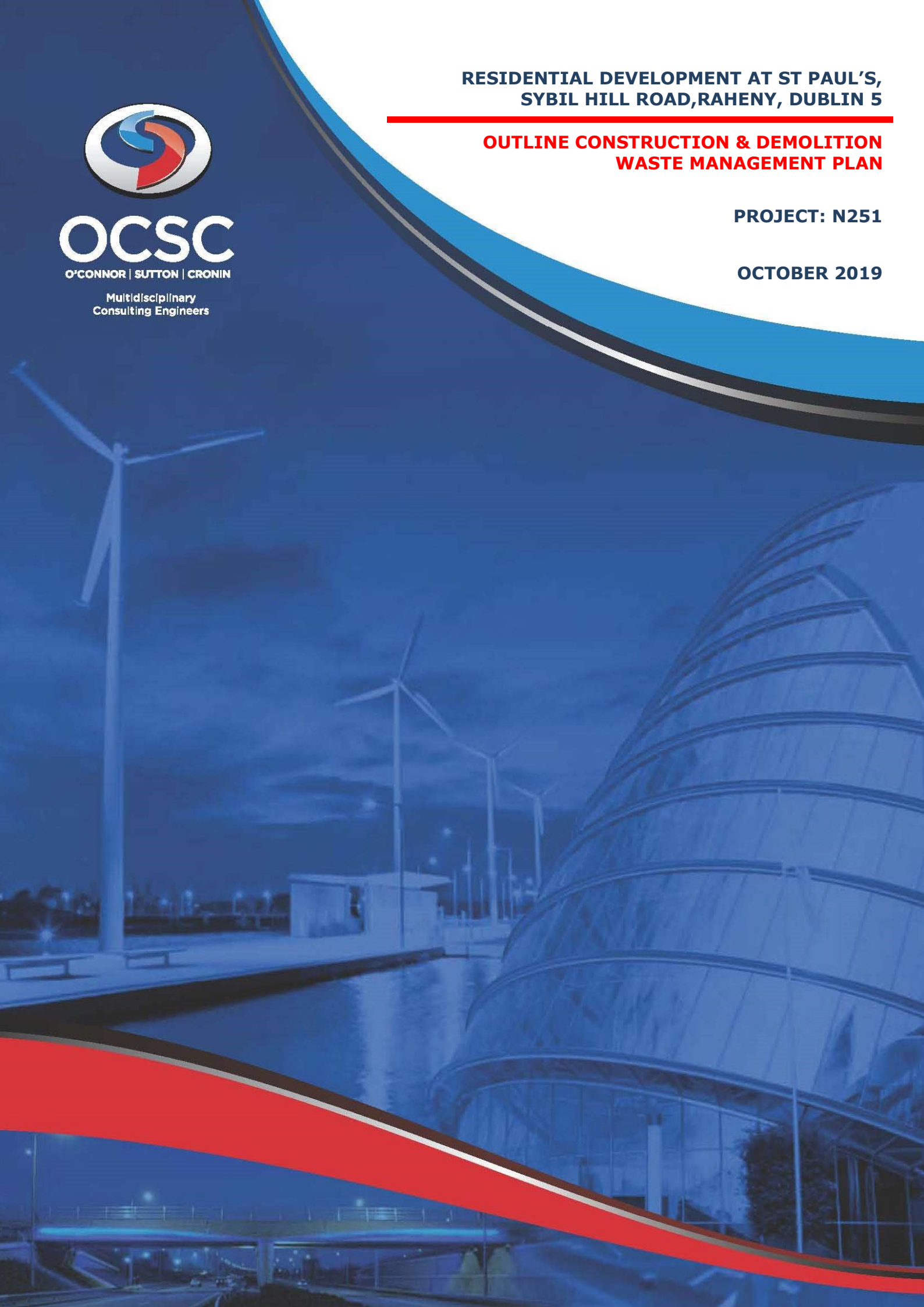
OCSC
O'CONNOR | SUTTON | CRONIN
Multidisciplinary
Consulting Engineers

RESIDENTIAL DEVELOPMENT AT ST PAUL'S, SYBIL HILL ROAD,RAHENY, DUBLIN 5

OUTLINE CONSTRUCTION & DEMOLITION WASTE MANAGEMENT PLAN

PROJECT: N251

OCTOBER 2019



RESIDENTIAL DEVELOPMENT AT ST PAUL'S, SYBIL HILL ROAD, RAHENY, DUBLIN 5

OUTLINE CONSTRUCTION & DEMOLITION WASTE MANAGEMENT PLAN

PROJECT: N251

OCTOBER 2019

OUTLINE DEMOLITION WORKS
AT
ST PAUL'S,
SYBIL HILL ROAD, RAHENY, DUBLIN 5

Outline Construction & Demolition Waste Management Plan

OCSC
O'CONNOR | SUTTON | CRONIN
Multidisciplinary
Consulting Engineers

NOTICE

Job No.: N251			**Document Ref.:** S:\1_OCSC_CURRENT_DRAWINGS\N__JOBS\Job-N251\Documents\Word\CDWMP			
Rev.	Status	Authors	Checked	Reviewed	Authorised	Issue Date
8						
7						
6						
5						
4						
3	Issued	AH	OG	PR	MOR	10/10/2019
2	Issued	AH	AH	PR	MOR	05/10/2019
1	Issued	OG	AH	AH	MOR	30/09/2019
0	Draft	JB	AH	AH	MOR	27/08/2019

RESIDENTIAL DEVELOPMENT AT ST PAUL'S, SYBIL HILL ROAD, RAHENY, DUBLIN 5

OUTLINE CONSTRUCTION & DEMOLITION WASTE MANAGEMENT PLAN

CREKAV TRADING GP LIMITED
O'CONNOR SUTTON CRONIN & ASSOCIATES
MULTIDISCIPLINARY CONSULTING ENGINEERS
PROJECT NO. N251

October 2019

Contents

1.0 INTRODUCTION

OCSC were commissioned by Crekav Trading GP Limited to prepare a Construction & Demolition Waste Management Plan (CDWMP) in respect of the development at St Paul's, Sybil Hill Road, Raheny, Dublin 5.

