APPENDIX 4-3

CONSTRUCTION & DEMOLITION WASTE MANAGEMENT PLAN

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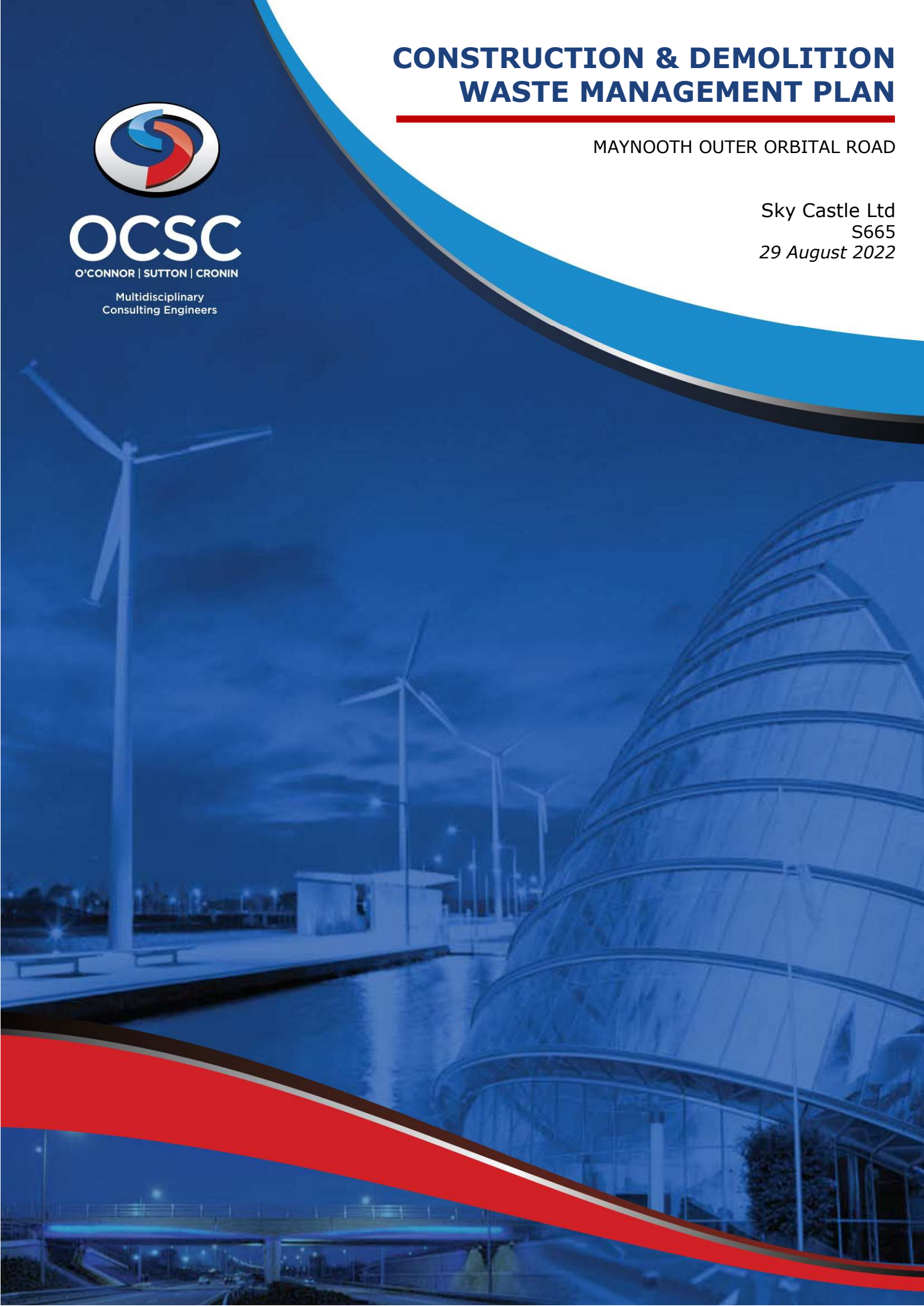
MAYNOOTH OUTER ORBITAL ROAD

Sky Castle Ltd
S665
29 August 2022

OCSC
O'CONNOR | SUTTON | CRONIN
Multidisciplinary
Consulting Engineers



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NOTICE

DOCUMENT CONTROL & HISTORY

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1 INTRODUCTION

APPOINTMENT

O'Connor Sutton Cronin & Associates (OCSC) have been appointed by Sky Castle Ltd to carry out the design of the civil engineering services associated with the development of the proposed Maynooth Outer Orbital Road (MOOR) on lands at Moygaddy, Co. Meath, which is located northeast of the town of Maynooth, Co. Kildare.

SETTING

Maynooth environs is a large growth area, category II Town status located in south County Meath, and is an economically vibrant area with high-quality transport links to larger towns/cities. The Meath Development Plan 2021-2027 outlines the social, economic, and planning context for the Maynooth environ lands, setting the framework for the plan's policies and objectives. It has a core strategic vision that seeks to ensure that future growth is based on principles of sustainable development that meet the needs of residents per National and Regional guidelines. The environs of Maynooth is a Core Economic Area included in the Gateway Core Economic Area located on the M4 corridor. The wider Maynooth Environs Lands proposed land-use zoning includes A2 – New Residential, E1 – Strategic Employment Zones, G1 – Community Infrastructure, D1 – Tourism and H1 – High Amenity.

The delivery of the Maynooth Outer Orbital Route (MOOR) is critical to facilitating residential, high-end employment, tourist, and leisure development in the Maynooth environ lands and fulfilling the transport infrastructure needs in proximity to Maynooth University and Maynooth town.

ADMINISTRATIVE JURISDICTION

The proposed development is located primarily in the jurisdiction of Meath County Council (MCC), and therefore the Maynooth Outer Orbital Route design and the associated civil engineering services were carried out with reference to the following:

- Meath County Development Plan 2021-2027;
- Maynooth Environs Local Area Plan 2014 (incorporated into adopted MCDP);
- Regional Spatial and Economic Strategy for the Eastern and Midland Region (2019);

Even though Maynooth Environs is situated in the Meath County Council administrative area, the Maynooth Environs Local Area Plan contains an objective to liaise with Kildare County Council in the identification, design, reservation and delivery of the section of the Maynooth Outer Relief Road located within the administrative area of Meath County Council. The administrative area of Kildare County Council is located immediately adjacent to the LAP environs lands and some infrastructure improvements will be located within the Kildare County Council (KCC) administrative area. Therefore, the design will also be conducted with due regard to:

- Maynooth LAP
- Kildare County Development Plan
- Maynooth Traffic Management Plan

OVERVIEW AND PURPOSE OF THE CDWMP

This report sets out the Outline Construction & Demolition Waste Management Plan (CDWMP) for the proposed development site. This CDWMP is a preliminary plan written by OCSC multidisciplinary design engineers and will be finalised after the granting of planning permission.

The purpose of this plan is to provide information necessary to outline the final management of Construction and Demolition (C&D) Waste at the site and that this is undertaken in accordance with current legal and industry standards including the *Waste*

Management Acts 1996 - 2013 and associated Regulations 1, *Protection of the Environment Act 2003* as amended with EPA Acts 1992 to 2013 2, *Litter Pollution Act 1997* as amended 3 and the *relevant Waste Management Plans and to* provide information necessary to ensure that the management of waste produced by the site is carried out in accordance with all current legal and environmental standards. This report has been prepared in accordance with the 'Best Practice Guidelines for the Preparation of Construction & Demolition Waste Management Plans for Construction and Demolition Projects' document produced by the Environmental Protection Agency.

The primary legislative instruments that govern waste management in Ireland and are applicable to the project are:

- Waste Management Act 1996 (No. 10 of 1996) as amended. Sub-ordinate legislation includes: European Communities (Waste Directive) Regulations 2011 (SI 126 of 2011) as amended
- Waste Management (Collection Permit) Regulations (S.I No. 820 of 2007) as amended
- Waste Management (Facility Permit and Registration) Regulations 2007, (S.I No. 821 of 2007) as amended
- Waste Management (Licensing) Regulations 2004 (S.I. No. 395 of 2004) as amended
- Waste Management (Packaging) Regulations 2014 (S.I. 282 of 2014) as amended
- Waste Management (Planning) Regulations 1997 (S.I. No. 137 of 1997)
- Waste Management (Landfill Levy) Regulations 2015 (S.I. No. 189 of 2015)
- European Union (Waste Electrical and Electronic Equipment) Regulations 2014 (S.I. No. 149 of 2014)
- European Union (Batteries and Accumulators) Regulations 2014 (S.I. No. 283 of 2014) as amended
- Waste Management (Food Waste) Regulations 2009 (S.I. 508 of 2009), as amended
- European Union (Household Food Waste and Bio-waste) Regulation 2015 (S.I. No. 191 of 2015)
- Waste Management (Hazardous Waste) Regulations, 1998 (S.I. No. 163 of 1998) as amended
- Waste Management (Shipments of Waste) Regulations, 2007 (S.I. No. 419 of 2007) as amended

- Waste Management (Movement of Hazardous Waste) Regulations, 1998 (S.I. No. 147 of 1998)
- European Communities (Transfrontier Shipment of Waste) Regulations 1994 (SI 121 of 1994)
- European Union (Properties of Waste which Render it Hazardous) Regulations 2015 (S.I. No. 233 of 2015) as amended
- Environmental Protection Act 1992 (No. 7 of 1992) as amended.
- Litter Pollution Act 1997 (No. 12 of 1997) as amended.
- Planning and Development Act 2000 (No. 30 of 2000) as amended

One priority of the CDWMP shall be to promote recycling, reuse and recovery of waste and diversion from landfills wherever possible. Guidance will also be given to ensure the appropriate method of transportation of waste is used to prevent littering or other serious environmental pollution. This plan aims to ensure maximum recycling, reuse and recovery of waste with a diversion from landfills, wherever possible. It also seeks to provide guidance on the appropriate collection and transport of waste from the site to prevent issues associated with litter or more serious environmental pollution (e.g. contamination of soil and/or water).

In preparation for the CDWMP, the following publications have been used as references:

- BEST PRACTICE GUIDELINES for the preparation of construction & demolition waste management plans for construction & demolition projects. Environmental Protection Agency 2021.
- Construction and Demolition waste management - A handbook for contractors and site managers, FAS and the construction industry federation 2002.
- In tandem with the launch of the National Construction and Demolition waste council, the Department of the Environment, Heritage and Local Government published the "Guidelines for preparation of waste management plans for construction and demolition projects".
- BS 10175:2011+A2:2017, Investigation of potentially contaminated sites, Code of Practice.
- EPA, 2015, Waste Classification, List of Waste & Determining if Waste is Hazardous or Non-hazardous.

