AtkinsRéalis

Resource & Waste Management Plan

Mayo County Council

June 2025

N58 STRADE RIVER BRIDGE REHABILITATION WORKS

Bonneagar Iompair Éireann
Transport Infrastructure Ireland

Comhairle Contae Mhaigh Eo
Mayo County Council

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1. Introduction

AtkinsRéalis was appointed by Mayo County Council (MCC) for Eirspan Task Order 315 – Mayo Bridge Assessments and Strengthening 2023, comprising the assessment and rehabilitation of 10 no. bridges in County Mayo. Strade River Bridge lies within the scope of this task order. AtkinsRéalis was further appointed to prepare a Resource and Waste Management Plan (RWMP) on behalf of MCC for proposed rehabilitation works at Strade River Bridge ("the proposed works").

This report has been prepared to support MCC in their Section 177AE application to An Bord Pleanála in relation to the proposed works.

The principal objective of the RWMP is to provide a framework for the proposed works to facilitate the development of a project specific Resource and Waste Management Plan (RWMP) by the Contractor. The following waste management considerations will apply for the entire life cycle of this construction project (hereafter referred to as 'the proposed works'). Waste is an inevitable output of any construction project, no matter the scale. The materials and waste streams that will arise from the proposed works will include:

- Excavated material;
- Demolition waste;
- Construction waste; and,
- Waste generated by workers at site compound facilities.

1.1 Aim of the Plan

The purpose of this plan is to provide sufficient information to ensure that the management of construction waste is undertaken in accordance with all relevant legislation and best practice standards (as set out in Section 2 of this document). The principal aim of this plan is to ensure efficient use of material resources, reduce waste at the source and reduce the quantity of waste that requires final off-site disposal to landfill or recycling in accordance with the waste hierarchy. A secondary aim is to facilitate the transition to a more circular economy, thereby minimising the need for new inputs of virgin materials and energy, while reducing environmental pressures linked to resource extraction, emissions and waste management.

The contractor(s) will develop and finalise the Resource and Waste Management Plan (RWMP) and will incorporate all the measures outlined in the Construction Environment Management Plan (CEMP). The RWMP identifies how waste arisings will be controlled and managed during the course of the proposed works, in particular how waste prevention principles will be applied and how on-site waste will be minimised. The RWMP is written in accordance with the best practice guidance (DoEHLG 2006).

The RWMP includes:

- Roles and responsibilities with regards to waste management;
- An analysis of the likely waste arisings;
- Specific waste management objectives for the proposed works (i.e., Separation of reusable materials from materials suitable for recycling/ recovery, segregation of contamination and clean materials);
- Methods proposed for recycling / reuse of waste;
- Material handling procedures (i.e., Identification and segregation of potentially contaminated soils, characterisation of contamination);
- Procedures for keeping records of all waste and materials which are removed from site; and
- Proposals for training of the workforce in waste management procedures and requirements.

The RWMP will be revised and updated throughout the construction phase of the proposed works to ensure that all construction waste is managed, stored and disposed of in an appropriate manner by licensed contractors in accordance with best practice and relevant legislation.

1.2 Methodology

This document has been prepared in accordance with the relevant industry standard guidance document*; 'Best Practice Guidelines for the preparation of resources & waste management plans for construction & demolition projects'* (EPA, 2021). This guidance supersedes the *'Best Practice Guidelines on the Preparation of Waste Management Plans for Construction & Demolition Projects'* (Department of Environment, Heritage and Local Government (DoEHLG), 2006).

The following relevant best practice guidance documents have also been consulted:

- 'Waste Classification: List of Waste & Determining if Waste is Hazardous or Non-Hazardous' (EPA, 2018);
- 'A review of Design and Construction Waste Management Practices on Selected Case Studies – Lessons Learned' (EPA, 2015);
- The Circular Economy Programme 2012-2027 (EPA, 2021);
- 'Design out Waste: Preparation of Waste Reduction Factsheets for Design Teams' (EPA, 2015);
- 'Development of an Audit Methodology to Generate Construction Waste Projection Indicators for the Irish Construction Industry' (EPA, 2009);
- TII guidance on The Management of Waste from National Road Construction Projects, 2017 (Standard GE-ENV-01101);
- Mayo County Development Plan 2022-2028 (MCC, 2022); and,
- Connacht-Ulster Waste Management Plan 2015-2021 (CUWR, 2025).

Additionally, the following reports have been referenced in preparation of this report:

- AtkinsRéalis (2025). *Natura Impact Statement: Strade Bridge.*
- AtkinsRéalis (2025). *Environmental Impact Assessment Screening Report: Strade Bridge.*
- AtkinsRéalis (2025). *Construction and Environmental Management Plan: Strade Bridge*.
- AtkinsRéalis (2025). *Hydraulic Assessment: Strade Bridge*. Mayo County Council (2022).
- Mayo County Council/TII (2025). Cultural Heritage Impact Assessment: Strade Bridge.

1.3 Need for the Plan

Within Section 3.1 of the EPA guidance document on the Circular Economy (EPA, 2021), it states that '*it is recommended that planning authorities stipulate that a Resource and Waste Management Plan (RWMP) shall be submitted for all construction and demolition projects as best practice to inform the planning consent process. It is recommended that all planning permissions granted include compliance with the RWMP as a standard condition of planning*.'

The level of detail presented in the RWMP should be reflective of the scale and complexity of the project and whether the project is within Tier 1 (smaller scale projects) or Tier 2 (larger scale projects) threshold.

This project is considered a Tier 1 project.

- Tier 1: Smaller scale projects, are below the following thresholds:
  - New residential development of less than 10 dwellings;

- Retrofit of 20 dwellings or less;
- New commercial, industrial, infrastructural, institutional, educational, health and other developments with an aggregate floor area less than 1,250m²;
- Retrofit of commercial, industrial, infrastructural, institutional, educational, health and other developments with an aggregate floor area less than 2,000m²; and,
- Demolition projects generating in total less than 100m³ in volume of C&D waste.

1.4 Format of the Plan

This is a live document which will be updated by the Contractor throughout the works' lifecycle. This document will provide a framework for waste management and will clearly identify the processes that will be implemented onsite, whilst also seeking to ensure compliance with relevant waste legislation, government policy objectives and project specific waste objectives. The Plan will provide a mechanism for monitoring and auditing waste management performance and compliance for the duration of the works.

The evolution of a single plan through a project lifecycle is recommended to ensure preventative and resource efficiency initiatives are undertaken, data are captured, and targets are set and measured throughout the project. This Plan will evolve throughout the duration of the works, from the initial advance works phase, followed by implementation at construction phase.

This outline Resource and Waste Management Plan (RWMP) will be further developed by the contractor, once appointed, who will be responsible for preparing the detailed RWMP prior to commencement of any works onsite. The RWMP needs to be regularly revisited throughout a project's lifecycle so that opportunities to maximise waste reduction/ efficiencies are exploited throughout, and that data is collected on an ongoing basis, so that it is as accurate as possible.

The contractor(s) will comply with the requirements of relevant statutory bodies (including MCC, EPA, EU).

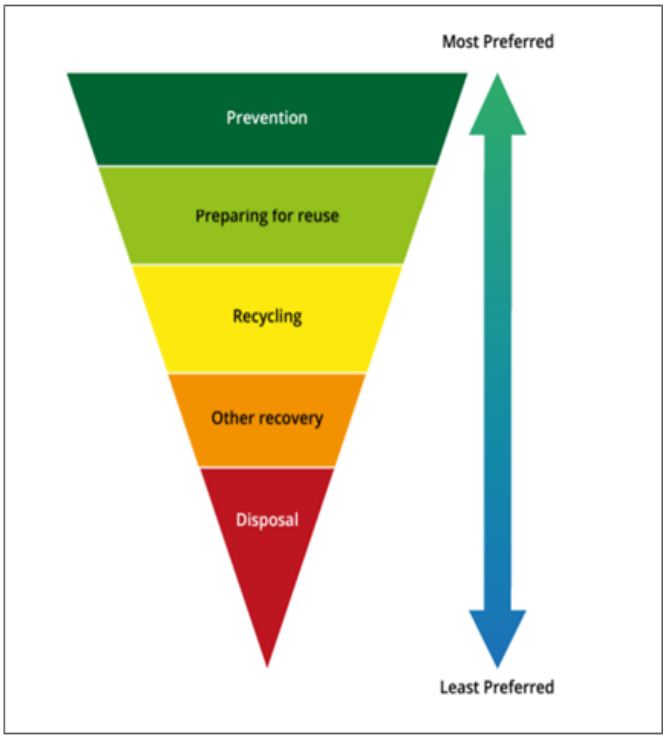
Management of excess soil will be managed in line with the Waste Hierarchy and utilise potential methods and sites for reuse, recovery, recycling and disposal of the excavated material with the aim of minimising disposal as waste. The contractor(s) will develop this strategy to provide an Excavated Material Management Plan for the proposed Project.

2. Policies, Legislation and Guidance

2.1 National Level

The implementation of the Waste Management Act in 1996 provided a legal basis for waste management, practice and infrastructure in Ireland. Following the implementation of this Act government policy moved from primarily relying on landfill disposal towards a more sustainable system of waste treatment through the promotion of recycling and recovery. The policy document entitled 'Changing our Ways' (DoEHLG, 1998) set specific targets for recycling and consolidated the now familiar waste hierarchy of prevention, minimisation, reuse/recycling, energy recovery and disposal. This approach was supported by subsequent legislation.

In 2002, the policy statement 'Preventing and Recycling Waste: Delivering Change' (DoEHLG, 2002) specifically focused on waste prevention and recycling. This document emphasised the importance of adopting a hierarchical approach, with prevention highlighted as the most desirable option. Various national waste prevention programmes and best practice guidance documents were subsequently delivered by the government.



The relevant guidance document in respect of the preparation of waste management plans for the construction sector was subsequently published by the DoEHLG in 2006, entitled 'Best Practice Guidelines on the Preparation of Waste Management Plans for Construction and Demolition Projects'. The purpose of these guidelines was to promote an integrated approach to the management of C&D) waste which all parties from planners, designers, contractors and regulators can adopt throughout the project lifecycle, to ultimately minimise the generation of C&D waste and to establish specific thresholds for the requirement of Waste Management Plans.

In 2011 the revised EU Waste Framework Directive was transposed into Irish law by the European Commission (Waste Framework Directive) Regulations 2011 (S.I. No. 126 of 2011) (EC, 2008). The Waste Framework Directive focused on sustainable and efficient materials management strategy and provides a legal basis for the waste hierarchy. Therefore, the waste hierarchy presented in Figure 2-1 should be applied as a priority in Ireland.

Figure 2-1 – Accepted Best Practice Waste Hierarchy (EPA, 2021)

In 2012 the Government published a new policy document entitled 'A Resource Opportunity Waste Management Policy in Ireland' (DoEHLG, 2012). This document sets out the steps to be implemented on a national scale to make further progress on resource efficiency and seeking the elimination of landfilling of municipal waste in Ireland. This approach is further supported by subsequent guidance including the EPA publication *'Green Procurement: Guidance for the Public Sector*' (EPA, 2014) which clearly states the following Core Green Public Procurement (GPP) Criteria for the Construction sector:

- Construction environmental management plan;
- Staff training;

- Management of fuel and hazardous substances;
- Use of secondary aggregate and recycled materials;
- Water Management; and,
- Waste Management.

This EPA (2014) publication *'Green Procurement: Guidance for the Public Sector'* clearly sets out the responsibility of the Contractor with regard to waste management and disposal, as follows:

'The Contractor must apply appropriate measures in order to reduce and recover waste that is produced during the construction activity. The Contractor shall prepare and submit a waste management plan with its tender which shall form part of the Construction Management Plan to be agreed with the Contracting Authority in advance of the commencement of works. The waste management plan must be prepared in accordance with the Department of Environment, Community and Local Government Best practice guidelines on the preparation of waste management plans for construction and demolition projects (2006).'

'Contractors are responsible for disposing of all waste generated under the contract in accordance with the Waste Management Act 1996 as amended. The Contractor must have full use of, or access to, waste disposal facilities with appropriate licenses and permits. The Contractor must provide copies of valid EPA Waste licences and Local Authority Waste Permits (including those relating to their subcontractors or brokers, where applicable) for collection and waste treatment/disposal/export facilities.'

According to the EPA (2021) updated '*Green Public Procurement: Guidance for the Public Sector': 'Ireland has committed to implementing green public procurement (GPP) in all tenders using public funds by 2023'*. The Department of Communication, Climate Action and Environment (DoCCAE) published *'A Waste Action for a Circular Economy – Ireland's National Waste Policy 2020-2025'* report, in 2020. This document was prepared in response to the 'European Green Deal' and sets out a roadmap for the transition to a new economy, where climate and environmental challenges are instead seen as opportunities. This report replaces the previous National Waste Management Plan *'A Resource Opportunity Waste Management Policy in Ireland'* (2012).

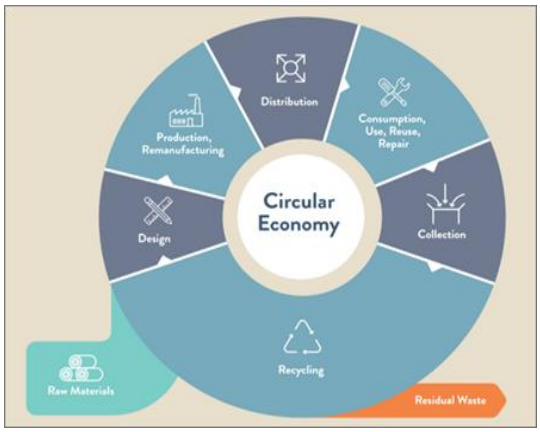


Figure 2-2 - The Circular Economy (DoCCAE, 2020)

The '*Waste Action for a Circular Economy*' report focuses on transition to a circular economy, shown in Figure 2-2, and the need to plan for C&D waste management at the earliest possible stage in a construction project, ideally at concept stage.