The site is bordered by the Vincentian Community Residence to the West. St Anne's Park to the North, South and East which is owned and managed by Dublin City Council. The Naniken Stream is located approx. 100m north of the site within St Anne's Park. The site is zoned Z15 "To protect and provide for institutional and community uses". in the current Dublin City Development plan 2016-2022. The total site comprises approximately 6.7 hectares. The development will consist of the construction of a residential development set out in 9 no. blocks, ranging in height from 5 to 9 storeys accommodating 657 no. apartments, residential tenant amenity and a crèche. At basement level the site will accommodate car parking spaces, bicycle parking, storage, services and plant areas. Landscaping will include extensive communal amenity areas, and a proposed significant area of public open space.

The proposed development also includes for the widening and realignment of an existing vehicular access onto Sybil Hill Road and the demolition of an existing pre-fab building to facilitate the construction of an access road from Sybil Hill Road between Sybil Hill House (a Protected Structure) and St Paul's College incorporating upgraded accesses to Sybil Hill House and St Paul's College and a proposed pedestrian crossing on Sybil Hill Road. The proposed road will entail the demolition of a 15m section of a block wall on the eastern boundary of St Paul's College. The proposed development also includes for the laying of a foul water sewer in Sybil Hill Road and the routing of surface water discharge from the site via St Anne's Park to the Naniken River and the demolition and reconstruction of existing pedestrian stream crossing in St Anne's Park with integral surface water discharge to Naniken River. This CDWMP has been prepared with reference to the following legislation and plans:

- The Waste Management Act 1996 – 2011, Amendments & Associated Regulations;
- Protection of the Environment Act 2003 as amended;
- The Litter Pollution Act 1997 as amended;

Pending appointment of the successful Contractor(s) they will need to adopt and adapt this report issuing further levels of required information.

The CDWMP is designed so as to ensure the highest possible levels of waste reduction, waste reuse and waste recycling are achieved for the proposed development. Specifically, the CDWMP aims to achieve waste prevention, maximum recycling and recovery of waste. The plan has as a central tenet, the diversion of waste from landfill wherever possible.

The CDWMP describes the applicable legal and policy framework for C&D waste management in Ireland (both nationally and regionally), it also estimates the category and quantity of waste generated by the proposed development and makes recommendations for the bespoke management of the various waste streams. The plan also provides guidance on collection and transport of waste to prevent issues associated with litter or more serious environmental pollution (e.g. contamination of soil or water resources).

2.0 SITE LOCATION & PROPOSED DEVELOPMENT OUTLINE

The site is located at St Paul's College, Sybil Hill Road, Dublin 5. The site is bordered by the Vincentian Community Residence to the West. St Anne's Park to the North, South and East which is owned and managed by Dublin City Council. The Naniken Stream is located approx. 100m north of the site within St Anne's Park. The exact site location is highlighted in Figure 1 following.

Figure 1: Site Location

The site is zoned Z15 "To protect and provide for institutional and community uses". in the current Dublin City Development plan 2016-2022. The total site comprises approximately 6.7 hectares.

2.1 Proposed Works: Demolition

The existing building to be demolished is a prefabricated school unit, shown below in Figure 1 in red. It is assumed for the purposes of this report that prefabricated unit is serviced with electricity, gas and water.

