Environmental Impact Assessment Report (EIAR) Volume 2 Main Body Part 3

Chapters 9-19

In respect of

The Royal Canal Urban Greenway

On behalf of

Fingal County Council

October 2026

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9 Archaeological, Architectural and Cultural Heritage

9.1 Introduction

IAC Archaeology has prepared this chapter in order to assess the impact, if any, on the archaeological, architectural and cultural heritage resource of the Proposed Development of the Royal Canal Urban Greenway (RCUG) – herein referred to as 'the Proposed Development' – (Figure 9-1, ITM 704139/738396), which largely follows the course of the Royal Canal as it passes through the Fingal Administrative area of County Dublin. This assessment has been undertaken by Faith Bailey (MA, BA (Hons), MIAI, MCIfA) of IAC Archaeology.

Faith is an Associate Director, Project Manager and Senior Archaeologist and Cultural Heritage Consultant with IAC Archaeology. She holds an MA in Cultural Landscape Management (archaeology and built heritage) and a BA in single honours archaeology from the University of Wales, Lampeter. She is a licence eligible archaeologist, a member of the Chartered Institute of for Archaeologists, a member of the Institute of Archaeologists of Ireland and has over 22 years' experience working in the commercial archaeological and cultural heritage sector. Faith joined IAC in 2004 and in her capacity as Senior EIAR Archaeologist and cultural heritage consultant, she has been responsible for the production and delivery of a large number of archaeological and built heritage EIAR and has performed as expert witness at multiple Oral Hearings, including Metrolink, Dart+ West and the Limerick-Foynes Road Scheme.



Figure 9-1 Scheme location

This study determines, as far as reasonably possible from existing records, the nature of the archaeological, architectural and cultural heritage resource in the Proposed Development area (and a 250m study area for archaeology and cultural heritage and a 100m study area for architecture), using appropriate methods of study. Desk-based assessment is defined as a programme of study of the historic environment within a specified area or site that addresses agreed research and/or conservation objectives. It consists of an analysis of existing written, graphic, photographic and electronic information in order to identify the likely heritage assets, their interests and significance and the character of the

study area, including appropriate consideration of the settings of heritage assets (Chartered Institute for Archaeologists, 2014). This leads to the following:

- Determining the presence of known archaeological and built heritage sites that may be affected by the Proposed Development;
- Assessment of the likelihood of finding previously unrecorded archaeological remains during the construction programme;
- Determining the impact upon the setting of known cultural heritage sites in the surrounding area; and
- Suggested mitigation measures based upon the results of the above research.

9.2 Data and Methodology

Research for this chapter was undertaken in two phases. The first phase comprised a paper survey of all available archaeological, historical and cartographic sources. The second phase involved a field inspection of the scheme.

9.2.1 Desktop Resources

- Record of Monuments and Places (RMP) for County Dublin;
- Sites and Monuments Record (SMR) for County Dublin;
- National Monuments in State Care Database;
- Preservation Orders List;
- Topographical files of the National Museum of Ireland;
- Cartographic and written sources relating to the study area;
- Fingal Development Plan 2023-2029;
- Fingal Heritage Plan 2018-2023;
- Kildare County Development Plan 2023-2029;
- Aerial photographs;
- Townlands and Townland Boundaries;
- Place Name Analysis;
- Excavations Bulletin (1970-2026)(Excavations Bulletin); and
- National Inventory of Architectural Heritage (NIAH).

RMP is a list of archaeological sites known to the National Monuments Section, which are afforded legal protection under Section 12 National Monuments Act 1930, as amended (the National Monuments Act, as amended), and are published as a record.

SMR holds documentary evidence and field inspections of all known archaeological sites and monuments. Some information is also held about archaeological sites and monuments whose precise location is not known e.g. only a site type and townland are recorded. These are known to the National Monuments Section as 'un-located sites' and cannot be afforded legal protection due to lack of locational information. As a result, these are omitted from the RMP. SMR sites are also listed on a website maintained by the Department of Housing, Local Government and Heritage (DHLGH) – www.archaeology.ie.

National Monuments in State Care Database is a list of all the National Monuments in State guardianship or ownership. Each is assigned a National Monument number whether in guardianship or ownership and has a brief description of the remains of each Monument.

The Minister for the DHLGH (the Minister) may acquire national monuments by agreement or by compulsory order. The state or local authority may assume guardianship of any national monument (other than dwellings). The owners of national monuments (other than dwellings) may also appoint the Minister or the local authority as guardian of that monument if the state or local authority agrees. Once

the site is in ownership or guardianship of the state, it may not be interfered with without the written consent of the Minister.

Preservation Orders List contains information on Preservation Orders and/or Temporary Preservation Orders, which have been assigned to a site or sites. Sites deemed to be in danger of injury or destruction can be allocated Preservation Orders under the National Monuments Act, as amended. Preservation Orders make any interference with the site illegal. Temporary Preservation Orders can be attached under the National Monuments Act, as amended . These perform the same function as a Preservation Order but have a time limit of six months, after which the situation must be reviewed. Work may only be undertaken on or in the vicinity of sites under Preservation Orders with the written consent, and at the discretion, of the Minister.

Topographical files of the National Museum of Ireland are the national archive of all known finds recorded by the National Museum. This archive relates primarily to artefacts but also includes references to monuments and unique records of previous excavations. The find spots of artefacts are important sources of information on the discovery of sites of archaeological significance.

Cartographic sources are important in tracing land use development within the development area, as well as providing important topographical information on areas of archaeological potential and the development of buildings. Cartographic analysis of all relevant maps has been made to identify any topographical anomalies or structures that no longer remain within the landscape.

Documentary sources were consulted to gain background information on the archaeological, architectural and cultural heritage landscape of the Proposed Development.

Development Plans contain a catalogue of all the Protected Structures, Architectural Conservation Areas (ACA) and archaeological sites within the county. The Fingal Development Plan 2023-2029 and the Kildare County Development Plan 2023-2029 were consulted to obtain information on cultural heritage sites in and within the immediate vicinity of the Proposed Development.

Aerial photographic coverage is an important source of information regarding the precise location of sites and their extent. It also provides initial information on the terrain and its likely potential for archaeology. A number of sources were consulted including aerial photographs held by the Ordnance Survey and Google Earth.

Townlands and Townland Boundaries. The townland is the smallest unit of territorial organization in Ireland. The term 'townland' was not used to denote a unit of land until the Civil Survey of 1654 and Sir William Petty. It bears no relation to the modern word ‘town’ but like the Irish word, *baile*, refers to a place. Before Sir William Petty and the Down Survey, the territorial unit subsequently called the townland was known by a variety of regional terms, such as tates, polls, and ballyboes. Petty standardized these under a single term. The origins of the townland certainly go back to the early medieval period. Townlands vary in size in relation to land quality: the size of the townland is proportional to the carrying capacity of the land. The making of the Down Survey maps was a key stage in the outlining of permanent boundaries for townlands: this process was completed by the Ordnance Survey in the 19th century. These townlands have been used as units of civil administration up to the present day.

Placename Analysis Place names are an important part in understanding both the archaeology and history of an area. Place names have in some cases been found to have their root deep in the historical past.

Excavations Bulletin is a summary publication that has been produced every year since 1970. This summarises every archaeological excavation that has taken place in Ireland during that year up until 2010 and since 1987, has been edited by Isabel Bennett. This information is vital when examining the archaeological content of any area, which may not have been recorded under the SMR and RMP files. This information is also available online with information from 1970 – 2026 – www.excavations.ie.

NIAH was established in 1990 to fulfil Ireland's obligations under Article 2 of the 1985 Convention for the Protection of the Architectural Heritage of Europe, (the Granada Convention). Article 2 states '[f]or the purpose of precise identification of the monuments, groups of buildings and sites to be protected, each Party undertakes to maintain inventories'. The NIAH is responsible for the establishment and maintenance of a central record documenting and evaluating the architectural heritage of Ireland. The NIAH was established on a statutory basis by the enactment of the Architectural Heritage (National Inventory) and Historic Monuments (Miscellaneous Provisions) Act 1999 (the Architectural Heritage Act). Structures listed in the NIAH are deemed to be of architectural, archaeological, historical, artistic, scientific, social or technical interest by the Minister. It is noted that inclusion within the NIAH survey does not afford statutory protection. However, the structure may be added to the RPS by the relevant Local Authority in the future.

9.2.2 Field Inspection

Field inspection is necessary to determine the extent and nature of archaeological and historical remains, and can also lead to the identification of previously unrecorded or suspected sites and portable finds through topographical observation and local information.

The field inspection comprised the following:

- Walking the Proposed Development and its immediate environs.
- Noting and recording the terrain type and land usage.
- Noting and recording the presence of features of archaeological or historical significance.
- Verifying the extent and condition of any recorded sites/structures.
- Visually investigating any suspect landscape anomalies to determine the possibility of their being anthropogenic in origin.

9.2.3 Definitions

In order to assess, distil and present the findings of this study, the following definitions apply:

‘Cultural Heritage’ where used generically, can be an over-arching term applied to describe any combination of archaeological, architectural, and cultural heritage features, where the term:

- ‘Archaeological heritage’ is applied to objects, monuments, buildings or landscapes of an (assumed) age typically older than AD 1700 (and recorded as archaeological sites within the RMP.
- the term ‘architectural heritage’ is applied to structures, buildings, their contents and settings of an (assumed) age typically younger than AD 1700
- ‘Cultural heritage’, where used specifically, is applied to other (often less tangible) aspects of the landscape such as historical events, folklore memories and cultural associations.

9.2.4 Guidance and Legislation

The following legislation, standards and guidelines were consulted as part of the assessment.

- National Monuments Act, as amended (DHLGH);
- The Planning and Development Act 2000, as amended (DHLGH)(the Planning and Development Act 2000, as amended);
- Planning and Development Regulations 2001, as amended (DHLGH);
- Heritage Act 1995, as amended;
- Frameworks and Principles for the Protection of the Archaeological Heritage, 1999, (Department of Arts, Heritage, Gaeltacht and Islands (as it then was), 1999);
- Architectural Heritage (Act;

Historic and Archaeological Heritage and Miscellaneous Provisions Act 2023 (the 2023 Act);

- European Convention on the Protection of the Archaeological Heritage ETS No. 143 (Valletta Convention 1992);
- The European Landscape Convention (Florence Convention 2000);
- The Granada Convention ; and

- Architectural Heritage Protection: Guidelines for Planning Authorities (DHLGH, 2011) (Architectural Heritage Protection Guidelines).
- Guidelines on the information to be contained on the Environmental Impact Assessment Report (Environmental Protection Agency (EPA), 2022)(the EPA Guidelines).

The National Monuments Act 1930, as amended by various acts including but not limited to: the National Monuments (Amendment) Act 1954, the National Monuments (Amendment) Act 1987, the National Monuments (Amendment) Act 1994 and the National Monuments (Amendment) Act 2004 (together the National Monuments Acts) make provision for the protection and preservation of national monuments, archaeological monuments and archaeological objects in Ireland. The description of the existing study area in this chapter takes account of those statutory designations and the chapter takes account of the legislative monitoring and licencing requirements as mitigation.

The Historic and Archaeological Heritage and Miscellaneous Provisions Act 2023 (the 2023 Act) was enacted by the Oireachtas in late 2023 and aims to address a range of structural issues and simplify terminology present in the 1930 Act (and subsequent Amendments), and to provide a single accessible and comprehensive piece of legislation. At the date of writing (September 2026) many sections of the 2023 Act have yet to commence. It is not anticipated that this will result in statutory protection being extended to any potential receptors apart from those already considered in this chapter. In addition, the chapter already identifies as mitigation the various archaeological investigations and licencing requirements that will come into force when the 2023 Act is commenced. Accordingly, the EIAR conclusions are likely to be unchanged should the 2023 Act commence fully while the application is moving through the planning process.

9.2.5 Consultations

A number of statutory and voluntary bodies were consulted to gain further insight into the cultural background of the background environment, receiving environment and study area, as follows:

- DHLGH – the Heritage Service, National Monuments and Historic Properties Section: RMP; SMR; Monuments in State Care Database; Preservation Orders; Register of Historic Monuments;
- National Museum of Ireland, Irish Antiquities Division: topographical files of Ireland; and
- Fingal County Council (FCC): Planning Section.

9.2.6 Assessment Methodology

Information obtained through the desktop assessment and field inspections leads to the following:

- Determining the presence of known cultural heritage assets that may be affected by the Proposed Development;
- Assessment of the likelihood of finding previously unrecorded archaeological remains during the construction phase;
- Determining the potential pre-mitigation effects upon the setting of known cultural heritage assets in the study area
- Determining mitigation measures based upon the results of the above research; and
- Determining the residual effects, and their significance, following the implementation of mitigation measures.

The significance of potential effects has been evaluated using a systematic approach, based upon identification of the importance/value of receptors and their sensitivity to the Proposed Development activity, together with the predicted magnitude of the impact. This is in accordance with the approach laid out in the Environmental Protection Agency's (EPA) "Guidelines on Information to be Contained in Environmental Impact Statements" (EPA 2022).

The quality and type of an effect can be classed as one of the following (as per the Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (EPA 2022):

- Negative Effect: A change which reduces the quality of the environment, for example a change that will detract from or permanently remove an archaeological, architectural or cultural heritage site from the landscape
- Neutral Effect: A change which does not affect the quality of the environment; or
- Positive Effect: A change which improves the quality of the environment, for example a change that improves or enhances the setting of archaeological, architectural or cultural heritage site.

The below terms are used in relation to the archaeological, architectural and cultural heritage and relate to whether a site will be physically impacted upon or not:

- Direct Impact: Where an archaeological and/or cultural heritage feature or site is physically located within the footprint of the proposed development and entails the removal of part, or all, of the monument or feature; and
- Indirect Impact: Where a feature or site of archaeological and/or cultural heritage merit or its setting is located in close proximity to the footprint of a development.

9.2.7 Baseline Importance and Sensitivity

For each impact, the assessment identifies receptors sensitive to that impact and implements a systematic approach to understanding the impact pathways, magnitude and the level of effects on given receptors.

The definitions of receptor importance for the purpose of the Cultural Heritage assessment are provided in Table 9-1. This is based on the presence (or not) of statutory protection and the determination by the author.

Table 9-1 Baseline Environment Criteria Rating

Baseline Rating (Importance)	Criteria
Very High	Receptors of International Importance: UNESCO World Heritage Properties (including tentative list) Any archaeological, architectural or cultural heritage site of designated international/national importance National Monuments Monuments subject to Preservation Orders
High	RMP Protected Structures Architectural Conservation Areas (ACA) Proposed RMP Previously unrecorded archaeological sites Well-preserved demesne landscapes
Medium	SMR Areas of Archaeological Potential (AAP) Sculptures/Memorials/Buildings with cultural heritage merit (based on professional judgement) National Inventory of Architectural Heritage (NIAH) Townland boundaries – upstanding Moderately well-preserved demesne landscapes
Low	Lands where previous disturbance may have affected the potential archaeological resource Sculptures/Memorials/Buildings with cultural heritage merit (based on professional judgement) Redundant records Poorly preserved demesne landscapes

Baseline Rating (Importance)	Criteria
Very Low	Sculptures/Memorials/Buildings with cultural heritage merit (based on professional judgement) Townland boundaries – site of Fully developed demesne landscapes
Negligible	SMR – Record only RMP – excavated NIAH - demolished

9.2.8 Magnitude of Impacts

The scale or magnitude of potential impacts (both positive and negative) depends on the degree and extent to which the Project activities may change the environment, which usually varies according to project phase (i.e. construction, operation and maintenance and decommissioning).

As per the EPA Guidelines (2022), the nature of impacts can be categorised as follows:

- Quality: Positive, neutral or negative
- Nature: Direct, indirect
- Probability: Likely or unlikely
- Duration: Momentary, brief, temporary, short-term, medium-term, long-term, permanent, reversible
- Frequency: Once, rarely, occasionally, frequently, constantly

The criteria used to assess the different impacts associated with the Project are shown in Table 9-2. The criteria have been defined in consideration of the Guidelines on Information to be Contained in Environmental Impact Assessment Reports (EPA, 2022).

Table 9-2 Definition of Magnitude of Impact

Magnitude	Description
Very High	These impacts arise where an archaeology, architectural or cultural heritage site, either below ground or upstanding, is completely and irreversibly destroyed.
High	An impact which, by its magnitude, duration or intensity, alters an important aspect of the archaeological, architectural and cultural heritage environment, including the setting of upstanding monuments/structures. An impact like this would be where part of a site would be permanently impacted upon, leading to a loss of character, integrity and data about an archaeological, architectural or cultural heritage feature/site.
Medium	A medium impact arises where a change to a site/monument/structure is proposed which though noticeable, is not such that the archaeological, architectural or cultural heritage integrity of the site is compromised. The change is likely to be consistent with existing and emerging trends. Impacts are probably reversible and may be of relatively short duration.
Low	An impact which causes changes in the character of the environment, such as a visual impact, which are not high or very high and do not directly impact or affect an archaeological, architectural or cultural heritage feature or monument.
Very Low	An impact on an archaeological, architectural or cultural heritage feature or monument capable of measurement but without noticeable consequences.

9.2.9 Significance of Effects

An Impact Assessment Matrix (IAM) is used to determine the significance of an effect. In basic terms, the potential significance of an effect is a function of the importance of the receptor and the magnitude of the impact, as shown in Table 9-3.

The matrix provides a framework for the consistent and transparent assessment of predicted effects although it is important to note that the assessments are based on the application of expert judgement. The matrix provides levels of effect significance ranging from imperceptible to profound. For the purposes of this assessment, potential effects identified to be of significant significance or above (i.e., significant, very significant or profound) are considered to be "significant in EIA terms" and additional mitigation will be required. Potential effects identified as less than significant (i.e. moderate, slight, imperceptible or not significant) significance are considered to be not significant in EIA terms.

Table 9-3 Impact assessment matrix for determination of significance of effect

Importance of Receptor	Magnitude of Impact				
	Very High	High	Medium	Low	Very Low
Very High	Profound	Very Significant	Significant	Moderate	Slight
High	Very Significant	Significant	Significant-Moderate	Moderate	Not Significant
Medium	Significant	Significant-Moderate	Moderate	Slight	Imperceptible
Low	Moderate	Moderate-Slight	Slight	Not Significant	Imperceptible
Very Low	Slight	Not Significant	Imperceptible	Imperceptible	Imperceptible

9.3 Baseline Environment

The Proposed Development and its study area cross 16 townlands, which are located in Fingal Administrative Area in the western portion of the County of Dublin. The Proposed Development terminates at the county boundary with Kildare to the west. The study area also includes a further three townlands within County Kildare. The Proposed Development mostly follows the original routes of the historic tow paths that flank the Royal Canal as it leads westwards from Dublin City.

Table 9-4 Counties, Baronies, Parishes & Townlands

County	Barony	Parish	Townlands
Fingal Administrative Area	Castleknock	Castleknock	Blanchardstown
			Carpenterstown
			Castleknock
			Diswellstown
			Porterstown
		Clonsilla	Barberstown
			Barnhill

County	Barony	Parish	Townlands
			Clonsilla
			Kellystown
			Sheepmoor
		Leixlip	Allenswood
			Coldblow
			Laraghcon
			Passifyoucan
			St. Catherine's Park (Fingal)
			Westmanstown
Kildare	North Salt	Confey	Allenswood
			Catherine's
			Confey

Recorded and previously unrecorded sites, areas and structures of archaeological, architectural and cultural heritage significance, which are described within the relevant sections of this chapter, are shown on from Figure 9-2 to Figure 9-8.

The Royal Canal BH-01

The section of the Royal Canal, which is the key built heritage feature within the study area of the Proposed Development, in Fingal County is listed as a protected structure (BH-01, RPS 0944a). This designation includes all associated features, such as locks, tow paths, canal channel and stone/earth banks and any associated stone culverts, arches and bridges. The extent of the canal is shaded in blue within the figures that accompany this chapter.

By the middle of the 18th century several proposals were being considered for building canals through Ireland. Government funding was available and canals were an instrument to assist economic progress by encouraging trade and industrial development. The attraction of linking Dublin with the River Shannon was obvious and, in 1755, two alternative routes were put before the Irish Parliament. The southern route was chosen and work commenced on constructing the Grand Canal.

In the 1780s a disgruntled director of the Grand Canal Company decided to build a rival link to the Shannon using a more northerly route, roughly following the same path as the originally rejected itinerary. A parliament grant was received for constructing the canal and work commenced on the Royal Canal in 1790.

The Royal Canal finally reached the river at Clondra, County Longford, in 1817 at a total cost of £1,421,954 but was never hugely successful, with its construction marred by several costly mistakes. This included changes of alignment at Maynooth and Kinnegad and running through a large quarry at Porterstown. The management of the project was so bad that the original company was laid down by the government in 1813, when the construction and completion of the canal came into state control. Following the completion of the works in 1817 a new company was established in 1818 to run the canal. The revenues of the canal suffered badly from competition by road, particularly with the improvement in roads and road vehicles that took place from the late 18th century. The railway age signalled the

demise of the canal and in 1845 the Midland Great Western Railway Company purchased the entire canal for £289,059, principally to use the property to lay a new railway. The Railway Company was legally obliged to continue the canal business, but inevitably traffic fell into decline and by the 1950s there was virtually no traffic and the canal was officially closed in 1955.

Midland Great Western Railway Company CH-03

The advent of the railway to Ireland completely radicalised Irish transport, transforming concepts of speed and travel and allowing for the movement of people and goods as never before. In the summer of 1845, an Act of the British Parliament gave the newly-formed "Midland" Company the right to build a rail line from Dublin to Mullingar. The new line quickly reached Enfield and was opened for traffic in June 1847, running along the bank of the Royal Canal, and reached Galway by 1851. This railway runs along the southern bank of the Royal Canal to the immediate south of the scheme.

In 1858 the Dublin and Meath Railway was established with a view to developing a rail link from Athboy and Trim to Dublin; however, this ran into difficulties soon after work began and the developers turned their attentions to developing a line from Navan to Clonsilla. This 26-mile route opened in August 1862. This line became known as 'The Meath Road' but the company suffered financial difficulties and went into receivership in 1868. The Midland and Great Western Railway took a lease on the Clonsilla-Navan line before eventually buying it in 1888. The Midland and Great Western Railway Company was absorbed by Great Southern Railways in 1925 and in 1947, following a huge decline in rail passengers the line was permanently suspended.

9.3.1 Archaeological and Architectural Background

Mesolithic Period (8000-4000 BC)

Traditionally, the Mesolithic period was believed to be the earliest period for human occupation of the island of Ireland. While this long-held belief has been challenged by recent discoveries in the southwest (Dowd and Carden, 2016), the Mesolithic period is accepted as the earliest time for which there is widespread evidence of human occupation of the island. During the Mesolithic period, people lived in small mobile groups which were heavily dependent on the availability of seasonal resources. As a result of this transient lifestyle, relatively little evidence of settlement survives. Often the only trace of these communities are scatters of stone tools and the by-products of their manufacture. In some areas, shell middens survive which date to the Mesolithic period. Riverine and coastal resources played a particularly crucial role for these communities, and it is often in these areas that evidence of these groups survives.

Although there is no recorded evidence for Mesolithic activity within the study area, significant Mesolithic activity has been unearthed in the Dublin area both in close proximity to a river course and within an estuarine environment. Situated at its closest point c. 1.3km to the southeast, the River Liffey and its environs were frequently visited by Mesolithic communities who may have used it as a route way to the coast and as a food and materials resource. During an excavation in 1995, Mesolithic material consisting of a large flint assemblage (DU017-079) was unearthed c. 1.8km to the southwest of the Proposed Development area, within a 18th century landscape folly. It was found the construction of this folly disturbed Mesolithic material at this location that overlooked the River Liffey.

Neolithic Period (4000-2500 BC)

The Neolithic period was a revolutionary period which provides the first evidence of the emergence of farming societies in Ireland. There was profound change as people moved (both gradually and rapidly) from a peripatetic lifestyle to one organised around animal husbandry and cereal cultivation. Understandably, the transition to the Neolithic was marked by major social transformation; communities expanded and moved further inland to create more permanent settlements. This afforded the further development of agriculture, which altered the physical landscape. Forests were rapidly cleared and field boundaries constructed.

Pottery was also being produced, possibly for the first time, as well as a variety of other artefacts including polished stone axes, a variety of flint tools and saddle querns for grinding corn. People lived in rectangular houses which contained hearths as well as specially demarcated areas for activities such as food preparation.

There was a greater concern for territory, which saw the construction of large communal ritual monuments called megalithic tombs, which are characteristic of the period. Whilst there are two types of megalithic tombs recorded in County Fingal, none of these are located within the study area of the Proposed Development.

Evidence for settlements dating to this period is hard to identify as the land has been so intensively farmed and urbanised in modern times that most sites have no above surface expression. However, records held by the National Museum of Ireland indicate the presence of a Neolithic population in Fingal due to the discovery of stray artefacts dating to this period. These records relate to two stray finds of polished stone axes from within the study area in the townlands of Kellystown (NMI 1979:104) (c. 120m to the north) and Sheepmoor (NMI 1980:30) (c. 240m to the south). Further afield within the Dublin area, the present location of a megalithic structure (DU018-007009) within the Phoenix Park (which is listed c. 5.1km to the southeast of the Proposed Development), does support the assumption that there was a Neolithic community within the area which buried their dead within what would later become the Phoenix Park range.



Figure 9-2 Proposed Development (Blanchardstown) showing archaeological, architectural and cultural heritage sites



Figure 9-3 Proposed Development (Carpenterstown, Sheepmoor, Diswellstown, Porterstown) showing archaeological, architectural and cultural heritage sites



Figure 9-4 Proposed Development (Porterstown, Kellystown) showing archaeological, architectural and cultural heritage sites



Figure 9-5 Proposed Development (Kellystown, Clonsilla, Barberstown) showing archaeological, architectural and cultural heritage sites



Figure 9-6 Proposed Development (Barberstown, Barnhall, Westmanstown) showing archaeological, architectural and cultural heritage sites



Figure 9-7 Proposed Development (Westmanstown, Coldblow) showing archaeological, architectural and cultural heritage sites



Figure 9-8 Proposed Development (Coldblow, St Catherine's Park) showing archaeological, architectural and cultural heritage sites

Bronze Age (2500-500 BC)

The most common Bronze Age site within the archaeological record is the burnt mound or *fulacht fiadh*. Over 7,000 *fulachta fiadh* have been recorded in the country and hundreds excavated, making them the most common prehistoric monument in Ireland (Waddell, 1998, 174). Although burnt mounds of shattered stone occur as a result of various activities that have been practiced from the Mesolithic to the present day, those noted in close proximity to a trough are generally interpreted as Bronze Age cooking/industrial sites. *Fulachta fiadh* generally consist of a low mound of burnt stone, commonly in horseshoe shape, and are found in low-lying marshy areas or close to streams. Often these sites have been ploughed out and survive as a spread of heat- shattered stones in charcoal-rich soil with no surface expression near a trough. Numerous *fulachta fiadh* are recorded within Fingal, although there are none recorded within the study area of the Proposed Development. The remains of a burnt mound were identified within the townland of Deanstown, c. 1.7km to the north-northeast of the Proposed development (DU013-147).

The Bronze Age heralded further change within society both in terms of material culture and social practises as well as the nature of the construction and use of sites and monuments. Megalithic tombs were no longer constructed and the burial of the individual became more typical. Cremated or inhumed bodies were often placed in a cist, a small stone box set into the ground, or a stone-lined grave. Burials were often made within cemeteries which were either unenclosed or else marked in the landscape with the construction of an earthen barrow.

Barrows of this period often vary in form and can include the ring-ditch, the embanked ring-ditch, the ring barrow, the bowl barrow and the bowl barrow lacking an external bank. In general, ring ditches date to the Bronze Age, with the earlier examples being simpler in form and later examples incorporating entrances and a wider range of burial practices. Ring-ditches continued to be constructed and earlier monuments re-used, during the Iron Age and early medieval period. In the east of the country ring-ditches (a term applied to barrows with a flat centre) have been dated as late as the seventh century AD. A ring-barrow (DU013-018) is recorded c. 62m south of the Proposed Development in Kellystown on the opposite southern side of the Royal Canal. A second site, a ring ditch (DU013-047) is located c. 72m to the northwest in the townland of Westmanstown. These sites point to activity or occupation in the area during the prehistoric period. Further Bronze Age activity further afield is also attested by the discovery of early Bronze Age cists in the Phoenix Park in the last century.