The overarching objectives of this action plan are to:

- *'Shift the focus away from waste disposal and treatment to ensure that materials and products remain in productive use for longer, thereby preventing waste and supporting reuse through a policy framework that discourages the wasting of resources and rewards circularity;*
- *Make producers who manufacture and sell disposable goods for profit environmentally accountable for the products they place on the market;*
- *Ensure that measures support sustainable economic models (for example, by supporting the use of recycled over virgin materials); harness the reach and influence of all sectors including the voluntary sector, research and development (R&D), producers / manufacturers, regulatory bodies, civic society; and,*
- *Support clear and robust institutional arrangements for the waste sector, including through a strengthened role for Local Authorities (LAs).'*

The headline points on C&D waste in the Waste Action Plan are as follows:

- *'Project Ireland 2040 sets out the State's development goals over the next 20 years, which allows for the opportunity to forecast large, specific C&D waste streams, with a focus on preventing or efficiently managing the waste from these areas;*
- *Prevention of soil arisings, which are a significant financial burden on the sector, are to progress by placing value on the used material where possible. There is a strong focus on Article 27 by-product and Article 28 end-of-waste decision making process. These processes are to be streamlined and detailed guidance will be developed for specific problematic materials;*
- *The use of recycled construction materials will be incentivised (potentially by introducing a levy on virgin aggregates);*
- *The plan looks to make national end-of-waste decisions for specific construction and demolition waste streams at the earliest possible stage; and,*
- *The 2006 Best Practice Guidelines for construction and demolition waste will be revised to improve the Preparation of Waste Management Plans for Construction and Demolition Waste Projects.'*

2.2 Relevant Guidance

The EPA (2021) *'Best Practice Guidelines for the preparation of resources & waste management plans for construction & demolition projects'* supersedes the Department of Environmental, Heritage and Local Government (DoEHLG, 2006) '*Best Practice Guidelines on the Preparation of Waste Management Plans for Construction & Demolition Projects'.*

Since the publication of the DoEHLG (2006) guidelines, waste policy in Europe has shifted from the established linear economic model to a circular economic model. '*Circular economy-inspired interventions focus not only on increasing recycling quantitatively, but also on:*

- *Reducing the use of virgin resources;*
- *Keeping materials in the economy as long as possible;*
- *Maintaining their intrinsic value/quality as high as possible; and,*
- *Reducing hazardous substances in products and waste*'. (EPA, 2021).

The resource and waste management approaches presented in the EPA (2021) guidelines are based on international principles of optimising resources and reducing waste on construction projects through:

- Prevention;
- Reuse;
- Recycling;
- Green Procurement Principles;
- Off-Site Construction;
- Materials Optimisation; and,
- Flexibility and Deconstruction.

These principles are applied to the Resource and Waste Management Plan (RWMP) through both the pre-construction phase and the construction phase. The evolution of a single plan through a project lifecycle is recommended to ensure preventative and resource efficiency initiatives are undertaken, data is captured, and targets set and measured throughout the project. The evolution of the plan through the project from initial pre-construction phase (in blue) followed by implementation at construction phase (in orange) is illustrated in Figure 2-3 below.

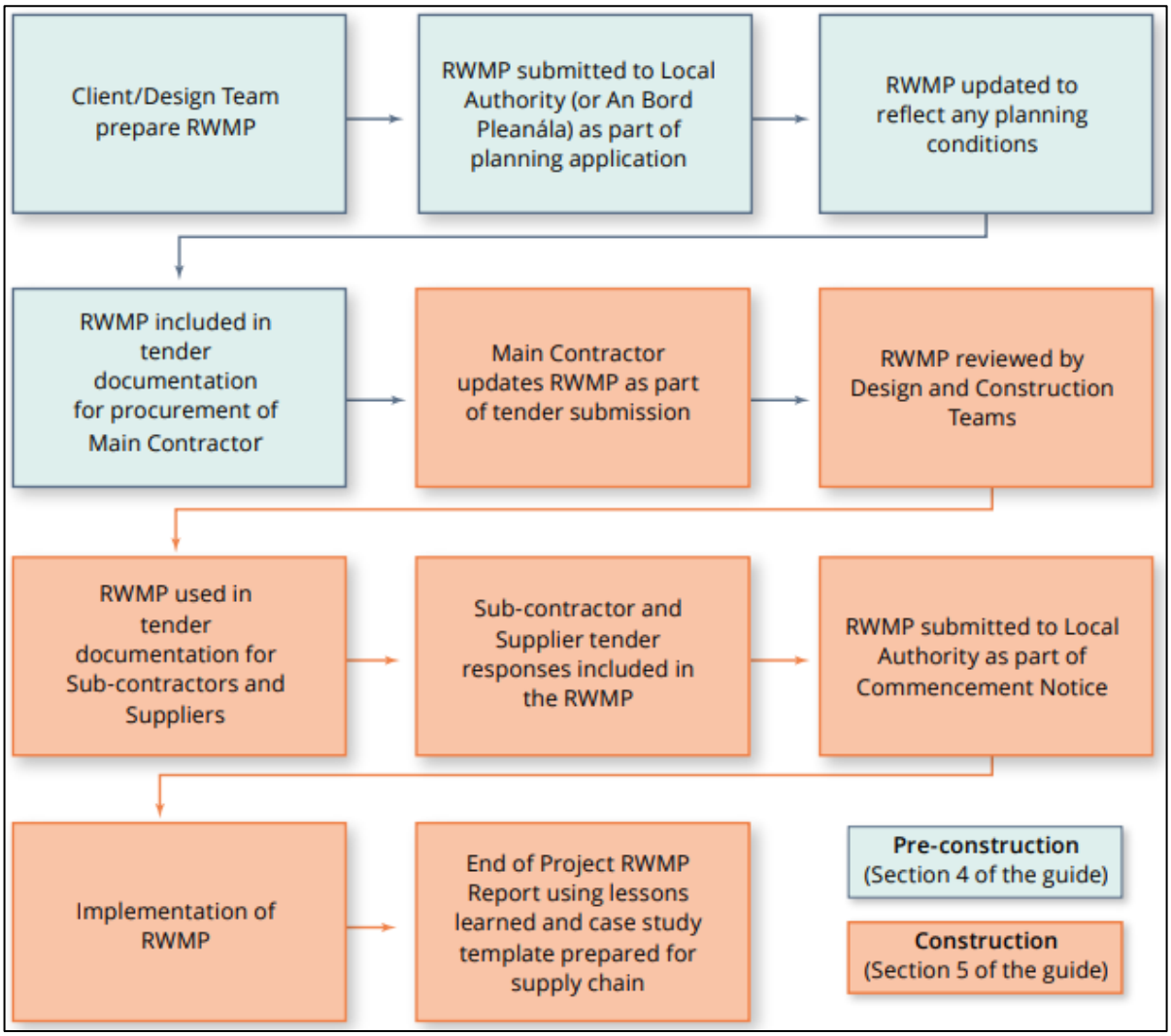


Figure 2-3 – Typical Project Life Cycle of the RWMP (EPA, 2021)

According to the EPA (2021) the level of detail presented in the RWMP should be reflective of the scale and complexity of the project and whether the project is within Tier 1 or Tier 2, as previously outlined. The thresholds for each tier are defined by EPA as follows:

- Tier 1: Smaller scale projects, below the following thresholds:
  - New residential development of less than 10 dwellings;
  - Retrofit of 20 dwellings or less;
  - New commercial, industrial, infrastructural, institutional, educational, health and other developments with an aggregate floor area less than 1,250m²;
  - Retrofit of commercial, industrial, infrastructural, institutional, educational, health and other developments with an aggregate floor area less than 2,000m²; and,
  - Demolition projects generating in total less than 100m³ in volume of C&D waste.
- Tier-2 projects: Larger scale projects, including Strategic Infrastructure Developments, Strategic Housing Developments, infrastructure projects (road, rail, gas, energy) or any project above Tier 1 thresholds (presented above).

2.3 Circular Economy Programme

The Circular Economy Programme 2021-2027 (EPA, 2021) '*builds upon the previous National Waste Prevention Programme to support national-level strategic programmes to prevent waste and drive the Circular Economy in Ireland'* and '*responds to the commitment within the national policy document The Waste Action Plan for a Circular Economy to reconfigure the National Waste Prevention Programme into Ireland's The Circular Economy Programme.'*

Its objectives are to:

- *"Provide LEADERSHIP on the circular economy to improve coherence and alignment of national, regional and local circular economy activities and ensure maximum impact.*
- *Maintain a competitive programme of SUPPORTS to drive the circular economy through providing innovation grants and seed-funding to nationally relevant initiatives.*
- *Implement actions that build KNOWLEDGE and an evidence base to inform circular economy development in Ireland, and to report on progress towards greater circularity.*
- *Realise the enterprise OPPORTUNITY of a circular economy by supporting new business models; promoting resource efficiency; and retaining material value through enhanced use of secondary/ recycled materials, applying the appropriate regulatory framework."*

2.4 Regional Waste Management Plan

The relevant Regional Waste Management Plan for Mayo County Council was previously the Connacht Ulster Waste Management Plan (CURWMP) 2015-2021. The regional plan, which was launched in 2015, provides the framework for waste management up to 2021 and sets out a range of policies and actions, in order to meet mandatory and performance targets. The key objectives of this plan are as follows:

- 1% reduction per annum in the quantity of Household Waste generated per capita over the period of the plan;
- Achieve a recycling rate of 50% of Managed Municipal Waste by 2020; and,
- Reduce to 0% the direct disposal of Unprocessed Residual Municipal Waste to landfill (from 2016 onwards), in favour of higher value pre-treatment processes and Indigenous recovery practices. It's noted that this Connacht Ulster Regional Waste Management Plan has now been replaced by the National Waste Management Plan for a Circular Economy 2024-2030[1]. The key objectives of this plan are as follows:
- *"Promote Sustainable Consumption and Prevent Waste*
- *Strengthen National Waste Collection and Treatment Capacity*
- *Support the Transition to a Circular Economy*
- *Deliver Action through Collaboration and Shared Ownership"*

As the National Waste Management Plan for a Circular Economy 2024-2030 had not yet been established, the overarching objectives of the Connacht Ulster Region Waste Management Plan 2015-2021 have been incorporated into the latest development plan pertinent to this site, i.e., Mayo County Development Plan 2022-2028 (MCC).

[1] https://mywaste.ie/wp-content/uploads/2024/05/National-Waste-Management-Plan-for-a-Circular-Economy-Executive-Summary.pdf

2.4.1 Mayo County Development Plan (MCDP) 2022-2028

According to the MCDP 2022-2028;

"Waste management involves measures to protect the environment and human health by preventing or reducing adverse impacts of the generation and management of waste. Waste management is regulated by national and European legislation, with policy and enforcement operated between the Department of the Environment, Climate Action and Communications, the EPA and Local Government. Mayo is located within the Connacht-Ulster Waste Management Region, governed by the Waste Management Plan 2015 – 2021. Mayo County Council is the regional lead authority, acting on behalf of the other authorities with responsibility for the successful implementation of the plan.

The Council will support circular economy principles, prioritising prevention, reuse, recycling and recovery over the disposal of waste."

The MCDP 2022-2028 specifically states the following Policies and Objectives with regards to Resource Management and the Circular Economy approach to construction and demolition waste management;

- **INP 7 -** To support the Implementation of the Connacht Ulster Regional Waste Management Plan 2015-2021(as amended) or replacement plan with particular emphasis on reuse, recycling and disposal of residual waste in the most appropriate manner where it can be demonstrated that the development will not have significant adverse effects on the environment, the integrity of the Natura 2000 network, traffic safety, residential or visual amenity.
- **INP 8 -** To promote the sustainable management of waste generation and investment in different types of waste treatment and support a healthy environment, economy and society.
- **INO 10 -** Promote prioritising prevention, reuse, recycling and recovery, and to sustainably manage residual waste. New developments shall take account of the provisions of the Connacht Ulster Regional Waste Management Plan 2015-2021(as amended) and observe those elements of it that relate to waste prevention and minimisation, waste recycling facilities and the capacity for source segregation.

