (Source: Davey Smith Architecture)**Error! Bookmark not defined.**

Figure 2 Demolition Area 17

1 INTRODUCTION

1.1 Introduction

This Outline Construction Demolition Waste Management Plan has been prepared in support of a planning application to South Dublin County Council for lands in the Clonburris SDZ.

The purpose of this Construction & Development Wate Management Plan (C&D WMP) is to ensure that waste arisings during the construction and demolition phase will be managed and disposed of in a way that ensures the provisions of the Waste Management Acts 1996 - 2008 and associated Regulations 1 and the Southern Region Waste Management Plan are complied with. It will also ensure that optimum levels of waste reduction, re-use and recycling are achieved.

1.2 Background

Compliance with this Waste Management Plan will ensure maximum recycling, reuse and recovery of waste with diversion from landfill, wherever possible.

This Waste Management Plan also provides guidance on the appropriate collection and transport of waste from the site to prevent issues associated with litter or more serious environmental pollution (e.g. contamination of soil and/or water).

This Waste Management Plan will have regard to national guidelines and policies:

- Best Practice Guidelines for the Preparation of Waste Management Plans for Construction and Demolition Projects, July 2006
- Construction and Demolition Waste Management – a handbook for Contractors and Site Managers – CIF/FAS (2002)
- CIRIA document 133 Waste Minimisation in Construction
- The Quality Protocol for the Production of Aggregates from Inert Waste
- A Resource Opportunity – Waste Management Policy in Ireland
- The guidelines outline the issues that need to be addressed at the pre-planning stage of a development, through to completion and are considered to define best practice for C&D projects in Ireland and describe how C&D projects are to be undertaken such that environmental impacts and risks are minimised and maximum levels of waste recycling are achieved.

This CDWMP will include

- Predicted C&D wastes and procedures to prevent, minimise, recycle and reuse wastes.
- Waste disposal/recycling of C&D wastes at the site.
- Provision of training for waste manager and site crew.
- Details of proposed record keeping system.
- Details of waste audit procedures and plan.
- Details of consultation with relevant bodies i.e. waste recycling companies, Local Councils, etc

This Outline Construction Traffic Management Plan (CTMP) has been prepared in consultation with Applicants and their contractors. It is as a key construction contract document, the implementation of which aims to reduce possible impacts which may occur during the construction of the proposed development.

The applicant is responsible for ensuring construction activities are managed in accordance with the final CTMP. This Outline CTMP will shape the final plan but is subject to change/revision.

Objectives and measures are also included for the management, design and construction of the project to control the traffic impacts of construction insofar as it may affect the environment, local residents and the public in the vicinity of the construction works.

1.3 Implementation

Key to the implementation of this CTMP is the dedication of the on-site construction manager who will regularly liaise with and update the Client's resident representative and associated team on all environmental and construction programming issues relating to the site. All site personnel are charged with following good practice and encouraged to provide feedback and suggestions for improvements. All site personnel are also required to ensure compliance with the requirements of the site's CTMP.

1.4 Scope

The objective of this CTMP is to ensure that the residual impacts to the public road network during the construction phase of the project which have been identified in the application documentation are minimised and that transport related activities are carried out as safely as possible and with minimum disruption to other road users.

The CTMP has also been prepared for the purpose of identifying appropriate and safe methods of access for construction traffic to the proposed development. This CTMP describes the traffic management for the transportation of construction materials, equipment and personnel along the public road network to facilitate the construction of the proposed development. Light vehicles, such as cars and vans, will be used by site operatives travelling to and from the site. Heavy Construction Vehicles (HCV) will be required to deliver general construction materials, such as concrete, to the site.

This CTMP remains a live document that will be reviewed by the contractor and expanded upon, where necessary, throughout the construction phase of the project. However, this version is considered to be wholly relevant for the expected works.

1.5 Consultation

The Applicant, and their connected companies, has a number of active construction sites. It has engaged in detail consultation with their incumbent contractors to review and sense check the measures contained in this outline CTMP.

While the measures contained in this CTMP are subject to detailed design and the appointment of a main contractor, all the pertinent issues have been reviewed by a number of contractors to ensure holistic approach has been taken with regard to the proposed CTMP measures.

2 CONSTRUCTION & DEMOLITION WASTE MANAGEMENT IN IRELAND

2.1 National Level

The Government issued a Policy Statement in September 1998, known as Changing Our Ways, which identified objectives for the prevention, minimisation, reuse, recycling, recovery and disposal of waste in Ireland. The target for C&D waste in this Strategy was to recycle at least 50% of C&D waste within a five-year period (by 2003), with a progressive increase to at least 85% over fifteen years (by 2013).

In response to the "Changing Our Ways" report, a task force (Task Force B4) representing the waste sector of the already established Forum for the Construction Industry, released a report titled 'Recycling of Construction and Demolition Waste' concerning the development and implementation of a voluntary construction industry programme to meet the governments objectives for the recovery of construction and demolition waste.

The National Construction and Demolition Waste Council (NCDWC) was launched in June 2002, as one of the recommendations of the Forum for the Construction Industry, in the Task Force B4 final report. The NCDWC subsequently produced Guidelines for the Preparation of Waste Management Plans for Construction and Demolition Projects in July 2006 in conjunction with the Department of the Environment, Heritage and Local Government. There are threshold criteria set out in the Guidelines to determine whether a C&D WMP is required. The development requires a C&D WMP under the following criterion:

- New developments with an aggregate floor area in excess of 1,250 m2;
- Demolition/renovation/refurbishment projects generating in excess of 100m3 in volume, of C&D waste

The Guidelines outline the issues that need to be addressed at the pre-planning stage of a development all the way through to its completion. These Guidelines have been followed in the preparation of this document and include the following elements:

- Predicted demolition & construction wastes and procedures to prevent, minimise, recycle and reuse wastes;
- Waste disposal/recycling of C&D wastes at the site;
- Provision of training for waste manager and site crew;
- Details of proposed record keeping system;
- Details of waste audit procedures and plan;
- Details of consultation with relevant bodies, i.e. waste recycling companies and South Dublin County Council, etc.

Other guidelines followed in the preparation of this report include the "Construction and Demolition Waste Management – a handbook for Contractors and Site Managers" published by FÁS and the Construction Industry Federation (2002).

Comprehensive reports regarding the quantities of C&D waste produced in Ireland have been compiled by the Environmental Protection Agency (EPA). National Waste (Database) Reports detailing, among other things, C&D generation and the level of recycling, recovery and disposal of this material, provide estimates based on information from waste companies and contractors.

