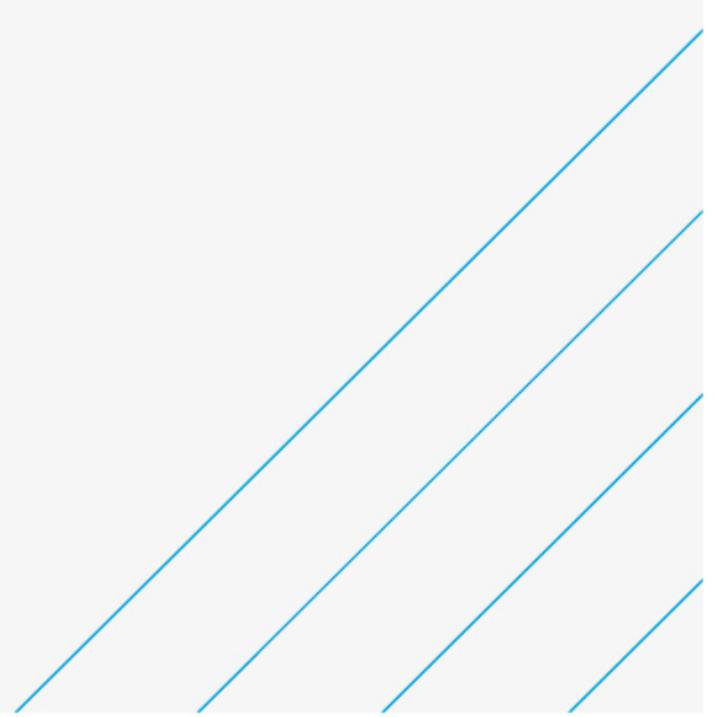


# Fassaroe Phase 1 Strategic Housing Development

Resource and Waste Management Plan

Cosgrave Property Group

April 2022



## Notice

This document and its contents have been prepared and are intended solely as information for Cosgrave Property Group use in relation to Fassaroe Phase 1 Strategic Housing Development.

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This document has 43 pages including the cover.

## Document history

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## Client signoff

Client	Cosgrave Property Group
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# 1. Introduction

This Resource and Waste Management Plan (RWMP) has been prepared by WS Atkins (Atkins) on behalf of Cosgrave Property Group (the applicant) as part of the supporting documents required for a planning application for a proposed residential development at Fassaroe, Bray Co. Wicklow.

Cosgrave Property Group are applying to An Bord Pleanála (ABP) for permission for a Strategic Housing Development comprising of the construction of 650no. residential units comprising a mix of apartments and houses along with a neighbourhood centre, a crèche, a district park, local parks, the diversion and rerouting of ESB electricity lines, a distributor road connecting to Ballyman Road, a new pedestrian / cycle route across the N11 connecting to Dargle Road, historic landfill remediation works, landscaping works, parking facilities, ancillary services and facilities and associated site development works on predominately agricultural lands in the administrative areas of Wicklow County Council. The proposed development is situated on a ca. 81.16 hectares (ha) parcel of land, to the west of Bray Town Centre. The proposed maximum height of the apartment blocks will be ca. 5no. storeys. The site location is presented in Figure 1.1.

The proposed Phase 1 lands are the subject of this Strategic Housing Development (SHD) application to ABP and are hereafter also referred to as ‘the Site’, or the ‘proposed development’. A detailed development description and further details are presented as part of the planning documents and drawings submitted for this planning application.

## 1.1. Aim of the Plan

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

## 1.2. Methodology

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

In addition, the following relevant best practice guidance documents have also been consulted;

- ‘Waste Classification: List of Waste & Determining if Waste is Hazardous or Non-Hazardous’ (EPA, 2018);
- ‘A review of Design and Construction Waste Management Practices on Selected Case Studies – Lessons Learned’ (EPA, 2015);
- ‘Design out Waste: Preparation of Waste Reduction Factsheets for Design Teams’ (EPA, 2015); and,
- ‘Development of an Audit Methodology to Generate Construction Waste Projection Indicators for the Irish Construction Industry’ (EPA, 2009);
- Bray Municipal District Local Area Plan 2018-2024; and,
- Wicklow County Development Plan 2016 -2022 Development and Design Standards (WCC, 2016).

## 1.3. Need for the Plan

Within Section 3.1 of the guidance (EPA, 2021), it states that ‘it is recommended that planning authorities stipulate that an Resource and Waste Management Plan (RWMP) shall be submitted for all construction and demolition projects as best practice to inform the planning consent process. It is recommended that all planning permissions granted include compliance with the RWMP as a standard condition of planning.’ Based on the nature and scale of the proposed development (as presented in

further detail in Section 2.2 of this document) the preparation of a RWMP as part of the planning submission for the proposed development is warranted.

## 1.4. Format of the Plan

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

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

This resource and waste management plan (RWMP) will be further developed by the contractor. The RWMP needs to be regularly revisited throughout a project's lifecycle so that opportunities to maximise waste reduction/ efficiencies are exploited throughout, and that data is collected on an ongoing basis so that it is as accurate as possible.

## 1.5. List of Acronyms

The following list of abbreviations have been used within this document;

- AOD – Above Ordnance Datum
- WCC – Wicklow County Council
- C&D - Construction and Demolition
- DoEHLG - Department of Environment, Heritage and Local Government
- EPA - Environmental Protection Agency
- EWC - European Waste Catalogue
- LoW - List of Waste
- NWCPO - National Waste Collection Permit Office
- PSCS - Project Supervisor Construction Stage
- PSDP - Project Supervisor for the Design Process
- SDS - Safety Data Sheet
- WAC - Waste Acceptance Criteria
- SHD - Strategic Housing Development
- RWMP – Resource and Waste Management Plan

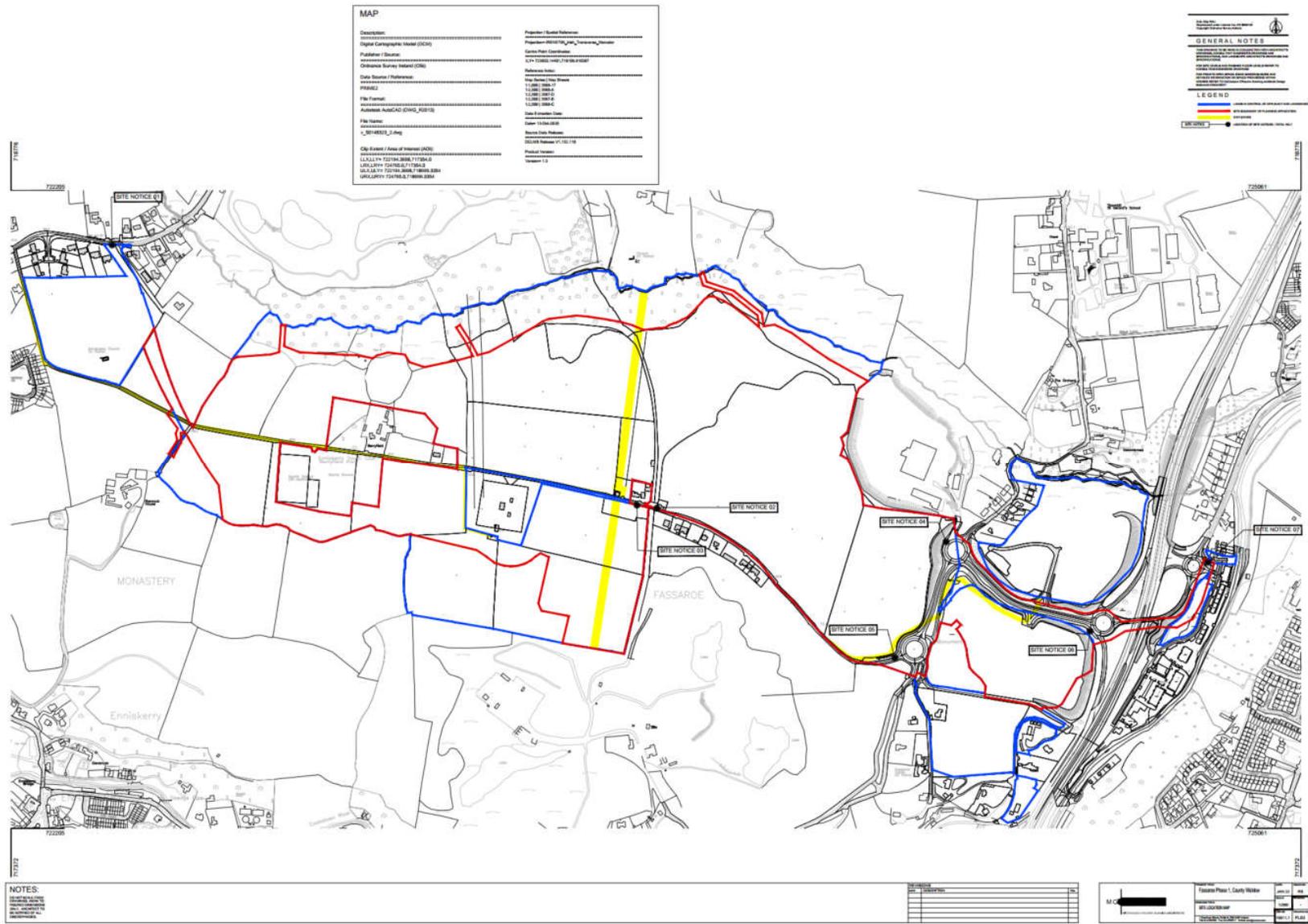


Figure 1.1 - Site Location (with red-line site boundary)

## 2. Waste Management – Policies, Legislation and Guidance

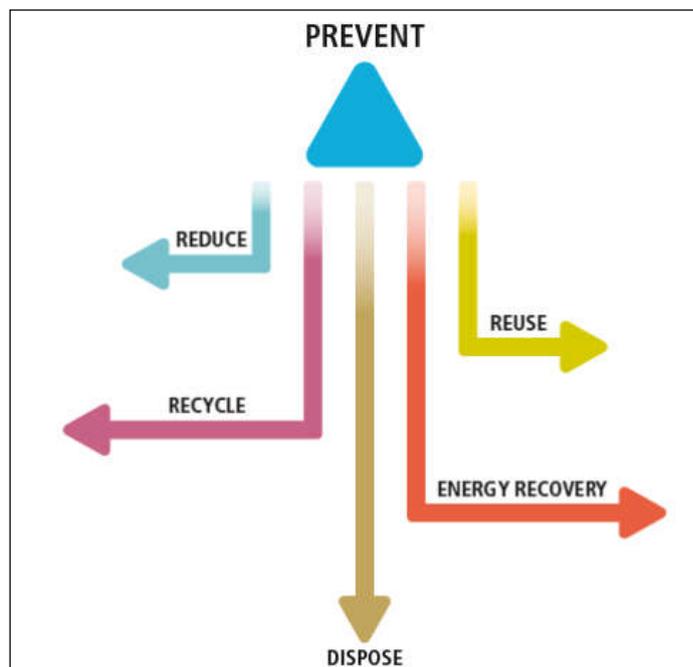
### 2.1. National Level

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

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

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

In 2011 the revised EU Waste Framework Directive was transposed into Irish law by the European Commission (Waste Framework Directive) Regulations 2011 (SI 126 of 2011) (EC, 2008). The Waste Framework Directive focussed on sustainable and efficient materials management strategy and provides a legal basis for the waste hierarchy. Therefore, the waste hierarchy presented in Figure 2.1 should be applied as a priority in Ireland.