2.5 Waste Legislation

It will be the Contractor's responsibility to ensure that they are familiar and comply with the requirements of all relevant waste legislation for the duration of the proposed works. The following non-exhaustive list of legislative requirements typically apply to the construction stage of major developments:

- Waste Framework Directive 2008/98/EC of the European Parliament and Council on waste, as amended, 2018 (S.I. No.851 of 2018);
- European Communities (Waste Directive) Regulations (Directive 2008/98/EC) 2011 (S.I. No. 126 of 2011) as amended 2016 (S.I. No. 315 of 2016), as amended, 2018 (S.I. No. 2018/851), as amended 2020 (S.I. No. 323 of 2020);
- Waste Management Act of 1996, 2001 and 2003;
- Litter Pollution Act of 1997, and as amended in 2009 and 2017;
- Litter Pollution Regulations 1999, (S.I. No. 359 of 1999);
- European Communities (Waste Electrical and Electronic Equipment) Regulations 2011 (S.I. No. 355 of 2011), as amended 2011 (S.I. No. 397 of 2011) 2013, (S.I. No. 32 of 2013);
- European Union (Waste Electrical and Electronic Equipment) Regulations 2014 (S.I. No. 149 of 2014) and 2019 (S.I No. 233 of 2019);
- Waste Management (Collection Permit) (Amendment) (No. 2) Regulations 2023 (S.I. No. 104 of2023);

- Waste Management (Facility Permit and Registration) Regulations 2007, S.I. No. 821 of 2007, as amended, 2008 (S.I. No. 86 of 2008), 2015 (S.I. No. 198 of 2015), 2019 (S.I. No. 250 of 2019);
- Waste Management (Collection Permit) Regulations 2007, S.I. No. 820 of 2007), as amended, 2015 (S.I. No. 197 of 2015), 2016 (S.I. No. 24 of 2016);
- Waste Management (Licensing) Regulations 2004 (S.I. No. 395 of 2004) as amended 2010 (S.I. No. 350 of 2010);
- Waste Management (Miscellaneous Provisions) Regulations, 1998, S.I. No. 164 of 1998;
- Waste Management (Landfill Levy) Regulations 2008, S.I. No. 199 of 2008, as amended 2009, (S.I. No. 550 of 2009), 2010 (S.I. No. 31 of 2010), 2012 (S.I. No. 221 of 2012), 2013 (S.I. No. 194 of 2013), 2015 (S.I. No. 189 of 2015), 2019 (S.I. No.182 of 2019);
- Waste Management (Hazardous Waste) Regulations, 1998, as amended, 2000 (S.I. No. 73 of 2000);
- Waste Management (Shipment of Waste) Regulations 2007, S.I. No. 419 of 2007;
- Waste Management (Movement of Hazardous Waste) Regulations, 1998 (S.I. No. 147 of 1998);
- European Communities (Shipments of Hazardous Waste Exclusively within Ireland) Regulations 2011, S.I. No 324 of 2011;
- European Communities (Transfrontier Shipment of Waste) Regulations 1994 (S.I. No. 121 of 1994);
- Waste Management (Transfrontier Shipment of Waste) Regulations 1998, as amended, 2014 (S.I. No. 861 of 2014);
- Waste Management (Tyres and Waste Tyres) Regulations 2007 (S.I. No. 664 of 2007), 2017, as amended (S.I. No. 400 of 2017) and 2018 (S.I. No. 96 of 2018);
- European Union (Batteries and Accumulators) Regulations 2014, S.I. No. 283 of 2014, as amended, 2014 (S.I. No. 349 of 2014), 2015 (S.I. No. 347 of 2015);
- Waste Management (Registration of Brokers and Dealers) Regulations 2008, S.I. No. 113 of 2008;
- Waste Management (Prohibition of Material Disposal by burning) Regulations 2009, S.I No. 286 of 2009, as amended 2013 (S.I. No. 504 of 2013), 2017 (S.I. No. 599 of 2017);
- Waste Management (Prohibition of Material Disposal by burning) (Amendment) Regulations, (S.I. No. 16/23);
- European Waste Catalogue (EWC) and Hazardous Waste List 2002;
- Waste Management (Food Waste) Regulations 2009, S.I. No 508 of 2009, as amended, 2015 (S.I. No. 430 of 2015);
- European Union (Properties of Waste Which Render It Hazardous) Regulations 2015, S.I. No. 233 of 2015 as amended 2018 (S.I. No. 383/2018);
- Air Pollution Act, 1987 (Emission Limit Values for use of Asbestos) Regulations, 1990, S.I. No. 28 of 1990, as amended 1996 (S.I. No. 264 of1996);
- EC (Control of Emissions of Gaseous & Particulate Pollutants from Non-Road Mobile Machinery) Regulations 2007, S.I. No.147 of 2007, as amended, 2011 (S.I. No. 263 of 2011), 2012 (S.I. No. 407 of 2012), 2013 (S.I No. 417 of 2013), 2016 (S.I. No. 2016 of1628);
- The EU Regulation 2037/2000 (CFC's, HCFC's, Halons) - Ozone Depleting Substances. Control of Substances that Deplete the Ozone Layer Regulations 2006, S.I. No 281 of 2006, as amended, 2011 (S.I. No. 465 of 2011);
- EU F Gas Regulations 2014, S.I. No. 517 of 2014;
- Waste Management (Packaging) Regulations 2014 (S.I. 282 of 2014) as amended 2015 (S.I No 542 of 2015);
- Planning and Development Acts 2000 to 2015, as amended 2018, 2019 and 2020;
- Protection of Environment Act 1992 as amended 2003 and 2017;
- European Union (Ship Recycling) (Waste) Regulations 2019 (SI. No 13/2019);
- European Union (Environmental Impact Assessment) (Waste) Regulations 2013 SI. No. 505 of 2013;
- Industrial Emissions Directive 2010/75/EU; and,
- Landfill Directive 1999/31/EC.

2.6 Waste Soils Classification

According to the EPA document 'Waste Classification, List of Waste & Determining if Waste is Hazardous or Non-Hazardous': '*correct classification is the foundation for ensuring that the collection, transportation, storage and treatment of waste is carried out in a manner that provides protection for the environment and human health and in compliance with legal requirements'* (EPA, 2018).

The waste classification system within this EPA guidance document applies across the EU and is the basis for all national and international waste reporting obligations.

Since 2015, waste classification is based on:

- Commission Decision of 18 December 2014, amending Decision 2000/532/EC on the list of waste pursuant to Directive 2008/98/EC of the European Parliament and of the Council (2014/955/EEC) [referred to hereafter as 'The List of Waste (LoW)'].
- Commission Regulation (EU) No 1357/2014 of 18 December 2014, replacing Annex III to Directive 2008/98/EC of the European Parliament and of the Council on waste and repealing certain Directives.

Soils requiring offsite disposal should be appropriately characterised, prior to transport and disposal, as follows:

- Representative chemical analytical results are input into a waste classification tool (to determine the relevant List of Waste (LoW) Code) and if the waste soils are hazardous or non-hazardous;
- Representative Waste Acceptance Criteria (WAC) analytical results are then separately screened against the relevant screening values (as established under the European Communities Council Decision ((EC) 92003/33/EC) 'COUNCIL DECISION of 19 December 2002 establishing criteria and procedures for the acceptance of waste at landfills pursuant to Article 16 of and Annex II to Directive 1999/31/EC); and,
- All waste soils removed from site must be transported by appropriately permitted hauliers and must be disposed of to an appropriately authorised disposal / recovery facility (via. valid Certificate of Registration, Waste Facility Permit, or Waste Facility Licence).All remaining balance of surplus excavated material will be classified as 'waste'.
- Any material to be removed from site will be transported by vehicles in possession of a valid Waste Collection Permit.
- Where practical the closest suitable facilities will be used to minimise, the impacts associated with transporting the material, such as air and noise emissions from vehicle movements.
- It is intended that in so far as is possible, the surplus excavated material will be managed within Ireland in order to minimise impacts associated with the transport of the material.
- While being retained on-site, the excavated material will be properly managed and stored in order to reduce impacts associated with storage of soil and stone.
- Different types of excavated material will be stored separately, i.e., where applicable made ground will be stockpiled separate to soils and subsoils, which will be stockpiled separate to rock.
- Any material which has been classified as a by-product in accordance with Article 27 will be stored separately to any material which is classified as a waste. Where possible, excavated material will be placed directly into tipper-type HGVs for transport to its final destination.
- Any contaminated land will be stockpiled separately from all other material in order to minimise the risk of cross contamination.

Stockpiling shall be strictly controlled to ensure that impacts to the environment surrounding the site are kept to a minimum. The Contractor will identify suitable areas for the stockpiles that will be remote from any sensitive environments such as waterbodies.

The Waste Framework Directive (EU 2008) sets out the exclusions from the scope of the Directive which includes the following under Article 2(1)(c):

'*Uncontaminated soil and other naturally occurring material excavated in the course of construction activities where it is certain that the material will be used for the purposes of construction in its natural state on the site from which it was excavated.'*

Materials from the proposed works which fall within this provision are therefore not subject to the requirements of EU and National waste legislation. Article 27 of the European Communities (Waste Directive) Regulations 2011 allows an economic operator to decide, under certain circumstances, that material is a by-product and not a waste. The following conditions must be met in this case:

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

Note the requirement for the further use of the material to be certain means that the intended end-use must be known at the time the material is produced. Material stock-piled in the hope that a market will be found for it sometime in the future is a waste rather than a by-product.

Classification of material as a by-product means that the material is approved for a use that is not regulated by waste management legislation, and therefore is not required to be managed as per that legislation. For such construction projects, excavated soil and stone can be categorised under this exemption provided the material adheres to the conditions stipulated under Article 27. The economic operator and destination for the material must adhere to EPA and Local Authority requirements and an EPA authorisation for this exemption to be availed of.

3. Project Description

3.1 Project Location

The proposed development site is located on the Strade River at the convergence of Knockagarraun, Strade and Knockshanbally townlands in County Mayo and are c. 2.9km northeast from Ballyvary village. The existing MO-N58-001.00 Strade River Bridge carries the N58 National Secondary Road over the Strade River at the location (Figure 3-1). The existing bridge comprises a two span filler beam deck with steel railway girders encased in concrete and supported on a mass concrete pier and abutments.

The ITM co-ordinates of the existing structure are:

Easting: 525753 Northing: 797497

The proposed development site is immediately upstream of a Natura 2000 site, the River Moy SAC (site code: 002298). Further downstream (> 30km) lies the Killala Bay/Moy Estuary SAC (000458) and Killala Bay/Moy Estuary SPA (004036). Lough Conn and Lough Cullin SPA (004228) lies c. 4.1km overland from Strade River Bridge. There are no other Natura 2000 sites with connectivity to Strade River Bridge.

The bridge is located in a rural location with farmland located northwest and southwest of the structure. The Michael Davitt Museum (NIAH 31307029[2]) is located to the east of the structure with Strade Friary, the Catholic Church of Saint Peter and Saint Paul (RPS 0129; NIAH 31307027[3]) and associated graveyards also located northeast of the structure. A public house and a residential premises is located southeast of the structure.

Two other protected structures are located in close proximity. Strade Bridge (RPS 0130; NIAH 31307030[4]) is located 40m upstream of the existing bridge and was in use until bypassed as part of a road realignment in 1983. The O'Donnell Mausoleum (RPS 0006, NIAH 31307028[5]) is also located east of the structure.

The bridge location is also within the Zone of Notification for MA070-067001 (Religious House - Dominican Friars); MA070-067004 (Graveslab); MA070-067005 (Religious House - Franciscan Friars); MA070-067006 (Graveyard) and other associated monuments.

[2] https://www.buildingsofireland.ie/buildings-search/building/31307029/strade-strade-co-mayo
[3] https://www.buildingsofireland.ie/buildings-search/building/31307027/catholic-church-of-saint-peter-and-saint-paul-knockagarraun-strade-co-mayo
[4] https://www.buildingsofireland.ie/buildings-search/building/31307030/knockshanbally-strade-co-mayo
[5] https://www.buildingsofireland.ie/buildings-search/building/31307028/strade-strade-co-mayo

Figure 3-1 - Location of Strade River Bridge

3.2 Project Overview

The proposed works to the existing Strade River Bridge to increase the load carrying capacity and structural integrity of the bridge comprise the demolition of the existing bridge superstructure and replacement with a new single span deck constructed to align with the retained existing abutments. The proposed replacement deck would be formed of precast prestressed concrete beams with an in situ concrete deck infill. The replacement deck has an approximate clear span of 10.8m and an approximate width of 11.8m.

New independent foundation supports would be located behind the existing abutment walls with the proposed foundations comprising reinforced concrete bored cast in place piles and pile caps. The existing pier and concrete apron are to be demolished to improve conveyance through the structure with a new reduced height (300mm) concrete apron constructed to maintain the existing low flow channel, following consultation with the Office of Public Works (OPW) and Inland Fisheries Ireland (IFI).

In order for the new bridge soffit to meet the medium probability design flood level requirements of OPW the vertical alignment of the road is required to be raised by approximately 450mm immediately at the bridge with tie-ins to existing road levels provided on the approaches.

The existing carriageway width is to be retained across the new superstructure with the raised verges widened to achieve a minimum width of 2m. New 1.25m high reinforced concrete masonry clad parapets will be constructed over the length of the structure with safety barriers installed on both verges approaching and crossing the bridge.

Ancillary works include the reconstruction of the landowner boundary wall southeast of the bridge.

The proposed site layout and Elevations and Section for the proposed works are shown in Figures 3-2 and 3-3 below.