2.2 Regional Level

The proposed development is located in the Eastern Midlands Waste Region which covers the following councils:-

- Dublin City Council;
- Dun Laoghaire Rathdown County Council;
- Fingal County Council;
- South Dublin County Council;

- Kildare County Council;
- Louth County Council;
- Laois County Council;
- Longford County Council;
- Offaly County Council;
- Westmeath County Council;
- Meath County Council; and
- Wicklow County Council.

The Eastern Midlands Region Waste Management plan was published in 2015 and covers the period 2015-2021.

2.3 South Dublin County Council Policy

2.3.1 Introduction

SOUTH DUBLIN COUNTY COUNCIL Construction and Demolition Waste Management Plan Pre-Planning Guidance During Pre-Planning consultation, the attention of the applicants is drawn to the following:

1. Applicant must note that the Construction Management Plan Report and Project Construction and Demolition Waste Management Plan report are two different standalone reports.
2. A Project Construction and Demolition Waste Management Plan should accompany a planning application for major development, otherwise it will be sought as Additional Information.
3. In the preparation of the Waste Management plans for development proposed that involves Demolition and Construction, applicants must familiarise themselves with, and ensure that such plans are consistent with the document: "Best Practice Guidelines on the Preparation of Waste Management Plans for Construction and Demolition Projects" published in July, 2006 by the Department of the Environment, Community and Local Government.
4. A Project Construction and Demolition Waste Management plan for a proposal must provide the information recommended in sections 3.2,3.3 and 3.4 of the document "Best Practice Guidelines on the Preparation of Waste Management Plans for Construction and Demolition Projects" from the Department of the Environment, Community and Local Government that can be viewed / downloaded from17 http://www.dccae.gov. ie/en-ie/environment/topics/waste/producer-responsibility-initiative/Pages/Construction-and-Demolition- (CD)-waste.aspx. Th e plan must also comply with the Example of an Indicative Project Construction and Demolition Waste Plan for a Development / Redevelopment Project C& D Waste Management Plan provided in Appendix 3 of the Best Practice Guidelines. A Project Construction and Demolition Waste Management plan lacking the details in these examples will be rejected.
5. As the condition for preparation of Project Construction and Demolition Waste Management plan is based on thresholds stated in Section 3 of the Guidelines, Applicants must provide: • Areas covered by the development • Th e volume of C & D waste generated during demolition / renovation / refurbishment projects • Th e volume of construction and demolition waste provided during civil engineering projects excluding waste materials used for development works on the sites.
6. Waste, arising from any development site must be kept to a minimum, segregated where appropriate, and disposed in accordance with the Waste Management Regulations 2007, as amended. Transport of such waste, must be by an authorised waste permit holder. Waste disposal records must be maintained and made available, for inspection by Authorised Persons appointed under the Waste Management Act 1996, as amended. A Waste Transfer Form shall accompany the transportation of all hazardous waste arising from construction works.
7. Th e Council would have serious concerns about contaminated land or groundwater arising from a development project. Where the applicant believes contaminated land may be involved, the advice of the Council's Waste Management Section should be sought on how to carry out an Environmental Risk Assessment leading to the remediation of site. Th e Council's principal aim in dealing with contaminated land and groundwater related issues is to secure the protection of human health, water bodies (including groundwater) and the wider environment.

Th e waste management Section will advise on the scope of work required for environmental risk assessment consistent with EPA code of practice. It is important that the report of the environmental risk assessment accompanies any application. A developer seeking permission to develop land where there may be an issue of contamination would have to fully satisfy the Council that all risks arising can be addressed. To address any issue of contaminated land it would be the applicant's must to provide

i. A full site characterisation and assessment, (ii) A corrective action feasibility plan and
ii. A corrective action and implementation plan with aftercare

Further useful information is available from https://www.epa.ie/pubs/advice/waste/contaminatedland/contaminatedland/Guidance_on_the_Management_of_Contaminated_Land_and_Groundwater_at_EPA_ Licensed_Sites_FINAL.pdf

2.3.2 Consultation with South Dublin County Council

Once demolition and construction contractors have been appointed and prior to removal of any C&D waste materials offsite, details of the proposed destination of each waste stream will be provided to South Dublin County Council.

South Dublin County Council will also be consulted, as required, throughout the demolition, excavation and construction phases in order to ensure that all available waste reduction, reuse and recycling opportunities are identified and utilised and that compliant waste management practices are carried out.

2.3.3 Consultation with Recycling/Salvage Companies

The appointed waste contractor for the main waste streams managed by the demolition and construction contractors will be audited to ensure that relevant and up-to-date waste collection permits and facility registrations/permits/licences are held. In addition, information will be obtained regarding the feasibility of recycling each material, the costs of recycling/reclamation, the means by which the wastes will be collected and transported off-site, and the recycling/reclamation process each material will undergo off site.

2.4 Legislative Requirements

One of the guiding principles of European waste legislation, which has in turn been incorporated into the Waste Management Act 1996 and subsequent Irish legislation, is the principle of "duty of care". This implies that the waste producer is responsible for waste from the time it is generated through until its legal disposal (including its method of disposal). Following on from this is the concept of "polluter pays" whereby the waste producer is liable to be prosecuted for pollution incidents, which may arise from the incorrect management of waste produced, including the actions of any contractors engaged (e.g. for collection and transport of waste).

It is therefore imperative that the owners/managers of the site and any contractors engaged, undertake on and off-site management of waste in accordance with all legal requirements.

Waste contractors are typically engaged to transport waste off-site. Each contractor must comply with the provisions of the Waste Management Act 1996 (amended 2001) and associated Regulations. This includes the requirement that a contractor handle, transport and dispose of waste in a manner that ensures that no adverse environmental impacts occur as a result of any of these activities. A collection permit to transport waste must be held by the relevant contractor, which is typically issued by the local authority where the majority of the contractors business takes place.

Waste receiving facilities must also be appropriately licensed/permitted. Operators of such facilities cannot legally receive any waste, unless in possession of a waste permit granted by the relevant local authority under the Waste Management (Facility Permit & Registration) Regulations 2007 or a waste licence granted by the EPA. The permit/licence held will specify the type and quantity of waste that can be received, stored, sorted, recycled and/or disposed of at the specified site.

2.5 Regional Waste Management Service Providers and Facilities

Various private waste contractors offer waste collection services across the Eastern Midlands Waste Region. Details of waste collection permits (granted, pending and withdrawn) for the Region are contained within the Eastern Midlands Region Waste Management Plan.