Iron Age (500BC-500AD)

This period is distinguished from the rather rich remains of preceding Bronze Age and subsequent early medieval period by a relative paucity of evidence in Ireland. However, there is increasing evidence for Iron Age settlement and activity in recent years because of development-led excavations as well as projects such as LIARI (Late Iron Age and Roman Ireland).

As in Europe, there are two phases of the Iron Age in Ireland; the Hallstatt and the *La Tène*. The Hallstatt period generally dates from 700 BC onwards and spread rapidly from Austria, across Europe, and then into Ireland. The later Iron Age or *La Tène* culture also originated in Europe during the middle of the 5th century BC. For several centuries, the *La Tène* Celts were the dominant people in Europe, until they were finally overcome by the Roman Empire. There are no recorded Iron Age sites within the immediate vicinity of the Proposed Development area.

Early Medieval Period (AD 500-1000)

The earliest Irish names for the Castleknock area seem to mean the ‘Druid's Mound’ or grave; it was also called "*Cnock Bran*", probably from the name of a druid who may have been buried there. The best-known name, and the one by which it is always called in later Irish Annals, is *Cnucha*, derived from the Irish word *Cnoc* (a hill), presumably referring to the position of the ancient residence or mound. The high king *Niall Glundubh* (Niall of Cnucha) was killed at Castleknock fighting against the Danes of Dublin in A.D 919. A fierce battle ensued called by the Irish chroniclers, the Battle of *Ath Cliath,* with much of

the fighting taking place midway between Castleknock and Dublin at a place called Kilmahavogue. One result of the battle was that *Cnucha* ceased to be an Irish fortress and became a Danish residence.

During this period, Ireland was depicted in the surviving historical sources as entirely rural. Secular habitation sites in the early medieval period include *crannógs*, cashels and ringforts which are largely defined as circular enclosures surrounded by banks and ditches. In addition to these, there is some evidence for unenclosed settlements which are more difficult to identify in the archaeological record. The ringfort, or *ráth*, is considered to be the most common indicator of settlement during the early medieval period (Stout, 1997). Ringforts are strongly associated with agricultural land and, as such, are rarely situated at higher altitudes. Ringforts and potential ringforts—often recorded as enclosures—are the most common archaeological sites recorded across the Irish landscape. As noted, a possible levelled ringfort (DU017-005) has been identified in the townland of Porterstown, c. 830m south-southwest of the Proposed Development.

The early medieval landscape also saw the construction of a large number of ecclesiastical sites throughout Ireland in the centuries following the 5th century AD. These early churches tended to be constructed of wood or post-and-wattle (O'Sullivan *et al* 2014). Many of the sites, some of which were monastic foundations, may have originally been defined by an elliptical enclosing wall or bank similar to that found at the coeval secular sites mentioned above. This enclosing feature may have bounded a sacred area. An inner and outer enclosure can be seen at some important sites; the inner enclosure surrounding the sacred area of church and burial ground and the outer enclosure providing a boundary around living quarters and craft areas.

The site on which the current Church of Ireland (Saint Mary's) now stands in Clonsilla, c. 105m northeast of the Proposed Development, has an ecclesiastical history dating back to AD 500. Clonsilla was a cell church of Coolmine, which is located c. 1.2km north-northeast of the scheme. The last surviving disciple of Saint Patrick, Saint Machutus, the first Abbot of Louth, founded "The White Church of Saint Machutus" (a Benedictine order) in Coolmine early in the first part of the 6th century. Nonetheless, there is little documentary evidence of a building or church in Clonsilla until 1215/1217. The lands were then owned by the "priory of Little Malvern", to which all revenues were sent.

Many holy wells are associated with early ecclesiastical sites. The veneration of wells is a very widespread and ancient tradition in Ireland. Many holy wells can be found associated with early ecclesiastical sites. Well veneration and its antecedent well worship are not confined to Ireland, or even to Europe, and at least some holy wells in Ireland were important venues of pre-Christian ritual activity. Most wells are springs but occasionally other water sources, or hollowed stones that collect water, are treated as holy wells. The site of a holy well (DU017-002) is recorded c. 752m southwest of the Proposed Development area in the townland of St. Catherine's.

Medieval Period (AD 1000-1600)

The beginning of the medieval period was characterised by political unrest that originated from the death of Brian Borumha in 1014. Diarmait MacMurchadha, deposed King of Leinster, sought the support of mercenaries from England, Wales and Flanders to assist him in his challenge for kingship. Norman involvement in Ireland began in 1169, when Richard de Clare and his followers landed in Wexford to support MacMurchadha. Two years later de Clare (Strongbow) inherited the Kingdom of Leinster and by the end of the 12th century the Normans had succeeded in conquering much of the country (Stout and Stout, 1997).

Clonsilla was part of a grant of lands made to Hugh Tyrrell during the Anglo-Norman settlement of Ireland following their arrival in 1169. The grant was centred on the lands of the parish of Castleknock and it was at Castleknock Castle that Hugh Tyrell and his descendants based themselves. The remains of Castleknock Castle are in the grounds of Castleknock College. By the end of the 13th century, several families had become established on the Castleknock lands, either by grant from the Crown or from the Tyrrells. One such family were the Luttrells who had been granted lands by the Tyrrells at Clonsilla.

The first member of the Luttrell family to come to Ireland was Sir Geoffrey Luttrell, who had been a loyal follower of King John, when Earl of Mortain, and became one of the monarch's favourite ministers after his accession to the throne. Luttrell's connection with Ireland appears to have begun in 1204 when, in the beginning of that year, he was appointed a commission to settle disputes between the justiciar and the Anglo-Norman magnates in the country. In 1210, he accompanied King John on a visit to Ireland. He later died when sent on an embassy to the Pope, but had already established the lineages of both the Irish and English lines of the Luttrell family (Ball, 1906, 1-3).

The present house at Luttrellstown (RPS 723), situated c. 1.3km southeast of the proposed cycle way, incorporates portions of an earlier fortification in its northeast end. It is said that King John occupied one of the apartments. The only major portion surviving from Luttrell's time is the library, which was the original entrance hall to the castle (RMP DU017-004). Luttrelstown demesne, which incorporates the earlier castle, is designated as an ACA within the Fingal County development plan.

Castleknock or *Caisleán Cnucha* (Castle of the hill), is a name of comparatively recent origin dating to the arrival of the Normans; with the introduction of the word castle. In documents relating to the 12th and 13th centuries the place is called *Castrum Cnuc*, or simply *Cnuc* whilst some Norman-French writers used the expression *Chastel-cnoc* or *Castel-cnoc*. The Norman invasion of 1169 brought a change in the fortunes and appearance of *Cnucha*. One of the outstanding events of that invasion was the siege of Dublin in 1171 by Roderick O'Connor, who was encamped at *Cnucha* (Castleknock) with a huge army, supported by many Irish Chiefs. The strategic importance of Castleknock regarding the defences of the city on its western side, and the necessity of having strong fortification to check an enemy in this direction, was noted by the invading Normans. About the year 1172 Hugh de Lacy was created Earl of Meath and received from Henry II huge grants of land extending from Dublin far into the present county of Meath. De Lacy, as King's bailiff or representative subdivided his immense territory among his knights as his feudal vassals. To his intimate friend and associate, Hugh Tyrrell, he granted by charter about 1177 the stronghold of *Cnucha* and the surrounding territory. De Lacy's charter was later confirmed by another granted by Henry II.

The Anglo-Norman castle (DU017-01202, RPS 748) situated on the top of the mound (an earlier motte and bailey DU017-01201), c. 1.48km southeast of the Proposed Development, was built by Hugh Tyrell in the late 12th century. Francis Place's drawing of 1698 shows the castle as a strongly built multi-angular keep standing about 80 feet above the hill on which it was erected. Less than half of the original keep of the castle survives, with a portion of the walls of the bailey, enclosing a space of c. 30m x 18m. The bailey is still surrounded to the north and west by the original deep double fosses and the double earthen ramparts which formed the other defences of the castle. The interior of the bailey is now occupied by a Vincentian cemetery, first consecrated in the mid-19th century and still used by the community at Castleknock College.

The Church of Coolmine, though originally the most important place of worship in the parish of Clonsilla, was in decline by the 13th century. It was mentioned in the time of Archbishop Henry de Loundres, who held the See of Dublin from 1212 to 1228, as one of the churches in his gift. That prelate; however, consecrated another church as the Priory of Little Malvern, the site of which is now occupied by the present church of Clonsilla, which completely superseded the church of Coolmine. In 1486 the lands were made over to Saint Mary's Abbey, under the name of the White Chapel of Saint Machutus of Clonsilla (Ball, 1906).

Post-Medieval Period (AD 1600–1800)

Dublin was held by the English forces for the King during the Civil War of 1641, and the owner of Castleknock sided with the Anglo-Irish of the Pale. The stronghold of Castleknock was too important a position to be left in the hands of the enemy close to the walls of Dublin. Attempts were made in 1642 to secure it for the King and to place a royalist garrison therein and the castle was subsequently taken by siege.

In the ensuing years, Dublin was handed over to the Parliamentarians by the desertion of Ormonde. Owen Roe O'Neill commanded the Irish forces and in 1647 he advanced upon Dublin, and came as far as Castleknock. He quickly got possession of the Castle, but apparently was not strong enough to lay siege to the city and decided to withdraw in the direction of Drogheda. Two years later, another attempt was made to regain Dublin by the Royalists. The Marquis of Ormonde advanced with his forces and, having encamped at Castleknock, engaged in skirmishes with the Parliamentarian general, Colonel Jones, but after a short time withdrew with his main face towards Finglas, leaving a garrison in Castleknock.

The 18th century saw a dramatic rise in the establishment of large residential houses around the country. A large country house was only a small part of the overall estate of a large landowner and provided a base to manage often large areas of land that could be located nationwide. Lands associated with the large houses were generally turned over to formal gardens, which were much the style of continental Europe. Gradually this style of formal avenues and geometric garden design was replaced during the mid-18th century by the adoption of parkland landscapes, to be able to view a large house within a natural setting. Although the creation of a parkland landscape involved working with nature, rather than against it, considerable constructional effort went into their creation. Earth was moved, field boundaries disappeared, streams were diverted to form lakes and quite often roads were completely diverted to avoid travelling anywhere near the main house or across the estate. The landscape surrounding Dublin city was valued by the land-owning classes as a prime location to establish a country house and while many have been lost to the residential suburbs of Dublin, those further to the north have a better survival rate. The Proposed Development passes through the demesne landscapes of Clonsilla House, Clonsilla Lodge and Beech Park House. Neither Clonsilla Lodge nor House are extant today. Beech Park House remains present and is listed as a protected structure, but is located outside of the study area for the Proposed Development.

Vernacular Architecture, the most common style of building found within the Irish landscape, is defined in James Steven Curl's Encyclopaedia of Architectural Terms (1993) as 'a term used to describe the local regional traditional building forms and types using indigenous materials, and without grand architectural pretensions', i.e. the homes and workplaces of the ordinary people built by local people using local materials. This is in contrast to formal architecture, such as the grand estate houses of the gentry, churches and public buildings, which were often designed by architects or engineers. The majority of vernacular buildings are domestic dwellings. Examples of other structures that may fall into this category include shops, outbuildings, mills, limekilns, farmsteads, forges, bridges, gates and gate piers. Single-storey thatched houses are the most widely understood form of Irish vernacular architecture and generally date from the 18th to early 19th centuries. These represent rare survivals when consideration is given to the amount of vernacular architecture that has been lost in the past 175 years.

9.3.2 Summary of Previous Archaeological Fieldwork

A review of the Excavations Bulletin has shown that several excavations have taken place alongside the route of the Proposed Development, which are summarised below in Table 9-.

Table 9-5 Previous Archaeological Fieldwork

Licence Ref.:	Excavations.ie Ref.:	Townland:	Type:	Description	Dist. from Proposed Development :
02E1422	2004:0488	Clonsilla	Testing	Test excavation within a cemetery (DU013-17002) uncovered the remains of a coffin from the 1960s and disarticulated skeletal	c. 108m to the north

Licence Ref.:	Excavations.ie Ref.:	Townland:	Type:	Description	Dist. from Proposed Development :
				remains from the late 19th century.	
04E0033	2004:0489	Clonsilla	Excavation	Excavation within cemetery (DU013-17002) uncovered the remains of 32 individuals on the site dating from the early 19th century onwards.	c. 116m to the north
25E0174	-	Clonsilla	Testing	No features of archaeological significance identified during testing although some ex-situ possible medieval masonry was recorded in the northwest corner of the site.	c. 85m northeast
05E0065	2005:402	Castleknock	Testing	No archaeological significance.	c. 200m to the north
24E0045	2024:272	Kellystown	Monitoring	No archaeological significance.	To the immediate south
25E0117	2025:021	Kellystown	Testing	Testing identified two areas of burnt mound activity and also recorded a fragment of a prehistoric stone axe.	To the immediate south
06E0348	2006:583	Kellystown	Testing	Test excavation identified a barrow/'embanked ring-ditch' (DU013-018).	c. 55m south-southwest
08E0754	2008:368	Barnhill	Testing	No archaeological significance.	c. 82m to the northwest
09E0096	2009:299	Porterstown	Testing	No archaeological significance.	c. 61m to the south
09E0537	N/A	Porterstown	Monitoring	Post-medieval cellars and tiled floor.	Crossed Proposed Development route
12E0432	2012:231	Hansfield	Monitoring	No archaeological significance.	c. 217m to the northwest
17E0256	2017:637	Clonsilla	Testing	No archaeological significance.	c. 150m to the north
19E0457	2019:723	Clonsilla	Monitoring	Medieval field system plus rows of pits in one of the medieval fields. Each pit was identical and arranged in rows 6m apart, with each pit 6m from each other pit. The pit rows extended over an area measuring at least 80m by 50m. The pits contained few artefacts other than small sherds of medieval pottery.	c. 100m to the north

9.3.3 Topographical Files of the National Museum of Ireland

Information on artefact finds from the study area within County Dublin has been recorded by the National Museum of Ireland since the late 18th century. Location information relating to these finds is important in establishing prehistoric and historic activity in the study area.

Only one artefact is recorded in the topographical files of the National Museum of Ireland with the 250m study area of the Proposed Development. This stray find represents a polished stone axehead (NMI Ref.: 1979:104), recovered from Kellystown, c. 105m to the northeast of the Proposed Development area.

9.3.4 Cartographic Analysis

Down Survey Barony of Castle Knock in the County of Dublin, and the Barony of Newcastle & Upper Cross in the County of Dublin 1656-58 (Figures 9.9-9.10)

The Down Survey maps were compiled in the mid-17th century at a scale of 40 perches to one inch (the modern equivalent of 1:50,000) and represent the first systematic mapping of a large area on such a scale attempted anywhere. These maps were completed in three categories which include a county, barony and a parish level. The primary purpose of these maps was to record the boundaries of each townland and to calculate their areas with great precision. These maps are the earliest cartographic sources which provide some detail of the area in which the Proposed Development is located that include representative illustrations of prominent structures such as churches, castles, houses and fortifications along with road networks and river courses.

At a county level, the Down Survey Map for Dublin provides some placename evidence of the townlands through which the Proposed Development passes through: Westmanstown, St. Catherine's, Porterstown Grange, Blanchardstown, Carpenterstown and Castleknock. These names were already in existence by the mid-17th century. The Down Survey County map also depicts the prominent houses of Luttrellstown Castle and St. Catherine's along with some topographical details- that include a series of small hills to the northside of the River Liffey.

At a Barony level, this Proposed Development passes through two baronies: Castleknock to the east (which encompasses the majority of the Proposed Development) and Newcastle, which is situated to the west, adjacent the county boundary with Kildare.

The Down Survey Map of the 'Barony of Castle Knock' illustrates Castleknock Castle and mound to the northern bank of the River Liffey. An enclosed area representing the Blanchardstown Estate is shown slightly to the northwest. A second castle, Luttrellstown Castle, is shown to the west and is depicted as surrounded by trees which represent its demesne landscape. An access road leads southwards from Luttrellstown Castle to a road that follows the route of the River Liffey to its northern side. The Proposed Development is located to the north of Luttrellstown Castle and there is no further detail provided at this level.

The Down Survey map for the Barony of Newcastle is merged with the Barony of Upper Cross. This map provides scarce detail concerning the route of this Proposed Development. Only the demesne houses of Westmanstown House and St. Catherine's are shown.

At a parish level, the Down Survey map for the Parish of Castleknock does not greatly increase the amount of detail for the Castleknock area. Most of the illustrations are similar to the Barony of Castleknock Map with the only increase in detail centred around the area of Blanchardstown. The parish map provides a brief list of the most prominent individuals in this locality which include Robert Dillon and Simon Lutterill. The estates are divided by an unnamed linear feature which represents part of the course of the Tolka River.

The townlands of Westmanstown and St. Catherine's are included in the Parish map 'of Adery and Lucan' and similarly there is no further increase in illustrated details when compared to the Barony Map of Newcastle. The only difference concerns the inclusions of the area extent to both of these townlands.

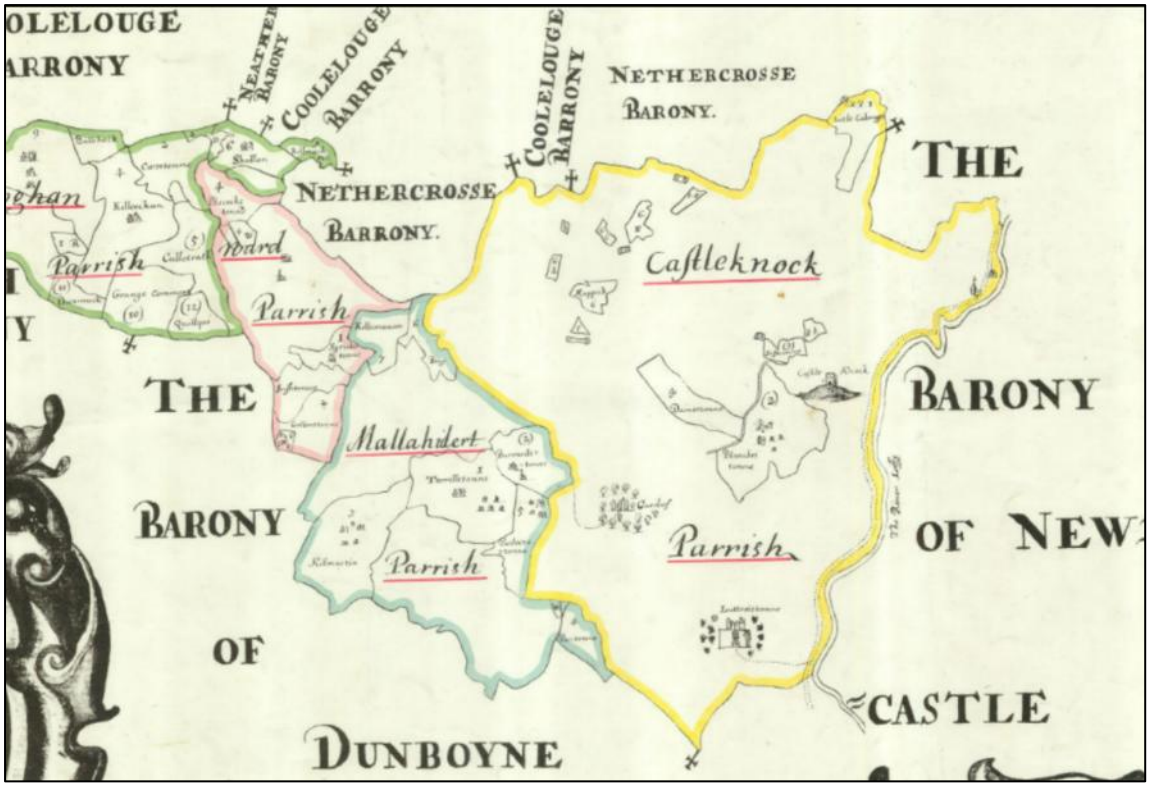


Figure 9-9 Extract from Down Survey map of the Barony of Castle Knock in the County of Dublin 1656-58



Figure 9-10 Extract from Down Survey map of the Barony of Newcastle & Upper Cross in the County of Dublin 1656-58

John Rocque's Map of County Dublin, 1760 (Figure 9.11)

John Rocque was an English-Huguenot mapmaker, surveyor and engraver of international standing who produced a series of maps of mid-18th century Dublin. Although the accuracy of these maps may not be to the standard that was produced in following century, they do provide a truthful representation of mid-18th century Dublin City and its environs and are a valuable insight into the Dublin environs pre-urbanisation.

The route of the Proposed Development in the mid-18th century is depicted as a rural area with occasional small settlements, demesnes and farmsteads dispersed throughout. This rural environment is dominated by small fields with various figurative representations indicating their use either as pasture/tillage or fruit/vegetable growing.

To the east, the village of Blanchardstown is positioned around a crossroads on the Old Navan Road. Several prominent country houses including those of Carpenterstown, Porterstown, Kellystown, Barberstown, Westmanstown and St. Catherine's along with several unnamed examples are shown in close proximity to the Proposed Development. Associated with these houses and villages are a number of gardens and orchards, some of which feature ornate geometric layouts. The estate of Luttrellstown Castle forms the largest and most prominent demesne within the surrounding area to the immediate south of the Proposed Development.

Rocque's map also provides an early account of the developing road infrastructure with notable details illustrating the presence of a circular road around the ecclesiastical site of Clonsilla Church (now known as St. Mary's Church) (DU013-017/ BH-12). Deliberate landscaping is evident with an avenue that leads to the southeast from Clonsilla Church to Luttrellstown Crossroads where the entrance to Luttrellstown Castle is positioned.

John Taylor's Map of the Environs of Dublin extending 10 to 14 miles from the castle County Dublin, 1821 (Figure 9.12)

Taylor's early 19th century map does not depict the exact locations of the field boundaries and land divisions along the route of the Proposed Development however, it does provide more detail as to the local topography, the road network and on the size of demesne landscapes that were associated with the country houses. Taylor's map does depict the route of the Royal Canal as occupying a relatively level channel between the diverging valleys of the River Tolka and the River Liffey.

Duncan's Map of County Dublin, 1821 (Figure 9.13)

This is the first accurate historic mapping coverage of the area containing the Proposed Development and clearly depicts the route of the Royal Canal. Many of the bridges on the NIAH survey are also depicted; Granard, Kirkpatrick, Carhampt (now Callaghan), Pakenham and Collins. Named large houses along with their demesne landscapes and tree-lined boundaries/avenues continue to be landmark features are again represented on this map along the route pf the Royal Canal. There are no other features of note.

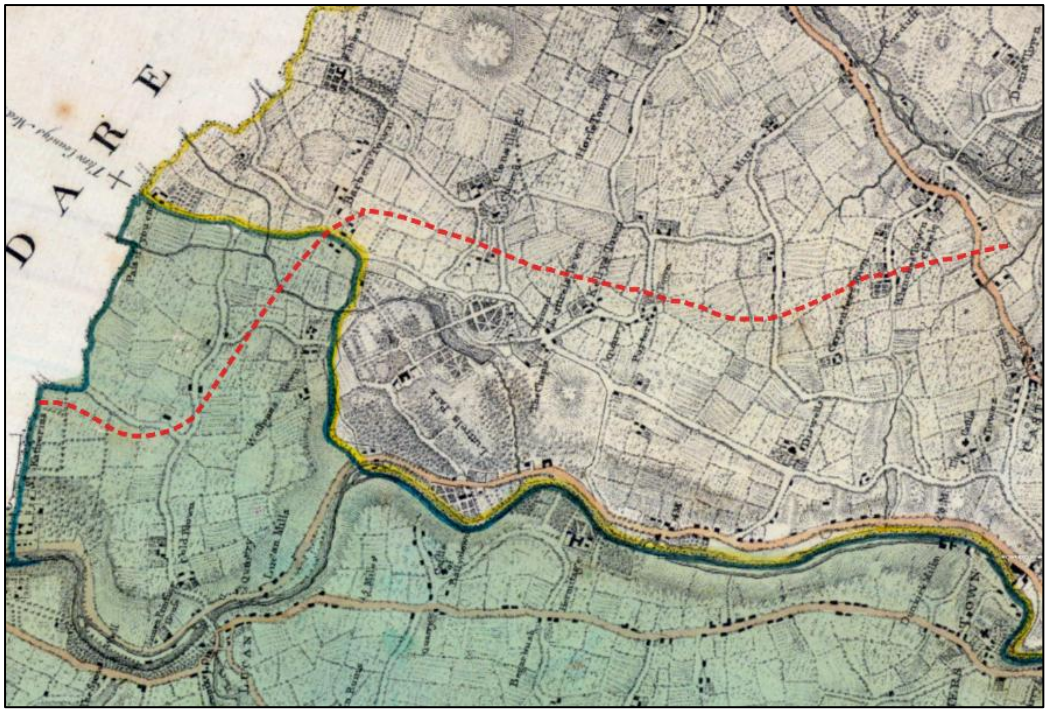


Figure 9-11 Extract from John Rocque's Map of County Dublin, 1760 showing approximate location of Proposed Development



Figure 9-12 Extract from John Taylor's Map of the Environs of Dublin, 1821



Figure 9-13 Extract from Duncan's Map of Dublin, 1821

First Edition Ordnance Survey Map, 1843, scale 1:10,560 (Figures 9.14-9.16)

Published by the Ordnance Survey, this series of maps represent the first accurate depiction of the complete island of Ireland and these maps provide a detailed illustration of the route of the Proposed Development (Figure 9-14). The general area and its surrounding environs were still a rural countryside setting in the first half of the 19th century with the village of Blanchardstown the closest urban cluster. The construction of the Royal Canal through the countryside has facilitated the development of small clusters of settlements around the new bridging points over the canal. The depth of the cutting which accommodates the Royal Canal is partially indicated from Kirkpatrick Bridge westwards, where hachuring indicates the presence of a slope down to the canal. Tow paths are also shown flanking the course of the canal. Hachuring indicating the presence of banks is shown flanking both sides of the canal within the townland of Kellystown. Both of these banks extend for a short distance into the neighbouring townlands of Porterstown to the east and Clonsilla to the west where they terminate at Callaghan Bridge. The Proposed Cycle Route either crosses by or over the site of a building that was located to the east side of the north bank at Kennan Bridge.

The Royal Canal itself is shown to possess a small indent or inlet to its south side within the townland of Kellystown (opposite a pond). To the east side of Collins Bridge, the canal widens to forms a harbour area with a central projection possibly representing a quay or jetty. Also at this location, the Proposed Cycle Route either crosses over or close by to the site of a former building (orientated northeast/southwest) as illustrated on this map below to the northeast side of Collins Bridge (Figure 9-15).

Within the surrounding environment to the Royal Canal, eight quarries are illustrated either directly flanking the canal or in close proximity to it between Talbot Bridge to the east and Kennan Bridge to the centre in the townlands of Castleknock, Carpenterstown and Porterstown. The Proposed Cycle Route does not fully follow the course of the Royal Canal tow paths and in several areas, it slightly diverges away from the waterside. In two instances, the Proposed Cycle Route crosses the site of two of these aforementioned quarries on the north side of the Royal Canal in the townland of Carpenterstown.

Further to the west in the townland of Porterstown, the Proposed Cycle Route passes by the site of two more quarries to their north and partially passes over the northern side of the site of a third smaller quarry (at this location the cutting for the Royal Canal is deep). Worsted Mill is marked just to the north of the Talbot Bridge. To the north of Kirkpatrick Bridge, the gate lodge for Woodville Lodge can be found.

