

Limerick City & County Council in partnership with Limerick Twenty Thirty DAC

Cleeves Riverside Quarter

Construction and Demolition Resource and Waste Management Plan

Reference: CRQMP-ARUP-ZZ-ZZ-RP-ES-0001

C01 | 3 October 2025



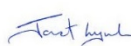
This report takes into account the particular instructions and requirements of our client. It is not intended for and should not be relied upon by any third party and no responsibility is undertaken to any third party.

Job number 277975-00

Ove Arup & Partners Ireland Limited
50 Ringsend Road
Dublin 4
D04 T6X0
Ireland
arup.com

Document Verification

Project title Cleeves Riverside Quarter
Document title Construction and Demolition Resource and Waste Management Plan
Job number 277975-00
Document ref CRQMP-ARUP-ZZ-ZZ-RP-ES-0001
File reference 4-04-02

Revision	Date	Filename	CRQMP-ARUP-ZZ-ZZ-RP-ES-0001		
C01	03/10/2025	Filename	CRQMP-ARUP-ZZ-ZZ-RP-ES-0001		
		Description	CDRWMP – Issued for Planning (Status A2)		
		Prepared by		Checked by	Approved by
		Name	Lorraine Guerin	Janet Lynch	Janet Lynch
Signature					

Issue Document Verification with Document



Contents

1.	Introduction	1
1.1	Overview	1
1.2	Environmental & Waste Policy of the Applicant	1
1.3	Relevant Legislation, Policy and Best Practice Guidance – Overview	2
1.4	Project-specific Resource Targets	3
1.5	Complementary Documents	4
2.	Project Description	5
2.1	The Proposed Development	5
2.2	Receiving Environment	6
2.3	Construction and Demolition Waste Statistics	8
2.4	Construction Products and Materials Statistics	10
2.5	Resource & Waste Management Infrastructure	10
2.6	Proposed Construction & Demolition Works	13
3.	Role and Responsibilities	16
3.1	Design Team	16
3.2	Future Roles and Responsibilities of Contractor	16
4.	Design Approach	17
4.1	Workshops	17
4.2	Circular Design and Waste Prevention Initiatives	17
5.	Key Materials, Quantities and Costs	20
5.1	Introduction	20
5.2	Estimated Resource and Waste Arisings	20
5.3	Costs of Resource and Waste Management	32
6.	Site Management	33
6.1	Resource Manager	33
6.2	Information and Training	33
6.3	Site Clearance Resource and Waste Management	33
6.4	Excavation Resource and Waste Management	33
6.5	Demolition Resource and Waste Management	34
6.6	Asbestos	35
6.7	Construction Resource and Waste Management	35
6.8	Authorisations	36
6.9	Record Keeping and Auditing	36
7.	Site Infrastructure	37

Tables

Table 1: Key policies, legislation and best practice guidelines	2
Table 2: Proposed project-specific resource and waste targets for the C&D phase	3
Table 3: C&D waste composition in 2022 (EPA, 2024)	8

Table 4: Operational Waste Licence and IE Licence waste facilities accepting C&D waste in the Southern Waste Region	10
Table 5: Project team	16
Table 6: Relevant policies and actions in the NWMPCE – Green procurement and C&D waste management	19
Table 7: Estimated volumes of demolition materials	20
Table 8: Waste authorisations for acceptance of inert waste concrete in Southern Waste Region (LoW codes: 17 01 01; 17 01 07)	21
Table 9: End-of-waste decisions for recycled aggregates in the Southern Waste Region	22
Table 10: Waste authorisations for acceptance of inert waste brickwork in Southern Waste Region (LoW codes: 17 01 02; 17 01 07)	23
Table 11: Waste authorisations for acceptance of inert waste metals (steel, zinc, aluminium and mixed metals) in Southern Waste Region	25
Table 12: Waste authorisations for acceptance of wood in Southern Waste Region	26
Table 13: Waste authorisations for acceptance of gypsum-based construction materials in Southern Waste Region	27
Table 14: Waste authorisations for acceptance of inert waste glass (LoW code 17 02 02) in Southern Waste Region	28
Table 15: Waste authorisations for acceptance of inert waste plastic (LoW code 17 02 03) in Southern Waste Region	28
Table 16: Quantities of excavated materials, envisaged fate, and fill requirements – all figures estimates only	30
Table 17: Estimated waste arisings from construction of new buildings	31
Table 18: Relevant targeted policies and priority actions of the NWMPCE	A-12
Table 19: Building a Circular Ireland Roadmap 2025-2040 – Actions and targets most relevant to the CDRWMP	A-24
Table 20: EPA LoW codes for C&D wastes (*hazardous)	C-2
Table 21: Proposed development construction waste estimates using BRE waste benchmarks (as of January 2020) – building construction by typology	D-0
Table 22: Resource and waste inventory template (adapted from EPA Guidelines)	E-2

Figures

Figure 1: Site layout	5
Figure 2: Existing site location plan	6
Figure 3: Treatment of C&D waste in Ireland in 2022 (%) (source: EPA, 2024)	9
Figure 4: Treatment of C&D waste in Ireland in 2022 by stream (source: EPA, ,2024)	9
Figure 5: Demolition site plan	14
Figure 6: Arup Circular Buildings Toolkit: circular design approaches	17
Figure 7: Resource management options for concrete generated during demolition works	21
Figure 8: Resource management options for brickwork generated during demolition works	23
Figure 9: Resource management options for brickwork generated during demolition works	25
Figure 10: The United Nations Sustainable Development Goals (Source: United Nations)	A-2
Figure 11: The waste hierarchy (Source: European Commission)	A-5
Figure 12: Regulation 27 By-product Decision Tree (EPA, 2020; adapted from EC, 2012)	A-19

Appendices

Appendix A	A-1
Relevant Policies, Legislation and Guidelines	A-1
A.1 Multilateral Policies	A-2
A.2 European Union Policies, Legislation & Guidelines	A-2
A.3 National Policies, Legislation & Guidelines	A-8
A.4 Regional Policies	A-20
A.5 Other Publications	A-22
Appendix B	B-1
Contractor Responsibilities (as per EPA Guidelines)	B-1
Appendix C	C-1
EPA – List of Waste Codes for Construction and Demolition Wastes	C-1
Appendix D	D-1
BRE Benchmark Construction Waste Estimates	D-1
Appendix E	E-1
Resource and Waste Inventory Template (as per EPA Guidelines)	E-1

1. Introduction

1.1 Overview

This Construction and Demolition Resource and Waste Management Plan (CDRWMP) has been prepared by Arup on behalf of Limerick City & County Council in partnership with Limerick Twenty Thirty DAC (LTT) as part of a planning application for the proposed Cleeves Riverside Quarter Development.

Limerick City and County Council, in partnership with Limerick Twenty Thirty DAC, intends to seek the approval of An Coimisiún Pleanála in accordance with Section 175 and 177AE of the Planning and Development Act 2000, as amended, for a mixed-use development that seeks the regeneration and adaptive reuse of a strategic brownfield site, as part of the Limerick City and County Council ‘World Class Waterfront revitalisation and transformation project’.

This CDRWMP has been prepared in accordance with the Environmental Protection Agency (EPA) *Best Practice Guidelines for the Preparation of Resource & Waste Management Plans for Construction & Demolition Projects* (2021)¹ (‘the EPA Guidelines’) (Tier 2 development guidance) and the European Commission (EC) *EU Construction & Demolition Waste Management Protocol & Guidelines for Pre-demolition and Pre-renovation Audits of Construction Works* (2024)². It also meets the requirement for a Construction and Demolition Waste Management Plan as recommended for developments with 30 or more residential units and 1,000m² of mixed use development in the *Sustainable Residential Development and Compact Settlements Guidelines for Planning Authorities* (2024) (Appendix C – Supplemental Information for Planning Applications).³

Following appointment, the Contractor will be responsible for detailing and maintaining the CDRWMP and updating it as appropriate. The responsibilities of the Contractor as set out in the EPA Guidelines are included in Appendix B.

1.2 Environmental & Waste Policy of the Applicant

Limerick Twenty Thirty (LTT) has committed to sustainable development and circular economy principles under the scope of its environmental, social and governance (ESG) policy.⁴ LTT’s stated ambition in respect of ESG is to embed sustainability throughout its activities and enable environmental, social and economic development. It aims to be a leader in driving the sustainability agenda and acknowledges its strategic position and responsibility in this regard as custodian of priority sites in Limerick. LTT has identified a number of priorities to drive forward its sustainability ambitions, including the following:

- Enable transformative and sustainable development for Limerick whilst protecting its Heritage;
- Align with public sector and government targets;
- Comply with regulations and strive for exemplar standards and certifications;
- Reduce embodied and operational carbon;
- Adopt circular economy principles;
- Responsible sourcing and consumption;
- Protect cultural heritage; and
- Support the natural environment.

¹ EPA (2021) *Best practice guidelines for the preparation of resource & waste management plans for construction & demolition projects*. Available at <https://www.epa.ie/publications/circular-economy/resources/best-practice-guidelines-for-the-preparation-of-resource--waste-management-plans-for-construction--demolition-projects.php>. Accessed December 2024.

² European Commission: Directorate-General for Internal Market, Industry, Entrepreneurship and SMEs (2024) *EU Construction & Demolition Waste Management Protocol including guidelines for pre-demolition and pre-renovation audits of construction works*. Available at <https://op.europa.eu/en/publication-detail/-/publication/d63d5a8f-64e8-11ef-a8ba-01aa75ed71a1/language-en>. Accessed December 2024.

³ Department of Housing, Local Government and Heritage (2024) *Sustainable Residential Development and Compact Settlements Guidelines for Planning Authorities*. Available at: <https://www.gov.ie/en/department-of-housing-local-government-and-heritage/publications/sustainable-residential-development-and-compact-settlements-guidelines-for-planning-authorities/>. Accessed August 2025.

⁴ Limerick Twenty Thirty (n.d.) *ESG*. Available at: <https://limerick2030.ie/esg/>. Accessed October 2024.

The Opera Square Project

The Opera Square project provides an example of how LTT has successfully implemented circular economy principles on a recent development.⁴

Opera Square is a landmark €290 million commercial property development of 3.7 acres on Patrick Street in Limerick City. The project is being developed by Treaty Stone Partnership DAC, a joint venture between LTT and the Ireland Strategic Investment Fund (ISIF). Once completed, the development will create a new business and employment hub in the city centre, including a 14-storey landmark office building that will accommodate the Revenue Commissioners, a new city library and café, and a revitalised public realm. The development was designed to LEED Platinum, WELL Platinum and nZEB standards.

The development is situated on a previously developed site with 18 existing structures, including Georgian buildings of architectural heritage significance. The majority (16) of the existing historic buildings were retained *in situ* for redevelopment. However, the development still necessitated large-scale demolition works – the largest undertaken in Limerick to date.

The enabling works commenced with the completion of Ireland's first Pre-demolition Audit, identifying materials to be reused before the demolition works got underway. Facilitated through a partnership between the Southern Region Waste Management Office, LTT and contractor John Sisk & Son, over 1,000 tonnes of existing components and materials were salvaged during demolition and enabling works and reused on-site or elsewhere in the city and county. Salvaged materials were diverse and included stone, glass, timber, bricks, ceiling and floor tiles, fencing panels and door frames. Significant volumes of stone and brick were reused in other developments including the Foynes Flying Boat Museum, the Canal Harbour Building; in old stone wall repairs; and as materials for trainee stone masons. Almost all of the waste generated during the enabling works (99.3%) was diverted from landfill.

1.3 Relevant Legislation, Policy and Best Practice Guidance – Overview

Resource and waste management takes place in a legislative and policy framework. Applicable legislation, policy and best practice guidance has been reviewed during the preparation of this CDRWMP. Key policies, legislative instruments and best practice guidance documents of relevance to the CDRWMP are listed in Table 1. A summary of each of these and their relevance to C&D resource and waste management is provided in Appendix A.

The key principles of EU, national and regional policy of relevance to C&D projects may be summarised as follows:

- Prevention and minimisation of waste are the preferred options;
- Where construction and demolition resource and waste materials are generated, these should be segregated into separate streams at source to optimise rates of reuse and recycling;
- Where waste cannot be avoided or recycled, it should be transported and recovered or disposed of in accordance with applicable legislation and without causing environmental pollution; and
- Waste may only be transferred by a waste collection permit holder and delivered to an authorised waste facility.

Table 1: Key policies, legislation and best practice guidelines

Scope	Items
Multilateral	United Nations 2030 Agenda and Sustainable Development Goals (2015)
European Union	Policy European Green Deal (2019) Circular Economy Action Plan (2020) 8 th Environment Action Programme (2022) Clean Industrial Deal (2025) Legislation

Scope	Items
	Waste Framework Directive (Directive 2008/98/EC) Commission Decision 2014/955/EU Commission Regulation (EU) No 1357/2014 Waste Directive (Directive (EU) 2018/851) Ecodesign for Sustainable Products Regulation (Regulation (EU) 2024/1781) (2024) Construction Products Regulation (Regulation (EU) 2024/3110) (2024) Guidelines EU Construction & Demolition Waste Management Protocol (2024)
National	Policy Waste Action Plan for a Circular Economy – Ireland’s National Waste Policy 2020-2025 National Hazardous Waste Management Plan 2021-2027 Whole of Government Circular Economy Strategy 2022-2023 National Waste Management Plan for a Circular Economy (2024) Buying Greener: Green Public Procurement Strategy and Action Plan 2024-2027 Climate Action Plan 2025 Legislation Waste Management Act, 1996 Waste Management (Collection Permit) Regulations 2007 Waste Management (Shipments of Waste) Regulations 2007 European Union (Waste Directive) Regulations 2011-2020 Circular Economy and Miscellaneous Provisions Act 2022 Guidelines Waste Classification – List of Waste & Determining if Waste is Hazardous or Non-hazardous (EPA, 2019) Guidance on Soil and Stone By-products (Version 3) (EPA, 2019) By-product Guidance Note (EPA, 2020) End-of-Waste Guidance Document – Part 1: Introducing End-of-Waste (EPA, 2020) End-of-Waste Guidance Document – Part 2: Preparing an End-of-Waste Application (EPA, 2020) Best Practice Guidelines for the Preparation of Resource & Waste Management Plans for Construction & Demolition Projects (EPA, 2021)
Regional	Limerick Development Plan 2022-2028
Other publications	Construction and Demolition Waste Soil and Stone Recovery/Disposal Capacity Update Report (RPS, 2020) EPA National Waste Statistics and Bulletins Circularity Gap Report Ireland (2024) Building a Circular Ireland Roadmap 2025-2040

1.4 Project-specific Resource Targets

Resource and waste targets for the C&D phase of the proposed development are set out in Table 2, below. These may be revised, as appropriate, during the detailed design stage (e.g., on the basis of new information and/or new targets set out in national or regional policies).

Table 2: Proposed project-specific resource and waste targets for the C&D phase

KPI	Target
Percentage (%) of waste to landfill	0%
Percentage (%) recovery of total volume C&D non-hazardous waste, excluding soil and stone	95%
Percentage (%) reuse of total volume uncontaminated soil and stone – on-site (preferred) and/or off-site (as by-product)	95%
Volume (tonnes) of waste generated per 100 m ² gross internal area (GIA)	≤ 3.2 tonnes

1.5 Complementary Documents

A number of reports of relevance to the CDRWMP will be prepared and submitted alongside this document as part of the planning application for the proposed development, including those listed below. In reading this CDRWMP, regard should be had to the contents of these documents.

- Pre-demolition Audit Report;
- Structural Report;
- Construction Environmental Management Plan (CEMP);
- Environmental Impact Assessment Report – Material Assets – Waste Chapter;
- Environmental Impact Assessment Report – Land, Soils & Geology Chapter;
- Environmental Impact Assessment Report – Biodiversity Chapter;
- Invasive Species Management Plan; and
- Circular Economy Statement.

2. Project Description

2.1 The Proposed Development

The proposed development comprises Phase II, of an overall Masterplan with four phases of development proposed. Phase II is subsequent to ongoing stabilisation and repair of the Flaxmill protected structure (Phase I). Phase III is intended to comprise an educational campus, inclusive of the adaptive reuse of the Flaxmill Building as part of that development and will be subject to a future separate application. Phase IV comprising the Shipyard site will be the final phase of development.

The proposed development provides for the (A) Demolition of a number of structures to facilitate development and (B) Construction and phased delivery of (i) buildings within the site ranging in height from 3 – 7 stories (with screened plant at roof level) including (a) 234 no. residential units; (b) 270 no. student bedspaces (PBSA) with ancillary resident services at ground floor level; (c) 256sqm of commercial floorspace; and (d) a creche; (ii) extensive public realm works, (iii) riverside canopy and heritage interpretative panels, (iv) 3 no. dedicated bat houses; (v) Mobility Hub with canopy; and (vi) all ancillary site development works including (a) water services, foul and surface water drainage and associated connections across the site and serving each development zone; (b) attenuation measures; (c) raising the level of North Circular Road; (d) car and bicycle parking; (e) public lighting; (f) telecommunication antennae and (g) all landscaping works. Consent is also sought for use of the PBSA accommodation, outside of student term time, for short-term letting purposes.

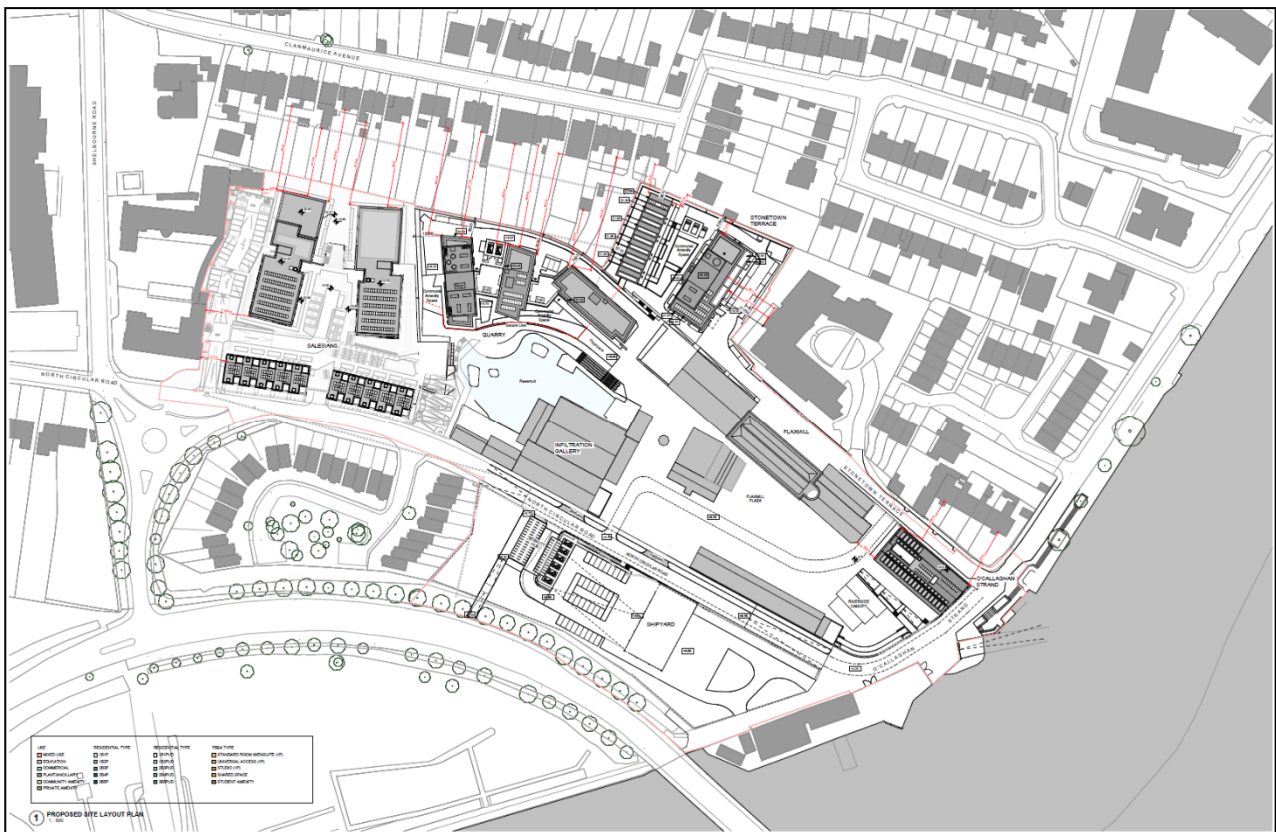


Figure 1: Site layout

2.2 Receiving Environment

2.2.1 Site Location

The site of the proposed development is located at North Circular Road and O’Callaghan Strand, immediately north-west of the River Shannon in Limerick City. It is situated in a built-up, urban area, with surrounding uses including educational, recreational/sports, commercial, industrial and residential.

The site of the proposed development is currently occupied by numerous (approx. 18) disused industrial buildings, including two Protected Structures; areas of hardstanding and revegetating bare ground. Historic uses of the site are detailed in Section 2.2.3, below.

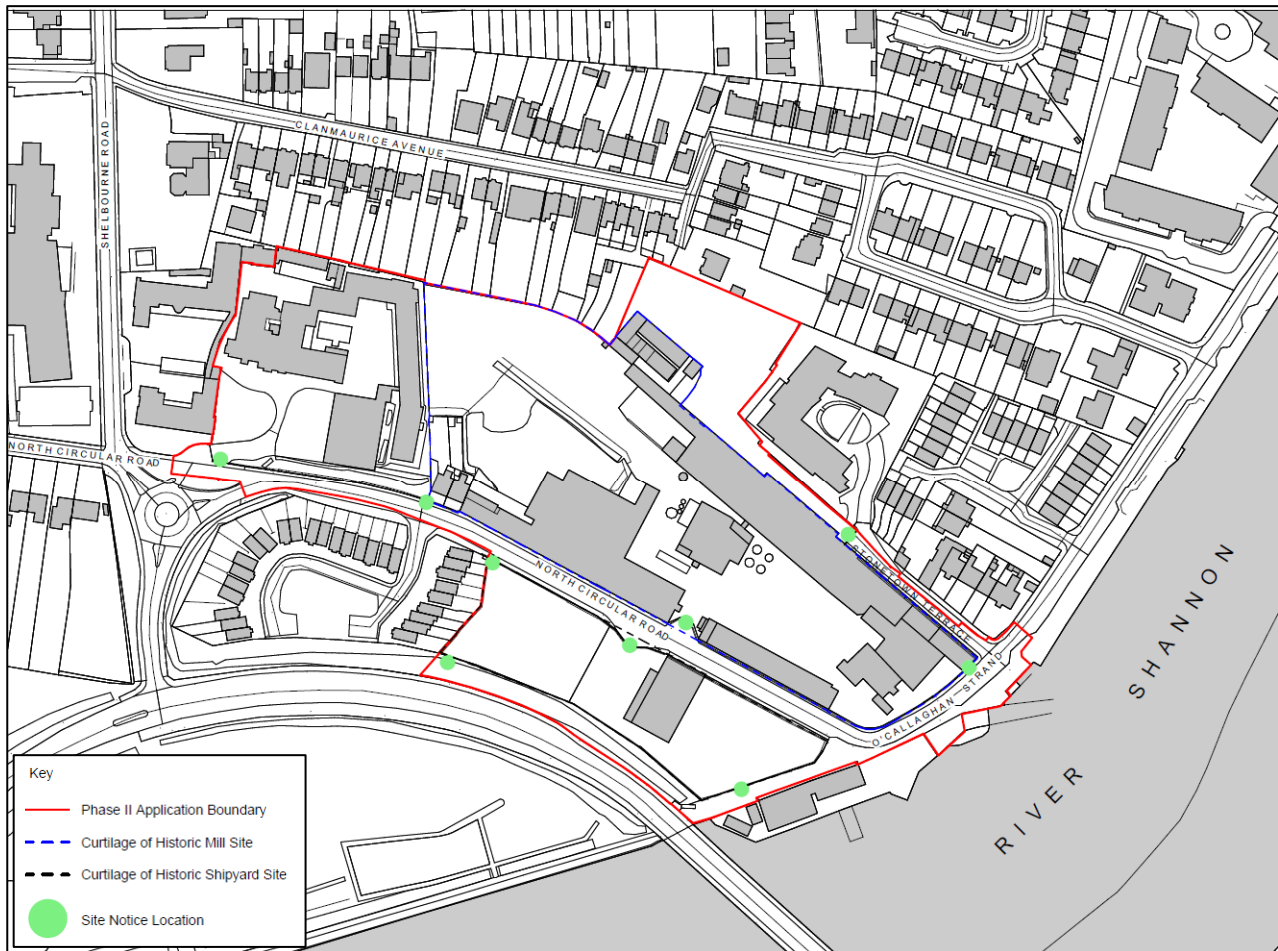


Figure 2: Existing site location plan

2.2.2 Topography

The topography of the site is variable. The northwest to southeast naturally sloping topography towards the River Shannon has been significantly altered through anthropogenic activities at the site, including quarrying, shipyard backfilling, and material stockpiling. The lowest elevations encountered across the site of approximately 1.5 mOD are associated with the disused quarry excavation in the centre of the site. The highest elevations are approximately 14 mOD and are encountered in the north-west of the site (former Salesian’s School) and in the north of the site (Stonetown Terrace).