The Eastern Midlands Region Waste Management Plan also sets out licensed waste management facilities and landfill sites across the region

3 DESCRIPTION OF PROJECT

3.1 Development Description

Kelland Homes Ltd seeks permission for development on a site area of 6.3Ha, on lands within the townland of Cappagh, Dublin 22. The proposed development is located west of the Ninth Lock Road, south of the Dublin-Cork railway line, north of Cappaghmore housing estate and Whitton Avenue, and east of an existing carpark / park & ride facility at the Clondalkin Fonthill train station and the R113 (Fonthill Road). The proposed development is located within the Clonburris Strategic Development Zone (SDZ), within part of the development areas of Clonburris Urban Centre (i.e. CUC-S4) and Clonburris South East (i.e. CSE-S1 & CSE-S2), as identified in the Clonburris SDZ Planning Scheme 2019.

The proposed development consists of the construction of 294 no. dwellings, crèche and retail / commercial unit, comprised of:

- 118 no. 2, 3 & 4 bed, 2 storey semi-detached and terraced houses;
- 104 no. 2 & 3 bed duplex units accommodated in 10 no. 3 storey buildings;
- 72 no. 1 & 2 bedroom apartments in 2 no. 4 & 6 storey buildings;
- 1 no. 2 storey creche (c.520.2m²);
- 1 no. 2 storey retail /commercial unit (c.152.1m²).

Access to the development will by via the permitted road network (under Ref. SDZ20A/0021) which provides access from the Ninth Lock Road to the east and the R113 (Fonthill Road) to the west. The proposed development will connect into the permitted infrastructural works as approved under the Clonburris Strategic Development Zone Planning Scheme (2019) and permitted under Ref. SDZ20A/0021, with the proposed development connecting into the permitted surface water drainage attenuation systems i.e. 1 no. pond, 3 no. modular underground storage systems and 1 no. detention basin combined with modular underground storage systems. The proposed wastewater infrastructure will connect into a permitted foul pumping station and pipe network within proposed road corridors to facilitate drainage connections to future wastewater drainage infrastructure within the adjoining SDZ lands (including future Irish Water pumping station permitted under SDZ21A/0006).

The proposed development also provides for all associated site development works above and below ground, public & communal open spaces, hard & soft landscaping and boundary treatments, surface car parking, bicycle parking, bin & bicycle storage, public lighting, plant (M&E), utility services & 4 no. ESB sub-stations.

This application is being made in accordance with the Clonburris Strategic Development Zone Planning Scheme 2019 and relates to a proposed development within the Clonburris Strategic Development Planning Scheme Area, as defined by Statutory Instrument No. 604 of 2015.

The site has an area of 6.3 Ha.

It is proposed to develop this site based on the following schedule of accommodation:

Proposed Land Uses	
Land Use	Size
Houses	118
Duplex	104
Apartments	72
Total	**294**

Table 1 Proposed Land Uses

The proposed site access points are illustrated in Figure 9 below. The South Link Street will provide access to the development. The South Link Street will be constructed separately and is not part of the current planning application.

The proposed site access points are illustrated in Figure 1 below.

Figure 1 Proposed Access

Primary vehicular access to the development will be via the 9th Lock Road and the R113.

Pedestrian access will coincide with the vehicular accesses.

Primary vehicular access between the local road network and the development will be via the 9th Lock Road and the R113 using the new South Link Road.

Pedestrian access will coincide with the vehicular accesses. Additional green links will be provided.

3.2 Project Scope

Nature of Project: The demolition of existing derelict building and associated structures on site and the construction of 286 No. residential units and associated facilities and infrastructure.

Scope of Project (subject to change):

- Excavation and pouring of concrete strip foundations.
- Blockwork rising walls
- Underground drainage
- Cast insitu ground floor slabs and rising elements
- Blockwork and brickwork rising elements
- Pre-cast floors stairs and balconies
- Aluminium windows and curtain walling.
- Fit out of houses, duplexes and apartments

Contract Period: To be confirmed

Recycling Co-Ordinators: To be confirmed on appointment of main contractor

Recycling Contractor: Panda Waste NWCPO 13-11193-05 & W0039-02 or other nominated and licenced recycling contractor.

Waste Handling Facility: Concrete, Soil and C& D general waste- Panda NWCPO 13-11193-05 or other nominated and licenced waste handling facility.

Position	Name	Contract Details
Client	Kelland Homes Ltd.	To be confirmed
Contractors Manager	To be confirmed on appointment of main contractor	To be confirmed
Waster Manager on Site	To be confirmed on appointment of main contractor	To be confirmed
Site Manager	To be confirmed on appointment of main contractor	To be confirmed

Table 2 Key Contacts

3.3 Waste Management Goal

This project aims to recycle, reuse or salvage the maximum as practically possible.

3.4 Diversion and Waste Prevention

Waste Materials fall into three categories for management, these are:

- Re-use
- Recycle
- Re-used

If surplus materials can be used in the permanent works they are classified as materials,

which have been re-used. If they are surplus to requirements and need to be removed from

site and they can be removed and used in their present form, they can be removed from site

for re-use.

3.5 Recycling

If the surplus material cannot be re-used in its present form but could be used in a different form, it is sent for recycling such as 50x50 timber to make chipboard.

Waste will be minimized on-site by careful ordering of materials and scheduling of deliveries as required for use.

Any surplus materials which can be re-used will be stacked and stored for removal from site and re-use on other projects in their current form including undamaged timbers, clean unbroken blocks etc.

Recycling and waste bins are to be kept clean and clearly marked in order to avoid contamination of materials.

As subcontractors commence works on site their waste will be reviewed and a separate skip will be provided should it be deemed appropriate e.g. Drylining plasterboard

All waste will be removed from site by the noted above companies and brought to the nearest waste facility.

All C & D waste will be segregated at the waste facility for recycling and a breakdown of this waste will be provided from each company.

3.6 Waste Collection

A designated storage & waste will be established on site where the skips will be located, and a clear area provided for storage of materials suitable for re-use.

Appropriately sized portable skips will be positioned in work areas for removal to the large skips. These skips will be clearly labelled to reduce cross contamination of waste

Canteens complete with bins for general waste and recyclable waste will be established on-site. Eating elsewhere will be prohibited in all other areas to prevent generation of food waste in other areas of the site.

The authorized waste collector will be Advance Waste Recycling Ltd Glenowlen, Church Rd, Saggart, Co.Dublin – licence No – NWCPO-14-11395-05. Advanced Waste will remove these skips to Thorntons Recycling at the following locations:

- Killeen Road, Killeen Road, Cherry Orchard, Ballyfermot, Dublin 10, or
- JFK Industrial Estate, Bluebell, Dublin 12.

Thorntons will process the waste and segregate it into different material classes as per Table 3 as appropriate with the sorting and recovery facilities outlined in Table 8.