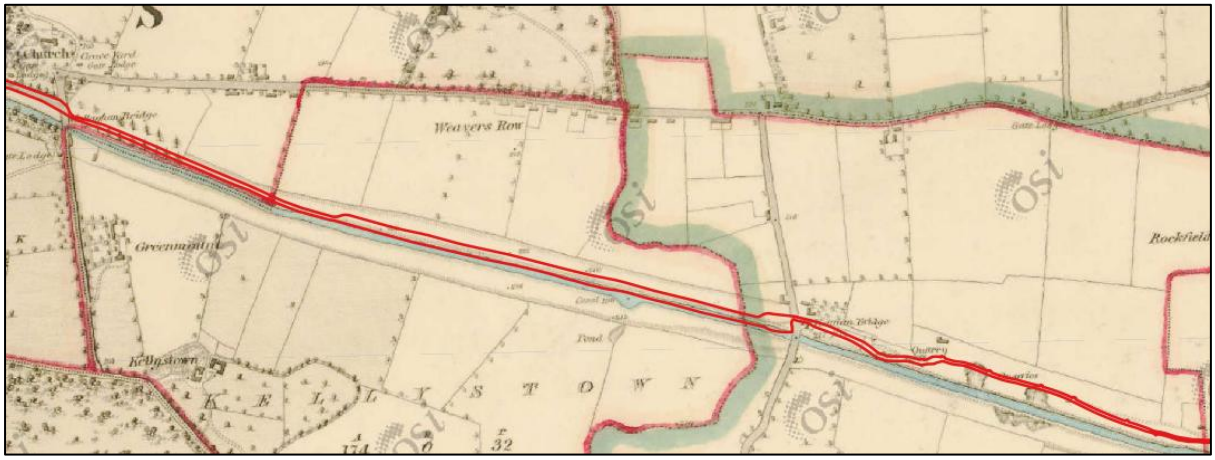


Figure 9-14 Extract from First Edition Ordnance Survey Map, 1843, showing quarries, clustered settlement around bridges and Royal Canal details

The church and graveyard at Clonsilla are clearly depicted (DU013-017001-2/BH-12) beside the gate lodge for Clonsilla House. The gate lodge for Beech Park House is located just south of these features across Callaghan Bridge. The gate lodge for Clonsilla Lodge is located just to the west of Clonsilla House. Towards the western extremity of the Proposed Development at the townland boundary between Barberstown and Westmanstown, an aqueduct is marked. An extensive tree-lined avenue is marked leading northwards from the location of St. Catherine's Park Demesne beside the county border with Kildare.

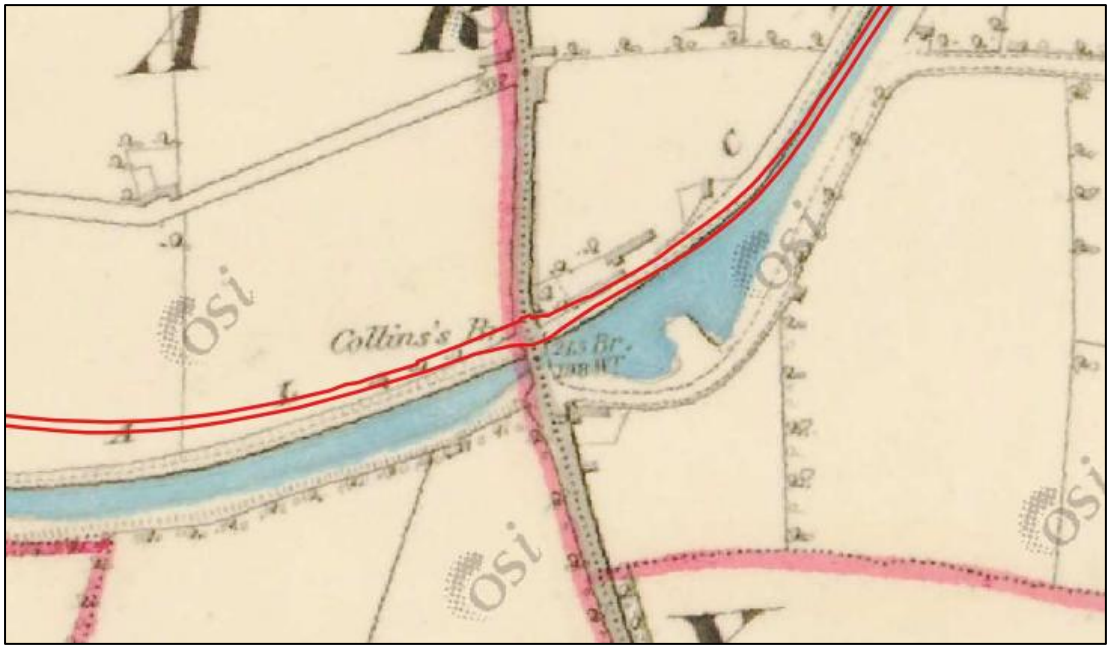


Figure 9-15 Extract from First Edition Ordnance Survey Map, 1843, showing harbour area adjacent Collins Bridge

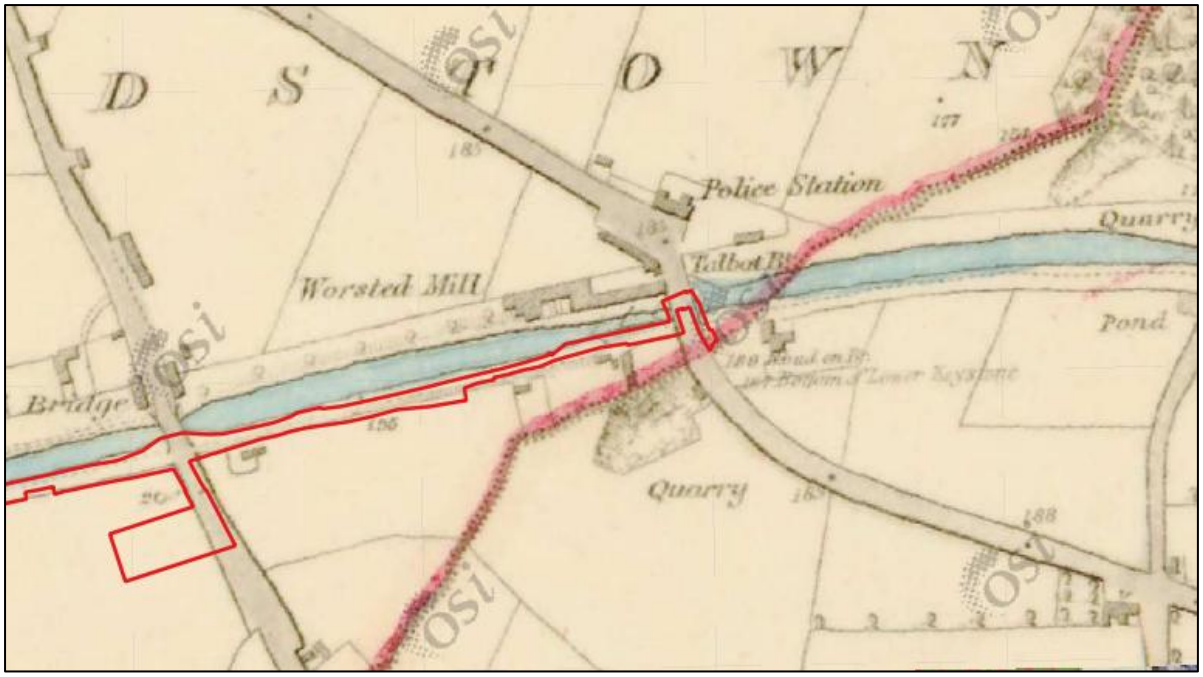


Figure 9-16 Extract from First Edition Ordnance Survey Map, 1843, showing Worsted Mill adjacent Talbot Bridge

Second Edition Ordnance Survey Map, 1871, scale 1:10,560

By the time of the 1871 Ordnance Survey map, this illustrates a broadly similar landscape which is still predominantly a rural countryside with the only urban growth visible to the small settlements that surround the bridges which cross the canal. The most significant development is the construction of the railway line which, operated by Midland Great Western Railway (MGWR), is shown as running roughly parallel to the Royal Canal to its south. This railway line also entailed the construction of a number of associated infrastructure elements such as stations, workers' houses, level crossings, culverts and signal boxes.

At the eastern end of the Proposed Development, Talbot and Granard Bridges remain present along with the canal. The railway is shown to the south of the railway and additional road bridges are marked as crossing the tracks. The remaining structures remain unchanged, including the Worsted Mill. Further to the west, Kirkpatrick remains marked, although the level crossing to the south is not annotated. The quarries within the footprint of the Proposed Development to the east of the bridge are no longer marked, although new quarries are marked to the west of the bridge to the immediate south of the Proposed Development.

At Kennan Bridge, the bridge across the canal is marked, although the level crossing to the south is again not annotated, although a 'Watch House' is marked. To the north of the canal and the Proposed Development, Clonsilla National School is marked (BH-08). Further to the west, a station house is marked to the west of Callaghan Bridge, to the north of the train tracks. The railway is marked as running through the northern section of the demesne associated with Beech Park House (DL5). The Proposed Development runs to the immediate north of the canal, partially through the southern extents of the demesne landscape associated with Clonsilla Lodge (DL7).

To the west of Clonsilla Lodge, the Proposed Development turns south and passes beneath the railway by means of an underpass, which is marked on this map and joins the annotated tow path that runs along the northern and western side of the Royal Canal. It passes Pakenham Bridge to the immediate north and a further level crossing across the railway is shown to the southeast. It continues along the marked tow path and passes to the north of Collins Bridge. To the south of the canal a building is annotated as Coldblow and Lucan Station. The Proposed Development continues along the canal tow

path until it terminates at the boundary with County Kildare. No major changes are shown in the cartography for this section.

Ordnance Survey Map, 1911 scale 1: 2,500 (Figures 9.17-9.18)

There are no major changes to note within this mapping when compared to the 1871 edition, although the scale of this map is more detailed and shows the route of the Proposed Development, canal and railway in more detail. At the eastern end of the Proposed Development to the southern bank of the Royal Canal adjacent the 12th Lock, there is illustrated an overflow drain to the canal, an essential element in the regulation of the water levels within the canal. At this location, the Worsted Mill has also been extended and is now labelled as a Margarine Factory (Figure 9-17), although no other major changes are noted in the environs at this location.

The church and graveyard at Clonsilla along with the aqueduct are still depicted. Woodville Lodge has significantly shrunk in size but Clonsilla House, Beech Park House and Clonsilla Lodge have expanded. The previous two buildings located adjacent Kennan Bridge and Collins Bridge which the Proposed Development either passes over or close by to, both of these structures are marked as no longer standing on this map. In general, the field systems surrounding the Proposed Development have remained unchanged and the landscape remains predominantly rural.

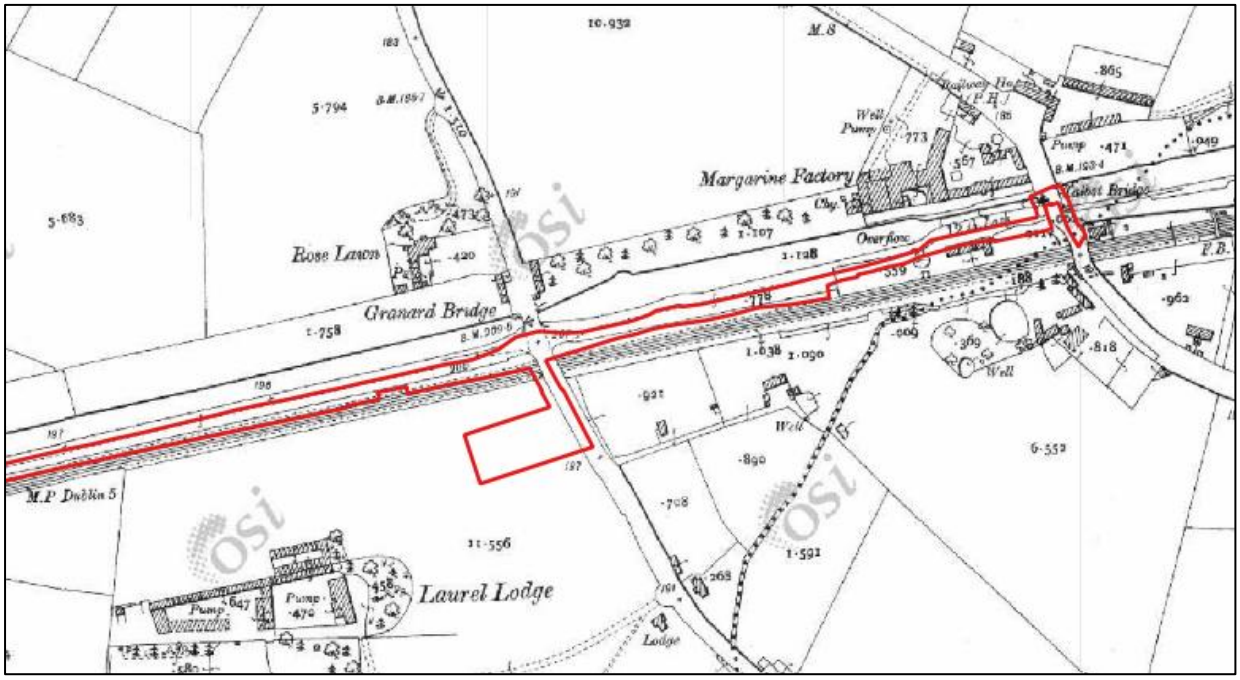


Figure 9-17 Extract from Ordnance Survey 25" Map, 1911, showing area around Talbot Bridge to Granard Bridge

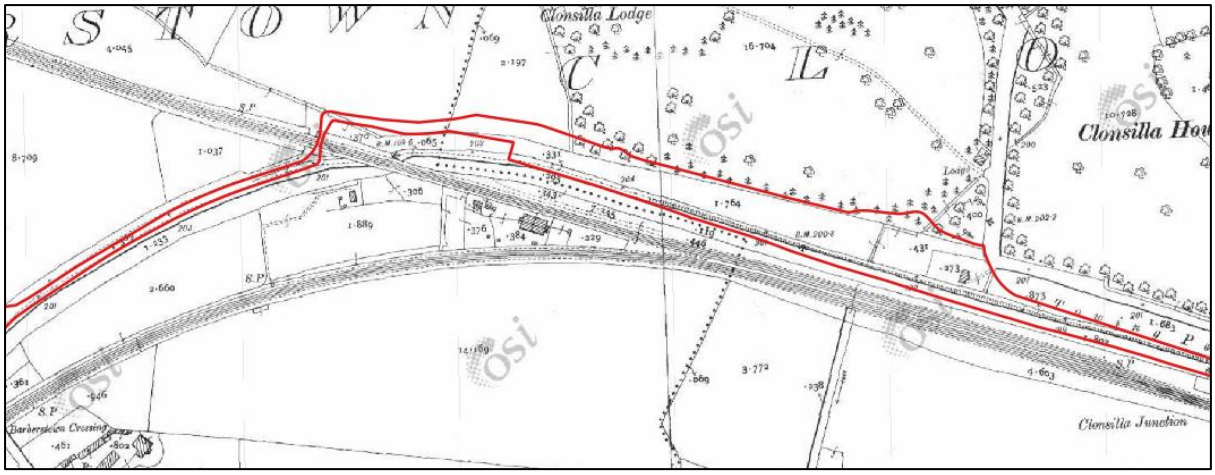


Figure 9-18 Extract from Ordnance Survey 25" Map, 1911, showing Navan Branch diverging to the northwest

Third Edition Ordnance Survey Map, 1937, scale 1:10560

This later 20th century map does not depict any major changes of note that relate to the Proposed Development area. The railway is shown on this map as operated by Great Southern Railways. The already- mentioned settlements that are nucleated around the bridging points have continued to develop, although a number of these structures are removed and under hard standing at the time of writing. The study area remained relatively rural towards the mid-20th century.

9.3.5 County Development Plans

Archaeological Heritage

The Fingal Development Plan 2023-2029 and the Kildare County Development Plan 2023-2029 both recognise the statutory protection afforded to archaeological sites included within the RMP and seek to protect those monuments, including their setting, access, views and prospects. FCC and Kildare County Council recognise the value and significance of the county's archaeological heritage, and the importance of fostering a greater public appreciation of this heritage. Through policies contained in these Development Plans, they seek to ensure the effective protection, conservation and enhancement of archaeological sites, monuments and their settings. Policies relating to the archaeological resource are included in Appendix 9.1.

The study area for the Proposed Development partially extends into County Kildare at the western limit of the Proposed Cycle Route; however, an analysis of recorded archaeological sites has indicated that there are no previously recorded archaeological sites within this portion of the study area.

Within the Fingal County Administrative Area, there are three groups or individual recorded archaeological sites within 250m of the Proposed Development . The closest recorded archaeological site to the Proposed Development is a ring-barrow (DU013-018), located in the townland of Kellystown c. 58m south of the middle section of the Proposed Development scheme (Table 9-).

St. Mary's Church (DU013-017001) is also listed in the Fingal County Development Plan 2023-2029 as a Protected Structure; RPS. Nos.: 705 (BH-12). All recorded archaeological sites are shown on Figure 9-2 to Figure 9-8.

There are no National Monuments or Monuments under Preservation Order within the study area of the Proposed Development.

Table 9-6 Archaeological Heritage (AH) sites within the study area

SMR/RMP No.	Classification	Statutory Protection	Location	Distance From Proposed Development	Importance
DU013-017001-3	Church, graveyard and graveslab	RMP	Clonsilla	c. 78m-104m northeast	High
DU013-018	Barrow – ring-barrow	RMP	Kellystown	c. 55m south-southwest	High
DU013-047	Ring-ditch	No	Westmanstown	c. 72m northwest	High

Architectural Heritage

The Fingal Development Plan 2023-2029 and the Kildare County Development Plan 2023-2029 recognise the statutory protection afforded to all RPS under the Planning and Development Act 2000, as amended, and contains aims and objectives in relation to architectural heritage (Appendix 9.2). There are 14 Protected Structures listed in the Fingal Development Plan 2023-2029 that are located within a 100m study area of the Proposed Development. Of these 14 Protected Structures, 12 are also listed in the NIAH Survey of County Dublin and one site is also listed in the RMP for County Dublin. While the study area of the Proposed Development extends within County Kildare at its western extent, there are no protected structures located within this area.

The route of the Proposed Development follows and crosses the Royal Canal, which is listed as a Protected Structure in its own right (BH-01, RPS Ref.: 944a). Also included in the curtilage for this record for the Royal Canal within Fingal County are the tow paths, the canal channel with its stone and earth banks and the canal locks (10th, 11th and 12th Lock). All recorded built heritage sites are shown on Figure 9-2 to Figure 9-8.

Table 9-7 Protected Structures within the study area

BH No.	Name	Classifi-cation	Description	Townland(s)	Dist. from Proposed Development	Status/ Import-ance
BH-01	Royal Canal	Canal	Canal connecting Dublin with the Shannon via Mullingar. Also includes the deep cutting which accommodates the royal Canal which is known as the ' Deep Sinking' section.	Castleknock, Blanchardstown, Carpenterstown, Sheepmoor, Diswellstown, Porterstown, Kellystown, Clonsilla, Barberstown, Barnhill, Westmanstown, Coldblow, St. Catherine's Park, Allenswood	0m	RPS 944a (FCC) High
BH-02	Talbot Bridge	Canal bridge	Single-span canal bridge of limestone with splayed segmental arch.	Blanchardstown	To immediate north	RPS 695 (FCC); NIAH 11354003 High

BH No.	Name	Classifi-cation	Description	Townland(s)	Dist. from Proposed Development	Status/ Import-ance
BH-03	12th Lock, Royal Canal	Canal lock	Double-chamber canal lock of limestone ashlar.	Blanchardstown	To immediate north	RPS 944d (FCC) High
BH-04	Granard Bridge, Castle-knock Road	Canal bridge	Single-span limestone canal bridge with elliptical arch.	Blanchardstown	To immediate north	RPS 696 (FCC); NIAH 113540 02 High
BH-05	Kirkpatrick Bridge, Carpenter-stown Road	Canal bridge	Single-span, segmental, limestone canal bridge.	Carpenterstown/S heepmoor	c. 5m to the north	RPS 697 (FCC); NIAH 113610 32 High
BH-06	Kennan Bridge, Porterstown Road	Canal bridge	Single-span, segmental, limestone canal bridge. Includes a memorial plaque to 15 people who died in an accident on the canal in 1845.	Porterstown	c. 11m to the south	RPS 698 (FCC); NIAH 113610 04 High
BH-07	Crossing keeper's house, Porterstown Road	Crossing keeper's house	Single-storey, three-bay house with rendered façade and projecting porch.	Porterstown	c. 48m to the south	RPS 699 (FCC); NIAH 113610 05 High
BH-08	Clonsilla National School, Porterstown Road	Disused school building	Two-storey over basement, three-bay, roughcast rendered former school.	Clonsilla	c. 7m to the north	RPS 700 (FCC); NIAH 113610 01 High
BH-09	Signal box at Clonsilla Station	Signal box	Two-storey signal box with brick lower floor and timber upper floor.	Kellystown	c. 13m to the south	RPS 707 (FCC); NIAH 113530 04 High
BH-10	Callaghan Bridge, Clonsilla Road	Canal bridge	Single-span, elliptical arch limestone canal bridge.	Kellystown/ Clonsilla	0m	RPS 706 (FCC); NIAH 113530 03 High

BH No.	Name	Classifi-cation	Description	Townland(s)	Dist. from Proposed Development	Status/ Import-ance
BH-11	Footbridge at Clonsilla Station	Foot-bridge	Footbridge of cast- and wrought-iron.	Kellystown	c. 20m to the south	RPS 707 (FCC); NIAH 113530 04 High
BH-12	St Mary's Church, Clonsilla	Church	Detached Church of Ireland church, built 1846.	Clonsilla	91m northeast	RPS 705 (FCC); NIAH 113530 05 High
BH-13	Pakenham Bridge, Barberstown Lane	Canal bridge	Single-span limestone canal bridge with elliptical arch.	Barnhill/ Barberstown	To the immediate southeast	RPS 711 (FCC); NIAH 113520 02 High
BH-14	Collins Bridge	Canal bridge	Single-span limestone canal bridge with elliptical arch.	Westmanstown, Catherine's Park (Fingal)	To the immediate south	RPS 713 (FCC); NIAH 113600 02 High

Architectural Conservation Areas (ACAs)

An ACA is defined as 'A place, area, group of structures or townscape, taking account of building lines and heights, that is of special architectural, historical, archaeological, artistic, cultural, scientific, social or technical interest or that contributes to the appreciation of a protected structure, and whose character it is an objective of a development plan to preserve.' (Architectural Heritage Protection Guidelines , 40). Chapter II of Part IV of the Planning and Development Act 2000, as amended, states that that all development plans must now include objectives for preserving the character of ACAs.

ACAs are subject to statutory protection and are a key architectural heritage constraint. There are no ACAs within the development area or its study area. The closest is located c. 270m southeast of the Proposed Development area and comprises the demesne landscape surrounding Luttrellstown Castle.

9.3.6 National Inventory of Architectural Heritage

Building Survey

All structures listed in Table 9-8 are included in the County Dublin NIAH building survey. All of the structures, with the exception of BH-15 and BH-16, are included in the RPS (Table 9-7). Inclusion in the NIAH survey does not confer statutory protection. All NIAH structures are shown on Figure 9-2 to Figure 9-8.

It should be noted that BH-15 is unlikely to be the original position of the water pump recorded in the NIAH, as it is not marked at this location in the historic mapping. It is not clear where the feature has

been relocated from, but it may have formerly been located on the eastern side of the road, 35m north of Kennan Bridge.

Table 9-8 NIAH Structures within the study area

BH No.	Name	Classifi-cation	Description	Townland(s)	Dist. From Proposed Development	Status/ Import-ance
BH-02	Talbot Bridge	Canal bridge	Single-span canal bridge of limestone with splayed segmental arch.	Blanchardstown	To immediate north	RPS 695 (FCC); NIAH 11354003 High
BH-04	Granard Bridge, Castle-knock Road	Canal bridge	Single-span limestone canal bridge with elliptical arch.	Blanchardstown	To immediate north	RPS 696 (FCC); NIAH 11354002 High
BH-05	Kirkpatrick Bridge, Carpenter-stown Road	Canal bridge	Single-span, segmental, limestone canal bridge.	Carpenterstown/Sheepmoor	c. 5m to the north	RPS 697 (FCC); NIAH 11361032 High
BH-06	Kennan Bridge, Porterstown Road	Canal bridge	Single-span, segmental, limestone canal bridge.	Porterstown	c. 11m to the south	RPS 698 (FCC); NIAH 11361004 High
BH-07	Crossing Keeper's house, Porterstown Road	Crossing Keeper's house	Single-storey, three-bay house with rendered façade and projecting porch.	Porterstown	c. 48m to the south	RPS 699 (FCC); NIAH 11361005 High
BH-08	Clonsilla National School, Porterstown Road	Disused school building	Two-storey over basement, three-bay, roughcast rendered former school.	Clonsilla	c. 7m to the north	RPS 700 (FCC); NIAH 11361001 High
BH-09	Signal box at Clonsilla Station	Signal box	Two-storey signal box with brick lower floor and timber upper floor.	Kellystown	c. 13m to the south	RPS 707 (FCC); NIAH 11353004 High
BH-10	Callaghan Bridge,	Canal bridge	Single-span, elliptical arch	Kellystown/ Clonsilla	0m	RPS 706 (FCC);

BH No.	Name	Classifi-cation	Description	Townland(s)	Dist. From Proposed Development	Status/ Import-ance
	Clonsilla Road		limestone canal bridge.			NIAH 113530 03 High
BH-11	Footbridge at Clonsilla Station	Foot-bridge	Footbridge of cast- and wrought-iron.	Kellystown	c. 20m to the south	RPS 707 (FCC); NIAH 113530 04 High
BH-12	St Mary's Church, Clonsilla	Church	Detached Church of Ireland church, built 1846.	Clonsilla	91m northeast	RPS 705 (FCC); NIAH 113530 05 High
BH-13	Pakenham Bridge, Barberstown Lane	Canal bridge	Single-span limestone canal bridge with elliptical arch.	Barnhill/ Barberstown	To the immediate southeast	RPS 711 (FCC); NIAH 113520 02 High
BH-14	Collins Bridge	Canal bridge	Single-span limestone canal bridge with elliptical arch	Westmanstown, Catherine's Park (Fingal)	To the immediate south	RPS 713 (FCC); NIAH 113600 02 High
BH-15	Water pump, Porterstown Road	Water pump	Cast-iron roadside water pump.	Kellystown	c. 60m to the north	NIAH 113610 02 Medium
BH-16	House, Clonsilla Road	House	Single-storey, five-bay, roughcast rendered house with red tiled roof, dated 1901.	Kellystown	c. 51m to the northeast	NIAH 113530 06 Medium

Garden Survey

A total of eight demesnes have been identified in the 100m study area of the Proposed development (Table 9.9), although only two of these are included in the NIAH garden survey. The landscapes are shown as stippled 'demesne' landscapes on the first edition OS mapping. These environments were intended to represent a natural parkland setting for a large house, a practice that became fashionable from the middle of the 18th century onwards. The landscapes, which can vary greatly in size, often possess specific features, such as long driveways, gate lodges, stately entrances, walled gardens, bodies of water and belts, avenues and clumps of trees and specimen trees.

Table 9-9 Demesne landscapes within the study area

DL No	NIAH Garden Ref	Townland	Description	Distance from Proposed Development	Importance
DL 1	n/a	Carpenterstown / Sheepmoor	Woodville Lodge. Small demesne to the north of the Royal Canal. Gate lodge shown in the southwest corner of the demesne. Completely developed as residential estates.	c. 32m to the north	Very low
DL 2	n/a	Sheepmoor	Abbey Cottage. Small demesne with house near road frontage and walled garden to rear. Now fully built over.	c. 39m to the south	Very low
DL 3	FI0036	Kellystown	Named as Kellystown on the first and second editions OS maps and Dollard on the 1911 OS map. Small demesne to the south of the Royal Canal. Gate lodge shown to the southeast of the principal structures and outside the study area. Appears to be occupied by an agricultural complex today, although the house survives, and the parkland has been subsumed back into agricultural land.	c. 23m to the southwest	Medium
DL 4	n/a	Kellystown	Greenmount Demesne. Small demesne shown on first edition OS mapping with formal gardens to the west of the principal structures. Principal structures remain extant.	c. 92m to the southwest	Medium
DL 5	FI0010	Beechpark	Beech Park House. Demesne shown on the first edition OS map complete with gate lodge to the northeast of the parkland and walled garden to the immediate west of the house. The house and outbuildings (arranged around a courtyard) together form an agricultural complex. Today, much of the demesne has been subsumed back into agricultural use; however, a large area of mature planting is located to the east of the principal structure and the walled	Adjacent to the southwest	Medium

DL No	NIAH Garden Ref	Townland	Description	Distance from Proposed Development	Importance
			garden appears to have survived. Much of the north of the parkland appears to be in use as allotments.		
DL 6	FI0026	Clonsilla	Clonsilla House is shown on the first edition OS map as having extensive outbuildings, with gate lodge to the south. The majority of the demesne is now covered by residential development and the house and outbuildings are no longer extant.	c. 13m to the northeast	Low
DL 7	FI0027	Clonsilla	Clonsilla Lodge is shown on the first-edition OS map as having a gate lodge, a walled garden and some outbuildings. The demesne has been partly developed for institutional use and partly for housing.	0m	Very low
DL 8	n/a	Barberstown	Barberstown. Small demesne shown on the first-edition OS mapping. MGWR railway line subsequently severed the northern margin of the demesne.	c. 23m to the southeast	Low

9.3.7 Aerial Photographic Analysis



Figure 9-19 Aerial photograph from 1968 showing the Proposed Development area (AVS029 - https://www.cambridgeairphotos.com/location/avs029/)

Inspection of the aerial photographic coverage of the Proposed Development has been carried out as part of this assessment. Sources consulted included those held by the University of Cambridge, Ordnance Survey (1995-2013), Google Earth (2002-2022) and Bing Maps.