2.2.3 Previous Land Use

Historically, the site has had a variety of uses since the early 19th century. During the early- to mid-19th century, the site mostly comprised of agricultural land. There was a quarry located in the central portion of the site. By 1839, there was an active dock yard located in the southern portion of the site operated by the Limerick Ship Company.

During the 1850s, the site underwent rapid development associated with linen factory production. The flax mill, cold store, Victorian houses, and weaving complex buildings were constructed in the central portion of the site, with the addition of the chimney stack in 1860.

In the late-19th century, the site and buildings were used for a variety of purposes. During the 1870s, the site factory buildings were reopened as a flour and corn mill following a fire in the previous spinning factory. By 1881, manufacturing of prepared coffee began in the southern dock yard site. In 1884, the Cleeves site began to process cream and skimmed milk. Additional ancillary buildings and structures were constructed during the late-19th and early-20th centuries associated with the condensed milk operation.

The site conditions and majority of structures remained relatively unchanged during the 20th century. The Salesian's School in the northwest of the site was established in 1924 through the purchase of existing buildings from the Cleeve family. In 1940, the St. Michael's Rowing Club workshop was constructed in the southeast of the site along the River Shannon. In 1950, additional packaging stores and storerooms were constructed associated with the cheese plant. Active use and operation on the site, including milk processing, ceased in 2011. The site is currently disused/vacant.

2.2.4 Ground Investigation

Site-specific geotechnical investigations were carried out at the site in 2015 (Verde, 2015), 2019 (GII, 2019) and 2025 (PGL, 2025). The Structural Report prepared by Arup provides a summary of the findings of these investigation. Refer also to the Structural Report, which is appended to the EIAR.

2.2.5 Site Stratigraphy

The stratigraphy of the site has been described as topsoil (one occurrence – BH301) and made ground (surfacing material) composed of bituminous surfacing and concrete hardstanding underlain by made ground (fill material) composed of historical fill material, construction and demolition waste, and reworked subsoil material with anthropogenic material. Widespread made ground deposits are typically underlain by glacial subsoils composed of coarse-grained slightly clayey to very clayey, sandy to very sandy gravel and fine grained slightly sandy slightly gravelly to gravelly clay. Bedrock level is variable across the site, being encountered from 0.7 to 14.5 m BGL. There was minor evidence of karstic dissolution features encountered in BH311.

2.2.6 Contaminated Land

Geo-environmental testing has demonstrated that there is a variable contamination risk across the site. While the majority of made ground material across the site is suitable for disposal to an inert licenced landfill, hazardous material was encountered in samples from a number of locations in the site. All excavated material will be tested and categorised to ensure compliance with relevant standards and regulations related to the proposed intended use (in the case of reuse) or acceptance criteria at the destination authorised facility (in the case of export for off-site recovery or disposal). For further details, refer to the Structural Report prepared by Arup, which is appended to the EIAR.

2.2.7 Asbestos

A Phase 2 site environmental assessment undertaken in 2015 identified the presence of asbestos in soils, on the ground and in building materials (roof tiles) in existing structures on the site. Additionally, an asbestos refurbishment/demolition (formerly type 3) survey of the proposed development site carried out by Phoenix Environmental in November 2024 identified asbestos containing materials (ACMs) in numerous existing buildings throughout the site.

All asbestos and ACMs should be removed from the site by a suitably authorised and qualified contractor to a facility holding an appropriate and valid licence granted by the EPA, in accordance with the Health and Safety Authority (HSA) guidelines, *Asbestos-containing Materials (ACMs) in Workplaces – Practical*

Guidelines on ACM Management and Abatement.⁵ Site-specified recommendations for the management of asbestos and asbestos-containing materials (ACM) are outside the scope of this report.

2.2.8 Invasive Species

A number of invasive alien plant species have been previously identified on the site, including Japanese Knotweed (*Fallopia japonica*)⁶. For further information related to invasive species and possible biosecurity measures, refer to the Biodiversity Chapter of the EIAR.

2.3 Construction and Demolition Waste Statistics

In 2022, the latest year for which there are published statistics available⁷, 8.3 million tonnes of C&D waste were generated in Ireland, representing a reduction of 700,000 tonnes (9%) from 2021. Of this waste, approximately 6.7 million tonnes comprised of soil and stones, making up approximately 82% of the C&D waste stream.

A breakdown of the composition of C&D waste in Ireland in 2022 is set out in Table 3. These figures should be considered as a guide only, as C&D waste can vary significantly from one project to another, depending on the nature of the development and the waste management practices employed on site.

Table 3: C&D waste composition in 2022 (EPA, 2024)

Waste materials from C&D Sources	Quantity (tonnes)	Proportion of material stream (%)
Soils, stone and dredging spoil	6,741,489	82%
Concrete, bricks, tile and gypsum	616,687	7%
Mixed C&D waste	544,415	7%
Metal	206,851	3%
Bituminous mixtures	104,270	1%
Segregated wood, glass and plastic	54,101	<1%
Total	8,267,813	100%

Data issued by the EPA demonstrate that final treatment operations (backfilling, recycling, disposal and energy recovery) of C&D waste materials varied greatly between material streams. 80.8% of C&D waste was used for backfilling (a recovery operation), which mainly reflects the dominance of soil and stones in the overall composition mix. For non-hazardous C&D waste other than soil and stone, Ireland achieved 82% material recovery in 2022. Under the Waste Framework Directive, Member States must achieve 70% material recovery of this stream.

⁵ HSA (2013) *Asbestos-containing Materials (ACMs) in Workplaces – Practical Guidelines on ACM Management and Abatement*. Available at: https://www.hsa.ie/eng/publications_and_forms/publications/chemical_and_hazardous_substances/asbestos_guidelines.pdf. Accessed August 2025.

⁶ Which is listed in the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. No. 477 of 2011)

⁷ EPA (2024) *Construction & Demolition Waste Statistics for Ireland*. Available at: <https://www.epa.ie/our-services/monitoring--assessment/waste/national-waste-statistics/construction--demolition/>. Accessed November 2024.

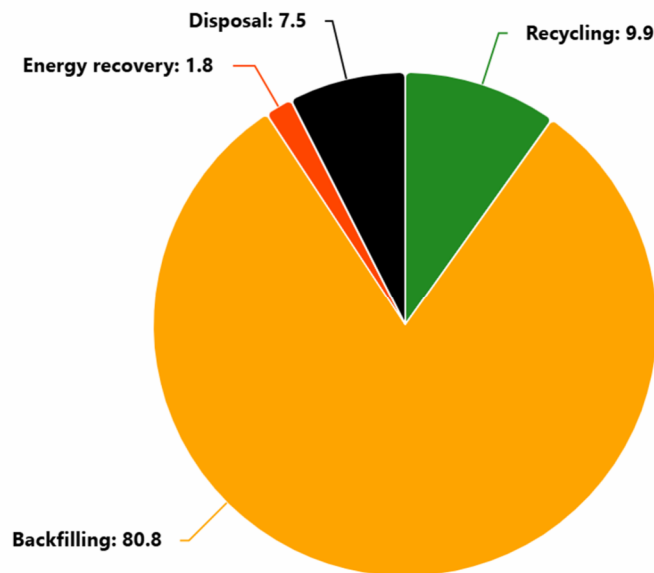


Figure 3: Treatment of C&D waste in Ireland in 2022 (%) (source: EPA, 2024)

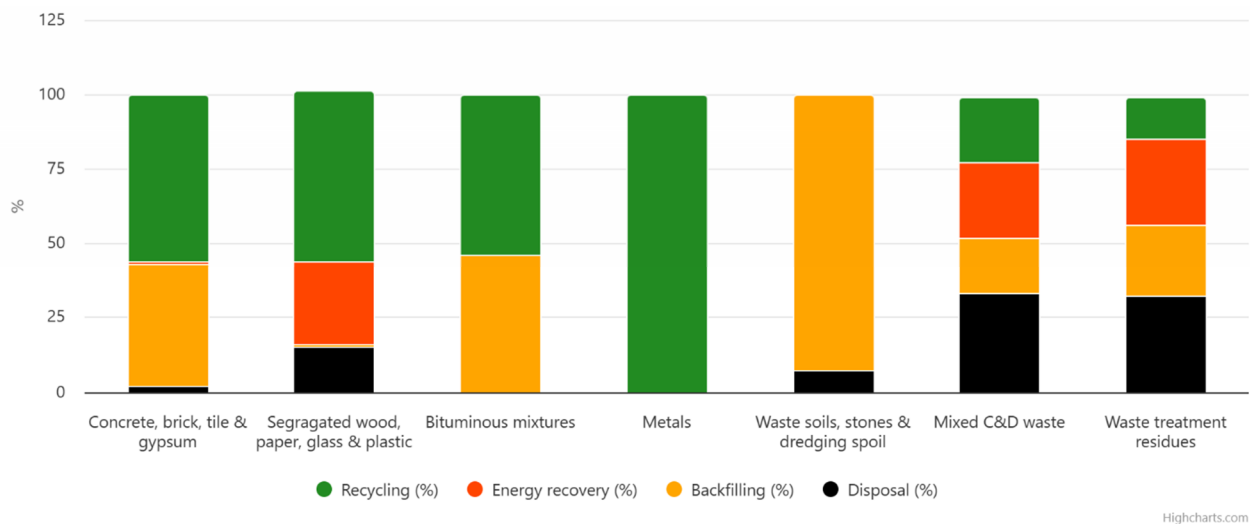


Figure 4: Treatment of C&D waste in Ireland in 2022 by stream (source: EPA, 2024)

Regulation 27 of the European Union (Waste Directive) Regulations 2011-2020 allows a material producer to determine, under prescribed circumstances, that a material is a by-product and not a waste and so can be reused on-site or off-site within the industry. On receipt of Regulation 27 notifications to the EPA, materials can be determined as a waste or a by-product. In some cases, no determination has been issued by the EPA, meaning the material has not been determined as a waste. In 2022, 114 by-product notifications were assessed by the EPA. Of these, the EPA determined that 2.6 million tonnes of soil and stone notified were by-product and 203,851 tonnes were waste. Notifications for 9,900 tonnes of soil and stone were withdrawn. No determinations were made for approximately 848,795 tonnes of soil and stone.⁷

The EPA reports that a total of 389,908 tonnes of hazardous waste were generated in Ireland in 2022, representing a decrease of 16% relative to 2021, driven by reduced dredging activities at Dublin Port. The construction sector is a major contributor to Ireland's hazardous waste, generating 15% of hazardous waste in 2022. Hazardous waste materials generated by the sector include contaminated soils excavated from brownfield sites, dredging spoil, asbestos, asphalt and contaminated wood, concrete, bricks, metals and tiles.

In 2022, over half (57%) of hazardous waste was treated abroad. However, contaminated soils generated in Ireland are almost entirely (99%) treated domestically.⁸

2.4 Construction Products and Materials Statistics

The report by the Irish Concrete Federation (ICF) provides details of Ireland's natural aggregates reserves⁹. At the time of publication (2019), Ireland has approximately 500 active large commercial quarries, approximately 220 ready mixed concrete plants, 20 large-scale precast concrete plants, and 40 asphalt plants producing bitumen bound road surfacing materials.

The ICF quantifies the annual production of these materials in Ireland on their website, with the 2022 figures (the most recent available) being as follows¹⁰:

- Five million cubic metres of ready-mixed concrete;
- 135 million concrete blocks;
- 38 million tonnes of aggregates;
- Two million tonnes of bituminous road surfacing materials; and
- Two million square metres of paving products.

2.5 Resource & Waste Management Infrastructure

The proposed development is situated in Co. Limerick, which is in the Southern Waste Region.

2.5.1 Waste Collection

Collection of C&D waste in Ireland is undertaken by permitted private waste collectors, typically through a combination of material haulage vehicles (e.g., for soil and stone) and collection of skips for less voluminous streams (e.g., metals, wood, glass, plastic, etc.).

2.5.2 Waste and IE Licence Facilities Overview

Sites in the Region that are authorised to accept C&D waste streams by the EPA through Waste and IE Licensing are summarised in Table 4, below.

Table 4: Operational Waste Licence and IE Licence waste facilities accepting C&D waste in the Southern Waste Region

Facility type	No.	Authorised annual capacity (all streams) (tonnes)	Authorised annual capacity (C&D waste) (tonnes)
Composting / anaerobic digestion	3	115,800.00	Not specified
Hazardous waste	2	106,000.00	3,000.00
Materials recovery facility (MRF)	5	430,100.00	75,150.00
Soil recovery facility	4	1,151,000.00	1,151,000.00
Total capacity		1,802,900.00	1,229,150.00

2.5.3 Recovery of Soil and Stone

As described in Section 2.3, above, the majority of C&D waste generated in Ireland is sent for 'backfilling', which refers to any recovery operation where suitable non-hazardous waste is used for purposes of

⁸ EPA (2024) *Hazardous waste statistics for Ireland*. Available at <https://www.epa.ie/our-services/monitoring--assessment/waste/national-waste-statistics/hazardous/#:~:text=EPA%20licensed%20industrial%20facilities%20fully,dredging%20soil%20at%20Dublin%20Port>. Accessed December 2024.

⁹ ICF (2019) *Essential Aggregates: Providing for Ireland's Needs to 2040*. Available at <https://irishconcrete.ie/wp-content/uploads/2019/10/Essential-Aggregates-Final.pdf>. Accessed December 2024.

¹⁰ ICF (2024) *Irish Quarrying and Concrete Products Industry 2022*. Available at <https://irishconcrete.ie/industry-at-a-glance/>. Accessed December 2024.

reclamation in excavated areas or for engineering purposes in landscaping.¹¹ Backfilling is undertaken at soil recovery facilities, of which there are approximately 474 operating nationally.¹² These are typically former quarries. The capacity of these sites is inherently finite, being constrained by the volume of the former quarry void.

Inert (i.e., non-hazardous/uncontaminated) soil and stone and smaller quantities of other C&D waste materials, such as concrete, brick, tile and bituminous mixtures, may be used to backfill these excavated sites. Contaminated/hazardous soil and stone may not be disposed of by backfilling and is typically exported for treatment overseas.

Soil recovery facilities are regulated and operated in accordance with waste authorisations issued by a Local Authority or the EPA, as follows:

- Certificate of Registration (CoR) from Local Authority: $\leq 25,000$ tonnes p/a;
- Waste Facility Permit (WFP) from Local Authority: $> 25,000$ and $\leq 200,000$ tonnes p/a;
- Waste Licence from EPA: $> 200,000$ tonnes p/a.

As shown in Table 4, above, there are currently four active soil recovery facilities operating under EPA Waste Licences in the Southern Waste Region. Details of these are provided below. The nearest of these to the proposed development site are Tulligmore Quarry Solutions Limited (W0255-02) and Garryhesta Pit (Roadstone Limited) (W0299-01) in Co. Cork, both of which are an approximately 100km distance away by road.

- Tulligmore Quarry Solutions Limited in Tulligmore, Dripsey, Co. Cork: An operational sand and gravel quarry with a Waste Licence (W0255-02) allowing backfilling of excavated areas with inert soil and stone from C&D projects not exceeding 280,000 tonnes per annum. The licence also allows for the processing of C&D waste (concrete) on-site to produce saleable recycled aggregate for use on construction projects (refer to Section 2.5.4, below). In 2024, the facility accepted over 276,000 tonnes of C&D waste for backfilling and production of recycled aggregates.
- CHI Environmental Limited in Grannagh, Kilmacow, Co. Kilkenny: A former quarry with a Waste Licence (W0260-01) allowing backfilling of the excavated area with inert soil and stone from C&D projects not exceeding 170,000 tonnes per annum. The licence also allows for the processing of C&D waste on-site to produce recycled aggregate (refer to Section 2.5.4, below). In 2024, the facility accepted over 35,000 tonnes of C&D waste for backfilling and production of recycled aggregates.
- Brownswood Inert Waste Recovery Facility (Roadstone Limited) in Enniscorthy, Co. Wexford: A former quarry with a Waste Licence (W0280-01) allowing backfilling of the excavated area with inert soil and stone (including that from C&D projects) not exceeding 401,000 tonnes per annum. In 2024, the facility accepted over 83,000 tonnes of soil and stone for backfilling.
- Garryhesta Pit (Roadstone Limited) in Knockanemore, Ovens, Co. Cork: A former quarry with a Waste Licence (W0299-01) allowing backfilling of the excavated area with inert soil and stone from C&D projects and dredge spoil not exceeding 300,000 tonnes per annum. In 2024, the facility was operating at maximum capacity, accepting 300,000 tonnes of waste for backfilling.

In addition to Waste Licence sites, there are numerous (approx. 136) WFP authorised sites accepting inert soil and stone from C&D projects in the Southern Waste Region.

As highlighted in the *National Waste Management Plan for a Circular Economy 2024 – 2030*, there is a need for greater soil recovery capacity nationally to meet increasing demand for backfilling, to avoid the need for export of this material and to prevent leakage out of the formal waste management system through

¹¹ Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste and repealing certain Directives, *OJ L 312*. Available at <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:02008L0098-20240218>. Accessed July 2025.

¹² Regional Waste Management Planning Offices (2024) *National Waste Management Plan for a Circular Economy 2024 – 2030*. Available at <https://mywaste.ie/sustainability/circular-living/national-waste-management-plan-for-a-circular-economy-2024-2030/>. Accessed July 2025.

unauthorised activities. Soil recovery capacity is concentrated in the Eastern-Midlands Region, which currently has about 80% of the available national capacity for backfilling.¹²

2.5.4 Recycling

Segregated skips of metals, wood, paper, glass, plastic, concrete, brick, tile, gypsum and bituminous mixtures from C&D sites may be transported to suitably licensed or permitted recycling facilities. According to the IWMA website, there are several operators providing commercial skip hire and collection services to the C&D sector in the Limerick City area, including Mr Binman, Clean Ireland Recycling, Clonmel Waste, AES/Bord na Móna and Panda.¹³

As shown in Table 4, above, there are currently five active materials recovery facilities (MRFs) accepting C&D waste operating under EPA Waste or IE Licences in the Southern Waste Region. Details of these are provided below. The nearest of these to the proposed development site is Clean (Irl) Refuse & Recycling Co. in Co. Clare (W0253-01), which is an approximately 75km distance away by road.

- Waste Recovery Services (Fermoy) Limited in Cullenagh, Fermoy, Co. Cork: A MRF/waste transfer station with a Waste Licence (W0107-01) allowing the acceptance of various waste streams, including up to 1,800 tonnes per annum of non-hazardous C&D waste. Waste streams (including timber and metals) are sorted, segregated and sent off-site for recycling, recovery or disposal, as appropriate.
- Greenstar Recycling (Munster) Limited in Sarsfieldcourt Industrial Estate, Sarsfieldcourt, Glanmire, Co. Cork: A MRF with a Waste Licence (W0136-03) allowing the acceptance of various waste streams, including up to 35,000 tonnes per annum of C&D waste.
- Killarney Waste Disposal Unlimited Company in Aughacurreen, Killarney, Co. Kerry: A MRF with a Waste Licence (W0217-02) allowing the acceptance of various waste streams, including up to 17,500 tonnes of non-hazardous C&D waste and 350 tonnes of hazardous C&D waste per annum.
- Clean (Irl) Refuse & Recycling Co. in Ballinagun West, Cree, Co. Clare: A MRF with an IE Licence (W0253-01) allowing the acceptance of various waste streams, including up to 7,500 tonnes per annum of C&D waste. Waste streams are segregated and temporarily stored before being sent off-site to specialist waste facilities for onward processing, recycling or recovery.
- Country Clean Recycling Unlimited Company in Churchfield Industrial Estate, John F. Connolly Rd, Cork, Co. Cork: A MRF/waste transfer station with an IE Licence (W0257-01) allowing the acceptance of various waste streams, including up to 13,000 tonnes per annum of non-hazardous C&D waste.

Capacity in the Region for production of recycled aggregates from C&D waste is documented in Section 5.2.1.1, below.

2.5.5 Landfills

Ireland has three active waste landfills with a combined annual capacity of 458,000 tonnes. These are located in Counties Dublin, Kildare and Wicklow.

2.5.6 Energy Recovery

Ireland has two dedicated energy recovery plants (incinerators) with a combined annual capacity of 910,000 tonnes. These are located in Counties Dublin and Meath.

2.5.7 Exports

Hazardous and non-hazardous soil and stone and waste metals are the main C&D wastes exported for treatment outside of the State. These exports occur due to the lack of indigenous capacity for treatment of waste soil and stone (particularly hazardous soil and stone) and metal recycling.

¹³ IWMA (2025) *IWMA Members in your Area*. Available at: <https://iwma.ie/commercial-waste/iwma-members-in-your-area/>. Accessed July 2025.

2.6 Proposed Construction & Demolition Works

As detailed in Chapter 2 of the EIAR (Project Description), it is envisaged that the project will be delivered in nine distinct but overlapping stages. Depending on market conditions and delivery mechanisms, some stages may progress more quickly or slightly ahead of others. The anticipated sequence of stages is outlined below and detailed further in Chapter 2 of the EIAR:

- Stage 1: Construction of Bat Houses - A 3-month period is allocated exclusively to this stage to allow bats on-site to adjust to their new accommodation. No other construction activity will overlap with this stage.
- Stage 2: Site Demolition and Enabling Works - This stage involves demolishing identified buildings and structures to facilitate development and installing enabling drainage infrastructure across the Flaxmill area. Temporary surface treatments will be applied to support access to the upper-level sites (Salesians and Stonetown). This stage is expected to take 12–15 months.
- Stage 3: Flood Protection Works - Raising the North Circular Road and implementing other flood protection measures will occur concurrently with Stage 2 and is expected to take 15 months.
- Stage 4: Salesians Zone Development - Construction of apartments and townhouses, along with local public realm and communal open spaces, will begin midway through Stage 2. This stage is expected to take 18–24 months.
- Stage 5: Stonetown Terrace Zone Development - This stage will likely begin alongside Stage 4 and take 15–18 months. Given its timeline, Stonetown Terrace is expected to be the first zone ready for occupation.
- Stage 6: O’Callaghan Strand Zone Development - Construction of apartments in this zone will begin midway through the Stonetown Terrace works and is expected to take 15 months, likely completing before the Salesians Zone.
- Stage 7: Quarry Zone PBSA and Public Realm - This stage includes the construction of Purpose-Built Student Accommodation (PBSA) and associated amenities, as well as public realm improvements around the reservoir. It is expected to take 24 months.
- Stage 8: Flaxmill Plaza and Riverside Public Realm - Delivery of Flaxmill Plaza and riverside canopy works is anticipated to take 15 months. This stage will begin after the completion of Stonetown Terrace but before the Salesians Zone is finished. Completion is expected to align with the PBSA.
- Stage 9: Shipyard Mobility Hub - The final stage involves constructing the Mobility Hub on the Shipyard site, along with associated site works. This will commence once all other stages are complete and is expected to take 6 months

It is envisaged that the Shipyard site will be utilised as a construction compound with access via the existing access arrangement on North Circular Road. There is the potential for a secondary compound/storage area to facilitate construction of O’Callaghan Strand on part of the Flaxill site, while construction of the PBSA in the quarry can be facilitated with a compound in the area of vehicular access and partial open spaces between the wings. Stockpiles of C&D resources and waste materials (including excavated materials) will primarily be stored at the Shipyard site.