- EPA 2013, Guidance on the Management of Contaminated Land and Groundwater at EPA Licensed Sites.
- EPA 2007, Code of Practice, Environmental Risk Assessment for Unregulated Waste Disposal Sites.
- EA, 2015, Guidance on the classification and assessment of waste, Technical Guidance WM3.
- EA, 2019, Land Contamination: Risk Management (CLRM).

These guidelines cover issues to be addressed from the preplanning stage right through to completion. These include:

- Predicted Construction and demolition wastes;
- Classification of material;
- Waste disposal/recycling of construction & demolition wastes at the site;
- List of the sequence of operations to be followed;
- Provision of training for waste managers and site crew;
- Details of the proposed record-keeping system;
- Details of waste audit procedures and plans;
- Details of consultation with relevant stakeholders.

OVERVIEW OF C&D WASTE MANAGEMENT IN IRELAND

Directive 2006/12/EC (repealed with effect from 12th of December 2010) of the European Parliament and of the Council of 19th November 2008 on waste and Directive 2008/98/EC (amended by Directive (EU) 2018/851 and approved by the EU in July 2018, and transposed into Irish Law in July 2020) which is transposed into Irish law by the Waste Management Acts and the European Communities (Waste Directive) Regulations 2011 (the "Waste Directive Regulations") in addition the national legislation is relevant.

The European council of ministers has adopted the revised waste framework directive, a decision that means member states will now be expected to reach a 70% recycling rate for non-hazardous construction and demolition by 2020. The Waste Directive 2008/98, which is transposed into Irish law by the Waste Management Acts and the

European Communities (Waste Directive) Regulations 2011 (the "Waste Directive Regulations") states that uncontaminated soil and other naturally occurring material excavated in the course of construction activities where it is certain that the material will be used for the purposes of construction in its natural state on the site from which it was excavated will not be deemed to be waste. If it is used on a site elsewhere, it may or may not be waste depending on the individual circumstances of the case. It will not be waste if there is no intention to discard it.

The Third Schedule to the Waste Management Acts lists activities commonly regarded as disposal activities while common recovery activities are listed in the Fourth Schedule. Broadly, disposal means getting rid of waste forever by, for example, landfilling it or burning it without recovering the energy from it.

Directive 2008/98/EC lays down the five-step hierarchy of waste management options, with waste prevention as the preferred option, followed by re-use, recycling, recovery and safe disposal, in descending order.

The five-stage waste hierarchy, which is designed to prevent and reduce waste production, is made more certain and comprehensive and moved to a more prominent place in the Waste Directive 98/2008. Article 7 of the Waste Directive Regulations 2011, which came into force on March 31, 2011, transposes the waste hierarchy into Irish law. It is understood that it is not proposed to reuse any material on site with the possible exception of rubble from the demolition works. These will be confirmed by the Contractor and completed in accordance with all legislation. In addition, the directive also deals with the issue of "end of waste" and "by-products" and clarifies the definitions of recovery, disposal and by-product.

The Irish Government issued a policy statement in September 1998 known as 'Changing Our Ways', which identified objectives for the prevention, minimisation, reuse, recycling, recovery and disposal of waste in Ireland. The target for C&D waste in this report was to recycle at least 50% of C&D waste within a five-year period (by 2003), with a progressive increase to at least 85% over fifteen years (i.e. 2013). In response to the Changing Our Ways report, a task force (Task Force B4) representing the waste sector of the already established Forum for the Construction Industry, released a report

entitled 'Recycling of Construction and Demolition Waste' concerning the development and implementation of a voluntary construction industry programme to meet the Government's objectives for the recovery of C&D waste.

The most recent national policy document was published in July 2012, entitled 'A Resource Opportunity - Waste Management Policy in Ireland'. This document stresses the environmental and economic benefits of better waste management, particularly in relation to waste prevention. The document sets out a number of actions in relation to C&D waste and commits to undertake a review of specific producer responsibility requirements for C&D projects over a certain threshold.

The Environmental Protection Agency published a guidance document in 2021 BEST PRACTICE GUIDELINES for the preparation of construction & demolition waste management plans for construction & demolition projects. These guidelines outline the issues that need to be addressed from the pre-planning stage of development all the way through to its completion. These guidelines have been followed in the preparation of this document and include the following elements:

- Predicted C&D wastes and procedures to prevent, minimise, recycle and reuse wastes;
- Waste disposal/recycling of C&D wastes at the site;
- Provision of training for a waste manager and site crew;
- Details of the proposed record-keeping system;
- Details of waste audit procedures and plan; and
- Details of consultation with relevant bodies i.e. waste recycling companies

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

LEGISLATIVE REQUIREMENTS

WASTE MANAGEMENT ACTS, 1996 AS AMENDED AND REGULATIONS MADE UNDER THE ACTS

Waste management in Ireland is subject to EU, national and regional waste legislation which defines how waste materials must be managed, transported and treated. The overarching EU legislation is the Waste Framework Directive (2008/98/EC) which is transposed into national legislation in Ireland. The cornerstone of Irish waste legislation is the Waste Management Act 1996 (as amended).

In addition, the Irish government issues policy documents which outline measures aimed to improve waste management practices in Ireland and help the country to achieve EU targets in respect of recycling and disposal of waste. The most recent policy document A Resource Opportunity – Waste Management Policy in Ireland was published in 2012 and stresses the environmental and economic benefits of better waste management, particularly in relation to waste prevention.

The strategy for the management of waste from the construction phase is in line with the requirements of the Best Practice Guidelines for the Preparation of Waste Management Plans for Construction and Demolition Projects published in 2021. The guidance document Construction and Demolition Waste Management: A handbook for Contractors and Site Managers were also consulted in the preparation of this assessment.

The Waste Management Act, of 1996 (as amended) sets out the responsibilities and functions of various persons in relation to waste. In summary the act:-

- Prohibits a person from holding, transporting, recovering or disposing of waste in a manner which causes or is likely to cause environmental pollution.
- Requires any person who carries out activities of an agricultural, commercial or industrial nature to take all such reasonable steps as are necessary to prevent or minimise the production of waste.

- Prohibits the transfer of waste to any person other than an authorised person (i.e. a holder of a waste collection permit or a local authority.)
- Requires the environmental protection agency (EPA) to make a national plan in relation to hazardous waste.
- Requires local authorities to make waste management plans in relation to non-hazardous waste.
- Imposes certain obligations on local authorities to ensure that a service is provided for the collection of household waste and to provide facilities for the recovery and disposal of such waste;
- Enables the minister of the environment and local government to make regulations for various purposes to promote better waste management and provides for substantial penalties for offences including fines, imprisonment and/or liability for clean-up measures.

There are currently no Irish guidelines on the assessment of operational waste generation and guidance is taken from industry guidelines, plans and reports including the EMR Waste Management Plan 2015 – 2021 and BS 5906:2005 Waste Management in Buildings – Code of Practice.

WASTE MANAGEMENT (COLLECTION PERMIT) REGULATIONS, 2007 AS AMENDED

Waste from the proposed development may only be collected by the holder of a waste collection permit or a local authority. The effect of s.34 of the Waste Management Acts is that waste (whether hazardous or not) should only be given to a haulier or collector who has the correct permit under the Waste Management (Collection Permit) Regulations 2008 (the "Waste Collection Permit Regulations"), or whatever regulations amend or replace them, to collect and transport the particular waste in question, or to a local authority.
Waste storage and collection areas on site should be designed to prevent environmental pollution.

WASTE MANAGEMENT (SHIPMENTS OF WASTE) REGULATIONS 2007 S.I. NO. 419

Where waste from the proposed development is exported outside of Ireland for recovery or disposal the national TFS office within Dublin City Council must be notified. Certain financial guarantees must be in place and certificates issued by the national TFS officer prior to the waste movement taking place. If the waste involved is hazardous, the contractor must ensure that it complies with the Waste Management (Hazardous Waste) Regulations 1998 (as amended) and the European Communities (Shipments of Hazardous Waste exclusively within Ireland) Regulations 2011, unless it is exempted from compliance with those Regulations under art.35 of the Collection Permit Regulations. Hazardous waste can only be given to a collector or haulier with a collection permit under the Waste Collection Permit Regulations and the collector or haulier must bring the waste to a licensed hazardous waste management facility and ensure that it is shipped within Ireland in accordance with the stringent requirements of the European Communities (Shipments of Hazardous Waste exclusively within Ireland) Regulations 2011 and/or exported from Ireland in accordance with the Waste Management (Shipments of Waste) Regulations 2007 (as amended) and Council Regulation (EC) No. 1013/2006 on shipments of wastes, as amended (the "TFS Regulations").

POLICIES AND GUIDANCE – A HISTORY

DOEHLG – WASTE MANAGEMENT CHANGING OUR WAYS (SEPTEMBER 1998)

The October 1998 policy statement on waste management – "changing our ways" – outlines the government's policy objectives in relation to waste management and suggests some key issues and considerations that must be addressed in order to achieve these objectives. In particular, it focuses on the need to give clear and particle expression to the requirements of the hierarchy, by developing and pursuing integrated solutions, which combine progressive policies with a suitable and cost-effective waste infrastructure.

Changing our ways set the following ambitions targets for achievement over a fifteen-year time scale.

- A diversion of 50% of overall household waste away from landfill
- A minimum 65% reduction in biodegradable municipal wastes consigned to landfill
- The development of composing and other feasible biological treatment facilities capable of treating up to 300,000tonnes of organic waste annually.
- Materials recycling of 35% of municipal waste.
- Recovery of at least 50% of construction and demolition waste within a five-year period, with a progressive increase to at least 85% over fifteen years.
- Rationalisation of municipal waste landfills with progressive and sustained reductions in numbers, leading to an integrated network of some 20 or so state-of-the-art facilities incorporating energy recovery and high standards of environmental protection.

DOEHLG – PREVENTING AND RECYCLING WASTE – DELIVERING CHANGE – A POLICY STATEMENT (2002)

The government added to the messages presented in waste management "changing our ways" with the publication of preventing and recycling waste – delivering change 2002. In addition to setting objectives, the policy statement set out how these might be achieved through investment from the national development plan in waste infrastructure. The key objectives of the policy statement are:

- The setting up of a market development group focusing on markets for recyclables.
- Formulating a national strategy on biodegradable waste policy.
- Expansion of the network of civic amenity sites and materials recycling facilities.