3.7 Communication Measures

Pre-contract meetings will be held with subcontractors. As part of the agenda of these meetings project goals and requirements will be explained to ensure subcontractors fully understand their role in the achieving the least waste from the site. Waste prevention and recycling measures and expected waste materials for each individual contractor will be discussed and methodology of waste segregation and disposal agreed

A copy of the construction waste management plan will be issued to all subcontractors

The Site Manger/Assistant Manager will provide on-site briefing via induction on appropriate separation, handling, recycling, re-use and return methods to be used by all parties and at appropriate stages of the project where applicable. Toolbox talks will be carried out regularly on waste issues and all subcontractors will be expected to attend. This will ensure that everyone feels they are included and that their participation is meaningful.

Clear signage will be provided on skips indicating the type of waste permitted.

The Site Manager will monitor the effectiveness and accuracy during the routine site inspections

4 WASTE ARISING & PROPOSALS FOR MANAGING WASTE

4.1 Introduction

Waste will be segregated on site. The C&D WSA will have skips and receptacles for all recyclable wastes. The appointed waste contractor will collect and transfer the recyclable wastes as receptacles are filled. The non-recyclable waste will be transferred to landfill. Numerous waste contractors in the South County Dublin region carry out this operation.

4.2 Bedrock, Blocks and Concrete

Most of the waste C&D material will be clean, inert material and it is proposed to reuse it for construction purposes where possible.

Following a desktop study, it is unlikely that bedrock will be encountered during excavations.

4.3 Topsoil/ Subsoil

Topsoil and subsoil will be excavated to facilitate construction of the foundations and installation of underground services for the new build. Excess inert soils and subsoils excavated that are not required for use as fill on site will be disposed of or re-used offsite.

If the total amount of soil to be removed from the site will exceed 1,000 tonnes, the soil will be removed and disposed of by contractors licensed under the Waste Management Act of 1996 (as amended 2001), the Waste Management (Facility Permit & Registration) Regulations of 2007 and the Waste Management (Collection Permit) Regulations of 2007. The issuing of such a permit to contractors allows the contractor to use such fill material for landscaping and land reclamation, subject to conditions defined in the Permit.

The site manager will investigate whether nearby construction sites may require fill material, to both minimise the costs of transport and to reuse as much material as possible.

A site investigation will be carried out to determine the state of the soil/subsoil. . If the site investigation establishes that some soil/subsoil excavated at the site was deemed to be contaminated appropriate measures will be taken to manage its excavation and removal as necessary.

During the construction phase the contaminated soil/subsoil (i.e. non- hazardous or hazardous) will be stored separately to the inert soil/subsoil, sampled and tested. The material will be appropriately classified as non-hazardous or hazardous in accordance with Council Decision 2003/33/EC, which establishes the criteria for the acceptance of waste at landfills, prior to being transported to an appropriately licensed facility by permitted contractors.

4.4 Soil , Stone & Made Ground – By Products

Classification of soil and stone, where appropriate, as a by- product, brings significant economic benefits as the material can be appropriately handled outside of waste legislation. The environmental benefits are also considerable, as the process facilitates the circular economy.

All such classification will be carried out in accordance with the EPA issued 'Guidance on Soil and Stone By-Products in the Context of Article 27 of the European Communities (Waste Directive) Regulations 2011' (June 2019)

Such notifications must be by the material producer or one who makes the notification with the express written consent of the material producer. The guidance calls for all notifications to ensure each and all by-product conditions are met, namely:

- Further use of the soil and stone is certain;
- The soil and stone can be used directly without any further processing other than normal industrial practice;
- The soil and stone are produced as an integral part of a production process; and,
- Further use is lawful in that the soil and stone fulfil all relevant product, environmental and health protection requirements for the specific use and will not lead to overall adverse environmental or human health

By-product decisions must be notified to the Agency using the online notification form.

Any article 27 notifications being notified to the Agency that relate to soil and stone material are required to have the following three templates signed and uploaded to the online notification form prior to notification:

1. Material Producer's Declaration;
2. Declaration of Soil and Stone Suitability - Civil, and
3. Declaration of Soil and Stone Suitability - Environmental.

The next option (beneficial reuse) may be appropriate for the excavated material pending environmental testing to classify the material as hazardous or non-hazardous in accordance with the EPA Waste Classification – List of Waste & Determining if Waste is Hazardous or Non-Hazardous publication. Clean inert material may be used as fill material in other construction projects or engineering fill for waste licensed sites. Beneficial reuse of surplus excavation material as engineering fill may be subject to further testing to determine if materials meet the specific engineering standards for their proposed end-use.

Any nearby sites requiring clean fill/capping 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 a by-product (and not as a waste), this will be done in accordance with Article 27. Similarly, if any soils/stones are imported onto the site from another construction site as a by-product, this will also be done in accordance with Article 27. It is not envisaged that article 27 will be used to import material onto this site.

If the material is deemed to be a waste, then removal and reuse/recovery/disposal of the material will be carried out in accordance with the Waste Management Acts 1996 – 2011 as amended, the Waste Management (Collection Permit) Regulations 2007 as amended and the Waste Management (Facility Permit & Registration) Regulations 2007 as amended. Once all available beneficial reuse options have been exhausted, the options of recycling and recovery at waste permitted and licensed sites will be considered.

In the event that contaminated material is encountered and subsequently classified as hazardous, this material will be stored separately to any non-hazardous material. It will require off-site treatment at a suitable facility or disposal abroad via Trans frontier Shipment of Wastes (TFS).

4.5 Tarmacadam

It is anticipated that the tarmacadam to be excavated at the site contains bitumen based materials and will be non-hazardous, however, historically (typically pre early 1980's) tar was manufactured using coal-tar pitch which is considered hazardous. Waste facilities may accept the waste tarmacadam without testing where the waste producer can confirm the age of the tar. However, if this is unclear, then coal-tar analysis may be required to confirm the presence/absence of hazardous substances. If the presence of coal-tar is confirmed, then the tarmac will require disposal as a hazardous waste.

4.6 Silt & Sludge

During the construction phase, silt and petrochemical interception should be carried out on runoff and pumped water from site works, where required. Sludge and silt will then be collected by a suitably licensed contractor and removed offsite.

4.7 Plastic

As plastic is now considered a highly recyclable material, much of the plastic generated during construction, primarily from packaging and material off-cuts, will be diverted from landfill and recycled. All recyclable plastic will be segregated at source and stored in a dedicated skip.

4.8 Cardboard

Cardboard packaging can also be recycled. Cardboard will be flattened and placed in a covered skip, to prevent it getting wet.

4.9 Timber

It is expected there will be timber waste generated from demolition activities, material off-cuts, damaged pieces and wooden pallets used for deliveries to site. Timber that is uncontaminated, i.e. free from paints, preservatives, glues etc., will be stored on site in a designated area for collection and recycling by a nominated waste contractor.

4.10 Metal

Steel is highly recyclable; there are numerous companies that will accept these materials. A segregated skip will be available for storage of metals on site pending recycling.