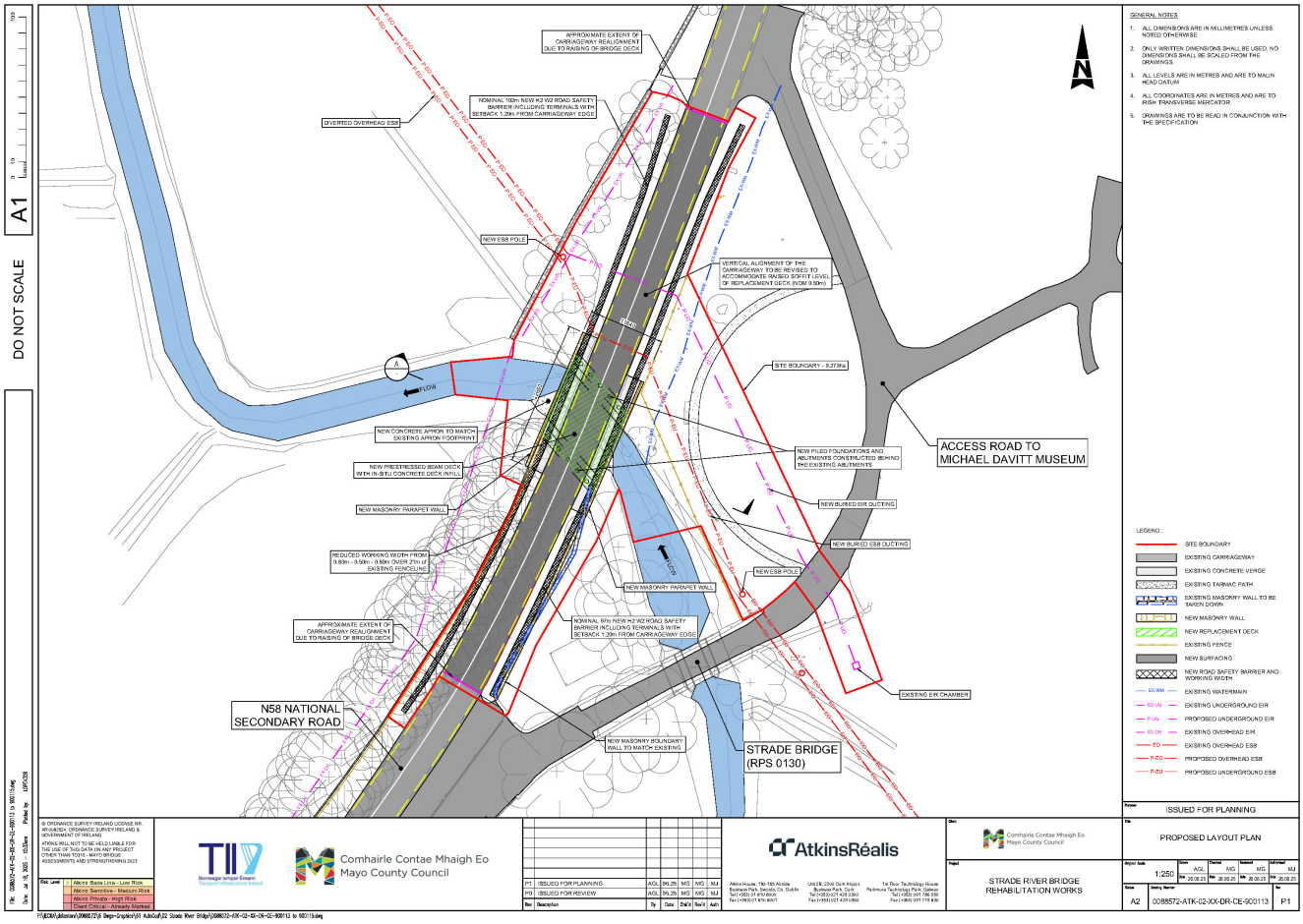


Figure 3-2 - Proposed Works Site Layout

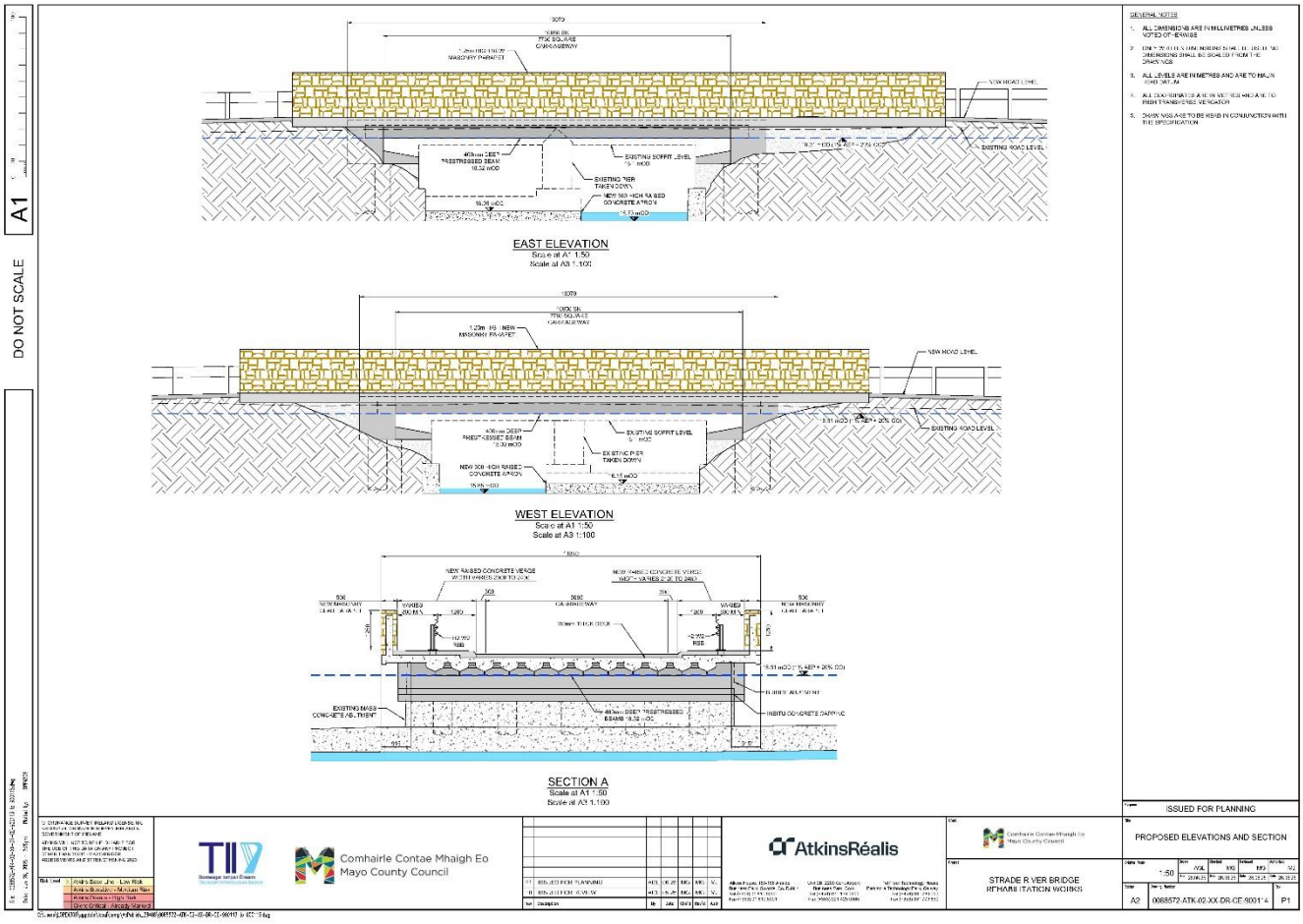


Figure 3-3 - Proposed elevations and cross-section depicting pier removal and reinstatement of a concrete apron

The construction methodology and sequence of works are: -

1. The site compound will be marked within the road closure footprint of the N58 national road. All machinery and plant will be stored on site for the duration of works along the proposed road closure route.
2. Traffic Management installed at the works location. Detailed Traffic Management Plan to be provided by the successful contractor once appointed.
3. Installation of working platform spanning 4m between the existing concrete supports below the north span of the structure to prevent material entering the watercourse during the demolition works. Minor instream access by operatives is required to facilitate the installation of the working platform. Platform decking to comprise timber planking with plastic sheeting on top to catch falling material. The platform will extend under the bridge as well as 3m upstream and downstream. The platform will be fully sealed using plastic sheeting. Minor instream footings are required for the extension of the working platform upstream and downstream of the bridge.
4. Demolition of existing bridge parapets using excavator mounted breaker positioned on the existing bridge carriageway and removal by hand. Works completed under an alternating lane closure. 11m³ material removed from site to tip. All works here will be undertaken from land and existing bridge carriageway.
5. Full closure of N58 carriageway and installation of diversion route traffic management on the N5 National Road and R321 Regional Road. Estimated 6 months closure period.
6. Removal of existing carriageway surface on the bridge extent and 5m back on the approaches by breaking and excavation with an excavator. 24m³ material removed off site to tip.

7. Existing fill material and concrete verges on top of bridge to be removed by excavator to expose deck top surface. 24m³ material removed off site to tip.
8. Excavation of made ground behind both abutments for the full 10m width of the bridge structure by 4m long to a depth of 3m below existing ground level using an excavator. 130m³ material removed off site to tip. The area of excavation is immediately behind both abutment walls, c. 1m from the river course, contained behind the existing abutments and wing walls.
9. Bored cast in place reinforced concrete piles (Figure 1-9) to then be installed to a suitable depth (depth will be informed by ground investigation works) within both excavations behind the abutments, sleeved from excavation level to pile cap level. Piles to be installed by a 40t rotary piling rig positioned on the approach carriageway and sleeved above excavation level.
10. Reinforced concrete OGEE pipes to be installed around each pile to provide isolation between the top of the pile and backfill to facilitate movement of the new structure. Pipes to be lifted into place using an excavator positioned on the approach carriageway.
11. Lean mix concrete backfill to be installed between pipe units and existing abutments to the bottom of pile cap level. 8m³ concrete to be pumped from on top of the approach carriageway at each abutment.
12. 6N granular material backfill to be installed to the back of both excavations to pile cap level using an excavator and compacted using hand operated compaction equipment. 50m³ imported material for each abutment. 100m³ total.
13. Pile cap reinforcement cages constructed on the existing carriageway and lifted into place using an excavator. 10m³ concrete to then be poured for each pile cap from the approach carriageways and a 7-day curing time allowed before being trafficked.
14. Additional imported 5m³ granular fill material to be placed using dumper and excavator above both pile caps to facilitate access to demolish the existing bridge superstructure.
15. Arrangement of steel filler beams to be identified and marked on the deck. Deck to be cut into single span longitudinal sections using a large blade concrete road saw. The large blade concrete road saw will contain a vacuum to improve dust control at the dust source. Deck sections to then be lifted by excavator and removed off site to tip. 29m³ total quantity.
16. Existing pier to be taken down 1.5m to the raised apron level using a breaker mounted to an excavator. The excavator will be positioned on top of the existing abutments at carriageway level. 13m³ material to be lifted from existing concrete apron and temporary working platform by grab lorry and removed from site to tip.
17. Top sections of existing abutments to be demolished by hand and abutment height reduced by minimum 600mm to bottom of pile cap level. 11m³ material to be lifted by grab lorry and removed from site to tip.
18. The working platform will then be removed from the watercourse and the working area will be made dry, prior to the pouring of any concrete directly adjacent to or over the watercourse, and excavation of the existing concrete apron.
19. Once the dry working area is in place, the demolition of existing raised concrete apron using breaker mounted on excavator positioned on approach carriageway. Removal of 53m³ material off site to tip using grab positioned on approach carriageway.
20. Excavation to 300mm below existing bed level to formation level for the new apron by an excavator positioned on the approach carriageway. 21m³ existing material to be moved off site to tip. Excavation works will be undertaken within the dry working area.
21. A new 600mm high raised concrete apron installed on concrete blinding with reinforcement mesh provided for crack control. 42m³ concrete to be pumped from truck positioned on top of the carriageway. The dry working area is required to be maintained throughout the duration of concrete apron demolition and installation of new.
22. Erection of shuttering on top of reduced height abutments and pouring of concrete capping from concrete truck located on approach carriageways will occur. 3.6m³ concrete to be poured for each abutment capping. Nominal

reinforcing mesh to be included in capping for crack control. 20mm compressible filler board to be installed between pile cap and capping to facilitate minor movement of the structure. Wet concrete will be pumped from landside with shuttering fixed to front face of existing abutments and sealed platform tight to abutment preventing spillage to the (dry) river channel.

23. Prestressed concrete beams will be delivered to site and installed on top of pile caps by mobile crane positioned on the approach carriageway.
24. Dry pack mortar will be hand placed between beams to seal gaps with the deck reinforcement installed and tie ins to pile cap reinforcement provided. Shuttering erected to form the deck cantilevers.
25. The deck concrete infill will be pumped from concrete truck located on approach carriageway. Integral connection to be formed at pile caps. A minimum of 7 days curing time required for deck; concrete pouring/pumping works will be undertaken over the dewatered channel. 30m³ of concrete required for these works.
26. Vertical shuttering will be fixed to cantilever slabs for concrete parapet stems with reinforcement tying into starter bars from deck slab. 18m³ concrete to be pumped from concrete truck located on approach carriageway.
27. Following the completion of works to the concrete apron and all pouring of concrete works to the deck, the dewatering of the channel will be removed. 28. The existing surfacing on the northern and southern road approaches will be planned out for a distance of 40m from the bridge with 24m³ material to be removed from site to tip. These works by nature occur set back from the watercourse along the existing roadway and are over land.
28. Additional asphalt surfacing base course and binder course construction on approaches to increase the vertical alignment to the bridge by c.400mm. 70m³ surfacing required. These works are contained on the existing road approaches to the bridge and are over land.
29. Deck surface to be cleared of all dust and debris by sweeping with collected material removed from site to tip.
30. Spray applied epoxy waterproofing system to be installed to the deck surface and parapet upstands from on top of the deck surface. 178m³ total area. 4m³ sand asphalt protection layer installed to protect the deck waterproofing. Epoxy to be sprayed by hand in proximity to the surface of the deck; works are contained on the bridge surface with no potential for materials to enter the watercourse.
31. Concrete verges will be constructed on the bridge, with 28m³ concrete pumped from the approach carriageway. Spare ducting for future utilities provided in verges. Mesh reinforcement included for crack control. Brush finished concrete surface. Concrete pumping here will be contained on the new bridge deck with no potential for material to enter the watercourse.
32. Asphalt surfacing binder course will be installed across the bridge surface with tie ins to the approaches. 100m³ quantity. Works are contained on the new bridge deck with no potential for material to enter the watercourse.
33. The N58 National Secondary Road will then open with a single lane closure remaining in place for the works. Lane closure to alternate as required for the remaining works.
34. Masonry construction to the faces of both parapets across the length of the structure. Masonry to match upstream arch bridge with lime mortar to be placed by hand on top of the structure with a temporary scaffold platform erected to construct the outside faces. The temporary scaffold platform requires the provision for instream footings at both the upstream and downstream faces of the structure. The light working decks will be sealed with plastic and will catch any accidental spillage of materials when undertaking masonry works. 105m³ quantity.
35. Surfacing course will be installed across the full extent of the works. 282m³ quantity.
36. The southeast masonry approach wall to be taken down and reconstructed further back from the edge of carriageway. 12m3 masonry. Masonry wall to be rebuilt by hand using lime mortar. Works here are over land.
37. Both verges on approaches to the structure will be regraded to align with new carriageway level. 80m³ quantity of topsoil. Verges to be seeded on completion.