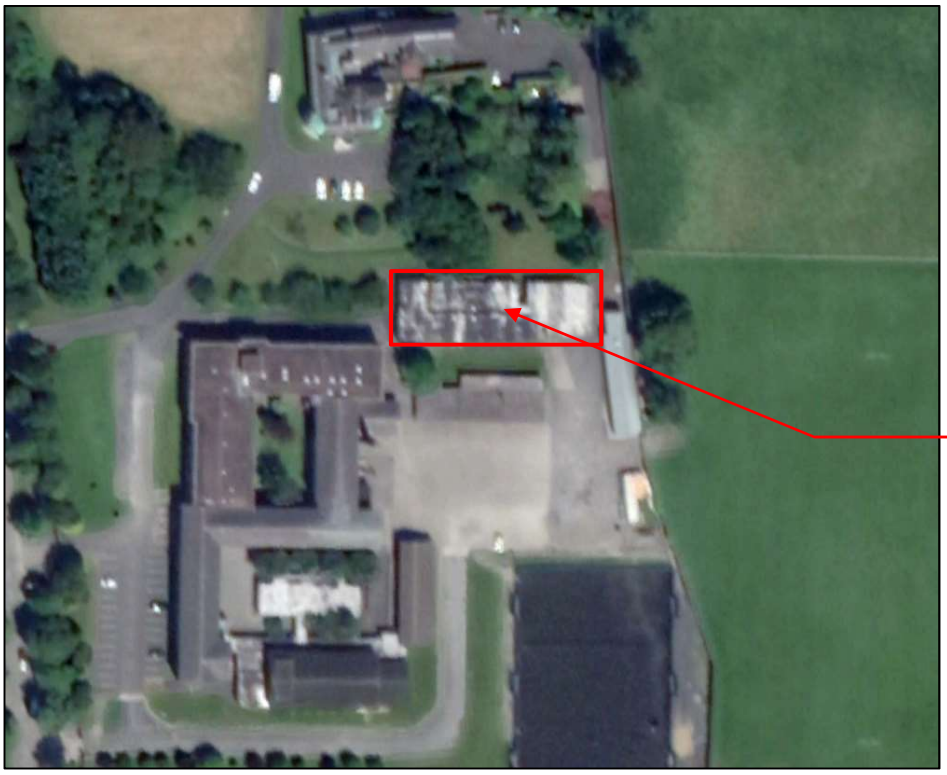


Figure 2: Prefabricated School Unit

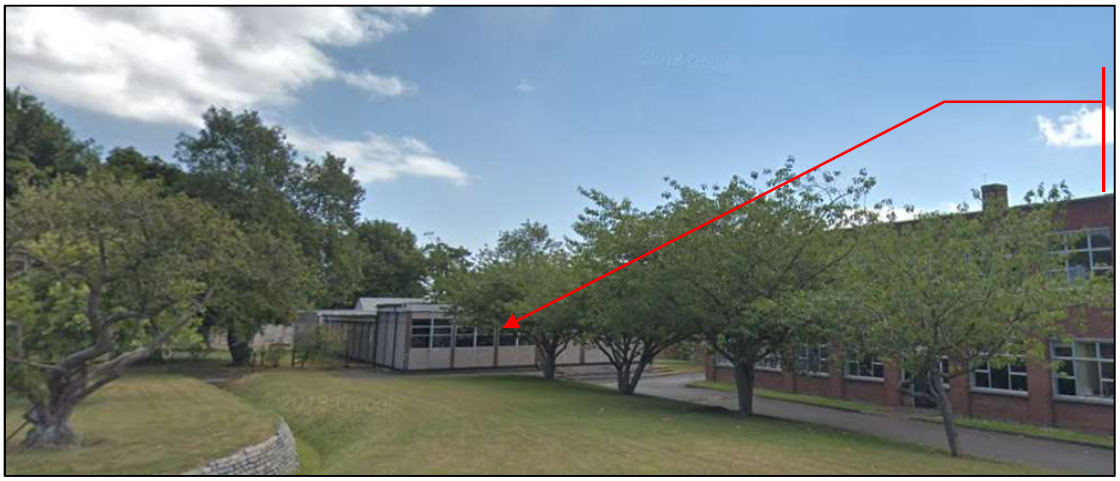


Photo 1: Prefabricated School Unit

The demolition will be for the existing building below the existing ground floor slab level including hardstanding areas. There will be no removal of

foundations, soil and services below ground level at this stage. The major element of work will be the removal of the above ground elements.

The small pedestrian crossing over the Naniken Stream, shown below in Photo 2, is also to be demolished and replaced.

Photo 2: Stream Crossing

The bridge is just under 2m tall, 7m wide, including wing walls, and 6m long. Consisting of 73m^3 of reinforced concrete. The fence railing is comprised of approximately 100 number 20mm diameter iron bars of 1m length.

The last elements of the demolition works are associated with the upgraded entrance road and footpath and consist of the removal of the existing gate and 12m of the existing 0.2m by 0.3m brick wall and steel palisade fencing, shown overleaf in Photo 3, and a 15m stretch of the 0.3m by 2m block wall and steel fencing shown overleaf in Photo 4. Totalling approximately 10m^3 of block and brickwork.

Photo 3: Entrance Gate and Wall on Sybil Hill Road

Photo 4: Eastern Boundary Wall – St Paul's College

3.0 PREDICTED WASTE ARISINGS

3.1 WASTE CATEGORISATION

Typical non-hazardous and hazardous waste streams generated by construction and demolition at typical sites are shown below along with their accompanying European Waste Code (EWC) Classification.

Waste Materials Categorisation		
Category	Description	Code
Non-Hazardous	Metals	17 04
	Wood, glass, plastic	17 02
	Soil, stones, dredged soils	17 05
	Gypsum based materials	17 08
	Cardboard	15 01 01
	Glass	17 02 02
	Bituminous mixtures, coal tar, tar products	17 03
	Concrete, bricks, tiles, ceramics	17 01
Hazardous	Electrical and Electronic Components	16 02
	Liquid Fuels	13 07
	Wood Preservatives	03 02
	Batteries	16 06
	Soil and stones containing dangerous substances	17 05 03
	Waste construction material containing asbestos	17 06 05
	Other construction and demolition wastes containing dangerous substances	17 09 03

Table 1: C&D Waste Categories

3.2 NON HAZARDOUS ARISINGS

During the demolition phase an amount of materials will arise. Details on type and quantities are set out in Table 3 later. Materials will include glass, concrete, masonry, tiles, ceramics, plasterbroad, timber, steel and tarmac.

The classification of materials as non-hazardous and/or hazardous will be based on the www.hazwasteonine.com web based system as well as classification using Waste Acceptance Criteria in accordance with the European Communities (EC) Council Decision 2003/33/EC, which establishes criteria for the acceptance of waste at landfills.

3.3 HAZARDOUS ARISINGS

3.3.1 Contaminated Soil

The demolition work will not include the removal of the ground floor slab of the existing buildings. No soil beneath the buildings will be excavated. It is not therefore expected that there will be any contaminated soils encountered or arising as part of these enabling works.

It is noted that any soil generated as part of the works will be managed to ensure appropriate handling and disposal in accordance with Irish and EU legislative requirements. It is proposed that prior to any bulk excavation that a suitably qualified professional will be engaged to take samples of the subject area for the excavation to test for contamination and a suitable strategy will be drawn up and submitted to detailing the method of dealing with any contaminated material found.

3.3.2 Fuels/Oils

In the event there is to be any on site storage of fuels or oils during the demolition process then all storage tanks and draw-off points will be bunded 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.