For further details of the proposed construction methodology and phasing, refer to Chapter 2 of the EIAR (Project Description) and the CEMP for the proposed development.

2.6.1 Proposed Demolition Works

As described in the project description in Section 2.1, it is proposed to retain *in situ* several existing structures on the site, two of which are designated Protected Structures; the Flaxmill Building (LCCC RPS reg. no. 3265; NIAH reg. no. 21512053) and the Chimney Stack (RPS reg. no. 3264; NIAH reg. no. 21512059).

For other structures on the site, it is proposed to deconstruct/demolish to facilitate the proposed development (refer to Figure 5, below). As described in Section 2.1, structures identified for whole or partial demolition include the following:

- Salesians Secondary School and Fernbank House;
- Mid and late 20th Century building structure adjoining Cold Store (former Weaving Mill);
- Upper Reservoir on Stonetown Terrace comprising 2 no. structures;
- Linen Store and later 20th Century store next to Linen Store on Stonetown Terrace/O'Callaghan Strand;
- Office and Laboratory Building on O'Callaghan Strand;
- Packaging Offices on North Circular Road;
- 2 no. Houses on North Circular Road;
- Warehouse on the Shipyard site;
- Stone boundary wall adjoining O'Callaghan Strand (partial removal); and
- 20th Century extension at rear of Main Mill.

Substantial volumes of reclaimed construction materials and waste will be generated as a result of these works. The nature and quantities of these materials are further detailed in the Pre-demolition Audit Report, submitted under separate cover, and in Section 5.2.1, below. Details of the proposed demolition works are provided in the CEMP for the proposed development.

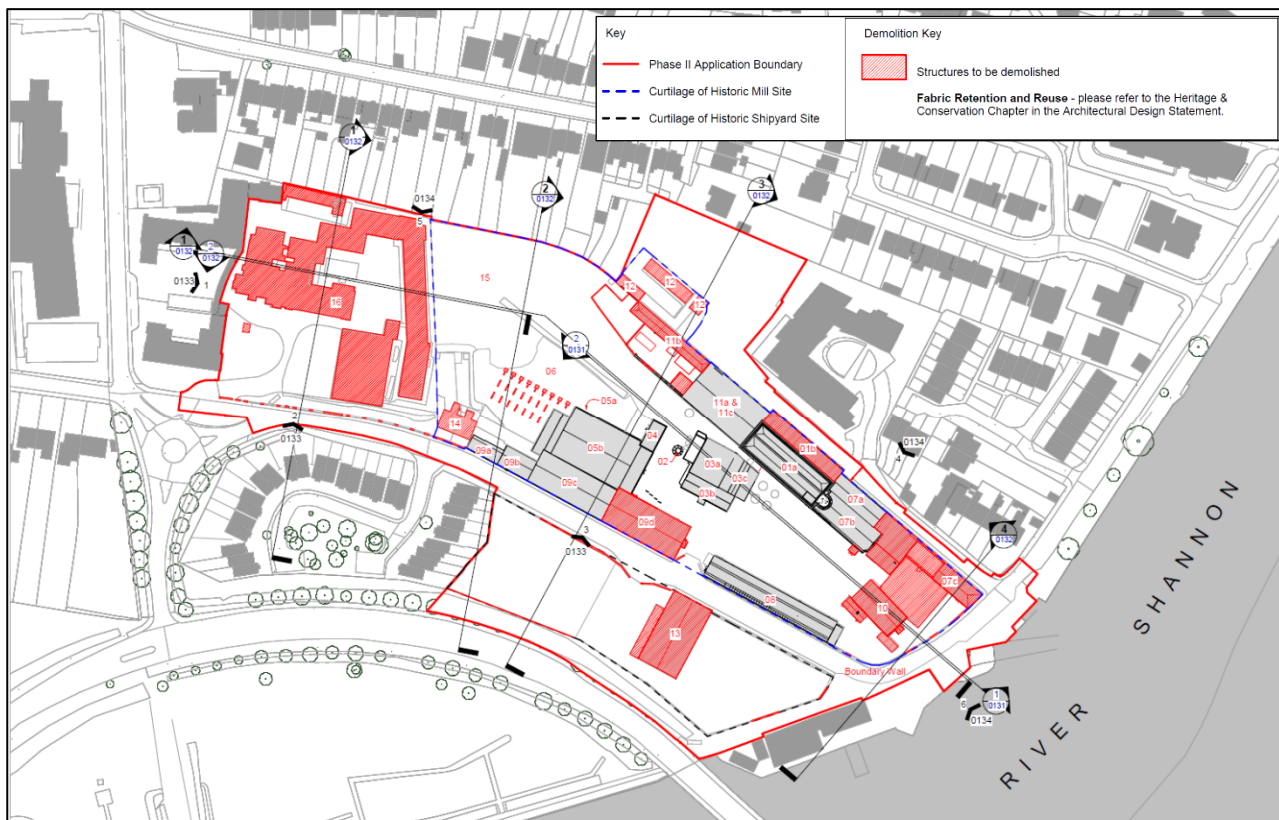


Figure 5: Demolition site plan

2.6.2 Earthworks

During the construction phase, earthworks (excavations) will be required to achieve the required formation levels, for building foundations and substructures, internal road network and parking areas, and

installation/diversion of site services and utilities. Estimated earthworks volumes and the potential for reuse of excavated material are addressed in Section 5.2.2, below.

3. Role and Responsibilities

3.1 Design Team

Table 5 provides an overview of key members of the project team, including the design team.

Table 5: Project team

Organisation	Role(s)
Limerick Twenty Thirty (LTT)	• Client • Project Manager
Feilden Clegg Bradley Studios (FCBS)	• Lead Designer • Architect • Conservation Architect
Bucholz McEvoy Architects (BMA)	• Masterplanning • Architect • Urban Design
Arup	• Civil & Structural Engineer • Building Services & Digital Engineers • Façade Engineer • Fire Safety • Resource & Waste Management
Mitchells + Associates	• Landscape Architect
HRA Planning	• Planner
Mitchell McDermott	• Quantity Surveyor
AtkinsRéalis	• Resource & Waste Management

3.2 Future Roles and Responsibilities of Contractor

The responsibilities of the appointed Contractor in relation to the CDRWMP, as specified in the EPA Guidelines, are listed in Appendix B.

Copies of the CDRWMP will be made available to all relevant personnel on site. All site personnel and sub-contractors will be instructed about the objectives of the CDRWMP and informed of their responsibilities.

The nominated Resource Manager responsible for implementation of this CDRWMP will be identified prior to construction commencement. The Resource Manager will be responsible for informing contractor staff and sub-contractors of content of the CDRWMP and for maintaining and keeping the records set out in Section 6. In the event of the Resource Manager leaving the project team, the contractor will nominate a suitable replacement.

The Resource Manager will be responsible for conducting ongoing resource and waste audits at the site during construction. The Resource Manager shall ensure that where training is required regarding the handling and management of wastes on site, that this is provided to staff as required.

4. Design Approach

4.1 Workshops

To inform the development of a Circular Economy Statement (CES) for the proposed development, a Circular Design Workshop was held with key members of the design team on Tuesday, 6 May 2025. Existing circular design approaches integrated into the design were identified, and the potential for further integration of circular design approaches and designing out waste were explored. Attendees of the workshop included representatives from Arup, LTT, FCBS, BMA and AtkinsRéalis.

The workshop used Arup's Circular Buildings Toolkit, co-developed with the Ellen MacArthur Foundation, as a framework for the workshop. The Toolkit is structured around four principles for circular buildings – build nothing, build for long-term value, build efficiently, and build with the right materials – with a series of corresponding circular design approaches, as illustrated in Figure 6.

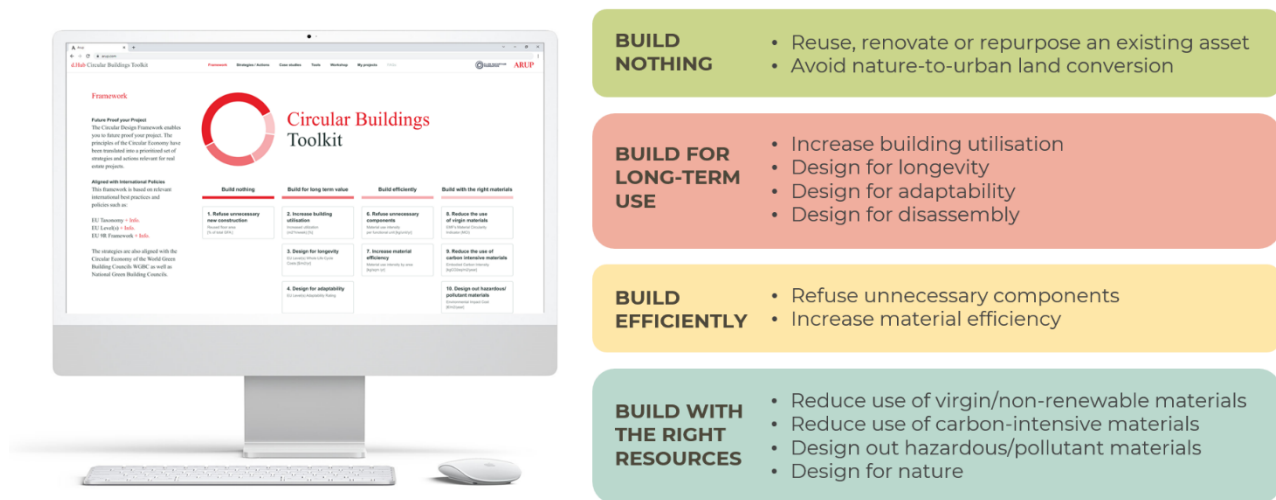


Figure 6: Arup Circular Buildings Toolkit: circular design approaches

4.2 Circular Design and Waste Prevention Initiatives

According to the EPA Guidelines, the CDRWMP for the pre-construction phase should document, at a minimum, design initiatives adopted in relation to:

- Reuse and recycling;
- Green procurement;
- Off-site construction;
- Materials optimisation;
- Flexibility and deconstruction.

The following provides a summary of design initiatives proposed or under consideration to integrate circular design principles into the proposed development and to prevent waste over the life cycle of the development. Further details of potential and proposed circular initiatives for the proposed development are provided in the Circular Economy Statement, which will be submitted under separate cover as part of the application.

4.2.1 Reuse and Recycling

4.2.1.1 Infill Development on a Brownfield Site

The proposed development is an infill development on a vacant, brownfield site that has itself been developed and redeveloped for a range of industrial activities and enterprises since at least the 1830s. By reusing a previously developed site within the existing built-up footprint of Limerick City, the proposal avoids the need for greenfield development and takes advantage of existing infrastructure in the receiving

environment. This is consistent with the national policy of compact urban development and represents an efficient use of resources.

4.2.1.2 *Adaptive Reuse of Existing Structures*

The proposed development is one phase of the broader masterplan for the Cleeves Riverside Quarter (CRQ). While this application is comprised of new build elements and public realm development, there are a number of existing heritage buildings on the site that will be retained *in situ* as part of the development, for redevelopment under the scope of a separate application. These include the Flax Mill, Chimney Stack, Engine House and Dairy Buildings. Thus, the proposed development will enable the adaptive reuse of these structures. Additionally, where feasible, it is proposed to retain existing architectural heritage elements, including stone walls, *in situ* in the public realm.

4.2.1.3 *Reuse of Site-won Materials*

During the C&D phase, the on-site reuse of site-won materials will be prioritised. It is proposed to retain and reuse existing materials on the site to the extent practicable. For example, there are salvaged cobblestones on the site that will be integrated into the landscape design to the extent feasible. It is also proposed to retain certain areas of existing concrete hardstanding and stone walls *in situ*. There may also be opportunities to reuse salvaged timber and steel on site (e.g., in street furniture, SuDS features, proposed canopy structures and/or in temporary structures).

Where there is excess site-won material that cannot be reused on-site, opportunities will be identified to reuse or recover this material off-site in accordance with the European Union (Waste Directive) Regulations 2011-2020, in collaboration with other projects, sites and initiatives, prioritising those in closest proximity to the proposed development site. Further details are provided in Section 5, below.

Section 5.2.1 provides a proposed strategy for the management of resource and waste materials generated during the proposed deconstruction/demolition works. Section 5.2.3 provides a strategy for the management of excavated materials generated during the proposed works.

4.2.1.4 *Circular Water Infrastructure*

The design will also support reuse and recycling during operation, e.g., through rainwater harvesting.

4.2.2 *Green Procurement*

Green procurement can be used as a tool to promote waste prevention and adoption of circular economy principles during the C&D phase of a project. As noted in the EPA Guidelines, “*Green procurement facilitates using tender specifications, selection and award criteria and contract conditions to procure products and services that prevent and reduce waste*”. Green procurement is used to set out the client’s commitment to circular economy and waste prevention and ensure that the appointed contractor/supplier is capable of meeting the client’s requirements in this regard.

The *National Waste Management Plan for a Circular Economy* (NWMPCE) includes an action for the local government sector (LGS) to implement GPP criteria on all local authority C&D projects, to support waste prevention and circularity in the sector (refer to Table 6, below). *Buying Greener*, the Government’s GPP strategy and action plan, notes that the EU is in the progress of developing updated GPP criteria for buildings. Following the publication of these, the EPA will update its national criteria for the sector.

In the interim, *Buying Greener* states that public bodies should use GPP criteria related to construction where these are already available, e.g., the EPA’s national criteria for office building design, construction and management¹⁴; and the EU’s criteria for road design, construction and maintenance¹⁵.

¹⁴ EPA (2023) *Irish GPP Criteria: Office Building Design, Construction and Management*. Available at: https://www.epa.ie/publications/circular-economy/resources/EPA_GPP_Criteria_Office_2023_06.pdf. Accessed July 2025.

¹⁵ European Commission (2016) *Commission Staff Working Document: EU Green Public Procurement Criteria for Road Design, Construction and Maintenance*. Available at: <https://circabc.europa.eu/ui/group/44278090-3fae-4515-bcc2-44fd57c1d0d1/library/bc468fa0-c88f-4c2b-a33f-af55e713ca5d/details>. Accessed July 2025.

Table 6: Relevant policies and actions in the NWMPCE – Green procurement and C&D waste management

Targeted Policy	Priority Action
TP8.1: Prioritise waste prevention and circularity in the construction and demolition sector to reduce the resources that need to be captured as waste.	PA8.1 (LGS): Implement Green Public Procurement criteria on all local authority construction and demolition projects and promote its wider use within the sector.

Consideration will be given to opportunities to apply green procurement to promote circularity and waste prevention during the C&D phase of the proposed development. Examples of the application of green procurement to C&D resource and waste management include the following:

- State the client’s policy and targets in relation to waste prevention and circular economy in tender documentation;
- Require the preparation/update and implementation of a CDRWMP in tender documentation for procurement of main contractor;
- Include waste prevention and circular economy capability and competence questions in contract pre-qualification questionnaires;
- Include gateway reviews during the design process to monitor compliance with designing out waste principles; and/or
- Include requirement for ‘waste per work package’ in tender documentation, whereby waste must not exceed a contractually agreed limit.

4.2.3 Off-site Construction

Opportunities will be considered to facilitate and incorporate the use of prefabricated and modular elements into the proposed development, such as prefabricated 2D panels and 3D units, precast concrete, and engineered timber. Where feasible, the design seeks to facilitate the integration of prefabricated and modular elements (e.g., through standardisation and repetition of units) while allowing flexibility for the detailed design stage.

4.2.4 Materials Optimisation

Opportunities will be considered to employ lean/precision design to avoid overspecification of materials in the proposed development. For example, it may be possible to use shallow foundations in areas in which there is rock at or close to the surface. It is proposed to minimise the resource use needed for construction, where appropriate.

4.2.5 Flexibility and Deconstruction

Options to design for adaptability (DfA) and disassembly or deconstruction (DfD) will be considered at detailed design stage to facilitate circular management of building materials and components throughout the building life cycle, including at end-of-life. Potential frameworks to facilitate this exercise include ISO 20887:2020 ‘Sustainability in buildings and civil engineering works – Design for disassembly and adaptability – Principles, requirements and guidance’ and Level(s) indicator 2.4, ‘Design for deconstruction’.¹⁶

The proposed development has been designed to support flexible use. For example, the public realm has been designed to accommodate a range of uses, including pop-up public events, and to be used at different times of the day and throughout the seasons. For the proposed student accommodation, options for summer lettings are being considered to ensure continuous use.

¹⁶ Dodd, N., Donatello, S. & Cordella, M. (2021) *Level(s) indicator 2.4: Design for deconstruction – User manual: introductory briefing, instructions and guidance*, Version 1.1. [EC JRC Technical Report]. Available at: https://susproc.jrc.ec.europa.eu/product-bureau/sites/default/files/2021-01/UM3_Indicator_2.4_v1.1_18pp.pdf. Accessed June 2025.

5. Key Materials, Quantities and Costs

5.1 Introduction

Construction and demolition (C&D) waste is defined as waste which arises from construction, renovation and demolition activities. Also included within the definition are surplus and damaged products and materials arising in the course of construction work or used temporarily during the course of on-site activities. Typical C&D waste types which are likely to arise during the proposed C&D works are set out Appendix C, including the corresponding EPA List of Wastes (LoW) codes.¹⁷ Non-waste materials expected to be generated are also identified and options for reuse discussed.

5.2 Estimated Resource and Waste Arisings

5.2.1 Deconstruction and Demolition

Table 7 provides estimates of the types and volumes of materials to be generated as a result of the proposed deconstruction and demolition works. This is based on the Demolition Bill of Quantities provided in the Pre-demolition Audit Report for the proposed development, submitted under separate cover as part of the application. The largest material streams by weight are expected to be concrete, brickwork and steel. The following sections document the proposed management strategies for the resource and waste streams identified.

Table 7: Estimated volumes of demolition materials

Material	LoW code	Estimated in situ volume (tonnes)	Estimated proportion of demolition resource and waste materials
Concrete (including pre-cast panels)	17 01 01	6,850	71%
Brickwork	17 01 02	2,260	24%
Steel	17 04 05	316	3%
Metal corrugated cladding	17 04 07	78	<1%
Timber	17 02 01	38	<1%
Natural stone	17 05 04	32	<1%
Gypsum	17 08 02	16	<1%
Asphalt	17 03 018	10	<1%
Fluorescent lighting	17 09 01*	7	<1%
Glass	17 02 02	6	<1%
PVC window frames	20 01 39	2	<1%
Total		9,605	-

¹⁷ EPA (2019) *Waste Classification – List of Waste & Determining if Waste is Hazardous or Non-hazardous*. Available at: https://www.epa.ie/publications/monitoring--assessment/waste/EPA_WasteClassificationGuidanceReport2019.pdf. Accessed August 2025.

5.2.1.1 Concrete (including pre-cast panels)

Opportunities to directly reuse salvaged, intact, pre-cast elements on the site (i.e., as an alternative to crushing and recycling) may be limited but should be given due consideration (e.g., refer to the (P)RECAST project in Denmark)¹⁸.

It is proposed to crush waste concrete from demolition works on-site using a mobile crusher to produce recycled aggregate, which may potentially be used on-site, where this meets the requirements of the corresponding national end-of-waste criteria (EoW N001/2023).¹⁹ This would require a waste authorisation (CoR) being in place for the mobile crusher and a Regulation 28 registration for the production of recycled aggregate in accordance with the criteria. Sampling, testing and storage of the material would be required in accordance with the national criteria.

Where it is deemed necessary to export waste concrete for management off-site, this should preferentially be sent to an operator authorised to produce recycled aggregates.

Waste authorisations allowing the acceptance of concrete in the Southern Waste Region are summarised in Table 8, below.

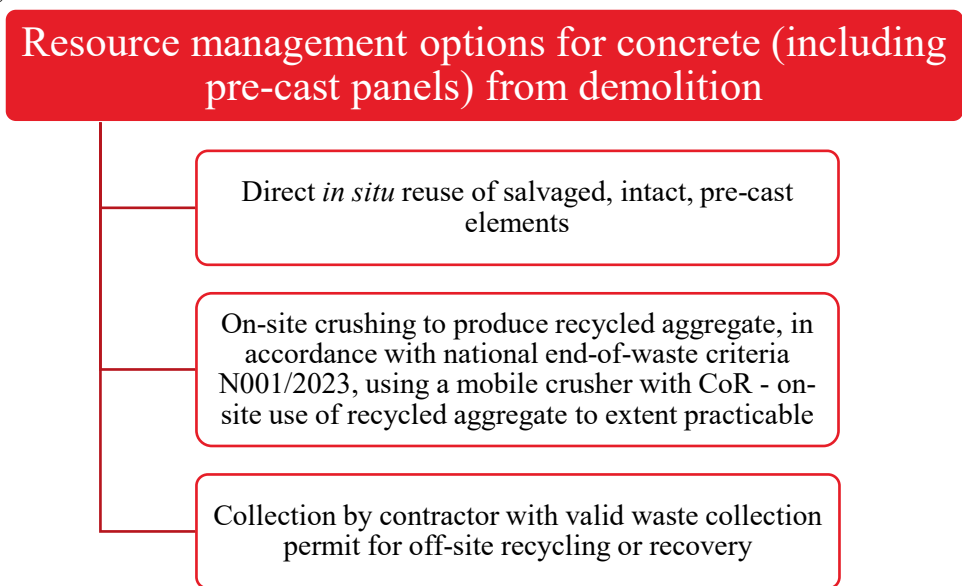


Figure 7: Resource management options for concrete generated during demolition works

Table 8: Waste authorisations for acceptance of inert waste concrete in Southern Waste Region (LoW codes: 17 01 01; 17 01 07)

Authorisation type	County	No.	Combined annual volume (minimum) (tonnes) (concrete) ²⁰
Waste Licence	Kerry	1	Not specified
Waste Facility Permit (WFP)	Limerick	9	>55,850.00
	Carlow	1	Not specified
	Clare	7	>2,230.00
	Cork	10	>71,885.00

¹⁸ GXN (2025) (P)RECAST. Available at <https://gxn.3xn.com/project/precast>. Accessed July 2025.

¹⁹ Use of the recycled aggregate is restricted to specific allowed uses, as set out in the criteria.

²⁰ It should be noted that these are minimum volumes, as for numerous authorisations, specific tonnages are not provided for individual LoW codes, or documentation is not available. Additionally, particular CoRs are likely to be project-specific authorisations for mobile crushers producing recycled aggregates on-site.

Authorisation type	County	No.	Combined annual volume (minimum) (tonnes) (concrete) ²⁰
	Kerry	19	>38,547.00
	Kilkenny	9	>5,700.00
	Tipperary	10	>41,530.00
	Waterford	5	>8,700.00
	Wexford	8	>169,250.00
Certificate of Registration (CoR)	Limerick	13	>25,091.00
	Clare	23	>19,950.00
	Cork	2	>17,950.00
	Kerry	2	>300.00
	Tipperary	5	>3,680.00
	Wexford	1	Not specified
Total			>460,663.00

There are nine operators in the Southern Waste Region with Regulation 28 end-of-waste decisions from the EPA, as listed in Table 9, below. These are authorised to produce recycled aggregates from C&D waste, including concrete, bricks, tiles and ceramics, inert soil and stone and mixtures thereof; in accordance with the corresponding national EOW criteria.²¹ Note that some of these registrations (e.g., N-EOW-0039) are for C&D sites where on-site crushing is/was proposed using mobile crushers.