38. Safety barriers will be erected on both approaches and across the bridge.
39. Road marking will be completed.
40. Removal of traffic management.
41. Demobilisation from site and restoration of site compound area (in this case, the N58 road) to pre-works condition.

3.2.1 Demolition

Demolition works are required for the removal of all bridge material requiring replacement. This comprises of removal of existing surfacing and verges, parapet walls and pier. All material will be removed off site and disposed of at an appropriate waste disposal facility (also referred to as tip).

3.3 Construction Phase

3.3.1 Details of Non-Hazardous Wastes to be produced

Waste materials generated during the construction stage will primarily comprise topsoil and excavated subsoil arising during installation of the structural foundations of the bridge, as well as surplus general construction waste materials, and waste generated by construction workers.

In accordance with good practice, excavated soils will be reused onsite wherever feasible, including for boundary treatment and landscaping purposes, if suitable. Any surplus soils will be disposed of offsite in accordance with all relevant waste management legislation and best practice requirements.

Should any ground contamination be encountered during the construction phase of the development the Employer and Employers Representative, and the Resource Manager should be immediately notified and consulted with. Appropriate measures must be put in place, as set out below, including appropriate transport and disposal of such waste materials to a suitably licenced facility in accordance with all relevant waste legislation.

According to the EPA '*Correct classification is the foundation for ensuring that the collection, transportation, storage and treatment of waste is carried out in a manner that provides protection for the environment and human health and in compliance with legal requirements'*. Hence soils requiring offsite disposal must be characterised as per the requirements of the relevant Waste Acceptance Criteria (WAC) under the European Communities Council Decision ((EC) 92003/33/EC) 'COUNCIL DECISION of 19 December 2002 establishing criteria and procedures for the acceptance of waste at landfills pursuant to Article 16 of and Annex II to Directive 1999/31/EC'. Soils requiring offsite disposal will also require waste classification in strict accordance with the requirements of the EPA as set out in the following document 'Waste Classification List of Waste & Determining if Waste is Hazardous or Non-hazardous' (EPA, 2018). All waste soils removed from site must be transported by appropriately permitted hauliers and must be disposed of to an appropriately authorised disposal / recovery facility (via. valid Certificate of Registration, Waste Facility Permit, or Waste Facility Licence).

Surplus construction materials, including metals, plastics, packaging, and timber, will also be generated during the Construction Phase. Such materials will be segregated and recycled where possible and all other materials will be disposed of offsite in accordance with all relevant waste management legislation and best practice requirements.

Additional waste generated by onsite personnel during the construction works will broadly include the following; canteen waste, waste arising from temporary onsite self-contained welfare facilities, and a minor volume of waste electrical and electronic equipment. Such materials will be segregated and recycled where possible and all other materials will be disposed of offsite in accordance with all relevant waste management legislation and best practice requirements. A breakdown of the likely waste streams generated is presented in Section 6.

3.3.2 Details of Potentially Hazardous Wastes to be produced

3.3.2.1 Fuels, Oils and Chemicals

Hazardous materials (fuels, oils and chemicals) will be used at the site during the Construction Phase. As agreed with MCC, the successful contractor will utilise the area of road closure along the N58 national road as a site compound for the duration of works. There may be a requirement for temporary (mobile) lighting within the site compound area along the N58 should works extend to winter months, however this is not foreseen given the works window of July to September6 required to facilitate instream works. Upon completion of works the site compound area will cease to exist and will revert to fully operational road use. As per industry standards, any fuel and oils temporarily stored onsite will be stored in double skinned / appropriately bunded storage tanks, in a secure dedicated fuel storage location onsite. All other chemicals, including paints, varnishes, glues, adhesives, degreasing agents and cleaning agents, will be securely stored in a dedicated temporary bunded chemical store onsite. All machinery, including any generators / pumps used onsite, should be checked at the start of each work shift for evidence of any fuel or oil leaks (and removed offsite for any repairs as may be required).

Fuel, oil and chemical spill kits will be made available at the designated storage areas, along with the relevant Safety Data Sheet (SDS). SDS documents contain information on the potential hazards (health, fire, reactivity and environmental) and how to work safely with the relevant chemical. All site operatives should receive training in appropriate refuelling methods and machinery checks, and chemical handling methods to be implemented onsite. Taking account of these control measures, along with the fact that the volumes of paints, varnishes, glues, adhesives etc. will be minor, it is not expected that any waste fuel, oil or chemicals will be generated during the Construction Phase.

3.3.2.2 Contaminated Soils

Based on available information no potential sources of significant onsite ground contamination associated with current or historic land-use have been identified. Therefore, the risk of encountering significant ground contamination (i.e., hazardous soils) beneath the site is considered to be highly unlikely at this preliminary juncture.

Nonetheless, excavation works during the Construction Phase should be monitored and in the highly unlikely event that contaminated materials are encountered, they will need to be segregated from all uncontaminated soils, temporarily stored (any stockpiles should be lined and covered by heavy duty 1000-gauge plastic), sampled and analysed for relevant parameters (Waste Acceptance Criteria suite e.g., Rilta Disposal Suite). Any contaminated soils must be characterised as per the requirements of the relevant Waste Acceptance Criteria (WAC) under the relevant European Communities Council Decision (EC) (92003/33/EC) and classified in accordance with the requirements of the EPA as set out in the following documents ‘Waste Classification List of Waste & Determining if Waste is Hazardous or Non-hazardous’ (EPA, 2018). Any contaminated soils must be transported by appropriately permitted hauliers and disposed of to an appropriate EPA licensed Waste Facility in accordance with all relevant waste management legislation. Management of non-native invasive species is outline below.

3.3.3 Non-native Invasive Species

The sites was surveyed by AtkinsRéalis Senior Ecologists Owen O’Keefe and Kevin McCaffery for invasive plant species listed on the third schedule of the EC (Birds and Natural Habitats) Regulations 2011 S.I. No. 477 of 2011. Species surveyed for included, Japanese knotweed (*Reynoutria japonica*) and associated hybrids. Surveys were undertaken on 7th May 2025 which is within the seasonally appropriate window to assess the Site for the presence of invasive plant species.

No evidence of third schedule invasive plant species were recorded within the extents of the Site.

A pre-construction survey will be needed before any construction works can begin on the proposed works. If any non-native invasive species including Japanese knotweed (*Fallopia japonica*) are identified prior to or during construction activity, however, appropriate measures (designed, scoped and managed by a relevant specialist) will be required in order to remediate any identified Japanese Knotweed stems and any soils impacted by the plant roots.

In regard to non-native invasive species the following points should be noted;

- Regulations 49 of Part 6 of the European Communities (Birds and Natural Habitats) Regulations, 2011 (S.I. No. 477 of 2011) outlines the legal context for the prohibition of the introduction and dispersal of certain plant and animal species. Specifically, Section 49, paragraph 2 states that any person without the required licence “who plants, disperses, allows or causes to disperse, spreads or otherwise causes to grow” any plant species listed in Part 1 of the Third Schedule within the State shall be guilty of an offence.

4. Roles & Responsibilities

For the purposes of clarity, the roles, and responsibilities of the project team for the development should be determined at the very outset of the construction stage of the works. Key roles are typically performed by the Client, Engineer, and Contractor as presented in Table 4.1 below. Specific details will be determined during the Detailed Design and Contract stage.

Table 4-1 - Roles and Responsibilities

Employer	**Planning Agents**
The Client: Mayo County Council Tel: 094 906 4000 Contact: Kieran Irwin	Consultant: AtkinsRéalis Tel: 01 8108000 Contact: Mark Gilsenan
Employers Representative	**Civil, Structural and Environmental Team**
Consultant: AtkinsRéalis Tel: 01 8108000 Contact: Mark Gilsenan	Consultant: AtkinsRéalis Tel: 01 8108000 Contact: Mark Gilsenan
Project Supervisor for the Design Process (PSDP)	
Consultant: AtkinsRéalis Tel: 01 8108000 Contact: Richard Joyce	
Contractor	**Project Supervisor Construction Stage (PSCS)**
Contractor: to be confirmed Tel: to be confirmed Contact to be confirmed	Contractor: to be confirmed Tel: to be confirmed Contact: to be confirmed

The EPA (2021) *'Best Practice Guidelines for the preparation of resources & waste management plans for construction & demolition projects'* state that a number of responsibilities for the development of resources & waste management plans are identified for parties under Waste Framework Directive 2008/98/EC including the following:

- 'Original Waste Producer means anyone whose activities produce waste or anyone who carries out pre-processing, mixing or other operations resulting in a change in the nature or composition of this waste (in this case the Client); and,
- Waste Holder means the waste producer or the natural or legal person who is in possession of the waste (the Client).'

The EPA (2021) *'Best Practice Guidelines for the preparation of resources & waste management plans for construction & demolition projects'*, highlights the responsibilities of the following key personnel for implementing resources & waste management plans.

4.1 Client

The responsibilities of the client are as follows:

- Require the preparation and submission of an RWMP as part of the design and planning submission;

- Require the preparation and submission of an updated RWMP as part of the construction tendering process;
- Ensure that the RWMP is agreed and submitted to the local authority prior to commencement of works on site; and,
- Request the end-of-project RWMP from the Contractor.

4.2 Design Team

The responsibilities of the design team are as follows:

- Drafting and maintaining the RWMP through the design, planning and procurement phases of the project;
- Appointing a Resource Manager (RM) to track and document the design process, inform the Design Team and prepare the RWMP;
- Include details and estimated quantities of all projected waste streams;
- Incorporate relevant conditions imposed in the planning permission into the RWMP;
- Handover of the RWMP to the Contractor at commencement of construction for the development of the RWMP in a similar fashion to how the safety file is handed over to the Contractor; and,
- Work with the Contractor as required to meet the performance targets for the project.

4.3 Contractor

The responsibilities of the Contractor are as follows:

- Preparing, implementing and reviewing the RWMP through construction (including the management of all suppliers and sub-contractors) as per the requirements of these guidelines;
- Identifying a designated and suitably qualified Resource Manager (RM) who will be responsible for implementing the RWMP;
- Identifying all hauliers to be engaged to transport each of the resources / wastes off-site;
- End-of-waste and by-product notifications addressed with EPA where required;
- Clarification of any other statutory waste management obligations, which could include on-site processing; Full records of all resources (both wastes and other resources) should be maintained for the duration of the project;
- Carry out training and site inductions;
- Preparing a RWMP Implementation Review Report at project handover;
- The compliant management of all waste generated by advance works activities and will be responsible for preparing and implementing a CEMP, identifying construction methodologies for the Project and standard operating procedures that will be implemented to minimise the impact. Circular economy principles will be incorporated within the management of materials during the Construction Phase in order to reduce the amount of materials used and waste generated by the proposed Project.
- The Contractor(s) will prepare and finalise the CEMP and specific method statements based on the outline CEMP adopted. The Contractor(s) will prepare and implement a CEMP, identifying construction methodologies for the proposed Project and standard operating procedures that will be implemented to minimise the impact.
- The Contractor(s) will ensure that any facilities to which waste is brought are licensed / permitted / registered in compliance with waste management legislation. Similarly, the transportation of waste away from any of the construction sites or compounds will be carried out by vehicles in possession of Waste Collection Permits in compliance with legislation.
- The Contractor(s) will also be responsible for management of the ordering of supplies, ensuring that supplies are ordered as needed to avoid over-ordering or the requirement for long-term storage of materials, thus reducing the potential for damage or expiration of supplies while being stored on site.

- An Ecological Clerk of Works (ECoW) will be appointed and will supervise all aspects of the critical works on site, in particular initial site set up, dam/ silt fence installation, and pouring of concrete. The ECoW will be a suitably qualified and experienced ecologist, which will be appointed by the successful Contractor. The ECoW will ensure compliance of mitigation measures on site and liaise with IFI and NPWS staff where required.

All contractors will maintain their duty of care to protect the interests and safety of others from the potential effects related to waste and ensure that waste generated from the project is handled in accordance with the relevant legislation governing its storage, transfer, treatment and disposal. All contractors have a legal obligation to ensure compliance with all relevant waste legislation.

