



Client:

Dublin City Council and Irish Water

Applicant:

Dublin City Council

Project:

Grand Canal Storm Water Outfall Extension

Report:

Appendix 13A: Resource and Waste Management Plan

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SECTION 1: Introduction

J.B. Barry and Partners have been commissioned to prepare this Resource and Waste Management Plan (RWMP) as part of the Environmental Impact Assessment Report (EIAR) for the proposed Grand Canal Storm Water Outfall Extension (GCSWOE) project.

The purpose of the RWMP is to identify the activities on the proposed GCSWOE project that will generate waste and to outline how the waste will be dealt with as per the legislative and contractual obligations. This plan is aimed at promoting Prevention, Reduction, Reuse and Recycling of material during the construction and demolition works. The plan will include the following (but not limited to):

- Specific / achievable waste management objectives;
- Analysis of waste arising; and
- Methods for proposed prevention, reuse, and recycling of wastes.

This report also outlines the Waste Management Framework and identifies the key categories of wastes that are likely to be generated during construction.

The RWMP will be a working document and will be finalised by the Contractor following appointment and prior to commencing works on site. The Contractor will be responsible for detailing and maintaining this report and updating it as appropriate. However, all of the content provided in the RWMP will be implemented in full by the Contractor. The Contractor is responsible for delivering the measures outlined in this plan with the Construction/Resource Manager.

The RWMP is a dynamic document, and the Contractor will ensure that it remains up to date for the duration of the construction period. The RWMP may need to be altered during the lifecycle of the construction period to take account of monitoring results, legislative changes, outcomes of third-party consultations etc. Additional appendices may be added to the RWMP to accommodate monitoring results, permits etc.

This plan specifies points of contact for each type of waste generated through the project and reference written procedures for the management of each type of waste. An Environmental Impact Assessment Report (EIAR) and Appropriate Assessment Natura Impact Statement (AA NIS) have been prepared for the assessment and analysis of potential impacts on the receiving environment caused by a proposed project. The mitigation measures regarding resources and waste arising from the EIAR, and AA NIS are addressed in this RWMP and should be read in conjunction with this report. A Construction Environmental Management Plan (CEMP) has also been prepared by J.B. Barry and Partners for the proposed development and should also be considered along with this report.

1.1 Legislation

This document aims to comply with the contents and recommendations of the following legislation and guidance:

- Eastern Midlands Region Waste Management Plan 2015-2021;
- Dublin City Development Plan 2016-2022;
- Draft Dublin City Development Plan 2022-2028;
- Waste Framework Directive 2008/98/EC;
- Landfill Directive 1999/31/EC;
- Annex II to Directive 1999/31/EC (the Landfill Directive), Council Decision of 19 December 2002 (203/33/EC), criteria and procedures for the acceptance of waste at landfills outlined therein will be applied to any waste dispatched off-site. This includes basic characterisation of the materials, testing for total pollutant content and leaching behaviour, and on-site verification prior to dispatch;
- Waste Management Act 1996 – 2011 (as amended);
- European Communities (Waste Directive) Regulations, 2011 (as amended);
- The Waste Management (Permit) Regulations, 1988 (S.I. No. 165 of 1998);
- The Waste Management (Collection Permit) Regulations, 2001 (S.I. No. 402 of 2001);

- The Local Government (Water Pollution) Acts, 1977 & 1990;
- The Waste Management Act, 1996 and amendments;
- Waste Management (Movement of Hazardous Waste) Regulations, 1998 (S.I. No. 147 of 1998);
- Waste Management (Transfrontier Shipment of Waste) Regulations, 1998 (S.I. No. 149 of 1998)
- A Resource Opportunity – Waste Management Policy in Ireland (Department of the Environmental, Climate and Communications, 2012);
- Best Practice Guidelines for the Preparation of Resource and Waste Management Plans for Construction and Demolition Projects (EPA 2021);
- National Hazardous Waste Management Plan 2021 – 2027 (EPA 2021);
- Eastern – Midlands Region Waste Management Plan 2015 – 2021 (DCC 2015);
- Guidance on Soil and Stone By-products in the context of article 27 of the European Communities (Waste Directive) Regulations 2011, Version 3 (EPA 2019);
- By-Product Guidance Note, A Guide to by-products and submitting a by-product notification under Article 27 of the European Communities (Waste Directive) Regulations 2011 (S.I. No. 126 of 2011) (EPA, 2020);
- A Waste Action Plan for a Circular Economy, Ireland’s National Waste Policy 2020 – 2025, Department of Communications, Climate Action and Environment, 2020;
- Waste Minimisation in Construction (SPU SP 133), Construction Industry Research and Information Association (CIRIA) 1997;
- Waste Classification, List of Waste and Determining if Waste is Hazardous or Non-hazardous, (EPA 2018); and
- Guidance on the Management of Contaminated Land and Groundwater at EPA Licensed Sites (EPA 2013).

1.2 Guidance

This plan adheres to the *Best Practice Guidelines for the Preparation of Resource Management Plans for Construction and Demolition Projects* draft issued in April 2021 by the Environmental Protection Agency (EPA). These guidelines supersede the *Best Practice Guidelines on the Preparation of Waste Management Plans for Construction and Demolition Waste Projects* of 2006 and are hereafter referred to as the EPA Draft Guidelines. The RWMP is compiled prior to construction and documents the measures implemented at preliminary design stage and will be updated and finalised by the Contractor prior to the construction stage.