DOEHLG – WASTE MANAGEMENT – TAKING STOCK AND MOVING FORWARD (2004)

Waste management – taking stock and moving forward reviews progress of implementing key policies including the national waste prevention to 2004. It sets up a framework for implementing key policies including the national waste prevention programme and the setting up of a market development group. It also sets an objective

date of 1st January 2005 for the implementation of user-based sharing for waste collection.

DOEHLG – NATIONAL STRATEGY ON BIODEGRADABLE WASTE (2021)

The national strategy on biodegradable municipal waste published by the DoEHLG in 2021 sets out measures to progressively divert biodegradable municipal waste from landfill in accordance with the agreed targets in EU Directive 1999/31/EC on the landfill of waste (landfill Directive). By 2016, the region of 1.8 million tonnes of biodegradable municipal waste will need to be diverted annually in order to meet the directive's targets.

The strategy is based on the integrated waste management approach established as government policy since the publication of "change our ways" in 1998. The preferred options for dealing with biodegradable municipal waste (BMW) are:

- Prevention and minimisation – avoiding generating waste.
- Recycling – mainly paper and cardboard but also textiles.
- Biological treatment – mainly of kitchen and garden waste including composting.
- Residual treatments – thermal treatment with energy recovery by way of mechanical biological treatment.

WASTE MANAGEMENT PLAN FOR THE DUBLIN REGION 2005-2010

The Dublin Region Waste Management Plan 2005-2010 aims toward achieving 59% recycling, 25% incineration and 16% landfill. The 2011 annual progress report shows waste management rates are improving year on year. The household recycling rate is up 3%- 44%, municipal waste recovery is up 1% to 47% and landfilling has decreased by 1% to 53%. The region remains overly reliant on the landfill with 49% of commercial waste sent for disposal. There remains a need to develop recovery alternatives for residual waste.

EASTERN - MIDLANDS REGIONAL WASTE MANAGEMENT PLAN 2015 – 2021

The Eastern Midlands Regional Waste Management Plan 2015-2021 identified the following targets:

- Preparing for reuse and recycling rate of 60-70% of Municipal Waste by the end of 2030.
- Eliminate the use of landfilling of all major waste streams including municipal, industrial and construction and demolition wastes in favour of recovery of residual wastes.

NATIONAL WASTE PREVENTION PROGRAMME (NWPP)

A National Waste Prevention Programme (NWPP) operated by the EPA, focuses on reporting on the prevention and minimization of waste. It produces annual progress reports. A Resource Efficiency Unit (formerly known as the Core Prevention Team), within the EPA, promotes waste minimization. A Prevention Programme Steering Group also known as the NWPP Steering Committee was established to "liaise with public authorities, monitor the overall thrust of the NWPP, and provide strategic direction to the CPT." A new National Waste Prevention Plan entitled "Towards a Resource Efficient Ireland, A National Strategy to 2020" was published in 2014. A report on the Overview of progress made on waste prevention projects during 2014 was published by the EPA in 2015 and is available on its website.

2 PROJECT DESCRIPTION

STUDY AREA

The subject site is located on the southernmost extent of County Meath, as shown in Figure 1, aligning with the county boundary to Co. Kildare. It is approximately 1.5km north of the town of Maynooth, Co. Kildare, which forms part of a larger strategic landbank on zoned lands known as Maynooth Environs. The site is immediately bound by:

- R157 Maynooth – Dunboyne Road, to the east;
- Agricultural lands, to the north and west; and
- River Rye Water, to the south;

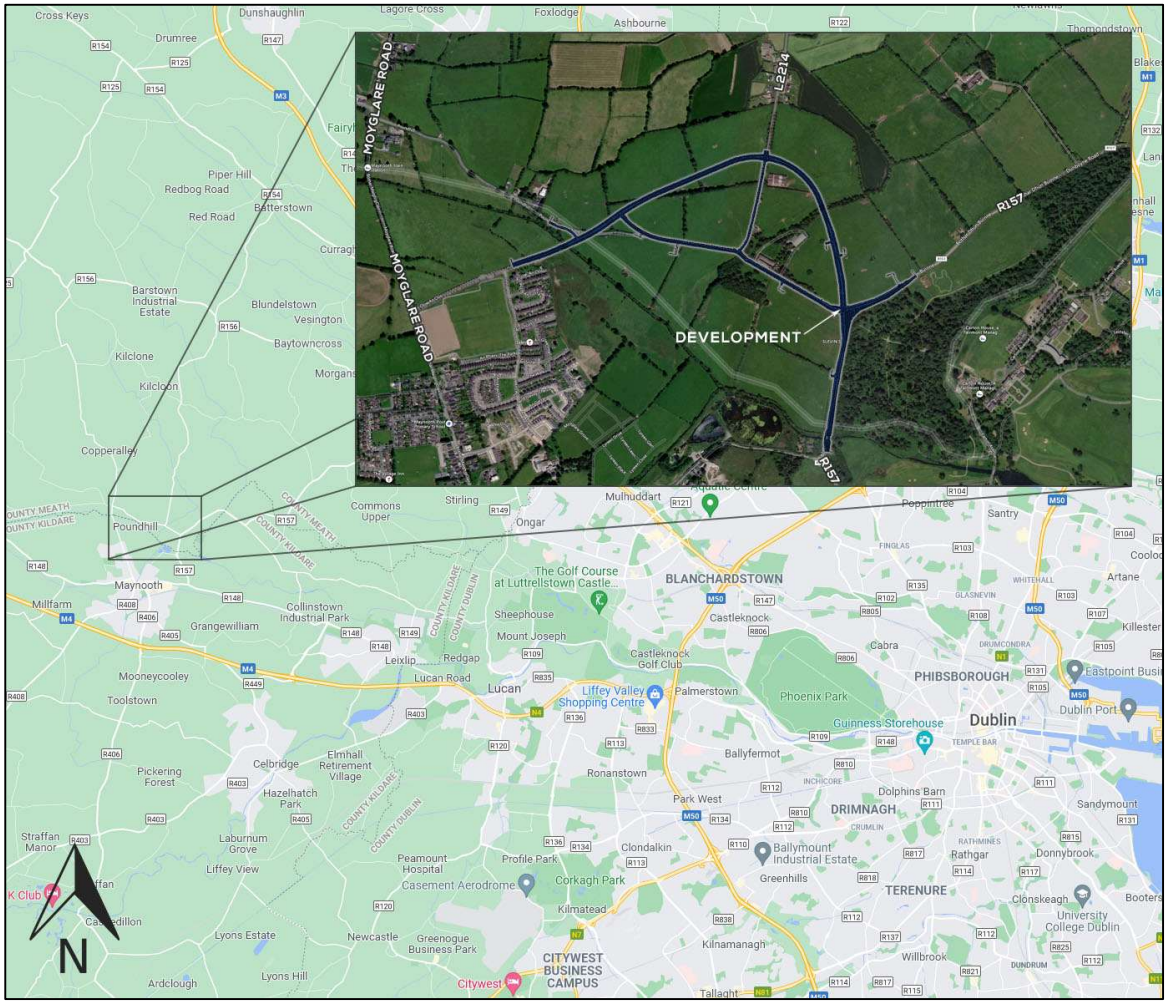

Figure 1: Development Locality Plan

The previous image highlights the location of the overall road area and there are small areas of incidental works outside of that for elements such as attenuation facilities, demolition of existing roads, etc.

DEVELOPMENT DESCRIPTION

Planning Permission is sought by Sky Castle Ltd. for the development of the Maynooth Outer Orbital Road (MOOR) in the townland of Moygaddy, Maynooth Environs, Co. Meath.

The proposed road development will consist of the following:

1. Provision of approximately 1,700m of new distributor road (MOOR Arc) comprising of 7.0m carriageway with turning lane where required, footpaths, cycle tracks and grass verges. All associated utilities and public lighting including storm water drainage with SuDS treatment and attenuation.
2. Proposed road improvement and realignment works including:
   (i) realignment of a section of the existing L6219 local road, which will entail the demolition of an existing section of the road which extends to circa 2,500 sqm.
   (ii) Provision of pedestrian and cycle improvement measures along the L6219 and L22143 which abuts the boundary of Moygaddy House which is a Protected Structure (RPS ref 91558).
   (iii) Provision of pedestrian and cycle improvement measures along the R157 which abuts the Carton Demense Wall which is a Protected Structure (RPS Ref 91556).
   (iv) Realignment of a section of the existing L22143 local road and R157, which will entail the demolition of an existing section of the road which extends to circa 3,200 sqm.
   (v) Provision of a new signalised junction at the realigned junction between the L22143 and R157.
   (vi) Provision of a new signalised junction between the L2214 local road and the MOOR with right-turn lanes on approaches.
   (vii) Reconfiguration of the L2214 section within the MOOR arc to a one-way from north to south with right-turn lanes, where applicable.

(viii) Reconfiguration of the northbound lane of the L2214 within the arc to a shared facility for use by pedestrians and cyclists.

(ix) Addition of chicanes on the L6219 and L22143 local road to reduce traffic flow and encourage utilisation of the MOOR.

3. Provision of 4 no. bridge structures comprising:
   (i) an integral single span bridge at Moyglare Hall over the River Rye Water to connect with existing road infrastructure in County Kildare and associated floodplain works and embankments.
   (ii) a new pedestrian and cyclist bridge at Kildare Bridge which will link the proposed site with the existing road network in County Kildare.
   (iii) a new pedestrian and cycle bridge across Blackhall Little Stream on the L22143 adjacent to the existing unnamed bridge.
   (iv) an integral single span bridge on the north-eastern section of the MOOR arc, over the Blackhall Little Stream, and associated floodplain works and embankments.
4. Provision of site landscaping, public lighting, site services and all associated site development works.
5. A Natura Impact Statement (NIS) and Environmental Impact Assessment Report (EIAR) has been included with this application.

DEVELOPMENT & SITE OVERVIEW

The MOOR will be a single carriageway road connecting the Maynooth environs between the east and west. A portion on the western side will be constructed in County Kildare and tie in with existing infrastructure by means of a new bridge and road section. This can be seen in the figure below.