3.3.3 Asbestos

OHSS Ltd. completed an Asbestos Surveys in August of 2019. Asbestos containing materials (ACMs) were identified in the existing buildings to be demolished in substructure, the ceiling and walls, bitumen adhesives and cement on site.

The removal of asbestos must be carried out by a suitably qualified 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. This design note will be included in the tender for the demolition contractor.

3.3.4 Other Hazardous Substances

Paints, glues, adhesives and other known hazardous substances will be stored in designated areas. They will generally be present in small volumes only and associated waste volumes generated will be kept to a minimum. Wastes will be stored in appropriate receptacles pending collection by an authorised waste contractor.

Outline surveys of the existing buildings have been undertaken by the Client. Taking into account the age, type and nature of construction it is not expected that any paints, glues, and adhesives will be encountered.

WEEE (containing hazardous components), printer toner/cartridges, batteries (Lead, Ni-Cd or Mercury) and/or fluorescent tubes and other mercury containing waste may be generated from during demolition activities or temporary site offices. These wastes (if encountered) will be stored in appropriate receptacles in designated areas of the site pending collection by an authorised waste contractor.

4.0 WASTE MANAGEMENT IN IRELAND

4.1 OVERARCHING LEGISLATION

The overarching legislative instruments governing waste management in Ireland are as follows:

- Waste Management Act 1996 (S.I. No. 10 of 1996) as amended 2001 (No. 36 of 2001), 2003 (No. 27 of 2023) and 2001 (No. 20 of 2011)
- Sub-ordinate legislation includes:
    - European Communities (Waste Directive) Regulations 2011 (S.I. 126 of 2011) as amended 2011 (S.I. No. 323 of 2011) and 2016 (S.I. 315 of 2016);
    - Waste Management (Collection Permit) Regulations 2007 (S.I. No. 820 of 2007) as amended 2008 (S.I. No. 87 of 2008), 2015 (S.I. No. 197 of 2015) and 2016 (S.I. No. 24 and 346 of 2016);
    - Waste Management (Facility Permit and Registration) Regulations 2007 (S.I. No. 821 of 2007) as amended 2008 (S.I. No. 86 of 2008), 2014 (S.I. No, 320 and No. 546 of 2014) and 2015 (S.I. No. 198 of 2015);
    - Waste Management (Licensing) Regulations 2000 (S.I. No. 185 of 2000) as amended 2004 (S.I. No. 395 of 2004), 2010 and (S.I. No. 350 of 2010);
    - Waste Management (Packaging) Regulations 2014 (S.I. 282 of 2014) as amended 2003 (S.I. No. 61 of 2003) as amended 2004 (S.I. No. 871 of 2004), 2006 (S.I. No. 308 of 2006) and 2007 (S.I. No. 798 of 2007);
    - Waste Management (Planning) Regulations 1997 (S.I. No. 137 of 1997);
    - Waste Management (Landfill Levy) Regulations 2015 (S.I. No. 189 of 2015) as amended 2011 (S.I. No. 434 of 2011) as amended 2012 (S.I. No. 221 of 2012);
    - European Union (Waste Electrical and Electronic Equipment) Regulations 2014 (S.I. No. 149 of 2014);

- European Union (Batteries and Accumulators) Regulations 2014 (S.I. No. 283 of 2014) as amended 2014 (S.I. No. 349 of 2014) and 2015 (S.I. No. 347 of 2015);
- Waste Management (Food Waste) Regulations 2009 (S.I. 508 of 2009);
- European Union (Household Food Waste and Bio-waste) Regulation 2015 (S.I. No. 191 of 2015);
- Waste Management (Hazardous Waste) Regulations 1998 (S.I. No. 163 of 1998) as amended 2000 (S.I. No. 73 of 2000);
- Waste Management (Shipments of Waste) Regulations 2007 (S.I. No. 419 of 2007) as amended by European Communities (shipments of Hazardous Waste) Regulation, 1998 (S.I. No. 147 of 1998);
- Waste Management (Movement of Hazardous Waste) Regulations 1998 (S.I. No. 147 of 1998);
- European Communities (Transfrontier Shipment of Waste) Regulations 1998 (S.I. No. 147 of 1998) as amended 1994 (SI 121 of 1994);
- European Union (Properties of Waste which Render it Hazardous) Regulations 2015 (S.I. No. 233 of 2015).

- Litter Pollution Act 1997 (S.I. No. 12 of 1997) as amended by Protection of the Environment (amendment) Act 2003 as amended;
- Planning and Development Act 2000 as amended (S.I. No. 30 of 2010) and 2015 (S.I. No. 310 of 2015);
- Protection of the Environment Act 1992 as amended 2003 (S.I. No. 413 of 2003) and by Planning and Development Act 2000 as amended (S.I. No. 30 of 2010).

The above Acts and Regulations transpose European Union policy and Directives into Irish law. The over-riding 'Duty of Care' principle implies that the producer is responsible for waste from the time it is generated through until its legal disposal (including its method of disposal.). As it is not practical in most cases for the waste producer to physically transfer all waste from where it is produced to the final disposal area, waste contractors will be employed to transport waste to the final waste disposal site. In

addition, the 'Polluter Pays' principle means that 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 (for transportation and disposal/recovery/recycling of waste).

It is imperative then that the developer ensures that waste companies engaged by construction contractors are legally compliant with respect to waste transport and disposal/recovery/recycling. This includes the requirement that a contactor 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. In this regard, a waste collection permit, issued by the National Waste Collection Permit Office (NWCPO), must be held by every waste contractor engaged on the project. Waste receiving facilities must also be appropriately permitted or licensed to accept waste. Operators of such facilities cannot 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 and Amendments or a waste licence granted by the Environmental Protection Agency (EPA). The permit/licence held will specify the type and quantity of waste able to be received, stored, sorted, recycled and/or disposed of at the specified site.