The earliest aerial photography of the Proposed Development area dates to 1968 and is held by University of Cambridge (Figure 9-19). This aerial photograph is taken above the Royal Canal near the townland of Kellystown and is facing along the course of the Royal Canal as it leads into Dublin City. This photograph shows this stretch of the Proposed Development as a rural area. The railway is located to the right (south) side of the Royal Canal. While to the left (northern) side of the Royal Canal, a parallel field boundary to the canal marks the position of the tow path.

No previously unrecorded sites or areas of archaeological potential were noted within the aerial photographic coverage.

9.3.8 Cultural Heritage

The term ‘cultural heritage’ can be used as an over-arching term that can be applied to both archaeology and architecture. It also refers to more ephemeral aspects of the environment, which are often recorded in folklore or tradition, or possibly date to a more recent period.

Previously unrecorded sites and structures of cultural heritage merit have been identified from a review of historic mapping and site inspection.

A total of 11 previously unrecorded sites and features of cultural heritage merit have been identified within the study area across Fingal.

Of particular merit is the presence of two significant (self-guided) trail routes, which already utilise the towpaths of the Royal Canal: the Royal Canal Way (CH-02) and the National Famine Way (CH-01). The Royal Canal Way (CH-02) follows the course of Royal Canal for 130km from Ashtown to Abbeyshrule in County Longford. The National Famine Way (CH-01) has national importance as it forms Ireland's Official Famine Heritage Trail. This trail covers a longer distance of 167km and stretches from Strokestown, County Roscommon to Dublin Port. The trail follows the ill-fated journey of 1490 famine emigrants who walked from Strokestown Park to Dublin Port in 1847. This trail follows the road network east of Strokestown and meets the Royal Canal at Cloondara, County Longford. The trail is marked by mounted bronze shoe sculptures with associated plaques along its entire route (two of these are located immediately adjacent to the Proposed Development CH-01a and CH-01b).

Other Cultural Heritage aspects of the Royal Canal also include events and unfortunate accidents that occurred along its course. At Kennan Bridge, a wall mounted memorial plaque commemorates those that lost their lives in a boating accident. Just before 4.00pm on 25 November 1845, two hours into its journey, the Royal Canal Company's passage-boat 'Longford' struck the rocky side of the Royal Canal between Porterstown and Clonsilla bridges, beyond the 'Deep Sinking' section, which resulted in 15 lives being lost - www.irishwaterwayshistory.com.

All cultural heritage sites are shown on Figure 9-2 to Figure 9-8.

Table 9-10 Cultural Heritage (CH) sites within the study area

CH No.	Townland	Description	Distance from Proposed Development	Importance
CH-01	Castleknock, Blanchardstown, Carpenterstown, Sheepmoor, Diswellstown, Porterstown, Kellystown, Clonsilla,	National Famine Way. A 167km long trail from Strokestown, County Roscommon to Dublin Port. The trail follows the ill-fated journey of 1490 famine emigrants who walked from Strokestown Park to Dublin Port in 1847. This trail meets the Royal Canal at Cloondara, County Longford.	0m	Very high
CH-01a	Blanchardstown	Bronze Shoe Sculpture (National Famine Way).	Immediately south	Very high
CH-01b	Clonsilla	Bronze Shoe Sculpture (National Famine Way).	Immediately north	Very high
CH-02	Castleknock, Blanchardstown, Carpenterstown, Sheepmoor, Diswellstown, Porterstown, Kellystown, Clonsilla,	Royal Canal Way. Recreational trail stretching 130km along the towpaths of the Royal Canal.	0m	High
CH-03	Castleknock, Blanchardstown, Carpenterstown, Sheepmoor, Diswellstown, Porterstown, Kellystown, Clonsilla, Barberstown, Barnhill,	MGWR line.	Adjacent Proposed Development	Medium

	Westmanstown, Coldblow, St. Catherine's Park, Allenswood			
CH-04	Clonsilla, Barberstown,	MGWR Navan Branch railway line.	Immediately adjacent	Medium
CH-04a	Barberstown	Underpass contemporary with the railway and still in use for pedestrians.	0m	Medium
CH-05	Blanchardstown/ Castleknock	Railway over-bridge at Old Navan Road. Replacement bridge arch on original stone abutments.	c. 21m southeast	Low
CH-06	Blanchardstown	Single-span, three-centred, skew railway bridge.	0m	Medium
CH-07	Clonsilla	Victorian cylindrical cast-iron Post Box.	c. 26m north	Medium
CH-08	Westmanstown/ Barberstown/ Barnhill	Aqueduct allowing the Royal Canal to pass over a small local stream that flows into the Luttrellstown Castle Estate.	c. 12m to the southeast	High
CH-09	Westmanstown	Cropmark of a possible irregular shaped enclosure visible on Google Aerial Imagery dated 6/2018. Feature measures c. 35m long (east/west) by c. 32m wide (north/south) and is comprised of a straight side to the east which runs north/south.	c. 77m to the northwest	High
CH-10	Westmanstown	Former Coldblow and Lucan Station. Two-storey house presenting two gables toward the railway.	c. 32m southeast	Medium
CH-11	Westmanstown	Single-storey red-brick structure with pitched slate roof.	c. 18m southeast	Low

9.3.9 Townland Boundaries

A total of 11 townland boundaries are located partially within the Proposed Development, details of each are given in the table below (Table 9.11). Many of the boundaries have been removed where they are crossed by the Proposed Development, or follow the existing road network. Only TB-08 survives as an upstanding section of mature hedgerow.

Table 9-11 Townland Boundaries within the study area

TB No.:	Townlands	Description	Importance
TB-01	Blanchardstown/Carpenterstown	Removed where it crosses the Proposed Development.	Very low
TB-02	Blanchardstown/Sheepmoor	Removed where it crosses the Proposed Development.	Very low
TB-03	Sheepmoor/Carpenterstown	Townland boundary follows the path of the modern road.	Medium

TB No.:	Townlands	Description	Importance
TB-04	Diswell/Sheepmoor	Removed where it crosses the Proposed Development.	Very low
TB-05	Diswellstown/Porterstown	Removed where it crosses the Proposed Development.	Very low
TB-06	Porterstown/Kellystown	Removed where it crosses the Proposed Development.	Very low
TB-07	Clonsilla/Kellystown	Townland boundary follows the path of the modern road.	Medium
TB-08	Clonsilla/Barberstown	Preserved as a field boundary – hedgerow.	Medium
TB-09	Barberstown/Barnhill	Formed by the Barberstown Road.	Medium
TB-10	Westmanstown/Barberstown	Culverted under canal and tow path (CH-08).	Very low
TB-11	Westmanstown/ St. Catherine's Park	Formed by the roadway.	Medium

9.3.10 Analysis of Placenames within the Receiving Environment

Townland and topographic names are an invaluable source of information on topography, land ownership and land use within the landscape. They also provide information on history, archaeological monuments and folklore of an area. The Ordnance Survey surveyors wrote down townland names in the 1830s and 1840s, when the entire country was mapped for the first time. Some of the townland names in the study area are of Irish origin and through time have been anglicised. The main references used for the place name analysis are Irish Local Names Explained by P.W Joyce (1870) and www.logainm.ie. A description and possible explanation of each placename in the environs of the Proposed Development area are provided in Table 9.12. In cases in which a full translation is not available a blank (___) has been inserted to highlight the missing information.

Table 9-12 Placenames within the study area

Name (English)	Name (Irish)	Possible Meaning
Blanchardstown (Fingal Administrative Area)	Bhaile Bhlainséir	Baile: townland, town, homestead Townland/town/homestead of ___
Carpenterstown (Fingal Administrative Area)	Bhaile an Chairpintéaraigh	Baile: townland, town, homestead Townland/town/homestead of ___
Castleknock (Fingal Administrative Area)	Chaisleán Cnucha	Cnoc: hill Caisleán: castle
Diswellstown (Fingal Administrative Area)	Bhaile an Diosualaigh	Baile: townland, town, homestead Townland/town/homestead of Diswell
Porterstown (Fingal Administrative Area)	Bhaile an Phóirtéaraigh	Baile: townland, town, homestead Townland/town/homestead of Porter (Family Name)

Name (English)	Name (Irish)	Possible Meaning
Barberstown (Fingal Administrative Area)	Bhaile an Bhearbóraigh	Baile: townland, town, homestead Townland/town/homestead of ___
Barnhill (Fingal Administrative Area)	Chnoc an Sciobóil	Cnoc: hill of ___
Clonsilla (Fingal Administrative Area)	Chluain Saileach	Pasture of (the) willow(s)/ the meadow of sallows
Kellystown (Fingal Administrative Area)	Bhaile Uí Cheallaigh	Baile: townland, town, homestead Townland/town/homestead of ___
Sheepmoor (Fingal Administrative Area)	Mhóinteán na gCaorach	Móin(also:mónaidh): bogland of __
Woodlands (Fingal Administrative Area)	Fhearann na Coille	Coill (also: coillidh, coillte, coille): wood
Allenswood (Fingal Administrative Area)	Choill Alain	Coill (also: coillidh, coillte, coille): wood of ___
Coldblow (Fingal Administrative Area)	English name	Unknown
Laraghcon (Fingal Administrative Area)	Láithreach Con	Lathrach Con: Hounds' Grave
Passifyoucan (Fingal Administrative Area)	English name	Unknown
St. Catherine's Park (Fingal Administrative Area)	Pháirc San Caitríona	Páirc: field
Westmanstown (Fingal Administrative Area)	Bhaile an Bhaspailigh	Baile: townland, town, homestead Townland/town/homestead of ___
Allenswood (County Kildare)	Choill Alain	Coill: wood
Confey (County Kildare)	Chonfaí	Con-magh, hound-field
St. Catherine's (County Kildare)	Phrióireacht San Caitríona	St. Catherine’s Priory

9.3.11 Field Inspection

The field inspection sought to assess the Proposed Development, its previous and current land use, the topography and any additional information relevant to the report. During the course of the field

investigation the route of the Proposed Development and its immediate surrounding environs were inspected.

It was noted during this field inspection that both the Royal Canal and its two associated trails, the Royal Canal Way (CH-02) and the National Famine Way (CH-01), form an important resource today on many levels and both are in active daily use. Timber mooring posts and jetties are provided at certain locations along the course of the Royal Canal within the Study Area. Clusters of moored boats are present in the section adjacent to the 12th Lock, opposite Castleknock Railway Station, and in the area around the Confey Slipway. The Confey slipway marks the western terminus of the proposed cycleway within the Fingal Administrative area as the route passes into County Kildare.

All the historic bridges which cross the Royal Canal within the study area, feature a narrow ledge to one side. This ledge was wide enough to accommodate the working horses, which first pulled the barges along the canal. In some places these paths under the bridges are still accessible; however, only to walking/pedestrian traffic. The tow paths near the water level which flank the canal within the deep cutting are narrow and are currently inaccessible and are overgrown. The existing pathways diverts around the inaccessible sections of the tow paths. Where road crossings are required, the pathways cross the roads directly via either stepped or ramped approaches that lead up to the road level at the abutments of these canal bridges.

Both the waymarked trails, the Royal Canal Way (CH-02) and the National Famine Way (CH-01), within this study area, comprise a mixture of tarmac, cobblelock, gravel and the grass-covered earthen banks of the Royal Canal. Mature trees are also present in many locations along the banks of the Royal Canal. Where the earthen banks of the canal do exist, they comprise a raised bank with a flat top. In places, a ditch is present to the external side; however, these are mostly covered in dense overgrowth and trees. The National Famine Way is marked by mounted bronze shoe sculptures along its route, two of which are located within the study area of the Proposed Development (CH-01a, CH-01b).

The field inspection commenced at the northeastern end of the scheme, where the proposed greenway crosses the Talbot Bridge (BH-02) (to the east of the 12th Lock). On the northeastern side of this point, the Royal Canal Greenway - Ashtown to Castleknock section, commences and leads into the city (Plate 9.1). The 12th lock represents the only lock which this proposed section of new greenway passes (BH-03).

Talbot Bridge (Plate 9.2) has somewhat been extended to the east by a modern bridge (which covers its eastern elevation); however, much of its historic fabric within the western elevation has been retained including its fine masonry and artistic detailing of rounded piers forming terminals to the parapet walls (Plate 9.3). A pedestrian access point to the south end of the western parapet wall is also flanked by these rounded pier terminals.

The limestone-built 12th lock (BH-03) is in good repair and is overlooked by modern apartment blocks that occupy the site of the Worsted Mill (later the Margarine Factory), marked within the historic mapping (Plate 9.4). Located to the southwest of this lock is a sluice gate operated outflow channel which regulates the water levels of the Royal Canal between the 12th and 13th locks. A fence comprising low bollards that are linked via chains forms a barrier along the lock itself.

Approaching the Granard Bridge (BH-04) to the west, the path is paved and flanked by grass verges (Plate 9.5). A stepped approach gives access to the road level to the east side of Granard Bridge. A modern jetty is provided opposite the Castleknock Railway Station to the southern bank of the Royal Canal. An area of hard standing is also located on the southern bank and serves as a car parking area to the moored boats.

Between Granard Bridge (BH-04) and Kirkpatrick Bridge (BH-05), the trail route follows the southern grass covered bank of the canal. The adjacent railway (CH-03) is elevated on an embankment above the level of the banks to the canal. Approximately 600m west of Granard Bridge, a proposed new bridging point over the Royal Canal will be installed and the Proposed Development will cross to the

northern bank of the canal (Plate 9.6). On the opposite northern bank of the canal, along the path of the Proposed Development, there is mature trees and dense overgrowth bounded to the north by gardens.

A deep rock cut cutting known as 'The Deep Sinking' section, which accommodates the Royal Canal also commences between Granard Bridge and Kirkpatrick Bridge (Plate 9.7). This cutting extends as far west as Clonsilla. The banks of this cutting are densely populated with trees. Access to the area where the proposed runs along the northern bank of the canal was restricted by dense overgrowth.

To the west of Kirkpatrick Bridge (BH-05), the Proposed Development joins an established road and footpath, which has been constructed as part of a recent residential development. The route the crosses a modern road bridge (services the Diswellstown Road) after which, it diverges slightly away to the north to avoid a private property. At the Coolmine/Carpenterstown Road, the Proposed Development continues along the established footpath that runs to the south of the derelict Clonsilla National School (BH-08) and north of Kennan Bridge (BH-06). A denuded section of stone walling is located along the road, which originally formed part of the eastern boundary to Clonsilla School.

To the east of Callaghan Bridge (BH-10), the existing tow path enjoys a wide berth and has a tarmac surface (Plate 9.8). At the bridge the Proposed Development again diverges slightly northwards away from the existing tow path where it joins up with an existing cycle and pedestrian lane (to the south of a newly built residential area). It will pass through TB-08, which is formed by a poorly maintained row of hedge and trees before running beneath the railway that runs to Dunboyne (CH-04) by means of an existing underpass (CH-04a).

The Proposed Development then follows a less formal footpath along the wide northern bank of the canal to Pakenham Bridge (BH-13). It continues in a southerly direction along the bank of the canal to Collins Bridge (BH-14). Here the existing footpath and Proposed Development passes to the northwest of Lucan Station (CH-10), which is now a modern residence and a small derelict structure that is located adjacent to the railway (CH-11). The existing footpath and Proposed Development continues in a westerly direction along the northern bank of the canal, before terminating at the edge of the Fingal Administrative area. The canal is wider at this location and a number of narrow boats are moored along the northern bank.



Plate 9.1 Royal Canal Greenway adjacent Talbot Bridge, facing east



Plate 9.2 Talbot Bridge (BH-02), facing east



Plate 9.3 Talbot Bridge (BH-02), facing east



Plate 9.4 Royal Canal 12th Lock (BH-03), facing northwest



Plate 9.5 Granard Bridge (BH-04), facing west



Plate 9.6 Location of proposed new bridge across Royal Canal, facing west



Plate 9.7 The 'Deep Sinking', facing east



Plate 9.8 Callaghan Bridge (BH-10), facing east

9.4 Proposed Works

9.4.1 Section 1 – Kildare County Border to Hansfield Railway Bridge (Ch. 0000 – 3200)

Section 1 extends from the Kildare/Dublin County Boundary to Hansfield Railway Bridge. This section is rural/peri-urban in nature and is predominantly characterised by farmland, with local amenities including Westmanstown Golf Club and Westmanstown Sports Centre located nearby.

Construction of the Proposed Development will comprise an unbound surface (width 2-3m) from Kildare County Border to Hansfield Railway Bridge (Ch. 0 – 3200m).

9.4.2 Section 2 – Hansfield Railway Bridge to Kennan Bridge (Ch. 3200 – 5300)

Section 2 extends from Hansfield Railway Bridge, through Clonsilla under Callaghan Bridge to Kennan Bridge at Porterstown Road. In Section 2, the character of the area changes from rural to predominantly suburban in nature. This section is predominately residential on the northern side of the canal with farmlands on the southern side.

Construction of the Proposed Development will comprise a bituminous surface (3-4m width) for the majority of the section, with the exception of pre-cast concrete cantilevered boardwalk from approx. Ch. 4235 - 4610.

9.4.3 Section 3 – Kennan Bridge to Talbot Bridge (Chainage 5300 – 8100)

Section 3 runs from Kennan Bridge (Porterstown Road) to Talbot Bridge (Old Navan Road). This section is predominately urban with extensive residential catchments on both sides of the Canal.

Construction of the greenway route will comprise a bituminous surface (4m width) for the majority of the section, in-situ concrete surfacing and portions of raised boardwalk due to local topography.

9.4.4 General

Construction of embankments and retaining structures along certain sections of the route where the topography requires stabilisation.

Provision of 3 no. toucan signalised crossings and 1 no. zebra crossing at road interfaces along the route.

Lighting will not be provided on the western section of the Proposed Development. Lighting will be provided from Hansfield Railway Bridge to the 12th Lock, approximately Ch. 3200m to Ch. 8100m. The lighting design will be developed in accordance with relevant design standards and the environmental considerations assessed in the EIAR and Appropriate Assessment Screening.

To prevent the greenway overlooking the back gardens of the residents of Delwood Park and for security reasons, the ground level of the greenway is proposed to be lowered to match, or be lower than, the existing ground level of the adjacent back gardens and a 2m high timber palisade fence provided, with an anti-climb wire mesh fence (Ch. 6200 – 6800).

Construction of the Quarry Bridge (30m single span composite steel beam and concrete deck bridge) which spans a steep section of historic quarry on the northern bank of the Royal Canal (Ch. +6500m).

The 2m high fence line to be maintained along the southern side of the greenway along the Brompton green area. To provide further privacy to the Brompton residents, planting and railings will be provided on the Brompton side of the greenway through the Brompton green area.

Construction of Landmark Bridge, a steel bridge which will traverse the canal at approximately Ch. 7115m to Ch. 7350m. The bridge will be approximately 235m in length and will have a maximum single span of approximately 30m.

Construction of an underpass is proposed in Section 3 beneath Castleknock Road on the southern side of Granard Bridge (Ch. +7820).

A Pocket Park is proposed at Hansfield, south of the St. Joseph's residential development. The park will have a wildflower meadow, native hedgerow, embankment slide, informal play area and benches etc.

Removal of two existing residential properties and associated ancillary structures in the vicinity of Hansfield Road in order to facilitate the delivery of the greenway alignment and associated pocket park infrastructure.

Landscape works, including the removal of selected trees, hedgerows and vegetation where required, and replacement planting using native and naturalised species as part of the Proposed Development's Landscape Plan.

The principal construction activities associated with the Proposed Development are anticipated to include site establishment, fencing of works areas, temporary traffic management, temporary surface water management, vegetation clearance, topsoil stripping, earthworks, utilities works, pavement construction, construction of the proposed bridges, boardwalks and underpass, ancillary roadworks,

accommodation works, landscaping and reinstatement. These activities are described at a level appropriate to the scheme description, with further detail provided in the Outline Construction Management Plan.

9.5 Potential Impacts

9.5.1 Archaeological Heritage

Construction

Overall, the Proposed Development will be relatively low impact in terms of required excavations. This is due to the fact that much of the route way is already in use as a path and has been since the establishment of the canal. No recorded monuments will be impacted by the Proposed Development and no previously unrecorded features of archaeological potential will be affected.

It remains possible that significant excavations, including those within proposed compound areas, which have not been previously developed, may result in a direct, negative and permanent impacts on archaeological remains that may survive in these areas with no surface expression. Any such remains are likely to possess a moderate to high importance. The magnitude of impact may vary from high to very high, resulting in a significance of effect that may vary from moderate to very significant in terms of significance.

Operation

No direct or indirect impacts are predicted upon the archaeological resource during the operation of the Proposed Development.

9.5.2 Architectural Heritage

Construction

The construction of the Proposed Development will involve the construction of new footpaths along sections of banks associated with the Royal Canal, which is a protected structure (BH-01). As such, direct, negative, permanent impacts will occur during construction although this will represent an upgrade to the existing footpath network. Where the Proposed Development cannot be accommodated within the existing footpath network, it will be established setback from the canal. The Royal Canal possesses high importance with the magnitude of impact considered to be medium. This will result in an overall significance of effect that is determined to be moderate.

A new landmark bridge will cross the canal, but this will be by means of a clear span structure due to the fact that the canal is a significant heritage and ecological constraint. The construction of the bridge will result in an indirect short-term, negative impact on the canal, of medium magnitude. This will result in an overall significance of effect that is determined to be moderate.

A new underpass will be constructed through the embankment to the immediate north of the railway bridge at Castleknock (beneath the Old Navan Road) (CH-06). The construction activities (cut and cover) may result in a direct, negative, permanent impact on the bridge structure. The magnitude of impact may be high, and the importance of the structure is medium, resulting in a moderate significance of effect.

The construction of the Proposed Development will result in indirect short-term negative impacts on the setting of the built heritage assets that are immediate to the Greenway (BH02-06, 08, 10, 13-14). These structures have a high importance with the magnitude of impact being low. This will result in a moderate significance of effect.

Operation

The operation of the landmark bridge across the Royal Canal will result in a permanent direct impact on the setting of the industrial heritage feature. The magnitude of impact is low (given the overall scale

of the feature) and the importance of the canal is high. This will result in moderate significance of effect for this section of the canal.

The operation of the Proposed Development will result in an indirect, positive, permanent impact on the built heritage resource of the Royal Canal and associated historic infrastructure. The architectural heritage resource will be more accessible and visible to the public and will promote better appreciation for same. The magnitude of impact will be high and the importance of the built heritage resource is high, resulting in a significant significance of effect.

9.5.3 Cultural Heritage

Construction

During the construction of the Proposed Development there will be a direct, short-term and temporary negative impact upon the route of the National Famine Way (CH-01), as sections of the route will be closed during construction. The importance of the route is very high and the magnitude of the impact is low, resulting in a moderate significance of effect. The bronze shoe sculptures that form part of the famine route (CH-01a and 01b) are located adjacent to the Proposed Development and will not be impacted by construction works.

During the construction of the Proposed Development there will be a direct, short-term and temporary negative impact upon the route of the Royal Canal Way (CH-02), as sections will be closed during construction. The importance of the route is high and the magnitude of the impact is low, resulting in a moderate significance of effect.

No other impacts upon cultural heritage sites or areas are predicted during the construction of the Proposed Development.

Operation

The operation of the Proposed Development will result in an indirect, positive, permanent impact on the cultural heritage resource of the Royal Canal, including the two designated route ways. The cultural heritage resource and route ways will be more accessible and visible to the public and will promote better appreciation for same. The magnitude of impact will be high and the importance of the cultural heritage resource varies from medium to very high, resulting in a moderate to very significant significance of effect.

9.5.4 Do Nothing Impact

If the Proposed Development were not to proceed there would be no negative impact on the archaeological, architectural or cultural heritage resource. However, the opportunity to present and promote the cultural heritage of the Royal Canal would be lost.

9.6 Mitigation Measures

9.6.1 Archaeological Heritage

Construction

All topsoil stripping associated with the Proposed Development, including all enabling works and construction works, will be subject to archaeological monitoring. This will be carried out under licence to the National Monuments Service of the DHLGH. Should any archaeological remains be identified during the course of works, further mitigation will be required such as preservation in-situ by record (archaeological excavation). Any further mitigation will require the agreement of the National Monuments Service of the DHLGH.

Operation

No mitigation is required in relation to the operation of the development and the archaeological resource.

9.6.2 Architectural Heritage

Construction

A photographic survey, including ground and aerial survey, of the Royal Canal and the site of the landmark bridge, will be carried out prior to the commencement of construction, in order to provide a record of the current landscape context of the canal and its associated infrastructure. This will be undertaken by a suitably qualified historic buildings specialist and survey team.

Section 2.3.5 of the Construction Methodology describes how the underpass beneath the Old Navan Road will be built. The proposed methodology will ensure that the road and adjacent bridges will not be undermined during the cut and cover process. This will be subject to the appropriate monitoring by DBFL Consulting Engineers, the engineering team for the project.

Operation

A photographic survey, including ground and aerial survey, of the Royal Canal and the site of the landmark bridge, will be carried out prior to the commencement of construction, in order to provide a record of the current landscape context of the canal and its associated infrastructure. This will be undertaken by a suitably qualified historic buildings specialist and survey team.

9.6.3 Cultural Heritage

Construction

In relation to the National Famine Way (CH-01) and Royal Canal Way (CH-02), the following mitigation measures will be employed in order to ensure continued access:

- Construction phasing will seek to maintain pedestrian continuity along the canal corridor during the works, with access maintained on at least one canal bank where practicable and safe to do so.
- Where temporary closures or restrictions are unavoidable, suitable temporary diversion routes shall be provided and clearly signed in advance.
- Temporary diversion signage for the National Famine Way and Royal Canal Way shall be agreed with Waterways Ireland and, where relevant, the National Famine Way committee / route promoters before implementation.
- The bronze shoe sculptures identified as CH-01a and CH-01b shall be protected during the construction phase by temporary fencing or other suitable physical protection, as agreed with the appointed built heritage specialist.
- The location and condition of CH-01a and CH-01b shall be recorded before works commence in their vicinity, and protection shall remain in place until the risk of accidental damage has passed.
- The contractor's construction-stage traffic management and environmental management plans shall include these requirements
- Operation
- No mitigation is required in relation to the operation of the development and the cultural heritage resource. This is due to the fact that the operation of the development will result in significant positive effects on the cultural heritage resource.

9.7 Residual Impacts

There will be no significant negative residual impacts upon the archaeological, architectural and cultural heritage resource, following the implementation of the mitigation measures. There will be a significant

positive residual impact on the architectural and cultural heritage resource, due to the fact that the heritage of the area will be more accessible to the public.

9.8 Cumulative Impacts

Chapter 1 of this EIAR provides a full list of consented residential and non-residential developments within the study area. These have been assessed in order to identify any potential cumulative impacts on the archaeological, architectural and cultural heritage resource at construction and operation stage.

No negative cumulative impacts on the archaeological resource have been identified as any archaeological deposits or features that are identified as part of the Proposed Development will be preserved either by record or in-situ. No cumulative impacts are predicted on the architectural or cultural heritage resource, as none of the developments proposed in the study area will result in direct or indirect effects on sites or structures that will be subject to impacts as part of the Proposed Development.

9.9 Interactions

One discipline has been identified during the compilation of the EIAR chapter where there is a potential interaction between architectural heritage and vibration effects (Chapter 7). This relates to the potential for indirect negative impacts on historic structures resulting from vibration associated with the construction of the scheme. A full review of Chapter 7 has revealed that no vibration impacts are predicted upon sensitive historic structures during construction.

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www.excavations.ie – Summary of archaeological excavation from 1970–2026.

www.googleearth.com – Satellite imagery of the Proposed Development area.

www.heritagemaps.ie – Historic mapping source and topographical find information.

www.irish-place-names.com – Place names Database of Ireland

www.waterwaysireland.org – Waterways Ireland website

www.nationalfamineway.ie – The National Famine Way website

www.royalcanal.ie – The Royal Canal Amenity Group's core objective is to promote recreation, heritage, education and tourism along Ireland's 145 km linear parkway that is the Royal Canal.