**Figure 2.1 - Accepted Best Practice Waste Hierarchy (EPA, 2018)**

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

- Construction environmental management plan;

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

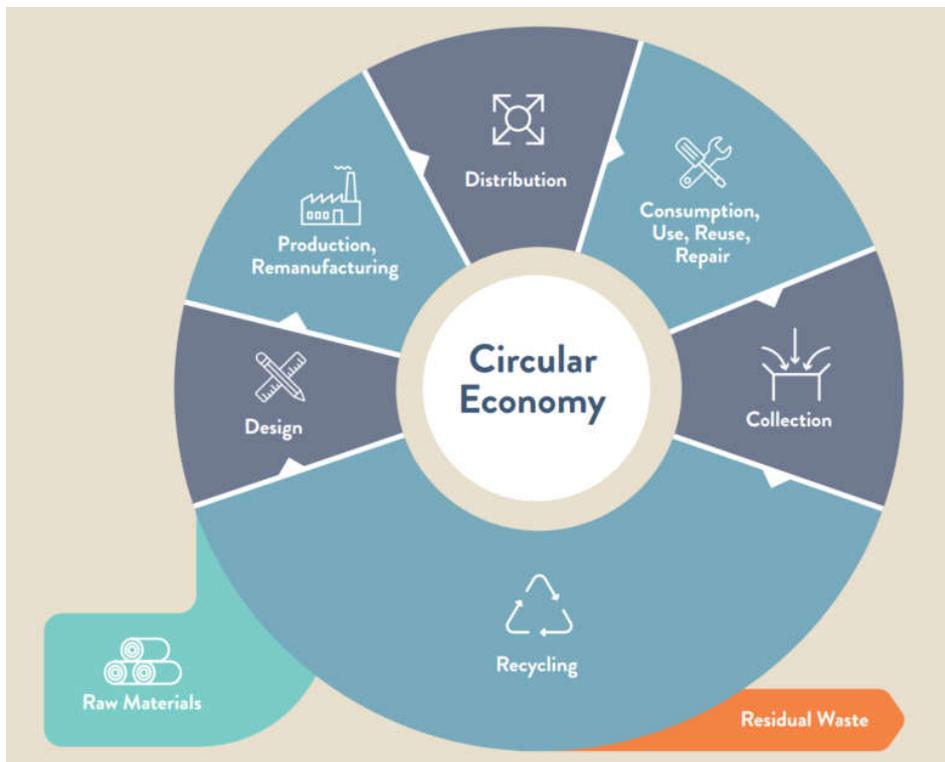
This EPA (2014) publication ‘Green Procurement: Guidance for the Public Sector’ clearly sets out the responsibility of the Contractor with regard to waste management and disposal, as follows:

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

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

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

The ‘Waste Action for a Circular Economy’ report focuses on transition to a circular economy, shown in Figure 2.2, and the need to plan for C&D waste management at the earliest possible stage in a construction project, ideally at concept stage.



**Figure 2.2 - The Circular Economy (DoCCA, 2020)**

The overarching objectives of this action plan are to:

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

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

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

## 2.2. Relevant Guidance

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

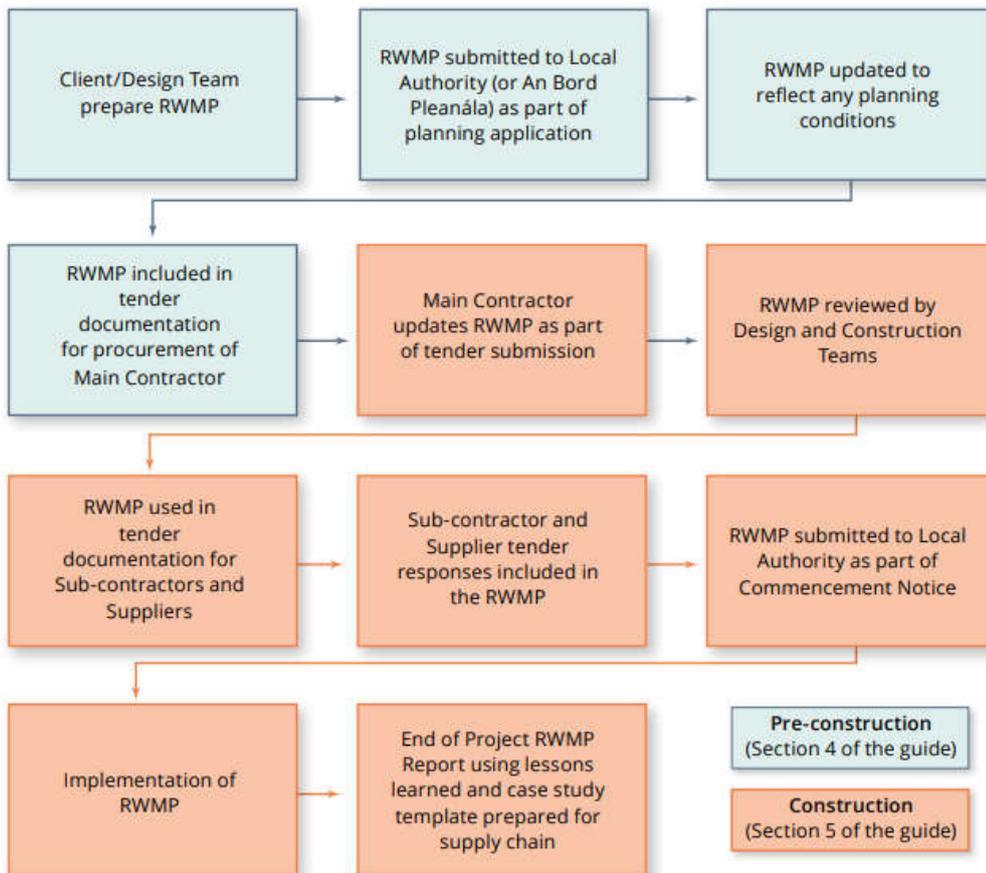
Since the publication of the 2006 guidelines, waste policy in Europe has shifted from the established linear economic model to a circular economic model. *'Circular economy-inspired interventions focus not only on increasing recycling quantitatively but also on:*

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

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

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

These principles are applied to the Resource and Waste Management Plan (RWMP) through both the pre-construction phase and the construction phase. The evolution of a single plan through a project lifecycle is recommended to ensure preventative and resource efficiency initiatives are undertaken, data are captured, and targets set and measured throughout the project. The evolution of the plan through the project from initial pre-construction phase (in green) followed by implementation at construction phase (in orange) is illustrated in Figure 2.3 below.



**Figure 2.3 - Project Life Cycle of the RWMP (EPA, 2021)**

According to the EPA (2021) the level of detail presented in the RWMP should be reflective of the scale and complexity of the project and whether the project is within Tier 1 or Tier 2 thresholds.

- Tier 1: Smaller scale projects, below the following thresholds:
  - New residential development of less than 10 dwellings;
  - Retrofit of 20 dwellings or less;
  - New commercial, industrial, infrastructural, institutional, educational, health and other developments with an aggregate floor area less than 1,250m<sup>2</sup>;
  - Retrofit of commercial, industrial, infrastructural, institutional, educational, health and other developments with an aggregate floor area less than 2,000m<sup>2</sup>; and,
  - Demolition projects generating in total less than 100m<sup>3</sup> in volume of C&D waste.
- Tier-2 projects: Larger scale projects, including Strategic Infrastructure Developments, Strategic Housing Developments, infrastructure projects (road, rail, gas, energy) or any project above Tier 1 thresholds (presented above).

The proposed development comprises a Strategic Housing Development, therefore this project is classed as a Tier 2 development, and has been prepared in line with the relevant EPA recommendations for such developments.

This document applies only to the construction and demolition stage of the proposed development.

## 2.3. Regional Level

The relevant regional waste management plan for Wicklow County Council is the Eastern-Midlands Region Waste Management Plan 2015-2021. The Eastern-Midlands Region encompasses the following local authorities: Dublin City, Dún Laoghaire-Rathdown, Fingal, South Dublin, Kildare, Louth, Laois, Longford, Meath, Offaly, Westmeath and Wicklow. The regional plan which was launched in May 2015, provides the framework for waste management up to 2021 and sets out a range of policies and actions in order to meet mandatory and performance targets. The key objectives of this plan are as follows:

- Prevent waste: a reduction of one per cent per annum in the amount of household waste generated over the period of the plan;

- More recycling: increase the recycle rate of domestic and commercial waste from 40 to 50 per cent by 2020; and,
- Further reduce landfill: eliminate all unprocessed waste going to landfill from 2016.

The overarching objectives of the Eastern-Midlands Region Waste Management Plan 2015-2021 have been incorporated into the latest development plan pertinent to this site and Wicklow County Council Development Plan 2016-2022. According to Wicklow County Development Plan 2016 – 2022 the Regional Waste Management Plans 2015-2021 provides the following:

- *'Framework for solid waste management in the region and sets out a range of policies and actions to meet specified mandatory and performance based targets. The WMP seeks to assist and support resource efficiency and waste prevention initiatives. A key WMP target is to achieve a 1% reduction per annum in the quantity of household waste generated per capita over the period of the WMP. In tandem, the WMP identifies measures to develop a circular economy whereby waste management initiatives are no longer confined to treating and disposing of waste, instead supporting initiatives that value waste as a resource or potential raw material.'*

The Wicklow County Development Plan 2016 - 2022 specifically sets out the following policy's objectives with regards to waste management.

### 2.3.1. Statement of Policy/Objectives

Solid Waste Management Objectives:

- **WE1** - To require all developments likely to give rise to significant quantities of waste, either by virtue of the scale of the development or the nature of the development (e.g. one that involves demolition) to submit a construction management plan, which will outline, amongst other things, the plan for the safe and efficient disposal of waste from the site.
- **WE2** - To require all new developments, whether residential, community, agricultural or commercial to make provision for storage and recycling facilities (in accordance with the standards set out in Development & Design Standards of this plan).
- **WE3** - To facilitate the development of existing and new waste recovery facilities and in particular, to facilitate the development of green waste recovery sites.
- **WE4** - To facilitate the development of waste-to-energy facilities, particularly the use of landfill gas and biological waste.
- **WE5** - To have regard to the Council's duty under the 1996 Waste Management Act (as amended), to provide and operate, or arrange for the provision and operation of, such facilities as may be necessary for the recovery and disposal of household waste arising within its functional area.
- **WE6** - To facilitate the development of sites, services and facilities necessary to achieve implementation of the objectives of the Regional Waste Management Plan.