Table 9: End-of-waste decisions for recycled aggregates in the Southern Waste Region

Reg. no.	Producer	Address	Waste authorisation ref. no.
N-EOW-0039	Smith Demolition Limited	Zone B, Vacated Building, St. Camillus Hospital, Shelbourne Road, Limerick, V94 5V24	COR/L/2024/235
N-EOW-0031	Coolrus Plant Hire Limited	Ballinagoul, Co. Limerick, V35 DA09	WFP-L-2022-189-R2
N-EOW-0026	O'Kelly Brothers Civil Engineering Company Limited	R&H Hall Building, Kennedy Quay, Cork, T12 N231	CoR-CC-2024-15-R1
N-EOW-0022	Smith Demolition Limited	Block B1 to 11, Ardmore Avenue, Knocknaheeny, Cork, T23 AOK8	COR-CC-2024-84
N-EOW-0064	Eamon Costello (Kerry) Ltd	20 Mitchels Road, Kerry, V92K4VR	
N-EOW-0061	J. Ryan Haulage Limited	Powerstown, Goresbridge, Kilkenny, R95KV29	WFP-KK-23-002-01
N-EOW-0056	Crystalhill Inns Limited (t/a CHI Environmental)	Kilmacow, Kilkenny, X91 FF29	WFP-KK-21-0003-03
N-EOW-0030	Kilkenny County Council	Knockard, Pleberstown, Kilkenny, R95XY16	NWCPO-11-99995-01

²¹ EPA (2023) *National End-of-Waste Decision EoW-N001/2023 of 12th September 2023 establishing criteria determining when recycled aggregate ceases to be waste under Regulation 28 of the European Union (Waste Directive) Regulations 2011-2020*. Available at: <https://www.epa.ie/publications/licensing--permitting/waste/Final-Decision---National-End-of-Waste-Criteria-N001-2023.pdf>. Accessed July 2025.

Reg. no.	Producer	Address	Waste authorisation ref. no.
N-EOW-0016	Kereen Quarries Limited	Kereen Lower, Cappoquinn, Co Waterford	WFP-WCCC-18-0004-01

5.2.1.2 Brickwork

Where feasible, it is proposed to reuse salvaged, intact bricks and blocks on-site in the proposed development. This would involve sorting, cleaning/conditioning and storage of the salvaged brickwork. Where opportunities are limited to reuse intact brickwork on-site, these can be removed off-site to another project or salvage business.

Where brickwork is damaged or otherwise unsuitable for reuse, it may be crushed to produce recycled aggregate in accordance with the national end-of-waste criteria (EoW N001/2023). As detailed above, where it is proposed to do this on-site, it will be necessary to obtain an appropriate waste authorisation for the mobile crusher (CoR) and submit a Regulation 28 registration to the EPA. This may also be undertaken off-site by an appropriately authorised contractor.

Waste authorisations allowing the acceptance of brickwork in the Southern Waste Region are summarised in Table 10, below. These authorisations indicate capacity for the acceptance of at least 332,000 tonnes of waste brickwork in the Region. Registered producers of recycled aggregates in the Region are listed in Table 9, above.

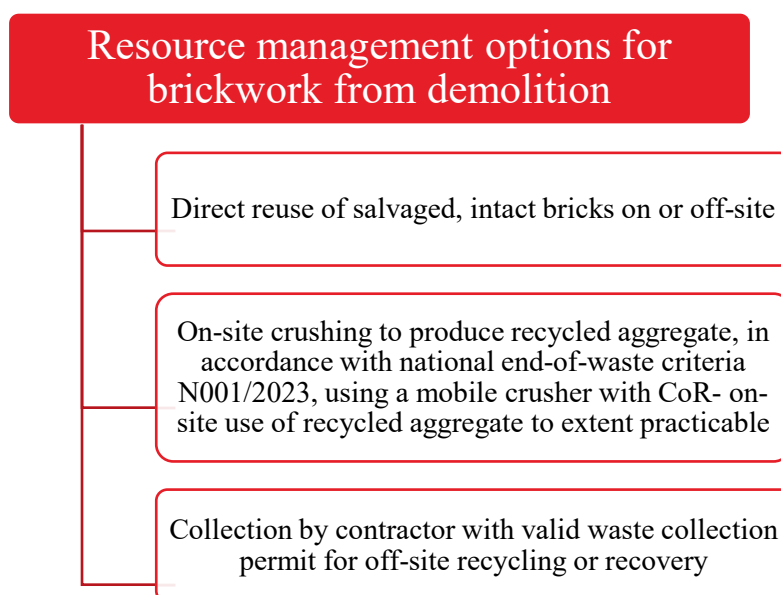


Figure 8: Resource management options for brickwork generated during demolition works

Table 10: Waste authorisations for acceptance of inert waste brickwork in Southern Waste Region (LoW codes: 17 01 02; 17 01 07)

Authorisation type	County	No.	Combined annual volume (minimum) (tonnes) (brickwork) ²²
Waste Licence	Kerry	1	Not specified
Waste Facility Permit (WFP)	Limerick	9	>18,900.00
	Carlow	1	Not specified

²² It should be noted that these are minimum volumes, as for numerous authorisations, specific tonnages are not provided for individual LoW codes, or documentation is not available. Additionally, particular CoRs are likely to be project-specific authorisations for mobile crushers producing recycled aggregates on-site.

Authorisation type	County	No.	Combined annual volume (minimum) (tonnes) (brickwork) ²²
	Clare	7	>730.00
	Cork	10	>37,152.00
	Kerry	16	>20,032.00
	Kilkenny	8	>1,700.00
	Tipperary	10	>31,790.00
	Waterford	5	>1,650.00
	Wexford	7	>162,992.00
Certificate of Registration (CoR)	Limerick	10	>34,000.00
	Clare	23	>15,715.00
	Cork	1	>4,000.00
	Kerry	2	Not specified
	Tipperary	5	>3,680.00
	Wexford	1	Not specified
Total			>332,341.00

5.2.1.3 Steel

Where feasible, it is proposed to reuse steel elements on-site. Potential applications could range from temporary works to non-structural (e.g., landscape design/drainage) and structural applications. Any proposed steel reuse would need to comply with the relevant legislation, including Part D of the Building Regulations and the EU Construction Products Regulation, and standards (e.g. EN 1993/Eurocode 3: Design of steel structures). Steps involved in steel reuse may include sorting, testing, cleaning, reconditioning, storage and re-certification, depending on the proposed application. For further information, refer to SCI publications P427 (Structural Steel Reuse) and its supplement, P440 (Reuse of Pre-1970 Steelwork).

Where it is not feasible to reuse salvaged steel elements on-site, this will be exported off-site for recycling. Waste authorisations allowing the acceptance of waste steel and mixed metals in the Southern Waste Region are summarised in Table 11, below.

Resource management options for steel from demolition

- Direct reuse of steel elements on-site in accordance with the relevant standards and legislation
- Collection by contractor with valid waste collection permit for recycling off-site

Figure 9: Resource management options for brickwork generated during demolition works

5.2.1.4 Other demolition resource and waste streams

Other resource and waste streams arising from deconstruction/demolition works identified in the Pre-demolition Audit Report include:

- Corrugated metal cladding;
- Timber;
- Natural stone;
- Gypsum;
- Asphalt;
- Fluorescent lighting; and
- Windows (glass and PVC frames).

Where feasible, intact, salvaged building materials will be sorted and stored for reuse on- or off-site, as appropriate. Where it is not possible to reuse such materials in the proposed development, there may be opportunities to reuse these off-site in conjunction with another project or salvage business. It is noted that there are a number of salvage yards in the Region – including one in Monaclooe, Co. Limerick, that specialises in worktops, cabinetry and doors – which may be able to accept certain salvaged materials from the site.

Residual waste streams generated from demolition works that are unsuitable for reuse on- or off-site will be sent for recycling, recovery or disposal (as appropriate and in accordance with waste hierarchy) through a suitably authorised contractor.

Corrugated metal cladding

Corrugated metal cladding is typically produced of steel, aluminium or zinc. Waste authorisations allowing the acceptance of these metals, as well as mixed metals, in the Region, are summarised in Table 11, below.

Table 11: Waste authorisations for acceptance of inert waste metals (steel, zinc, aluminium and mixed metals) in Southern Waste Region

Authorisation type	County	No.	Combined annual volume (minimum) (tonnes) ²³			
			Steel (17 04 05)	Zinc (17 04 04)	Aluminium (17 04 02)	Mixed metals (17 04 07)
Waste Licence	Kerry	1	Not specified	Not specified	Not specified	Not specified
	Clare	1	Not specified	Not specified	Not specified	Not specified
Waste Facility Permit (WFP)	Limerick	10	>25,620.00	>5.00	>1,030.00	>170.00

²³ It should be noted that these are minimum volumes, as for numerous authorisations, specific tonnages are not provided for individual LoW codes, or documentation is not available.

Authorisation type	County	No.	Combined annual volume (minimum) (tonnes) ²³			
			Steel (17 04 05)	Zinc (17 04 04)	Aluminium (17 04 02)	Mixed metals (17 04 07)
	Carlow	2	>3,000.00	Not specified	>28.00	>2,685.00
	Clare	4	Not specified	Not specified	Not specified	>100.00
	Cork	19	>2,099.00	Not specified	>520.00	>850.00
	Kerry	4	Not specified	Not specified	Not specified	>190.00
	Kilkenny	4	Not specified	>300.00	>300.00	>1,600.00
	Tipperary	5	>200.00	>1.00	>51.00	>371.00
	Waterford	5	>155.00	Not specified	>15.00	>65.00
	Wexford	6	>26,000.00	>25,500.00	>25,500.00	>25,500.00
Certificate of Registration (CoR)	Cork	1	>2,099.00	Not specified	>520.00	>850.00
Totals			>59,173.00	>25,806.00	>27,964.00	>32,381.00

Timber

Where feasible, salvaged timber will be sorted and stored for reuse on- or off-site, as appropriate. Where reuse of salvaged timber from demolition works is not feasible, waste wood will be sent off-site for processing into chips, which may have a range of end uses. Waste authorisations allowing the acceptance of waste wood in the Region, are summarised in Table 12, below.

Table 12: Waste authorisations for acceptance of wood in Southern Waste Region

Authorisation type	County	No.	Combined annual volume (minimum) (wood) (17 02 01)
Waste Facility Permit (WFP)	Limerick	7	>210.00
	Carlow	1	Not specified
	Clare	2	>1,500.00
	Cork	9	>4,390.00
	Kerry	6	>40.00
	Kilkenny	3	>300.00
	Tipperary	4	>1,162.00
	Waterford	4	>100.00
	Wexford	7	>29,242.50
Certificate of Registration (CoR)	Tipperary	1	>500.00
Totals			>37,444.50

Natural stone

Where feasible, it is proposed to reuse salvaged, intact stone blockwork on-site in the proposed development. This would involve sorting, cleaning/conditioning and storage of the salvaged blocks. Where opportunities are limited to reuse intact blocks on-site, these can be removed off-site to another project or salvage business.

Where stone blockwork is damaged or otherwise unsuitable for reuse, it may be crushed to produce recycled aggregate in accordance with the national end-of-waste criteria (EoW N001/2023). As detailed above, where it is proposed to do this on-site, it will be necessary to obtain an appropriate waste authorisation for the mobile crusher (CoR) and submit a Regulation 28 registration to the EPA. This may also be undertaken off-site by an appropriately authorised contractor. Registered producers of recycled aggregates in the Region are listed in Table 9, above.

Gypsum

It is proposed to send gypsum-based materials (e.g., plasterboard) salvaged during demolition works to a suitably authorised contractor for recycling.²⁴ Waste authorisations allowing the acceptance of gypsum-based construction materials in the Region, are summarised in Table 13, below.

Table 13: Waste authorisations for acceptance of gypsum-based construction materials in Southern Waste Region

Authorisation type	County	No.	Combined annual volume (minimum) (gypsum) (17 08 02)
Waste Facility Permit (WFP)	Limerick	4	>55.00
	Carlow	1	-
	Clare	2	-
	Cork	4	>550.00
	Kerry	1	-
	Kilkenny	1	-
	Tipperary	4	>132.00
	Waterford	2	-
	Wexford	2	>16,500.00
Totals			>17,237.00

Asphalt

Where feasible, it is proposed to reclaim site-won asphalt for use on- or off-site to produce bituminous mixtures that can be used to construct pavements. In this scenario, the site-won asphalt ('road planings') is a by-product rather than a waste material. In 2023, the EPA published national by-product criteria for the use of site-won asphalt as a raw material in Reclaimed Asphalt Pavement (RAP) plant, including mobile and stationary plant.

Fluorescent tubes

Fluorescent tubes pose a human health risk due to the potential for breakage and exposure to mercury vapour and broken glass and must not be stored in an exposed or uncontrolled manner. Care shall be taken to avoid breakage of waste lamps during deconstruction works. Waste lamps shall be stored in dedicated six- or eight-foot waste lamp containers (or 'coffins') pending collection by an appropriately authorised waste contractor.

Windows

In some cases, it may be possible to salvage and reuse windows and glazing to minimise quantities of glass sent for recycling. For example, the 1 Triton Square project in London involved the *in situ* reuse of over

²⁴ Under the EU Landfill Directive, non-hazardous gypsum-based materials may only be disposed of in a mono-cell landfill where no biodegradable waste is accepted, to prevent the generation of toxic hydrogen sulphide gas. No such landfill operates in Ireland.

3,000m² of façade glazing.²⁵ This involved removing deconstructed façade elements to a nearby site for refurbishment prior to reuse on the original site.²⁶

It is understood that the windows present on the site are older and of poor environmental performance, which may limit their reuse potential. Where it is not possible to reuse windows or glass panes directly, the constituent materials will be sent for recycling. Waste authorisations in the Region allowing the acceptance of glass and PVC (plastics) are summarised in Table 14 and Table 15, below.

Table 14: Waste authorisations for acceptance of inert waste glass (LoW code 17 02 02) in Southern Waste Region

Authorisation type	County	No.	Combined annual volume (minimum) (tonnes) (glass) ²⁷
Waste Facility Permit (WFP)	Limerick	4	>60.00
	Carlow	1	Not specified
	Clare	3	>1,100.00
	Cork	5	>555.00
	Kerry	3	>50.00
	Kilkenny	2	Not specified
	Tipperary	2	>51.00
	Waterford	3	Not specified
	Wexford	6	>29,250.00
Total			>31,066.00

Table 15: Waste authorisations for acceptance of inert waste plastic (LoW code 17 02 03) in Southern Waste Region

Authorisation type	County	No.	Combined annual volume (minimum) (tonnes) (plastic) ²⁷
Waste Facility Permit (WFP)	Limerick	5	>50.00
	Carlow	1	Not specified
	Clare	4	>7,300.00
	Cork	6	>555.00
	Kerry	3	>20.00
	Kilkenny	3	>300.00
	Tipperary	2	>51.00
	Waterford	2	>150.00
	Wexford	4	>25,500.00

²⁵ Arup (2025) *Circular Buildings Toolkit – 1 Triton Square*. Available at https://ce-toolkit.dhub.arup.com/case_studies/42. Accessed July 2025.

²⁶ Arup (2025) *Lowering emissions through innovative refurbishment – 1 Triton Square*. Available at <https://www.arup.com/projects/1-triton-square/>. Accessed July 2025.

²⁷ It should be noted that these are minimum volumes, as for numerous authorisations, specific tonnages are not provided for individual LoW codes, or documentation is not available.

Authorisation type	County	No.	Combined annual volume (minimum) (tonnes) (plastic) ²⁷
Total			>33,926.00

5.2.2 Excavation

During the construction phase, excavated materials will arise from excavations to achieve the required formation levels, for building foundations and substructures, internal road network and parking areas, and installation/diversion of site services and utilities. It is estimated that approximately 46,100 m³ (98,120 tonnes) of excavated material will be generated, comprised of made ground (fill), glacio-fluvial subsoils and rock. A breakdown of the estimated quantities of the various excavated materials and indicative reuse and disposal quantities are provided in Table 16, overleaf.

Opportunities for the on-site reuse of excavated material include use as fill material to achieve the required levels across the site, for the proposed raising of the North Circular Road and/or in earthworks (berms) for the proposed flood defence works. It has been estimated that 13,950 m³ of general fill and 16,800 m³ of engineered slab fill (combined total of 30,750 m³) will be needed to achieve the required levels for the proposed development.

There is made ground and contaminated land present on the site. The made ground is described as follows in the Structural Report:

“The made ground is generally composed of reworked fill material typically described as CLAY / SILT / SAND / GRAVEL with variable secondary constituent components. Anthropogenic material was also encountered within the made ground material including red brick, concrete, plastic, and timber fragments. Ash and cinder were also encountered in minor pockets of made ground.”

“The majority of the made ground material tested is suitable for disposal to an inert licenced landfill.”

- *One made ground sample (BH309) is suitable for disposal to a non-hazardous licenced landfill due to elevated TOC.*
- *Seven of the samples tested were categorised as hazardous, with the European Waste Code (EWC) 17 05 03*, all located in the Shipyard site (BH309, BH311, TP318, TP320, TP321, and TP322). The material tested was classified as hazardous due to elevated levels of heavy metal concentrations including Copper, Lead, and Zinc. One sample (TP321 at 0.75 m BGL) also displayed elevated levels of Polycyclic aromatic hydrocarbons (PAHs) (phenanthrene, anthracene, and fluoranthene).*
- *Seven other samples were classified as non-hazardous (with the EWC 17 05 04), require disposal to a hazardous licenced facility due to exceeding the limits for acceptance into a non-hazardous licenced facility.”*

As documented in Table 16, the made ground is considered unlikely to be suitable for reuse and all of this material is expected to require off-site disposal (approximately 26,800 m³ or 50,920 tonnes). In theory, the excavated subsoils and rock may be suitable for reuse on site (combined total of 19,300 m³ or 47,200 tonnes). In summary, it is envisaged that just under half of the excavated material by volume (19,300 m³ of rock and subsoils, ~42% of total volume) will be reused on site, with the remainder of the material requiring off-site disposal (26,800 m³ of made ground, ~58% of total volume).

Due to the cut/fill balance and the estimated deficit of fill material, no off-site reuse of excavated material is envisaged at this stage. However, in the event that there is a surplus of non-hazardous excavated material that cannot be reused on-site, opportunities will be considered for off-site reuse of this material as a by-product in accordance with Regulation 27 of the European Communities (Waste Directive) Regulations 2011-2020.

As documented in Table 16, assuming all the excavated subsoils and rock can be reused on-site, this indicates that approximately 11,450 m³ of fill material will need to be imported to meet the fill requirement for the proposed development.

Table 16: Quantities of excavated materials, envisaged fate, and fill requirements – all figures estimates only

Material	Overall quantity*		On-site reuse		Off-site reuse		Off-site disposal		Fill requirement	
	m³	tonnes	m³	tonnes	m³	tonnes	m³	tonnes	m³	tonnes
Excavated material										
Made ground (fill)	26,800	50,920	-	-	-	-	26,800	50,920		
Glacio-fluvial subsoils	6,750	14,790	6,750	14,790	-	-	-	-		
Rock	12,550	32,410	12,550	32,410	-	-	-	-		
Total	46,100	98,120	19,300	47,200	-	-	26,800	50,920		
Fill material										
General fill									13,950	27,900
Engineered slab fill									16,800	32,800
Total									30,750	60,700
Cut/fill balance										
[Fill requirement] – [Excavated material to be reused on-site] = [Fill import requirement] [30,750 m³] – [19,300 m³] = [11,450 m³]										
*Limitations and assumptions of model										
- Bulk density testing was not carried out on the soils of bedrock. Values for conversion from m³ to tonnes were based on literature. - The majority of overburden material on-site contains anthropogenic materials, meaning the composition of the soils are expected to vary significantly in consistency across difference areas. It is assumed that most of the made ground consists of reworked boulder clay mixed with anthropogenic inclusions. - Bulking factors and post-excavation changes in moisture content were not considered, as this would introduce an additional level of uncertainty into the calculations. - All calculations have been carried out based on in situ conditions, including volume, mass, density and moisture content. - Volumes have assumed vertical sides to excavations and no over-dig for soft spots or other unwanted inclusions. - Excavations for utilities and services have not been included in the model. - All figures are estimates only.										

These figures are estimates subject to the completion of an earthworks reusability assessment during the construction phase. This assessment will determine the suitability of site-won excavated materials for reuse as engineering and landscape fill material within the site, thereby minimising the need to import and export materials. Extensive testing and assessment will be required to demonstrate the suitability of the excavated materials for reuse. The suitability of excavated materials will be assessed in accordance with the requirements of the relevant specifications and standards (e.g., TII Specification for Road Works Series 600, NSAI).

It is proposed to use an on-site, mobile crusher to crush excavated stone for reuse on-site. For example, crushed stone could be used on-site as granular fill material, subject to the material fulfilling the requirements of the specification for Class 6F3 in the TII Earthworks Specification for National Roads (Series 600)²⁸ and any other relevant regulations or specifications that may apply to the proposed use.

5.2.3 Construction

Waste generation benchmarks from the Building Research Establishment (BRE) and the net internal areas (NIA) for the building typologies in the proposed development have been used to estimate waste arisings from the construction of the proposed buildings.²⁹ Detailed calculations are provided in Appendix D. A summary of predicted waste generation by stream is provided in Table 17, below. Overall, it has been estimated that the construction of the proposed buildings will generate approximately 3,380 tonnes of waste materials, as set out in Table 17. Note that this is an estimate, which does not account for waste generation from construction of public realm areas.

Table 17: Estimated waste arisings from construction of new buildings

Waste stream	Estimated waste generation (tonnes)
Bricks	248.40
Tiles and ceramics	17.70
Concrete	344.27
Inert	982.54
Insulation materials	17.22
Metals	48.14
Packaging materials	93.69
Plasterboard/gypsum	118.38
Binders	4.24
Plastic (excl. packaging waste)	62.90
Timber	287.30
Floor coverings (soft)	1.81
Electrical and electronic equipment	1.36
Furniture	0.68

²⁸ TII (2024) *Earthworks Specification for National Roads (CC-SPW-00600)*. Available at: <https://cdn.tii.ie/publications/CC-SPW-00600-04.pdf>. Accessed July 2025.

²⁹ The BRE provides waste benchmarks for the construction sector based on over 20 years of data from its SmartWaste® tool. These benchmarks provide an indication of volumes of waste typically generated relative to floor areas construction projects. They are based on real-world data for new build construction projects completed by January 2020 in the UK. These benchmarks may be used to estimate volumes of waste likely to arise from new construction projects.

Waste stream	Estimated waste generation (tonnes)
Canteen/office/ad hoc waste	35.72
Liquids	1.99
Oils	0.44
Bituminous mixtures	20.77
Hazardous waste	20.66
Other waste	93.82
Mixed construction and/or demolition waste	977.84
Total	3,379.68

5.3 Costs of Resource and Waste Management

In accordance with the Waste Management (Landfill Levy) Regulations 2015, as amended by the Waste Management (Landfill Levy) (Amendment) Regulations 2024, there is a landfill levy of €85 per tonne when disposing of certain classes of waste to landfill, including C&D waste (this was previously charged at €75). Under the Amendment Regulations, certain classes of C&D waste, including concrete, bricks, tiles and excavation spoil, are subject to a lower levy of €10.