4.2 NATIONAL WASTE MANAGEMENT POLICY

The 1998 '*Changing Our Ways*' policy document by the Irish Government identified objectives for the prevention, minimisation, reuse, recycling, recovery and disposal of waste in Ireland. The target for C&D waste in this report was to recycle at least 50% of C&D waste within an initial five year period with incremental increases to at least 85% by 2013. A waste industry task force of the *Forum for the Construction Industry* released '*Recycling of Construction and Demolition Waste*' recommending the development of a voluntary construction industry programme to meet Government objectives for the recovery of C&D waste. '*A Resource Opportunity - Waste Management Policy in Ireland*' published in 2012 stresses the environmental and economic benefits of better waste management, particularly in relation to waste prevention. In respect of C&D waste, the report commits to

undertaking a review of specific producer responsibility requirements for C&D projects above a certain threshold.

The National Construction and Demolition Waste Council (NCDWC) published '*Best Practice Guidelines for the Preparation of Waste Management Plans for Construction and Demolition Projects*' in 2006 in conjunction with the Department of the Environment, Heritage and Local Government (DoEHLG). 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 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; and
- Details of consultation with relevant bodies i.e. waste recycling companies, Dublin County Council etc.

In accordance with Section 3 of the Guidelines Construction and Demolition Waste Management plans should be submitted as part of development proposals for projects in excess of any of the following thresholds:

- New residential development of 10 units or more;
- New developments other than above, including institutional, educational, health and other public facilities, with an aggregate floor area in excess of 1,000 sq metres;
- Demolition/renovation/refurbishment projects generating in excess of 100 cubic metres in volume of construction and demolition waste, and;
- Civil engineering projects in excess of 500 cubic metres of waste materials used for development works on the site.

A Construction and Demolition Waste Management Plan, as a minimum, should include provision for the management of all construction and demolition waste arising on site, and make provision for the re-use of said material and/or the recovery or disposal of this waste to authorised facilities by authorised collectors. Where appropriate, excavated material from development sites should be reused on the subject site.

The development requires a CDWMP under the following two criteria:

- New residential development of 10 houses or more;
- Demolition/renovation/refurbishment projects generating in excess of 100m^3 in volume, of waste.

These guidance documents are considered to define best practice for construction and demolition projects in Ireland and describe how construction and demolition projects are to be undertaken such that environmental impacts and risks are minimised and maximum levels of waste recycling are achieved.

4.3 REGIONAL WASTE MANAGEMENT PLANS

The proposed development is located within the Dublin County Council (DCC) administrative area. A new Regional Waste Management Plan for the Eastern-Midland Region was launched in November 2014 which covers the four Dublin Councils (DCC, FCC, DRCC & SDCC) as well as Kildare, Laois, Longford, Louth, Meath. Offaly, Wicklow and Westmeath. The final Eastern-Midland Region Waste Management Plan (EMWR) was published in late May 2015 to replace the 'Waste Management Plan for the Dublin Region 2005 – 2010'. This was replaced due to changing National policy as set out in '*A Resource Opportunity: Waste Management Policy in Ireland*' and changes being enacted by the Waste Framework Directive (2008/98/EC). The Plan's implementation will be led by the new Eastern-Midlands Regional Waste Office based in Dublin City Council.

The three key objectives of the Eastern-Midlands Region Waste Management Plan are:

- Prevent waste: a reduction of one per cent per annum in the amount of household waste generated over the period of the plan.
- More recycling: increase the recycle rate of domestic and commercial waste from 40 to 50 per cent by 2020.
- Further reduce landfill: eliminate all unprocessed waste going to landfill from 2016.

The strategic approach of the new plan is to place a stronger emphasis on preventing waste and material reuse, instead focusing on increasing the collection of quality materials to improve recycling. The plan seeks to further reduce the role of landfill in favour of higher value recovery options. The objective Eastern Midlands Region Waste Management Plan is to achieve more sustainable waste management practices in the C&D sector. The recycling rates for C&D waste adopted by the EMWR are 82%. The EC (Waste Directive) Regulations, 2011 sets a 70% target for the resuse, recycling and recovery of man-made C&D waste in Ireland by December 2020. It is reported by the EPA that this has already been achieved with a 97% waste recovery rate. This requires the following actions:

- The development company must employ best practice at the design, planning and construction stage to ensure waste prevention and recycling opportunities are identified and implemented;
- Waste collectors are required to introduce source-separation of recyclables and introduce graduated charges to incentivise better site practices;
- Local Authorities will ensure the voluntary industry code is applied to development control, to regulate the collection and treatment of waste to meet the Plan objectives, and also work to develop markets for recycled materials.

The Dublin City Development Plan 2016-2022 provides policies and objectives in relation to waste management in South Dublin which are reflective of overarching EU, National and Regional policy and legislation.

The main objective of DCC current waste management development plan is to promote an increase in the amount of waste re-used and recycled consistent with the Regional Waste Management Plan and Waste Hierarchy and facilitate recycling of waste through adequate provision of facilities and good design in new developments. Individual waste objectives and actions for DCC areas relevant to the proposed development are:

- Objectives:
  - SIO15: To provide for municipal/public recycling and recovery facilities in accessible locations throughout the city.
  - SIO16: To require the provision of adequately sized recycling facilities in new commercial and large-scale residential developments, where appropriate.
  - SIO17: To promote the re-use of building materials, recycling of demolition material and the use of materials from renewable sources. In all developments in excess of 10 housing units and commercial developments in excess of 1000 sq.m, a materials source and management plan showing type of materials/proportion of re-use/recycled materials to be used shall be implemented by the developer.
  - SIO18: To implement the current Litter Management Plan through enforcement of the litter laws, street cleaning and education and awareness campaigns. SIO19: To implement the Eastern-Midlands Regional Waste Management Plan 2015–2021 and achieve the plan targets and objectives.