Hazardous Waste and Emissions Objectives:

- **WE7** - To facilitate the development of sites, services and facilities for the disposal of hazardous household wastes in accordance with the objectives of the Regional Waste Management Plan.
- **WE8** - To have regard to the "Major Accidents Directive" (Seveso-III (Directive 2012/18/EU). This Directive relates to the control of major accidents involving dangerous substances with an objective to prevent major accidents and limit the consequences of such accidents. This policy will be implemented through Development Management, through specific control on the siting of new establishments and whether such a siting is likely to increase the risk or consequence of a major accident.

## 2.4. Waste Legislation

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

- Waste Framework Directive 2008/98/EC of the European Parliament and Council on waste, as amended, 2018 (S.I. 2018/851);
- European Communities (Waste Directive) Regulations (Directive 2008/98/EC) 2011 (SI 126 of 2011) as amended 2016 (S.I 315 of 2016), as amended, 2018 (S.I. 2018/851), as amended 2020 (S.I. No. 323 of 2020);
- Waste Management Act of 1996, 2001 and 2003;
- Litter Pollution Act of 1997, and as amended in 2009 and 2017;

- Litter Pollution Regulations 1999, S.I. No. 359 of 1999);
- European Communities (Waste Electrical and Electronic Equipment) Regulations 2011 (S.I. 355 of 2011), as amended 2011 (S.I. No. 397 of 2011) 2013, (S.I. No. 32 of 2013);
- European Union (Waste Electrical and Electronic Equipment) Regulations 2014 (S.I. No. 149 of 2014) and 2019 (S.I. No. 233 of 2019);
- Waste Management (Facility Permit and Registration) Regulations 2007, S.I. No. 821 of 2007, as amended, 2008 (S.I. No. 86 of 2008), 2015 (S.I. No. 198 of 2015), 2019 (S.I. No. 250 of 2019);
- Waste Management (Collection Permit) Regulations 2007, S.I. No. 820 of 2007), as amended, 2015 (S.I. No. 197 of 2015), 2016 (S.I. No. 24 of 2016);
- Waste Management (Licensing) Regulations 2004 (S.I. No. 395 of 2004) as amended 2010 (S.I. No. 350 of 2010);
- Waste Management (Miscellaneous Provisions) Regulations, 1998, S.I. No. 164 of 1998;
- Waste Management (Landfill Levy) Regulations 2008, S.I. No. 199 of 2008, as amended 2009, (S.I. No. 550 of 2009), 2010 (S.I. No. 31 of 2010), 2012 (S.I. No. 221 of 2012), 2013 (S.I. No. 194 of 2013), 2015 (S.I. No. 189 of 2015), 2019 (S.I. No.182 of 2019);
- Waste Management (Hazardous Waste) Regulations, 1998, as amended, 2000 (S.I. No. 73 of 2000);
- Waste Management (Shipment of Waste) Regulations 2007, S.I. No. 419 of 2007;
- Waste Management (Movement of Hazardous Waste) Regulations, 1998 (S.I. No. 147 of 1998);
- European Communities (Shipments of Hazardous Waste Exclusively within Ireland) Regulations 2011, S.I. No 324 of 2011;
- European Communities (Transfrontier Shipment of Waste) Regulations 1994 (S.I. No. 121 of 1994);
- Waste Management (Transfrontier Shipment of Waste) Regulations 1998, as amended, 2014 (S.I. No. 861 of 2014);
- Waste Management (Tyres and Waste Tyres) Regulations 2007 (S.I. No. 664 of 2007), 2017, as amended (S.I. No. 400 of 2017) and 2018 (S.I. No. 96/2018);
- European Union (Batteries and Accumulators) Regulations 2014, S.I. No. 283 of 2014, as amended, 2014 (S.I. No. 349 of 2014), 2015 (S.I. No. 347 of 2015);
- Waste Management (Registration of Brokers and Dealers) Regulations 2008, SI No. 113 of 2008;
- Waste Management (Prohibition of Material Disposal by burning) Regulations 2009, S.I. No. 286 of 2009, as amended 2013 (S.I. No. 504 of 2013), 2017 (S.I. No. 599 of 2017);
- European Waste Catalogue (EWC) and Hazardous Waste List 2002;
- Waste Management (Food Waste) Regulations 2009, S.I. No 508 of 2009, as amended, 2015 (S.I. No. 430 of 2015);
- European Union (Properties of Waste Which Render It Hazardous) Regulations 2015, S.I. No. 233 of 2015 as amended 2018 (S.I. No. 383/2018);
- Air Pollution Act, 1987 (Emission Limit Values for use of Asbestos) Regulations, 1990, S.I. No. 28 of 1990, as amended 1996 (S.I. No. 264/1996);
- EC (Control of Emissions of Gaseous & Particulate Pollutants from Non-Road Mobile Machinery) Regulations 2007, S.I. No.147 of 2007, as amended, 2011 (S.I. No. 263 of 2011), 2012 (S.I. No. 407 of 2012), 2013 (S.I. No. 417 of 2013), 2016 (S.I. No. 2016/1628);
- The EU Regulation 2037/2000 (CFC's, HCFC's, Halons) - Ozone Depleting Substances. Control of Substances that Deplete the Ozone Layer Regulations 2006, S.I. No 281 of 2006, as amended, 2011 (S.I. No. 465 of 2011);
- EU F Gas Regulations 2014, S.I. No. 517 of 2014;
- Waste Management (Packaging) Regulations 2014 (S.I. 282 of 2014) as amended 2015 (S.I. No 542 of 2015);
- Planning and Development Acts 2000 to 2015, as amended 2018, 2019 and 2020;
- Protection of Environment Act 1992 as amended 2003 and 2017;
- European Union (Ship Recycling) (Waste) Regulations 2019 (SI. No 13/2019);
- European Union (Environmental Impact Assessment) (Waste) Regulations 2013

- SI. No. 505 of 2013;
- Industrial Emissions Directive 2010/75/EU; and,
- Landfill Directive 1999/31/EC.

## 2.5. Waste Soils Classification

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

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

Since 2015, waste classification is based on:

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

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

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

## 3. Project Description

### 3.1. Site History & Surrounding Land Use

The proposed development site is located within predominantly agricultural lands, a combination of arable crops, vegetable crops and grassland, in Fassaroe to the west of Bray, Co. Wicklow as shown on Figure 1.1. There are 5no. historic landfill locations within the development, known as Site 1, Site 2, Site 3A, Site 3B and Site 3C which were used from the early-1970s to the early-1990s. The landfill operations ceased in the early 1990s, where the landfills were sequentially covered in topsoil and returned to agricultural use. The historic landfill areas are now very overgrown with grass and other rough vegetation present with no waste noted on the surface.

Four of the landfills (Site 2, Site 3A, Site 3B and Site 3C) are now authorised under Certificates of Authorisation (CoA) granted by the Environmental Protection Agency (EPA) to Wicklow County Council in November 2019. The fifth site, Site 1 does not fall under the CoA requirements. However, its remediation is being treated in the same manner as that authorised for the other 4no. landfills sites.

While Sites 2, 3A, 3B and 3C are located in lands owned by Cosgrave Property Group, Wicklow County Council as the CoA holder, is responsible for the remediation and ongoing monitoring of these sites and for ensuring the conditions of the Certificates of Authorisation are complied with.

As per RPS (2022) Historic Landfill Remediation Strategy Report '*agreement has therefore been obtained by Cosgrave Property Group from Wicklow County Council to include the capping of the landfills within the proposed Phase 1 development as it is acknowledged that the remediation of the sites in accordance with the Certificates of Authorisation is intrinsically linked to the future use of the sites post-development*'.

The proposed development site is zoned within a number of land use zoning objectives as per the development plan as follows:

- *PU Public Utility: To maintain lands providing services infrastructure;*
- *NC Neighbourhood Centre: To protect, provide for, and improve a mix of neighbourhood centre services and facilities, which provide for the day-to-day needs of the local community;*
- *Community & Education: To provide for civic, community and educational facilities;*
- *AOS Active Open Space: To protect and enhance existing and provide for new active open space;*
- *OS1 Open Space: To protect and enhance existing and provide for recreational open space;*
- *OS2 Open Space: To protect and enhance existing open, undeveloped lands;*
- *E1 Employment: To provide for the development of enterprise and employment; and,*
- *R-HD New Residential-High Density: To protect, provide and improve residential amenities in a high density format.*

There are 3no. existing Irish Water watermains located within the boundary of the proposed development site, as follows:

- 33" watermain running north south through the centre of the site;
- 24" watermain also running generally north south through the eastern side the site; and,
- 800mm dia interconnector watermain crossing from west to east along Berryfield Lane between the existing 33" and 24" watermains.

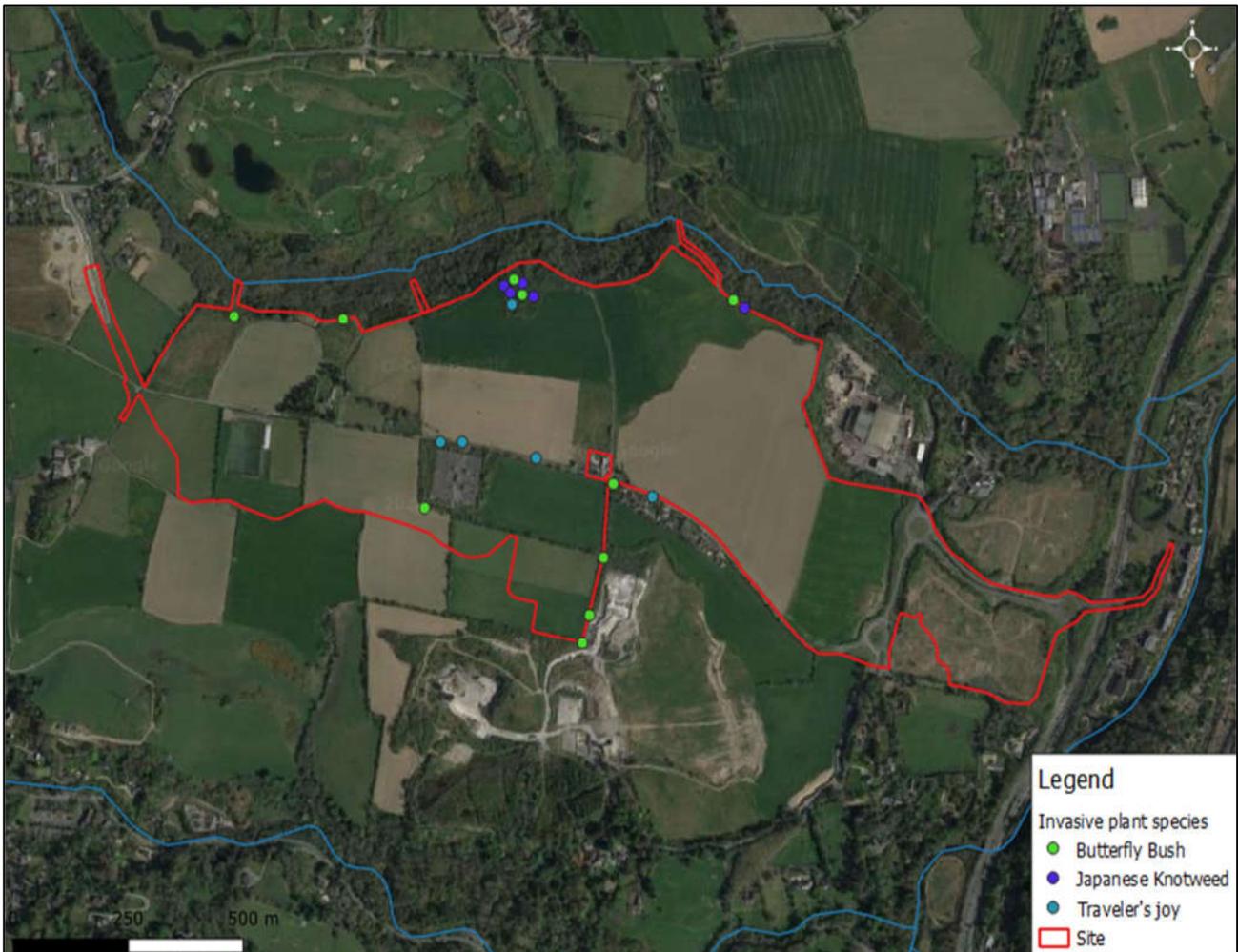
The land form generally falls from west to east from ca. 100mOD in the west to ca. 30mOD to the east of the site. The site is bounded to the east by the N11, to north east by Greenstar recycling centre, to the north by woodland / scrubland and Ballyman Glen, to the south by agricultural lands and Roadstone quarry to the south east and the west by agricultural lands and residential dwellings.