Additionally, under the Circular Economy (Waste Recovery Levy) Regulations 2024, a new waste recovery levy of €10 applies to C&D waste, including concrete, bricks, tiles, glass, plastic and greenfield soil and stone. This is being applied on a phased basis, as follows:

- 1 January 2025: C&D waste recovered at municipal landfills;
- 1 September 2025: C&D waste recovered at recovery sites other than municipal landfills, authorised to recover over 200,000 tonnes of waste;
- 1 March 2026: C&D waste recovered at recovery sites other than municipal landfills, authorised to recover less than 200,000 tonnes of waste under the Waste Management (Facility Permit and Registration) Regulations 2007, as amended.

Landfill operator gate fees will also apply in the case of disposal to landfill. Typically, the current cost of disposal to landfill in Ireland exceeds €170 per tonne. Disposal of hazardous waste can cost from €350 upwards.

In addition to landfill operator fees and levies, there are additional costs included in the ‘true cost of resource management’ including:

- The purchase cost of waste materials (including imported soil);
- Handling costs;
- Storage and transportation costs; and
- Revenue generated from sales.

Therefore, in order to reduce costs associated with waste management, waste should be avoided and minimised to the extent practicable, excess materials should be reused and recycled, where appropriate, and construction materials should be carefully stored and handled to minimise risk of damage.

6. Site Management

6.1 Resource Manager

- The contractor will ultimately be responsible for the management of resources on a project and agreeing and revising as necessary any commitments or targets included in the CDRWMP developed at design/planning with the client for acceptance and adoption in the CDRWMP for construction.
- The contractor will allocate responsibility for resource management to one or more individuals of sufficient seniority to put the relevant procedures into practice.
- The contractor will nominate a suitably qualified Resource Manager (RM) with expertise in waste and resource management to implement the CDRWMP.
- The nominated RM responsible for implementation of this CDRWMP will be identified prior to construction commencement.
- In the event of the RM leaving the project team, the contractor will nominate a suitable replacement.

6.2 Information and Training

- Copies of the CDRWMP will be made available to all relevant personnel on site.
- As part of induction training, all site personnel and sub-contractors will be provided with a copy of the CDRWMP and will be informed of the objectives of the CDRWMP and their responsibilities in relation to compliance with the CDRWMP.
- The RM will be responsible for informing contractor staff and sub-contractors of content of the CDRWMP and for maintaining and keeping the records set out below.

6.3 Site Clearance Resource and Waste Management

- Vegetation clearance will be kept to the minimum required to facilitate construction.
- Removal of woody vegetation shall only take place outside the bird breeding season (1 March – 31 August, inclusive).
- No removal of habitats will occur outside of the masterplan area during the construction phase.
- Prior to vegetation clearance, the site shall be re-inspected and re-surveyed for invasive species. The stand of Japanese Knotweed within the reservoir area shall be surveyed and any mitigation measures necessary shall be undertaken in accordance with the Invasive Species Management Plan.
- There is a responsibility on the Environmental Manager or Ecological Clerk of Works (ECoW) to regularly inspect and supervise maintenance of the environmental controls throughout the site clearance process.
- Where feasible and appropriate, cleared vegetation will be reused on-site to minimise generation of green waste. Potential options for consideration include incorporation of trunks/logs into landscaping and wood-chipping of woody materials for reuse as mulch in landscaping.
- Surplus green waste requiring removal from site will be removed by a waste collection permit holder and delivered to an authorised composting or organic waste facility.

6.4 Excavation Resource and Waste Management

- Only a suitably experienced contractor shall be used to carry out the excavation works. During construction, they shall employ standard practices to manage risk from contaminated soils. These will be determined by the contractor depending on their construction practices but are likely to include the use of gloves, dust masks and potentially disposable overalls. These and other appropriate measures will minimise the exposure of site workers and members of the public.

- Excavations of contaminated land will be monitored by an appropriately qualified person to ensure that any hotspots of possible contamination are properly identified, with the contaminated material segregated and disposed of appropriately. Any identified contaminated material will be segregated and stored in an area where there is no possibility of run-off generation or infiltration to ground or surface water drainage. Care will be taken to ensure that the hotspot does not cross contaminate clean soils elsewhere throughout the site.
- Possibilities for reuse of clean non-hazardous excavation material as fill on the site will be considered following appropriate testing to ensure material is suitable for its proposed end use.
- Excavated material that is not suitable for reuse on site or which is surplus to requirements, will be stockpiled, tested and classified. Where feasible, classification for reuse on other construction site(s) will be considered. Where the material is not suitable for reuse, it will be categorised in accordance with the EPA waste classification guidelines³⁰ for recycling or recovery, where practicable.
- Excavated material that is deemed hazardous will be treated at an authorised facility either in Ireland or abroad. Export of hazardous waste from the proposed development outside of the State is subject to a Europe-wide control system founded on Council Regulation (EC) No. 1013/2006 (Waste Shipments Regulation), as amended. This legislation is supplemented by S.I. No. 419/2007 (Irish Shipments of Waste Regulations) and S.I. No. 113/2008 (Registration of Brokers and Dealers Regulations). Dublin City Council (DCC) is designated as the competent authority in Ireland for the export and import of waste shipments and the transit of hazardous waste shipments within Ireland. Export of hazardous waste from site outside the state will comply with the procedures set out in this legislation.

6.4.1 By-products (Regulation 27)

- Where removal from site of construction by-products for further use is proposed, this will take place in compliance with Regulation 27 of the European Communities (Waste Directive) Regulations 2011-2020, where appropriate. The Contractor will be responsible for ensuring compliance with these regulations, where appropriate.
- Where it is proposed to use a Regulation 27 EPA notification in relation to excavated material from the proposed development, the contractor will be responsible for submission of the Regulation 27 notification to the EPA.
- The contractor will be responsible for carrying out any necessary due diligence regarding the material and ensuring that all EPA guidelines relating to the Regulation 27 (by-product) regime are complied with.
- Where feasible, appropriate and available, Regulation 27 by-products arising from other sites will be used in the proposed development.
- The contractor will be responsible for ensuring that all applicable regulatory requirements under waste, planning and related legislation are complied with prior to the movement of excavated material.

6.5 Demolition Resource and Waste Management

- A Pre-demolition Audit (PDA) has been prepared by AtkinsRéalis. This will be updated based on a survey of the structures on the site prior to commencement of demolition works, in accordance with the *EU Construction & Demolition Waste Management Protocol including guidelines for pre-demolition and pre-renovation audits of construction works*³¹. This will estimate the types and quantities of materials likely to arise from proposed demolition/deconstruction of existing structures on the site. It will identify opportunities for the circular use of demolition materials in accordance with the applicable policies, regulations and best practice guidelines. The completion of a PDA will support optimal rates of

³⁰ EPA (2018) *Waste Classification: List of Waste & Determining if Waste is Hazardous or Non-hazardous*. Available at <https://www.epa.ie/publications/monitoring--assessment/waste/national-waste-statistics/2019--FULL-template.pdf>. Accessed December 2024.

³¹ European Commission: Directorate-General for Internal Market, Industry, Entrepreneurship and SMEs (2024) *EU Construction & Demolition Waste Management Protocol including guidelines for pre-demolition and pre-renovation audits of construction works*. Available at <https://op.europa.eu/en/publication-detail/-/publication/d63d5a8f-64e8-11ef-a8ba-01aa75ed71a1/language-en>. Accessed December 2024

reuse, recycling and recovery, and waste prevention, in accordance with circular economy principles and waste hierarchy.

- Possibilities for reuse of clean, non-hazardous demolition material in construction works on site will be considered following appropriate testing to ensure the material is suitable for its proposed end use. Should such suitable material arise and be re-used on site, it will be exempt from waste regulations.
- Demolition material that is not suitable for reuse on site or which is surplus to requirements, will be stockpiled, tested and classified. Where feasible classification for reuse on other construction site(s) will be considered. Where the material is not suitable for reuse, it will be categorised in accordance with the EPA waste classification guidelines³⁰.
- Demolition material that is deemed hazardous will be treated at an authorised facility either in Ireland or abroad. Export of hazardous waste from the proposed development outside of the State is subject to the Waste Shipment Regulation, as described above. Export of hazardous waste from site outside the state will comply with the procedures set out in this legislation.

6.6 Asbestos

As discussed in Section 2.2.7, asbestos and ACMs have been identified in soils and buildings on the proposed development site. All asbestos and ACMs should be removed from the site by a suitably authorised and qualified contractor to a facility holding an appropriate and valid licence granted by the EPA, in accordance with the Health and Safety Authority (HSA) guidelines, *Asbestos-containing Materials (ACMs) in Workplaces – Practical Guidelines on ACM Management and Abatement*.³² A report prepared by Phoenix Environmental in 2024 includes site-specific recommendations for the management of ACMs in existing structures on the site.³³

6.7 Construction Resource and Waste Management

The contractor shall take the following measures to prevent waste, facilitate recycling and minimise waste disposal during the construction phase:

- Where waste generation cannot be avoided, waste disposal will be minimised.
- Waste stream colour coding and photographs will be used to facilitate segregation at source.
- Where possible, metal, timber, glass and other recyclable material will be segregated at source and removed off-site to a permitted/licensed facility for recycling.
- Office and food waste arising on site will be source segregated at least into dry mixed recyclables, residual waste, organic waste and glass.
- Segregated skips will be used within a designated waste segregation area to be located in the on-site construction compound (particularly for hazardous, gypsum, metal, timber, inert waste and general waste).
- Waste bins, containers, skip containers and storage areas will be clearly labelled with waste types that they should contain, including photographs as appropriate.
- The site will be maintained to prevent litter and regular litter picking will take place throughout the site.
- Excessive temporary works will be avoided. Existing facilities will be reused as appropriate.
- ‘Just in time’ delivery will be used insofar as is reasonably practicable to minimise material wastage.
- Paints, sealants and hazardous chemicals will be stored in secure, bunded locations.
- Materials on-site will be correctly and securely stored.

³² HSA (2013) *Asbestos-containing Materials (ACMs) in Workplaces – Practical Guidelines on ACM Management and Abatement*. Available at: https://www.hsa.ie/eng/publications_and_forms/publications/chemical_and_hazardous_substances/asbestos_guidelines.pdf. Accessed August 2025.

³³ Phoenix Environmental Safety Ltd. (2024) *Asbestos Survey Report (Refurbishment/Demolition Survey)*. Report No. PE24-1226.

- All hazardous waste will be separately stored in appropriate lockable containers prior to removal from site by an appropriate waste collection permit holder.
- Waste generated on site will be removed as soon as practicable following generation for delivery to an authorised waste facility.

6.8 Authorisations

- Waste from construction will be transported by authorised waste collectors in accordance with the Waste Management (Collection Permit) Regulations, 2007 as amended. A list of currently authorised waste collectors is available on the website of the National Waste Collection Permit Office (NWCPO)³⁴.
- An up-to-date list of all waste collectors used to transport waste from site during the proposed development will be maintained on site and updated by the contractor. Copies of valid appropriate waste collection permits will be held on site by the contractor.
- Waste may only be transferred from site by a waste collection permit holder and delivered to an authorised waste facility (i.e. a facility that holds a Certificate of Registration, Waste Facility Permit or Waste Licence) for the specific waste types it receives³⁵.
- The contractor will ensure that any off-site interim storage facilities for excavated material have the appropriate authorisations in place.
- An up-to-date list of all waste facilities to which waste from the site is delivered will be maintained on site and updated by the Contractor. Copies of valid Certificates of Registration, Waste Facility Permits and/or Waste Licences will be held on-site by the Contractor, as well as evidence that the proposed facility has the capacity to accept the required quantity of waste from the proposed development, where appropriate.

6.9 Record Keeping and Auditing

- The Contractor will record the quantity in tonnes and types of waste and materials leaving the site during the construction and demolition works. The name, address and authorisation details of all facilities and locations to which waste and materials are delivered will be recorded along with the quantity of waste in tonnes delivered to each facility. Records will show material that is recovered and disposed of.
- The contractor will record the quantity in tonnes and types of waste and materials leaving the development site during site clearance, demolition, excavation and construction of the proposed development. Quantities will be regularly reviewed and compared with any corresponding targets. A sample resource and waste inventory is provided in Appendix E.
- The name, address and authorisation details of all facilities and locations to which waste and materials from the proposed development are delivered will be recorded along with the quantity of waste in tonnes delivered to each facility and the date of the waste movement. Records will show material which is recovered and disposed of.
- The Resource Manager will arrange for a waste audit of the project once demolition has fully commenced on site and of any facilities to which demolition waste from the project is delivered as required. The Resource Manager will also arrange for a waste audit of the project once construction has fully commenced on site and of any facilities to which construction waste from the project is delivered as required.

³⁴ NWCPO (2024) *Permit Search*. Available at <https://www.nwcpo.ie/permitsearch.aspx>. Accessed December 2024.

³⁵ Waste recovery or disposal activities are either (a) exempted (requiring no authorisation); (b) require a Waste Facility Permit (WFP) and/or Certificate of Registration (CoR) from the Local Authority in accordance with the Waste Management (Facility Permit and Registration) Regulations 2007 (S.I. No. 821/2007), as amended; or (c) require a Waste (or IPC) Licence from the EPA in accordance with the Waste Management Act 1996, as amended.

7. Site Infrastructure

The following site infrastructure requirements will be adopted by the contractor during the construction phase:

- While earthworks are underway, sufficient space will be made available for wastes, by-products and material storage, as necessary. It will be the responsibility of the contractor to ensure all necessary relevant waste authorisations are in place for any such storage in accordance with the Waste Management Act, 1996, as amended.
- Waste storage areas may include stockpiles (for soil and stone, aggregates, etc.), skips (for metals, wood, glass, etc.) and/or secure containers for hazardous materials. All waste storage areas will be assessed as fit for purpose and will be suitably contained, bunded and/or defined, as required.
- The waste storage areas will be set out to reduce any potential for impact on sensitive human (e.g., residential) or natural (e.g., water courses) receptors and a suitable buffer will be applied to mitigate any impact.
- Labelling and signage shall be used on site to inform personnel of key waste storage area requirements and restrictions with clear signage provided.
- Signage is also required to provide information to assist good resource practice across the site.
- In relation to resource storage, the Waste Management Act 1996, as amended, allows for the temporary storage of resources defined as 'waste' at the site where it was produced. The Act defines the phrase 'the temporary storage of waste' limiting it to having a six-month duration. As such, it is acceptable to store waste on the site of generation for up to six months without the need for any further waste permit/licence.
- The use of mobile crushing plant is proposed on site to process excavated rock and/or C&D waste, such as concrete, broken or damaged bricks, blocks, slabs and tiles, to recycle on-site as fill material, where appropriate. Before a mobile crusher is used, the appropriate authorisations (e.g., Waste Facility Permit and/or Certificate of Registration) will be obtained from the Local Authority. The operation of a mobile crusher shall be in accordance with the relevant legislation and any planning conditions (e.g., in relation to noise and dust).

Appendix A

Relevant Policies, Legislation and Guidelines

A.1 Multilateral Policies

A.1.1 United Nations 2030 Agenda and Sustainable Development Goals (2015)

The United Nations (UN) 2030 Agenda for Sustainable Development was adopted by UN Member States at the UN Sustainable Development Summit in New York in September 2015. It provides a shared blueprint for peace and prosperity for people and the planet, now and into the future. It set out 17 Sustainable Development Goals (SDGs) – shared goals for the UN to 2030 (Figure 10).

Of the 17 SDGs, many if not all are related to resource use and waste, even if indirectly. The most relevant is Goal 12, Responsible Consumption and Production. Targets for this goal include:

- **Target 12.2**, to achieve the sustainable management and efficient use of natural resources by 2030;
- **Target 12.5**, to substantially reduce waste generation through prevention, reduction, recycling and reuse, by 2030; and
- **Target 12.7**, to promote public procurement practices that are sustainable, in accordance with national policies and priorities.

Figure 10: The United Nations Sustainable Development Goals (Source: United Nations)



A.2 European Union Policies, Legislation & Guidelines

A.2.1 Policies

A.2.1.1 European Green Deal (2019)

The European Green Deal is Europe's flagship sustainable development agenda. It was launched by the European Commission (EC) in December 2019. It provides the overarching plan for a package of policy initiatives that aim to set the European Union (EU) on the path to a green transition, with the ultimate goal of achieving climate neutrality by 2050.

The EC's initial communication on the Green Deal states that, where waste cannot be avoided, its economic value must be recovered and its impact on the environmental and climate change avoided or minimised.³⁶ It

³⁶ European Commission (2019). *Communication from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Committee and the Committee of the Regions – the European Green Deal*. [COM (2019) 640 final]. Available at:

supports measures to reduce waste generation and promote a market for secondary materials. It also sets out the EC's commitment to ending the export of waste from EU Member States to non-EU countries.

Initiatives under the Green Deal include the Circular Economy Action Plan, a key building block of Green Deal implementation.

A.2.1.2 Circular Economy Action Plan (2020)

One of the main building blocks of European Green Deal implementation is the EC's Circular Economy Action Plan (CEAP), adopted in March 2020. The CEAP announced a series of legislative and non-legislative proposals targeting the entire lifecycle of key product categories, promoting ecodesign and circular strategies, fostering sustainable consumption, and aiming to ensure that resources used in the EU are kept in the EU economy for as long as possible.

The CEAP sets out measures to:

- Make sustainable products the norm in the EU;
- Empower consumers and public buyers;
- Focus on the sectors that use most resources and where the potential for circularity is high such as: electronics and ICT; batteries and vehicles; packaging; plastics; textiles; construction and buildings; food; water and nutrients;
- Ensure less waste;
- Make circularity work for people, regions and cities; and
- Lead global efforts on circular economy.

It notes that “...the EU needs to accelerate the transition towards a regenerative growth model that gives back to the planet more than it takes, advance toward keeping its resource consumption within planetary boundaries, and therefore strive to reduce its consumption footprint and double its circular material use rate in the coming decade.”

‘Construction and buildings’ is identified as a key product value chain in the CEAP. The significance of the construction sector in terms of global resource consumption and waste generation is highlighted as follows:

“The built environment has a significant impact on many sectors of the economy, on local jobs and quality of life. It requires vast amounts of resources and accounts for about 50% of all extracted material. The construction sector is responsible for over 35% of the EU's total waste generation. Greenhouse gas emissions from material extraction, manufacturing of construction products, construction and renovation of buildings are estimated at 5-12% of total national GHG emissions. Greater material efficiency could save 80% of those emissions.”

To address these and other problems, in the CEAP, the Commission commits to launching a new Strategy for a Sustainable Built Environment, with the aim of increasing material efficiency and reducing climate impacts of the built environment, particularly through promoting the adoption of circular economy principles throughout the lifecycle of buildings. The Commission has stated that this new strategy will:

Revise the Construction Product Regulation, to improve the sustainability performance of construction products, potentially introducing recycled content requirements for certain products;

- Use ‘Level(s)’, the European framework for sustainable buildings, to integrate lifecycle assessment (LCA) in public procurement and the EU sustainable finance framework;³⁷

https://eur-lex.europa.eu/resource.html?uri=cellar:b828d165-1c22-11ea-8c1f-01aa75ed71a1.0002.02/DOC_1&format=PDF. Accessed September 2024.

³⁷ EC (n.d.) *Level(s): European framework for sustainable buildings*. Available at: https://environment.ec.europa.eu/topics/circular-economy/levels_en. Accessed October 2024.

- Consider a revision of EU waste legislation in relation to material recovery targets for construction and demolition waste, and specific fractions thereof (to be defined); and
- Promote initiatives related to soil, to reduce soil sealing, rehabilitate brownfield sites, and increase the safe and circular reuse of excavated soils.

A.2.1.3 8th Environment Action Programme (2022)

The 8th Environment Action Programme (EAP) for the EU entered into force in May 2022³⁸. Building on the European Green Deal, it provides a legally agreed common agenda for environmental policy in the EU to 2030. It forms the basis of the EU's response to the United Nations (UN) 2030 Agenda and Sustainable Development Goals (SDGs), setting out priority objectives for 2030 and identifying conditions needed to achieve them.

The headline objective of the EAP is that, by 2050 at the latest, *“Europeans live well, within planetary boundaries and in a well-being economy **where nothing is wasted**”* (emphasis added). The EAP sets out six interlinked thematic priority objectives, which include *“advancing towards a well-being economy that gives back to the planet more than it takes and accelerating the transition to a **non-toxic circular economy**, where growth is regenerative, resources are used efficiently and sustainably, **and the waste hierarchy is applied**”* (emphasis added).

The EAP sets out six priority objectives to 2030, as follows:

- Achieving the 2030 greenhouse gas emissions reduction target and climate neutrality by 2050;
- Enhancing adaptive capacity, strengthening resilience and reducing vulnerability to climate change;
- Advancing towards a regenerative growth model, decoupling economic growth from resource use and environmental degradation, and accelerating the transition to a circular economy;
- Pursuing a zero-pollution ambition, including for air, water and soil, and protecting the health and well-being of Europeans;
- Protecting, preserving and restoring biodiversity, and enhancing natural capital; and
- Reducing environmental and climate pressures related to production and consumption (particularly in the areas of energy, industry, buildings and infrastructure, mobility, tourism, international trade and the food system).

A range of enabling conditions required to realise these objectives are identified, including *“significantly decreasing the Union's material and consumption footprints”*.

A.2.1.4 Clean Industrial Deal (2025)

On 26 February 2025, the EC published its new ‘Clean Industrial Deal’ (CID). The CID provides a growth strategy for EU industry that aims to align competitiveness and decarbonisation, supporting European industry in the face of high energy costs and fierce global competition. It focusses primarily on energy-intensive industries including steel, chemicals and minerals; and the clean-tech sector, necessary to support decarbonisation and circularity.

The CID makes circularity a priority for the future growth of the EU industrial sector. It is an explicit ambition of the CID to *“make the EU the world leader on circular economy by 2030”*. It states that *“Putting decarbonisation and circularity at the heart of our economic policy is the only way for the EU to keep up with resource rich competitors”*.

It is a target of the CID to increase the circular material user rate (CMUR) in the EU from 11.8% to 24% by 2030. The CID acknowledges that, while EU industry is a frontrunner in circular economy, the circular transition is hampered in Europe by insufficient demand for secondary and reusable materials, and a lack of circular design in key product groups, including those containing valuable and scarce materials.

³⁸ Decision (EU) 2022/591 of the European Parliament and of the Council of 6 April 2022 on a General Union Environment Action Programme to 2030, *Official Journal of the European Union*, L114/22. Available at: <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32022D0591>. Accessed September 2024.

The CID sets out a range of measures to support circularity in the EU industrial sector, including a proposed for a new EU Circular Economy Act to accelerate the circular transition, to be adopted in Q4 2026. The new Act will, among other things, enable the free movement of secondary raw materials and waste, harmonise end-of-waste criteria to facilitate the transition from waste to valuable secondary raw material, provide incentives to increase the use of scrap metal, introduce mandatory digitalisation of demolition permits and pre-demolition audits.

A.2.2 Legislation

A.2.2.1 Waste Framework Directive (Directive 2008/98/EC)

Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste and repealing certain Directives, known as the ‘Waste Framework Directive’ came into force on 12 December 2008. It provides a general framework of waste management requirements and sets the basic waste management definitions for the European Union (EU).

The Directive enshrines the ‘waste hierarchy’ in EU policy, the five-step hierarchy of waste management options, with waste prevention as the preferred option, followed by re-use, recycling, recovery and safe disposal, in descending order (Figure 11). In addition, the Directive provides for ‘end of waste’ and clarifies the definitions of recovery, disposal and by-product. The Directive states that, *“The recovery of waste and the use of recovered material as raw materials should be encouraged in order to conserve natural resources”*.

Articles 5 and 6 of the Waste Framework Directive provide regulatory regimes for by-products and end-of-waste, which are transposed into Irish legislation by Regulations 27 and 28, respectively, of the European Union (Waste Directive) Regulations 2011-2020 (see below).