- Actions:
  - Support and facilitate the separation of waste at source into organic and non-organic streams or other waste management systems that divert waste from landfill and maximise the potential for each waste type to be re-used and recycled or

composted and divert organic waste from landfill, in accordance with the National Strategy on Biodegradable Waste (2006).

- Promote an increase in the amount of waste re-used and recycled consistent with the Regional Waste Management Plan and Waste Hierarchy and facilitate recycling of waste through adequate provision of facilities and good design in new developments.

5.0 PROPOSED SITE WASTE MANAGEMENT PLAN

5.1 DEMOLITION WASTE

The approximate combined demolition areas of the existing structures is c.700m^2. The demolition of the existing buildings and hardstanding areas is estimated to give rise to a total of 183 tonnes of mixed waste as set out in Table 3 below.

5.2 CONSTRUCTION WASTE

The Environmental Protection Agency (EPA) produce figures on the amounts of waste generated by various developments. These figures are contained in EPA databases. The split between individual C&D waste categories is shown in Table 2.

Waste Types	%
Soil & Stones	51
Concrete, Bricks, Tiles, Ceramics, Plasterboard	39
Asphalt, Tar and Tar products	2
Metals	2
Other	6
Total Waste	100

Table 2: Breakdown of C&D Waste Materials at a Typical Site

Further figures are available for typical overall waste generation figures for construction sites based on the type and scale of development. Therefore by using the EPA category split figures and the industry standard overall waste generation figures, the C&D waste arising's for the subject site can be estimated – Table 3 over.

The predicted waste amounts shown in the table have been derived on this basis with amendments and additions being made for bespoke site data.

Construction Waste: Reuse, Recovery, Recycle & Disposal							
Waste Type	Qty	Reuse/Recover		Recycle		Disposal	
		%	tonnes	%	tonnes	%	tonnes
Glass	0.5	0	0	85	.43	15	.07
Concrete, Brick, Tiles, Ceramics	183	0	0	80	146	20	37
Plasterboard	5	0	0	80	4	20	1
Timber	9.5	0	0	50	4.5	50	4.5
Metals	10	0	0	85	8.5	15	1.5
Asphalt	80	0	0	50	40	50	40
Total	287		0		203		84

Table 3: Construction Waste Reuse, Recycle & Disposal Amounts

It should be noted that until final materials and methods of construction have been determined it is not possible to predict with a high level of accuracy the construction waste that will be generated. A detailed demolition management plan will be prepared by the demolition contractor.

5.3 SITE WASTE MANAGEMENT OPERATIONS

Waste materials generated will be segregated on site where it is practical. An Outline Layout Plan for a site-based waste segregation compound is shown in Figure 5 over. Where the on-site segregation of certain wastes types is not practical, off-site segregation will be carried out. There will be skips and receptacles provided to facilitate segregation at source. All waste receptacles leaving site will be covered or enclosed. The appointed waste contractor will collect and transfer the wastes as receptacles are filled.

Any soil removed off-site will be carried by contractors licensed under the Waste Management Acts 1996 - 2008, the Waste Management (Collection Permit) Regulations 2007 and Amendments and the Waste Management (Facility Permit & Registration) Regulations 2007 and Amendments.


Plastics
Cardboard
Metals
Concrete & Blocks Etc.
Timber
Asphalt
Glass
WEEE
Plaster Board
Truck Collection Access Area
O'Connor Sutton Cronin Consulting Engineers
Demolition Works at St. Pauls, Dublin
Proposed C & D Waste Storage Area - Outline Layout Plan
Scale: NTS

All waste arising will be handled by an approved waste contractor holding a current waste collection permit. All waste arising requiring disposal off-site will be disposed of at a facility holding the appropriate licence or permit, as required. Written records will be maintained by the contractor(s) detailing the waste arising throughout the construction and demolition phases, the classification of each waste type, the contact details and waste collection permit number of all waste contactors who collect waste from the site and the end destination and waste facility permit or licence number for all waste removed and disposed off-site. Dedicated bunded storage containers will be provided for hazardous wastes such as batteries, paints, oils, chemicals etc., if required. The management of the main waste streams are detailed as follows:

5.3.1 Soil/Subsoil:

CUT & FILL CALCULATIONS

The greatest volume of materials generated will be topsoil and subsoil/stones from site reprofiling to accommodate roads, footpaths and services and basement excavation to enable construction. It is worthwhile to set out the calculations in respect of same, based on a 3d ground model of the existing site and detail of the proposed development. Given that the entire application area I 6.7 Ha and the development site area is approximately 6.4 Ha, the following calculations have been made:

- Allowing an average depth of 200 mm, topsoil strip will generate approximately 13,640 m^3.
- Subsoil excavation for road and footpath construction and basement excavation and for future housing will generate approximately 66,205 m^3 of material;
- Excavation for watermains, foul and surface water sewers, will generate an additional 5,617 m^3 of material;
- Subsoil excavation in to provide a SuDS attenuation area and exaction for an attenuation tank amounts to 4,790 m^3;
- The total subsoil excavation therefore amounts to 72,460 m^3;

- 5,264 m^3 of fill is required on site to make up level differences and cover the attenuation tank
- If we assume that the 5,265m^3 of fill required for the northern part of the site can be won from the subsoil then the site will generate an excess of 67,200 m^3 of subsoil;
- The assumptions here are conservative in nature, if any further topsoil can be reused on site, ideally it will be

The above is shown in tabular format in Table 3 with units of cubic metres.