1.3 RWMP

A RWMP is a specific, targeted, and ‘stand-alone’ plan to ensure that all of the mitigation measures, obligations, requirements and constraints regarding resources and waste identified in all relevant documents and planning conditions, are fully implemented under the construction contract. The RWMP will be further updated by the Contractor prior to the commencement of works.

The Contractors will prepare the following for inclusion within the RWMP prior to construction stage:

- Management Structure for Construction and Operation Phases;
- Resources – roles and responsibilities;
- Training;
- Construction Activities and Sequencing;
- Method statements;
- Communications;
- Management of Sub Contractors;
- Monitoring;
- Inspections and Auditing;
- Reporting;
- Corrective and Preventative Action Procedures;
- Procedures for Review and Improvement; and
- Records.

SECTION 2: Description of Proposed Development

2.1 Site Location

The development is located in the Grand Canal Docks, Dublin, Ireland. This area is in an urban environment and is a hub of modern apartment buildings and office and retail spaces which has been zoned as a Strategic Development Regeneration Area (SDRA) in the Dublin City Council Development Plan, 2016 – 2022, see Figure 2.1. The area is also known as a Key Developing Area (KDA) within the Development Plan, as well as a Strategic Development Zone (SDZ) within the North Lotts and Grand Canal Planning Scheme, 2013.

The project scope of works will begin at the most southern point in the Grand Canal Basin at the Grand Canal Tunnel Outfall. The works will involve constructing new pipelines in a multi-piped culvert from the Grand Canal Tunnel Outfall, near the Grand Canal Dock Dart Station, north along the bed of the Basin, where it will pass through a section of Hanover Quay. It will then link up with an existing culvert on Asgard Road, built in 2002 as part of the Phase 1 works for this project. Various reinforced concrete transition chambers will also be constructed. At the northern end of this existing culvert, a pipeline will be constructed underneath Sir John Rogerson’s Quay together with an outfall to the River Liffey. The stormwater discharge will therefore have bypassed its previous outfall within the Basin and will discharge into the River Liffey/ Lower Liffey Estuary.

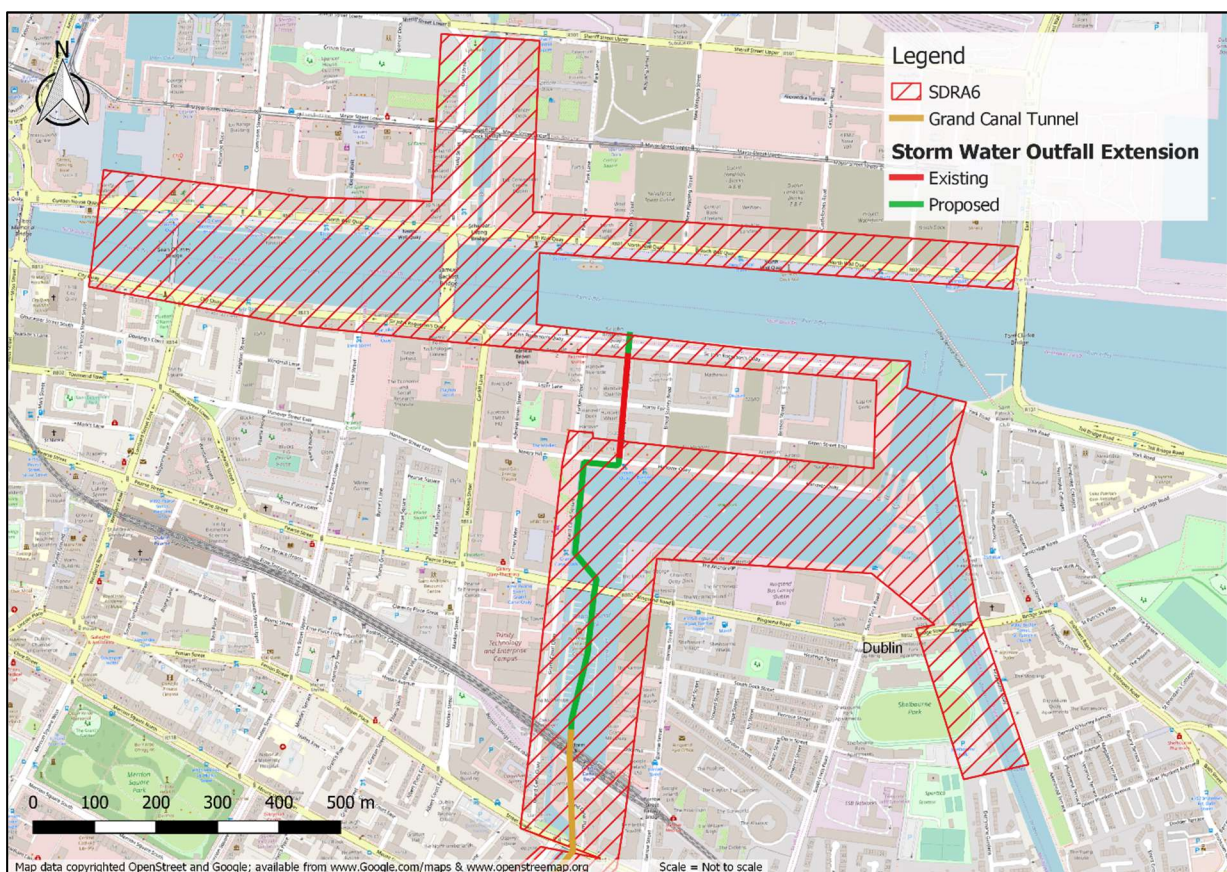


Figure 2.1 Site Location in context of the Strategic Development Regeneration Area (Dublin City Council Development Plan, 2016)