Figure 11: The waste hierarchy (Source: European Commission)



A.2.2.2 Commission Decision 2014/955/EU and Commission Regulation (EU) No 1357/2014

‘Commission Decision 2014/955/EU amending Decision 2000/532/EC on the list of waste pursuant to Directive 2008/98/EC of the European Parliament and of the Council’ and ‘Commission Regulation (EU) No 1357/2014 replacing Annex III to Directive 2008/98/EC of the European Parliament and of the Council on waste and repealing certain Directives’ (the ‘List of Waste’ (LoW) Decision and Regulation, respectively) consolidate the legislation relating to waste classification and allow the generators of waste to classify the waste as hazardous or non-hazardous and in the process assign the correct LoW entry codes. Each list of waste entry is a six-digit code that is closely linked to the list of the main characteristics that render waste hazardous contained in Annex III to the Waste Framework Directive.

A.2.2.3 Waste Directive (Directive (EU) 2018/851)

Directive (EU) 2018/851 of the European Parliament and of the Council of 30 May 2018 amending Directive 2008/98/EC on waste amends the Waste Framework Directive. It provides a number of updated waste management definitions. The Directive allows Member States to use economic instruments, including taxes and levies, to incentivise the application of the waste hierarchy.

The Directive sets targets for the preparing for re-use and the recycling of municipal waste as follows:

- By 2025, at a minimum 55% (by weight) will be prepared for re-use or recycling;
- By 2030, at a minimum 60% (by weight) will be prepared for re-use or recycling; and
- By 2035, at a minimum 65% (by weight) will be prepared for re-use or recycling.

With regard to construction and demolition waste, Member States must take measures to promote selective demolition in order to enable removal and safe handling of hazardous substances, facilitate re-use and high-quality recycling. The Directive obliges Member States to take measures to prevent waste generation, including reduction of waste generation in processes related to construction and demolition, taking into account best available techniques.

A.2.2.4 Ecodesign for Sustainable Products Regulation (Regulation (EU) 2024/1781) (2024)

On 16 July 2024, Regulation (EU) 2024/1781 establishing a framework for the setting of eco-design requirements for sustainable products, amending Directive (EU) 2020/1828 and Regulation (EU) 2023/1542 and repealing Directive 2009/125/EC (the ‘Ecodesign for Sustainable Products Regulation’ or ESPR), entered into force. The ESPR is based on, and will ultimately replace in full, the previous Ecodesign Directive (Directive 2009/125/EC),³⁹ providing a framework for the setting of eco-design requirements for specific product groups, including those used in construction projects.

The ESPR aims to improve the circularity, energy performance and other environmental sustainability aspects of products placed on the single market, whether produced inside or outside the EU. It enables the setting of performance and information rules – known as ‘ecodesign requirements’ – for almost all categories of physical goods, including:

- Improving product durability, reusability, upgradability and reparability;
- Enhancing the possibility of product maintenance and refurbishment;
- Making products more energy and resource-efficient;
- Addressing the presence of substances that inhibit circularity;
- Increasing recycled content;
- Making products easier to remanufacture and recycle;
- Setting rules on carbon and environmental footprints;
- Limiting the generation of waste; and
- Improving the availability of information on product sustainability.

Specific eco-design requirements will be established by delegated acts pursuant to Article 4 the ESPR.

On 16 April 2025, the EC adopted the ESPR and Energy Labelling Working Plan 2025-2030, identifying the priority product categories for which the first new eco-design requirements will be adopted, which include iron and steel, and aluminium. The first delegated act setting eco-design requirements may come into force as early as July 2025.⁴⁰

A key pillar of the ESPR is the requirement for the Digital Product Passport (DPP), a digital identity card for products, components and materials, containing up-to-date product information, including regarding its circularity and end-of-life management. Every product for which eco-design measures will be adopted will have a DPP, except where there is an alternative, equivalent system in place. Technical preparations for the roll-out of the DPP are underway, including the establishment of a DPP registry and web portal. Information to be made available in DPPs will be specified in the product-specific delegated acts under the ESPR.

The ESPR has entered into force and will come into effect gradually over the next five years. In the built environment, the ESPR will facilitate the uptake of more circular construction products. The availability of

³⁹ Directive 2009/125/EC of the European Parliament and of the Council of 21 October 2009 establishing a framework for the setting of eco-design requirements for energy-related products (recast) (2012), *Official Journal of the European Union*, L 315.

⁴⁰ Medium (2024) *Ecodesign for Sustainable Products Regulation (ESPR) Timeline*. Available at: <https://medium.com/@piconext/ecodesign-for-sustainable-products-regulation-espr-timeline-f4e2e2ba9dbd#:~:text=December%2031%2C%202028%20%E2%80%94%20January%201,discarding%20of%20unsold%20consumer%20products> .. Accessed March 2025.

DPPs for construction products will provide valuable information to support circular design, procurement of more circular alternatives and more circular materials management throughout the building lifecycle.

A.2.2.5 Construction Products Regulation (Regulation (EU) 2024/3110) (2024)

In December 2024, the revised Construction Products Regulation (CPR) (Regulation (EU) 2024/3110) was published in the Official Journal of the EU. The revised CPR lays down harmonised rules for the placing and making available on the market of construction products by establishing:

- Harmonised rules on how to express the environmental and safety performance of construction products in relation to their essential characteristics, including on life cycle assessment; and
- Environmental, functional and safety product requirements for construction products.

The previous iteration of the CPR addressed the ‘essential characteristics’ of construction products (e.g., physical characteristics such as compressive strength and durability). The new CPR also addresses the sustainability performance of construction products.

Article 7 empowers the EC to adopt delegated acts establishing product requirements for a product family/category or parts thereof. Annex III identifies the categories of ‘product requirements’ that products may be required to have before being placed on the market, which include ‘product environmental requirements’ related to *“the extraction and manufacturing of the materials, the manufacturing of the product, the transport of materials and products, its maintenance, its potential to remain as long as possible within a circular economy and its end of life phase”*.

The revised CPR is aligned with the ESPR, including the requirement for DPPs, whereby construction product information will be provided in a digital format and may be stored in centralised digital information systems, such as building logbooks.

A.2.3 Guidelines

A.2.3.1 EU Construction & Demolition Waste Management Protocol & Guidelines for Pre-demolition and Pre-renovation Audits of Construction Works (2024)

In September 2016, the EC published its *EU Construction & Demolition Waste Management Protocol*, the first protocol of its kind.⁴¹ Subsequently, in May 2018, the EC published *Guidelines for the waste audits before demolition and renovation works of buildings*.⁴² These documents were not legally binding and were introduced as a proposal to the C&D industry, with the overarching aims of increasing confidence in the C&D waste management process and the quality of secondary materials from C&D works, in line with EU policy at the time on the construction sector and circular economy.⁴³

In August 2024, the EC published an updated *EU Construction & Demolition Waste Management Protocol including guidelines for pre-demolition and pre-renovation audits of construction works*⁴⁴ as a single document (as opposed to the previous Protocol and audit guidelines, which were published separately). The aim of this was to update the Protocol and guidelines “in light of the evolution of technologies, practices and legislation, supporting industry in a shift to a circular economy by considering stakeholders’ needs and the diversity of CDW management practices across the EU27 Member States”.

The updated Protocol and guidelines place a greater emphasis on the question of whether demolition is warranted (as opposed to renovation), and the use of measures, including the pre-demolition/pre-renovation audit, to support selective demolition and dismantling and to enhance C&D material recovery with a view to reuse, preparation for reuse and recycling (i.e., waste prevention).

The updated document reflects a shifting policy focus from a linear to a more circular model of resource use, and from direct and/or operational carbon emissions to whole lifecycle carbon – including the embodied carbon of new construction materials and C&D waste generation.

In relation to ‘resource and waste management plans’ for C&D projects, the revised Protocol and Guidelines acknowledge that mandatory requirements exist in some Member States to prepare site-specific CDRWMPs. The Protocol described the scope of the CDRWMP as follows:

“A resource and waste management plan is a strategic document which describes in detail, how the waste from a construction and demolition project is to be dealt with, focussing on the prevention, re-use and recycling of [C&D waste]. In some cases, the resource and waste management plan is prepared using predefined templates and must be submitted to the relevant authorities for examination and/or approval. The resource and waste management plan cannot replace the demolition plan which is part of the execution planning and prepared by those responsible for the intervention, e.g. the contractor in charge...”

A.3 National Policies, Legislation & Guidelines

A.3.1 Policies

A.3.1.1 Waste Action Plan for a Circular Economy – Ireland’s National Waste Policy 2020-2025

The *Waste Action Plan for a Circular Economy* (WAPCE) is an action focused plan that reflects the EC’s 2020 CEAP. The WAPCE fulfils the commitment in the Programme for Government (2020) to publish and

⁴¹ EC (2016) *EU Construction & Demolition Waste Management Protocol*. Available at: https://single-market-economy.ec.europa.eu/news/eu-construction-and-demolition-waste-protocol-2018-09-18_en. Accessed September 2024.

⁴² EC (2018) *Guidelines for the waste audits before demolition and renovation works of buildings*. Available at: https://single-market-economy.ec.europa.eu/news/eu-construction-and-demolition-waste-protocol-2018-09-18_en. Accessed September 2024.

⁴³ EC (2018) *EU Construction and Demolition Waste Protocol and Guidelines*. Available at: https://single-market-economy.ec.europa.eu/news/eu-construction-and-demolition-waste-protocol-2018-09-18_en. Accessed September 2024.

⁴⁴ EC (2024) *EU Construction & Demolition Waste Management Protocol including guidelines for pre-demolition and pre-renovation audits of construction works*. Available at: <https://op.europa.eu/en/publication-detail/-/publication/d63d5a8f-64e8-11ef-a8ba-01aa75ed71a1>. Accessed September 2024.

start implementing a new National Waste Action Plan. It informs and gives direction to waste planning and management in Ireland over the plan period.

The WAPCE shifts focus away from waste disposal and moves it back up the value chain. It contains over 200 measures across various waste areas including circular economy, municipal waste, consumer protection and citizen engagement, plastics and packaging, construction and demolition, textiles, green public procurement and waste enforcement.

The overarching objectives of the 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, 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 WAPCE contains a dedicated chapter on construction and demolition (C&D) waste, which emphasises the significance of the sector in terms of waste generation as follows:

“In 2017, almost 5 million tonnes of C&D waste were collected by authorised waste collectors. Excavated soil and stone is the largest element of construction and demolition waste at approximately 80%. The remainder includes concrete, brick, tiles, metal, glass, wood, plastic and metal. This represents a huge cost and loss of value to the construction sector as well as resulting in significant volumes of avoidable waste. C&D waste is the largest waste stream in the EU representing approximately one third of all waste produced.”

The WAPCE notes that both upstream waste prevention and downstream waste management measures are needed to mitigate the impacts of the sector in this regard:

“If the State is to meet the targets as set out in the National Development Plan 2018-2027, it is vital that there is sufficient capacity for the recovery and/or disposal of the envisaged increased construction and demolition waste. From a broader circular economy perspective however, it is even more important that prevention and reuse is hardwired into construction activity.”

Specific issues of importance identified in relation to C&D waste include Regulation 27 by-product determinations, Regulation 28 end-of-waste decisions, waste permit threshold limits, capacity for recovery and/or disposal of waste, waste enforcement, and the need for best practice waste prevention and circular economy interventions on-site.

The WAPCE states that, in the coming years, the construction sector needs to:

- Promote waste prevention in the first instance;
- Follow best available techniques (BAT) (under the WAPCE, the Government has committed to developing a BAT document for the sector);
- Expand the range and use of recycled products;
- Create a market demand for recycled products and segregating more material on-site to allow for recycling; and
- Meet the target of preparing for reuse, recycling and other material recovery (including beneficial backfilling operations using waste as a substitute) of 70% by weight of C&D non-hazardous waste (excluding natural soils and stone).

Under the WAPCE, the Government has committed to a range of measures to achieve optimum results, including working with key stakeholders to seek national Regulation 28 end-of-waste decisions for specific

C&D waste streams, and developing detailed guidance on the Regulation 27 by-product regime for several specific C&D materials.

The WAPCE acknowledges that the current Regulation 27 by-product regime in Ireland could be improved to provide more clarity, certainty and timely decisions for economic operators: *“We must enhance the efficiency of the process if we are to fully realise the circularity potential of by-product status”*. The Government is committed to working with the public sector to ensure that the Regulation 27 regime is utilised, where appropriate, in all public sector contracts; and working with the EPA and Local Authorities to establish whether Regulation 27 notifications for certain materials, such as uncontaminated soil and stone, could be assessed by Local Authorities rather than the EPA, with a view to speeding up determinations.

A target is set in the WAPCE to *“obtain end-of-waste status for a number of priority waste streams, particularly in the C&D sector”*. This may include recycled aggregates, for which the EPA established national end-of-waste criteria in September 2023.

A.3.1.2 National Hazardous Waste Management Plan 2021-2027

In 2021, the EPA published its fourth *National Hazardous Waste Management Plan* (NHWMP) under Section 26 of the Waste Management Act 1996.⁴⁵ It sets out the priorities to be pursued over the six-year plan period and beyond to improve the prevention and management of hazardous waste in Ireland. The purpose of the plan is to protect the environment and human health in Ireland through best practice management of hazardous wastes. The NHWMP has five objectives:

1. Support and drive priority prevention actions by industry and the public to **reduce the generation of** hazardous waste;
2. Support the identification of adequate and appropriate **collection infrastructure** for all hazardous wastes with a view to mitigating environmental and health impacts;
3. Endorse the **proximity principle** such that hazardous wastes are treated as close to the point of production as possible – including within Ireland, taking into account the need for specialised installations for certain types of waste;
4. Support effective regulation of the **movement and management** of hazardous wastes in line with national policy priorities; and
5. Promotion of **safe reuse and recycling** pathways in support of the circular economy (emphasis added).

The NHWMP touches on the potential for hazardous waste (such as asbestos) to be present in C&D waste and includes an action to *“Develop training to promote awareness on identification and proper management of hazardous fractions in [C&D] waste”*. It states that, before any demolition work is undertaken on structures containing asbestos, the contractor should identify a waste facility licenced by the EPA for disposal of asbestos waste.

A.3.1.3 Whole of Government Circular Economy Strategy 2022-2023

In December 2021, the Department of Environment, Climate and Communications (DECC) published Ireland’s first circular economy strategy, the *Whole-of-Government Circular Economy Strategy 2022-2023* (CES). The CES provides a roadmap for Ireland to transition to a circular economy across all sectors and at all levels of government, promoting a coherent policy on circular economy across all of government. It defines what the government means by the ‘circular economy’ and sets out the rationale for pursuing a circular transition. It aims to support and implement measures that significantly reduce Ireland’s circularity gap⁴⁶, such that Ireland’s rate is above the EU average by 2030.

In relation to the construction sector, the CES states the following:

⁴⁵ EPA (2021) *National Hazardous Waste Management Plan 2021-2027*. Available at: https://www.epa.ie/publications/circular-economy/resources/NationalHazardousWasteManagementPlan_2021_2027.pdf. Accessed September 2024.

⁴⁶ A measure of the total amount of (re)cycled materials as a proportion of the total material inputs into the economy each year.

“Within the Construction and Demolition sector, greater resource efficiency and resource re-use could avoid the need for millions of tonnes of virgin raw materials per annum, as well as reducing the carbon intensity of our built environment. [...] Reducing the volume, and associated costs, of Construction and Demolition waste could also contribute to greater affordability, particularly in relation to the high-density residential sector.”

Annex 4 of the CES sets out a preliminary outline of actions for inclusion in sectoral circular economy roadmaps. For the construction sector, the following potential actions are identified:

- Increased use of off-site design and manufacture;
- Modular building design;
- Refurbishment and retrofitting of existing stock;
- Tackling dereliction and bringing stock back into occupancy; and
- Increased use of C&D waste as a secondary construction material.

A.3.1.4 National Waste Management Plan for a Circular Economy (2024)

The Waste Management Act 1996 requires Local Authorities to make a waste management plan either individually or collectively for their functional areas. This requirement was previously met under the scope of three *Regional Waste Management Plans*, published in 2015. In February 2024, a single *National Waste Management Plan for a Circular Economy* (NWMPCE) was published, replacing the regional plans. The NWMPCE aims to “influence sustainable consumption and prevent the generation of waste, improve the capture of materials to optimise circularity and enable compliance with policy and legislation”. The states ambition of the Plan is for “0% total waste growth per person over the life of the Plan with an emphasis on non-household wastes including waste from commercial activities and the construction and demolition sector”.

The NWMPCE places a strong emphasis on construction and demolition (C&D), which is identified as one of six material focus areas of the Plan. It provides a detailed description of the baseline scenario in terms of resource and waste management and circularity in the C&D sector in Ireland. It highlights that Ireland’s C&D waste accounts for c. 60% of total waste generated in the State, significantly exceeding the EU average of 35%. Projections of C&D waste in Ireland provided by the Plan indicate that this waste stream will continue to grow, increasing to c. 15 million tonnes by 2030 (a 73% increase relative to 2021).

The Plan provides an overview of the C&D waste stream in Ireland, which is comprised of soil and stone; brick, tile and gypsum; unsegregated, mixed waste; metal; bituminous mixtures; and segregated wood, glass and plastic. It notes that the majority of C&D waste generated in Ireland is recovered by backfilling (c. 85%), with the remainder being recycled (c. 8%) or sent for disposal (c. 7%). The majority of C&D waste (c. 96%) undergoes final treatment in Ireland, while c. 4% is exported for final treatment overseas. The Plan also highlights that the C&D sector is a major source of hazardous waste, contributing c. 23% of all hazardous waste generated.

The NWMPCE sets out eight overarching national targets, including the following of particular relevance to C&D projects:

- **National Target 1B – Construction Materials:** A cumulative 12% reduction in C&D waste by 2030 relative to the 2021 baseline of nine million tonnes.
- **National Target 3A – Reuse:** Per capita reuse target of 20 kg per year relative to the 2021 baseline of 10.6 kg per person.

The Plan proposes to achieve these targets in respect of the C&D sector by promoting the use secondary materials through national decisions on Regulations 27 (by-products) and 28 (end-of-waste) of the European Union (Waste Directive) Regulations 2011-2020, and implementation and enforcement of best practice on construction sites. This ambition is reflected in Key Deliverables 7, 8 and 9 of the NWMPCE:

- **Key Deliverable 7 – National Decisions – Regulation 27:** The EPA have published national decisions on Regulation 27 which will unlock the potential for a reduction in significant amounts of waste and increase in circularity rates annually.

- **Key Deliverable 8 – National Decision – Regulation 28:** The EPA have published a national decision on Regulation 28 to unlock the potential for a reduction in significant amounts of crushed aggregate waste annually.
- **Key Deliverable 9 – C&D Best Practice Guidelines:** The local government sector (LGS) is committed to the roll out and promotion of the EPA best practice guidelines for C&D projects.

The NWMPCE explicitly states that the “*greatest opportunity for reduced consumption in this Plan is the consumption of primary aggregates for construction, which may be substituted by secondary aggregates through the application of Regulation 27 and 28 decisions and through the implementation of best practice*”. In summary of the challenge for the C&D sector, the Plan states the following:

“With strong projected growth in the construction sector in the short to medium term, the generation of construction wastes is predicted to continue to grow over the Plan period. The need for significant intervention in this sector with materials which have a high circular potential is well established. It is imperative that the planned interventions on by-products, end-of waste and best practice are implemented without delay. In particular, the by-product measure has the greatest potential to curb waste generation within the sector if suitably implemented and widely adopted by the sector.”

The Plan includes a range of targeted policies and priority actions of relevance to C&D projects, as summarised in Table 18.

Table 18: Relevant targeted policies and priority actions of the NWMPCE

Focus Area	Targeted Policies	Priority Actions
Focus Area 8: Construction and Demolition Waste	TP8.1: Prioritise waste prevention and circularity in the construction and demolition sector to reduce the resources that need to be captured as waste	PA8.1 (LGS): Implement Green Public Procurement criteria on all local authority construction and demolition projects and promote its wider use within the sector.
	TP8.2: Identify and promote the growth of secondary material markets, including the elimination of barriers to the development of these markets, within the construction and demolition sector.	PA8.2 (LGS): Pilot the preparation of Resource & Waste Management Plans for construction and demolition projects at selected local authority developments.
	TP8.3: Incorporation of the EPA Best Practice Guidelines for the preparation of Resource & Waste Management Plans for Construction & Demolition Projects and NPWS Soil & Spoil Action Plan, and monitoring by local authorities of the application of these requirements.	PA8.3 (EPA/LGS): Develop and deliver training, with the EPA, to support national decisions on Regulation 27 by-products for site won asphalt (road planings) and greenfield soil and stone; and support the implementation of a national decision on Regulation 28 end-of-waste for aggregates, which includes crushed concrete and prioritise the use of materials arising from national end-of-waste or by-product decisions.
	TP8.4: Identify and promote materials with a low embodied carbon and high circular potential to maximise use in the construction sector.	PA8.4 (LGS): Incorporate the requirement for Construction and Demolition Resource & Waste Management Plans in land use policy in County/City Development Plans.
	TP8.5: Pursue and support a targeted levy on virgin materials to encourage the use of secondary raw materials.	PA8.5 (LGS): Explore the potential to segregate waste streams in mixed waste skips to minimise contamination and maximise reuse, recycling and circularity on construction projects and provide guidance to the sector.
		PA8.6 (LGS): Allocate available resources, and identify any additional resources required, to consistently monitor construction and demolition projects to assess compliance with the project Resource & Waste Management Plan and apply appropriate enforcement measures to ensure compliance.

Focus Area	Targeted Policies	Priority Actions
Focus Area 11: Infrastructure (Regulatory)	TP11.3: Ensure that future authorisations of waste infrastructure take account of the authorised and available capacity in the market.	PA11.3 (EPA/LGS): Ensure at least one facility per local authority is authorised for storage of waste from road maintenance and other local authority construction projects.
Focus Area 12: Reuse/Repair Infrastructure	TP12.4: Encourage the development of circular activities which stimulate and support viable secondary material markets and secondary product markets in the construction, industrial and bioeconomy sectors.	PA12.4 (LGS): Identify and encourage potential materials markets for reuse and repaired goods.
Focus Area 14: Recovery Infrastructure	TP14.2: Support the provision of 200,000 to 300,000 tonnes of additional dedicated thermal recovery capacity for the treatment of non-hazardous residual wastes nationally, to ensure there is adequate active thermal treatment capacity.	PA14.2 (EPA/LGS): Set circularity criteria for the output from biological treatment facilities and for soil and other construction and demolition waste streams.

The Plan also places an emphasis on the role of GPP on the part of Local Authorities in waste reduction. This is reflected in Core Policy 10, ‘Green Public Procurement’, to “*Reinforce the consistent application of [GPP] criteria in local authority contracts to ensure that public spending is aligned with the policies of this Plan and the [GPP] strategy and Action Plan*”.

7.1.1 Buying Greener: Green Public Procurement Strategy and Action Plan 2024-2027

‘Buying Greener: Green Public Procurement Strategy and Action Plan 2024-2027’ (‘Buying Greener’) provides the strategy and action plan for green public procurement (GPP) in Ireland from 2024 to 2027, as required under the Government’s Climate Action Plan (CAP23 and CAP24). The document supersedes ‘*Green Tenders – An Action Plan on Public Procurement*’, the Government’s previous GPP document, published in 2012.

Buying Greener sets out key principles for GPP as follows, which summarise the GPP implementation mandate for the public sector in Ireland:

- Consider environmental sustainability when assessing need.
- Insert GPP criteria in published tender documentation:
 - When inserting GPP criteria, use national GPP criteria for goods, services or works, where available.
 - Use GPP criteria from other sources where no national GPP sectoral GPP criteria are available.
 - Use ‘Minimum Sustainability/Environmental Criteria’ where no national, EU GPP criteria or other guidance for the goods, services or works being procured are available.
 - Consideration should be given to using an innovative procurement procedure or the innovation partnership to find goods, services, or works to address a specific environmental need that cannot be otherwise met.
- Comply or explain.