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10 Landscape and Visual

10.1 Introduction

This chapter of the EIAR was prepared to assess the potential significant effects of the Proposed Development on the landscape, views and visual amenity of the study area of the subject site of the Royal Canal Greenway, of approximately 8.1km overall length, from the Kildare County Boundary to the Old Navan Road (near the 12th Lock), as well as the surrounding landscape context including any views to and from the site from the wider landscape that are considered as representative sensitive receptors.

This chapter should be read in conjunction with the verified views/photomontage document which forms an appendix to this EIAR (See Chapter 10, Appendix 10.3 of this Verified View Photomontages for Proposed Royal Canal Greenway by G-NET 3D).

Expertise and Qualifications

Margaret holds the following qualifications: Irish Landscape Institute, Professional Practice Examination 2005, Diploma in EIA Management, UCD 2003, Bachelor's in Landscape Horticulture, UCD 1999, Bachelor of Science (Environmental Resources Management), DIT 1993 and has been involved in the preparation of LVIA's for the following projects:

- Deerpark, Howth Road, LRD, LVIA, Howth, Co. Dublin
- Newmarket Square Development SHD, LVIA (Mixed Use, multi-storey) Dublin 8
- Brighton Grove LRD LVIA, Foxrock Co. Dublin
- Greystones Media Campus LVIA, Greystones, Co. Wicklow
- The Speaker Conolly Public House, Mixed Use Development, LVIA, Firhouse, Co. Dublin
- Northwood 2E, SHD, LVIA, Santry, Co. Dublin
- Coolagad LRD, LVIA, Greystones, Co. Wicklow
- Glebe House LRD, LVIA, Blackrock, Co. Dublin
- Parson Street Maynooth, LVIA, Co. Kildare
- The Farm at Cashel Palace LVIA, Cashel, Co. Tipperary
- Cookstown Road SHD, Enniskerry, LVIA, Co. Wicklow
- Russell Street, Mixed Use Development, LVIA, Dublin 1
- Church Lane, Santry, LVIA, Dublin
- Newcastle Phase 4 LRD, Dublin.
- Railpark LRD, Maynooth, LVIA, Co. Kildare
- Rye River Valley LRD, Maynooth, Co. Kildare

The Proposed Development Overview

The Proposed Development consists of the construction of an approximately 8.1km shared pedestrian and cycle greenway along and adjacent to the Royal Canal towpath, extending from the Kildare County

Council boundary in the west to Talbot Bridge (Old Navan Road) in the east, where it will tie into the completed Ashtown Greenway.

The cycleway is for the exclusive use of pedal cyclists and pedestrians. Full details of the Proposed Development are set out in Chapter 1 of the EIAR.

The proposal will facilitate a link between completed sections of the Royal Canal Greenway to the east – from Ashtown to Castleknock, and to the west starting at Leixlip in Co. Kildare and which runs continuously for 120km to Cloondara in Co. Longford.

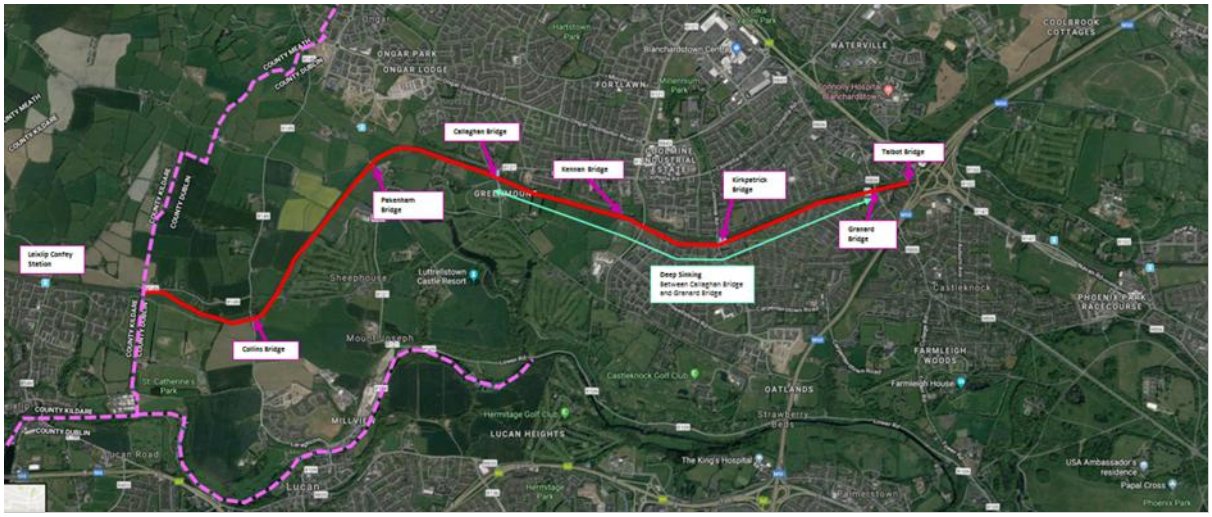


Figure 10-1 Royal Canal Scheme Extents

10.2 Methodology

This LVIA has been prepared with reference to the following guidance documents:

- Environmental Protection Agency, 2022, Guidelines on the Information to be Contained in Environmental Impact Assessment Reports
- Guidelines for Landscape and Visual Impact Assessment (GLVIA)(Landscape Institute and Institute of Environmental Management & Assessment, 2013)
- European Commission, 2017, Environmental Impact Assessment of Projects – Guidance on the preparation of the Environmental Impact Assessment Report (Directive 2011/92/EU as amended by 2014/52/EU
- European Union, Environmental impact assessment of projects; Guidance on the preparation of the environmental impact assessment report (Directive 2011/92/EU as amended by 2014/52/EU)
- Scottish Natural Heritage (SNH), 2018, Environmental Impact Assessment Handbook – Guidance for competent authorities, consultation bodies, and others involved in the Environmental Impact Assessment process in Scotland

The EPA Guidelines provide a general methodology and impact ratings. The Guidelines for Visual Impact Assessment (GLVIA) provide more specific guidelines for landscape and visual impact assessment. A combination of both have been utilised in this chapter's methodology, along with professional experience.

- Landscape and Visual Impact Assessment (LVIA) is a tool used to identify and assess the significance of and the effects of change resulting from development on both the landscape as an environmental resource in its own right and on people's views and visual amenity. *(Guidelines for Landscape and Visual Impact Assessment (Landscape Institute and Institute of Environmental Management & Assessment, 2013).*

- The first step in the assessment process is the baseline assessment which establishes the baseline landscape and visual conditions. This allows for a comparison process to assist in defining the landscape and visual effects of the proposed development, using guidance from both the Environmental Protection Agency, 2022, Guidelines on the Information to be Contained in Environmental Impact Assessment Reports and Guidelines for Landscape and Visual Impact Assessment (Landscape Institute UK and Institute of Environmental Management & Assessment, 2013)

Landscape Baseline: the aim is to provide an understanding of the landscape in the area that may be affected – its constituent elements, its character and the way this varies spatially, its geographic extent, its history (which may require its own specialist study), the way the landscape is experienced, and the value attached to it.

Visual Baseline: the aim is to establish the area in which the development may be visible, the different groups of people who may experience views of the development, the places where they will be affected and the nature of the views and visual amenity at those points.

Zone of Theoretical Visibility

Given the linear nature of the Proposed Development along with its predominant visual containment by trees, hedgerows and ditches along its route, the viewpoints study for baseline and proposed photomontages focused mainly on views along the immediate route towpath that were publicly accessible and along areas of greater usage such as barge mooring locations, existing access points from surrounding roads and pathways.

The baseline assessment is established through site assessments and desktop studies. This involves a review of a number of sources of information to identify the main sensitive receptors, protected views, scenic routes, special and protected landscapes, landscape character designations, historical information etc.

Site assessment which included a site walkover were undertaken in April 2022 and October 2025, where notable landscape features were recorded. Weather conditions on site walkovers were clear with good visibility. Trees were not in leaf in April 2022; trees were in the process of dropping leaf in October 2025.

Viewpoint locations were prepared during the field study part of the visual assessment of this chapter. The following sensitive receptors were assessed in the preparation of the viewpoint location map:

- Protected Views and Prospects / Views of Special Amenity Value and Special Interest
- Local Amenity and Heritage Features
- Local community views to assess the landscape and visual effects of the proposals on those who live (local residents) and work in proximity to the Proposed Development as well as those utilising local amenities, engage in recreation, those visiting the site, those travelling through the site;
- Relevant local settlement nodes
- Major routes adjacent to the site

This viewpoint list was further expanded in consultation with the design team between 2024 and 2026 as the project progressed further. Professional judgement was utilised in the final locations of the viewpoints, as recommended by the Guidelines for Landscape and Visual Impact Assessment (GLVIA).

The existing (baseline views) were taken by G-NET 3D in February 2024, and June 2026, and are presented with the proposed views (photomontages) in Appendix 10.3 of this EIAR. Cumulative views were also prepared by G-NET 3D to include available information on the DART+West Rail infrastructure.

The photomontages process has informed the overall design of the site plan and assisted in mitigating any likely significant effects on the landscape at an early stage during the design process and also any short-term effects that are to be expected during the construction phase. All site photography presented as plate numbers in this chapter has been undertaken by Áit Urbanism + Landscape.

The desktop study included review of the following resources:

- Fingal County Development Plan 2023-2029 (Consolidated Version, March 2026), Sheet + Interactive Map Viewer
- Waterways Ireland Royal Canal Navigation Guidehttps://wwi.maps.arcgis.com/
- National Parks and Wildlife Service – Interactive Mapping
- Tailte Éireann (Ordnance Survey Ireland) – Geohive and Interactive Mapping
- Google Earth /Google Maps/ Streetview/Bing Maps

The desktop study, in combination with on-site assessment, give an overview of the physical characteristics of both the development site itself and its' surrounding environment. The desktop study provides a planning context and any statutory planning designations that highlight landscape value and important views that need to be considered in the assessment process. The potential extent of visibility of the Proposed Development is identified through reference to Google Maps and Google Streetview combined with observations made in the field. This also allows potential visual receptors likely to be affected by the proposed impact to be identified.

This Landscape and Visual Impact Assessment chapter describes the existing receiving environment and contiguous landscape, and the methodology utilised to assess likely significant effects according with best practice guidance. It assesses the visual extent of the Proposed Development and the proposal's visual effects on key views throughout the study area. It describes the landscape character of the subject site and hinterland, together with the visibility of the site from significant viewpoints in the locality. The report details the effect of the Proposed Development on the landscape and visual amenity of the subject site and contiguous area.

While our visual sense is generally acknowledged to represent the dominant contribution to our perception of place and its context, other factors also contribute. Hearing/sound, smell and a variety of social/cultural factors relating to the land-use, function or business conducted on the land (or indeed, memory) can sometimes over-rule or outweigh the visual aspects and lead to individual perceptions which could be described as relatively subjective. The relevance of these non-visual aspects to our perception of our environment and the effect of proposed changes is considered in other sections of this assessment document in accordance with best practice guidance. The purpose of this section is to objectively examine and assess the nature and extent of the visual effect created as a result of the development proposal.

Definition of Landscape

The term '*Landscape*' is defined in the Guidelines for Landscape and Visual Impact Assessment (GLVIA) (Landscape Institute and Institute of Environmental Management & Assessment, 2013) as:

"Landscape is an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors".

Forces for Landscape Change

The landscape is not static and is continuously changing. Over time, many different pressures have altered landscapes and will continue to do so in the future. The key drivers of this change come from ongoing development that is required to meet the needs of a growing population and economy. This includes but is not limited to new housing and commercial development, new forms of energy generation and land management.

10.2.1 Key Principles of the Guidelines for Landscape and Visual Impact Assessment

Use of the Term '*Effect*' vs *'Impact'*

The GLVIA advises that the terms *'Impact' and Effect'* should be clearly distinguished and consistently used in the preparation of an LVIA.
'Impact' is defined as the action being taken. In the case of the development, the impact would include the construction of the greenway itself along with supporting road and utility infrastructure.

'Effect' is defined as the change or changes resulting from those actions, e.g. a change in landscape character, or changes to the composition, character and quality of views in the receiving environment. This report focusses on these effects.

Assessment of Both *'Landscape'* and '*Visual*' Effects

Another key distinction to make in a LVIA is that between landscape effects and the visual effects of development.

'Landscape' results from the interplay between the physical, natural and cultural components of our surroundings. Different combinations of these elements and their spatial distribution create distinctive character of landscape in different places. 'Landscape character assessment' is the method used in LVIA to describe landscape, and by which to understand the potential effects of a development on the landscape as 'a resource'. Character is not just about the physical elements and features that make up a landscape, but also embraces the aesthetic, perceptual and experiential aspects of landscape that make a place distinctive.

'Views and Visual Amenity' refer to the interrelationship between people and the landscape. The GLVIA prescribes that effects on views and visual amenity should be assessed separately from landscape, although the two topics are inherently linked. Visual assessment is concerned with changes that arise in the composition of available views, the response of people to these changes and the overall effects on the area's visual amenity.

10.2.2 Methodology for Landscape Assessment

In sections 10.3.3 to 10.4.2 of this chapter the landscape effects of the development are assessed. The nature and scale of changes to the landscape elements and characteristics are identified, and an assessment of the consequential likely significant effects on landscape character and value are discussed. The assessment of significance of the effects takes account of the sensitivity of the landscape resource and the magnitude of change to the landscape which resulted from the development.

Sensitivity of the Landscape Resource

The sensitivity of the landscape is a function of its land use, landscape patterns and scale, visual enclosure and the distribution of visual receptors, and the value placed on the landscape. It also relates to the nature and scale of development proposed. It includes consideration of landscape values as well as the susceptibility of the landscape to change.

Landscape values can be identified by the presence of landscape designations or policies which indicate particular values, either on a national or local level. In addition, a number of criteria are used to assess the value of a landscape.

Landscape susceptibility is defined in the GLVIA as the ability of the landscape receptor to accommodate the Proposed Development without undue consequences for the maintenance of the

baseline scenario and/or the achievement of landscape planning policies and strategies. Susceptibility also relates to the type of development – a landscape may be highly susceptible to certain types of development but have a low susceptibility to other types of development. Sensitivity is therefore a combination of Landscape Value and Susceptibility.

For the purpose of assessment, five categories are used to classify the landscape sensitivity of the receiving environment as presented in Table 10.1 below.

Table 10-1: Categories of Landscape Sensitivity

Sensitivity	Description
Very High	Areas where the landscape exhibits a very strong, positive character with valued elements, features and characteristics that combine to give an experience of unity, richness and harmony. The character of the landscape is such that its capacity for accommodating change in the form of development is very low. These attributes are recognised in landscape policy or designations as being of national or international value and the principal management objective for the area is protection of the existing character from change.
High	Areas where the landscape exhibits strong, positive character with valued elements, features and characteristics. The character of the landscape is such that it has limited/low capacity for accommodating change in the form of development. These attributes are recognised in landscape policy or designations as being of national, regional or county value and the principal management objective for the area is conservation of the existing character.
Medium	Areas where the landscape has certain valued elements, features or characteristics but where the character is mixed or not particularly strong or has evidence of alteration to / degradation / erosion of elements and characteristics. The character of the landscape is such that there is some capacity for change in the form of development. These areas may be recognised in landscape policy at local or county level and the principal management objective may be to consolidate landscape character or facilitate appropriate, necessary change.
Low	Areas where the landscape has few valued elements, features or characteristics and the character is weak. The character of the landscape is such that it has capacity for change; where development would make no significant change or would make a positive change. Such landscapes are generally unrecognised in policy and where the principal management objective is to facilitate change through development, repair, restoration or enhancement.
Negligible	Areas where the landscape exhibits negative character, with no valued elements, features or characteristics. The character of the landscape is such that its capacity for accommodating change is high; where development would make no significant change or would make a positive change. Such landscapes include derelict industrial lands or extraction sites, as well as sites or areas that are designated for a particular type of development. The principal management objective for the area is to facilitate change in the landscape through development, repair or restoration.

Magnitude of Landscape Change

The magnitude of change is a factor of the scale, extent and degree of change imposed on the landscape with reference to its key elements, features and characteristics, also known as *'Landscape receptors'*. Five categories are used to classify magnitude of landscape change as described below.

Table 10-2: Categories of Landscape Change

Magnitude of Change	Description
Very High	Change that is large in extent, resulting in the loss of or major alteration to key elements, features or characteristics of the landscape and/or introduction of large elements considered totally uncharacteristic in the context. Such development results in fundamental change in the character of the landscape.
High	Change that is moderate to large in extent, resulting in major alteration to key elements features or characteristics of the landscape and/or introduction of large elements considered uncharacteristic in the context. Such development results in change in the character of the landscape.
Medium	Change that is moderate in extent, resulting in partial loss or alteration to key elements features or characteristics of the landscape, and/or introduction of elements that may be prominent but not necessarily substantially uncharacteristic in the context. Such development results in change in the character of the landscape.
Low	Change that is moderate or limited in scale, resulting in minor alteration to key elements features or characteristics of the landscape, and/or introduction of elements that are not uncharacteristic in the context. Such development results in minor change to the character of the landscape.
Negligible	Change that is limited in scale, resulting in no alteration to key elements features or characteristics of the landscape and / or introduction of elements that are characteristic of the context. Such development results in no change to the landscape character.

Significance of Effects

To classify the significance of effects (both landscape and visual), the predicted magnitude of change is measured against the sensitivity of the landscape/viewpoint, using the table below, and applying the following seven classifications of significance: *1) Imperceptible, 2) Not Significant, 3) Slight, 4) Moderate, 5) Significant, 6) Very Significant, 7) Profound.*

Table 10-3: Guide to Classification of Significance of Landscape Effects

	Sensitivity of the Landscape Resource				
	Very High	**High**	**Medium**	**Low**	**Negligible**

Magnitude of Change						
	Very High	Profound	Profound-Very Significant	Very Significant-Significant	Moderate	Slight
	High	Profound-Very Significant	Very Significant	Significant	Moderate-Slight	Slight-Not Significant
	Medium	Very Significant-Significant	Significant	Moderate	Slight	Not Significant
	Low	Moderate	Moderate-Slight	Slight	Not significant	Imperceptible
	Negligible	Slight	Slight-Not Significant	Not significant	Imperceptible	Imperceptible

The matrix above is used as a guide only. The assessor also uses professional judgement informed by their expertise, experience and common sense, to arrive at a classification of significance that is reasonable and justifiable.

Landscape effects are also classified as positive, neutral or negative/adverse. Development has the potential to improve the environment as well as damage it. In certain situations, there might be policy encouraging a type of change in the landscape, and if a development achieves the objective of the policy the resulting effect might be positive, even if the landscape character is profoundly changed.

10.2.3 Methodology for Visual Assessment

The predicted visual effects of the Proposed Development are assessed in Section 10.6. Visual assessment considers the changes to the composition of views, the character of the views, and the visual amenity experienced by visual receptors. The assessment is made for a number of viewpoints selected to represent the range of visual receptors in the receiving environment. The significance of the visual effects experienced at these locations is assessed by measuring the viewpoint sensitivity against the magnitude of change to the view resulting from the development. Definitions of viewpoint sensitivity are provided in the table below.

Table 10-4: Categories of Viewpoint Sensitivity

Sensitivity	Description

Very High	Iconic viewpoints - towards or from a landscape feature or area - that are recognised in policy or otherwise designated as being of national value. The composition, character and quality of the view are such that its capacity for accommodating change in the form of development is very low. The principal management objective for the view is its protection from change.
High	Viewpoints that that are recognised in policy or otherwise designated as being of value, or viewpoints that are highly valued by people that experience them regularly (such as views from houses or outdoor recreation features focused on the landscape). The composition, character and quality of the view may be such that its capacity for accommodating compositional change in the form of development may or may not be low. The principal management objective for the view is its protection from change that reduces visual amenity.
Medium	Viewpoints representing people travelling through or past the affected landscape in cars or on public transport, i.e. viewing but not focused on the landscape which is regarded as moderately scenic. The views are generally not designated, but which include panoramic views or views judged to be of some scenic quality, which demonstrate some sense of naturalness, tranquillity or some rare element in the view.
Low	Viewpoints reflecting people involved in activities not focused on the landscape e.g. people at their place of work or engaged in similar activities such as shopping, or on heavily trafficked routes etc. The view may present an attractive backdrop to these activities but is not regarded as particularly scenic or an important element of these activities.
Negligible	Viewpoints reflecting people involved in activities not focused on the landscape e.g. people at their place of work or engaged in similar activities such as shopping where the view has no relevance or is of poor quality.

Magnitude of Change to the View

Classification of the magnitude of change takes into account the size or scale of the intrusion of development into the view (relative to the other elements and features in the composition, i.e. its relative visual dominance), the degree to which it contrasts or integrates with the other elements and the general character of the view, and the way in which the change will be experienced (e.g. in full view, partial or peripheral, or glimpses). It also takes into account the geographical extent of the change, the duration and the reversibility of the visual effects.

Five categories are used to classify magnitude of change in the view as described in the table below:

Table 10-5: Categories of Visual Change

Magnitude of Change	Description
Very High	Full or extensive intrusion of the development in the view, or partial intrusion that obstructs valued features or characteristics, or introduction of elements that are completely out of character in the context, to the extent that the development becomes the dominant the composition and defines the character of the view and the visual amenity.
High	Extensive intrusion of the development in the view, or partial intrusion that obstructs valued features, or introduction of elements that may be considered uncharacteristic in the context, to the extent that the development becomes co-dominant with other elements in the composition and affects the character of the view and the visual amenity.

Medium	Partial intrusion of the development in the view, or introduction of elements that may be prominent but not necessarily uncharacteristic in the context, resulting in change to the composition but not necessarily the character of the view or the visual amenity.
Low	Minor intrusion of the development into the view, or introduction of elements that are not uncharacteristic in the context, resulting in minor alteration to the composition and character of the view but no change to visual amenity.
Negligible	Barely discernible intrusion of the development into the view, or introduction of elements that are characteristic in the context, resulting in slight change to the composition of the view and no change in visual amenity.

Significance of Visual Effects

As for landscape effects, in order to classify the significance of visual effects, the magnitude of change to the view is measured against the sensitivity of the viewpoint, using the same guide that is used to classify the significance of landscape effects; see Guide to Classification of Significance of Landscape Effects above.

10.2.4 Quality and Timescale

The predicted effects are also classified as beneficial, neutral or adverse. This is not an absolute exercise; in particular, visual receptors' attitudes to development, and thus their response to the effect of a development, will vary. However, the methodology applied is designed to provide robust justification for the conclusions drawn. These qualitative effects are defined as per the following table.

Table 10-6: Categories of Visual Effect Quality

Quality of Effect	Description
Beneficial	Scheme improves landscape view quality and character, fits with the scale, landform and pattern and enables the restoration of valued characteristic features or repairs / removes damage caused by existing land uses.
Neutral	Scheme complements the scale, landform and pattern of the landscape (townscape)/view and maintains landscape quality.
Adverse	Scheme at variance with landform, scale, pattern. Would degrade, diminish or destroy the integrity of valued features, elements or their setting or cause the quality of the landscape(townscape)/view to be diminished.

Effects are also categorised according to their longevity or timescale as per Table 10.7 below:

Table 10-7: Categories of Visual Effect Duration

Description	Duration
Temporary	Lasting less than 1 year
Short Term	Lasting 1 to 7 years
Medium Term	Lasting 7 to 15 years
Long Term	Lasting 15 to 60 years
Permanent	Lasting over 60 years

A statement is made as to the appropriateness of the Proposed Development based on the combined assessment of the predicted landscape and visual effects. This methodology, in accordance with the various guidelines for LVIA, results in a conclusion as to the appropriateness of the Proposed Development based on objective assessment of its likely landscape and visual impacts.

Verified View Methodology

Choice of Views

38 representative views (sensitive receptors) were chosen to assess the impacts of the Proposed Development on local sensitive receptors such as local residents, walkers, cyclists, recreational users such as the canal barge community; the Royal Canal itself, which is a Protected Structure, other protected structures along the Proposed Development route such as canal locks and canal bridges. The 38 representative views are numbered 1-38, starting at No. 1 at west of the route of the Proposed Development at the Kildare County border, ending in No. 38 to the east at Talbot Bridge (Lock 12).



Figure 10-2: Viewpoint Location Map prepared by G-NET 3D (Refer to Verified View Photomontages for Proposed ROYAL CANAL GREENWAY- Appendix 10.3)

10.3 Baseline Environment

Site assessments were undertaken in April 2022 and October 2025. Desktop studies were undertaken to evaluate the current planning context, existing site conditions such as topography, vegetation, settlement patterns, contiguous land use, drainage, landscape character as well as overall visibility of the site from surrounding areas. Information was also collated on protected views, scenic routes, special and protected landscapes etc.

10.3.1 Landscape Planning Policy Context

The Proposed Development has been designed to fulfil and support the following policies and objectives of the Fingal County Development Plan 2023-2029 (Consolidated version, March 2026)

Landscape Planning policies and objectives relevant to the assessment of the effects of the Proposed Development are laid out in the Fingal County Development Plan 2023-2029 (Consolidated Version, March 2026), in the following chapters:

- Chapter 2: Planning for Growth, Core Strategy, Settlement Pattern
- Chapter 5: Climate Action
- Chapter 6: Connectivity and Movement
- Chapter 9: Green Infrastructure and Natural Heritage
- Chapter 13: Land Use Zoning
- Chapter 14: Development Management Standards

Chapter 2: Planning for Growth, Core Strategy, Settlement Pattern

(S. 2.2.3 Fingal County Development Plan 2023-2029 (Consolidated Version, March 2026),

Regional Spatial and Economic Strategy and Metropolitan Area Spatial Plan

'The Eastern and Midlands Regional Assembly (EMRA) prepared the Regional Spatial and Economic Strategy (RSES) in June 2019 for the Eastern and Midlands region; which gives effect to the NPF at regional level. The RSES further endorses the NPF's principles of consolidation, brownfield development, densification and compact growth. The RSES sets out a new regional plan providing a long-term spatial planning direction for the region in which Dublin is categorised as a Global Gateway in recognition of the international role it plays for the country.

Included in the RSES is the 12–20-year Metropolitan Area Strategic Plan (MASP) for Dublin. The MASP identifies a regional framework which aligns population and employment growth with associated transport and infrastructure investment priorities.'

Transport Strategy for the Greater Dublin Area 2022–2042

'The National Transport Authority's (NTA) Transport Strategy for the Greater Dublin Area 2022-2042 sets out various proposals for future transport investment for the next 20 years. The new strategy commits fully to the existing transformative public transport projects including Bus Connects, DART+ and MetroLink as well as LUAS Finglas, LUAS Lucan, LUAS Poolbeg and LUAS Bray.'

The strategy includes for the implementation of the DART Expansion Programme which proposes the provision of high frequency DART services including the electrification of the existing Maynooth rail lines along with the delivery of the metropolitan cycle network set out in the Greater Dublin Area Cycle Network Plan which includes key commuter routes and urban greenways on the canal corridors.

The Core Strategy Climate Change

(S. 2.2.11 Fingal County Development Plan 2023-2029 (Consolidated Version, March 2026)

'Central to the entire Core Strategy is the clear purpose of driving forward the steps necessary that deliver climate action. Fingal County Council is uniquely placed to provide for new housing in locations that fully support sustainable forms of development and allow large numbers of people live, move and work in a way that limits their carbon footprint. Providing for a critical mass along public transport corridors, creates the opportunity for people to engage with a wide range of services and social opportunities as well as a work location, all within distances that are well served by high quality public transport, premium cycle routes and attractive public realm.'

Core Strategy	
Policy CSP5 – Key Enabling Infrastructure	Identify and support the provision of key enabling infrastructure at strategic development sites in Fingal County, as outlined in the MASP, to facilitate their release for development during the lifetime of the Development Plan.
Objective CSO7 – Enabling Infrastructure	Identify and support the provision of key enabling infrastructure at strategic sites in Fingal County to facilitate their release for development in response to the current housing crisis.

Local Area Plans

(S.2.4.1 Fingal County Development Plan 2023-2029 (Consolidated Version, March 2026)

'LAPs play an important role in setting the framework for the achievement of integrated and balanced communities within a specified area. They seek to provide the optimal development framework to ensure the protection and enhancement of the existing areas, key features and the environment within an area, while providing for a high-quality living environment through the use of robust urban design

principles. The function of a LAP is to take a detailed look at a specific area, identifying and analysing the various issues of relevance, before establishing and setting out principles for the future development of the area.'