2.2 Description of the proposed works

The proposed development will result in the re-routing of the stormwater section of the Grand Canal Tunnel to the River Liffey. This currently discharged into the Basin. The discharge periodically contains

elevated concentrations of Faecal Coliform, BOD, Nutrients and Suspended Solids from Combined Sewer Overflows (CSOs). The proposed works for the scheme consists of the following:

- Construction of Transition Chamber 1 at chainage Ch.+0m (Starting at southernmost point of development at existing storm water outfall);
- Construction of 5 no. 1.5m diameter pipes from chainage Ch.+7.26 – Ch.+310.00m;
- Construction of Transition Chamber 2 at chainage Ch.+310.00 – Ch.+320.00m;
- Construction of Twin 2.4m diameter pipes from chainage Ch.+320.00 – Ch.+490.00m;
- Construction of Transition Chamber 3 at chainage Ch.+490.00m;
- Construction of 4m wide 2.7m high (internal diameter) culvert on Hanover Quay;
- Construction of new outfall structure at Sir John Rogerson’s Quay into the River Liffey; and
- Construction of permanent floating platform along Grand Canal Quay.

The total length of the pipeline to be constructed is 550m. The proposed works involve 450m of development on the silt bed of the Grand Canal Basin, and 100m along existing road and pedestrian infrastructure, see Figure 2.1. The bed of the Basin is mostly flat with some gentle undulations; a maximum depth of 3.9m was observed by the Archaeological Diving Company (ARDCO) during a dive survey completed in 2008.

Three temporary cofferdams will be built at each of the transition chambers including:

- Transition Chamber 1 at the existing Grand Canal Tunnel Outfall;
- Transition Chamber 2 at the transition point from the 5 no. 1.5m diameter pipeline to the 2 no. 2.4m diameter pipeline; and
- Transition Chamber 3 at Hanover Quay.

The route is proposed to traverse underwater through the centre of the southern portion of the Basin, pass underneath the MacMahon Bridge, then bear close to the western wall of the Basin. The pipeline will enter Transition Chamber 3 at Hanover Quay and will run underground along the quay before connecting to the existing Phase 1 culvert on Asgard Road.

Particular constraints considered in the design of the project include:

- Meeting canal draught requirements in terms of navigation, 1.9m minimum clearance;
- Avoiding the existing 8-foot (2.4m) diameter sewer, which is more than 100years old, underneath the Basin;
- Minimising discharge velocities into the River Liffey; and
- Minimising risk of damage to the proposed extension pipe which could cause rapid drawdown of the Grand Canal Basin.