4.11 Plasterboard

There are currently a number of recycling services for plasterboard in Ireland. The Waste Manager will ensure that oversupply of plasterboard in the material deliveries is kept to a minimum. Excess plasterboard will be stored in a separate skip, pending collection for recycling.

4.12 Glass

A designated skip will be provided for any broken or other waste glass, which can then be recycled. The Waste Manager will liaise with the nominated waste contractor to establish any specific segregation requirements for waste glass (e.g. by colour or type).

4.13 Hazardous Materials

During actual construction activities, on-site storage of any hazardous wastes produced will be minimised, with off-site removal organised on a regular basis. Storage of all hazardous wastes on site will be undertaken so as to minimise exposure to on-site personnel (and the public) and to also minimise potential for environmental impacts. Hazardous wastes will be recovered wherever possible and failing this, disposed of appropriately and measures put in place to stop it occurring again.

4.14 Fuel/Oils

As fuels and oils are classed as hazardous materials, any on-site storage of fuel/oil, all storage tanks and all draw-off points will be bunded (or stored in double-skinned tanks) and located in a dedicated, secure area of the site. Provided that these requirements are adhered to and site crew are trained in the appropriate refuelling techniques, it is not expected that there will be any fuel/oil wastage at the site.

4.15 Asbestos

Removal of asbestos or ACMs will be carried out by a suitably qualified contractor and ACM's will only be removed from site by a suitably permitted/licenced waste contractor in accordance with S.I. No. 386 of 2006 Safety, Health and Welfare at Work (Exposure to Asbestos) Regulations 2006-2010. All material will be taken to a suitably licensed or permitted facility.

4.16 Non-Recyclable Waste

There will be a general skip or other receptacle provided for non-hazardous C&D waste not suitable for reuse or recycling. This skip will include general wet waste (mixed food waste and food packaging), polystyrene, contaminated cardboard, contaminated plastic etc. Prior to removal, the receptacle will be examined by the Waste Manager (or delegate) to determine those recyclable materials have not been placed in there. If this is the case, efforts will be made to determine the cause of the waste not being segregated correctly.

4.17 Waste Management System

All information will be entered in a waste management system to be maintained on site. The main waste stream arisings, including surplus materials, which are likely to be generated during the project are illustrated in Table 2.

Waste Type	European Waste Classification Code	Waste Classification
Concrete, bricks, tiles, ceramics	**17 01**	
Concrete [Foundations, floor slabs (in-situ & hollowcore), beams & columns]	17 01 01	Non-hazardous

Concrete (blocks / bricks)	17 01 01	Non-hazardous
Clay Bricks (walls)	17 01 02	Non-hazardous
Mixtures of, or separate fractions of concrete, bricks and ceramics (other than those mentioned in 17 01 06) (toilets / bathrooms)	17 01 07	Non-hazardous
Wood, Glass, Plastic	**17 02**	
Wood	17 02 01	Non-hazardous
Glass	17 02 02	Non-hazardous
Plastic	17 02 03	Non-hazardous
Metals (Including Their Alloys)	**17 04**	
Copper, bronze, brass (sheeting, pipes, handles)	17 04 01	Non-hazardous
Aluminum (roller shutters, flashings)	17 04 02	Non-hazardous
Lead (flashings)	17 04 03	Non-hazardous
Iron & steel (reinforcement, roof beams, roof trusses, radiators, pipes)	17 04 05	Non-hazardous
Cables other than those mentioned in 17 04 10	17 04 11	Non-hazardous
Soil (including excavated soil from contaminated sites), stones and dredged spoil	**17 05**	
Soil and Stones other than those mentioned in 17 05 03	17 05 04	Non-hazardous
Insulation Materials and Asbestos-Containing Construction Materials	**17 06**	

Insulation materials containing asbestos*	17 06 01*	Hazardous*
Insulation materials other than those mentioned in 17 06 01 and 17 06 03 (underfloor, cavity & roof insulation)	17 06 04	Non-hazardous
Construction materials containing asbestos*	17 06 05*	Hazardous*
Gypsum-Based Construction Material	**17 08**	
Gypsum-based construction materials other than those mentioned in 17 08 01	17 08 02	Non-hazardous
Insulation materials containing asbestos*	17 06 01*	Hazardous*
Insulation materials other than those mentioned in 17 06 01 and 17 06 03 (underfloor, cavity & roof insulation)	17 06 04	Non-hazardous
Construction materials containing asbestos*	17 06 05*	Hazardous*

Table 3 Main Waste Types and Associated EWC Code

Note:

1 The selected European Waste Classification (EWC) codes provided are provisional only. In a number of instances more than one EWC may be considered appropriate. Care should be taken to ensure that the waste collectors permit includes all EWC codes specified in the appropriate documentation. In addition, there will be a requirement for a technically competent person to assess waste as it arises and to decide as to the classification of the material in accordance with the Hazardous Waste List.

2 For the purposes of this plan it is assumed that all of the soil and stone waste arising from the project will be categorised as inert. Analysis may be required prior to acceptance at certain facilities to demonstrate this assessment.

* Waste marked with an asterisk is considered as a hazardous waste pursuant to Directive 91/689/EEC on Hazardous Waste, European Waste Catalogue and Hazardous Waste List (Valid from 01/01/20002) EPA, Ireland.

4.18 Areas

The areas subject to development are illustrated below. No known structurers are on site. Construction works will commence with site clearance and other associated ground works.