Core Strategy Objectives	
Objective CSO29 – LAPs, Masterplans and Frameworks Plans for Dublin City and Suburbs	Implement existing Local Area Plans and Masterplans within Dublin City and Suburbs

New Masterplans

Fingal County Council has prepared a list of Masterplans that are to be prepared over the lifetime of the development plan, one of which is The Old Schoolhouse, Clonsilla, (MP 13.A) which are located at chainage Ch.4200-4600).

Local Area Plans (LAP)

There are two Local Area Plans adjacent to the Proposed Development site, Barnhill LAP 13.A and Kellystown LAP.13.B.

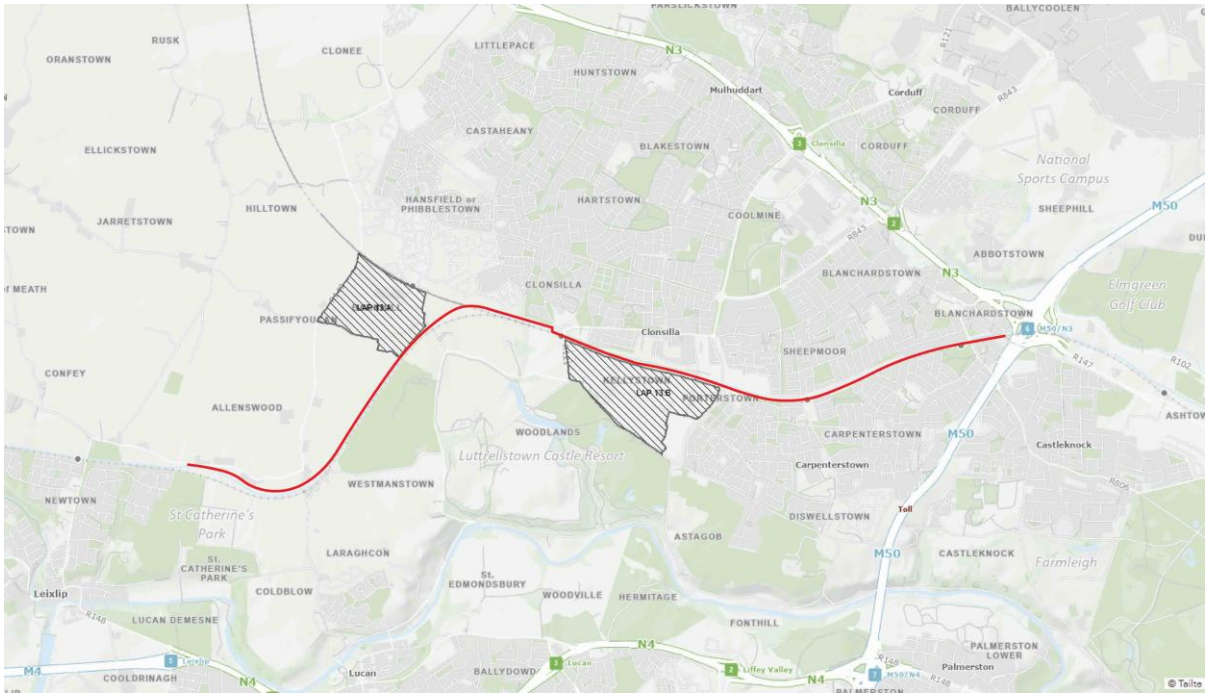


Figure 10-3: Extract of LAP's from Fingal County Development Plan 2023-2029 (Consolidated Version, March 2026), Sheet + Interactive Map Viewer (with indicative red line of Proposed Development)

Hansfield Strategic Development Zone (SDZ) is also located to the northwest of the Proposed Development. It is anticipated that there will be substantial future residential in both Hansfield SDZ and both Kellystown and Barnhill local areas.

Chapter 5: Climate Action

(S.5.1 Fingal County Development Plan 2023-2029 (Consolidated Version, March 2026)

The Fingal County Development 2023-2029 (Consolidated Version, March 2026) highlights the importance of both sustainable transport measures and the role of nature-based solutions as two key areas where climate action can be addressed positively through the planning system.

Climate Action	
Policy CAP4 – Sustainable Environmental Infrastructure	Ensure that the County's need for sustainable environmental infrastructure is addressed in a way which contributes to wider climate action goals and targets.
Policy CAP5 – Climate Mitigation and Adaptation in the Built Environment	Ensure the built environment is equipped for the impacts of climate change by supporting climate change mitigation and adaptation measures as part of new and existing developments.
Policy CAP11 – Climate Adaptation Actions in the Built Environment	Development proposals should demonstrate sustainable design principles for new buildings/services/site. The Council will promote and support development which is resilient to climate change. This would include: c. Minimising pollution by reducing surface water runoff through increasing permeable surfaces and use of Sustainable Drainage Systems (SuDS); f. Promoting and protecting biodiversity and green infrastructure.
Policy CAP35 – Climate Action and Green Infrastructure	Protect, connect and expand the County's green infrastructure while optimising the climate change adaptation and mitigation services it provides.

Chapter 6: Connectivity and Movement

The key policies and objectives relating to connectivity and movement in order to achieve sustainable development within the Fingal local authority area are as follows;

Connectivity and Movement	
Policy CMP3 – Integrated Land-Use and Transport Approach	Provide for an integrated approach to land-use and transportation aimed at minimising the demand for travel and prioritising sustainable modes of transport including walking, cycling and public transport.
Objective CMO3 – Integration of Public Transport and Development	Support and facilitate high-density, mixed-use development and trip intensive uses along public transport corridors and to ensure the integration of high-quality permeability links and public realm in conjunction with the delivery of public transport services through plan frameworks to generate and reinforce sustainable patterns of compact growth and development in the County.
Policy CMP5 – Mobility Management and Travel Planning	Promote best practice mobility management and travel planning through the requirement for proactive mobility strategies for developments focussed on prioritising sustainable modes of travel including walking, cycling and public transport.
Policy CMP6 – Integrated Transport Network	Support and facilitate sustainable mobility objectives set out in the NPF, RSES, Smarter Travel and the NTA's GDA Transport Strategy and any subsequent plan to ensure the creation of a high-quality and integrated transport network to serves the needs of the County and the wider region.

Walking and Cycling (Active Travel)

(S.6.5.1 Fingal County Development Plan 2023-2029 (Consolidated Version, March 2026)

Fingal County Council supports the development of high-quality walking and cycling infrastructure throughout the county. The provision of active travel infrastructure requires a quality public realm, permeability, accessibility and legibility to be key considerations in the delivery of this sustainable mode of transport and improve the user experience. The council is currently preparing an Active Travel Strategy, which will inform future walking and cycling infrastructure and include the provision of 'publicly accessible bicycle parking'.

Fingal County Council has a current programme of Greenway projects that include greenways, high-quality cycling and walking routes, which includes the Proposed Development at The Royal Canal:

Table 6.1: Greenways/High Quality Cycling and Walking Routes

Fingal Coastal Way (Donabate–Balbriggan)
Broadmeadow Way (Malahide–Donabate)
Sutton to Malahide
Royal Canal
Royal Canal-Grand Canal Loop
Ward River Valley and Broadmeadow River Valley
Tolka Valley
Hamilton Way
Lusk/Rush (via Rogerstown Park)
Donabate to Portrane Village (via Ballymastone and Cliff Walk)
Racecourse Park (Baldoyle)
Millpond Park
Drumnigh Road to Kinsealy

Table 10.8: Extract of Table 6.1 Greenways/ High-Quality Cycling and Walking Routes from Fingal Development Plan 2023-2029 (Consolidated Version, March 2026)

Connectivity and Movement	
Policy CMP7 – Pedestrian and Cycling Network	Secure the development of a high-quality, connected and inclusive pedestrian and cycling network and provision of supporting facilities / infrastructure across the County, including the upgrade of the existing network and support the integration of walking, cycling and physical activity with placemaking including public realm improvements, in collaboration with the NTA, other relevant stakeholders, local communities and adjoining Local Authorities in the context of the impact of development schemes with cross boundary impacts and opportunities where appropriate. Routes within the network shall have regard to NTA and TII national standards and policies.
Policy CMP8 – Greenway Network	Secure the development of an expanded Greenway network in collaboration with relevant stakeholders including the NTA, adjoining landowners, local communities and adjoining Local Authorities where appropriate and encourage and facilitate opportunities

	for enhanced linkage and connectivity to adjoining towns and villages and their services, amenities, attractions and public transport nodes and to cross-County, Regional and National Greenway projects.
Policy CMP9 – Prioritisation of Pedestrians and Cyclists	Support the prioritisation of pedestrians and cyclists and the provision of improved public realm to make walking and cycling safer, healthier, quicker, more direct and more attractive.
Policy CMP10 – Bicycle Infrastructure	Improve bicycle priority measures and cycle parking infrastructure throughout the County in accordance with best accessibility practice.
Objective CMO6 – Improvements to the Pedestrian and Cyclist Environment	Maintain and improve the pedestrian and cyclist environment and promote the development of a network of pedestrian/cycle routes which link residential areas with schools, employment, recreational destinations and public transport stops to create a pedestrian/cyclist environment that is safe, accessible to all in accordance with best accessibility practice.
Objective CMO7 – Integration of Active Travel with Public Transport	Work with the relevant transport providers, agencies and stakeholders to facilitate the integration of active travel (walking/cycling etc.) with public transport, ensuring ease of access for all.
Objective CMO8 – Active Travel Strategy	Prepare an Active Travel Strategy to encourage active travel and modal shift to sustainable transport modes.
Objective CMO10 – Bicycle Parking	Provide publicly accessible high-quality cycle parking spaces, both standard bicycle spaces and nonstandard for adapted and cargo bikes, in town and village centres and key destinations and near the entrance to all publicly accessible buildings as required.
Objective CMO11 – Walking and Cycling Infrastructure	Support the provision of walking and cycling infrastructure, including bike parking, bike repair and support services, to increase footfall and economic activity in town and village centres while reducing emissions and improving quality of life.
Objective CMO12 – Walking and Cycling and Green Infrastructure Network	Ensure that new walking and cycling routes are designed, insofar as possible, to function as links in the County's green infrastructure network and that adequate replacement and additional planting of native species and pollinators is provided and that SuDS approaches are used to treat surface water run-off.

Public Realm and Healthy Streets

(S.6.5.6.4 Fingal County Development Plan 2023-2029 (Consolidated Version, March 2026)

'Public realm refers to all the areas to which the public has access such as roads, streets, footpaths, parks, open spaces and public squares. The quality and attractiveness of the public realm plays a key role in encouraging walking, cycling and the use of public transport. 'Healthy Streets' is a concept for how street environments and the wider street network will be planned to promote healthier, more efficient and more sustainable transport options'.

The key policies and objectives relating to public realm are as follows:

Public Realm	

Policy CMP12 – Public Realm	Support and facilitate the provision of high-quality and attractive public realm that is accessible for all with a focus on improving connectivity and permeability in accordance with best practice public realm and guidance documents.
Objective CMO16 – Public Realm and Development	Encourage and facilitate the delivery of high-quality public realm in tandem with new developments throughout the County through the Development Management process and the retrospective provision in existing developments, including the provision of a pedestrianised core in town centres where appropriate.

Accessibility and Universal Design

(S.6.5.6.5 Fingal County Development Plan 2023-2029 (Consolidated Version, March 2026)

'Universal design is the design of the environment so that it can be accessed, understood and used to the greatest extent possible by all people regardless of their age or ability. The need for equality of access to all aspects of the built environment for all individuals is recognised by Fingal County Council as essential for equal opportunities and the development of an inclusive society is a recurring theme in this Plan. The principle of universal design for all is supported and required in the implementation of all aspects of the built environment including public realm and the pedestrian and cycling network including the Greenway network, to create an environment that is safe and accessible and in accordance with best accessibility practice'.

The key policies and objectives relating to accessibility and universal design are as follows:

Accessibility and Universal Design	
Policy CMP13 – Accessible Pedestrian and Cyclist Environment	Promote and facilitate a network of pedestrian and cycle routes and public realm that is universally accessible for all ages and abilities in accordance with best accessibility practice.
Objective CMO19 – Optimising Accessibility for All	Support and facilitate improvements to the pedestrian and cycle network and public realm that prioritise the removal of barriers to active movement, to improve connectivity and permeability and optimise accessibility for all users.

Permeability

(S.6.5.6.6 Fingal County Development Plan 2023-2029 (Consolidated Version, March 2026)

Fingal County Council promotes permeable street networks as an important design factor in walking and cycling environments.

Permeability	
Policy CMP14 – Permeable Neighbourhoods	Implement the provisions of the Design Manual for Urban Roads and Streets 2019 (DMURS) and the DMURS Interim Advice Note – Covid 19 Pandemic Response 2020 in relation to the delivery of safe streets and overall best practice design and promote the principle of filtered permeability in new developments to ensure that all pedestrian entrances are opened as soon as

	any new development is occupied where feasible and seek opportunities to improve permeability in existing developed areas in accordance with NTA's Permeability Best Practice Guide.

Public Transport

(S.6.5.7 Fingal County Development Plan 2023-2029 (Consolidated Version, March 2026)

The relevant policies and objectives of the Fingal County Development Plan 2023-2029 in relation to the Proposed Development and public transport are as follows:

Public Transport	
Policy CMP18 – Public Transport	Support the provision of a high-quality public transportation system that is accessible to all to serve the needs of the County and to enable a significant shift from car-based travel to public transport.
Objective CMO24 – NTA Strategy	Support NTA and other stakeholders in implementing the NTA Strategy including MetroLink, BusConnects, DART +, LUAS and the GDA Cycle Network.
Objective CMO29 – Integration of Public Transport Services and Development	Work with the NTA, TII and other relevant national transport agencies to optimise accessibility to public transport, increase catchment and maximise permeability through the creation of high quality walking and cycling routes linking to public transport stops.
Objective CMO30 – Cycling and Walking Links	Avail of the opportunities provided by any public transport infrastructure works to improve and provide new cycling and walking links, including crossings of motorways and major roads which currently represent major permeability barriers to active travel especially in South Fingal.

Roads and Streets Design

(S.6.5.10 Fingal County Development Plan 2023-2029 (Consolidated Version, March 2026)

Street design in urban areas is guided by DMURS – the Design Manual for Urban Roads and Streets 2019. The Fingal County Development Plan 2023-2029 supports the implementation of the principles of DMURS for all new transportation and public realm project in the county.

The relevant policies and objectives of the Fingal County Development Plan 2023-2029 in relation to the Proposed Development and roads and street design are as follows:

Roads and Streets Design	
Policy CMP34 – Road and Street Design	Ensure that roads and streets within the County are designed to balance the needs of all road users, including children and other vulnerable road users and promote road safety, place-making and sustainable movement, providing a street environment that prioritises active travel and public transport whilst ensuring the needs of commercial servicing is accommodated.

Objective CMO45 – Design Manual for Urban Roads and Streets	– Design new streets and roads within urban areas in accordance with the principles, approaches and standards contained within DMURS. – Junctions will be designed with corner radii that reduce pedestrian crossing distances to the minimum allowable by DMURS wherever possible. – The narrowest carriageway widths allowable by DMURS will be the default standard in Fingal wherever possible.
Objective CMO47 – Road Safety and Rural Roads	Prioritise safety on rural roads and junctions, while having regard to the protection of biodiversity, Green Infrastructure and rural character present in roadside trees, hedgerows and banks.
Objective CMO48 – Roads and Streets and Green Infrastructure	New roads and streets to incorporate green Infrastructure elements such as sustainable drainage infrastructure, planting of native trees, hedgerows and pollinator species in medians and on roadside verges, as appropriate to the location.

Chapter 9: Green Infrastructure and Natural Heritage

(S.9.1 Fingal County Development Plan 2023-2029 (Consolidated Version, March 2026)

'Green infrastructure can be understood as a planned network of interconnected natural areas such as parks, rivers and open spaces that help to conserve natural ecosystem functions. Green infrastructure planning results in environmental, economic and social benefits by providing nature-based solutions to development objectives. This approach results in resilient urban landscapes adapted for and reducing the negative effects of climate change.'

The relevant policies and objectives of the Fingal County Development Plan 2023-2029 in relation to the Proposed Development and green infrastructure and natural heritage are as follows:

Green Infrastructure and Natural Heritage	
Policy GINHP1 – Resilient Design	Promote an awareness of the benefits of resilient design and the multi-functional nature of green infrastructure. Apply multi-functional principles of green infrastructure to inform the Development Management process in terms of design and layout of new residential areas, business/industrial development and other significant projects while maximising the multi-functional nature of green infrastructure by ensuring the development of synergies between Public Open Space, Biodiversity, SuDS/Water Sensitive Design, Climate Change and Active Travel objectives.
Policy GINHP2 – Protection of Green Infrastructure	Ensure that areas and networks of green infrastructure are identified, protected, enhanced, managed and created to provide a

	wide range of environmental, social and economic benefits to communities.
Policy GINHP3 – Greening of Developments	Ensure that areas and networks of green infrastructure are identified, protected, enhanced, managed and created to provide a wide range of environmental, social and economic benefits to communities.

Fingal County Council has identified five Green Infrastructure (GI) themes:

- Biodiversity,
- Parks, Open Space and Recreation
- Sustainable Water Management
- Archaeological and Heritage Landscapes
- Landscape

Policy GINHP4 – Green Infrastructure Themes	Ensure the green infrastructure strategy for Fingal protects and enhances existing green infrastructure resources and plans for future green infrastructure provision which addresses the five main themes identified in this Plan, namely: Biodiversity, Parks, Open Space and Recreation, Sustainable Water Management, Archaeological and Heritage landscapes, Landscape.

Biodiversity

(S.9.1.1 Fingal County Development Plan 2023-2029 (Consolidated Version, March 2026)

'Biodiversity can be defined as the diversity of plants, animals, insects, birds, fish and micro-organisms and their habitats in which they live and interact, such as grasslands, woodlands, streams, hedgerows, public parks and private gardens. The County's natural heritage is a core component of Fingal's green infrastructure. Key elements are:

- *Fingal's Ecological Network includes Core Biodiversity Conservation Areas: Ramsar sites,Natura 2000 sites (Special Areas of Conservation (SAC) and Special Protection Areas (SPAs)), Natural Heritage Areas (NHA), proposed Natural Heritage Areas (pNHA), Statutory Nature Reserves, Refuges for Fauna, Annex I habitats outside designated sites, habitats of protected or rare flora'.*
- *Ecological Buffer Zones*
- *Nature Development Areas*
- *River Corridors along major Rivers*

Green Infrastructure and Natural Heritage	
Policy GINHP5 – Green Infrastructure Network	Develop the green infrastructure network to ensure the conservation and enhancement of biodiversity, including the protection of European Sites, the provision of accessible parks, open spaces and recreational facilities (including

	allotments and community gardens), the sustainable management of water, the maintenance of landscape character including historic landscape character and the protection and enhancement of archaeological and heritage landscapes.
Objective GINHO2 – Fragmentation	Reduce fragmentation and enhance the resilience of Fingal's green infrastructure network by strengthening ecological links between urban areas, Natura 2000 sites, proposed Natural Heritage Areas, parks and open spaces and the wider regional network by connecting all new developments into the wider green infrastructure network.
Objective GINHO3 – Biodiversity in Open Space	Make provision for biodiversity within public open space and include water sensitive design and management measures (including SuDS) as part of a sustainable approach to open space design and management.
Objective GINHO4 – Green Infrastructure and Development	Resist development that would fragment or prejudice the County's strategic green infrastructure network.
Objective GINHO5 – Pollinator Plan	Continue to support the provisions of the National Pollinator Plan 2021-2025 through the management and monitoring of the County's pollinator protection sites and through the promotion of additional pollinator sites during the lifetime of this Development Plan.

Parks, Open Space and Recreation

(S.9.5.1.2 Fingal County Development Plan 2023-2029 (Consolidated Version, March 2026)

Fingal County Council manages over 2000 hectares of public open space as amenity areas for recreation, health and wellbeing.

The relevant policies and objectives of the Fingal County Development Plan 2023-2029 in relation to the Proposed Development and Parks, Open Space and Recreation are as follows:

Parks, Open Space and Recreation	
Policy GINHP6 – Multi-Functionality	Ensure delivery of multifunctional green and civic spaces that meet community needs, promote active and passive recreation, flood and surface water management and local habitat improvements. The multi-functionality of spaces will be balanced against the need to protect and enhance local habitat and the recreational and functional requirements of parks.
Objective GINHO7 – Provision of Open Space	Provide a range of accessible new parks, open spaces and recreational facilities accommodating a wide variety of uses (both passive and active), use intensities and interests.
Objective GINHO8 – Routes	Provide attractive and safe routes linking parks and open spaces and other related features such

	as cultural sites and heritage assets as an integral part of green infrastructure provision, where appropriate and feasible.
Objective GINHO9 – Greenways and Net Gain	Ensure that all greenway developments have a biodiversity net gain. Nature conservation and opportunities for biodiversity enhancement will be a key part of these infrastructure projects and nature conservation will be considered throughout the lifetime of the project and into the future, following project completion.

Sustainable Water Management

(S.9.5.1.3 Fingal County Development Plan 2023-2029 (Consolidated Version, March 2026)

'The considered management and enhancement of watercourses including rivers and streams, riverine floodplains and wetland areas and coastal areas liable to flooding can provide effective measures to help manage flooding and improve the quality of water'.

The relevant policies and objectives of the Fingal County Development Plan 2023-2029 in relation to the Proposed Development and sustainable water management are as follows:

Sustainable Water Management	
Policy GINHP7 – Protection	Protect and enhance the natural, historical, amenity and biodiversity value of the County's watercourses, flood plains, riparian corridors, wetlands and coastal area though long-term and liaison with relevant Prescribed Bodies where appropriate.
Objective GINHO12 – Green Infrastructure Requirements	Ensure the provision of new green infrastructure addresses the requirements of functional flood storage, the sustainable management of coastal erosion, and links with provision for biodiversity, Sustainable Drainage Systems (SuDS) and provision for parks and open space wherever possible and appropriate.
Objective GINHO13 – Wetlands	Seek the creation of new wetlands and/or enhancement of existing wetlands through provision for Sustainable Drainage Systems (SuDS) where appropriate.
Objective GINHO15 – SuDS	Limit surface water run-off from new developments through the use of appropriate Sustainable Urban Drainage Systems (SuDS) using nature-based solutions and ensure that SuDS is integrated into all new development in the County.

Archaeological and Heritage Landscapes

(S.9.5.1.4 Fingal County Development Plan 2023-2029 (Consolidated Version, March 2026)

'There is a significant link between our archaeological, built and natural heritage. Historic graveyards, stone structures and ruins are a rich part of not only our cultural but natural heritage and are of significant ecological value while archaeological monuments are often preserved within open space.'

The relevant policies and objectives of the Fingal County Development Plan 2023-2029 in relation to the Proposed Development and archaeological and heritage landscapes are as follows:

Policy GINHP8 – Archaeology and Green Infrastructure	Protect, conserve and enhance landscape, natural, cultural and built heritage features, and support the implementation of the Fingal Heritage Plan in relation to the provision of green infrastructure.
Objective GINHO17 – Fingal Heritage Plan	Protect, conserve and enhance landscape, natural, cultural and built heritage features, and support the objectives and actions of the Fingal Heritage Plan.
Objective GINHO18 – Heritage Landscape	Ensure, wherever possible and appropriate, that elements of the archaeological and heritage landscape are fully integrated into proposals for new developments at the project design stage.

There are 13 protected structures within the immediate site boundary of the project area, and one located approximately 100m to the north of the Proposed Development; 14 in total as presented in the Fingal County Development Plan 2023-2029, Consolidated Version, March 2026, and in Table 10.8 below.

Table 10.9: Protected Structures

RPS No.	Structure Name	Street Address	Description
695	Talbot Bridge	Royal Canal, Old Navan Road, Blanchardstown, Dublin 15	Late 18th century single-arched stone road bridge over Royal Canal at 12th Lock
944d	Royal Canal 12th Lock	Old Navan Road, Blanchardstown, Dublin 15	12th Lock of late 18th century Royal Canal structure, formed by cut stone walls and timber gates
696	Granard Bridge	Royal Canal, Castleknock Road, Blanchardstown, Dublin 15	Late 18th century single-arched stone road bridge over Royal Canal at Castleknock Train Station
697	Kirkpatrick Bridge	Royal Canal, Coolmine Road, Carpenterstown, Dublin 15	Late 18th century single-arched stone road bridge over Royal Canal at Coolmine Train Station
698	Kennan Bridge	Royal Canal, Porterstown Road, Porterstown, Clonsilla, Dublin 15	Late 18th century single-arched stone road bridge over Royal Canal
699	Keeper's Cottage	Porterstown Road, Porterstown, Clonsilla, Dublin 15	Mid-19th century Rail Keeper's Cottage at rail crossing

700	Former Clonsilla School	Porterstown Road, Kellystown, Clonsilla, Dublin 15	Mid-19th century three-storey former school building
705	St Mary's Church, Clonsilla	Clonsilla (91m north of the site)	Detached Church of Ireland church, built 1846.
706	Callaghan Bridge	Royal Canal, Clonsilla Road (R121), Clonsilla, Dublin 15	Late 18th century single-arched stone road bridge over Royal Canal at Clonsilla Train Station
707	Clonsilla Signal Box	Clonsilla Road (R121), Kellystown, Clonsilla, Dublin 15	Mid-19th century signal box Station building demolished and replaced by modern structure.
707	Overbridge	Clonsilla Road (R121), Kellystown, Clonsilla, Dublin 15	Mid-19th century cast-iron pedestrian overbridge at Clonsilla Train Station. Station building demolished and replaced by modern structure.
711	Pakenham Bridge	Royal Canal, Baberstown Lane, Barberstown, Clonsilla, Co. Dublin	Late 18th century single-arched stone road bridge over Royal Canal
713	Collins Bridge	Royal Canal, Westmanstown, Lucan, Co. Dublin	Late 18th century single-arched stone road bridge over Royal Canal
944a	Royal Canal	Ashtown to St. Catherine's Park (Leixlip), Co. Dublin	Late 18th century man-made canal, including the tow paths, the canal channel with its stone and earth banks, and the canal locks (10th, 11th and 12th Lock)

There are no Architectural Conservation Areas within the boundary of the Proposed Development. There are two Architectural Conservation Areas highlighted in the Fingal Development Plan 2023-2029 (Consolidated Version, March 2026) that are outside the project area; Luttrellstown Castle ACA and Castleknock ACA. Neither will be impacted by the Proposed Development.

Landscape

(S.9.5.1.5 Fingal County Development Plan 2023-2029 (Consolidated Version, March 2026)

Inclusive of the Special Amenity Areas (Howth Head and the Liffey Valley), High Amenity Areas, Highly Sensitive Landscapes and County Geological Sites

The relevant policies and objectives of the Fingal County Development Plan 2023-2029 in relation to the Proposed Development and landscape are as follows:

Landscape Character	

Policy GINHP9 – Landscape Character	Ensure green infrastructure provision responds to and reflects landscape character including historic landscape character, conserving, enhancing and augmenting the existing landscapes and townscapes of Fingal which contribute to a distinctive sense of place.

Landscape Character Assessment

The Fingal County Council Development Plan 2023-2029 (Consolidated Version, March 2026) contains a Landscape Character Assessment (LCA) which categorises the county into six distinct Landscape Character Types and provides classification of these landscapes with regard to (1) types and values, and (2) sensitives.

. The Landscape Character Types are:

- Rolling Hills Character Type
- High Lying Character Type
- Low Lying Character Type
- Estuary Character Type
- Coastal Character Type
- River Valleys and Canal Character Type"

The Royal Canal falls within the River Valleys and Canal Character Type. The extract from the Development Plan below provides a description of these areas with regard to their landscape classification:

"The Tolka and Liffey valleys together with the Royal Canal Corridor are the main landscape features in this area…The Royal Canal corridor is also included in this zone. The canal and its corridor provide valuable habitat for fish and other species and is a pNHA. The canal itself and the many bridges and other structures associated with it are an integral part of the County's architectural heritage.