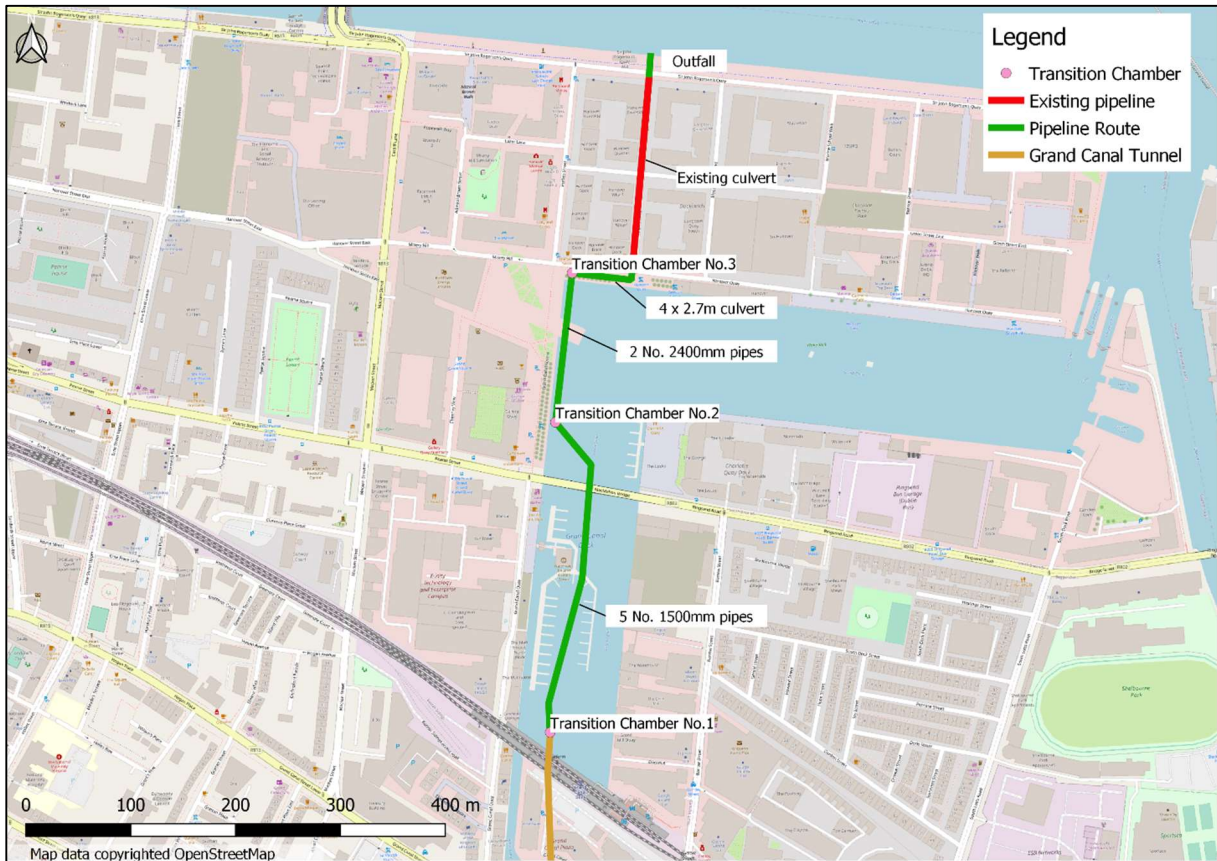


Figure 2.2 Grand Canal Storm Water Outfall pipeline within the Grand Canal Docks

SECTION 3: Roles and Responsibilities

3.1 Employer

The project is jointly funded by Dublin City Council (DCC) and Irish Water (IW). The planning application to An Bord Pleanála is made by DCC. The Employer will ensure that competent parties are appointed to undertake the works and that sufficient resources are made available at all stages of the project for the appropriate management of risks to the environment.

3.2 Employers Representative

Employer and the Employers Representative (ER) are responsible for monitoring compliance with the RWMP.

During the design and planning phases of the project, the ER will identify project specific waste management requirements as well as waste avoidance solutions and update the RWMP accordingly. The ER is also responsible for monitoring the compliance with the RWMP throughout the various project phases.

The Employers Representative will appoint temporary or permanent Specialists as required.

3.3 Contractor

The Contractor is procured by the Employer to implement the construction operations and is responsible for the following regarding the RWMP:

- Updating and reviewing the RWMP through the construction phase of the project;
- Appointing a designated and suitably qualified Resource Manager who will be responsible for implementing the RWMP at the construction stage;
- Identifying all suitable and authorised Service Providers to be engaged to handle, transport and dispose of all resources and wastes off-site;
- Identify all suitable and authorised destinations for resources and wastes to be taken off-site;
- Maintaining comprehensive records of all resources and wastes maintained on-site as well as transported off-site;
- Conduct internal and external audits and reviews to ensure compliance to RWMP and best practice waste management procedures; and
- Preparing a RWMP Implementation Review Report at the completion of the project.

SECTION 4: Design Approach

4.1 Waste Management Principles

Management of all waste throughout the project lifecycle will be in accordance with EU, National and Regional waste management policy and the principles of the Waste Hierarchy i.e. prevention, minimization, reuse, recovery and recycling. Refer to Figure 4.1.

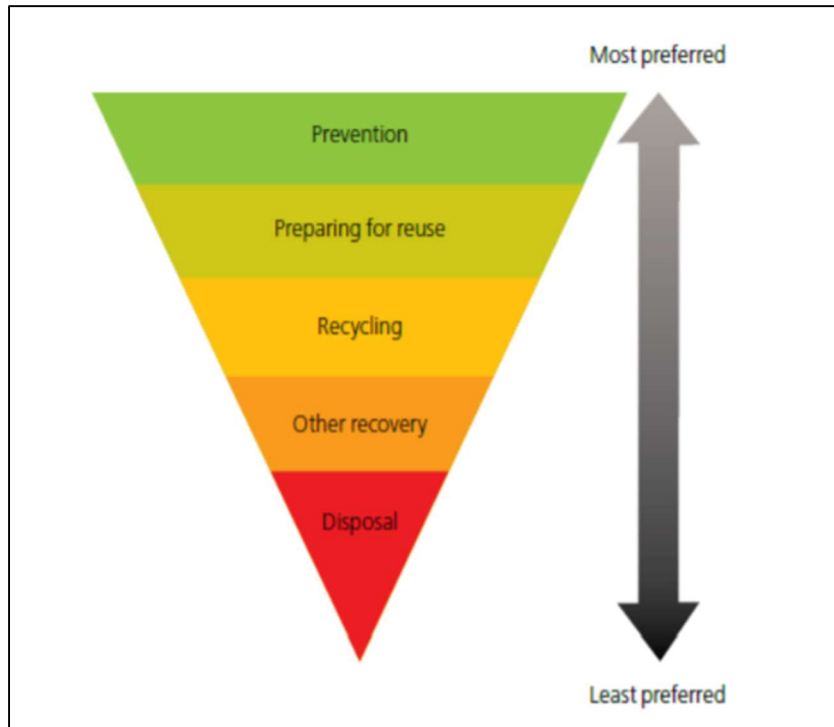


Figure 4.1 Waste Hierarchy (source: EPA)

4.1.1 Prevention of Waste

The management of material is key to implementing an effective waste prevention and minimization policy on site. Materials will be ordered in a timely manner and as required to avoid over ordering, excess supply and wastage. The RWMP will be updated prior to construction phase to provide for proper storage and handling of construction material to maximise usage and minimise waste. Materials delivered to site will be inspected to ensure they are defect free and suitable for use.