### 3.2. Current Site Conditions

The proposed development site is located within predominantly agricultural lands in Fassaroe to the west of Bray, Co. Wicklow. There are 5no. historic landfill sites (Site 1, 2, 3A, 3B and 3C) which are located generally within the northern part of the site with Site 3B located along the route of the proposed road at the western half of the site. 4no. of the landfills are located adjacent to the Ballyman Glen which is a designated Special Area of Conservation (Site Code: 000713). RPS carried out an Environmental Risk Assessment Report for the historic landfills (RPS, 2018), which is being submitted as part of this planning application in Volume 3 Part 3 of the EIAR.

During the course of the site surveys in June 2021, four stands of Japanese knotweed (*Fallopia japonica*) were recorded within the north of the site in an area of scrub and there is also stands further east within the site at its northern boundary which are located within the historic landfills. Japanese knotweed is classified as a 'high impact' invasive species and is listed in the Third Schedule European Communities (Birds and Natural

Habitats) Regulations 2011 (S.I. No. 477 of 2011). Butterfly Bush and Traveller's Joy were also identified within the site boundary, which are both listed as being of 'Medium Impact' but are not listed in the Third Schedule European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. No. 477 of 2011). Refer Figure 3.1.



**Figure 3-1 - Invasive Plant locations (RPS, 2022)**

The findings and mitigation measures are outlined in the RPS (2022) Japanese knotweed Management Plan (JKMP), which is being submitted as part of this planning application in Appendix A of the Natura Impact Statement forming part of the application documentation. *'Excavation and burial within a cell membrane is the preferred option for Japanese Knotweed management on the Fassaroe Phase 1 lands'* (RPS, 2022). Specific method statement for managing Japanese Knotweed on Fassaroe Phase 1 lands is described within RPS (2022) Japanese knotweed Management Plan and summarized below:

The proposed Root Barrier Membrane methodology which will occur at Fassaroe Phase 1 lands is as follows:

- *'Map the underground rhizomes (roots) by digging test pits in order to determine the extent of underground infestation or alternatively it can be assumed that underground infestation extends for 7m in all directions from the nearest stem and to 3m depth (NRA, 2010).*
- *Calculate the volume required and excavate site, allowing for 2m depth of burial.*
- *Protect the integrity of the root barrier membrane with a layer of sand and provide shutter ply supports for the edge of the cell.*
- *Put approved Japanese Knotweed root barrier membrane in place, allowing enough material along the edges to eventually provide a seal.*
- *Protect the root barrier membrane from tyre damage with a layer of sand.*
- *Excavate the infested area (as defined above).*
- *Fill the cell with the Knotweed infested soil. No other material, contaminants, or wastes should be included.*
- *Make sure that dedicated vehicles are used and cleaned properly after they have been used. Haulage routes must be protected.*

- *Put the surface of the root barrier membrane in place and make sure the cell is adequately sealed.*
- *Protect the surface of the cell with sand and bury deep enough to prevent disruption in the future.*
- *Following completion of works, monitor re-growth throughout the growing season over the next 4 years (May-September 2023-2027, every 4-6 weeks) or until no further re-growth appears’.*

Five Ground Investigations (G.I) were carried out at the proposed site. Each Ground Investigations were carried out in accordance with Eurocode 7 Part 2: Ground Investigation and testing (ISEN 1997 – 2:2007) and B.S. 5930:2015. Further details of Ground Investigations undertaken at the site are provided in the Chapter 6; Soil, Land and Geology within the EIAR being submitted as part of this planning application.

### 3.3. Proposed Development

The proposed development site is located in predominately agricultural lands in Fassaroe to the west of Bray, Co. Wicklow.

The proposed development comprises of the the construction of 650no. residential units comprising a mix of apartments and houses along with a neighbourhood centre, a crèche, a district park, local parks, the diversion and rerouting of ESB electricity lines, a distributor road connecting to Ballyman Road, a new pedestrian / cycle route across the N11 connecting to Dargle Road, historic landfill remediation works, landscaping works, parking facilities, ancillary services and facilities and associated site development works.

The various elements of the application then include:

- Road link (2.4km) connecting N11 to Ballyman Road (with westerly connection to Ballyman Road already in place).
- Pedestrian / cycle route including bridge across the N11 to Dargle Road Upper.
- 15.3ha of District Park / Active Open Space.
- 650 no. residential units comprising 241 no. houses and 409 no. apartments.
- 3 No. pocket park areas comprising a total of 0.43ha.
- 733sq.m approx. crèche with capacity for approx. 138 no. childcare spaces.
- Retail unit / kiosk (108sq.m.) in district park.
- Neighbourhood Centre Phase 1 comprising:
  - 1,035sq.m. retail
  - 360sq.m. café
  - 480sq.m community concierge (serving entire Fassaroe community)
  - 414sq.m. residential ancillary uses for residents of the neighbourhood centre apartments (residents lounge 256sq.m., residents gym 90sq.m., and residents concierge 68sq.m.)
- Demolition of an existing dwelling at Berryfield Lane.
- Rerouting and undergrounding of overhead ESB lines (110kV and 38kV lines) across site and into existing ESB Substation.
- Site development / ground works on future development areas to ensure sustainable cut and fill balances across the lands
- Water supply, foul and surface water drainage proposals.
- Provisions for public bus services in line with demand towards Bray (DART and Bray bus interchange) and towards the Luas at Cherrywood / Brides Glen.
- Remediation of 5 no. historic landfill sites in line with Certificates of Authorisation issued to Wicklow County Council by the EPA in 2019.

Refer Figure 3.2 for the proposed site layout. Further details of the proposed development and proposed site layout are included within Chapter 2 of the Environmental Impact Assessment Report (EIAR) being submitted as part of this planning application.

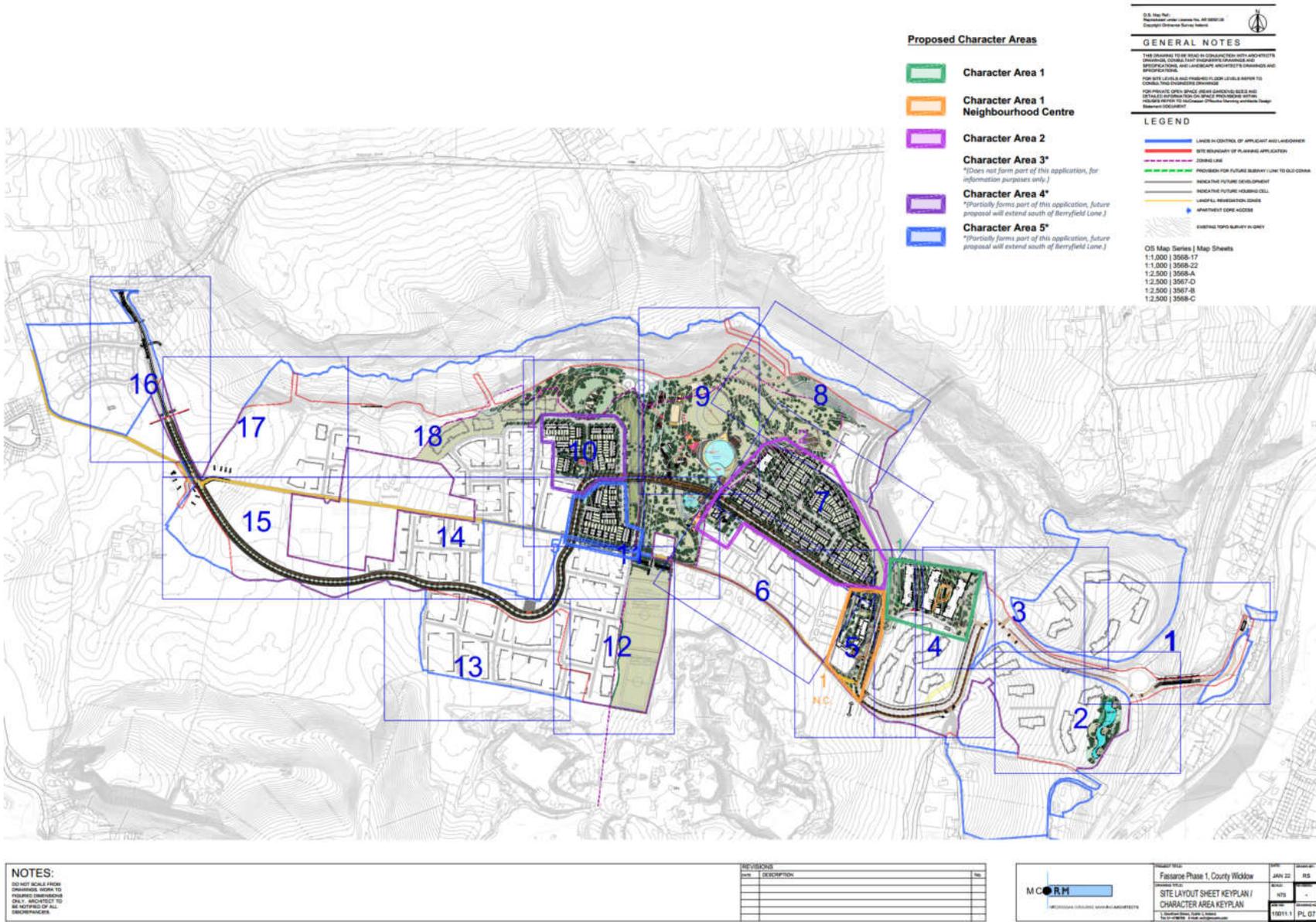


Figure 3-2 - Proposed Site Layout

An existing single storey bungalow is to be demolished as part of the proposed development. Refer to Figure 3.3.