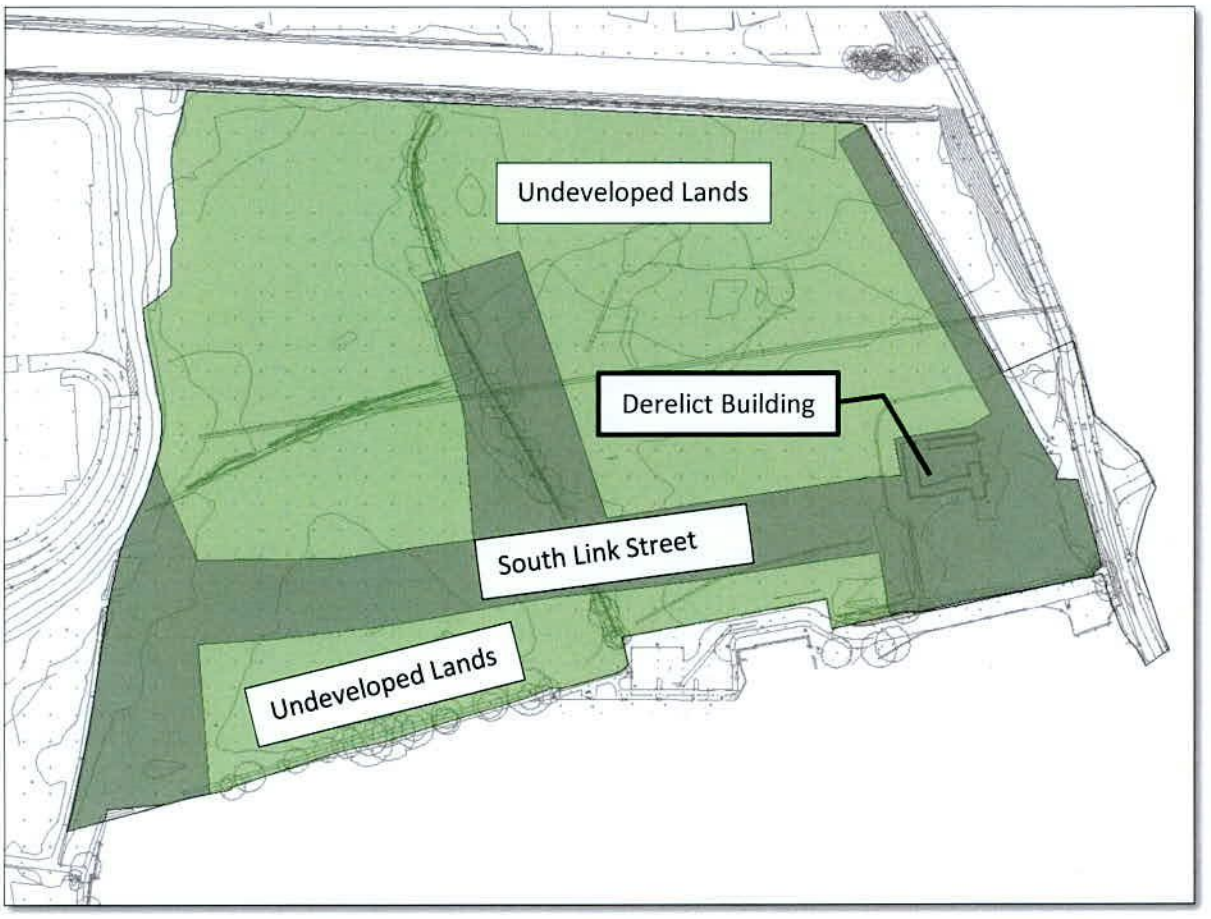

Figure 2 Areas

The area shown for the South Link Street is excluded from this report.

4.19 Predicted Waste Arising

At this stage of the development the figures provided should be considered as provisional only; however, they do provide an indication as to achievable recycling rates. At a minimum, the contractor will be obliged to aim for an overall recycling rate of 83%, in accordance with the Waste Management Plan for the Dublin Region, 2005 - 2010.

During the construction phase, it is estimated that the quantities of C&D wastes/material surpluses will arise as in Table 6.

4.20 Demolition Waste

No demolition is expected on site.

4.21 Construction Waste Generation

The EPA has produced figures for the C&D waste recorded in the National Waste Database. This included a percentage breakdown of waste showing the percentage of each waste type in the C&D stream.

The US EPA has also produced figures for the characterisation of building-related C&D waste. Figures for the C&D waste generated per m2 in the building industry, for mixed use developments from this study have been used as a waste range per m2 for this site.

Table 4 shows the breakdown of the C&D waste types (from Irish EPA figures) produced on a typical site.

Waste Type	%
Soil & Stones	83%
Concrete, Bricks, Tiles, Ceramics, Plasterboard	13%
Asphalt, Tar and Tar products	1%
Metals	1%
Other	2%
Total Waste	100%

Table 4 Construction Waste Generated on a Typical Irish Construction Site

Waste Type	Waste Tonnes
Soil & Stones*	61180.6
Concrete, Bricks, Tiles, Ceramics, Plasterboard	9582.5
Asphalt, Tar and Tar products	737.1
Metals	737.1
Other	1474.2
Total Waste	73711.5

Table 5 Total Waste*

*Excludes cut/fill and estimated topsoil

Waste Type	Waste	Reuse/Offsite		Recycle		Disposal	
Waste Types	**Tonnes**	**%**	**Tonnes**	**%**	**Tonnes**	**%**	**Tonnes**
Soil & Stones**	111520.6	85%	94792.49	0%	0.0	15%	16728.1
Concrete, Bricks, Tiles, Ceramics, Plasterboard	9582.5	20%	1916.50	75%	7186.9	5%	479.1
Asphalt, Tar and Tar products	737.1	0%	0.00	25%	184.3	75%	552.8
Metals	737.1	5%	36.86	80%	589.7	15%	110.6
Other	1474.2	10%	147.42	40%	589.7	50%	737.1
Total	124051.5		96893.27		8550.5		18607.7

Table 6 On and Off-Site Reuse, Recycle and Recovery Target Rates for Construction Waste

** includes an estimation for removal of topsoil only.

Any potentially contaminated material encountered will be classified and disposed of in accordance with Council Decision 2003/33/EC 10, which establishes criteria for the acceptance of waste at landfills. This is carried out by sampling and analysing the excavated material for a full waste acceptance criteria suite.

4.22 Waste Management Packages

The following table outlines the material type, its disposal method and handling procedure. Quantity of materials will be updated upon appointment of a Main Contractor.

Material	Quantity	Disposal Method	Handling Procedure
Planter clearing debris		Keep separate for reuse and/or wood sale	Keep separated designated areas on site
Clean dimensional and palette wood		Keep separate for reuse in onsite Demolition, or by site employees for either heating stoves or reuse in home projects.	Keep separated in designated areas on site. Place in "Clean Wood" container.
Plywood, OSB, particle board		Reuse Recycle	Reuse portion: Keep separated in designated areas on site. Landfill portion: Place in "Trash" container.
Painted or treated wood		Reuse Recycle	Reuse portion: Keep separated in designated areas on site. Landfill portion: Place in "Trash" skips.
Metals		Recycle at: Hammond lane Recycling	Keep separated in designated areas onsite. Place in "Metals" container.
Gypsum drywall		Recycle at: Panda Recycling Facility	Keep separate all demolished walls in a designated area.
Insulation		landfill	Keep separated in designated areas on site.
Flooring		landfill	Keep separated in designated areas on site.
Carpet and pad		Reuse or recycle with carpet manufacturer	
Glass		Glass Bottles: Recycle at: Panda Recycling Facility	Keep separated in designated areas on site. Place in "Glass/Plastic bottles/Metal Cans/Mixed

			Paper/Cardboard" container
Plastics		Plastic Bottles: Recycle Panda Recycling Faci Plastic bags: Reuse, landfill	Keep separated in designated areas on site. Place in "Glass/Plastic bottles/Metal Cans/Mixed Paper/ Cardboard" container
Beverage Containers		Recycle at: Panda Recycling Facility	Keep separated in designated areas on site. Place in "Glass/Plastic bottles/Metal Cans/Mixed Paper/ Cardboard" container
Cardboard		Recycle at: Panda Recycling Facility	Keep separated in designated areas on site. Place in "Glass/Plastic bottles/Metal Cans/Mixed Paper/ Cardboard" container

Table 7 Waste Management Packages

4.23 Tracking and Documentation Procedures for Off Site Waste

At the time of writing, the Main Contractor is yet to be appointment. Therefore, the waste stream destinations illustrated below is for information only. Upon appointment of the Main Contractor, the final destination of the Waste Stream Destinations will be confirmed with South Dublin County Council.