All necessary measures will be taken to ensure that waste management is carried out without endangering human health and without harming the environment, and in particular:

- Without risk to water, air, soil, plants or animals;
- Without causing a nuisance through noise or odours; and
- Without adversely affecting the countryside or places of special interest.

All relevant documents and required authorisations will be put in place before removing any waste from site, and a register of this information will be maintained. This will be in relation to the transfer of waste (waste carriers), any off-site waste management facilities (permitted or exempt sites) to which waste is taken.

Any waste leaving the site will be accompanied by appropriate duty of care documentation in line with the relevant statutory requirements for waste transfer and hazardous wastes (as appropriate). Duty of care documentation will be retained by the contractors in line with statutory requirements.

A register of all waste loads leaving the site and/or a tracking system for excavated material destined for re-use would be maintained to provide a suitable audit trail and to facilitate monitoring and reporting of waste and material types, quantities and management methods.

5. Design Approach

5.1 Introduction

The site preparation works will involve excavation of soils, and demolition / removal of the existing structures. The removal or retention of material on site will be maximised by the Contractor.

The total volume of material requiring excavation and/or removal off site is estimated to be approximately 186m3. It is anticipated that ca. 130m3 of soil will be suitable for re-use/landscaping at the site.

5.2 Design for Reuse and Recycling

Minor regrading of embankments is the extent of earthworks for the proposed works with existing alignments to be retained. The total site area of the proposed works is 0.3ha.

In accordance with good practice, excavated soils will be reused onsite where feasible. Any excess topsoil to be transported offsite will be transported to an appropriately licenced, permitted or registered facility. The soil will be characterised in accordance with EPA, 'Waste Classification: List of Waste & Determining if Waste is Hazardous or Non-Hazardous' and EC Council Decision, 2003/33/EC, on establishing criteria and procedures for the acceptance of waste at landfills.

An application may be made to the EPA under Article 27 of the European Communities (Waste Directive) Regulations 2011 for the use of excess soil or materials as a by-product if a definite use and need for this material can be determined. Also, an application may be made to the EPA under Article 28 which sets out the grounds by which a material, recovered or recycled from waste, can be deemed no longer a waste and complies with a set of end-of-waste criteria (substance/ object to be used for specific purposes, a market or demand exists, fulfils technical requirements and no overall adverse impact to human health or the environment).

Design for Reuse and Recycling (identifying, securing and using materials that already exist on-site, or can be sourced from other projects (e.g., by considering reusing materials) is the most efficient way of designing low carbon infrastructure and feeds into the circular economy as opposed to a linear economy where product is treated as 'waste' at the end of its life.

End of waste status is defined under Article 28 of the European Communities (Waste Directive) Regulations (GPO 2011), which sets out the grounds by which a material which is recovered or recycled from waste can be deemed to be no longer a waste. Certain specified waste shall cease to be a waste when it has undergone a recovery, including recycling and complies with criteria to be developed in accordance with the following conditions:

- The substance or object is commonly used for specific purposes;
- A market or demand exists for such a substance or object;
- The substance or object fulfils the technical requirements for the specific purposes and meets the existing
- legislation and standards applicable to products; and
- The use of the substance or object will not lead to overall adverse environmental or human health impacts.
- The end of waste criteria are the requirements which must be fulfilled by a material derived from waste, and that ensure the material quality such that it will not be discarded and the use of which is not detrimental to human health and the environment (Joint Research Centre 2009).

5.3 Design for Green Procurement

When selecting suppliers, it is essential to assess the technical capabilities required for the products or services being procured. This is valuable from the buyer's point of view as suppliers that clearly cannot meet the requirements will be eliminated. In addition, it is also useful for the suppliers to get a clear understanding of how committed the Client is to protect sustainability and what will be essential for any submission to be successful.

At an early stage (pre-procurement), the client will have discussion with potential contractors, subcontractors and suppliers regarding the following:

- Waste prevention and minimisation during the construction stage;
- Design solutions to encourage innovation in tenders and incentivise competitions to recognise sustainable approaches;
- Use ordering procedures that avoid waste, i.e., no over-ordering, take-back schemes for both material surplus and offcuts;
- Discuss options for packaging reduction with subcontractors and suppliers using measures such as 'Just-in-Time' delivery; and,
- Set reuse and recycling rates.
- Identifying and specifying materials that can be acquired responsibly, in accordance with a recognised industry standard (e.g., consider opportunities for materials to be returned to the supplier for future reuse (e.g., steel and concrete elements).

Green procurement integrates environmental considerations that include a combination of cost and quality into the procurement process. In order to help achieve this, both operational and embodied carbon targets for the works will be set out early on in collaboration with the design team in order to ensure that green procurement can take place. Through comparative data on embodied carbon, low carbon materials options will be favoured where possible. A sustainable construction plan will be developed that addresses all aspects of construction relating to design from reducing demolition, considering reuse / upcycling and recycling of existing materials to approaching suppliers for green construction materials e.g. Responsible Steel and adopt Design of Off-Site Construction. *'The use of off-site manufacturing reduces residual wastes by up to 90% (volumetric building versus traditional)'* (EPA, 2021). Low carbon additives to industry standard components will also be considered as part of this process e.g. the use of GGBS in concrete can be a way to reduce its carbon footprint whilst still achieving the structural and fire benefits of concrete.

5.4 Design for off-site construction

Maximise the use of prefabricated structure and components, encouraging a process of assembly rather than construction.

5.5 Design for Material Optimisation

As stated in the EPA (2021) guidelines the key design principle for design for material optimisation '*is to ensure manufacturers and construction companies adopt lean production models, including maximising the reuse of materials onsite. This helps to reduce the environmental impacts associated with transportation of materials and from waste management activities.*

Design for material optimisation includes the use of standardised sizes for certain materials to help reduce the number of offcuts produced on site, focusing on promotion and development of off-site manufacture.

Simplifying layout and form to minimise material use, using standard design parameters, balancing cut and fill, maximising the use of renewable materials and materials with recycled content (e.g., using material from low-carbon or sustainable sources).

5.6 Design for Flexibility and Deconstruction

It will be the contractor's responsibility to ensure that all products only contain materials that can be recycled and are designed to be easily disassembled, where possible. As per the EPA (2021) guidelines '*consider material efficiency for the duration and end of life of a building project; flexible, adaptable spaces that enable a resource-efficient, low-waste future change of use; durability of materials and how they can be recovered effectively when maintenance and refurbishment are undertaken and during disassembly/deconstruction*'.

5.7 Applying the Waste Hierarchy as a Priority Order to the Management of Waste

All waste will be managed in accordance with the waste hierarchy (see Figure 2.1), as set out in the Waste Framework Directive (2008/98/EC), in such a way as to prevent harm to human health, amenity and the environment. The primary objective in the construction of the works will be at the top of the waste hierarchy on zero avoidable waste, i.e., preventing waste and reusing waste wherever possible. As such, the aim will be not to focus on lower value recycling and other recovery, and in any case most construction and demolition waste is already 'recovered' in some form. The waste hierarchy will require to be departed from for particular types of waste, where justified, in order to ensure minimal environmental impact. It is important to understand any potential wider implications and thus any unintended consequences of managing waste. For example, there will be instances where avoiding waste in the first instance would create greater environmental impact. Consideration therefore will be given by the Contractor(s) to the relationship with other factors such as materials consumption, energy usage and the emission of carbon.

5.8 Demolition Plan

Demolition works are required for the removal of all bridge material requiring replacement. This comprises of removal of existing surfacing and verges, parapet walls and pier. All material will be removed off site and disposed of at an appropriate waste disposal facility (also referred to as tip).

The Demolition Plan will stipulate the procedure for the demolition of the structure at the bridge; detailing sequence and method of demolition to be adopted including any restrictions. The plan will specify all precautionary measures to be applied for the protection of the public. The Plan will also set out requirements for the handling of debris and method of waste disposal to a licensed facility.

The majority of the demolition waste will be concrete with steel.. It is anticipated that where possible a soft strip approach to demolition activities would be undertaken which means demolition waste such as concrete, steel and bricks would have a higher potential to be recycled.

All demolition waste will be properly managed in accordance with the Contractor(s)'s Construction & Demolition Waste Management in order to ensure that the site is kept tidy and safe, and that cross contamination of waste streams is prevented.

6. Key Material & Quantities

6.1 Type of Waste

The waste generated onsite is surplus or waste materials arising from either the materials imported to site or from those generated onsite. Imported materials are those which are imported to site for inclusion into the temporary and permanent works (such as concrete, construction aggregates, asphalt and cabling etc.). Included within this waste stream is product packaging. This waste stream is produced from a range of potentially preventable activities. Such activities include damaged materials and the over ordering of materials. This waste stream is described as construction (C) waste within the RWMP. Site generated materials are those which exist within the p works footprint such as topsoil and sub-soil etc. This waste stream is categorised as excavated (E) waste within the WMP. Refer to Table 6.1 for the breakdown of waste. For both groups of materials there are a number of considerations to waste management such as waste reduction, segregation of waste, disposal of waste, financial impacts of waste disposal and recording, monitoring, education and reviewing data.

It is the responsibility of the contractor(s) to design a robust sampling and analysis regime for testing the excavated materials arising from the proposed works. This will enable the correct procedures to be followed with regards to the segregation and storage of excavated materials on site to prevent cross-contamination of Article 27 compliant material with non-compliant material and separation and suitable stockpiling of inert, non-hazardous and hazardous material, including materials to be re-used on the proposed works.

Suitable testing (including taking sufficient samples per volume/ mass and testing for relevant parameters) will enable the contractor to identify materials with suitable physical and chemical properties to be used on site and ensure that materials sent off-site meet the receiving facilities' acceptance criteria.

The following measures will be implemented to ensure the segregation and safe storage of waste:

- Skips and other storage receptacles used to contain construction, demolition and excavation waste to be colour-coded in line with the local best practice;
- Skips to have appropriate signage to facilitate separation of waste for re-use, recycling or disposal and the separation of inert, hazardous and non- hazardous wastes;
- Plastic sheeting to be used to prevent leaching from waste soils and aggregates where these are not contained within skips or other storage receptacles;
- Skips and storage receptacles to be sheeted, or otherwise remain lidded or closed, when waste is not being deposited into them. They would also be covered to prevent the escape of waste while in transit;
- Skips and storage receptacles to be inspected on arrival to ensure they are fit for purpose;
- Mixing inert, hazardous and non-hazardous wastes, either while stored on site or upon collection, would not be permitted;
- All necessary measures to be taken to ensure that hazardous waste is not mixed, either with other categories of hazardous waste or with other waste, substances or materials;
- All necessary measures to be taken to ensure that, in the course of collection, transport and temporary storage, hazardous waste is packaged and labelled in accordance with the international and community standards in force;
- Liquid wastes to be stored on hard-surfaced areas with secondary containment systems to prevent spillages;
- Waste would not be stored within 10m of any controlled watercourse, borehole, well, spring, surface water drainage system or foul water drainage system; and
- The storage and segregation of waste would comply with any air quality mitigation measures to minimise nuisance impacts such as dust, odour or pests.

Table 6-1 - Breakdown of Types of Waste

Type of waste	Description
Imported material	Where possible, consideration should be given to the re-use of material back into the project development works. Any waste produced through the importation of materials needs to be monitored and included in the RWMP under construction works. Where possible, consideration should be given to the use of recycled imported material such as concrete, which has a higher recycled content.
Excavated materials (E)	Materials such as excavated soils should be segregated during the excavation process. Appropriately experienced staff should supervise the excavation works to manage the segregation of soil materials. Site-derived materials of a similar nature should be stockpiled together and any changes in the physical and/or chemical properties should prompt further segregation. Soils should be placed in clearly identified stockpiles and chemical testing undertaken to confirm the potential for re-use on site, or, if considered inappropriate for re-use (due to geotechnical or chemical properties or being surplus), to inform off site treatment and/or disposal routes. Where soil materials meet the geotechnical and chemical criteria for re-use given the proposed end use scenario, such materials may be re-used on site, if required. Disposal of excavated material will be by licensed carriers, to licensed landfill sites and handled in accordance with the Waste Management Regulations.
Concrete	This waste will be generated by demolition works and construction of the project.
Construction and Demolition materials	Comprising bricks, blocks, stone predominantly from demolition works
Gypsum-based construction material	Predominantly from demolition works.
Wood	Packaging such as pallets.
Packaging	From construction materials, etc.
Plastic	Offcuts of pipework/ducting etc.
Vegetation	Vegetation removal is required to facilitate the proposed works.
Metals	Offcuts from reinforced concrete for building foundations. Metal components or assets removed for site clearance.
Paper and Cardboard	Packaging from components delivered to site.
Canteen Waste	Food waste from site canteens
Asbestos containing materials	Predominantly from demolition works.
Segregated Haz Waste	Nominal 1% to account for packaging that contained hazardous material such as oils, solvents, sealants etc.

In relation to the overall works particular attention is drawn to the following waste/soil related activities:

- The site location deliveries/ removals are to phone ahead; Just-in-Time' (JIT) delivery processes; receive precise directions and named person to liaise with on site. The Contractor is to erect required signage approaching site and ensure deliveries are programmed to cause minimal disruption;
- Hazardous manual handling operations are to be avoided so far as is reasonably practicable; and,

- Note that waste generated by the project will be managed in compliance with Waste Management Act 1996, Waste Management (amended) Act 2003 and associated Regulations.