The proposed development will be constructed in 2no. phases; Phase 1a and Phase 1b, as follows:

- Phase 1a Development will involve the following:
  - Site development works including the main spine road linking the development with the existing roads to the east towards the N11 and to the west towards Ballyman link Road;
  - Residential - 296 units consisting of 144 apartments and 152 dwellings; and,
  - District Park including remediation of landfill.
- Phase 1b Development will involve the following:
  - Neighbourhood Centre; and,
  - Residential - 354 units including 265 apartments and 89 dwellings.

The preliminary indicative construction programme is set out in Table 3.1. The construction periods are expected to overlap. A detailed construction programme will be developed once a contractor has been appointed, and construction methodologies and other factors are taken into consideration.

The general sequencing / phasing of works at the site will be as follows:

- Secure site boundaries with temporary fencing;
- Establish contractors' compound(s);
- Demolition works;
- Commence construction of proposed new main access road from eastern side of site to western side of development areas, as far as ESB substation (including provision for rerouted 38kV ESB lines) – including all associated roadside landscaping, drainage and utilities;
- Commence construction of new tower structures and underground route for rerouted twin 110kV lines, and for rerouted 38kV line;
- Commence landfill remediation works at Landfill Sites Nos. 1 & 2 (including provision for rerouted 38kV ESB lines);
- Commence construction of Phase 1a residential zone;
- Continue construction of western end of distributor road to Ballyman Road (including works to and remediation of landfill Site Nos. 3A, 3B and 3C);
- Complete remediation of Landfill Site Nos. 1 and 2 and set out as District Park;
- Construct Kiosk in Creche;
- Complete ESB diversion works and decommission existing;
- Complete remediation of Landfill Site Nos. 3A, 3B and 3C and Link Road;
- Continue / complete Phase 1a development;
- Commence Phase 1b including construction of Creche; and,
- Continue / complete Phase 1b including Neighborhood Centre.

**Table 3-1 - Outline Construction Programme**

<b>Development Element</b>	<b>Approximate Duration</b>	<b>Approximate Timeline</b>
Site Development Works, Distributor Road Construction	12 months	Q3 2022 – Q3 2023
Landfill Remediation, associated landscaping, district park, ESB Diversions	16 months	Q4 2022- Q1-2024
Phase 1a Residential	16 months	Q1 2023 – Q2 2025
Phase 1b Residential	14 months	Q1 2024 – Q2 2025
Neighbourhood Centre	12 months	Q2 2025 - Q3 2026

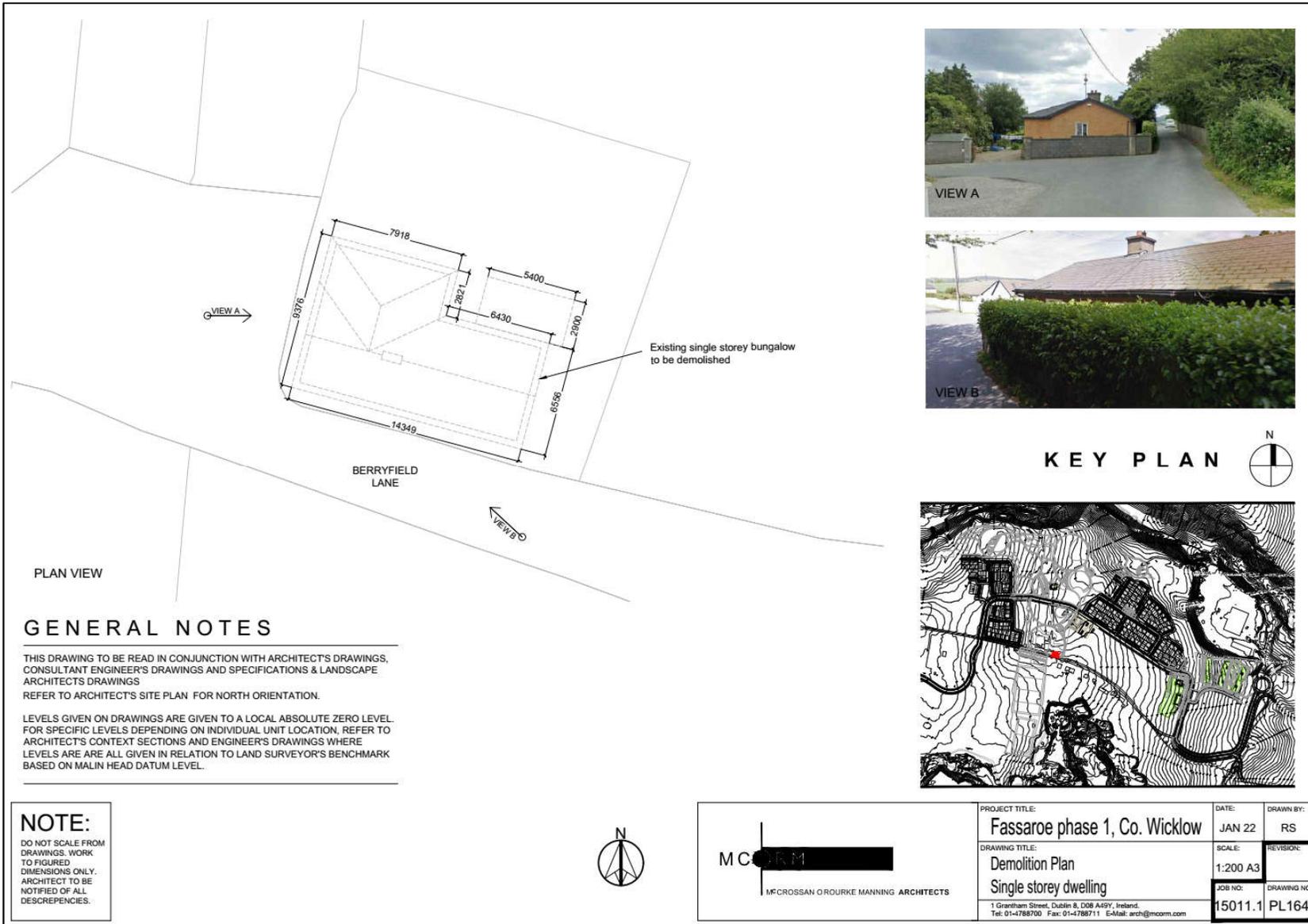


Figure 3-3 - Demolition Plan of the proposed development

### 3.4. Pre- Demolition Works / Phase

An existing single storey dwelling on the northern side of Berryfield Lane will be demolished as part of the proposed development.

Prior to any demolition being undertaken the contractor will need to ensure that the requirements to remove material off site are understood and ensure that appropriate treatment/recovery/recycling is undertaken. Prior to demolition works the following shall be carried out:

1. Completion of an asbestos survey (and offsite removal and disposal of any identified asbestos by specialist contractors); and,
2. Completion of any additional pre-demolition surveys (as may be required);

**Asbestos survey** - An asbestos survey shall be carried out prior to any demolition works taking place. The demolition contractor shall review the asbestos survey report and allow for the specialist removal of asbestos should this be required. Any asbestos material should be removed by a suitably experienced specialist asbestos removal contractor prior to commencement of any demolition or construction works commencing. Asbestos waste should be securely double bagged and removed from site immediately. Asbestos waste will be hazardous and should be transported and disposed of by a specialist waste disposal contractor (i.e. Rilta Environmental Ltd.).

All asbestos removal work must be carried out in accordance with S.I. No. 386 of 2006 Safety, Health and Welfare at Work (Exposure to Asbestos) Regulations 2006-2010. No demolition works will be permitted to commence until written confirmation has been obtained that all structures scheduled for demolition have been certified to be clear of asbestos material.

An intrusive asbestos survey will be carried out prior to any demolition works taking place. This intrusive asbestos survey / report will be provided to the demolition contractor.

**Pre-demolition survey** - In accordance with best practice, a pre-demolition survey will be undertaken by the contractor prior to the commencement of the demolition works. It is intended that estimated waste figures will be determined by the demolition contractor during this phase, based on the results of this survey.

It will be the Contractors responsibility to ensure that all required pre-construction surveys (including an asbestos survey) are completed as required, and that all demolition and construction works are undertaken in accordance with all relevant waste management legislation.

### 3.5. Construction / Demolition Phase

#### 3.5.1. Details of the Non-Hazardous Wastes to be produced

The site is located in predominately agricultural lands. In order to accommodate the proposed district park a single storey dwelling will be demolished. The main waste types expected during the demolition phase will generally be C&D, timber, plaster, tiles, carpet, steel, concrete and metal, glazing. The nominated contractor will need to separate and categorise waste streams as part of their method statement and work practices for this project.

Waste materials generated during the construction stage will primarily comprise topsoil, subsoil and excavated bedrock (via. excavation during the installation of structural foundations, internal roads, drainage networks and underground utilities), surplus general building waste materials, and waste generated by construction workers. Materials will be segregated and recycled where possible; all other materials will be disposed of offsite.

In accordance with good practice, excavated soils will be reused onsite where feasible, including for boundary treatment and landscaping purposes, if suitable. Therefore (subject to appropriate testing), such materials should largely be suitable for onsite reuse.

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

According to the EPA '*Correct classification is the foundation for ensuring that the collection, transportation, storage and treatment of waste is carried out in a manner that provides protection for the environment and human health and in compliance with legal requirements*'. Hence soils requiring offsite disposal must be characterised as per the requirements of the relevant Waste Acceptance

Criteria (WAC) under the European Communities Council Decision ((EC) 92003/33/EC) 'COUNCIL DECISION of 19 December 2002 establishing criteria and procedures for the acceptance of waste at landfills pursuant to Article 16 of and Annex II to Directive 1999/31/EC'. Soils requiring offsite disposal will also require waste classification in strict accordance with the requirements of the EPA as set out in the following document 'Waste Classification List of Waste & Determining if Waste is Hazardous or Non-hazardous' (EPA, 2018). All waste soils removed from site must be transported by appropriately permitted hauliers and must be disposed of to an appropriately authorised disposal / recovery facility (via. valid Certificate of Registration, Waste Facility Permit, or Waste Facility Licence).