All waste will be weighed and documented. Waste will be weighed on a site weighbridge if available and also independently by the contractor (either by weighing mechanism on the truck or at the receiving facility). These records will be kept on site (both hard and soft copies).

All movement of waste and the use of waste contractors will be undertaken in accordance with the Waste Management Act 1996, Waste Management (Facility Permit & Registration) Regulations 2007, and the Waste Management (Collection Permit) Regulations 2007. This includes the requirement for all waste contractors to have a waste collection permit issued by local authority where the majority of the contractors business takes place. The Waste Manager will maintain a copy of all waste collection permits.

If the waste is being transported to another site, a copy of the waste permit or EPA Waste Licence for that site must be provided to the waste manager. If the waste is being shipped abroad, a copy of the Transfrontier Shipping (TFS) document must be obtained from South Dublin County Council (as the relevant authority on behalf of all local authorities in Ireland) and kept on site along with details of the final destination (permits, licences, etc.). A receipt from the final destination of the material will be kept as part of the on-site waste management records.

In all instances, the contractor will look for proof from the waste facility that they have received it.

Waste destination streams are for information only and subject to review upon appointment of Main Contractor. Permit/licence numbers to be checked prior to appointment of waste contractor.

Waste	EWC Code	Collected by	Sorting Facility	Recovery Facility	
MSW Municipal Waste	20 03 01	Advance Waste Recycling Ltd Glenowlen, Church Rd, Saggart, Co.Dublin – Permit No – NWCPO-14-11395-05	Thorntons Recycling Killeen Road, Killeen Road, Cherry Orchard, Ballyfermot, Dublin 10, or JFK Industrial Estate, Bluebell, Dublin 12	Recovery Facility TBC	Permit TBC
Mixed Dry Recyclables	20 03 01	Advance Waste Recycling Ltd Glenowlen, Church Rd, Saggart, Co.Dublin – Permit No – NWCPO-14-11395-05	Thorntons Recycling Killeen Road, Killeen Road, Cherry Orchard, Ballyfermot, Dublin 10, or JFK Industrial Estate, Bluebell, Dublin 12	Recovery Facility TBC	Permit TBC
Compost / Organic	20 01 08	Advance Waste Recycling Ltd Glenowlen, Church Rd, Saggart, Co.Dublin – Permit No – NWCPO-14-11395-05	Thorntons Recycling Killeen Road, Killeen Road, Cherry Orchard, Ballyfermot, Dublin 10, or JFK Industrial Estate, Bluebell, Dublin 12	Recovery Facility TBC	Permit TBC
Glass	20 01 02	Advance Waste Recycling Ltd Glenowlen, Church Rd, Saggart, Co.Dublin – Permit No – NWCPO-14-11395-05	Thorntons Recycling Killeen Road, Killeen Road, Cherry Orchard, Ballyfermot, Dublin 10, or JFK Industrial Estate, Bluebell, Dublin 12	Recovery Facility TBC	Permit TBC
Bulky Waste	20 03 07	Advance Waste Recycling Ltd Glenowlen, Church Rd, Saggart, Co.Dublin – Permit No – NWCPO-14-11395-05	Thorntons Recycling Killeen Road, Killeen Road, Cherry Orchard, Ballyfermot, Dublin 10, or JFK Industrial Estate, Bluebell, Dublin 12	Recovery Facility TBC	Permit TBC
Timber	17 02 01	Advance Waste Recycling Ltd Glenowlen, Church Rd, Saggart, Co.Dublin – Permit No – NWCPO-14-11395-05	Thorntons Recycling Killeen Road, Killeen Road, Cherry Orchard, Ballyfermot, Dublin 10, or JFK Industrial Estate, Bluebell, Dublin 12	Greenstar, Fassaroe, Bray, Co.Wicklow	Permit TBC

C&D Waste	17 09 04	Advance Waste Recycling Ltd Glenowlen, Church Rd, Saggart, Co.Dublin – Permit No – NWCPO-14-11395-05	Thorntons Recycling Killeen Road, Killeen Road, Cherry Orchard, Ballyfermot, Dublin 10, or JFK Industrial Estate, Bluebell, Dublin 12	Lagon Cement or Quinn Cement for incineration	Permit TBC
Plastic	17 02 03	Advance Waste Recycling Ltd Glenowlen, Church Rd, Saggart, Co.Dublin – Permit No – NWCPO-14-11395-05	Thorntons Recycling Killeen Road, Killeen Road, Cherry Orchard, Ballyfermot, Dublin 10, or JFK Industrial Estate, Bluebell, Dublin 12	Van Werven, Ballycollin, Dublin 15	Permit TBC
Plasterboard	17 08 / 17 08 02	Advance Waste Recycling Ltd Glenowlen, Church Rd, Saggart, Co.Dublin – Permit No – NWCPO-14-11395-05	Thorntons Recycling Killeen Road, Killeen Road, Cherry Orchard, Ballyfermot, Dublin 10, or JFK Industrial Estate, Bluebell, Dublin 12	Skiptrans, Greenogue Business Park, Co. Dublin	Permit TBC
Metal	17 04/17 04 01/17 04 03/17 04 05/17 04 11	Advance Waste Recycling Ltd Glenowlen, Church Rd, Saggart, Co.Dublin – Permit No – NWCPO-14-11395-05	Thorntons Recycling Killeen Road, Killeen Road, Cherry Orchard, Ballyfermot, Dublin 10, or JFK Industrial Estate, Bluebell, Dublin 12	Hammond Lane Metal, Dublin Port, Dublin 2.	Permit TBC

Table 8 Waste Stream Destinations

The above table is for illustrative purposes only. The destination of waste packages will be at the discretion of the Main Contactor.

5 TRAINING

5.1 Introduction

A member of the construction team will be appointed as the project waste manager to ensure commitment, operational efficiency and accountability during the C&D phases of the project.