Within the basin, waste will be minimised by the redistribution of displaced soil and silts. Redistribution of suitable displaced material will not extend more than 10 metres from the pipeline structure and will not raise the bed level above the top of the structure (0.8 mOD) on the basin bed thus maintaining the minimum draft for boat traffic within the basin. Resuspension of sediments will be confined within silt curtains during the construction stage in the basin.

4.1.2 Reuse

Reusing materials and excavated soil on site facilitates a reduction in the associated handling/recovery/disposal costs for waste generated on site during the construction phase of the project. To establish the appropriate reuse, recovery and/or disposal route for the material to be removed off-site, waste will initially be classified as hazardous or non-hazardous in accordance with the *Waste Classification- List of Waste and Determining if Waste is Hazardous or Non-hazardous* guidelines from EPA issued in 2018.

The waste generated through earthworks will be a critical component of the waste management requirements of the project. Site investigations completed in the development area indicated potential contaminated material on both Hanover Quay and Sir John Rogerson's Quay. It is anticipated that the waste generated from excavations for these areas will be classified as hazardous waste in accordance with the Waste Management Act 1996 (and amendments), and will not be able to be reused. Determination of the full extent of ground contamination within the development site is required during the construction phase and the appropriate waste management requirements will be incorporated in the RWMP by the Contractor.

Where feasible non-hazardous excavated/dredged material generated during the construction of the multi-piped culvert within the Grand Canal Dock basin can be placed between the culvert and the dock wall (i.e. the length between Transition Chamber 2 and Hanover Quay). The waste generated from earthworks at Hanover Quay and Sir John Rogerson's Quay is discussed below in Section 4.1.5.

It is highlighted that recovering excavated material for reuse are subject to regulatory requirements. The conditions for reclassifying resources and waste, as set out in Article 27: By-products and Article 28: End of Waste, of the European Union (Waste Directive) Regulations 2011-2020 will be adhered to.

Any existing street furniture, surfaces, and historic features such as the granite ashlar quay walls, stone setts, mooring rings, steps, bollards, lamp standards and crane tracks, which are to be temporarily removed for construction, will be done so under supervision of a qualified archaeologist, catalogued and reinstated as existing.

Where possible, concrete waste will be returned to the supplier for reuse. In circumstances where this is not possible, Contractors are required to dispose of concrete crushed on-site, at an off-site authorised facility. It should be noted that crushed material from a waste recovery operation is not appropriate for the Article 27 Notification (By-products) procedure.

4.1.3 Recycle

Segregation of waste streams will be implemented on site to maximise recycling and recovery.

Waste generated from construction workers (e.g. organic/food waste, dry mixed recyclables (waste paper, newspaper, plastic bottles, packaging, aluminium cans, tins and Tetra Pak cartons), mixed non-recyclables, as well as general building waste (e.g timber, card board and metals) will be recycled where feasible. The segregation of waste streams will be implemented on site to maximise recycling and recovery and reduce costs in comparison to general mixed waste.

4.1.4 Demolition

The extent of the existing Hanover Quay and Sir John Rogerson's Quay walls requiring demolition to allow for the installation of the culvert and outfall structure, will be minimised to reduce the volume of residual waste being generated. The Contractor will update the RWMP to include the following:

- A pre-demolition audit detailing the best practice to be implemented;
- Specify the planned reuse and recycled deconstructed/demolished components.

4.1.5 Excavation Works of Contaminated Soil

The soils at Hanover Quay and Sir John Rogerson's Quay are contaminated. It is anticipated that the waste generated from the earthworks will be classed as hazardous waste in accordance with the Waste Management Act 1996 (and amendments) and will not be reused on site and will be transported and disposed of off-site to a suitably licenced acceptance facility.

4.1.6 Waste segregation, storage and removal

The Contractor will ensure as much as possible that all recyclable material will be separated at source. Individual waste streams will be segregated through the use of separate bins, storage containers or clearly defined areas for stockpiling. Reusable and recyclable waste streams will be stored separately to residual wastes to avoid contamination and maximize their reuse potential.

Waste will be stored appropriately as follows:

- Clearly marked signs;
- Enclosed to prevent waste escaping;
- Segregated by type where possible; and
- Suitable for that waste type, i.e. able to contain waste and prevent escape, including leaking of liquids.

Hazardous or contaminated material, including material that requires specialist treatment or disposal, will be stored separately on site to avoid cross-contamination. Hazardous wastes will not be mixed. Any hazardous waste generated (e.g. oil rags or waste oil) will be stored in appropriate receptacles or containers, banded or other storage areas prior to their removal by an appropriately licensed contractor.

The Contractor will ensure that:

- Any waste haulier employed is authorised by a waste collection permit;
- That any disposal or recovery facility to be used for the management of waste arising from the scheme is subject to an authorisation under the Waste Management Acts or other legislation;
- That the terms and conditions of these authorisations allow for the acceptance of the waste in question; and
- That these authorisations will not expire within the lifetime of the project.

4.2 Off-Site Construction

In the design of the works provision was made to allow for various works to be constructed off-site, utilising precast concrete elements which has significant waste management benefits. These works include, but is not limited to, precast U-shaped concrete sections in the multi-piped culverts and precast box culverts.