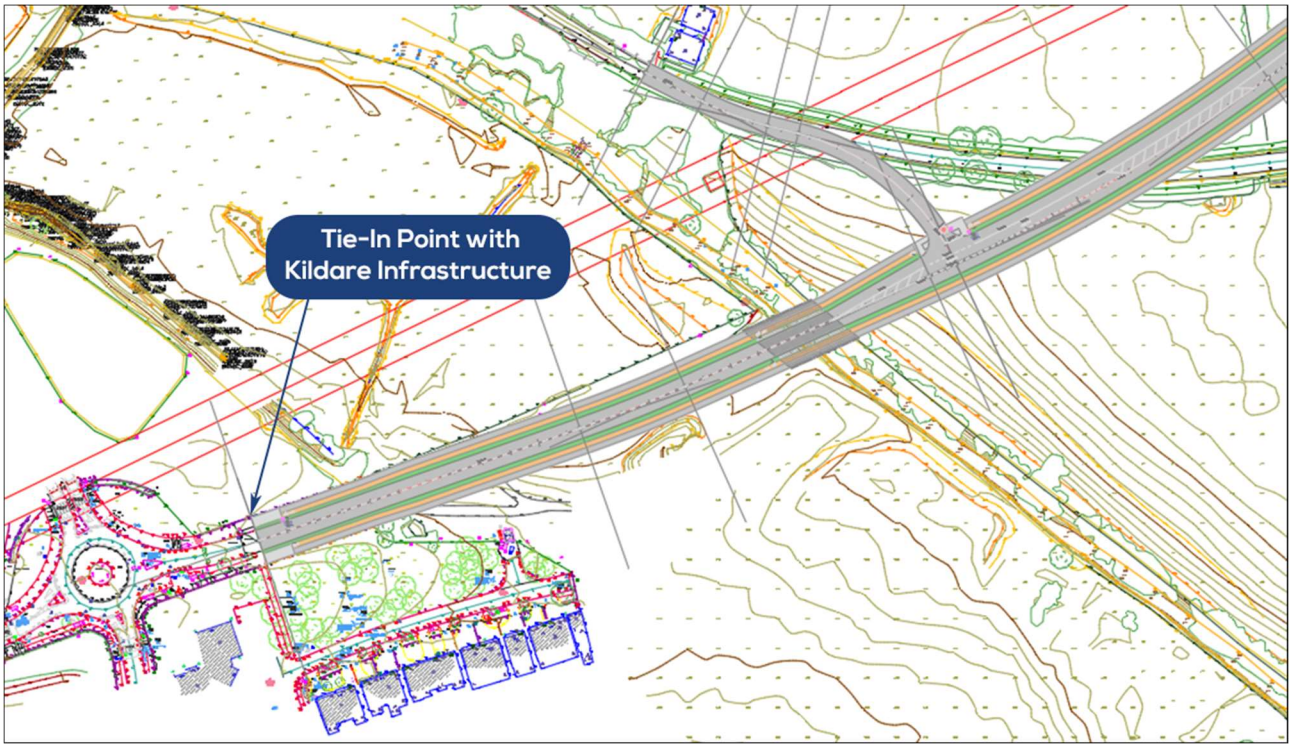

Figure 2: MOOR Western Kildare Tie-In

On the eastern side, the road will again tie in in County Kildare, just north of the roundabout on the R157. A separate cycle and pedestrian bridge will be constructed alongside the existing bridge to allow for continuation of this infrastructure, tying in with existing infrastructure in County Kildare. The tie-in location has been agreed with Kildare and on review of planning compliance submission made by Cairn Homes. This can be seen in the figure below.

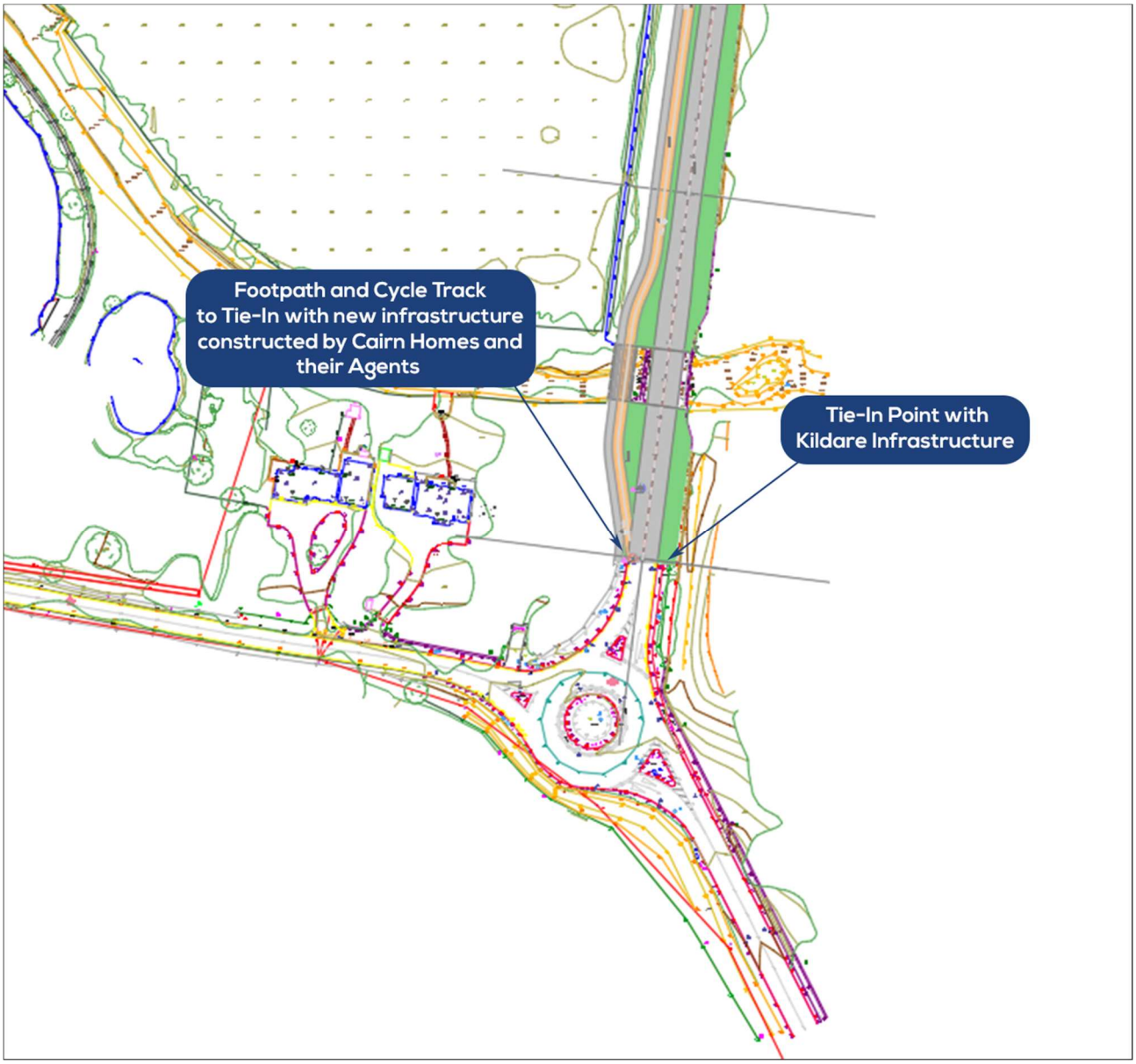

Figure 3: MOOR Eastern Kildare Tie-In

The rest of the MOOR will form an arc through the Maynooth Environs, connecting the western and eastern ends. A portion of the L6219 on the western side will be realigned to accommodate the arc. This section in the shown in the figure below.

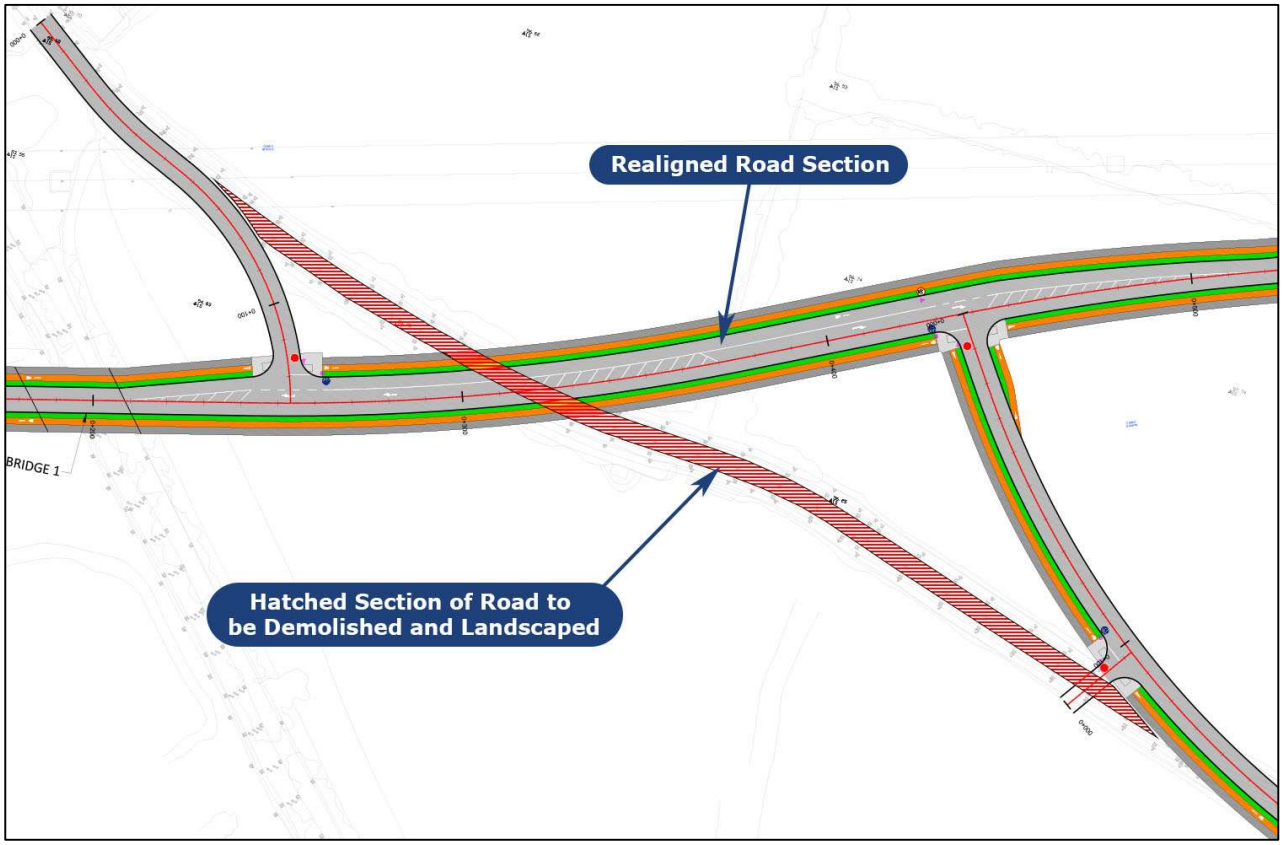

Figure 4: Road Section to be Realigned

The current L2214 (Kilcloon Road) will change to a north-to-south one-way road within the arc. The current south-to-north lane will be converted to a shared facility which can be used by pedestrians and cyclists. The new northern junction between the MOOR and the L2214 will be constructed as a signalised junction. The is shown in the figure below.