### 3.5.2. Details of Potentially Hazardous Wastes to be produced

#### 3.5.2.1. Asbestos Containing Material

An asbestos survey will be conducted on the existing house to be demolished as part of the proposed development during the pre-demolition works phase. It is therefore assumed that any hazardous asbestos containing material / waste (if present) will be removed prior to commencement of the demolition and construction phases, in strict accordance with the requirements outlined previously in Section 3.4.

#### 3.5.2.2. Fuels, Oils and Chemicals

Hazardous materials (fuels, oils and chemicals) will be used at the site during the Construction and Demolition Phases. As per industry standards any fuel and oils temporarily stored onsite will be stored in double skinned / appropriately banded storage tanks, in a secure dedicated fuel storage location onsite. All other chemicals including paints, varnishes, glues, adhesives, degreasing agents and cleaning agents will be securely stored in a dedicated temporary banded chemical store onsite. All machinery including any generators / pumps used onsite should be checked at the start of each work shift for evidence of any fuel or oil leaks (and removed offsite for any repairs as may be required).

Fuel, oil and chemical spill kits should be available at the designated storage areas, along with the relevant Safety Data Sheet (SDS). SDS documents contain information on the potential hazards (health, fire, reactivity and environmental) and how to work safely with the relevant chemical. All site operatives should receive training in appropriate refuelling methods and machinery checks, and chemical handling methods to be implemented onsite.

## 4. Roles & Responsibilities

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

**Table 4-1 - Roles and Responsibilities**

<b>Employer</b>	<b>Planning Agents</b>
The Client: Cosgrave Property Group Email: <a href="mailto:mcosgrave@cosgravegroup.com">mcosgrave@cosgravegroup.com</a> Contact: Michael Cosgrave	The Planner: RPS Tel: (01) 488 2900 Contact: Maria Lombard
<b>Employers Representative</b>	<b>Design Team</b>
The Contractor: to be confirmed Tel: to be confirmed Contact: to be confirmed	Atkins Tel: (01) 810 8000 Contact: Peter Foley
<b>Project Supervisor for the Design Process (PSDP)</b>	<b>Environmental Team</b>
Tel: to be confirmed Contact: to be confirmed	RPS Tel: (01) 488 2900 Contact: Maria Lombard
<b>Project Supervisor Construction Stage (PSCS)</b>	<b>Contractor</b>
Tel: to be confirmed Contact: to be confirmed	The Contractor: to be confirmed Tel: to be confirmed Contact: to be confirmed

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

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

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

### 4.1. Client

The responsibilities of the client are as follows:

- Require the preparation and submission of an RWMP as part of the design and planning submission;
- Require the preparation and submission of an updated RWMP as part of the construction tendering process;
- Ensure that the RWMP is agreed and submitted to the local authority prior to commencement of works on site; and,

- Request the end-of-project RWMP from the Contractor.

## 4.2. Design Team

The responsibilities of the design team are as follows:

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

## 4.3. Contractor

The responsibilities of the contractors are as follows:

- Preparing, implementing and reviewing the RWMP through construction (including the management of all suppliers and sub-contractors) as per the requirements of these guidelines;
- Identifying a designated and suitably qualified Resource Manager (RM) who will be responsible for implementing the RWMP;
- Identifying all hauliers to be engaged to transport each of the resources / wastes off-site;
- End-of-waste and by-product notifications addressed with EPA where required;
- Clarification of any other statutory waste management obligations, which could include on-site processing; Full records of all resources (both wastes and other resources) should be maintained for the duration of the project;
- Carry out training and site inductions; and,
- Preparing a RWMP Implementation Review Report at project handover.

## 5. Design Approach

### 5.1. Design for Reuse and Recycling

The site preparation works will involve the demolition of a single storey dwelling, stripping of topsoil, levelling and excavation for utilities and construction of building foundations and services during the construction phase.

The total volume of cut is ca.136,053m<sup>3</sup> and the volume of fill is ca. 265,800m<sup>3</sup> which will be required for the lane realignments, residential sites, apartment blocks, creche, neighbourhood centre and landscape areas, resulting in a net fill of 129,747m<sup>3</sup>.

For the landfill remediation works, 82,865m<sup>3</sup> of fill is required for the capping layer of the landfills at a depth of 1m and 24,860m<sup>3</sup> of pea gravel for fill is required to a depth of 0.3m.

Waste will require off-site disposal by a licenced waste contractor to a landfill in accordance with the waste hierarchy during the following activities as part of the proposed development:

- At Site 3B, in order to accommodate the access road which will be constructed in cut through the site, it is proposed that all of the waste beneath the pavement layers will be excavated down to clean material– it was estimated the amount of waste to be removed off site would be 6920m<sup>3</sup>;
- The section of the road which traverses Site 2 landfill is to be piled, due to this there will be waste material coming to the surface from the piling operations that will have to be removed off site.
- Remediation of the failed slopes/regrading of slope along Site 2 boundary in the north east of the site. Landfill waste will need to be removed either from failures in slope/benching of proposed capping and regrading of slope to allow stability.

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

As part of the proposed development an existing dwelling at Berryfield Lane will be demolished. The steps outlined Section 3.4 will be carried out before demolition works occurs. The pre-demolition survey will detail the resource recovery best practice, i.e. deconstruction and disassembly where feasible and practicable. The reuse and recycling of deconstructed components, elements and materials must be carried out in compliance with relevant requirements relating to by-product, end-of-waste and waste data reporting. It is recommended that demolition is informed by the European Commission (2018) '*Guidelines for the waste audits before demolition and renovation works of buildings*'. This document provides best practice guidelines for the assessment of waste streams prior to demolition or renovation through pre-demolition audits. The document also provides a series of useful templates for preparing an inventory of materials prior to demolition. The aim of the guidance is to facilitate and maximise recovery of resources from demolition for beneficial reuse and recycling.

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

During the construction, the contractor will review availability of recycled aggregates and other materials in the local area and decide on the most sustainable options, for example, the use of an on-site crusher for recycling of residual concrete to generate aggregates for use on site (subject to the appropriate waste consent, such as an Article 28 end of waste decision and once processing is industry standard practice, such as ensuring the aggregate outputs comply with the specifications of IS EN 13242).

The contractor will review 'new' materials to be used as part of the proposed development, which contain a recommended percentage of recycled content if they meet the functional, performance and regulatory requirements and are available locally at a reasonable cost.

The proposed design has facilitated material reuse and recycling at the end of the building's life. The majority of the materials selected for the project are natural materials such as clay brick and stone. Natural building materials on the whole have less embodied carbon and less embodied energy used in their production and are less likely to emit toxic Volatile Organic Compounds (VOCs) than non-natural materials, ensuring indoor air quality is preserved. The majority of the building's exterior will be constructed with non-painted clay bricks and mortar which will facilitate recycling when and if necessary. Windows are likely to be Unplasticised Polyvinyl Chloride (PVC-U) which is also fully recyclable and can be recycled up to ten times with no material degradation. Some stone details around windows and doors are likely to be constructed reconstituted stone, which is a low maintenance and durable material.

## 5.2. Design for Green Procurement

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

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

- Waste prevention and minimisation during the construction stage;
- Proposed design solutions to encourage innovation in tenders and incentivise competitions to recognise sustainable approaches;
- Use ordering procedures that avoid waste, i.e. no over-ordering, take-back schemes for both material surplus and offcuts;
- Discuss options for packaging reduction with subcontractors and suppliers using measures such as 'Just-in-Time' delivery; and,
- Set reuse and recycling rates.

## 5.3. Design of Off-Site Construction

*'The use of off-site manufacturing reduces residual wastes by up to 90% (volumetric building versus traditional)' (EPA, 2021).*

As part of this proposed development balconies, apartment and house floors are likely to be pre-cast concrete which will reduce the residual volumes of concrete blocks, mortars, plasters, etc.

Using pre-cast hollow-core flooring for the proposed apartment and house floors instead of in-situ ready mix flooring or timber flooring can reduce the residual volumes of concrete/formwork and wood/packaging, respectively.

## 5.4. Design for Material Optimisation

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

Design for material optimisation includes the use of standardised sizes for certain materials to help reduce the amount of offcuts produced on site, focusing on promotion and development of off-site manufacture. For this proposed development the balcony depths are standard sizes, which would enable maximum use of the same formwork in different places. Apartment bathroom types and kitchen types are standardised and repeated when possible, which will facilitate the building process and minimise the number of variables and bespoke elements to enable manufacturing and installation efficiencies. Although a well-considered and varied character area schedule is proposed as discussed in the Architectural Design Statement by MCORM Architects, which is submitted as part of this planning application as part of the planning application documentation, the main material used throughout is clay brick in different shades simplifying the design and built form.

## 5.5. Design for Flexibility and Deconstruction

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

## 6. Key Materials & Quantities

### 6.1. Type of Waste

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

**Table 6-1 - Breakdown of Types of Waste**

Type of waste	Description
Imported material	<p>Where possible, consideration should be given to the re-use of material back into the project development works, however the proposed works would require specific materials to be imported to the site. Any waste produced through the importation of materials needs to be monitored and included in the RWMP under construction works.</p> <p>Where possible, consideration should be given to the use of recycled imported material such as concrete, which has a higher recycled content.</p>
Excavated materials (E)	<p>Materials such as excavated soils should be segregated during the excavation process. Appropriately experienced staff should supervise the excavation works to manage the segregation of soil materials. Site-derived materials of a similar nature should be stockpiled together and any changes in the physical and/or chemical properties should prompt further segregation.</p> <p>Soils should be placed in clearly identified stockpiles and chemical testing undertaken to confirm the potential for re-use on site, or, if considered inappropriate for re-use (due to geotechnical or chemical properties or being surplus), to inform off site treatment and/or disposal routes. Where soil materials meet the geotechnical and chemical criteria for re-use given the proposed end use scenario, such materials may be re-used on site, if required. Any surplus materials should be removed from site for either direct beneficial use elsewhere (such as land remediation schemes) where an application may be made to the EPA under Article 27 of the European Communities (Waste Directive) Regulations 2011 for the use of excess soil as a by-product (if a definite use and need for this material can be determined), or for recycling or recovery at an appropriately permitted off-site facility. Where excavated materials are affected by contamination, such materials should be separated and sent for either treatment, where appropriate, or disposal at appropriately permitted / licenced facilities.</p> <p>Disposal of excavated material will be by licensed carriers, to licensed landfill sites and handled in accordance with the Waste Management Regulations.</p>
Concrete	This waste will be generated by works.
Wood	Packaging such as pallets.
Packaging	From construction materials, etc.
Plastic	Offcuts of pipework/ducting etc.

Vegetation	Re-use of such materials should be considered where possible. E.g. suitable vegetation could be turned into mulch or compost to be re-used in the project for landscape purposes.  If any material deemed acceptable from the enabling works is produced e.g. good quality topsoil, this should be stored and re-laid, within the proposed development or if this is not possible it should be sent for composting.
Metals	Offcuts from reinforced concrete for building foundations.
Paper and Cardboard	Packaging from components delivered to site.
Segregated Hazardous Waste	Nominal 1% to account for packaging that contained hazardous material such as oils, solvents, sealants etc.