4.3 Imported fill and soil

If imported fill material is required, the use of local quarries or locally available material will be prioritised.

Alternatively, fill material (soils stone) from another site that has been registered as a by-product (and not a waste) in accordance with Article 27 of the Waste Directive Regulations, will be used if it is available. This will conform to the Waste Hierarchy and divert waste from landfill.

SECTION 5: Key Materials, Quantities and Costs

5.1 Key Resource and Waste Streams

All resources and waste generated will be identified and segregated according to their category as described by the European List of Waste Codes (EWC). A List of Waste (LoW) template for all potential resources and waste streams to be generated is provided in Appendix A. The template will be modified and updated accordingly by the Contractor and incorporated in the RWMP.

Predicted key resources and waste that will be applicable to the project are categorised below (but are not limited to the categories identified).

5.1.1 Soil (including excavated soil from contaminated sites), boulders and dredged spoil

The waste generated by the earthworks on site will be a key component of the waste management requirements for the project. Earthworks associated waste will be generated through dredging and open trench excavations in the vicinity of the following areas:

- The Inner Basin; invert level of pipeline = -1.2 to -1.3mOD (average depth = 0.3m);
- The Outer Basin; invert level of pipeline = -1.3 to -1.5mOD (average depth = 0.5m);
- Hanover Quay; Construction of 4x2.7m culvert from Ch.0+450m to Ch.0+526.70, where invert level of pipeline = -1.59 to -1.65mOD (average depth = 6m); and
- Sir John Rogerson's Quay; invert level of pipeline and outfall structure = -4.38 to -4.8mOD (average depth = 7.6m).

As previously highlighted in this report, it is anticipated that the waste generated by the earthworks at both Hanover Quay and Sir John Rogerson's Quay will be classified as hazardous waste. Excavation works will be carefully monitored by a suitably qualified person to ensure hazardous soil is identified and segregated from any potentially non-hazardous soil, where encountered. Additional soil testing may be required in order to reclassify soil and the waste material generated will be required to be classified as inert, non-hazardous or hazardous in accordance with the EC Council Decision 2003/33/EC for acceptance of waste at landfills.

The Contractor will adhere to the guidelines provided in the Environmental Protection Agency (EPA) publication *Procedure for Identification of the Hazardous Components of Waste* and all applicable, current waste management regulations regarding the identification, handling and disposal of hazardous waste. Additional requirements regarding the handling, disposal and export of hazardous waste are discussed in Section 7 of this report.

Non-hazardous waste generated through earthworks will be reused where feasible as specified in Section 4.1.2 and/or disposed of accordingly.

5.1.2 Concrete, wall stones, bricks, tiles and ceramics and other related building fabrics

Waste concrete is likely to arise throughout the construction phase of the project.

Wall stones will be encountered during the construction activities at the Hanover Quay and Sir John Rogerson's Quay. Due to the archaeologically protected classification of the quay wall stones, only following the implementation of the specified reinstatement procedures will surplus stones be appropriately removed from site as per the Archaeologist's instructions.

Tiles, bricks, ceramic and/or other pavement surfaces and materials may be encountered during the demolition of the campshire surfaces at the Hanover Quay and Sir Rogerson's Quay. All material will be stored carefully and reused, where feasible, in the restoration of the campshire surfaces.

Any waste generated will be stored in appropriate containers for recycling or removal to an authorised waste facility.

5.1.3 Wood, glass and plastic

Timber waste will be stored separately and reused where possible. Unused timber will be returned to the supplier for reuse or be disposed of at a recycling facility.

5.1.4 Metals

Metals will be segregated on site for reuse and recycling. Scrap value will be generated through the recycling of metal waste.

5.1.5 Bituminous mixtures, coal tar and tarred products

Waste bituminous material may arise during the construction of internal site roads.

5.1.6 Insulation materials and asbestos-containing construction materials

It's unlikely to find insulation material or asbestos-containing construction materials during this project. In the unlikely event that asbestos waste is encountered on-site appropriate storage, transportation and disposal of waste will be adhered to.

5.1.7 Packages and Plastics

Packaging waste will be segregated at source and removed to a recycling facility. Waste packaging will be stored in separate covered containers.

5.1.8 Litter and other waste

Litter and waste create during the works will be disposed at suitable facilities.

Rechargeable batteries will be used for portable devices where possible and any batteries or electrical equipment which may become redundant during the project will be stored separately prior to transfer to an appropriate WEEE facility.

Food waste management will account for the need to align with health, safety and welfare at work guidelines to prevent rodent infestation.

5.2 Predicted Quantity of Key Waste Generated

5.2.1 Surplus Soil (including excavated soil from contaminated sites)

Table 5.1 shows the estimated surplus material that will be removed during the construction of the works. It is estimated that a total of approximately 5550m³ surplus soil will be removed, and that approximately 3400m³ will be classified as hazardous waste and disposed of accordingly.

Table 5.1 Waste generation volumes

Location	Volume of material to be removed (m ³)	
	Hazardous	Non-Hazardous
Hanover Quay	1,875	1250
Sir John Rogerson's Quay	460	307
Transition Chamber No.1	31	100
Transition Chamber No.2	50	117
Transition Chamber No.3 at Hanover Quay	375	273
Outfall Structure – River Liffey	600	100
	3,391	2,147

Table 5.2 shows the applicable List of Waste (LoW) codes as per the Waste Classification by EPA (2018) for the anticipated soil to be removed during the construction of the works.