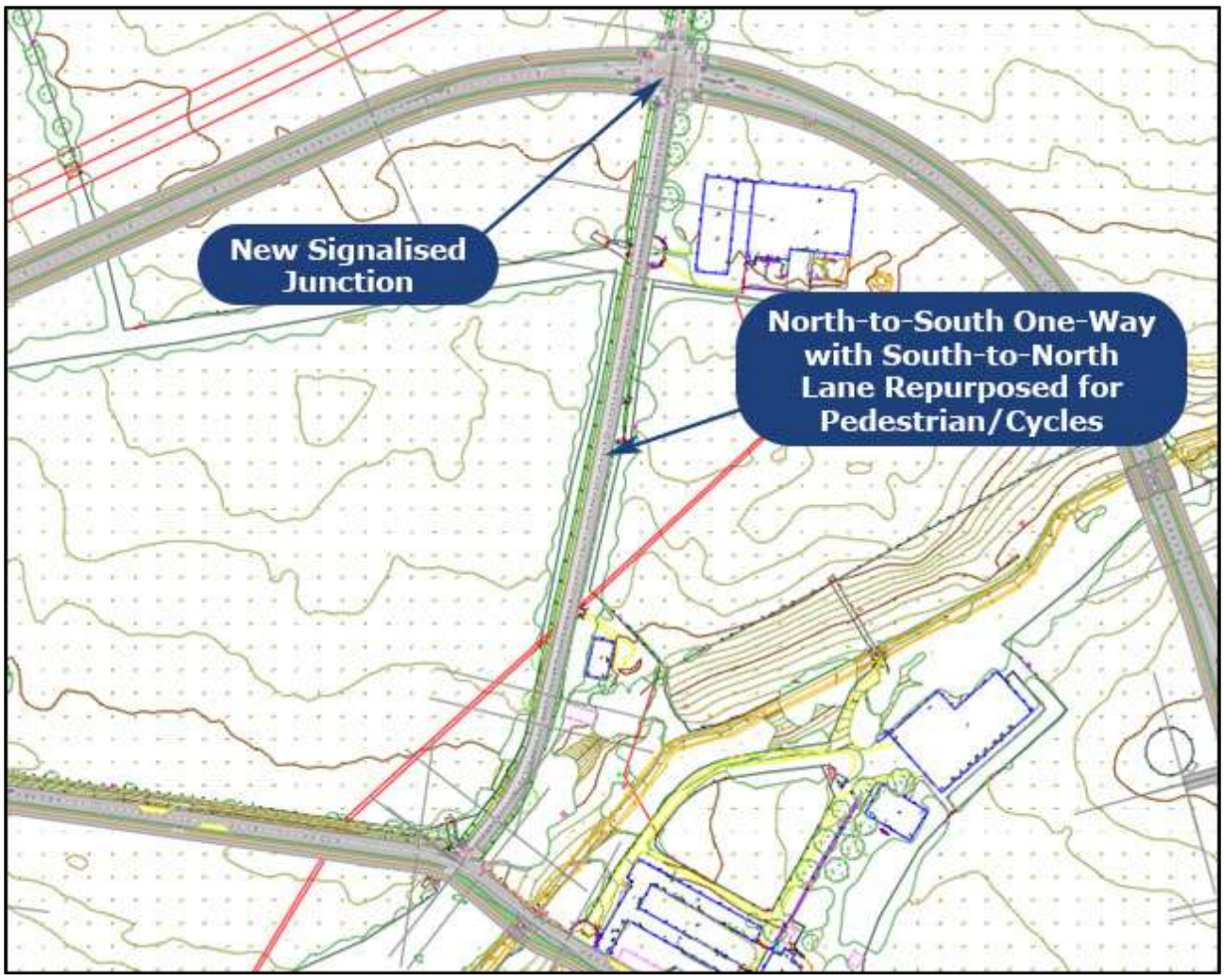

Figure 5: Center of Arc (L2214 - Kilcloon Road)

The junction between the R157, L6219, MOOR and Dunboyne Road on the eastern side of the arc will be realigned and constructed as 4-leg signalised junction, as shown below.

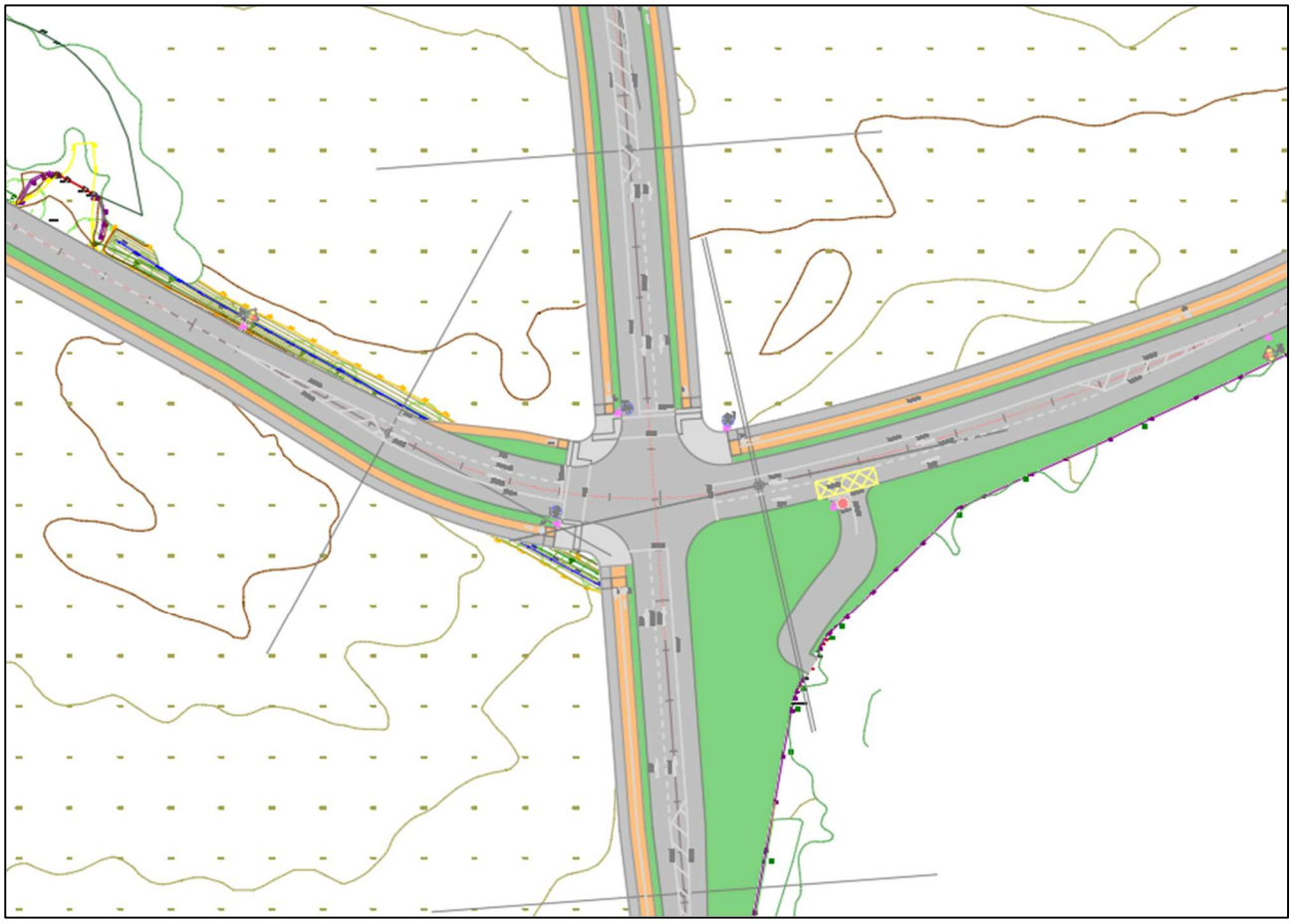

Figure 6: Realigned Signalised Junction on Eastern

For the construction of this junction, a portion of the existing R157 and Dunboyne Road will be realigned, as shown in the figure below.