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

- Given the site location deliveries/ removals are to phone ahead; 'Just-in-Time' (JIT) delivery processes; receive precise directions and named person to liaise with on site. The Contractor is to erect required signage approaching site and ensure deliveries are programmed to cause minimal disruption;
- Hazardous manual handling operations are to be avoided so far as is reasonably practicable; and,
- Note that waste generated by the project will be managed in compliance with Waste Management Act 1996, Waste Management (amended) Act 2003 and associated Regulations.

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

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

A summary of the main hazardous and non-hazardous waste streams which could arise during both the Demolition and Construction Phases are presented in Table 5.1, along with the relevant List of Waste (LoW) code. The LoW code (also referred to as European Waste Catalogue (EWC) code) serves as a common method of characterising various waste streams. Assignment of waste codes will determine how and where the generated waste can be disposed of. LoW codes must be selected for each waste type – a full description of each code is available on the EPA website<sup>1</sup>.

It should be noted that the summary list presented in Table 6.2 is a non-exhaustive list and it will be the Contractors responsibility to ensure all waste streams generated onsite during the Demolition and Construction Phases for this project are appropriately characterised, managed and disposed of in accordance with all relevant waste management legislation.

**Table 6.2 - Summary list of LoW Codes which may be relevant to the site (See Note 1)**

Waste Material	LoW Code
<b>Concrete, bricks, tiles and ceramics</b>	
Concrete	17 01 01
Bricks	17 01 02
tiles and ceramics	17 01 03
mixtures of concrete, bricks, tiles and ceramics other than those mentioned in 17 01 06	17 01 07

### **Wood, glass and plastic**

<sup>1</sup> <https://www.epa.ie/publications/monitoring--assessment/waste/2019--FULL-template.pdf>

Waste Material	LoW Code
Wood	17 02 01
Glass	17 02 02
Plastic	17 02 03
<b>Bituminous mixtures, coal tar and tarred products</b>	
bituminous mixtures	17 03 02
<b>metals (including their alloys)</b>	
mixed metals	17 04 07
<b>Soil (including excavated soil from contaminated sites), stones and dredging spoil</b>	
soil and stones containing hazardous substances	17 05 03*
soil and stones other than those mentioned in 17 05 03	17 05 04
<b>Gypsum-based construction material</b>	
Gypsum-based construction material	17 08 02
<b>Other construction and demolition wastes</b>	
mixed construction and demolition wastes other than those mentioned in 17 09 01, 17 09 02 and 17 09 03	17 09 04
<b>Wastes from electrical and electronic equipment</b>	
discarded equipment containing chlorofluorocarbons, HCFC, HFC	16 02 11*
discarded equipment containing free asbestos	16 02 12*
discarded equipment containing hazardous components (16) other than those mentioned in 16 02 09 to 16 02 12	16 02 13*
discarded equipment other than those mentioned in 16 02 09 to 16 02 13	16 02 14
hazardous components removed from discarded equipment	16 02 15*
components removed from discarded equipment other than those mentioned in 16 02 15	16 02 16
<b>Miscellaneous Waste</b>	
Paper and cardboard	20 01 01
biodegradable waste (Green waste)	20 02 01
batteries and accumulators included in 16 06 01, 16 06 02 or 16 06 03 and unsorted batteries and accumulators containing these batteries	20 01 33*
batteries and accumulators other than those mentioned in 20 01 33	20 01 34
Waste fuel oil and diesel	13 07 01*
Waste petrol	13 07 02*

Waste Material	LoW Code
Waste other fuels (including mixtures)	13 07 03*
tanks for liquefied gas	16 01 16
hydraulic oils, containing PCBs	13 01 01*
chlorinated emulsions	13 01 04*
non-chlorinated emulsions	13 01 05*
mineral-based chlorinated hydraulic oils	13 01 09*
mineral based non-chlorinated hydraulic oils	13 01 10*
synthetic hydraulic oils	13 01 11*
readily biodegradable hydraulic oils	13 01 12*
other hydraulic oils	13 01 13*
mineral-based chlorinated engine, gear and lubricating oils	13 02 04*
mineral-based non-chlorinated engine, gear and lubricating oils	13 02 05*
synthetic engine, gear and lubricating oils	13 02 06*
readily biodegradable engine, gear and lubricating oils	13 02 07*
other engine, gear and lubricating oils	13 02 08*
Chemicals – Solvents	20 01 13*
Chemicals – Pesticides	20 01 19*
Chemicals - paint, inks, adhesives and resins containing hazardous substances	20 01 27*
Chemicals - paint, inks, adhesives and resins other than those mentioned in 20 01 27	20 01 28
Chemicals - detergents containing hazardous substances	20 01 29*
Chemicals - detergents other than those mentioned in 20 01 29	20 01 30
fluorescent tubes and other mercury-containing waste	20 01 21*
insulation materials other than those mentioned in 17 06 01 and 17 06 03	17 06 04
wastes from asbestos-cement manufacture containing asbestos	10 13 09*
wastes from asbestos-cement manufacture other than those mentioned in 10 13 09	10 13 10

*Note 1: The use of an asterisk on a LoW code denotes that the material is characterised as hazardous.*

### 6.3. Demolition Waste Generation

The proposed development includes demolition of a single storey dwelling which will result in the generation of the following waste streams: hardcore, concrete, steel, tiles, carpet/carpet, mixed C&D, wood, timber, metals etc.

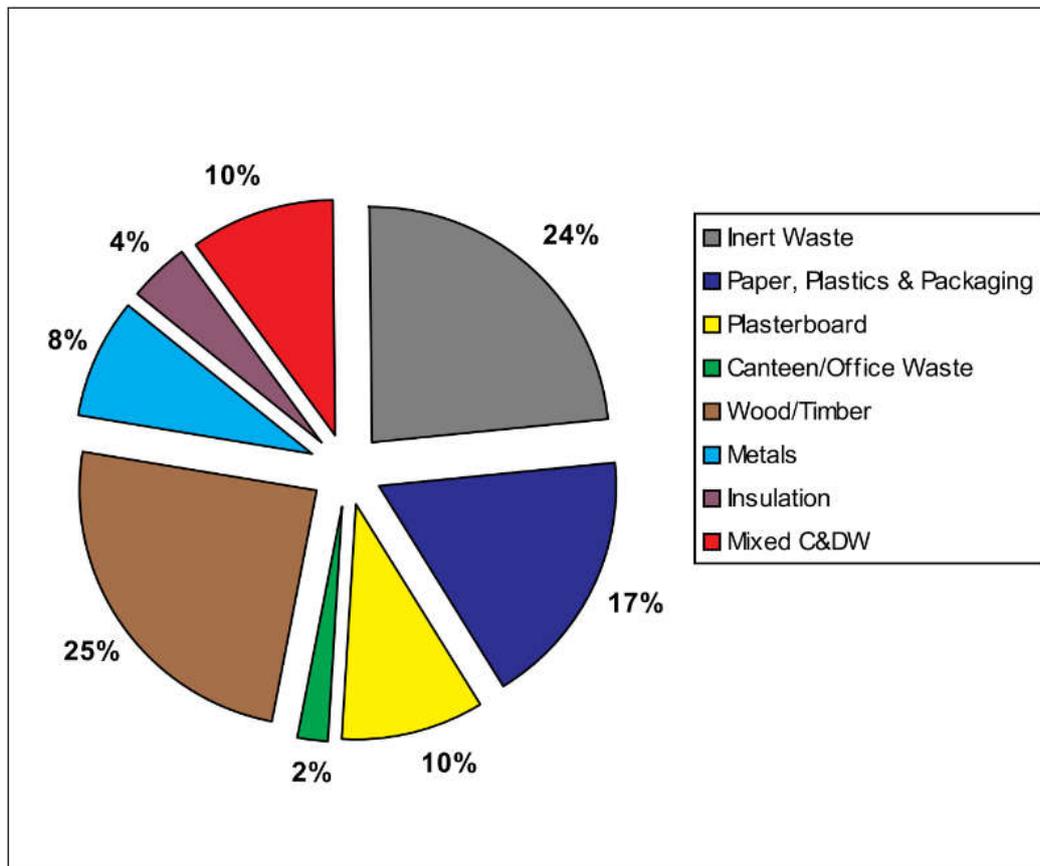
Prior to any demolition being undertaken the contractor will need to ensure that the requirements to remove material off site are understood and ensure that appropriate treatment/recovery/recycling is undertaken. The Contractor will be required to ensure that all demolition materials are managed, stored and disposed of in an appropriate manner in accordance with all relevant waste legislation. An Asbestos survey shall be carried out prior to any demolition works taking place, as outlined in this report. No demolition works will be permitted to commence until written confirmation has been obtained that all structures scheduled for demolition have been certified to be clear of asbestos material.

In accordance with best practice, a pre-demolition survey will be undertaken by the contractor prior to the commencement of the demolition works. It is intended that estimated waste figures will be determined by the demolition contractor during this phase, based on the results of this survey, and the Contractors proposed demolition methodology.

Final waste volumes arising from the pre-demolition surveys and demolition works can only be confirmed via. site audited waste disposal / recovery records. It is understood that all the waste arising from the demolition works will be transported off site by an approved waste contractor holding all the necessary waste collection and transportation permits.

## 6.4. Construction Waste Generation

A typical breakdown of C&D wastes generated during construction of this development type in Ireland is presented in Figure 6.1 (EPA, 2009). This figure indicates the percentage breakdown of waste from new residential construction.



**Figure 6.1 - New residential construction composition by volume (m3) (C&D Waste) (EPA, 2009).**

Taking account of an average generated waste factor of 0.107m<sup>3</sup> per m<sup>2</sup> (of completed floor space) for 'new residential construction' (EPA, 2009)<sup>2</sup>, and based on the building floor space areas for the

<sup>2</sup> Waste factor based on EPA audited data from new social infrastructure construction sites (2004 to 2005). EPA STRIVE Report Series 26 (2009) [https://www.epa.ie/publications/research/waste/STRIVE\\_26\\_Kelly\\_ConstructionWaste\\_syn\\_web.pdf](https://www.epa.ie/publications/research/waste/STRIVE_26_Kelly_ConstructionWaste_syn_web.pdf)

proposed development preliminary waste volumes have been calculated and are estimated to be ca. 14,060m<sup>3</sup> or 12,261 tonnes.

The total estimated C&D waste volume of 14,060m<sup>3</sup> (12,261 tonnes) has been further broken down into various waste streams tonnages, as presented in Table 6.3. This calculation is based on representative data gathered during a case study of waste composition arising from a new residential infrastructure construction (EPA, 2009) (refer to Figure 5.1). Volumes have been converted to tonnes using factors obtained from relevant UK waste guidance<sup>3</sup>.

It is noted that these volumes are based on literature values for representative Irish construction sites and are an approximate guideline only. In addition, no specific allowance has been made for C&D waste arising from the construction of access roads, utilities and services. Final volumes can only be confirmed via. site audited waste disposal / recovery records.