Table 5.2 Waste Classification Summary for Excavated Soil

Classification	LoW Code	LoW Code description
Hazardous soil	17 05 03	Soil and stones containing hazardous substances
	17 05 05	Dredging spoil containing hazardous substances
Non-hazardous soil	17 05 04	Soil and stones other than those mentioned in 17 05 03
	17 05 06	Dredging spoil other than those mentioned in 17 05 05

5.2.2 Other Waste Streams

Various other waste streams will also be generated through the demolition works at the Hanover Quay and Sir Rogerson's Quays and other general construction activities.

It should be noted that a detailed estimate of waste generation can only be completed when detailed construction methodologies are confirmed. In the RWMP a detailed waste inventory will be provided prior to construction phase, in line with the template provided in Appendix A. The inventory is to reflect the nature and complexity of the project and will also contain non-construction related streams such as food, litter, packaging etc.

Table 5.3 provides the latest representative breakdown of the various Construction and Demolition waste streams generated in construction projects during 2019, as published by the EPA.

Table 5.3 Breakdown of Construction and Demolition Waste Streams

C&D Waste Stream	Percentage of Total
Soils, stones and dredged spoil	84.8%
Concrete, brick, tile etc.	6.9%
Mixed C&D waste	4.5%
Metal	2.2%
Bituminous mixtures	1.3%
Segregated wood, glass & plastic	0.3%
Total	100%

SECTION 6: Site Management

6.1 Resource Manager (Waste Manager)

The Contractor will appoint a suitably qualified Resource Manager (RM). The responsibilities of the RM include the following actions (but are not limited to):

- The update and implementation of the RWMP;
- Agree, revise, and adopt the accepted commitments/targets included in the RWMP;
- Allocate responsibility for the required resource management to the appropriate parties to ensure the relevant procedures are put into practice;
- Update the RWMP as required to reflect new waste streams, work practices etc.
- Ensure delivery of all training and induction regarding resource and waste management as stipulated in the RWMP;
- Ensure appropriate site infrastructure is supplied and maintained;
- Conducting of all internal site audits, including audits of sub-contractors;
- Facilitating external audits with any Local Authority or other relevant stakeholder; and
- Maintaining site records for waste and resources exported off site and ensuring all waste management activities are undertaken by permitted operators to suitable permitted site.

6.2 Training

Waste training of site personnel will be provided and will be incorporated with other site training. All project personnel, including Sub-Contractors will receive an environmental induction before commencing with work on the project. The induction will at a minimum include the following:

- Scope and content of the RWMP;
- Commitments and targets undertaken in the RWMP;
- List of anticipated resources and wastes and estimated volumes to be generated;
- Procedures for the correct identification and segregation of project related resources and wastes;
- Temporary storage principles and the location of the Waste Storage Areas on the development site; and
- Clear instructions on the measures and requirements regarding hazardous wastes and the associated dangers of each hazardous waste.

Regular toolbox talks will be conducted to ensure all staff are aware of the associated resources and waste management practices relating to their work.

6.3 Supply Chain

The Contractor will ensure that procurement of materials and services are done in line with the best practice procedures to prevent residual resources on the development site.

6.4 Auditing

Continuous resource and waste auditing will be conducted on the development site throughout the construction phase of the project. The audits will include work practises, record keeping and off-site tracking.

The audits will assess the following key issues and associated risks as a minimum:

- The site signage and any corrective action required;
- The existing storage infrastructure and any corrective action required;
- The waste segregation measures implemented on site and the compliance of the protocols set out in the RWMP;

- The waste management methods implemented for each material type and whether targets are being met;
- The contamination of any resource streams; and
- The Contractor and Sub-Contractor work practice compliance with the RWMP.

The RM will also review all records of waste and resources generated on the development site as well as transported off-site periodically during the project. The records kept on site will be assessed in accordance with the targets and requirements as set in the updated RWMP by the Contractor.

As part of the outcomes of the audits conducted, required corrective actions will be issued where shortcomings in the implementation of the RWMP is identified (including training, penalties etc.).

6.5 Tracking and Tracing

The RM will maintain records for all resource material and waste generated, used and disposed of from site. This includes material utilised, reuse, recycling, backfilling and material disposed through third parties.

A sample recording table is provided in Appendix A. This table will be amended as required in order to track resource and waste movements. The information will be compiled into a database and incorporated into RWMP files at construction stage.

The type of information that will be recorded in the site tracking system are listed below (however is not limited to the list below):

- A description of each resource / waste stream, including the LoW code and the validated quantity of material moved off site;
- The details of the haulier including the relevant Waste Collection Permits (WCP), where required;
- The name and authorisation of the destination site for the resource/waste stream, including the relevant Certificates of Registration, Waste Permits and Licenses etc;
- Delivery records for each stream; and
- Record of end-use and waste treatment.

The tracking system implemented will enable the Employer and/or ER to evaluate successes or failures against the project targets set regarding prevention, reuse and recycle of resources and waste.

The RM has the responsibility to ensure all resources and waste taken off site adhere to the relevant legislation and that waste carriers and collection sites have the correct authorisations.

6.6 Identifying of Permitted Waste Collection Operators and Waste Destination Sites

The Contractor is responsible for identifying and engaging all hauliers to be utilised to transport all resources and waste off-site. It is highlighted that waste can only be transported by a haulier with the relevant Waste Collection Permit.