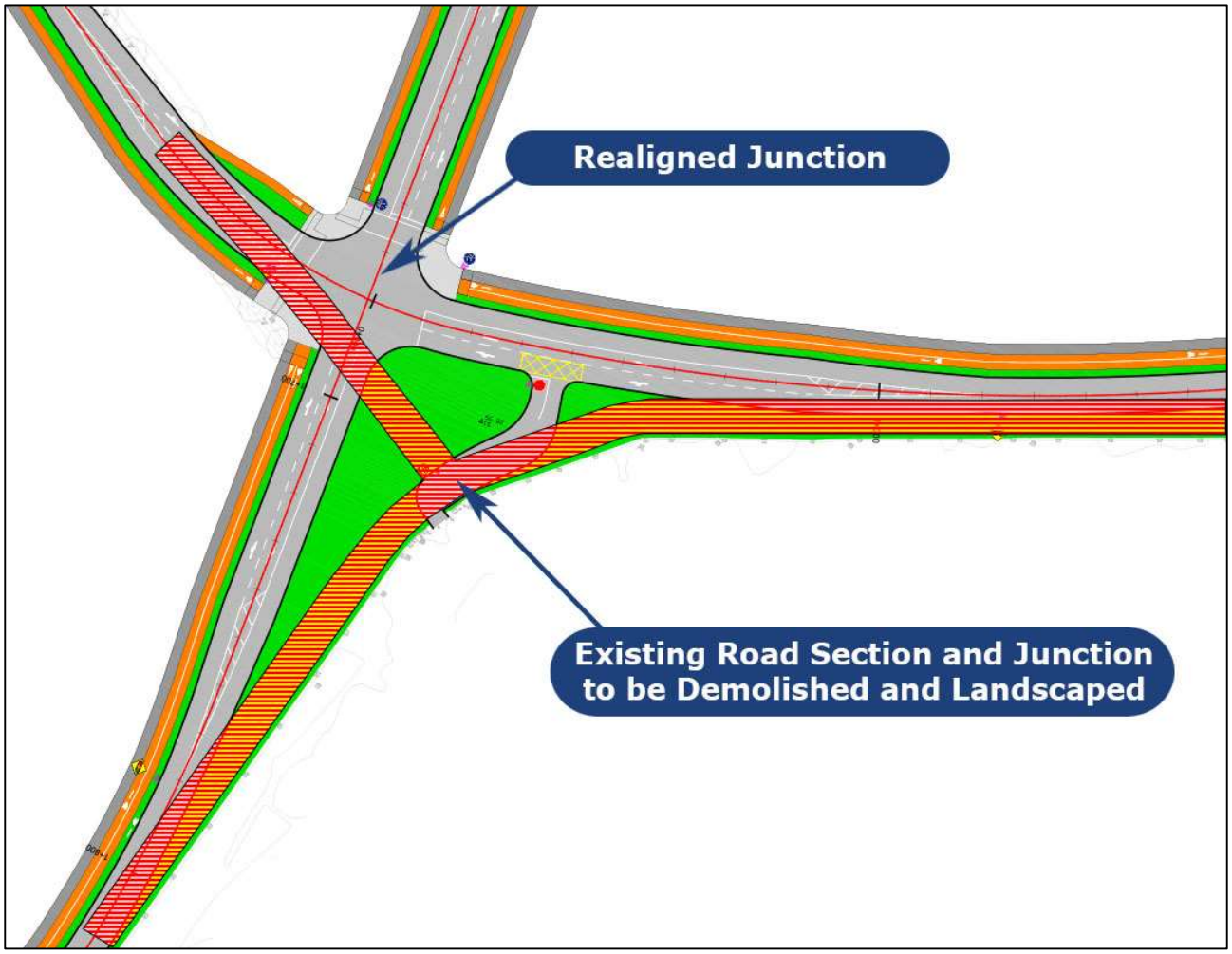

Figure 7: Existing R157/Dunboyne Road Realignment

Four different bridges will be constructed as part of the MOOR. These are highlighted in the figure below.

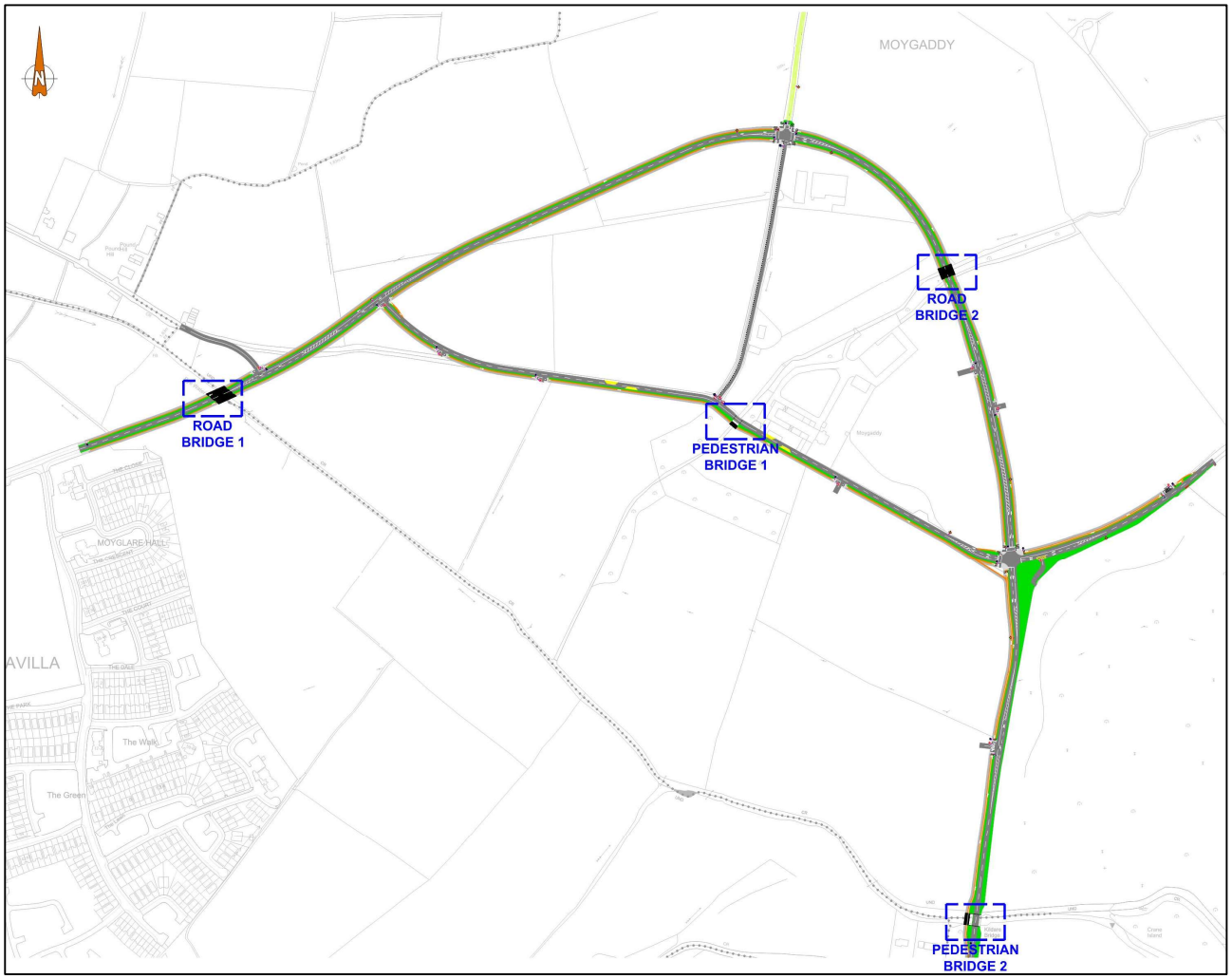

Figure 8: MOOR Bridges

Road bridges 1 and 2 will be new bridges which will be constructed as part of the MOOR. Pedestrian bridges 1 and 2 will be additional structures constructed adjacent to the existing bridge structures to accommodate pedestrian and cycle permeability. More information on these bridges is available in OCSC report "Bridge Options Report" submitted separately.

PHASING & CONSTRUCTION

It is anticipated that the construction of the full MOOR will be completed in one phase.

At present, the planned construction programme for the development is as follows:

- Planning Submission – September 2022
- Assumed Grant – Q4 2022
- Detailed Design Completion – Q2 2023
- Construction Commencement – Q3 2023
- Construction Completion – Q3 2025

It is anticipated that the construction duration will be approximately 21 months.

DEMOLITION

As part of this application, a section of the existing L6219 local road will be realigned. This will entail the demolition and removal of an existing section of the road, as indicated in the figure below.

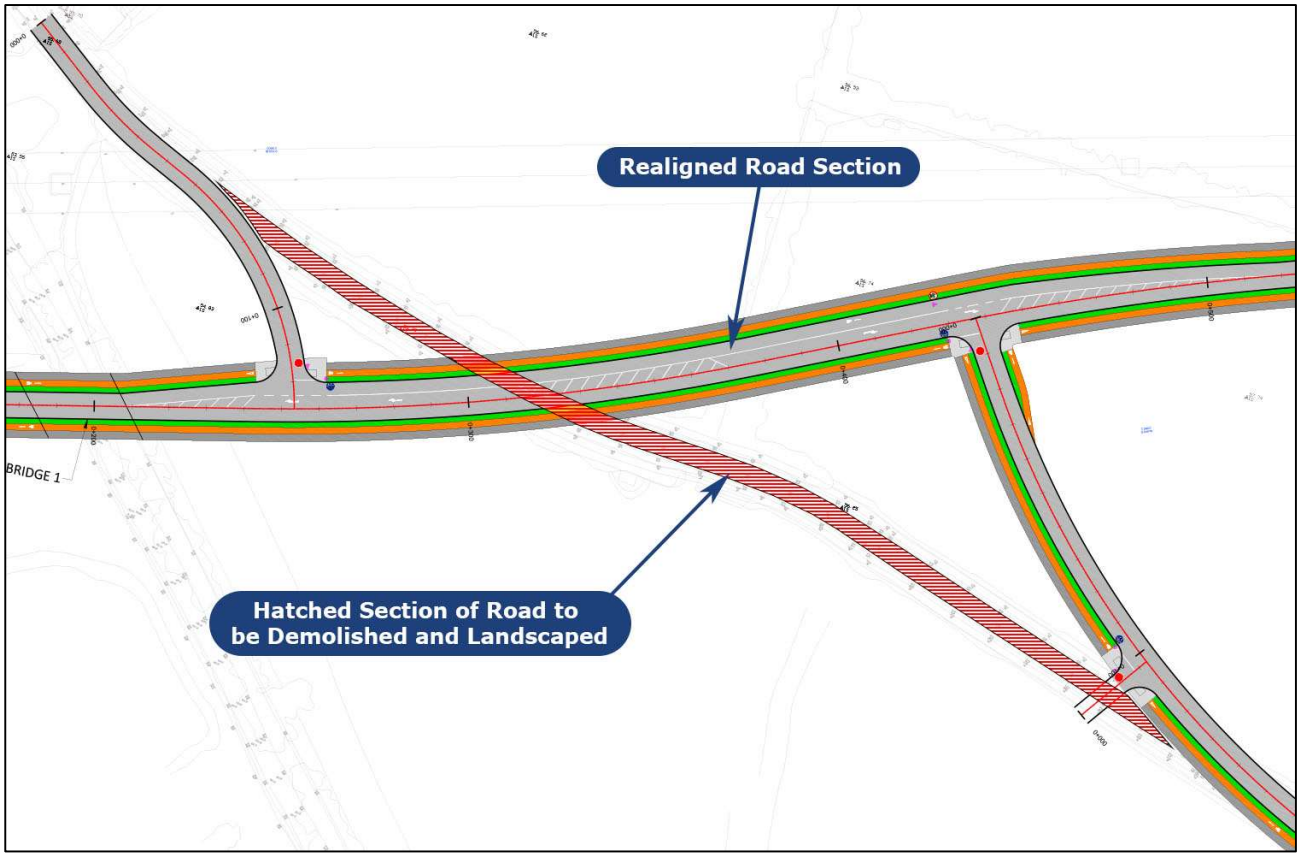

Figure 9: Road Section to be Demolished

The approximate combined demolition area of the existing road is c. 2 500 m^2.