This Character Type is categorised as having a high value, due to the visual and recreation qualities contained therein. This is evident by virtue of the High Amenity zoning and Special Amenity Area Order designation in the area in addition to the dense tree belts and steep river valley slopes. The river valleys and the canal are also important for their ecology and biodiversity." Section 9.6.14 Landscape Character Assessment, Fingal County Development Plan 2023-2029, as consolidated)

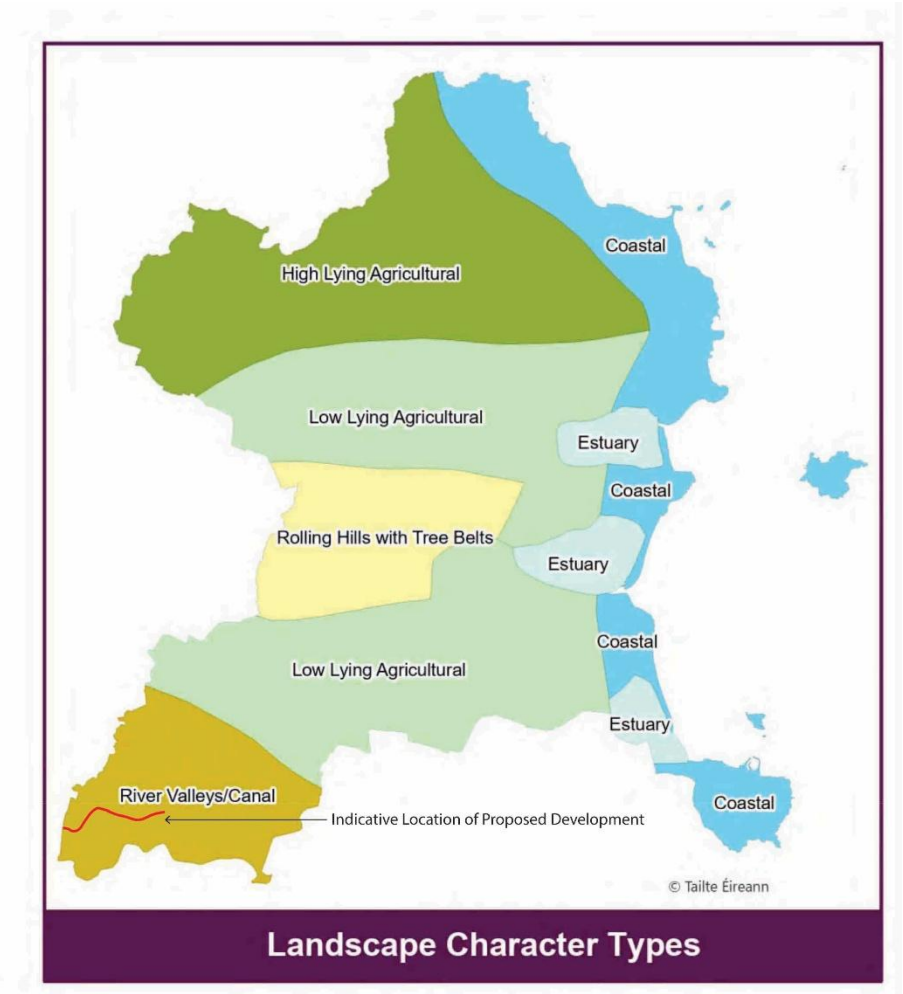


Figure 10.4: Fingal Landscape Character Types – Extract from Fingal County Development Plan 2023-2029 (Including Variations 1 & 2). Green Infrastructure 1, Sheet 14

With regard to the sensitivity of the Landscape Character Types, the Development Plan outlines the following:

As the Royal Canal falls within the River Valleys & Canal Character Type, it has been categorised as having a high sensitivity to development:

"The following four-character types are identified, in general, as having a high sensitivity to development, namely:

- High Lying Character Type
- Estuary Character Type
- Coastal Character Type
- River Valleys & Canal Character Type

Table 9.3: Landscape Character Assessment Summary-Character, Value and Sensitivity

Landscape Character Types	Landscape value	Landscape Sensitivity
Rolling Hills Type	Modest	Medium
High Lying Type	High	High
Low Lying Type	Modest	Low
Estuary Type	Exceptional	High
Coastal Type	Exceptional	High
River Valley and Canal Type	High	High

Table 10-10 Landscape Character Assessment Summary (Table 9.3 Extract): Fingal Development Plan 2023-2029 (Consolidated Version, March 2026)

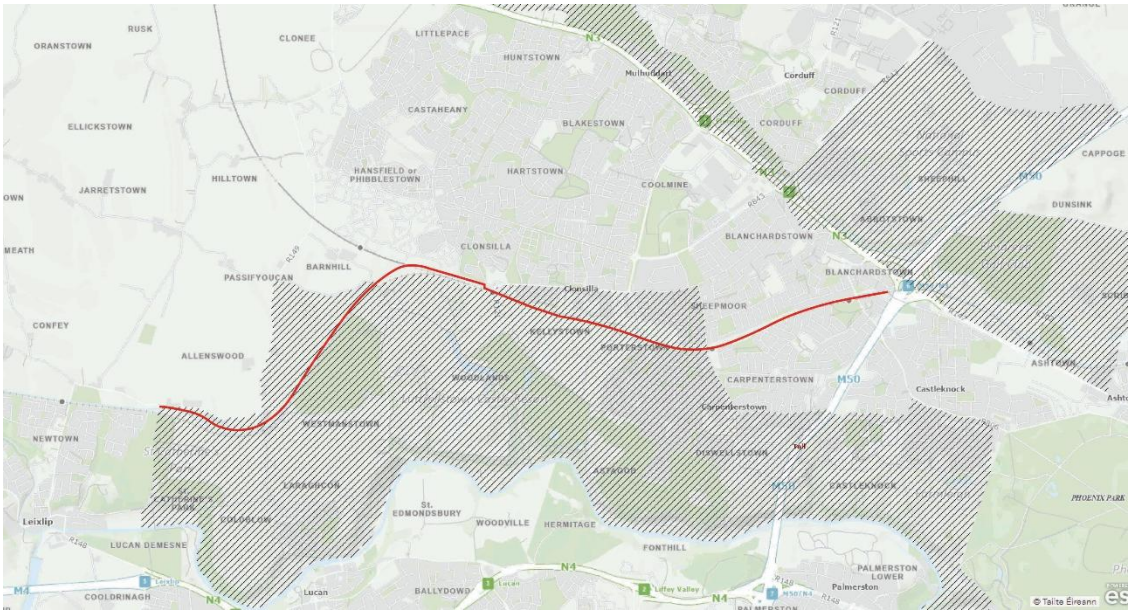


Figure 10-5 Highly Sensitive Landscape: Fingal Development Plan 2023-2029 (Consolidated Version, March 2026) (Interactive Map Viewer). Proposed Development indicated in red line.

The Proposed Development runs through a Highly Sensitive Landscape as indicated above.

Protected Views

With regard to views and prospects, the Development Plan outlines the following:

"Fingal has many areas of high-quality landscape especially along the coast, the river valleys and the upland area to the north along the border with County Meath. As a result the County contains many vantage points from which views and prospects of great natural beauty may be obtained over both seascape and rural landscape. The scenery and landscape of the County are of enormous amenity value to residents and tourists and constitute a valuable economic asset. The protection of this asset is therefore of primary importance in developing the potential of the County. Given the high rates of economic and population growth, the challenge the County faces is to manage the landscape so that any change is positive in its effects, such that the landscapes we value are protected. There is a need, therefore, to protect and conserve views and prospects throughout the County for future generations. In assessing views and prospects it is not proposed that this should give rise to the prohibition of

development along these routes, but development, where permitted, should not hinder or obstruct these views and prospects and should be designed and located to minimise their impact. Views and prospects for protection have been identified on the Green Infrastructure Maps and zoning maps."

Policy GINHP26 – Preservation of Views and Prospects	Preserve views and prospects and the amenities of places and features of natural beauty or interest including those located within and outside the County.
Objective GINHO60 – Protection of Views and Prospects	Protect views and prospects that contribute to the character of the landscape, particularly those identified in the Development Plan, from inappropriate development.
Objective GINHO61 – Landscape/Visual Assessment	Require a Landscape/Visual Assessment to accompany all planning applications for significant proposals that are likely to affect views and prospects.
Objective GINHO62 – Review and Update Views and Prospects	Review and update the views and prospects outlined the Development Plan in line with the policy as set out in Section 9.6.15 – Views and Prospects.

One Protected View is located outside the Proposed Development site on a section of Westmanstown Road (L6032), to the southeast of Hazelhatch Bridge, off of the R405. The Protected View is of lands to the south-east of the Proposed Development, looking towards views which are highlighted as a Highly Sensitive Landscape. The Proposed Development will not impact this protected view.

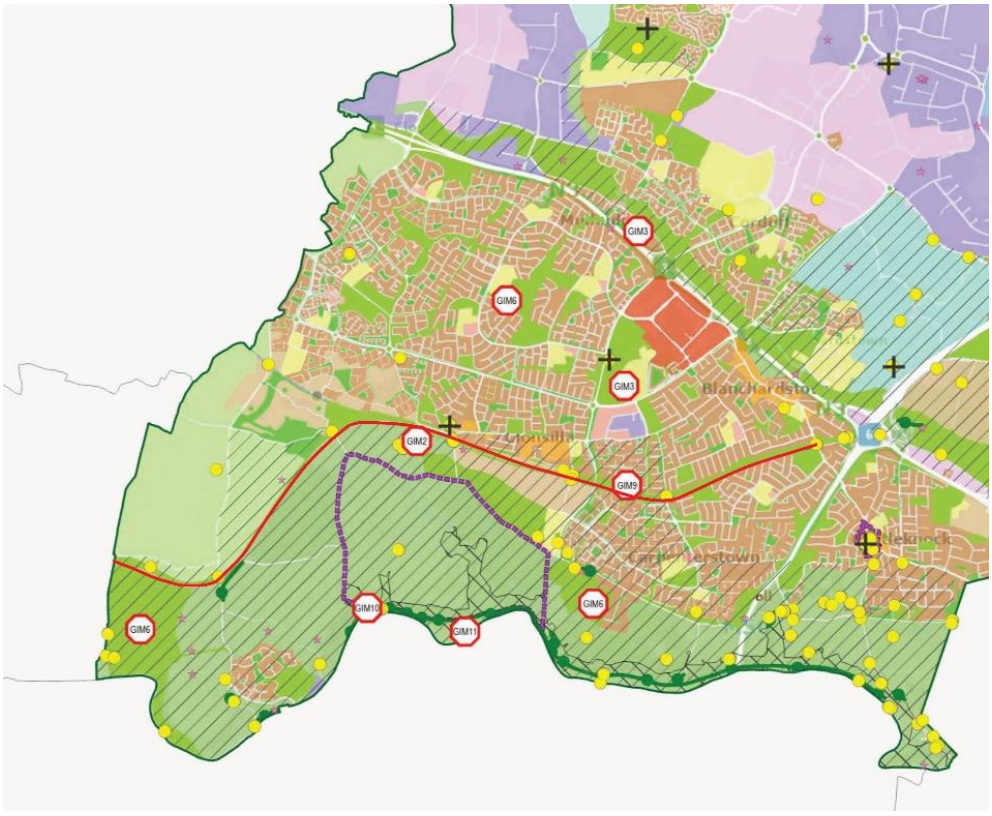


Figure 10-6 Protected Views Extract from Green Infrastructure 1 - Sheet No. 14: Fingal Development Plan 2023-2029 (Consolidated Version, March 2026) Proposed Development indicated in red line.

Nature Development Areas

Three areas of land designated as Nature Development Areas exist within the Development Plan that border the project area directly; these are highlighted in the map excerpt below. These areas have been categorised as Canal Woodland on the Fingal Development Plan 2023-2029 (Consolidated Version, March 2026). Three additional Nature Development Areas are located beside the project area, but these areas are beyond the railway line to the south of the canal and do not have a physical boundary with the project area: Beechpark Demesne which is categorised as Demesne, St. Catherine's, categorised as Parkland, and Westmanstown Liffey Valley which is categorised as Golf Course.

With regard to Nature Development Areas, the Development Plan outlines the following:

"The Council has identified a number of areas and land-uses in the County with potential for biodiversity enhancement (see Green Infrastructure Maps). These include:

- *Farmland Areas,*
- *Demesnes,*
- *Golf courses,*
- *Parkland,*
- *Quarries,*
- *Waterbodies,*
- *Areas suitable for new woodland or forestry.*

'Nature Development Areas' are locations where nature conservation can be combined with existing activities such as farming, forestry, quarrying and recreation (e.g. golf courses). These areas are reservoirs of biodiversity in the wider countryside and together with the corridors and stepping-stones allow species to move through the landscape. Specific objectives have been developed for the Nature Development Areas in the Fingal Biodiversity Action Plan *and the Council will work with landowners to achieve benefits for biodiversity in these areas."*

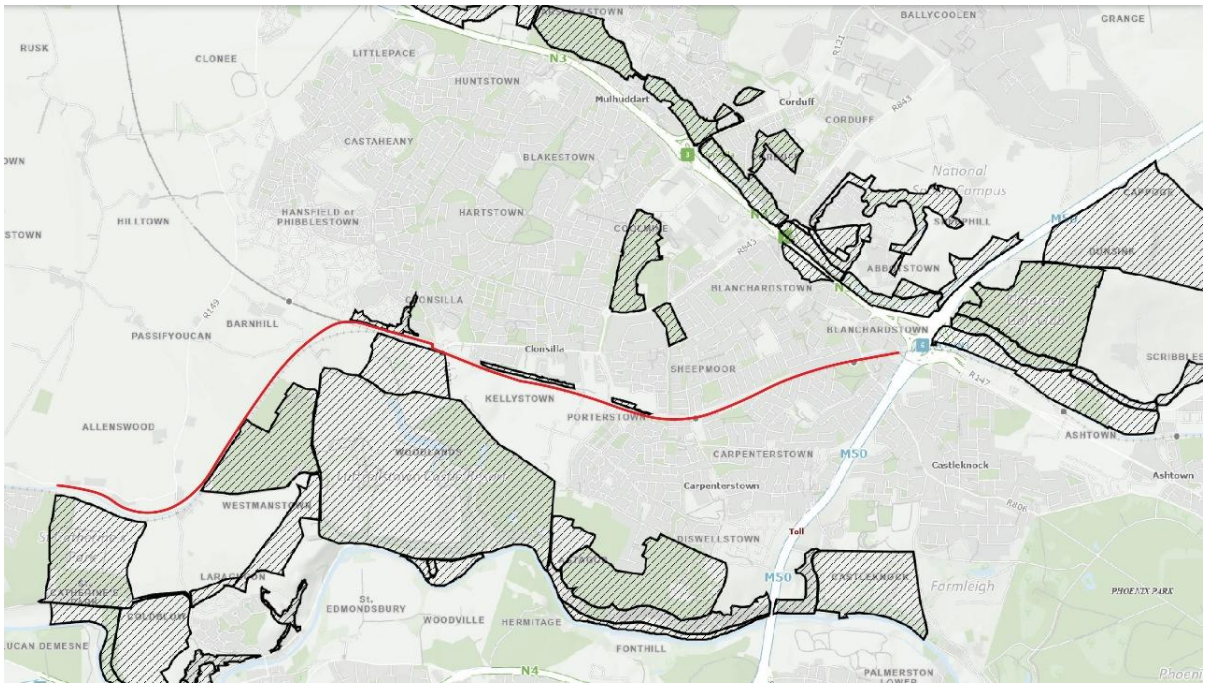


Figure 10-7 Extract of Nature Development Areas: Fingal Development Plan 2023-2029 (Consolidated Version, March 2026) Sheet + Interactive Map Viewer (with indicative red line of Proposed Development)

Objective GINHO37 – Nature Development Areas
Maintain and/or enhance the biodiversity of the Nature Development Areas indicated on the Green Infrastructure maps.
Objective GINHO38 – Demonstration Sites
Develop a demonstration site for each Nature Development Area.

Specific Objectives: Protection of Trees and Hedgerows

Specific objectives relating to the protection of trees and hedgerows, their value in terms of establishing a sense of place, providing healthy environments, visual amenity, landscape character along with their role in providing wildlife habitats, biodiversity corridors and their role in the green infrastructure network, air quality and climate change are provided through the following policies and objectives:

Policy GINHP21 – Protection of Trees and Hedgerows
Protect existing woodlands, trees and hedgerows which are of amenity or biodiversity value and/ or contribute to landscape character and ensure that proper provision is made for their protection and management in line with the adopted Forest of Fingal-A Tree Strategy for Fingal.
Policy GINHP22 – Tree Planting
Provide for appropriate protection of trees and hedgerows, recognising their value to our natural heritage, biodiversity and climate action and encourage tree planting in appropriate locations.

Objective GINHO45 – Hedgerow Categorisation
Develop a 'Hedgerow Categorisation and Management Appraisal Tool' and associated appropriate planning and management requirements for Development Management purposes to ensure a sustainable future for retained hedgerows in the context of new developments.
Objective GINHO46 – Tree Removal
Ensure adequate justification for tree removal in new developments and open space management and require documentation and recording of the reasons where tree felling is proposed and avoid removal of trees without justification.
Objective GINHO47 – Woodland Development Schemes
Promote and support woodland development schemes by identifying suitable areas to establish and enhance woodlands for biodiversity, climate change and recreational purposes in partnership with local communities in line with the adopted Forest of Fingal-A Tree Strategy for Fingal.
Objective GINHO48 – Wildlife Act and Roads Act
The Council shall comply with the requirements set out in the Wildlife Act and Roads Act in the context of its maintenance programmes and housing, recreational and infrastructure developments.

Greenways

The Royal Canal is listed in the Fingal Development Plan 2023-2029 (Consolidated Version, March 2026) under Greenways/High-Quality Cycling and Walking Routes.

With regard to Greenways, the Development Plan outlines the following policies and objectives:

Policy CMP7 – Pedestrian and Cycling Network
Secure the development of a high-quality, connected and inclusive pedestrian and cycling network and provision of supporting facilities / infrastructure across the County, including the upgrade of the existing network and support the integration of walking, cycling and physical activity with placemaking including public realm improvements, in collaboration with the NTA, other relevant stakeholders, local communities and adjoining Local Authorities in the context of the impact of development schemes with cross boundary impacts and opportunities where appropriate. Routes within the network shall have regard to NTA and TII national standards and policies.

Policy CMP8 – Greenway Network
Secure the development of an expanded Greenway network in collaboration with relevant stakeholders including the NTA, adjoining landowners, local communities and adjoining Local Authorities where appropriate and encourage and facilitate opportunities for enhanced linkage and connectivity to adjoining towns and villages and their services, amenities, attractions and public transport nodes and to cross-County, Regional and National Greenway projects.
Policy CMP9 – Prioritisation of Pedestrians and Cyclists
Support the prioritisation of pedestrians and cyclists and the provision of improved public realm to make walking and cycling safer, healthier, quicker, more direct and more attractive.
Policy CMP10 – Bicycle Infrastructure
Improve bicycle priority measures and cycle parking infrastructure throughout the County in accordance with best accessibility practice.

Objective CMO6 – Improvements to the Pedestrian and Cyclist Environment
Maintain and improve the pedestrian and cyclist environment and promote the development of a network of pedestrian/cycle routes which link residential areas with schools, employment, recreational destinations and public transport stops to create a pedestrian/cyclist environment that is safe, accessible to all in accordance with best accessibility practice.
Objective CMO7 – Integration of Active Travel with Public Transport
Work with the relevant transport providers, agencies and stakeholders to facilitate the integration of active travel (walking/cycling etc.) with public transport, ensuring ease of access for all.
Objective CMO8 – Active Travel Strategy
Prepare an Active Travel Strategy to encourage active travel and modal shift to sustainable transport modes.
Objective CMO9 – Active Travel Audits
Carry out active travel audits in towns and villages in collaboration with local communities and other relevant stakeholders to inform improvements to the public realm and the pedestrian and cycling network.
Objective CMO10 – Bicycle Parking
Provide publicly accessible high-quality cycle parking spaces, both standard bicycle spaces and non-standard for adapted and cargo bikes, in town and village centres and key destinations and near the entrance to all publicly accessible buildings as required.
Objective CMO11 – Walking and Cycling Infrastructure
Support the provision of walking and cycling infrastructure, including bike parking, bike repair and support services, to increase footfall and economic activity in town and village centres while reducing emissions and improving quality of life.
Objective CMO12 – Walking and Cycling and Green Infrastructure Network
Ensure that new walking and cycling routes are designed, insofar as possible, to function as links in the County's green infrastructure network and that adequate replacement and additional planting of native species and pollinators is provided and that SuDS approaches are used to treat surface water run-off.
Objective CMO13 – Walking and Cycling Network and Tourist Trail
Support the formulation and delivery of integrated pedestrian/cycle network plans which connect adjacent communities providing linkages to all modes of transport which will provide links to all destinations of the County creating the nucleus of a slow tourist trail.

Ecological & Environmental Designations

The Royal Canal is designated as a proposed Natural Heritage Area (pNHA) and is also listed on the Water Framework Directive Register of Protected Areas.

With regard to Natural Heritage Areas, the Development Plan outlines the following:

"Protected Areas of National Importance

Under the Wildlife (Amendment) Act*, 2000 Natural Heritage Areas (NHAs) are being designated to conserve species and habitats of national importance. This includes the Liffey Valley, Royal Canal and wetland sites such as the Sluice River Marsh and the Bog of the Ring. There are also a number of Statutory Nature Reserves and Refuges for Fauna in Fingal. These areas, established under the* Wildlife Acts 1976 to 2012*, are areas where nature conservation is the primary objective and takes precedence over all other activities'*

Chapter 13: Land Use Zoning

Zoning Objectives

With regard to zoning objectives, the project area is primarily designated as Open Space (OS) within the Fingal Development Plan 2023–2029 (Consolidated Version, March 2026). The zoning objective for areas designated as Open Space is as follows: *"Preserve and provide for open space and recreational amenities."*

A small portion of the route lies adjacent to lands zoned Green Belt (GB), with the objective to *"Protect and provide for a Greenbelt".*

The Proposed Development adjoins lands zoned High Amenity (HA), with the objective to *"Protect and enhance high Amenity Areas".*

The Proposed Development borders lands zoned Residential Area (RA), with the objective to "*Provide for new residential communities subject to the provision of the necessary social and physical infrastructure".*

The Proposed Development adjoins a number of residential neighbourhoods, that are zoned Residential (RS), with the objective to *"Provide for residential development and protect and improve residential amenity."*

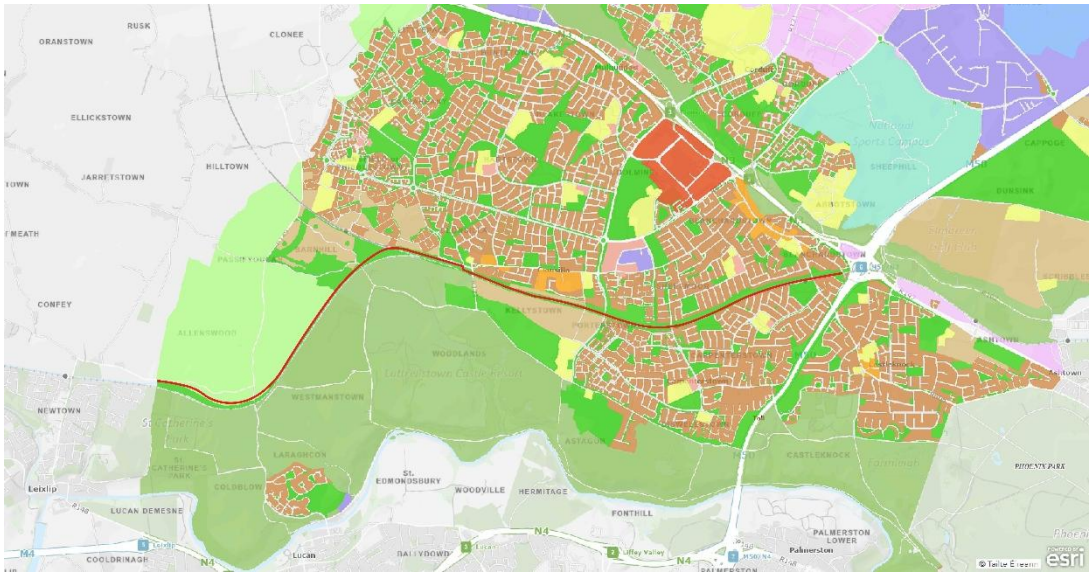


Figure 200.8 Extract from zoning map of Fingal County Development Plan 2023-2029 (Consolidated Version, March 2026), Sheet + Interactive Map Viewer (with indicative red-line of Proposed Development)

Chapter 14: Development Management Standards

Section 14.18 of the above chapter notes that green infrastructure should be identified at the initial stages of the planning process for development and should guide the design of the site layout. The management and protection of trees and hedgerows is covered under the following objectives:

Objective DMSO125 – Management of Trees and Hedgerows	Protect, preserve and ensure the effective management of trees and groups of trees and hedgerows.
Objective DMSO126 – Protection of Trees and Hedgerows during Development	Ensure during the course of development, trees and hedgerows that are conditioned for retention are fully protected in accordance with BS5837 2012 Trees in relation to the Design, Demolition and Construction – Recommendations or as may be updated and are monitored by the appointed arboriculture consultant.
Objective DMSO127 – Use of Native Species in New Developments	Require the use of native species where appropriate in new developments in consultation with the Council.
Objective DMSO129 – Tree Selection	Consider in tree selection the available rooting area and proximity to dwellings or business premises particularly regarding shading of buildings and gardens.
Objective DMSO133 – Location of new Trees	Where new trees are being planted, these will be located so they do not cause future interference to streetlights, typically trees shall be located so there is a distance of no less than 7m from the centre of the main stem to the lighting pole.

Section 14.2 of the Development Management Standards*, presents Key Principles for all Planning Applications*, all developments are to promote the principles of:

- *Accessibility*
- *Green Infrastructure*
- *Sustainable Design*
- *Best Practice in Architecture*
- *Best Practice in Conservation*

Objectives: Development Management Standards	
Objective DMSO153 – Green Corridors	Provide green corridors in all new developments where the opportunity exists.
Objective DMSO156 – Development Along Watercourses	Ensure that no development, including clearance and storage of materials, takes place within 10m as a minimum, measured from each bank of any river tributary or small stream or watercourse in the County (see Green Infrastructure Maps).
Objective DMSO157– Urban Ecological Corridors	Protect, develop and enhance terrestrial urban ecological corridors along existing linear features such as hedgerows where possible with a minimum corridor width of 25 m. These corridors comprise of a mixture of hedgerow, scrub, rank grassland, wildflower meadow, ponds, marshland and dead timber. SuDS features such as ponds and wetlands can be incorporated within these corridors. Green corridors should be incorporated into all new large

	developments, as part of multifunctional Green Infrastructure provision, linking large areas of open space and linking with areas outside the development site.

Landscapes Principles for Development relevant to the Proposed Development

- *Sites with natural boundaries should be chosen, rather than elevated or open parts of fields. The form of new developments should be kept simple and they should be sited within existing shelter planting or within the contours of the land to minimise visual impact*
- *Field and roadside hedgerows should be retained. Proposals necessitating the removal of extensive field and roadside hedgerows should not be permitted.*
- *The retention and active management of trees and woodland blocks should be promoted.*
- *The use of trees and woodlands to contain new development should be encouraged*
- *Strong planting schemes using native species, to integrate development into these sensitive landscapes, will be required. New planting needs to be carefully located and selected.*

Objective DMSO162– Landscape / Visual Assessment	
	Require a landscape/Visual assessment to accompany all planning applications for significant proposals that are likely to affect views and prospects.

Objective DMSO4 – Key Principles to consider in the achievement of Healthy Placemaking
- The design and layout of a development, the public realm and supporting infrastructure should incorporate Universal Design insofar as is feasible. Development should be well-designed and attractive to all users including children, people with disabilities, the elderly as well as accommodating cyclists and pedestrians. - The relationship between the proposed scheme and its site context, including between proposed buildings and the adjoining streets, existing site features, pedestrian and cycle paths, as well as levels of active and passive surveillance should be carefully considered. - There must be meaningful interaction between individual units within the scheme and the public realm. - Creation of areas of distinction where communities can foster a sense of identity, irrespective of scale. - Importance of the public realm as an area for passive and active use where the community can congregate. - High-quality finishing materials to proposed buildings and to the public realms, including seating, lighting, landscaping, tree planting, and green infrastructure. - Consideration of shelter, sunlight/daylight and shadowing. - The provision of safe environments for all users where the principles of DMURS are utilised and active travel modes such as walking and cycling are favoured over car use.