6.2 Summary of Potential Waste Streams (LoW / EWC Codes)

The following section represents the general waste streams than may be generated during the construction of the works.

All waste arising from the construction works will be transported off site by an approved waste contractor holding all the necessary waste collection and transportation permits. All the waste arisings requiring reuse, recycling, recovery or disposal will be brought to facilities holding the appropriate Certificate of Registration, Waste Licence or Waste Permit, as required.

A summary of the main hazardous and non-hazardous waste streams which could arise during the works required for the works are presented in Tables 6-2 to 6-3, along with the relevant List of Waste (LoW) code. The LoW code (also referred to as European Waste Catalogue (EWC) code) serves as a common method of characterising various waste streams. Assignment of waste codes will determine how and where the generated waste can be disposed of. LoW codes must be selected for each waste type – a full description of each code is available on the EPA website[6].

It should be noted that the summary tables presented in Tables 6-2 to 6-3 is a non-exhaustive list and it will be the Contractors responsibility to ensure all waste streams generated onsite during the construction phase for the works are appropriately characterised, managed and disposed of in accordance with all relevant waste management legislation.

Table 6-2 - Summary list of LoW Codes, which may be relevant to the site

Waste Material	LoW Code
Concrete, bricks, tiles and ceramics	
Concrete	17 01 01
Bricks	17 01 02
Tiles and ceramics	17 01 03
mixtures of concrete, bricks, tiles and ceramics other than those mentioned in 17 01 06	17 01 07
Wood, glass and plastic	
Wood	17 02 01
Glass	17 02 02
Plastic	17 02 03
Bituminous mixtures, coal tar and tarred products	
bituminous mixtures	17 03 02
metals (including their alloys)	
mixed metals	17 04 07

[6] https://www.epa.ie/publications/monitoring--assessment/waste/2019--FULL-template.pdf

Soil (including excavated soil from contaminated sites), stones and dredging spoil	
soil and stones containing hazardous substances	17 05 03*
soil and stones other than those mentioned in 17 05 03	17 05 04
Gypsum-based construction material	
Gypsum-based construction material	17 08 02
Other construction and demolition wastes	
mixed construction and demolition wastes other than those mentioned in 17 09 01, 17 09 02 and 17 09 03	17 09 04
Wastes from electrical and electronic equipment	
discarded equipment containing chlorofluorocarbons, HCFC, HFC	16 02 11*
discarded equipment containing free asbestos	16 02 12*
discarded equipment containing hazardous components (16) other than those mentioned in 16 02 09 to 16 02 12	16 02 13*
discarded equipment other than those mentioned in 16 02 09 to 16 02 13	16 02 14
hazardous components removed from discarded equipment	16 02 15*
components removed from discarded equipment other than those mentioned in 16 02 15	16 02 16
Miscellaneous Waste	
Paper and cardboard	20 01 01
biodegradable waste (Green waste)	20 02 01
batteries and accumulators included in 16 06 01, 16 06 02 or 16 06 03 and unsorted batteries and accumulators containing these batteries	20 01 33*
batteries and accumulators other than those mentioned in 20 01 33	20 01 34
Waste fuel oil and diesel	13 07 01*
Waste petrol	13 07 02*
Waste other fuels (including mixtures)	13 07 03*
Chemicals – Solvents	20 01 13*
Chemicals – Pesticides	20 01 19*
Chemicals - paint, inks, adhesives and resins containing hazardous substances	20 01 27*
Chemicals - paint, inks, adhesives and resins other than those mentioned in 20 01 27	20 01 28
Chemicals - detergents containing hazardous substances	20 01 29*
Chemicals - detergents other than those mentioned in 20 01 29	20 01 30
fluorescent tubes and other mercury-containing waste	20 01 21*
insulation materials other than those mentioned in 17 06 01 and 17 06 03	17 06 04

6.2.1 Discipline specific waste estimates

Table 6-3 - Waste Volumes

Description of Waste	Amount of Waste (m3)
Demolition waste from existing bridge parapets:	11m³
Removal of existing carriageway surface:	24m³
Existing fill material and concrete verges on top of bridge:	22m³
Excavation of made ground:	130m³
Deck sections:	29m³
Existing pier:	13m³
existing abutments:	11m³
existing raised concrete apron:	53m³
Excavation for new raised apron:	21m³
Existing surfacing on approaches:	24m³

6.3 Soil Generation

The total volume of material requiring excavation and/or removal off site is estimated to be approximately 186m3. It is anticipated that ca. 130m3 of soil will be suitable for re-use/landscaping at the site.

Excess excavated material will be removed and disposed offsite to a suitably permitted / licenced waste recovery / disposal facility in accordance with relevant waste management legislation (including but not limited to the Waste Management Act of 1996, 2001 and 2003 and all subsequent waste management regulations as amended).

Any soil transported off-site will be characterised in accordance with EPA guidance, '*Waste Classification: List of Waste & Determining if Waste is Hazardous or Non-Hazardous'* and Council Decision, 2003 on establishing criteria and procedures for the acceptance of waste at landfills. An application may be made to the EPA under Article 27 of the European Communities (Waste Directive) Regulations 2011 for the use of excess soil as a by-product if a definite use and need for this material can be determined.

6.4 Construction Waste Generation

It is anticipated that a limited amount of waste materials will be generated on site based on the scale and nature of the works. However, it is expected that minor volumes of waste will be generated and will therefore require management. Each waste stream will be managed onsite as follows.

Where material cannot be reused on the proposed works or classified as a by-product, excavated materials will be classified as "waste".

While disposal to landfill is the least preferred option it may not be possible to reuse, recycle or recover all excavated material generated by the proposed works due to the unsuitability of the material and/or lack of appropriate capacity at receiving sites. If excavated material cannot be reused, recycled or recovered, appropriate

procedures will be put in place to ensure that this material will be disposed of in a manner that is in accordance with all relevant current legislation and best practice guidelines.

All waste excavated material will be subject to laboratory testing in order to classify the material in accordance with soil recovery facility acceptance criteria or landfill acceptance criteria. The waste will be sent to a suitably licensed, permitted or registered waste facility for compliant handling and recovery or disposal. Material removed from site will be transported by vehicles in possession of a valid Waste Collection Permit.

Waste excavated material that may be utilised for recovery will include glacial sands and gravels and glacial till, topsoil and limestone. The Waste Framework Directive requires that a minimum of 70% of non-hazardous construction and demolition waste (excluding natural materials such as soil, rock and stone) shall be recovered, recycled or re-used.

6.4.1 Soils / Made Ground

Materials excavated from the site will be reused where possible for landscaping purposes, and infill where appropriate, ensuring that any residual soil / made ground waste is kept to a minimum. Any surplus excavated material will be characterised and removed offsite in accordance with all relevant waste management legislation.

Soils requiring offsite disposal must be appropriately characterised, prior to transport and disposal, as follows;

- Representative chemical analytical results are input into a waste classification tool (to determine the relevant List of Waste (LoW) Code) and if the waste soils are hazardous or non-hazardous;
- Representative Waste Acceptance Criteria (WAC) analytical results are then separately screened against the relevant screening values (as established under the European Communities Council Decision ((EC) 92003/33/EC) 'COUNCIL DECISION of 19 December 2002 establishing criteria and procedures for the acceptance of waste at landfills pursuant to Article 16 of and Annex II to Directive 1999/31/EC); and,
- All waste soils removed from site must be transported by appropriately permitted hauliers and must be disposed of to an appropriately authorised disposal / recovery facility (via. valid Certificate of Registration, Waste Facility Permit, or Waste Facility Licence).

6.4.2 Mixed C&D Waste

Following segregation onsite, any residual mixed C&D waste will be collected in containers specifically for mixed C&D waste; these will be removed offsite for subsequent offsite separation and disposal at a waste disposal / recovery facility.

6.4.3 Wood / Timber

Timber will be segregated in order to prevent contamination by other wastes and will be stored so as to limit the potential for this material to rot. Wooden pallets will be returned to relevant suppliers where possible. Timber offcuts will be reused onsite where feasible. A covered receptible for waste wood will be placed in the waste storage area, prior to removal from site for recycling. All such timber will be free from chemical treatment.

6.4.4 Metals

Metal waste will be generated during the works. All waste metal will be segregated offsite at the waste disposal / recovery facility for reuse and recycling. Given the significant scrap value associated with metal waste, this waste will be stored in a dedicated container within a secure part of the site, and regular collections from site to the waste recycling facility will limit the potential for unauthorised entry and theft.

6.4.5 Paper, Plastics, and Packaging

Packaging wastes will be removed (paper / cardboard / plastic / general waste) offsite for subsequent offsite separation and disposal at a waste disposal / recovery facility. Waste packaging will be stored in dedicated containers in the waste storage area for collection and subsequent segregation and recycling.

6.4.6 Canteen / Office Waste

Onsite staff canteens will generate food and packaging waste. Dedicated containers will be provided at each canteen to permit easy segregation of these wastes; brown bins will be provided for compostable food waste, green bins will be provided for dry recyclables (packaging, hard plastic, paper, cardboard, tetrapak etc.) and black bins will be provided for any residual waste.

6.4.7 Asbestos Containing Construction Materials.

It is very unlikely that Asbestos containing materials (ACM) will be encountered as a result of demolition works.

6.4.8 Hazardous Waste

Hazardous waste, if generated, will be managed as per the Waste Management (Hazardous Waste) Regulations (S.I. No. 163 of 1998) as amended and other applicable legislation. Any hazardous waste will be stored separately to non-hazardous waste, with individual hazardous waste streams segregated from each other. Appropriate signage will be put in place to denote any hazardous waste storage locations.

As fuels and oils are classed as hazardous materials, if there is any onsite storage of fuel/oil, all oil/fuel storage tanks will be bunded and located in a dedicated, secure area of the site. Provided that these requirements are adhered to, and the site Contractor(s) are trained in the appropriate techniques, no fuel/oil wastage is predicted during construction.

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.

The above wastes are typically unsuitable for disposal to landfill and will instead be managed in a closed-loop system, where suppliers will typically take back the materials they supply for recycling or special disposal.

Hazardous waste will be disposed of through a suitably permitted waste contractor for disposal or processing at a suitably licensed/permitted/ registered facility which can accept the type of hazardous waste being managed. As per legislative requirements, records of all hazardous waste generated and removed from site will be retained for a minimum period of three years by the Contractor(s). This includes documentation such as waste transfer forms (WTF), any applicable Transfrontier shipment records in the event that waste has to be exported, and any records on the treatment and ultimate disposal of the hazardous waste.

6.4.9 Other wastes

In addition to the above waste streams, other waste materials will be generated during the construction phase. These residual wastes will typically comprise non- recycling waste such as soiled paper / cardboard / plastics / cloth, canteen food waste, fibreglass, polystyrene insulations, and plasterboard. These materials will be stored separately to all other waste streams in order to prevent any cross contamination.

All C&D waste materials will be segregated onsite into the various waste streams, via. dedicated skips and storage areas. Waste will be removed from site by a suitably permitted waste haulage contractor. The Contractor should clearly identify all waste haulage contractors within the project specific Detailed C&D WMP. Each waste haulage contractor must hold a current valid waste collection permit issued by the National Waste Collection Permit Office (NWCPO). All waste materials generated during the Construction Phase must be removed offsite to an appropriately permitted or licenced waste disposal / recovery facility.

Table 6-4 - Potential Recycling/Re-use Targets

Waste type	Recycling/ Reuse %* (*WRAP best practice recovery rates)
Imported material	70-90
Excavated material	70-100
Concrete, track ballast etc	50-90
Wood	90
Packaging	95
Plastic	95
Metals	100
Paper and Cardboard	100
Hazardous soil	50
Foul waste	100

6.4.10 Article 28

If material from the works is categorised as a waste as opposed to a by-product, Article 28 of the European Communities (Waste Directive) Regulations 2011 (Article 6 of the WFD) allows for waste materials to be given End-of-Waste status following recovery or recycling process, as long as it meets a set of criteria as outlined in the legislation. This means that the material is no longer classified as a waste but is rather a product and therefore no longer falls under the jurisdiction of any waste management legislation. The material can therefore re-enter the supply chain.

Any facility to be used for the disposal of demolition waste shall be suitably licensed, permitted or certified to accept such waste, and will be transported by vehicles operating under a valid Waste Collection Permit. All demolition waste will be properly managed while on site and in accordance with the Contractor's C&D WMP in order to ensure that the site is kept tidy and safe, and that cross contamination of waste streams is prevented for the full duration of the works.

6.5 Tracking and Documentation Procedures for Off-Site Waste

All waste transport and disposal / recovery must be carried out in accordance with relevant waste management legislation (outlined in Section 3) and any subsequent future legislation which may apply. A Waste Manager, nominated by the Contractor, will be responsible for ensuring correct tracking and documentation procedures are undertaken for all waste removed from site during the works. Each consignment of waste removed from site will be tracked and recorded. A site record detailing the date, truck registration, waste type, estimated volume and destination will be filed onsite for each consignment, along with the corresponding truck docket and weighbridge record at the offsite disposal / recovery destination. A copy of the relevant waste collection permits and waste permit / waste licence for the relevant disposal / recovery facilities will be available onsite for the duration of the works.

6.6 Construction Waste Management Costs

Under the Waste Framework Directive 2008/98/EC and in accordance with the polluter-pays principle, there is a legal requirement that the costs of disposing of waste must be borne by the holder of waste or by the producers of the product from which the waste came, thereby placing the legal obligation for the management of the waste on the Client.