The principle of ‘comply or explain’ underpins the strategy and action plan. It states that “Having regard to the actions set out in the GPP Strategy and Action Plan (to be communicated by a Circular that replaces DPER Circular 20/2019), public bodies that do not include GPP criteria in published tender documentation in accordance with Principle 2a, must provide justified reasons for not including such criteria in an annual report.”

The strategy includes a foreword from the former Minister of State with responsibility for Public Procurement, eGovernment and Circular Economy, Ossian Smyth T.D., which clearly sets out the envisaged role of public bodies, such as TII, in supporting the transition to a circular economy through the implementation of GPP:

“One of the important areas of the economy that can play a key role in helping Ireland to become a more resource efficient and circular economy is Green Public Procurement. [The Strategy] aims to drive the implementation of green and circular procurement practices across the public sector. [...]

The implementation of this [GPP] Strategy and Action Plan will ensure that public bodies play a critical part in supporting the delivery of important commitments on climate action, and helping our transition to a circular economy”.

7.1.2 Climate Action Plan 2025

The Government’s Climate Action Plan (CAP) provides a roadmap of actions to halve Ireland’s emissions by 2030 and achieve climate neutrality no later than the end of 2050. It aligns with the legally binding economy-wide carbon budgets and sectoral emissions ceilings agreed by Government in July 2022. The CAP is a statutory plan, prepared under the Climate Action and Low Carbon Development (Amendment) Act 2021. It is updated on an annual basis.

The *Climate Action Plan 2025* (CAP25) was published on 15 April 2025. It is Ireland’s third annual update to the CAP prepared under the Climate Action and Low Carbon Development (Amendment) Act 2021.

CAP25 emphasises the role of the transition to a circular economy to decarbonise the economy and “*make a significant contribution to achieving our climate objectives*”. To this end, it endorses the implementation of the *Whole of Government Circular Economy Strategy 2022 – 2023*, the *National Waste Management Plan for a Circular Economy 2024 – 2030* and *Buying Greener: Green Public Procurement Strategy and Action Plan 2024 – 2027*.

CAP25 highlights relevant actions delivered in 2024, including:

- Commencement of the phasing out of levy exemptions for C&D waste from the existing Waste Recovery Levy and Landfill Levy;
- The introduction of a national by-product decision for greenfield soil and stone by the EPA;
- Continued work on the development of a roadmap for circularity in the construction sector; and
- The publication of the national Circularity Gap Report (CGR) by Circle Economy.

It notes that a second *Whole-of-Government Circular Economy Strategy* will be published in 2025, setting out key targets and metrics for the circular transition.

The previous Plan, CAP24 identified key metrics and measures to deliver emissions abatement in relation to waste, including the following:

- **2025 KPI:** Separate collection obligations extended to include hazardous household waste by end of 2024, bio-waste by end of 2023, and textiles by end of 2024.
- **2030 KPIs:**
 - Recycle 70% of packaging waste;
 - Recycle 55% of plastic waste;
 - Reduce food waste by 50%;
 - 90% collection of plastic drinks containers by 2029; and
 - Ensure all plastic packaging is reusable or recyclable by 2030.
- **2031 – 2035 measures:**
 - Reduce the amount of municipal waste landfilled to 10% by 2035; and
 - Recycle 65% of municipal waste by 2035.

A.3.2 Legislation

7.1.3 Waste Management Act, 1996

The Waste Management Act, 1996, sets out the responsibilities and functions of various persons in relation to waste. The 1996 Act has been amended by a number of subsequent acts including the Waste Management (Amendment) Act 2001 and the Protection of the Environment Act 2003. The Act:

- Prohibits any person from holding, transporting, recovering or disposing of waste in a manner which causes or is likely to cause environmental pollution.

- Requires any person who carries on activities of an agricultural, commercial or industrial nature to take all such reasonable steps as are necessary to prevent or minimise the production of waste.
- Prohibits the transfer of waste to any person other than an authorised person (i.e. a holder of a waste collection permit or a local authority).
- Requires the Environmental Protection Agency (EPA) to make a national plan in relation to hazardous waste.
- Requires local authorities to make waste management plans in relation to non-hazardous waste.
- Imposes certain obligations on local authorities to ensure that a service is provided for collection of household waste and to provide facilities for the recovery and disposal of such waste.
- Enables the Minister for Environment, Climate and Communications to make regulations for various purposes to promote better waste management.
- Provides for substantial penalties for offences including fines, imprisonment and/or liability for clean-up measures.

7.1.4 Waste Management (Collection Permit) Regulations 2007

A waste collection permit is required by anyone collecting waste on a commercial basis to ensure that the waste is gathered, sorted and transported correctly. Waste collection permits are granted in accordance with the Waste Management (Collection Permit) Regulations, 2007 as amended. All Waste Collection Permits are issued by the National Waste Collection Permit Office (NWCPO).

7.1.5 Waste Management (Shipments of Waste) Regulations 2007

Where waste is exported from Ireland for recovery or disposal the National Transfrontier Shipment (TFS) Office within Dublin City Council must be notified. Certain financial guarantees must be in place and a certificate issued by the National TFS Office prior to the waste movement taking place.

7.1.6 European Union (Waste Directive) Regulations 2011-2020

The adoption of the European Communities (Waste Directive) Regulations 2011 (S.I. No. 126 of 2011) substantially amended the provisions of the Waste Management Acts, 1996. These Regulations provide for measures to prevent or reduce the adverse impacts of the generation and management of waste, seeking to reduce the overall impacts of waste recycling and re-use, and to improve the efficiency of the use of waste. They provide definitions for 'waste disposal' and 'waste recovery', as well as setting out tests that must be satisfied with in order for material to be classified as a 'by-product' or achieve 'end of waste' status.

These Regulations were amended by the European Union (Waste Directive) Regulations 2020 (S.I. No. 323 of 2020), which give effect to Directive 2018/851 (the Waste Directive). These Regulations are construed together as one and collectively cited as the European Union (Waste Directive) Regulation 2011-2020.

The Regulations enshrine the waste hierarchy in national law. The hierarchy must be applied as a priority order in waste prevention and management legislation and policy (in decreasing order of preference):

- Prevention;
- Preparation for re-use;
- Recycling;
- Other recovery (including energy recovery); and
- Disposal.

Regulation 27 provides a national regulatory regime for by-products in accordance with Article 5 of the Waste Framework Directive. It distinguishes between 'waste' (as defined in Section 4 of the Waste Management Act, 1996) and 'by-products', providing a mechanism by which a substance or object, which is a production residue, could be determined not to be a waste but a by-product instead. Thus, Regulation 27 provides a mechanism by which economic operators can avoid unnecessary waste generation, facilitating further use of production residues in support of the circular economy.

Economic operators wishing to treat a substance or object as a by-product must make a by-product notification to the Environmental Protection Agency (EPA). By-product determinations are made by the EPA on a case-by-case and precautionary basis, with regard to four criteria that must be met in order for a production residue to be considered a by-product:

1. The further use of the substance or objective is certain;
2. The substance or object can be used directly without any further processing other than normal industrial practice;
3. The substance or object is produced as an integral part of a production process; and
4. The 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 and human health impacts.

The Regulation 27 (by-product) regime is a key mechanism facilitating circular reuse of site-won materials in construction and demolition projects. Key substances determined to be by-products by the EPA include soil and stone, bituminous road planings, concrete and other demolition materials.

To date, the EPA has published national by-product criteria for two classes of construction materials, as listed below. These provide for an alternative, more efficient system for attainment of by-product status through demonstration of compliance with these criteria for specific materials and applications.

- National by-product criteria for site-won asphalt to be used as a raw material at Reclaimed Asphalt Pavement (RAP) plants (November 2023);⁴⁷ and
- National by-product criteria for greenfield soil and stone to be used at another development with appropriate planning permission or exemption (August 2024).⁴⁸

Regulation 28 provides a regulatory regime for achieving ‘end-of-waste’ status for recovered materials, transposing Article 6 of the Waste Framework Directive. The end-of-waste process allows waste holders to demonstrate that a waste material can be fully recovered and no longer defined as waste, to be used as a valuable secondary resource in the place of virgin materials, without causing overall adverse impacts to the environment or human health. Like the Regulation 27 by-product process, Regulation 28 sets out criteria for an ‘end-of-waste test’, which must be met in order to achieve end-of-waste status:

1. The substance or object is to be used for specific purposes.
2. A market or demand exists for such a substance or object.
3. The substance or object fulfils the technical requirements for the specific purposes and meets the existing legislation and standards applicable to products.
4. The use of the substance or object will not lead to overall adverse environmental or human health impacts.

A key requirement is that the material has undergone a recovery operation with a waste authorisation. End-of-waste criteria exist at three levels for economic operators in Ireland: European, national and single-case. The EPA is responsible for making end-of-waste decisions on a case-by-case basis in Ireland. End-of-waste criteria have been established at EU level for (i) iron, steel and aluminium scrap; (ii) glass cullet; and (iii) copper scrap. In 2023, the EPA published national end-of-waste criteria for recycled aggregates.⁴⁹

⁴⁷ EPA (2023) *National By-product Criteria*, Reference Number: BP-N001/2023, of the 3rd of October 2023 establishing detailed criteria on the application of the conditions of Regulation 27(1)(a)-(d) when making the decision that site-won asphalt can be regarded as a by-product under Regulation 27 of the European Union (Waste Directive) Regulations 2011-2020. Available at: <https://www.epa.ie/publications/licensing--permitting/waste/National-By-Product-Criteria-Ref.-No.-BP-N0012023.pdf>. Accessed October 2024.

⁴⁸ EPA (2024) *National By-product Criteria*, Reference Number: BP-N002/2024, of the 2nd of July 2024 establishing detailed criteria on the application of the conditions of Regulation 27(1)(a)-(d) when making the decision that greenfield soil and stone can be regarded as a by-product under Regulation 27 of the European Union (Waste Directive) Regulations 2011-2020. Available at: <https://www.epa.ie/publications/licensing--permitting/waste/National-By-Product-greenfield-stone--Criteria-Ref.-No.-BP-N002.2024.pdf>. Accessed October 2024.

⁴⁹ EPA (2023) *National End-of-Waste Decision EoW-N001/2023* of 12th September 2023 establishing criteria determining when recycled aggregate ceases to be waste under Regulation 28 of the European Union (Waste Directive) Regulations 2011-2020. Available at: <https://www.epa.ie/publications/licensing--permitting/waste/Final-Decision---National-End-of-Waste-Criteria-N001-2023.pdf>. Accessed October 2024.

Additionally, the EPA has made end-of-waste decisions on single case applications for a range of materials and producers, including recycled aggregates.

7.1.7 Circular Economy and Miscellaneous Provisions Act 2022

In July 2022, the Government enacted the Circular Economy and Miscellaneous Provisions Act 2022 (the Circular Economy Act). The Circular Economy Act constitutes a key step in the transition of Ireland's economy to a circular economy and is evidence of Government's commitment to the achievement of that goal. It provides a statutory definition of the circular economy for the first time in Irish legislation, as follows:

“An economic model and the policies and practices which give effect to that model in which:

- a) production and distribution processes in respect of goods, products and materials are designed so as to minimise the consumption of raw materials associated with the production and use of those goods, products and materials,*
- b) the delivery of services is designed so as to reduce the consumption of raw materials.*
- c) goods, products and materials are kept in use for as long as possible thereby further reducing the consumption of raw materials and impacts harmful to the environment,*
- d) the maximum economic value is extracted from goods, products, and materials by the persons using them, and*
- e) goods, products and materials are recovered and regenerated at the end of their useful life”*

The Circular Economy Act also places the Whole of Government Circular Economy Strategy (CES) on a statutory, and requires the Government to periodically update the CES, among other provisions. It also aims to streamline the statutory mechanisms for C&D material reuse, under Regulation 27 (by-products) and Regulation 28 (end-of-waste) of the European Union (Waste Directive) Regulations 2011-2020.

A.3.3 Guidelines

7.1.8 EPA Waste Classification – List of Waste and Determining if Waste is Hazardous or Non-Hazardous (2019)

In 2019, the EPA published its guidelines, *Waste Classification – List of Waste & Determining if Waste is Hazardous or Non-hazardous*. They state that *“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”*.

As stated in the guidance document, waste classification in Ireland and the EU is based on the following legislation:

- 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; and
- Council Regulation (EU) 2017/997 of 8 June 2017 amending Annex 111 to Directive 2008/98/EC of the European parliament and of the Council as regards the hazardous property HP 14 ‘Ecotoxic’.

The EPA publication provides guidance on the correct interpretation and application of this legislation.

There are two main elements to waste classification, for which the document provides guidance:

1. The **List of Waste (LoW)**, a harmonised list of six-digit codes for classifying all waste types.

2. **Determining if waste is hazardous or non-hazardous**, based on whether it displays any of the hazardous waste properties HP1 – HP15 and/or contains persistent organic pollutants (POPs) above the specified concentration limit.

7.1.9 EPA Guidance on Soil and Stone By-products (Version 3) (2019)

In 2019, the EPA published specific *Guidance on Soil and Stone By-products* to encourage the prevention of waste, including the lawful and beneficial use of excess uncontaminated soil and stone; to set out the Agency's regulatory approach to determining by-product notifications for soil and stone; and to provide guidance to interested parties. The guidance document unambiguously states that the EPA encourages the prevention of waste, including the lawful and beneficial use of excess uncontaminated soil and stone. It sets out the following objective – and mandate for producers:

“By making certain that excess uncontaminated soil and stone is beneficially used with no overall adverse impacts on the environment or human health, a material producer will ensure that the material is regarded as a by-product rather than a waste.”

It distinguishes between the circumstances in which excess uncontaminated soil and stone from construction projects are regulated as waste and not regulated as waste. The document goes on to provide detailed guidance for interpreting the by-product criteria in respect of excavated soil and stone. It states that the management of excess uncontaminated soil and stone – either as by-product or as waste – should be pre-arranged by the producer at the earliest opportunity – at the planning stage or, at the latest, prior to commencement of the development. Where it is proposed to use the material as by-product, the corresponding Regulation 27 by-product notification should be made to the EPA prior to the commencement of development.

7.1.10 EPA By-product Guidance Note (2020)

The EPA's 2020 *By-Product Guidance Note* provides detailed guidelines for economic operators intending to make by-product notifications to the Agency. It includes a simplified decision tree for determining whether a material is a by-product or waste (Figure 12). In making a Regulation 27 notification to the EPA, economic operators must demonstrate compliance with the by-product criteria, as set out above. By-product notifications are reviewed by the EPA on a case-by-case basis. The EPA may consult with a notifier to clarify matters where there is doubt about the notification's compliance with the four criteria. The EPA will either determine in agreement with the notifier (i.e., the substance or object is a by-product) or determine that the substance/object is a waste, in which case a waste enforcement regime may apply (e.g., if the waste has already been moved to the proposed end use location).

Figure 12: Regulation 27 By-product Decision Tree (EPA, 2020; adapted from EC, 2012)

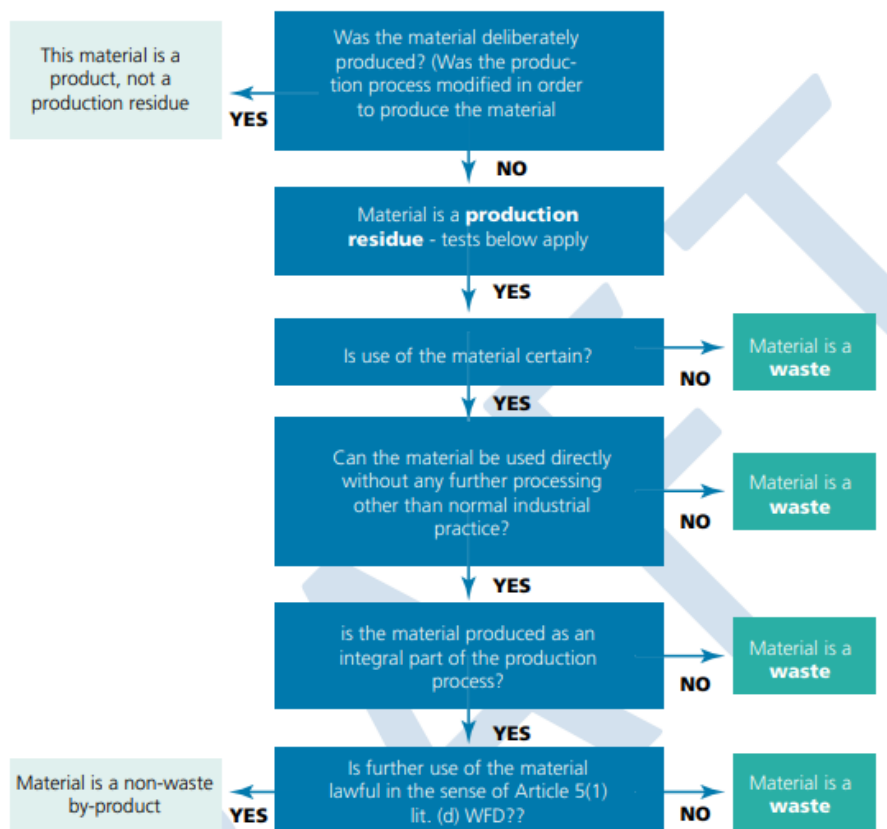


Figure 3: - Decision Tree for Determining Whether a Material is a by-product (EC, 2012).

7.1.11 EPA End-of-Waste Guidance Document – Part 1 & Part 2 (2020)

The EPA has published a two-part guidance document on end-of-waste status, as provided for under Regulation 28 of the European Union (Waste Directive) Regulations 2011-2020. Part 1 introduces the concept of end-of-waste and provides guidance as to whether an application for end-of-waste status is appropriate for a recovered/recycled material. It addresses the relevant provisions in EU and national legislation, and the potential benefits of achieving end-of-waste status. Part 2 supports applicants in making quality applications to the EPA for end-of-waste status, providing detailed guidance on how to address the requirements of the end-of-waste test.

7.1.12 EPA Best Practice Guidelines for the Preparation of Resource & Waste Management Plans for Construction & Demolition Projects (2021)

In 2021, the EPA published its *Best practice guidelines for the preparation of resource & waste management plans for construction & demolition projects*. The purpose of the guidelines is to provide a practical approach, informed by best practice, to the prevention and management of C&D waste from design through construction and demolition/deconstruction. They provide various stakeholder, including developers, designers and contractors with a common approach to preparing Construction & Demolition Resource and Waste Management Plans (CDRWMP).

The guidelines supersede the Government’s 2006 *Best Practice Guidelines on the Preparation of Waste Management Plans for Construction and Demolition Waste Projects*. The 2021 guidelines reflect developments in resource and waste management policy in the intervening years, including the increasing emphasis on waste hierarchy and circular economy and a paradigm shift away from purely ‘waste-centric’, end-of-pipe approaches. They place greater emphasis on waste prevention, material reuse, circular design and green procurement.

The guidelines set out seven key principles for optimising resources and reducing waste on construction and demolition projects in Ireland as follows:

- Prevention
- Reuse
- Recycling
- Green procurement
- Off-site construction
- Materials optimisation
- Flexibility and deconstruction

According to the guidelines, the level of detail presented in the CDRWMP should reflect the scale and complexity of the development. The guidelines set out thresholds distinguishing between smaller- and larger-scale developments. Projects below the following thresholds may be classed as Tier 1 developments:

- New residential developments 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.

Developments above these thresholds are classed as Tier 2 developments under the EPA guidelines. For Tier 1 developments, the guidelines require a simplified C&DRWMP, while for Tier 2 developments, the guidelines require a bespoke C&DRWMP. In both cases, the guidelines provide minimum information requirements.

A.4 Regional Policies

A.4.1 Limerick Development Plan 2022-2028

The Limerick Development Plan 2022 – 2028 (‘the Development Plan’) was adopted by the Elected Members of Limerick City and County Council in June 2022 and came into effect in July 2022. A first Variation to the Development Plan was adopted in May 2023.

The Development Plan provides a strategy for proper planning and sustainable development in Limerick City and County to 2028. The strategic vision for Limerick as set out in the Development Plan is as follows:

“By 2030, Limerick will become a green City region on the Shannon Estuary connected through people and places. This will be achieved through engagement, innovation, resilient urban development and self-sustaining rural communities.”

This vision is underpinned by 10 interlinked strategic objectives, including the following:

- Transition to an environmentally sustainable carbon neutral economy; and
- Ensure new and existing residential development is of the highest quality, enabling life cycle choices and physical, community, recreation and amenity infrastructure are provided in tandem, to create sustainable, healthy, inclusive and resilient communities.

The Development Plan acknowledges the important role of the circular economy as follows:

“The transition to a more circular economy, where the generation of waste is minimised by the principles of designing out waste and pollution and keeping products and materials in use for as long as possible, is essential in developing a competitive, sustainable, low carbon, resource efficient economy.”

This is reflected in Objective ECON 044, which states that “It is an objective of the Council to support the economic benefits and opportunities that exist in the transition to a more circular economy”; and Objective CAF 016, which states that “It is an objective of the Council to encourage the adoption of the circular

economy through promotion of the reuse, recycling and reduction of the use of raw materials and resources”.

The Development Plan notes that *“designing for waste prevention is the most desirable and effective option”* for promoting the transition to a circular economy, while *“waste that is generated can be accommodated in the circular economy reuse loop, through preparation for reuse, recycling and recovery”.*

Objective IN 017 sets out the Council’s objectives for the role of waste management in the circular economy, stating that *“It is an objective of the Council to...*

- (a) Support innovative, smart solutions and processes, based on the principles of the circular economy to implement the Regional Waste Management Plan for the Southern Region 2015 – 2021 and any subsequent plan, including any targets contained therein.*
- (b) Collaborate with the Regional Waste Management Office and other agencies to implement the EU Action Plan for the Circular Economy – Closing the Loop, 2015, its successor the Circular Economy Action Plan: A New Circular Economy Action Plan for a Cleaner More Competitive Europe, 2020 and the Resource Opportunity – Waste Management Policy, DECLG, 2012 and any subsequent plans.*
- (c) Promote sustainable patterns of consumption and production in the areas of product design, production processes and waste management.*
- (d) Implement the provisions of the Waste Action Plan for a Circular Economy – Ireland’s National Waste Policy 2020 - 2025, DECC, 2020 in the assessment of planning applications.*
- (e) Protect existing civic amenity sites and bring sites throughout Limerick and support the development of additional sites in accordance with the Southern Regional Waste Management Plan 2015 – 2021 and any subsequent plans.”*

The Development Plan highlights the importance of development design and construction and demolition waste management in supporting the transition to a circular economy:

“Construction related waste accounts for a significant proportion of total landfill waste in Ireland. During construction, measures should be implemented to minimise soil removal (as part of the scheme design process), properly manage construction waste, design with and use smart materials on the principles of the circular economy and encourage off-site prefabrication where feasible. All future developments should seek to minimise waste through reduction, re-use and recycling. Waste management and disposal should be carefully considered as part of the construction process and in the operation of the development when completed.”

It is further stated that:

“Those responsible for carrying out a construction and/or demolition project must ensure that they have a Waste Management Plan for all waste generated and ensure the segregation of waste for re-use, recycling or disposal appropriately. Developers shall submit, as part of a planning application, a Waste Management Plan. Where construction or demolition waste cannot be reused or recycled, the waste must be transported to authorised waste facilities using the services of authorised waste collectors. In the case of demolition, the developers will be required to submit a Refurbishment/Demolition Asbestos Survey (RDAS) with full details of disposal of the asbestos. [...]