Demolition of the above will generate low volumes of waste. The waste will predominantly be soil and stone with the potential for bitumen and tar to be found. Any road materials to be excavated and removed will be subject to a full suite of testing to establish if they are contaminated by way of either constituent or recent spillages. Any contaminates will be identified and disposed of in an appropriate facility should they be found.

The following table is a preliminary estimate of the demolition waste which might be generated, assuming a 200mm thick asphalt layer overlaying a 400mm thick stone layer with an average density of 2.3 tons/m^3. It should be noted that these numbers are approximated and are not indicative of the final values of the site:

Predicted demolition waste targets for the proposed road realignment:

Waste Types	Waste	Recycle		Disposal	
	tonnes	%	tonnes	%	tonnes
Bound Road Materials	1 150	75	863	25	287
Unbound Road Materials	2 300	95	2 185	5	115

Table 1: Demolition Recycle Targets

In addition a further section of the existing L6219 local road on the east will be realigned. This will entail the demolition and removal of an existing section of the road, as indicated in the figure below.

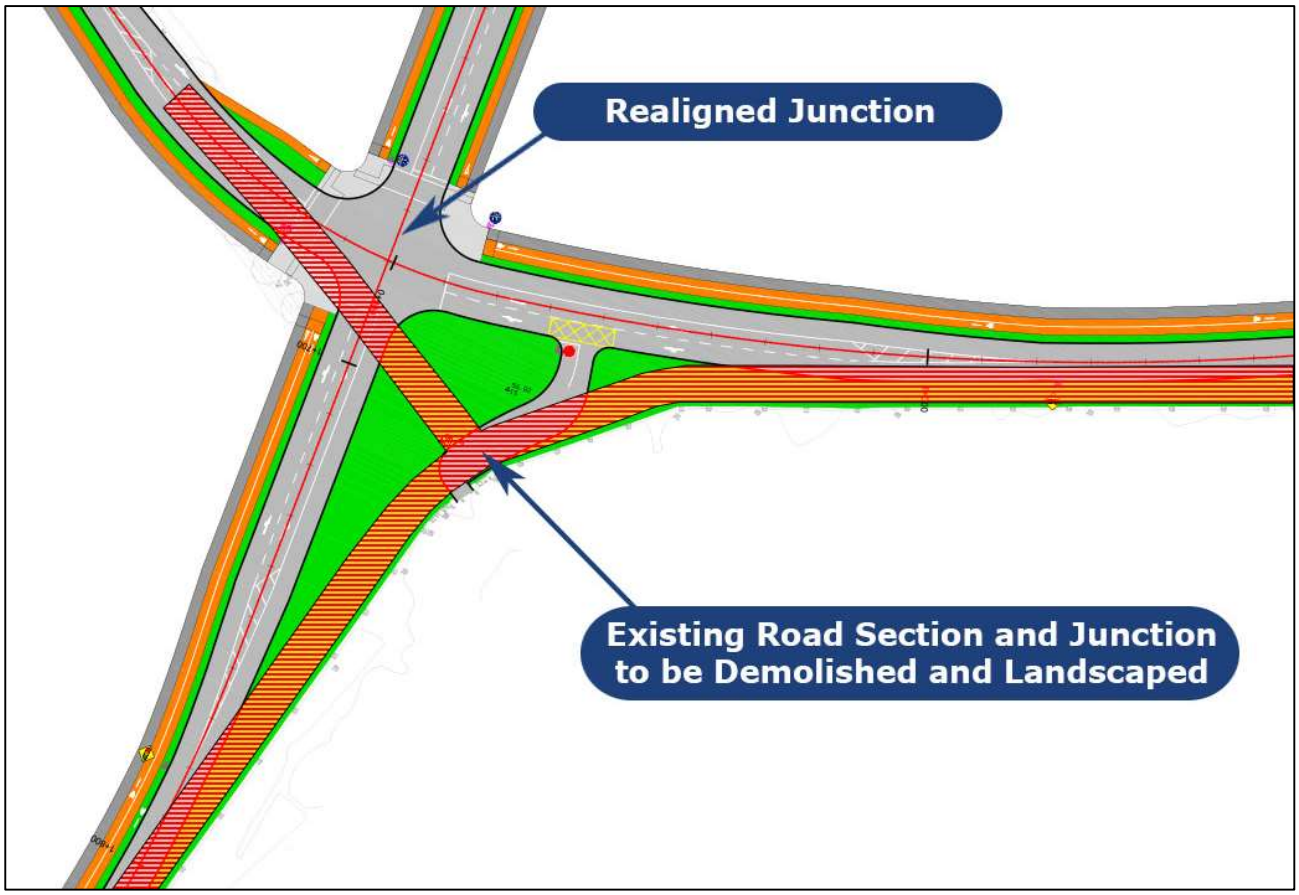

Figure 10: Road Section to be Demolished

The approximate combined demolition area of the existing road is c. 3 200 m^2.

Demolition of the above will generate low volumes of waste. The waste will predominantly be soil and stone with the potential for bitumen and tar to be found. Any road materials to be excavated and removed will be subject to a full suite of testing to establish if they are contaminated by way of either constituent or recent spillages. Any contaminates will be identified and disposed of in an appropriate facility should they be found.

The following table is a preliminary estimate of the demolition waste which might be generated, assuming a 200mm thick asphalt layer overlaying a 400mm thick stone layer with an average density of 2.3 tons/m^3. It should be noted that these numbers are approximated and are not indicative of the final values of the site:

Predicted demolition waste targets for the proposed road realignment:

Waste Types	Waste	Recycle		Disposal	
	tonnes	%	tonnes	%	tonnes
Bound Road Materials	1 500	75	1 125	25	375
Unbound Road Materials	3 000	95	2 850	5	150

Table 2: Demolition Recycle Targets

3 KEY MATERIALS & QUANTITIES

CONSTRUCTION PHASE WASTE

The bulk of waste material generated from the proposed development will be from the excavation of the subsoil to accommodate the construction of the under-croft and foundation structures.

Soil generated as part of the construction works will be managed in accordance with a *Soil Waste Management Plan* to be produced by an environmental management company based on the site investigation results in advance of the construction stage. That report will identify the nature and classification of the soil waste and will detail management procedures to be implemented to ensure appropriate handling and disposal in accordance with Irish and EU legislative requirements.

Additional waste as part of construction activities is expected. This waste will be produced from surplus materials such as broken or cut-offs of concrete blocks, bricks, tiles, timber, steel reinforcement etc. Waste from packaging and the oversupply of materials is also expected and should be recycled where possible.

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

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

CATEGORIES OF CONSTRUCTION WASTE GENERATED

The European Waste Catalogue (EWC) classifies waste materials and categorises them according to what they are and how they are produced. It is referred to in a number of European Union directives and commission decisions regarding waste management.

In 1994, the first European waste catalogue and the hazardous waste list were published as two separate documents. The lists were used by the Environment Protection Agency for the compilation of waste data from 1995 and were adopted into Irish legislation by the Waste Management Act 1996. In 1996 the Environmental Protection Agency published a single list incorporated both the European Waste Catalogue and the Hazardous waste list. The European Waste Catalogue and the hazardous waste list are used for the classification of all wastes and hazardous wastes and are designed to form a consistent waste classification system across the EU. They form the basis of all national and international waste reporting obligations, such as those associated with waste licences and permits, the national waste database and the transport of waste. The EPA published a more concise guide of these in January 2002.

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 is in compliance with legal requirements.

The waste classification system applies across the EU and is the basis for all national and international waste reporting obligations. From 1 June 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.

The aforementioned document consolidates the legislation and allows the generators of waste to classify the waste as hazardous or non-hazardous and in the process assign the correct List of Waste entry. It also replaces the 2002 European Waste Catalogue and the Hazardous Waste List

A non-exhaustive List of Waste expected for typical waste materials to be generated for this site is as follows and available online Waste Classification List of Waste & Determining if Waste is Hazardous or Non-hazardous APPLICABLE FROM 5 JULY 2018:

17 CONSTRUCTION AND DEMOLITION WASTES (INCLUDING EXCAVATED SOIL FROM CONTAMINATED SITES)	
17 01 01	concrete
17 01 02	bricks
17 01 03	tiles and ceramics
17 01 06*	mixtures of, or separate fractions of concrete, bricks, tiles and ceramics containing hazardous substances
17 01 07	mixtures of concrete, bricks, tiles and ceramics other than those mentioned in 17 01 06
17 02 01	wood
17 02 02	glass
17 02 03	plastic
17 02 04*	glass, plastic and wood containing or contaminated with hazardous substances
17 05 03*	soil and stones containing hazardous substances
17 05 04	soil and stones other than those mentioned in 17 05 03*
17 06 01*	insulation materials containing asbestos
17 06 03*	other insulation materials consisting of or containing hazardous substances
17 06 04	insulation materials other than those mentioned in 17 06 01* and 17 06 03*
17 06 05*	construction materials containing asbestos
17 09 04	mixed construction and demolition wastes other than those mentioned in 17 09 01, 17 09 02 and 17 09 03

Table 3: Construction & Demolition Wastes

ANTICIPATED CONSTRUCTION HAZARDOUS WASTE

Fuels used during construction will be classed as hazardous and these will be stored (for site machinery etc.), in suitable tanks with the draw-off points bunded. Where this is the case, it is not expected that there will be any fuel wastage.

Waste mixtures contain dangerous substances classified as hazardous waste. This will not be used as fill on the site and only be disposed of in a licensed hazardous waste facility.

ESTIMATED CONSTRUCTION WASTE GENERATED

Taken from the Irish EPA figures, the following is the breakdown of construction and demolition waste types expected to be generated from a typical site such as this per m^2.

Waste Types	%
Soil & Stones	83
Concrete, Bricks, tiles, plastics etc	13
Asphalt, tar/tar products	1
Metals	1
Others	2
Total Waste	**100**

Table 4: Waste materials generates from a typical Irish construction site

It should be noted that until final materials and detailed construction methodologies have been confirmed, it is difficult to predict with a high level of accuracy the construction waste that will be generated from the proposed works as the exact materials and quantities may be subject to some degree of change and variation during the construction process.

If the material is deemed to be waste, then removal and reuse/recovery/disposal of the material will be carried out in accordance with the Waste Management Acts 1996 – 2011 as amended, the Waste Management (Collection Permit) Regulations 2007 as amended and the Waste Management (Facility Permit & Registration) Regulations 2007 as amended. Once all available beneficial reuse options have been exhausted, the options of recycling and recovery at waste-permitted and licensed sites will be considered.