5.2 Waste Manager Training and Responsibilities

The nominated waste manager will be given responsibility and authority to select a waste team if required, i.e., members of the site crew that will aid them in the organisation, operation and recording of the waste management system implemented on site. The waste manager will have overall responsibility to oversee, record and provide feedback to the client on everyday waste management at the site. Authority will be given to the waste manager to delegate responsibility to sub-contractors, where necessary, and to coordinate with suppliers, service providers and sub-contractors to prioritise waste prevention and material salvage.

The waste manager will be trained in how to set up and maintain a record keeping system, how to perform an audit and how to establish targets for waste management on site. The waste manager will also be trained in the best methods for segregation and storage of recyclable materials, have information on the materials that can be reused on site and be knowledgeable in how to implement this C&D WMP.

5.3 Site Crew Training

Training of site crew is the responsibility of the waste manager and, as such, a waste training program should be organised. A basic awareness course will be held for all site crew to outline the C&D WMP and to detail the segregation of waste materials at source. This may be incorporated with other site training needs such as general site induction, health and safety awareness and manual handling.

This basic course will describe the materials to be segregated, the storage methods and the location of the Waste Storage Areas (WSAs). A sub-section on hazardous wastes will be incorporated into the training program and the particular dangers of each hazardous waste will be explained.

5.4 Proforma

The following proforma will be used to manage, motivate and reward the full adoption of the details outlined in the Construction & Waste Management Plan

RECYCLING OPERATIONS

Action ***	WHEN	WHO
☐ Choose bins/collection methods		
☐ Order bins - oversee delivery		
☐ Site bins/collection sites for optimum convenience		
☐ Sort or process wood		
☐ Sort or process metal		
☐ Sort or process cardboard		
☐ Sort or process drywall		
☐ Sort or process _____(material)		
☐ Schedule material pickups/drop-offs		
☐ Protect materials from contamination		
☐ Document material pickups/drop-offs		

*** Depending on the service option chosen, these may be the responsibility of the field personnel, the hauler, a full-service recycling contractor, or the subcontractors.

COMMUNICATION PLAN - Except for mandatory items (*), check other items intended to be used.

Action	Who	When	Completed
☐ Complete Construction Waste Mgmt. Plan*			
☐ Hold Orientation/Kick-off Meeting*			
☐ Progress Update in Weekly Job-Site Meetings*			
☐ Encourage Just-In-Time Deliveries			
☐ Post Targeted Materials (Signage)			
☐ Distribute Tip Sheets for Job-Site Personnel			
☐ Post Goals/Progress (Signage)			

MOTIVATION PLAN - Except for mandatory items (*), check other items intended to be used.

Action	Who	When Completed
☐ Use formal agreements committing Subs to program		
☐ Require Mis-Sorters to Re-Sort Bin		
☐ Provide Stickers, T-Shirts, or Hats		
☐ Public Recognition of Participating Subs		
☐ Letters of Recognition		
☐ Awards Luncheon		

EVALUATION PLAN - Except for mandatory items (*), check other items intended to be used.

Action	Who	When
Completed		
☐ Perform Short Form Waste Audit		
☐ Perform Full Waste Audit		
☐ Perform Mid-Course Assessment		
☐ Perform Monthly Cost and Materials Tracking*		
☐ Perform Final Evaluation*		

6 RECORDS

6.1 Introduction

Records will be kept for all waste material which leaves the site, either for reuse on another site, recycling or disposal. A recording system will be put in place to record the C&D waste arising's on site. A copy of the Waste Collection Permits, CORs, Waste Facility Permits and Waste Licences will be maintained on site at all times.

The waste manager or delegate will record the following.

1. Waste taken for reuse off-site.
2. Waste taken for recycling.
3. Waste taken for recovery.
4. Waste taken for disposal; and
5. Reclaimed waste materials brought on-site for reuse.

For each movement of waste off-site, a signed docket will be obtained by the Waste Manager from the contractor, detailing the weight and type of the material and the source and destination of the material. This will be carried out for each material type. This system will also be linked with the delivery records. In this way, the percentage of C&D waste generated for each material can be determined.

The system will allow the comparison of these figures with the targets established for the recovery, reuse and recycling of C&D waste presented earlier and to highlight the successes or failures against these targets.

7 AUDIT PROCEDURE

7.1 Responsibility for Waste Audit

The appointed waste manager will be responsible for conducting a waste audit at the site during the C&D phase of the development.

7.2 Review of Records and Identification of Corrective Actions

A review of all the records for the waste generated and transported off-site should be undertaken mid-way through the project. If waste movements are not accounted for, the reasons for this should be established in order to see if and why the record keeping system has not been maintained. The waste records will be compared with the established recovery/reuse/recycling targets for the site.

Each material type will be examined, in order to see where the largest percentage waste generation is occurring. The waste management methods for each material type will be reviewed in order to highlight how the targets can be achieved.

Waste management costs will also be reviewed.

Upon completion of the C & D phase, a final report will be prepared, summarising the outcomes of waste management processes adopted and the total recycling/reuse/recovery figures for the development.

References

1. Waste Management Act 1996 (S.I. No. 10 of 1996) as amended by the Waste Management (Amendment) Act 2001 and associated regulations:
2. Waste Management (Facility Permit and Registration) Regulations, S.I No. 821 of 2007 as amended 2008 (S.I No. 86 of 2008).
3. Waste Management (Collection Permit) Regulations S.I No. 820 of 2007 as amended 2008 (S.I No 87 of 2008).
4. Waste Management (Packaging) Regulations 2003 (S.I. No. 61 of 2003)
5. Waste Management (Licensing) Regulations 2000 (S.I 185 of 2000) as amended 2002 (S.I 336 of 2002)
6. Waste Management (Planning) Regulations 1997 (S.I. 137 of 1997)
7. Waste Management (Landfill Levy) Regulations 2002 (S.I 86 of 2002)
8. Eastern Midlands Region Waste Management Plan 2015-2021.
9. Waste Management – Changing Our Ways, A Policy Statement, Department of Environment and Local Government, 1998.
10. "Best Practice Guidelines on the Preparation of Waste Management Plans for Construction and Demolition Projects", Department of the Environment, Heritage and Local Government, 2006.
11. "Construction and Demolition Waste Management – a handbook for Contractors and Site Managers", FÁS and the Construction Industry Federation, 2002.
12. Characterisation of Building-Related Construction and Demolition Debris in the United States, US EPA, June 1998.
13. 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.
14. Council Directive 1999/31/EC, on the landfill of waste
15. Notification of by-product decisions by economic operators under Article 27 of the European Communities (Waste Directive) Regulations 2011, S.I. No. 126 of 2011
16. SOUTH DUBLIN COUNTY COUNCIL Construction and Demolition Waste Management Plan Pre-Planning Guidance
17. South Dublin County Council, South Dublin County Council Development Plan 2016-2022 (2015)

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