In terms of waste management and disposal costs, at this preliminary juncture it would not be feasible to estimate the total cost of waste management and disposal associated with the development. Estimated costs will be determined by the Contractor.

7. Site Management

7.1 Resource / Environmental Manager - Responsibilities

The Contractor will nominate a Resource Manager for the duration of the construction works. The Resource Manager will be responsible for the efficient operation of onsite waste management procedures; they will also be responsible for ensuring that all waste removed offsite is appropriately characterised (under the correct LoW / EWC code), transported and disposed of in accordance with all relevant waste management legislation. It will be the Waste Managers responsibility to maintain all waste management and disposal / recovery records onsite throughout the works. These site records should be made available for viewing by the Client, Employers Representatives and statutory consultees (MCC, EPA) as required.

The Resource Manager should be appropriately trained in the correct documentary procedure, waste auditing and best practice methods in onsite waste minimisation and waste management toolbox talks with site operatives to highlight any specific waste management concerns will also be carried out should the need arise.

7.2 Site Compound Location

All C&D waste materials will be segregated onsite into the various waste streams, via. labelled dedicated skips and storage areas. Waste will be removed from site by a suitably permitted waste haulage contractor. The Contractor should clearly identify all proposed waste haulage contractors within the project specific RWMP. Each waste haulage contractor must hold a current valid waste collection permit issued by the National Waste Collection Permit Office (NWCPO).

As agreed with MCC, the successful contractor will utilise the area of road closure along the N58 national road as a site compound for the duration of works. There may be a requirement for temporary (mobile) lighting within the site compound area along the N58 should works extend to winter months, however this is not foreseen given the works window of July to September required to facilitate instream works. The location of the site compound is selected to avoid any potential impacts to environmental receptors and to reduce any potential for impact on sensitive human receptors. The site compounds will also act as a storage centre for construction materials. The exact locations of the compound areas will be agreed with the appointed contractor and Mayo County Council prior to the commencement of development and will be used throughout the construction period.

7.3 Training

All site personnel should receive waste management information and environmental induction before commencing work on the works, which will include a module on resource management as part of their initial site briefing from the Resources Manager. The initial briefing should include a discussion of the key points set out in the RWMP, along with the specific procedures to be implemented onsite to segregate and appropriately store the generated waste and key control measures such as refuelling procedures and oil, fuel and chemical storage requirements. This will ensure that all onsite personnel are familiar with the site-specific waste management strategy.

As a minimum the following will be included in the induction, as per the EPA (2021) guidelines:

- ‘*Scope and content of the RWMP;*
- *Project commitments and targets;*

- *List of anticipated resources and wastes and volumes to be generated;*
- *Procedures for the proper identification and segregation of resources and wastes;*
- *Temporary storage and the location of the WSAs; and,*
- *Clear instruction on hazardous wastes will be incorporated into the training programme and the particular dangers of each hazardous waste.'*

The environmental induction shall be provided and delivered by the Contractor and be tailored to suit the tasks and responsibilities of site personnel from management and supervisory level through to site operatives. Toolbox talks on resource management should be provided on a continuous basis. Regular toolbox talks shall ensure site staff are aware of the resource management practices associated with their work and the appropriate control measures that are required to carry out their work in compliance with the RWMP.

7.4 General Site Maintenance

A number of waste management practices will be implemented by the Contractor(s) in order to manage waste arisings in an orderly fashion to minimise the impact in so far as is possible.

- A regular programme of site tidying will be established to ensure a safe and orderly site;
- Debris netting will be erected to prevent materials being scattered by the wind;
- Food waste will be strictly controlled on all parts of the site in order to minimise the attraction of vermin and other pests;
- In the event of any litter or debris escaping the site, it will be collected immediately and removed to storage on site, and subsequently recovered / disposed of in the normal manner;
- Waste receptacles such as skips will be secured so as to minimise impact from fly-tipping; and
- Waste will be collected in a timely fashion so as to prevent overly large volumes of waste accumulating.
- Provision of a site layout map showing key areas such as first aid posts, material storage, spill kits, material and waste storage and welfare facilities.
- Waste and chemical inventories will be developed/recorded/updated.
- Details of site managers contact numbers and public information signs (including warning signs) will be provided at the boundaries of the working areas. Any complaints from the public regarding waste and housekeeping will be entered in the complaints register and actioned as required.
- Provision of appropriate waste management facilities at each working area and regular collections to be arranged;
- No bonfires or burning of waste materials

7.4.1 Disposal / Recycling Proposals for Each Waste Stream

All C&D waste materials will be segregated onsite into the various waste streams, via. Dedicated, covered, secured skips and storage areas. Waste will be removed from site by a suitably permitted waste haulage contractor. Each waste haulage contractor must hold a current valid waste collection permit issued by the National Waste Collection Permit Office (NWCPO).

All waste materials generated during the Construction Phase must be removed offsite to an appropriately permitted or licenced waste disposal / recovery facility. Avoidance of the prolonged storage of waste materials on site.

7.4.2 Management Strategy for each Waste Stream

Key principles set out in the guidelines (EPA, 2021) is optimising resources and reducing waste on construction projects through:

- Prevention;
- Reuse;
- Recycling;
- Green Procurement Principles;
- Off-Site Construction;
- Materials Optimisation; and,
- Flexibility and Deconstruction.

These principles are applied to the RWMP throughout the construction phase. Therefore, every effort should be made to prevent and limit the amount of waste generated at the very outset of the works. At the preparatory phase of the works, the following measures will aid the prevention of waste in the first instance;

- Select procurement routes to minimise unnecessary packaging – for example applying 'Just-in-Time' (JIT) delivery processes to minimise material spoilage;
- Use of 'consolidation centres' to support JIT delivery – these are strategically-located storage and distribution facilities where materials can be stored prior to JIT delivery to sites;
- Implement ordering procedures and supply chain systems that avoid waste, i.e., no over-ordering, use of take-back schemes for packaging, material surplus and offcuts;
- Select procurement routes that minimise unnecessary packaging; and,
- Plan the work sequence to reduce the potential for on-site residual resource generation.

7.5 Record Keeping

7.5.1 Site Tracking System

The Contractor, through the appointed Resource Manager (RM), will be responsible for ensuring that the full details of all materials deliveries, materials movements and C&D waste generated is recorded during the construction of the works. Each C&D waste consignment removed from and to site will be tracked and documented to ensure full traceability of the material from site to the final destination. A single record will be completed for each individual consignment.

The Contractor will also receive printed receipts / weighbridge records from the waste disposal / recovery facilities for each individual consignment. These records will enable the Contractor to accurately quantify the total volume of waste removed for offsite disposal / recovery for each individual waste stream. These records will be maintained onsite and will be made available for auditing.

The type of information to be recorded in the site tracking system is described below in accordance with relevant guidelines and legislation.

- For each movement of resource off-site, a signed docket/invoice will be obtained by the RM from the haulier/contractor detailing the following:
  - Type of resource / waste stream;
  - List of Waste (Low) Code for each stream (where applicable); and,

- Quantity of material moved off-site by the haulier/contractor (tonnes).

- The name and authorisation of the haulier to transport the material – in the case of a 'waste' this requires a valid Waste Collection Permit (WCP). In the case of by-product or other materials that are not a waste, no WCP is required. In both cases the vehicle registration number should also be recorded for each load of material removed from site.
- The name and authorisation of the destination site for the resource – again for a 'waste' this requires a valid Cert of Registration, Waste Permit or Waste Licence and in the case of by-product the relevant by-product determination.
- Weighbridge dockets must be supplied by all destination sites to verify volume of material accepted and to help track each truck load from site to end-destination.
- The waste contractors must be required to provide details of end-use or waste treatment in waste reports.
- This recording will be carried out for each resource type and the system will also be linked with the delivery records. In this way, the percentage of residual resource generated for each material can be determined.
- The system will allow the comparison of these figures with the targets established for the prevention, reuse and recovery of resources to highlight successes or failures against these targets.

7.5.2 Inspections

Inspections of construction activities will be carried out by the RM on a daily basis to ensure all necessary waste management measures relevant to the construction activities are being effectively implanted by construction staff, ensuring legal and contractual conformity.

7.5.2.1 Daily Inspections:

The daily inspections should include, but not be limited to, checking that:

- The site boundary is marked out and respected;
- All waste is appropriately stored and segregated;
- Waste skips are covered to prevent wind-blown litter;
- Drip trays are in place for all stored equipment and plant;
- All chemicals/fuels are stored with appropriate containment/bunds/cover;
- Construction noise is within permitted limits and does not create a nuisance;
- Dust does not create a nuisance; and
- Fencing/hoarding is secure.

7.5.2.2 Weekly Inspections

The inspections should include, but not be limited to confirming that:

- Daily checklists have been completed;
- Waste storage areas have been checked and there is no build-up of waste materials;
- Spill kits have been checked and contain all relevant materials;
- The performance of all pollution control equipment has been checked and the equipment is working effectively;
- Noise reduction/monitoring equipment has been checked and is operating effectively;
- Temporary septic tanks are not overfull/discharging; and
- Special control measures identified in any relevant Permit/Planning Conditions and RWMP are adhered to.

Regular audits and inspections of waste management activities will be undertaken to ensure compliance with the legal requirements, statutory controls and other policies and procedures relevant to the management of waste and surplus excavated material. The types, quantities and fate of waste generated during construction will be identified, measured and recorded. This information would be reported on a periodic basis to facilitate monitoring of any key performance indicators and to measure progress against any waste management performance targets that may apply. A register of all waste loads leaving each construction site would be maintained to provide a suitable audit trail for compliance purposes and to facilitate monitoring and reporting of waste types, quantities and management methods.

7.6 Communication

The following communication tasks are recommended for the Contractors Resource Manager through the construction phase as per the EPA (2021) guidelines:

- '*Internal reporting of resource statistics to the Client and the Contractor management. This includes performance relative to agreed targets and objectives which should be included as an agenda item at site meetings;*
- *Engaging with relevant local authority on any site inspection or enforcement audits undertaken at the site. All follow-up actions and corrective actions should be logged and reported to the local authority.*
- *Engaging with other stakeholders (EPA, public, etc.) as appropriate in relation to the resource management on site; and,*
- *Upon completion of construction, the RM will prepare a final report summarising the outcomes of resource management processes adopted, the total reuse and recovery figures and the final destinations of all resources taken off-site. This report will be issued to the Client, Contractor management and the local authority. The local authority may make such a requirement a condition of planning and require the formal sign-off of same by the local authority for full planning compliance.'*

7.7 Outline Waste Audit Procedures

According to EPA (2021) a resource Audit represents a systematic study of the waste management practices applied in the works and is required to highlight firstly, the potential issues that can arise during the waste management process and secondly, the benefits of waste prevention and minimisation. Therefore, waste audits should be carried out routinely onsite by the Contractors Resource Manager. These audits will cover work practices, record keeping, and off-site tracking as follows in accordance with the EPA (2021) guidelines:

- When materials arrive on site, they will be properly recorded including the assignment of such materials to specific uses within the works;
- A review will be undertaken of onsite waste management practices to identify any improvements which may be required;
  - 'Ensure adequacy of site signage and need for any repairs or upgrades.
  - Adequacy of storage infrastructure and need for any repairs or upgrades.
  - Compliance with resource segregation protocols and observed contamination in any resource streams.
  - Assessment of observed Contractor and Sub-contractor work practices for compliance with the RWMP' (EPA, 2021).
- Onsite waste management processes / material management from materials delivery through to waste disposal / recovery (including the quantity, type and composition of all waste) will be reviewed to identify any opportunities for waste reduction;
- Corrective actions will be highlighted and implemented following each audit. Such actions include applying 'lessons learned' regarding efficient waste management on this project to other projects in the future to enable further waste reduction; and

- The key steps and findings from each waste audit should be presented in a summary report.

7.8 Nonconformity and Corrective and Preventative Action

The appointed RM will establish a procedure to outline the process for identifying, documenting and investigating events such as accidents, incidents, and non-compliances. This procedure will also incorporate preventative actions to prevent the reoccurrence of such accidents, incidents and non-compliances. This procedure is implemented to minimise any potential impact on the environment.

An Environmental Incident is defined as any unplanned or undesired events which:

- Results in damage / harm to the environment.
- Has the potential to impact on the environment.
- Requires an emergency response by the Local Authority.

A non-compliance is any deviation from the environmental management system, work practices and procedures, regulations etc, that could either directly or indirectly lead to an impact on the environment. In the event of an accident, incidents, non-compliance, the following must be undertaken as a minimum:

- Identify cause of the accident / incident / non-compliance.
- Develop a plan for corrective action.
- Determine preventative measures and ensure that they are effective.
- Verify the effectiveness of the correction actions.
- Ensure that any procedures affected by the corrective and preventative actions taken are revised accordingly. Responsibility must be designated for the investigation, correction, mitigation and prevention of non-conformity.

All sub-contractors will be obliged to adhere to the above procedures.

8. Consultation with Relevant Bodies

Appropriate consultation should be undertaken with relevant bodies by various members of the project team as required throughout the works. Relevant consultees include, but are not limited to, the following;

- Mayo County Council (MCC) (as the relevant local authority for waste matters);
- The Environmental Protection Agency (EPA) (as relevant regulatory body for environmental matters);
- National Waste Collection and Permit Office (NWCPO);
- Inland Fisheries Ireland;
- Permitted hauliers; and,
- Suitably permitted / licenced waste disposal / recovery facilities.

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