In the event that contaminated material is encountered and subsequently classified as hazardous, this material will be stored separately from any non-hazardous material. It will require off-site treatment at a suitable facility or disposal abroad via Transfrontier Shipment of Wastes (TFS):

Category	Qualifying Criteria
Category A	Inert Material, suitable for disposal at a waste permitted site in Ireland
Category B	Inert Material is suitable for disposal at an inert waste landfill in Ireland. Note this can be subdivided into B1 and B2
Category C	Non-hazardous material, suitable for disposal at a landfill facility in Ireland or for disposal/recovery in continental Europe
Category D	Hazardous material as defined by the application of the 'Hazardous Waste Classification Tool'5 is suitable for disposal/recovery in Continental Europe.

Table 5: Waste Categories

The following table shows typical target values for the management of waste at the site, to be completed by the contractor prior to starting on site.

Waste Types	Waste	Reuse/Recover		Recycle		Disposal	
	tonnes	%	tonnes	%	tonnes	%	tonnes
Soil & Stones	40250	20	8050	0	0	80	32200
Concrete, Bricks, tiles, plastics etc	6304	0	0	80	5043	20	1261
Asphalt, tar/tar products	485	0	0	20	97	80	388
Metals	485	5	24	90	436	5	24
Others	970	10	97	40	388	50	485
Total	48494	-	8171	-	5965	-	34358

Table 6: Predicted construction waste targets for the proposed development

4 SITE WASTE MANAGEMENT PLAN

Waste materials generated will be segregated on site. This will allow for the maximum possible degree of recycling. Where on-site segregation of certain waste types is not practical, off-site segregation will be carried out. Skips and receptacles will be provided to facilitate segregation at the source.

All waste receptacles leaving the site will be covered or enclosed. The on-site waste storage area will be secured within the overall site which will be hoarded off from the public and unauthorised access.

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

All waste arisings will be handled by an approved waste contractor holding a current waste collection permit. All waste arisings requiring disposal off-site will be disposed of at a facility holding the appropriate licence or permit, as required. Written records will be maintained by the contractor(s) detailing the waste arising throughout the construction phase, the classification of each waste type, the contact details and the waste collection permit number of all waste contractors who collect waste from the site and the end destination and waste facility permit or licence number for all waste removed and disposed of off-site.

Dedicated bunded storage containers will be provided for hazardous wastes such as batteries, paints, oils, chemicals etc. if required.

The management of the main waste streams is detailed in the figure overleaf:

Figure 11: Proposed C&D Waste Storage Area (Scale: NTS)

WASTE MANAGEMENT CATEGORIES

SOIL/SUBSOIL

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

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

CONCRETE, BRICKS, TILES & CERAMICS

The majority of concrete, bricks, tiles and ceramics generated as part of the construction works are expected to be clean, inert material and should be recycled, where possible.

HARD PLASTIC

Since hard plastic is a highly recyclable material, much of the plastic generated will be primarily from material off-cuts. It will be diverted from landfill and recycled. All recyclable plastic will be segregated and recycled, where possible.

TIMBER

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

METAL

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

PLASTERBOARD

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

GLASS

Glass materials will be segregated for recycling, where possible.

ORGANIC (FOOD) WASTE

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

WASTE ELECTRICAL AND ELECTRONIC EQUIPMENT (WEEE)

WEEE that does not contain hazardous components will be stored in dedicated covered cages/receptacles/pallets pending collection for recycling. There are not expected to be any significant amounts of such materials as there are no existing buildings on the subject site.

NON-RECYCLABLE WASTE

C&D waste which is not suitable for reuse or recovery will be placed in separate skips or other receptacles. This will include polystyrene, some cardboard and plastic which are deemed unsuitable for recycling.

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

HAZARDOUS WASTES

On-site storage of any hazardous wastes produced (i.e. contaminated soil and/or waste fuels) will be kept to a minimum, with removal off-site organised regularly. Storage of all hazardous wastes on site will be undertaken to minimise exposure to on-site personnel and the public and to also minimise the potential for environmental impacts.

MANAGEMENT & CONTROL SYSTEMS

It will be the role of an appointed Waste Manager to try to find alternative options for waste before sending it to the landfill. Waste materials will be stored in the specifically designated compound. All waste collected from the site will be by a permitted waste contractor, under the Waste Management (Collection Permit) Regulations 2007 as amended. The contractor will provide the Waste Manager on site with documentation of

the waste to be removed and a copy of the waste collection permit. Before the waste leaves the site, the Waste Manager will have documentation to show where the waste is being taken to, and that the facility is licensed to accept the particular waste. A receipt will be issued for each load that leaves the site.

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

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

If the waste is being transported to another site, a copy of the Local Authority waste permit or EPA Waste Licence for that site will be provided to the nominated project Waste Manager. If the waste is being shipped abroad, a copy of the Transfrontier Shipping (TFS) document will be obtained from Dublin City Council (as the relevant authority on behalf of all local authorities in Ireland) and kept on-site along with details of the final destination (permits, licences etc.). A receipt from the final destination of the material will be kept as part of the on-site waste management records.

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

SITE MANAGEMENT

RESOURCE MANAGER

A dedicated Resource manager will be appointed to ensure commitment, efficiency and site protocols are upheld during the construction stage.

The role of the Resource manager will be to record, oversee and manage the everyday handling of waste on the site.

Their training will be in setup and maintaining record-keeping systems and how to produce an audit to ensure waste management targets are being met.

They shall also be trained in the best methods for the segregation and storage of recyclables. They will also be familiar with the suitability of material reuse and know how to implement the CDWMP.

Dún Laoghaire-Rathdown County Council will be consulted throughout the Construction phase to ensure that all available waste reduction, reuse and recycling options are being explored and utilised and that compliant Waste Management is being carried out at the site.

SITE CREW

This shall be the responsibility of the resource manager and a training programme will be organised, and incorporated into typical onsite inductions to give an awareness of waste segregation on the site.

This will outline the types and treatments that should be given to different materials and hazardous materials.

DOCUMENTATION

All waste will be weighed and documented prior to leaving the site. Records will be kept at the site and at the relevant waste facility.

All movement of waste and the use of waste contractors will be undertaken in accordance with the *Waste Management Acts 1996 - 2011*, *Waste Management (Collection Permit) Regulations 2007* as amended and *Waste Management (Facility Permit & Registration) Regulations 2007* and amended. This includes the requirement for all waste contractors to have a waste collection permit issued by the NWCPO. If the waste is being transported to another site, a copy of the Local Authority waste COR/permit or EPA Waste/IE Licence for that site will be provided to the nominated project waste manager.

Construction and Demolition municipal waste will be separated and stored wherever possible and monitored/inspected by the site foreperson prior to removal to ensure that site protocol for recycling is being adhered to.

RECORD KEEPING

Specialist companies, where required, will be contacted to determine their suitability and each company's record reviewed to ensure relevant current collection permits/licenses are held.

Companies will also be contacted to gather information regarding the treatment of hazardous materials and if required costs of handling and the best methods of transportation for recycling or reuse when hauling off-site.

Records shall be kept for each material leaving the site for all types of use or disposal. This shall take the following basic outline form:

- Waste taken for reuse off-site
- Waste taken for recycling
- Waste taken for disposal

- Reclaimed waste materials brought to the site for reuse.

For any movement of waste, a docket shall be signed and recorded by the waste manager, detailing the type and weight of material and source or destination.

This will be readily comparable with all delivery records to the site, so a waste generation percentage for each material can be determined.

This will allow ease of comparison of figures with targets established for the recovery, reuse and recycling of Construction waste. It will also highlight the source of failure in meeting these targets.

WASTE AUDITS

The resource manager shall perform audits at the site during the complete construction phase of the works.

This shall ensure that all records are maintained for all movements of all materials.

Records shall also be readily available for comparison with the site's targets.

At the completion of the Construction phase, a final report will be prepared to outline the results of the Resource Management process and the total reuse, recycling and recovery figures for the site.

SIGNAGE

The resource manager shall ensure that appropriate signage is in place

STORAGE

The resource manager shall ensure that appropriate storage is provided for the different waste streams including:

- Dedicated skips
- Hazardous materials storage
- Stockpile management

5 PREDICTED IMPACTS OF THE PROPOSED DEVELOPMENT

Assuming all the proposed mitigation measures are implemented, the following impacts are expected to arise as a result of the proposed development.

CONSTRUCTION PHASE

Significant volumes of waste materials will be generated during the construction of the proposed development. Careful management of waste including segregation at source will help to ensure maximum recycling, reuse and recovery are achieved, in accordance with current local national waste targets.

It is expected however that a certain amount of waste will still need to be disposed of at landfill. Assuming appropriate facilities are provided, environmental impacts (e.g. litter, contamination of soil or water etc.) arising from waste storage are expected to be minimal. Particular attention must be given to the appropriate management of construction waste containing contaminated or hazardous materials. The use of suitably licenced waste contractors will ensure compliance with relevant legal requirements and appropriate off-site management of waste.

In summary, if the final CDWMP is implemented and a high level of due diligence is carried out at the site, it is envisaged that the environmental impact of the construction phase of the proposed development will be short-term and slight, with respect to waste management.

OPERATION PHASE

As with the construction phase, waste materials will be generated during the operational phase of the proposed development. Again, careful management of these, including segregation at source, will help ensure acceptable local and national waste targets are met. It is expected that some waste, for example, mixed non-recyclables will still be required to be disposed of at landfill.

Assuming appropriate on-site storage is provided, environmental impacts (e.g. litter and to a lesser extent contamination of soil and water etc.) arising from waste storage are expected to be minimal. Bin stores will be located throughout the development. The use of suitably licenced waste contractors will ensure compliance with the relevant legal requirements and appropriate off-site management of waste.

In summary, if the operational phase management plan is implemented and a high level of due diligence is carried out at the site, it is envisaged that the environmental impact of the operation phase of the proposed development will be long-term and slight, with respect to waste management. A separate Operation Waste Management Plan has been prepared for this phase.

6 VERIFICATION

This report was compiled and verified by:

Wian Marais BE (US), BE (Hons) (UP), Professional Engineer (ECSA)
Civil Engineer
O'Connor Sutton Cronin & Associates

OCSC

O'CONNOR | SUTTON | CRONIN

Multidisciplinary
Consulting Engineers

9 Prussia Street
Dublin 7
Ireland

T | +353 (0)1 8682000
W | www.ocsc.ie

Dublin | Belfast | Birmingham | Cork | Galway | London