The Contractor will also identify all suitable destinations for resources and waste taken off site. As above, waste will only be transported to a facility with a valid Certification of Registration, Waste Permit and/or Waste License.

The requirements for exporting hazardous waste are discussed in Section 6.7 below.

The Contractor will refer to Appendix B for the resources listed by the EPA in the *Best Practice Guidelines on the Preparation of Waste Management Plans for Construction and Demolition Waste Projects* in identifying suitably authorised hauliers and facilities.

6.7 Export of resources and waste

It is acknowledged that there are currently no hazardous waste facilities in operation in Ireland and hazardous waste will likely require export and disposal at a licensed hazardous waste facility abroad. The disposal methodology of hazardous waste will be included in the RWMP by the Contractor during the pre-construction stage.

If waste is to be exported from Ireland, the Contractor will liaise with the Employer or its representative and arrange the necessary Transfrontier Shipment approvals through the Competent Authority. The Contractor will also liaise with the Employer and/or the ER for approval regarding exporting hazardous waste.

6.8 Communications

The RM is responsible for the following communication tasks:

- Reporting of resource and waste statistics to the Contractor, Employer and Employers Representative, including feedback on targets and objectives;
- Engagement with relevant Local Authorities in relation to site inspections and audits;
- Engagement with other appropriate stakeholders (e.g. public) regarding resource and waste management; and
- Compilation of a final report summarising the outcomes of the resource and waste management processes and the targets achieved.

SECTION 7: Site Infrastructure

7.1 Site Layout and Waste Storage Areas

The planned site layout will be reviewed before construction to ensure there is adequate space and access to the designated Waste Storage Areas (WSA) to enable appropriate storage and handling. It is highlighted that careful planning will be required for the site layout as there will be limited space available on the development site.

Designated WSA may include stockpiles and skips, or secure areas and/or containers for hazardous waste and will mitigate any potential negative impacts on human or natural resources. The Contractor will ensure that appropriate measures are taken to safeguard the health of the Contractor's operatives and the general public for the duration of the works.

The Contractor will ensure, where possible, that all recyclable material will be separated at source. Individual waste streams will be segregated through the use of separate bins, storage containers or clearly defined areas for stockpiling. Reusable and recyclable waste streams will be stored separately and away from residual wastes to avoid contamination and to maximize their potential for reuse.

The excavation of contaminated material from Hanover Quay, and Sir John Rogerson's Quay will require disposal. The Contractor will provide appropriate storage until such volumes accumulate that will allow safe transportation and disposal or recovery. Any temporary storage of hazardous waste excavated will be required to adhere to the requirement that the temporary storage of hazardous waste exceeding 40m³ (non-liquid waste) on the premises where it is produced, is required to be registered by a Local Authority as stipulated in S.I.no.165 Waste Management (Permit) Regulations of 1998 (and amendments), Parts I & III First Schedule.

Adequate labelling and signage will be implemented on site to support good resource and waste management practices across the development site and will inform the personnel of the key WSA requirements and restrictions.

Appendix A: Waste Management Forms

Resource and Waste Inventory

LoW Code	Description	Volume Generated (tonnes)	Prevention (tonnes – non-waste)	Reused (tonnes – non-waste)	Recycled (tonnes - waste)	Recovered (tonnes - waste)	Disposed (tonnes - waste)	Unit Cost Rate (€/tonne)	Total Cost (€)
17 01 01	Concrete								
17 01 02	Bricks								
17 01 03	Tiles and Ceramics								
17 02 01	Wood								
17 02 02	Glass								
17 02 03	Plastic								
17 03 02	Bituminous mixtures								
17 04 01	Copper, Bronze and Brass								
17 04 02	Aluminium								
17 04 03	Lead								
17 04 04	Zinc								
17 04 05	Iron and Steel								
17 04 06	Tin								
17 04 07	Mixed Metals								
17 05 04	Soil and Stone								
17 09 04	Mixed C&D Waste								
Hazardous Waste									

17 01 06*	Mixtures of concrete, bricks tiles and ceramics containing hazardous substances								
17 02 04*	Glass, plastic and wood contaminated with								
17 03 01*	Bituminous mixtures containing coal tar								
17 04 09*	Metal waste contaminated with hazardous substances								
17 05 03*	Soil and stones containing hazardous substances								
17 06 05*	Construction materials containing asbestos								
Other resources (specify as needed)									
Other waste (specify as needed)									
Add as required									

Appendix B: Authorised Waste Collectors and Waste Disposal/Recovery Sites

Waste Collection

A list of all authorised waste collectors is available on the following website:

<https://www.nwcpo.ie/permitsearch.aspx>

For further information the National Waste Collection Permit Office will be contacted.

Waste Disposal/Recovery

The following authorisations are applicable for Waste Disposal Sites:

- Certificates of Registration from the Local Authority;
- Certificates of Registration from the EPA issued to the Local Authority;
- Waste Facility Permit from the Local Authority; and
- Waste or Industrial Emissions Licence from the EPA.

A list of currently authorised waste sites in each Local Authority is available on the following website:

<http://facilityregister.nwcpo.ie/>

A list of sites currently licensed by the EPA is available on the following websites:

<http://www.epa.ie/terminalfour/waste/>