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<sup>3</sup> [http://www.sustainabilityexchange.ac.uk/conversion\\_factors\\_for\\_calculation\\_of\\_weight\\_to\\_vol\\_end](http://www.sustainabilityexchange.ac.uk/conversion_factors_for_calculation_of_weight_to_vol_end)

**Table 6.3 - Predicted Construction Waste Volume and Breakdown for each Waste Stream**

Estimated Waste Stream - Breakdown (tonnes)

Property	Estimated Volume of C&D Waste (m3)	Mixed Waste C&D (tonnes)	Wood Timber (tonnes)	Plasterboard (tonnes)	Metals (tonnes)	Paper, Plastics & Packaging (tonnes)	Canteen / Office Waste (tonnes)	Inert Waste (tonnes)	Insulation (tonnes)
House	4361	523	763	436	419	445	65	1047	105
Apartments	9359	1123	1638	936	898	955	140	2246	225
Retail	149	18	26	15	14	15	2	36	4
Creche	78	9	14	8	8	8	1	19	2
Kiosk	12	1	2	1	1	1	0	3	0
Amenities (Gym, Concierge) etc.	102	12	18	10	10	10	2	24	2
<b>Total Tonnes</b>	<b>12261</b>	<b>1687</b>	<b>2461</b>	<b>1406</b>	<b>1350</b>	<b>1434</b>	<b>211</b>	<b>3374</b>	<b>337</b>

Each waste stream will be managed onsite as follows. Table 6.4 shows the potential recycling/re-use targets of each waste stream for the proposed project.

#### Native Non-Contaminated Soils

The total volume of cut is ca.136,053m<sup>3</sup> and the volume of fill is ca. 265,800m<sup>3</sup> which will be required for the lane realignments, residential site, apartment blocks, creche, neighbourhood centre and landscape areas, resulting in a net fill of 129,747m<sup>3</sup>.

For the landfill remediation works, 82,865m<sup>3</sup> of fill is required for the capping layer of the landfills at a depth of 1m and 24,860m<sup>3</sup> of pea gravel is required to a depth of 0.3m.

#### Mixed C&D Waste

Following segregation onsite, any residual mixed C&D waste (est.: 1,687 tonnes) will be collected in containers specifically for mixed C&D waste; these will be removed offsite for subsequent offsite separation and disposal at a waste disposal / recovery facility.

#### Wood / Timber

Timber waste (est.: 2,461 tonnes) will be segregated to prevent contamination by other wastes and will be stored to limit the potential for this material to rot. Wooden pallets will be returned to relevant suppliers where possible. Timber offcuts will be reused onsite where feasible. A covered receptacle for waste wood will be placed in the waste storage area, prior to removal from site for recycling. All such timber will be free from chemical treatment.

#### Metals

Metal waste (est.: 1,350 tonnes) will be generated during the project, particularly arising from the use of rebar. All waste metal will be segregated offsite at the waste disposal / recovery facility for reuse and recycling. Given the significant scrap value associated with metal waste, this waste will be stored in a dedicated container within a secure part of the site, and regular collections from site to the waste recycling facility will limit the potential for unauthorised entry and theft.

#### Paper, plastics and Packaging

Packaging wastes (est.: 1,434 tonnes) will be removed (paper / cardboard / plastic / general waste) offsite for subsequent offsite separation and disposal at a waste disposal / recovery facility. Waste packaging will be stored in dedicated containers in the waste storage area for collection and subsequent segregation and recycling.

#### Canteen / Office Waste

Onsite staff office and welfare facilities will generate food and packaging waste (est.: 211 tonnes). Dedicated containers will be provided at each canteen to permit easy segregation of these wastes; brown bins will be provided for compostable food waste, green bins will be provided for dry recyclables (packaging, hard plastic, paper, cardboard, tetrapak etc.) and black bins will be provided for any residual waste.

#### Other wastes

In addition to the above waste streams other waste materials (est. 5,118 tonnes) will be generated during the construction phase. These residual wastes will typically comprise non-recycling waste such as soiled paper / cardboard / plastics / cloth, canteen food waste, fibreglass, polystyrene insulations and plasterboard. These materials will be stored separately to all other waste streams to prevent any cross contamination.

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

Waste type	Recycling/ Reuse %* (*WRAP best practice recovery rates)
Imported material	70-90
Excavated material	100
Concrete, track ballast etc	50-90
Wood	90

Packaging	95
Asphalt (non-hazardous)	100
Metals	100
Paper and Cardboard	100
Foul waste	100

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

#### 6.4.1. Tracking and Documentation Procedures for Off-Site Waste

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

#### 6.4.2. Construction Waste Management Costs

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

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

# 7. Site Management

## 7.1. Resource Manager - Responsibilities

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

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

## 7.2. Site Compound Location

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

The exact location of the compound area will be agreed with the appointed contractor and Wicklow County Council prior to the commencement of development and will be used throughout the construction period. However the site compound is likely to be located on the site of the proposed Neighbourhood Centre as the Neighbourhood Centre will be constructed in the final stages of the development proposed. The site compound will also act as a storage centre for construction materials. The location of the site compound should be selected to avoid any potential impacts to environmental receptors and to reduce any potential for impact on sensitive human.

## 7.3. Training

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

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

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

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

### 7.3.1. Disposal / Recycling Proposals for Each Waste Stream

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

All waste materials generated during the Construction Phases must be removed offsite to an appropriately permitted or licenced waste disposal / recovery facility.

### 7.3.2. Proposed Management Strategy for each Waste Stream

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

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

These principles are applied to the RWMP through both the pre-construction phase and the construction phase. Therefore, every effort should be made to prevent and limit the amount of waste generated at the very outset of the project. At the preparatory phase of the Construction Phase and Demolition Phase the following measures will aid the prevention of waste in the first instance;

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

## 7.4. Record Keeping

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

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

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

- For each movement of resource off-site, a signed docket/invoice will be obtained by the RM from the haulier/contractor detailing the following:
  - Name the resource / waste stream;
  - List of Waste (Low) Code for each stream (where applicable); and,
  - Quantity of material moved off-site by the haulier/contractor (tonnes).
- The name and authorisation of the haulier to transport the material – in the case of a ‘waste’ this requires a valid Waste Collection Permit (WCP). In the case of by-product or other materials

that are not a waste, no WCP is required. In both cases the vehicle registration number should also be recorded for each load of material removed from site;

- The name and authorisation of the destination site for the resource – again for a ‘waste’ this requires a valid Cert of Registration, Waste Permit or Waste Licence and in the case of by-product the relevant by-product determination;
- The waste contractors must be required to provide details of end-use or waste treatment in waste reports;
- This recording will be carried out for each resource type and the system will also be linked with the delivery records. In this way, the percentage of residual resource generated for each material can be determined; and,
- The system will allow the comparison of these figures with the targets established for the prevention, reuse and recovery of resources to highlight successes or failures against these targets.

## 7.5. Communications

The following communication tasks are recommended for the Resources Manager through the construction and demolition phases as per the EPA (2021) guidelines:

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

## 7.6. Outline Waste Audit Procedures

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

- When materials arrive on site, they will be properly recorded including the assignment of such materials to specific uses within the works;
- A review will be undertaken of onsite waste management practices to identify any improvements which may be required;
  - *‘Ensure adequacy of site signage and need for any repairs or upgrades.*
  - *Adequacy of storage infrastructure and need for any repairs or upgrades.*
  - *Compliance with resource segregation protocols and observed contamination in any resource streams.*
  - *Assessment of observed Contractor and Sub-contractor work practices for compliance with the RWMP’ (EPA, 2021).*
- Onsite waste management processes / material management from materials delivery through to waste disposal / recovery (including the quantity, type and composition of all waste) will be reviewed to identify any opportunities for waste reduction;

- Corrective actions will be highlighted and implemented following each audit. Such actions include applying 'lessons learned' regarding efficient waste management on this project to other projects in the future to enable further waste reduction; and
- The key steps and findings from each waste audit should be presented in a summary report.

## 8. Consultation with Relevant Bodies

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

- Wicklow County Council (as the relevant local authority for waste matters);
- The EPA (as the relevant regulatory body for environmental matters);
- NWCPO;
- Permitted hauliers; and,
- Suitably permitted / licenced waste disposal / recovery facilities.

## 9. References

- Atkins (2022) Construction Environmental Management Plan
- Bray Municipal District Local Area Plan 2018-2024 (WCC, 2018)
- Department of Environment, Heritage and Local Government (DoEHLG), 2006 'Best Practice Guidelines on the Preparation of Waste Management Plans for Construction & Demolition Projects'
- DoELG, 1998. 'A Policy Statement – Waste Management - Changing our ways'.
- DoELG, 2002. 'Preventing and Recycling Waste: Delivering Change'
- EC, 2011. European Commission (Waste Framework Directive) Regulations 2011 (S.I 126 of 2011) (EC, 2008).
- EC, 2011. European Communities (Birds and Natural Habitats) Regulations, 2011 (S.I. No. 477 of 2011).
- Environmental Protection Agency (EPA), 2022. EPA Envision webmapping. Available at <http://gis.epa.ie/Envision>. Consulted February 2022
- EPA (2021) 'Best Practice Guidelines for the preparation of resources & waste management plans for construction & demolition projects'
- EPA, 2009. 'Development of an Audit Methodology to Generate Construction Waste Projection Indicators for the Irish Construction Industry'. STRIVE Report Series No. 26.
- EPA, 2014. 'Green Procurement: Guidance for the Public Sector'.
- EPA, 2015. 'A review of Design and Construction Waste Management Practices on Selected Case Studies – Lessons Learned'.
- EPA, 2015. 'Design out Waste: Preparation of Waste Reduction Factsheets for Design Teams'.
- EPA, 2015. 'Waste Classification: List of Waste & Determining if Waste is Hazardous or Non-Hazardous'.
- EU, 2014. European Union (Waste Electronic Equipment) Regulations 2008 (S.I. 556/2008) (as amended).
- European Communities Council Decision (EC), 2003. 'COUNCIL DECISION of 19 December 2002 establishing criteria and procedures for the acceptance of waste at landfills pursuant to Article 16 of and Annex II to Directive 1999/31/EC' (2003/33/EC).
- RPS (2018) Environmental Risk Assessment Report
- RPS (2022) Historic Landfill Remediation Strategy Report
- RPS (2022) Japanese knotweed Management Plan
- Waste Electrical and Electronic Equipment Directive 2002/96/EC (as amended)
- Wicklow County Council (WCC), Wicklow County Development Plan 2016-2022
- WRAP, 2018. 'Capacity Requirements'. Available at: <http://www.wrap.org.uk/sites/files/wrap/Flats%20recycling%20capacity%20guidance.pdf>

**WS Atkins Ireland Limited**

Atkins House  
150 Airside Business Park  
Swords  
Co. Dublin  
K67 K5W4

Tel: +353 1 810 8000

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