Item	Excavate	Reuse	Export
Topsoil Strip	13,640		
Topsoil Surplus for Export			13,640
Subsoil Roads & Excavation	62,974		
Fill Required		1,072	
Subsoil Surplus for Export			75,542
Total Surplus for Export Off-Site			75,542

Table 3: Cut & Fill Calculation

Based on the above we can develop the figures set out in Table 4 below.

Construction Waste: Reuse, Recovery, Recycle & Disposal							
Waste Type	tonnes	Reuse/Recover		Recycle		Disposal	
		%	tonnes	%	tonnes	%	tonnes
Soil & stone	161,172	0	2,251	0	0	100	158,721
Concrete, brick, tiles	183	0	0	80	146	20	37
Asphalt, tars	80	0	0	50	40	50	40
Metals	10	5	0.5	90	9	5	0.5
Miscellaneous	10	10	1	40	4	50	5
Total:	158,921	-	2,252.5	-	199	-	159,003

Table 4: Construction Waste Reuse, Recycle & Disposal Amounts

As can be seen from the table, the vast bulk of the excavation will comprise **INERT** topsoil and subsoil/stones to facilitate the construction and installation of roads and services and land reprofiling to accommodate same and the future construction of dwellings (subject to future planning applications).

SITE WASTE MANAGEMENT OPERATIONS

Waste materials generated will be segregated on site where practical. An Outline Layout Plan for a site-based waste segregation compound is shown in Figure 4 overleaf. Where on-site segregation of certain wastes types is not practical, off-site segregation will be carried out. There will be skips and receptacles provided to facilitate segregation at source. All waste receptacles leaving site will be covered or enclosed.

The appointed waste contractor will collect and transfer the wastes as receptacles are filled. Any soil removed off-site will be carried by contractors licensed under the Waste Management Acts 1996 - 2008, the Waste Management (Collection Permit) Regulations 2007 and Amendments and the Waste Management (Facility Permit & Registration) Regulations 2007 and Amendments.

All waste arisings will be handled by an approved waste contractor holding a current waste collection permit. All waste arisings requiring disposal off-site will be disposed of at a facility holding the appropriate licence or permit, as required. Written records will be maintained by the contractor(s) detailing the waste arising throughout the construction and demolition phases, the classification of each waste type, the contact details and waste collection permit number of all waste contactors who collect waste from the site and the end destination and waste facility permit or licence number for all waste removed and disposed off-site. Dedicated bunded storage containers will be provided for hazardous wastes such as batteries, paints, oils, chemicals etc., if required

Given the limited extent of demolition works planned it is not expected that any soil/subsoils will be encountered at this stage.

Any soil removed off-site will be carried by contractors licensed under the Waste Management Acts 1996 - 2011, the Waste Management (Collection Permit) Regulations 2007 and Amendments and the Waste Management (Facility Permit & Registration) Regulations 2007 and Amendments.

If any of the excavated spoil is found to be clean/inert, the site manager will investigate whether nearby construction sites may require clean fill material, to both minimise the costs of transport and to reuse as much material as possible. Any soil/subsoil deemed to be contaminated will be stored separately to the clean and inert soil/subsoil. The material will be appropriately classified as non-hazardous or hazardous in accordance with the www.hazwasteonline.com application and EC Council Decision 2003/33/EC, which establishes the criteria for the acceptance of waste at landfills, before being transported to an appropriately permitted/licensed facility by permitted contractors.

5.3.2 Bedrock:

It is not anticipated that bedrock will be encountered during the works.

5.3.3 Concrete, Bricks, Tiles & Ceramics

Most of the concrete, bricks, tiles and ceramics generated as part of the works is expected to be clean, inert material and should be recycled, where possible.

5.3.4 Hard Plastic

Given the limited extent of demolition and sewer diversion works planned it is not expected that any hard plastic will be encountered.

5.3.5 Timber

Timber that is uncontaminated, i.e. free from paints, preservatives, glues etc., will be segregated and stored in skips.

5.3.6 Metal

Metals will be segregated into mixed ferrous, cladding, aluminium, high grade stainless steel, low grade stainless steel etc. categories, where practical. Metal is highly recyclable and there are numerous companies that will accept these materials. Metals will be segregated and stored in skips.

5.3.7 Plasterboard

There are currently a number of recycling services for plasterboard in Ireland. Plasterboard from the construction phase will be stored in a separate skip, pending collection for recycling. The site manager will ensure that oversupply of new plasterboard is carefully monitored to minimise waste.

5.3.8 Glass

Glass materials will be segregated for recycling, where possible.

5.3.9 Organic (Food) Waste

An on-site canteen may be provided to allow workers to prepare and eat food. This facility will incorporate provisions so that organic waste will be segregated for separate collection. Segregation at source and separate collection of organic waste is required in accordance with the Waste Management (Food Waste) Regulations 2009 (if food is prepared on site).

5.3.10 Waste Electrical and Electronic Equipment (WEEE)

WEEE that does not contain hazardous components will be stored in dedicated covered cages/receptacles/pallets pending collection for recycling. There is not expected to be any significant amounts of such materials as there are little by way of existing buildings on the subject site.

5.3.11 Non-Recyclable Waste

C&D waste which is not suitable for reuse or recovery will be placed in separate skips or other receptacles.

Prior to removal from site, the non-recyclable waste skip/receptacle will be examined by a member of the waste team to determine if recyclable materials have been misplaced. If this is the case, efforts will be made to determine the cause of the waste not being segregated correctly and recyclable waste will be removed and placed into the appropriate receptacle.

5.3.12 Asbestos

The removal of asbestos must be carried out by a suitably qualified 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.