At the design stage, consideration should be given to the use of renewable building materials, such as wood, from sustainably managed forests and locally sourced building materials for development projects. Other aspects should be considered, including offsite construction and prefabrication to minimise the impact of building on the site, reductions in levels of onsite waste and also minimising the cost of waste disposal. The reuse of construction waste such as excavated material and topsoil onsite is welcomed, subject to the appropriate assessment of the presence of invasive species onsite. Any materials used in the construction of new buildings should comply with the minimum standards as set out in the Building Regulations (1997-2019).”

Objective IN 021 (Construction and Demolition) sets out requirements of developers in this regard:

“It is an objective of the Council to:

- (a) Require construction Waste Management Plans to be submitted as part of planning applications, to address waste management on site during construction and mitigation measures to address waste generation, in accordance with the principles of the circular economy and the principles of prevention, renewal and recycle.*
- (b) Require a Refurbishment/Demolition Asbestos Survey (RDAS) with full details of disposal of the asbestos to be submitted with any planning application. The RDAS should be carried out in accordance with Section 8 of the Health and Safety Authority, Asbestos Guidelines (Practical Guidelines on ACM Management and Abatement) by a suitable qualified professional with expertise in asbestos disposal.”*

The role of the circular economy in driving decarbonisation of the built environment is addressed in Section 11.7 (Climate Action), which notes that, in order to achieve a more sustainable built environment, the Council will encourage, among other measures, design statements addressing how the circular economy is addressed from design through to planned end-use.

The Development Plan further states that:

“The concept of the circular economy can be applied to the whole lifecycle of new developments, from planning and design right through demolition, construction, end-use and repurposing or end of life of a development. To adopt the principle of the circular economy more fundamentally, applicants shall be required to submit a Resource Management Plan, including a Circular Economy Statement, covering different phases of the project from initial design through to construction and end-use functioning. This approach would help the application of modular construction and the facilitation for easy repair and replacement of components and repurposing for reuse. Avoidance of demolition should be promoted in order to promote circularity and/or design for disassembly to facilitate reuse and recycling of materials back into a circular economy loop. An important source of information is the Environment Protection Agency’s Draft Best Practice Guidelines for the preparation of Resource Management Plans for Construction and Demolition Waste Projects.” (emphasis added)

Thus, the Development Plan requires developers to submit a CDRWMP in accordance with the EPA Guidelines as part of the documentation accompanying the planning application.

A.5 Other Publications

A.5.1 Circularity Gap Report Ireland (2024)

In September 2024, the *Circularity Gap Report* (CGR) for Ireland was published, providing an evidence-based baseline of the circularity of the Irish economy.⁵⁰ The analysis undertaken to inform the CGR found that Ireland’s rate of technical cycling is 2.7%, meaning that over 97% of materials flowing through the Irish economy are from virgin sources. This rate is low relative to the global economy (7.2%) and other EU Member States, including Austria (9.7%),⁵¹ Denmark (4%)⁵² and the Netherlands (24.5%).⁵³ This low rate can be attributed, in part, to Ireland’s very high material footprint per capita (22 tonnes), substantially higher than the EU average of 17 tonnes per capita.⁵⁰

⁵⁰ Circle Economy (2024) *The Circularity Gap Report – Ireland*. [Report commissioned by DECC]. Available at: <https://www.circularity-gap.world/ireland>. Accessed February 2025.

⁵¹ Circle Economy (2019) *The Circularity Gap Report – Austria*. Available at: <https://www.circularity-gap.world/cgr-austria>. Accessed February 2025

⁵² Circle Economy (2023) *The Circularity Gap Report – Denmark*. Available at: <https://www.circularity-gap.world/denmark>. Accessed February 2025

⁵³ Circle Economy (2020) *The Circularity Gap Report – The Netherlands*. Available at: <https://www.circularity-gap.world/netherlands>. Accessed February 2025

The CGR identifies the built environment as a priority sector for interventions to support Ireland's circular transition. According to the CGR, of all sectors, the built environment contributes the largest share of Ireland's material footprint, at 35%, and a significant proportion of its carbon footprint, at 11%.

The CGR highlights a number of issues for the C&D sector that negatively affect the circularity of the built environment. According to the CGR, the sector's impact is largely attributable to the significant proportion of construction materials that are imported from overseas, including India, China and the United Kingdom. The C&D sector generates very large volumes of waste. While the rate of recovery of C&D waste exceeds the EU target of 70%, this is largely used for low value applications, such as backfilling⁵⁴. The use of renewable and bio-based materials (such as timber) and secondary materials is low.

The CGR acknowledges the significant challenge for the built environment sector of meeting the existing and future housing needs of the population while reducing its material and carbon footprints. A number of potential interventions are highlighted to increase the circularity of the sector, including:

1. Optimising the use of existing buildings:
 - Prioritising the adaptive reuse of buildings and intensifying the use of existing spaces to reduce the need for new buildings; and
 - Increasing the reuse of building materials and components and reducing the consumption of virgin materials for new builds, e.g. through:
 - Use of deconstruction and pre-demolition audits to optimise reclamation of construction products and materials;
 - Reuse of materials through the Regulation 27 regime and national by-product criteria (e.g., for site-won asphalt and greenfield soil and stone); and
 - Recycling of materials through the Regulation 28 regime and national end-of-waste criteria (e.g., for recycled aggregates).
2. Creating a low-carbon, energy-efficient building stock:
 - Scaling up deep retrofitting of existing buildings; and
 - Employing low-carbon energy-efficient retrofitting.
3. Shifting to resource efficient building practices:
 - Employing lightweight and circular design practices;
 - Reducing construction losses; and
 - Supporting local procurement and low-carbon material and biobased alternatives.

A.5.2 Building a Circular Ireland Roadmap 2025-2040

On 15 May 2025 the Irish Green Building Council (IGBC) launched its 'Building a Circular Ireland', a roadmap for circularity in the construction sector and built environment in Ireland, developed as the output of a research project funded by the EPA, prepared by IGBC in conjunction with the University of Galway, Technological University of Dublin and Atlantic Technological University.

The roadmap is structured around six themes:

- Value our existing building stock;
- Plan for resource efficiency;
- Design for circularity;
- Close the materials loop;
- Change the business model; and
- Enable the circular transition.

⁵⁴ A recovery operation carried out at authorised facilities, where suitable waste is used for land improvement, for reclamation purposes in excavated areas, or for engineering purposes in landscaping. Soil recovery facilities are typically worked out quarries in the process of being restored or sites where soil and stone are imported to raise natural ground levels.

The roadmap highlights that 8.3 million tonnes of C&D waste are generated annually in Ireland (EPA, 2024), while 35% of Ireland’s total material footprint is associated with the construction sector (DETE, 2024). The vast majority of materials consumed by the sector are derived from ‘virgin’ sources. The document acknowledges that:

“Regardless of the project, waste will inevitably arise from construction and demolition activities. For these materials, it is essential to consider the best possible routes for their management, following the principles of the Waste Hierarchy. The aim should be to keep materials as high up the hierarchy as possible, prioritising prevention, reuse, and recycling. Downcycling and disposal to a landfill should always be the last resort.”

It notes that C&D materials, such as concrete, metals and wood, are underutilised resources that hold significant potential to be recovered and reused, reducing the need for primary materials and the associated embodied environmental impacts (including carbon emissions).

The roadmap sets out objectives and targets in relation to each theme. Objectives and targets of particular relevance to C&D resource and waste management are highlighted in Table 19.

Table 19: Building a Circular Ireland Roadmap 2025-2040 – Actions and targets most relevant to the CDRWMP

Theme	Relevant actions	Relevant targets	
		2030 interim targets	2040 targets
Close the materials loop	- Capture critical raw materials from the construction sector for secondary markets as required by the European Union CRMA27 - Support the reuse of materials through existing mechanisms, for example, TGD Part D (Section 1.1 Fitness of Materials), and share best practices and application findings - Invest in technology to increase the value of recovered materials from demolition, e.g., smart crushers to recover cement from concrete, and robotics to recover building elements - Set out targets for reused/secondary materials in construction, and require Life Cycle Assessments (LCAs) with all planning application submissions, with additional requirements for buildings of 1,000 sqm and over in line with the current EPBD - Coding or use of materials passports of construction materials, components, and assemblies to facilitate deconstruction and reuse - Contractors to sign up to Materials Exchange Platforms such as (CMEX) and integrate it with procurement, estimating and contract management functions		100% materials from de-construction reused/recycled
Enable the circular transition	- Promote measures to improve the durability and adaptability of built assets in line with the circular economy principles for building design and developing digital logbooks for buildings - Establish approved registers for contractors, consultants and specialist installers focusing on sustainability/circularity metrics and linked to continuous professional development and recognition of prior learning - Introduce mandatory training on the EU Construction & Demolition Waste Management Protocol (including pre-demolition and pre-renovation audits of construction works) for all demolition contractors - Ensure appropriate Quality Control principles are in place and actively implemented, including circularity metrics - Accelerate the adoption of digital solutions, including the use of digital twins, working in collaboration with Producers and solution providers - Implement the use of digital solutions such as Material Passports to enable data on products to be retained for future use	- All in the construction industry have already started upskilling in circular solutions - Digital solutions starting to enable traceability of components and materials, facilitating adaptation, repair, deconstruction and reuse	

A.5.3 Construction and Demolition Waste Soil and Stone Recovery/Disposal Capacity Update Report (2020)

This report was prepared by RPS on behalf of the Regional Waste Management Planning Offices (RWMPOs) to analyse the national capacity for recovery/disposal of waste soil and stone. A review was undertaken of soil waste generation and available capacity to accept soil waste in authorised facilities within the three waste regions.

The report identifies that the future authorised capacity available to recover soil and stones is an issue in each waste region in the context of likely strong construction activity. By the end of 2029 it is forecast that C&D waste will grow to a total of 10.1m tonnes per annum. The corresponding forecast data for soil and stone waste is 8.7m tonnes by end of 2029. The report indicates that there is sufficient capacity at licenced facilities. There are 15 soil recovery facilities in the EPA licensing system for the EMR. The annual active licenced capacity for the EMR, at end-2018, is 2,411,400 tonnes, whilst the annual authorised capacity is 3,951,400 tonnes. The authorised capacity includes the capacity of active and site which have not yet commenced waste acceptance.

Possible options recommended include expanding capacities at existing sites and the use of Regulation 27 by-product notifications to reduce volumes requiring recovery and disposal.

A.5.4 EPA National Waste Statistics and Bulletins

The EPA publishes national statistics and bulletins relating to waste generation, management and disposal in Ireland. The published data provide information on key statistics and trends in waste as well as information on Ireland's progress towards meeting EU waste collection, recovery and disposal targets. Key topics include municipal waste generation and management, packaging waste, waste electronic and electrical equipment, end of life vehicles, tyres, hazardous waste, C&D waste and waste infrastructure. The data are available on the EPA website at <http://www.epa.ie/nationalwastestatistics/>.

Appendix B

Contractor Responsibilities (as per EPA Guidelines)

The principal Contractor procured by the Client to undertake the construction operations is responsible for the following:

- Preparing, implementing and reviewing the CDRWMP 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 who will be responsible for implementing the CDRWMP.
- Identifying all hauliers to be engaged to transport each of the resources / wastes off-site. Note that any resource that is legally a 'waste' must only be transported by a haulier with a valid Waste Collection Permit (refer to Appendix F of the EPA Guidelines for a resource to find a suitably authorised local haulier).
- Please note that the movement of hazardous waste material off-site falls under the European Communities (Shipments of Hazardous Waste exclusively within Ireland) Regulations 2011. Each shipment of hazardous waste material off-site is to be legally accompanied by a Waste Transfer Form (see details Appendix F of the EPA Guidelines). Hazardous waste such as asbestos should only be handled by competent persons with appropriate training and expertise. More information on handling of asbestos-containing material is available from the Health and Safety Authority.⁵⁵
- Identifying all destinations for resources taken off-site. As above, any resource that is legally a 'waste' must only be transported to an authorised waste facility (refer to Appendix F of the EPA Guidelines for a resource to find a suitably authorised facility).
- 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.
- Preparing a CDRWMP Implementation Review Report at project handover.

⁵⁵ HSA (n.d.) *Asbestos Contractors*. Available at: https://www.hsa.ie/eng/your_industry/chemicals/legislation_enforcement/asbestos/asbestos_notifications/asbestos_removal/. Accessed October 2024.

Appendix C

EPA – List of Waste Codes for Construction and Demolition Wastes

Table 20: EPA LoW codes for C&D wastes (*hazardous)

LoW Code	Waste Type
03	Wastes from wood processing and the production of panels and furniture, pulp, paper and cardboard
03 02	Wastes from wood preservation
03 02 01*	Non-halogenated organic wood preservatives
03 02 02*	Organochlorinated wood preservatives
03 02 03*	Organometallic wood preservatives
03 02 04*	Inorganic wood preservatives
03 02 05*	Other wood preservatives containing hazardous substances
03 02 99	Wood preservatives not otherwise specified
13	Oil wastes and wastes of liquid fuels (except edible oils, and those in chapters 05, 12 and 19)
13 07	Wastes of liquid fuels
13 07 01*	Fuel oil and diesel
13 07 02*	Petrol
13 07 03*	Other fuels (including mixtures)
15	Waste packaging; absorbents, wiping cloths, filter materials and protective clothing not otherwise specified
15 01	Packaging (including separately collected municipal packaging waste)
15 01 01	Paper and cardboard packaging
15 01 02	Plastic packaging
15 01 03	Wooden packaging
15 01 04	Metallic packaging
15 01 05	Composite packaging
15 01 06	Mixed packaging
15 01 07	Glass packaging
15 01 09	Textile packaging
16	Wastes not otherwise specified in the list
16 02	Wastes from electrical and electronic equipment
16 02 09*	Transformers and capacitors containing PCBs
16 02 10*	Discarded equipment containing or contaminated by PCBs other than those mentioned in 16 02 09
16 02 11*	Discarded equipment containing chlorofluorocarbons, HCFC, HFC
16 02 12*	Discarded equipment containing free asbestos
16 02 13*	Discarded equipment containing hazardous components other than those mentioned in 16 02 09 to 16 02 12
16 02 14	Discarded equipment containing hazardous components other than those mentioned in 16 02 09 to 16 02 13

LoW Code	Waste Type
16 02 15*	Hazardous components removed from discarded equipment
16 02 16	Components removed from discarded equipment other than those mentioned in 16 02 15
16 06	Batteries and accumulators
16 06 01*	Lead batteries
16 06 02*	Ni-Cd batteries
16 06 03*	Mercury-containing batteries
16 06 04	Alkaline batteries (except 16 06 03)
16 06 05	Other batteries and accumulators
16 06 06*	Separately collected electrolyte from batteries and accumulators
17	Construction and demolition wastes (including excavated soil from contaminated sites)
17 01	Concrete, bricks, tiles and ceramics
17 01 01	Concrete
17 01 02	Bricks
17 01 03	Tiles and ceramics
17 01 06*	Mixtures of, or separate fractions of concrete, bricks, tiles and ceramics containing hazardous substances
17 01 07	Mixtures of concrete, bricks, tiles and ceramics other than those mentioned in 17 01 06
17 02	Wood, glass and plastic
17 02 01	Wood
17 02 02	Glass
17 02 03	Plastic
17 02 04*	Glass, plastic and wood containing or contaminated with hazardous substances
17 03	Bituminous mixtures, coal tar and tarred products
17 03 01*	Bituminous mixtures containing coal tar
17 03 02	Bituminous mixtures other than those mentioned in 17 03 01
17 03 03*	Coal tar and tarred products
17 04	Metals (including their alloys)
17 04 01	Copper, bronze, brass
17 04 02	Aluminium
17 04 03	Lead
17 04 04	Zinc
17 04 05	Iron and steel
17 04 06	Tin
17 04 07	Mixed metals

LoW Code	Waste Type
17 04 09*	Metal waste contaminated with hazardous substances
17 04 10*	Cables containing oil, coal tar and other hazardous substances
17 04 11	Cables other than those mentioned in 17 04 10
17 05	Soil (including excavated soil from contaminated sites), stones and dredging spoil
17 05 03*	Soil and stones containing hazardous substances
17 05 04	Soil and stones other than those mentioned in 17 05 03
17 05 05*	Dredging spoil containing hazardous substances
17 05 06	Dredging spoil other than those mentioned in 17 05 05
17 05 07*	Track ballast containing hazardous substances
17 05 08	Track ballast other than those mentioned in 17 05 07
17 06	Insulation materials and asbestos-containing construction materials
17 06 01*	Insulation materials containing asbestos
17 06 03*	Other insulation materials consisting of or containing asbestos substances
17 06 04	Insulation materials other than those mentioned in 17 06 01 and 17 06 03
17 06 05*	Construction materials containing asbestos
17 08	Gypsum-based construction material
17 08 01*	Gypsum-based construction materials contaminated with hazardous substances
17 08 02	Gypsum-based construction materials other than those mentioned in 17 08 01
17 09	Other construction and demolition wastes
17 09 01*	Construction and demolition wastes containing mercury
20	Municipal wastes (household waste and similar commercial, industrial and institutional wastes) including separately collected fractions
20 01	Separately collected fractions (except 15 01)
20 01 01	Paper and cardboard
20 01 02	Glass
20 01 08	Biodegradable kitchen and canteen waste
20 01 11	Textiles
20 01 21*	Fluorescent tubes and other mercury-containing waste
20 01 25	Edible oil and fat
20 01 27*	Paint, inks, adhesives and resins containing hazardous substances
20 01 33*	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 36	Discarded electrical and electronic equipment other than those mentioned in 20 01 21, 20 01 23 and 20 01 35
20 01 39	Plastics

LoW Code	Waste Type
20 01 40	Metals
20 03	Other municipal wastes
20 03 01	Mixed municipal waste
20 03 07	Bulky waste

Appendix D

BRE Benchmark Construction Waste Estimates

Table 21: Proposed development construction waste estimates using BRE waste benchmarks (as of January 2020) – building construction by typology

Waste stream	Commercial ⁵⁶				Leisure ⁵⁷				Residential				All typologies
	BRE benchmark (tonnes/100m²)	Project NIA (m²)	Project factor (NIA/100)	Waste volume (tonnes)	BRE benchmark (tonnes/100m²)	Project NIA (m²)	Project factor (NIA/100)	Waste volume (tonnes)	BRE benchmark (tonnes/100m²)	Project NIA (m²)	Project factor (NIA/100)	Waste volume (tonnes)	Total waste volumes (tonnes)
Bricks	0.39	274.00	2.74	1.06	0.51	373.00	3.73	1.91	1.12	22,012.00	220.12	245.43	248.40
Tiles and ceramics	0.01	274.00	2.74	0.03	0.02	373.00	3.73	0.06	0.08	22,012.00	220.12	17.61	17.70
Concrete	3.30	274.00	2.74	9.05	0.82	373.00	3.73	3.07	1.51	22,012.00	220.12	332.16	344.27
Inert	3.59	274.00	2.74	9.84	4.31	373.00	3.73	16.06	4.35	22,012.00	220.12	956.64	982.54
Insulation materials	0.04	274.00	2.74	0.12	0.04	373.00	3.73	0.15	0.08	22,012.00	220.12	16.95	17.22
Metals	0.28	274.00	2.74	0.77	0.19	373.00	3.73	0.70	0.21	22,012.00	220.12	46.67	48.14
Packaging materials	0.18	274.00	2.74	0.48	0.20	373.00	3.73	0.75	0.42	22,012.00	220.12	92.45	93.69
Plasterboard/gypsum	0.26	274.00	2.74	0.71	0.33	373.00	3.73	1.22	0.53	22,012.00	220.12	116.44	118.38
Binders	0.01	274.00	2.74	0.01	0.01	373.00	3.73	0.04	0.02	22,012.00	220.12	4.18	4.24
Plastic (excl. packaging waste)	0.12	274.00	2.74	0.33	0.08	373.00	3.73	0.28	0.28	22,012.00	220.12	62.29	62.90
Timber	0.77	274.00	2.74	2.10	0.81	373.00	3.73	3.00	1.28	22,012.00	220.12	282.19	287.30
Floor coverings (soft)	0.00	274.00	2.74	0.01	0.01	373.00	3.73	0.04	0.01	22,012.00	220.12	1.76	1.81
Electrical and electronic equipment	0.00	274.00	2.74	0.00	0.01	373.00	3.73	0.04	0.01	22,012.00	220.12	1.32	1.36
Furniture	0.03	274.00	2.74	0.09	0.04	373.00	3.73	0.15	0.00	22,012.00	220.12	0.44	0.68
Canteen/office/ad hoc waste	0.16	274.00	2.74	0.44	0.13	373.00	3.73	0.50	0.16	22,012.00	220.12	34.78	35.72
Liquids	0.06	274.00	2.74	0.17	0.02	373.00	3.73	0.06	0.01	22,012.00	220.12	1.76	1.99
Oils	0.00	274.00	2.74	0.00	-	373.00	3.73	-	0.00	22,012.00	220.12	0.44	0.44
Bituminous mixtures	0.22	274.00	2.74	0.60	0.21	373.00	3.73	0.80	0.09	22,012.00	220.12	19.37	20.77
Hazardous waste*	0.03	274.00	2.74	0.08	0.09	373.00	3.73	0.33	0.09	22,012.00	220.12	20.25	20.66
Other waste	0.41	274.00	2.74	1.12	1.07	373.00	3.73	3.99	0.40	22,012.00	220.12	88.71	93.82
Mixed construction and/or demolition waste	3.24	274.00	2.74	8.87	5.31	373.00	3.73	19.82	4.31	22,012.00	220.12	949.16	977.84
Total	13.10	274.00	2.74	35.88	14.21	373.00	3.73	53.00	14.95	22,012.00	220.12	3,290.79	3,379.68

⁵⁶ Average of BRE benchmarks for ‘commercial other’, ‘commercial offices’ and ‘commercial retail’ used for commercial typology

⁵⁷ BRE benchmark for ‘leisure’ used for mixed use typology

Appendix E

Resource and Waste Inventory Template (as per EPA Guidelines)

Table 22: Resource and waste inventory template (adapted from EPA Guidelines)

LoW Code	Description	Volume Generated (Tonnes)	Prevention (Tonnes) (Non-waste)	Reused (Tonnes) (Non-waste)	Recycled (Tonnes) (Waste)	Recovered ⁵⁸ (Tonnes) (Waste)	Disposed (Tonnes) (Waste)	Unit Cost Rate (€/tonne)	Total Cost (€)
17 01 01	Concrete								
17 01 02	Bricks								
17 01 03	Tiles and Ceramics								
17 02 01	Wood								
17 02 02	Glass								
17 02 03	Plastic								
17 03 02	Bituminous Mixtures								
17 04 01	Copper, Bronze, Brass								
17 04 02	Aluminium								
17 04 03	Lead								
17 04 04	Zinc								
17 04 05	Iron and Steel								
17 04 06	Tin								
17 04 07	Mixed Metals								
17 04 11	Cables								
17 05 04	Soil and Stone								

⁵⁸ Includes energy recovery, backfilling and other recovery

LoW Code	Description	Volume Generated (Tonnes)	Prevention (Tonnes) (Non-waste)	Reused (Tonnes) (Non-waste)	Recycled (Tonnes) (Waste)	Recovered ⁵⁸ (Tonnes) (Waste)	Disposed (Tonnes) (Waste)	Unit Cost Rate (€/tonne)	Total Cost (€)
17 06 04	Insulation Material								
17 08 02	Gypsum								
17 09 04	Mixed C&D waste								
17 01 06*	Mixtures of, or separate fractions of concrete, bricks, tiles and ceramics containing hazardous substances								
17 02 04*	Glass, plastic and wood containing or contaminated with hazardous substances								
17 03 01*	Bituminous mixtures containing coal tar								
17 04 09*	Metal waste contaminated with hazardous substances								
17 05 03*	Soil and stones containing hazardous substances								
17 06 05*	Construction materials containing asbestos								
	Other resources (non-waste materials) (specify as needed)								
	Other wastes (specify as needed)								