5.3.13 Other Hazardous Wastes

Given the limited extent of demolition works planned it is not expected that any hazardous wastes will be encountered. However, 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. On-site storage of any hazardous wastes produced (i.e. contaminated soil and/or waste fuels) will be kept to a minimum, with removal off-site organised on a regular basis.

6.0 MANAGEMENT & CONTROL SYSTEMS

It will be the role of an appointed Waste Manager to try to find alternative options for demolition waste before sending it to landfill. Waste materials will be stored in the specifically designated compound. All waste collected from the site will be by a permitted waste contractor, under the Waste Management (Collection Permit) Regulations 2007 as amended. The contractor will provide the Waste Manager on site with documentation of the waste to be removed and a copy of the waste collection permit. Prior to the waste leaving the site, the Waste Manager will have documentation to show where the waste is being taken to, and that the facility is licensed to accept the particular waste. A receipt will be issued for each load that leaves the site.

All waste will be documented prior to leaving the site. Waste will be weighed by the contractor, either by weighing mechanism on the truck or at the receiving facility. These waste records will be maintained on site by the Contractor. All movement of waste and the use of waste contractors will be undertaken in accordance with the Waste Management Acts 1996 - 2008, Waste Management (Collection Permit) Regulations 2007 and Amendments and Waste Management (Facility Permit & Registration) Regulations 2007 and Amendments. This includes the requirement for all waste contractors to have a waste collection permit issued by the NWCPO. The nominated project Waste Manager will maintain a copy of all waste collection permits.

Some wastes may be transported to another site for reuse on that site. The Waste Manager will be in contact with other sites to ensure that as much waste is reused as possible, such as concrete for fill purposes etc. All wastes leaving the site will be placed in appropriate containers. Any concrete, soil, gravel, or broken stone transported off site will be covered to prevent dust or particle emissions from the load.

If the waste is being transported to another site, a copy of the Local Authority waste permit or EPA Waste Licence for that site will be provided to the nominated

project Waste Manager. If the waste is being shipped abroad, a copy of the Transfrontier Shipping (TFS) document will be obtained from Dublin City 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.

All information will be entered in a waste management recording system to be maintained on site.

7.0 FINANCIAL ISSUES OF WASTE

An outline of the costs associated with different aspects of waste management is provided below. The total cost of implementation of this CDWMP will be measured and will take into account handling costs, storage costs, transportation costs, revenue from rebates and disposal costs.

7.1 REUSE/RECOVERY

By reusing materials on site, there will be a reduction in the transport and disposal costs associated with the requirement for a waste contractor to take the material away to landfill. Clean and inert soils, gravel, stones etc. which cannot be reused on site may be used as capping material for landfill sites, or for the reinstatement of quarries etc. This material is often taken free of charge for such purposes, reducing final waste disposal costs.

7.2 RECYCLING

Salvageable metals will earn a rebate which can be offset against the cost of collection and transportation of the skips. Clean uncontaminated cardboard and certain hard plastics can be recycled. Waste contractors will charge considerably less to take segregated wastes such as recyclable waste from a site than mixed waste. Timber can be recycled as chipboard. Again, waste contractors will charge considerably less to take segregated wastes such as timber from a site than mixed waste.

7.3 DISPOSAL

Landfill charges in the Leinster region are currently at around €120/tonne (includes a €75 per tonne landfill levy introduced under the Waste Management (Landfill Levy) (Amendment) Regulations 2015). In addition to disposal costs, waste contractors will also charge a collection fee for skips. Collection of segregated C&D waste usually costs less than municipal waste. Specific C&D waste contractors take the waste off-site to a licensed or permitted facility and, where possible, remove salvageable items from the waste stream before disposing of the remainder to

landfill. Clean soil, rubble, etc. is also used as fill/capping material wherever possible.

8.0 TRAINING PROVISIONS

8.1 Training Provisions for Waste Manager and Site Crew

One of the construction team or the foreperson will be appointed as a Waste Manager to ensure commitment, operational efficiency and accountability. The 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 him/her in the organisation, operation and recording of the waste management system on the 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 salvage on site.

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 the waste management on site. He/she will be also trained in the best methods for segregation and storage of recyclable materials, have information on the materials that can be reused on site and know how to implement the CDWMP.

Training of the site crew is the responsibility of the Waste Manager. A waste training program will be organised. A basic awareness course will be held for all site crew to outline the CDWMP and to detail the segregation of waste materials at source. This may be incorporated into the induction course or the safety-training course. This basic course will describe the materials to be segregated, the storage methods and the location of the waste storage areas. A subsection on hazardous wastes will be incorporated and the particular dangers of each hazardous waste will be explained.

9.0 RECORD KEEPING, AUDITING & CONSULTATION

9.1 RECORD KEEPING

Records will be kept for each waste material, which leaves the site, either for reuse on another site, recycling or disposal. A system will be put in place to record the construction waste arisings on site.

The Waste Manager or a member of his team will record the following:

- Waste taken for Reuse off-site (i.e. for capping of landfill cells or at another site);
- Waste taken for Recycling;
- Waste taken for Disposal;
- Reclaimed waste materials brought on-site for reuse.

For each movement of waste on- or off-site, the Waste Manager will obtain a signed docket 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 construction 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 construction waste and to highlight the successes or failures against these targets.

9.2 OUTLINE WASTE AUDIT PROCEDURE

The appointed Waste Manager on site will be responsible for conducting a waste audit at the site. A review of all the records for the waste generated and transported on- or off-site will be undertaken. 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.

A Summary Report will be prepared and 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.

9.3 CONSULTATION

Consultation with waste contractors and Dublin City Council through the construction phase will be pursued to ensure best practices for waste management are being followed on site.