Planning Policy Interactions with the Proposed Development

Chapter 2: Planning for Growth, Core Strategy, Settlement Pattern	The Proposed Development supports the objectives of Regional Spatial and Economic Strategy and Metropolitan Area Spatial Plan (RSES), the Metropolitan Area Strategic Plan (MASP), Transport Strategy for the Greater Dublin Area and the Greater Dublin Area Cycle Network Plan through the provision of a key commuter greenway on the canal corridor.
Chapter 5: Climate Action	The Proposed Development supports the development plans climate action objectives through the provision of a sustainable, high quality accessible, inclusive, active travel/cycling and walking infrastructure, set within an attractive public realm. The proposed development, through the underlying landscape design strategy, supports both the promotion, expansion and protection of biodiversity and green infrastructure.
Chapter 6: Connectivity and Movement	The Proposed Development supports prioritising walking and cycling as a form of active travel and a sustainable mode of transport for commuting and recreation. It supports improving public health and wellbeing through recreation opportunities, connecting in with existing residential areas, improving permeability through communities, schools, existing public transport, recreational amenities and places of employment along the route. The Proposed Development provides high-quality design and public realm improvements, guided by DMURS (Design Manual for Urban Roads and Streets). An enhanced public realm aims to provide an accessible, welcoming, safe and attractive active travel pursuit. The landscape design strategy provides for improved cycle parking infrastructure and parking, and connects in with a wider network of greenways.
Chapter 9: Green Infrastructure and Natural Heritage	The Proposed Development supports resilient design through the design principles and multi-functional aspects of green infrastructure which are incorporated into the landscape design strategy of the design proposals. The landscape proposals aim to enhance existing landscape settings, maintain the existing landscape character throughout the route, ensure planting proposals utilise pollinator friendly planting, enhance, support and conserve local biodiversity and green infrastructure including SuDs measures and Biodiversity Net Gain.
Chapter 13: Land Use Zoning	**OS:** Majority of the Proposed Development is located within lands zoned opens space. The Proposed Development supports the function of the

	Royal Canal Greenway corridor to act as an active travel/recreational amenity and area of open space. **GB:** The Proposed Development is located adjacent to a small section of lands zoned Green Belt. The Proposed Development supports active recreation/travel, connectivity, permeability and movement while respecting the landscape character of the canal corridor. **HA:** The Proposed Development is located adjacent to portions of lands zoned High Amenity. The Proposed Development will improve and enhance permeability and accessibility to existing recreational amenities. **RA:** The Proposed Development is located adjacent to some areas of Residential Area zoned lands. The Proposed Development will enhance and support both existing and future residential neighbourhoods through the provision of an active travel/ recreational amenity etc. and greater connections to local services, public transport **RS:** The Proposed Development is located a number of residential neighbourhoods zoned Residential. The Proposed Development will support and enhance residential amenity through the provision of a permeable, accessible and connected active travel/recreational amenity.
Chapter 14: Development Management Standards	The Proposed Development supports the key principles for all planning applications in that the design team have applied best practice guidance in accessibility (DMURs), green infrastructure and sustainable design. The design team, and specialist consultants have interacted on ecology, biodiversity, conservation, arboriculture, engineering solutions, lighting solutions and the design of a quality public realm. All soft and hardscape materials, street furniture, have been considered, along with lighting locations, to ensure public safety for both active and passive users of the proposed development.

10.3.2 Landscape Baseline: Description of the Proposal Site and Environs

Site Description and Context

The proposed Royal Canal Pedestrian & Cycle Route consists of an approximately 8.1 km pedestrian and cycle greenway from the 12th Lock at Talbot Bridge, Castleknock, west of the Old Navan Road, to the edge of the townland of Confey in Leixlip, Co. Kildare. The approximately 8.1 km route follows the course of the Royal Canal, a historic man-made waterway that connects the Shannon in Limerick with the River Liffey in Dublin. Work on the Royal Canal began in 1790 and was completed in 1817, built by the Royal Canal Company as a carrier of freight and a mode of public transport from rural Ireland to the docklands in Dublin. By the 1830s, the Royal Canal carried 80,000 tonnes of freight and 40,000 passengers a year. During the famine years, it was used as a mode of transport to the port of Dublin.

Many poor and starving Irish walked the towpath to board the 'coffin-ships' in Dublin port bound for Canada and other foreign destinations.

In 1845 the canal was bought by the Midland Great Western Railway Company who built the Dublin – Mullingar railway line alongside the canal for much of its length. The canal travels across one of the major junctions on the M50/N3 in a specially constructed aqueduct. Competition from the railway led to the decline in the use of barges as a mode of transport of people and cargo. The further development of the car and road development led to the closure of the canal in the mid-20th Century. In 1974 a group of volunteers comprised of the Royal Canal Amenity Group and Inland Waterways Association of Ireland began work on opening up the canal for navigation and amenity purposes. In 2000 the canal was taken over by Waterways Ireland, who reopened the entire length of the Royal Canal in 2010.

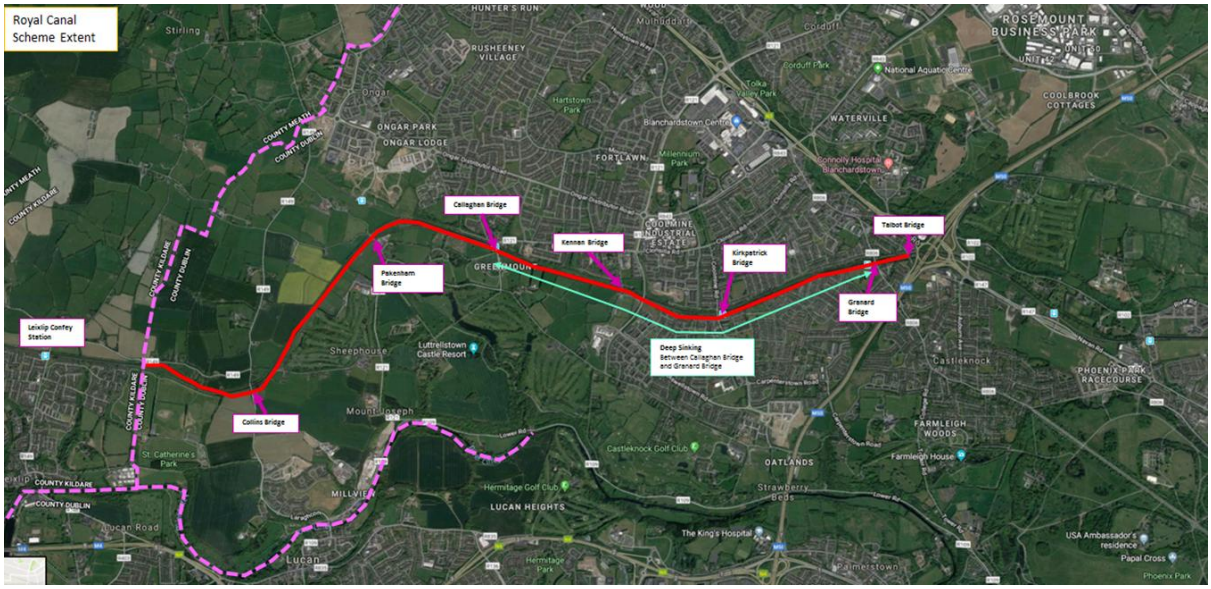


Figure 10-9: Project Area Extents

In this chapter of the EIAR, for the purposes of the baseline description of the site, the project has been divided into three sections as follows:

Section 1: Kildare County border (Royal Canal Amenity Group) to Hansfield Railway Bridge

Section 2: Hansfield Railway Bridge to Kennan Bridge (Porterstown Road)

Section 3: Kennan Bridge (Porterstown Road) to Talbot Bridge (Old Navan Road)

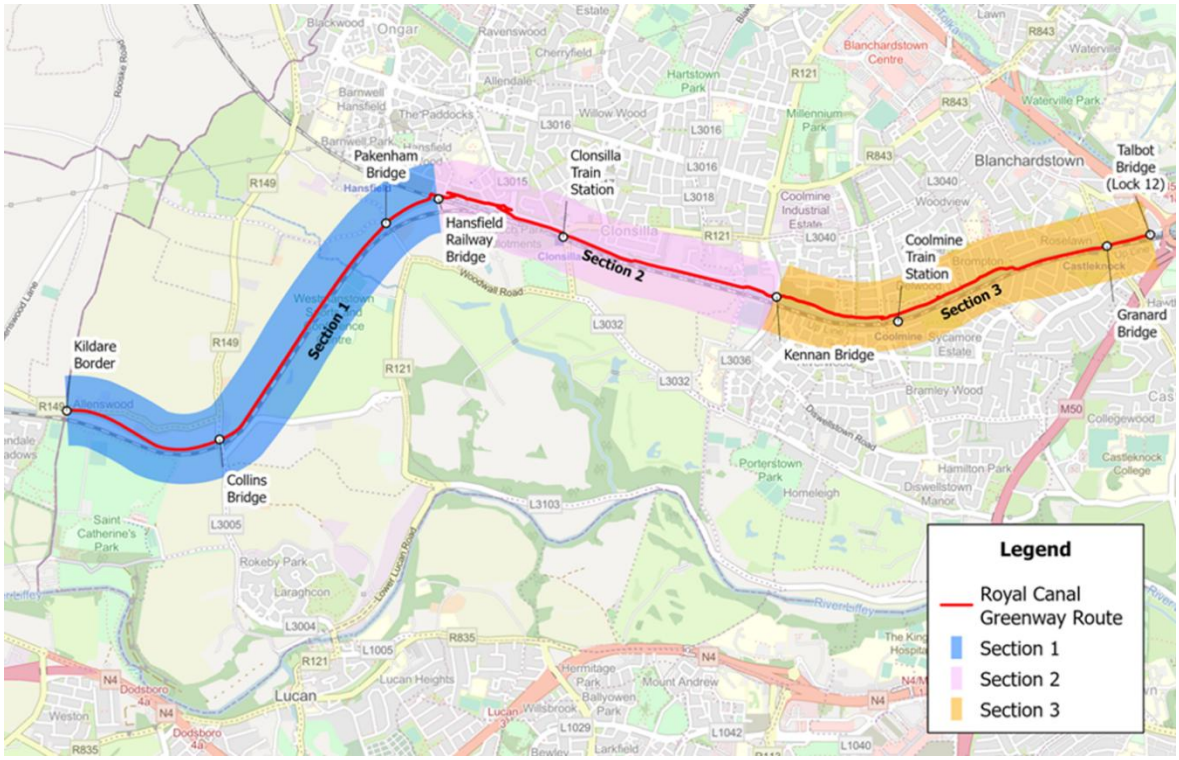


Figure 10-10 Project Area Subdivisions

Section 1 – Site Description

Kildare County border (Royal Canal Amenity Group) to Hansfield Railway Bridge:

This character of the contiguous landscape of this section of the route can be described as rural, with established agricultural land-uses, fieldscapes bounded by hedgerows and treelines, particularly to the north of the canal. There are a mix of land uses to the south of the canal that include the high amenity landscape of Luttrellstown Demesne. Landscape amenities include a large golf course on the grounds at Westmanstown. Hansfield Strategic Development Zone (SDZ) is located to the north-east of this section of the Royal Canal Corridor. The existing pathway, a rough track varies between approx. 1.10 to 2.80m width and is located on the northern side of the canal with the railway line located on the southern side of the canal bank. Hedgerows, lines and groups of trees form the boundary of the canal way and adjacent privately owned lands.

Section 2 – Site Description

Hansfield Railway Bridge to Kennan Bridge (Porterstown Road):

As one moves east along the Royal Canal corridor in Section 2, between Hansfield Railway Bridge to Kennan Bridge, the landscape character changes from rural to semi-rural and suburban. The lands to the north of the canal are comprised of the predominantly residential areas of Hansfield, Clonsilla. There are still large swathes of agricultural fields with treelines and hedgerows to the south-west of this section of the canal route. Luttrellstown Demesne and Golf Course, and Castleknock Golf Course cover a substantial area of landscape to the south of Porterstown Road. The residential area of Porterstown lies to the north of Castleknock Golf Course and south of the Royal Canal. There are hedgerows, treelines and groups of trees along either side of the boundary of the canal along this section of the route. The surface material varies; in the west it is comprised of rough track; the treatment changes to asphalt around Clonsilla train station. Pathway widths vary between approx. 1.80-2.80m wide.

Section 3 – Site Description

Kennan Bridge (Porterstown Road) to Talbot Bridge (Old Navan Road):

This contiguous landscape of this section of the Royal Canal is very much a suburban environment integrated into the metropolitan hinterland of Dublin City. The residential areas of Coolmine and Blanchardstown are located to the immediate north of the Royal Canal. Land-uses to the north are a mix of open space (Millennium Park), industrial estate (Coolmine Industrial Estate), and Blanchardstown Town Centre. To the south of the Royal Canal are the residential areas of Carpenterstown and Castleknock, set within a mosaic of open spaces. The 12th Lock forms the eastern extent of the Proposed Development.

The existing pathway on the northern side of the canal comes to an end at Porterstown Road. The pathway begins again to the east of the Porterstown Road on the south side of the canal. The profile of this section of the route is complex. A steep embankment rises to the south of the pathway, forming the substructure for the railway line. The embankment has a good coverage of groundcovers, scrub, hedgerows and trees. The pathway, mostly rough track, with widths vary substantially (approx. 1.20m wide). The northern edge of the track falls steeply into the canal, again with groundcovers, scrub and trees creating a rural aesthetic in this suburban setting.

Topography and Drainage

Due to the nature of the construction of the canal, the topography along its changes gradually over long distances with the exception of localised rises and falls at canal locks of approximately 3.00m (6.00m for a double lock) and vehicular bridges of approx. 3.50m.

The topography of the towpath route along the canal is summarised generally below:

- At the westernmost extend of the project boundary in Section 1, a level of approximately 57.00m Above Ordnance Datum (AOD) on the towpath at Confey by the Royal Canal Amenity Group building has been recorded on the topographical survey.
- At the easternmost extent of the project boundary in Section 3, a level of approximately 55.00m AOD on the towpath by Talbot Bridge by the Twelfth Lock hotel-restaurant has been recorded on the topographical survey.
- The canal towpath reaches its highest elevation of approximately 65.00m AOD at Kirkpatrick Bridge by Coolmine Station.
- The canal towpath reaches its lowest elevation of approximately 55.00m AOD by Talbot Bridge by the Twelfth Lock hotel-restaurant.

The topography of the towpath can therefore generally be described as rising from its lowest point in the east by Talbot Bridge (approximately 55.00m) towards its highest point at Coolmine Station at Kirkpatrick Bridge (approximately 65.00m) before gradually decreasing in elevation towards the west to a height of approximately 57.00m AOD, at Confey by the Royal Canal Amenity Group building.

There is a total difference of approximately 10.00m in height between the lowest and highest point on the towpath; this rise occurs between Talbot Bridge and Kirkpatrick Bridge over approximately 1.85km; this is a slope of approximately 0.54% which can be considered almost level.

In the locations where the towpath meets interfaces with a vehicular bridge crossing the canal, there is a localised rise of approximately 3.50m from the towpath to the apex of the bridge before falling away on the opposite side back towards the towpath by approximately the same height.

Along the canal bank, the average distance from the top of the bank to the surface of the canal is approximately 1m along the north side of the canal and 3m on the south side of the canal.

There is a section of the project area where there is a large difference in level between the towpath and top of bank of the canal and the canal channel; this section is known as the Deep Sinking. This section is located between Kennan Bridge and Castleknock Station. The largest difference in elevation within this section, on the south side of the canal, occurs at Kirkpatrick Bridge by Coolmine Station where the fall from the towpath and canal bank to the canal channel is in excess of 6m. The largest difference in

elevation within this section, on the north side of the canal, occurs to the east of Kirkpatrick Bridge and to the south of the Delwood residential estate where the fall from the towpath and canal bank to the canal channel is in excess of 10.00m.

The water table in the canal channel has been recorded as approximately 56.50m AOD on the topographical survey. For the majority of the length of the canal, the adjacent lands are at a higher elevation, typically falling towards the towpath and top of the canal bank before falling again towards the canal channel and water table level. This being said, there are a number of locations along the project route where the adjacent lands are at a lower elevation than the canal channel and water table. This occurs at lands on the north and south side of the project area at the western section of Section 1 by the Royal Canal Amenity Group building and Collins Bridge as well as at lands to the north and south of the project area at the eastern section of Section 3 by Castleknock Station and the 12th Lock hotel-restaurant.

Biodiversity (Vegetation and Habitats)

A biodiversity assessment of the Proposed Development was undertaken by JBA Consulting Ireland between 2022 and 2026 and is contained within Chapter 8 of the EIAR.

Surveys were undertaken by JBA Consulting, Triturus Environmental Ltd, Evelyn Moorkens & Associates and Bat Eco Services during this time frame. These surveys outline the baseline environment along the Royal Canal adjacent to the Proposed Development and identify sensitive ecological receptors.

21 habitats were recorded over the length of the Proposed Development, listed in Table 10.11 below:

Table 10-11: Identified Habitats

Habitat	**Description**
BL1	Stone Walls and other stonework
BL2	Earth banks
BL3	Buildings and Artificial Surfaces
ED3	Recolonising bare ground
FP1	Calcareous springs
FS1	Reed and large sedge swamps
FW3	Canals
FW4	Drainage ditches
GA1	Improved agricultural grassland
GA2	Amenity grassland (improved)
GS1	Dry calcareous and neutral grassland
GS2	Dry meadows and grassy verges
Mosaic:GS2 / WS1	Dry meadows and grassy verges / scrub
WD1	(Mixed) broadleaved woodland
WL1	Hedgerows
Mixed: WL1/FW4	Mixed: Hedgerows/Drainage Ditches
Mixed: WL1/WL2	Mixed: Hedgerows/Treelines
WL2	Treelines
Mixed: WL2/FW4	Mixed: Treelines/Drainage ditches
Mixed: WL2/GS2	Mixed: Treelines/Dry meadows and grassy verges
WS1	Scrub

The vegetation within the project area is comprised of a diverse group of plant species due to the variety of habitats that can be found along the Royal Canal. The majority of the area with the site boundary is part of the designated Royal Canal pNHA.

Hedgerow and woodland along the boundary of the canal are the most prevalent type of habitat and vegetation within the project boundary, with hawthorn (*Crataegus monogyna)* being the dominant hedgerow species. The hedgerows generally support a number of tree species such as Ash, Holly, Sycamore, Elder, Blackthorn, Hazel, Horse-chestnut, Downy Birch, White Poplar and Pedunculate Oak.

Birds

The Royal Canal is recognised as an important ecological corridor for birds, with a variety of species recorded on site during JBA consulting's Breeding Bird Surveys.

Most breeding birds surveyed are considered woodland and garden species, and favoured the wooded habitats on site, such as those near Coolmine Railway Station, and the wooded area east of Hansfield Railway Bridge. Vegetated areas along the proposed greenway route are noted as of considerable use to breeding birds for foraging and nesting and are therefore considered to be of higher local ecological importance for birds.

Riparian Birds

A Riparian Bird survey was carried out by JBA Ecologists in July 2024. Species recorded include Great Cormorant, Grey Heron, Little Grebe, Mallard, Moorhen, Reed Bunting and Tufted Duck. (Table 8-27, Chapter 8, Biodiversity).

Protected Mammals

Dedicated surveys for protected fauna including Otter, Badger and Bats have been undertaken by independent ecological consultancies.

Bats

The bat surveys were undertaken by Bat Eco Services in 2022, 2025 and 2026 Royal Canal Bat Assessment.

Seven protected bat species were identified across the length of the proposed route: Soprano pipistrelle, Common pipistrelle, Leisler's bat, Daubenton's bat, Nathusius' pipistrelle, Natterer's bat, and Brown long-eared bat.

Badgers

Triturus Environmental Ltd. conducted badger surveys in November 2021 and January 2022 with 71 signs of Badger being recorded along the proposed route, with the majority of these being snuffle holes.

Additional surveys were conducted in March and May 2022 by Triturus Environmental Ltd. to identify the location of foraging and commuting routes in the vicinity of identified setts to clarify the movement of Badgers between breeding areas and foraging habitats.

Trail cameras monitoring was undertaken in the Sheepmoor Lane area. Three main setts were identified, one of which was being actively used. 5 additional non-main setts were recorded, with only two of these showing signs of recent activity.

Triturus Environmental Ltd. carried out an additional badger survey in 2023 in the Old School House area, Porterstown and along the length of the development. 78 signs of Badger activity were recorded, and 11 setts identified. Three of these setts were identified as main setts, and 8 identified as non-main setts. Of these main setts, two were active at the time of surveying, with one inactive, while a single non-main sett was active at the time of surveying.

Further surveys in 2025 by Triturus Environmental Ltd. of the same area, recorded 38 badger signs and an artificial Badger sett. The artificial sett was not in use at the time of the survey. Badger Surveys by Triturus Environmental Ltd and Dr Chris Smal (See Chapter 8: Biodiversity Appendices)

Terrestrial Invertebrates

Pollinator surveys were undertaken by JBA ecologists in July 2022 and August 2024. A number of Bee, Ant, Butterfly and Moth species were recorded.

Invasive Non-Native Species

Eleven floral Invasive Non-Native Species (INNS) were recorded by JBA ecologists along or in close proximity to the Proposed Development.

In regard to the management of invasive species and protecting these woodland habitats, the on-site ECoW will follow the measures outlined within the invasive species management plan, which is outlined in sub-section 8.9.2.2.17 (Chapter 8 : Biodiversity). The plan includes specific guidance for the works between Coolmine Road and Roselawn Road (Chainages +6300 - +7170) and between Kennan Bridge and Dr Troy Bridge (Chainages + 5450 - +5550).

In addition to these measures, the woodland clearance works must avoid using large excavators and other large construction vehicles. The works will be conducted with small and handheld machinery. The machinery and equipment used must be agreed upon prior to the works with NPWS and the site appointed ECoW. This will be outlined in the OCEMP, which will strictly adhered to by the appointed contractor who will integrated the OCEMP into the final CEMP which they will provide to the WI Environmental Team and the Fingal Biodiversity Officer for approval prior to the commencement of any works.

Tree and Hedgerows

Dr. Philip Blackstock conducted tree surveys on 4th, 5th, 6th, 13th & 18th July 2018 and produced a Tree Survey Report to be included as part of this EIAR. In his report he suggested that there are only a small number of trees that are of the same age as the canal itself, noting large limes at the 12th Lock hotel-restaurant and the mature oak trees that have been planted in hedgerows along the rural stretches as such trees; it was also noted that some of the hawthorn scrub could be of similar age but most of the trees along the project area are younger than the canal itself. The trees growing between the railway and the canal have been coppiced in the past and the trees growing between the canal and towpath are either fairly young or have been coppiced in the past also. There are a few older trees growing amongst the hawthorn on the northern banks of the canal (close to the city, where public access is not possible). These are often multi stemmed and most are less than one hundred years old. This relative youth in woodland that should date from the construction of the canal indicates that most of these banks were managed, either actively (to maintain clearance from the railway and towpath) or by grazing, particularly before housing was developed in the area.

There are particularly dense hedgerow and sections of woodland along the project area from Castleknock Station to Clonsilla Station; there are areas of woodland that measure c. 40.00m wide in places along this section. The southern boundary along the length of this section does not host hedgerows as dense or as long as those on the northern side due to the proximity of the railway line and accompanying retaining wall structures.

To the west of Clonsilla Station railway embankment and railway line can be clearly seen along certain sections of the project area as the hedgerow on both sides of the canal boundary becomes considerably thinner, particularly along the southern edge of the canal. There are some wider areas of woodland and scrubland to the west of the Clonsilla Station and Callaghan Bridge, notably to the north side of the project area before the Hansfield Railway Bridge, and to the south side of the project area past the Hansfield Railway Bridge going westward.

Moving westward from Pakenham Bridge, the northern hedgerow boundary remains intact for the entire length as far as the westernmost boundary of the project area at Confey. Here, the hedgerow hosts a number of mature trees and has relatively uniform width of approx. 6.00-7.00m. After Collins Bridge, as the canal approaches Confey, sections of the hedgerow expand laterally to widths as wide as 20.00m.

There is a section of scrubland approximately 80m wide that forms the boundary between the canal corridor and the R149 approximately 350m from the Royal Canal Amenity Group building at Confey. The southern boundary of the canal from Pakenham Bridge to Confey is not as wide or intact as the hedgerow on the northern boundary and it breaks down entirely in certain lengths along this section, notably at Westmanstown Sports & Conference Centre allowing the railway line and fields beyond to become visible. At Collins Bridge, the hedgerow and tree lines along the southern boundary are once again well established and remain so until reaching western project boundary at Confey; here the hedgerow boundary between the canal and the railway line expands to approx. 60.00m in width, becoming scrubland.

There is length of c.900m along the project area from the furthest eastern end of the project area by the Twelfth Lock hotel-restaurant to c. 500m west of Castleknock Station where vegetation from private back gardens forms part of the northern edge of the boundary to the canal. There is also a similar section of approx. 350m along the project area that runs eastwards from Callaghan Bridge at Clonsilla Station where vegetation from private back gardens forms part of the northern edge of the boundary to the canal.

There are some ornamental hedge, perennial, and tree planting at the eastern end of Section 3 by the 12th Lock hotel-restaurant. This planting forms the boundary between the car park and the towpath, the edge to the canal lock, and the boundary to the Old Navan Road at Talbot Bridge. This is the only section within the project area where deliberate planting of ornamental vegetation can be observed.

Given the passage of time from the original tree survey undertaken in 2018, a new Tree Survey, Arboricultural Impact Assessment & Arboricultural Method Statement was undertaken by Charles Mc Corkrell, Arboricultural Consultant in November 2025, and again updated in September 2026. The main tree cover has been identified as native, with Ash being the dominant species. The Arboricultural Report is presented in Appendix 10.1 of this chapter. Tree Survey Drawings and Tree Protection Drawings accompany this Planning Application.

A total of 656 trees were surveyed along the entirety of the route of the Proposed Development, with a breakdown as follows:

Tree Life Stage Analysis

- Young - 6 no.
- Semi-Mature - 179 no.
- Early Mature – 284 no.
- Mature – 171 no.
- Late mature – 16 no.
- Ancient – Zero
- BS5837 (2012) category breakdown
- (A Category) 4.no
- (B Category) 108 no.
- (C Category) 417 no.
- (U Category) 127 no.

The proposed development will require the removal of the following trees and hedgerows per tree category, as per assessed quality and value:

(A Category)
- None

(B Category)
- 8 trees and the partial removal of 4 tree groups of moderate quality and value.

(C Category)
- 30 trees, 5 small hedgerows, 1 tree group, and the partial removal of 8 tree groups and 1 hedgerow of low quality and value

(U Category)
- the removal of 6 trees are specified within the Arboricultural Report (Tree Work Schedule), and on DBFL Drawings, Preferred Route -Sheets No. 3,9 ,11,12,13,14,17,20,21,22,23,24 and 25.

The Arboricultural Impact Assessment summary states that the Proposed Development has been carefully designed to minimize the impact on existing trees and maximise tree retention.

Trees identified for removal to facilitate the Proposed Development are located within areas where there is extensive tree canopy:

The proposed tree loss due to development is considered not significant. Opportunities for new tree planting have been considered and included in the Preliminary Landscape Plans, which will mitigate tree loss.

The Arboricultural Impact Assessment (AIA) concludes that the Proposed Development with new tree plantings will have a positive impact on the character of the local landscape.

- Construction operations within the rooting areas of retained trees will be required with each impact assessed within the (AIA) report
- Design and construction measures have been proposed to help reduce the level of impact.
- All working operations within the Root Protection Areas (RPA's) of retained trees must be carried out under the guidance and supervision of the arboricultural consultant.
- At each phase of the development, there will be a requirement to review the upcoming works and carry out toolbox talks to site contractors, highlighting the risks and proposed *working methods.*

The Arboricultural Impact Assessment states that:

> *'the proposed development is achievable in both arboricultural terms and in relation to local planning policy as it relates to trees. Tree impacts have been assessed, and tree protection measures have been specified in accordance with best practice and are sufficient to safeguard retained trees during the proposed works.'*

Contiguous Land Use

Section 1

Kildare County border (Royal Canal Amenity Group) to Hansfield Railway Bridge:

- The Irish Rail Western Commuter Train railway line follows the route of the canal in this section and is located directly adjacent to the canal on its southern side. For the majority of the section the railway is separated from the canal by hedgerow but is occasionally separated by larger expanses of scrubland.
- To the north side of the canal at its western end, there are a number (12 total) of large, detached, houses; the houses have large front and back gardens. 8 of these houses and their

accompanying curtilage are separated from the project area by the R149 and an expanse of scrubland. The front gardens of 3 of these houses are located directly adjacent to the canal.

- St Catherine's Park, a large regional park, is located to the south side of the canal at its western end. This park contains a variety of amenity spaces including cricket grounds, football fields, playgrounds, a dog run, an outdoor BMX facility, and a car park. The park occupies an area of approximately 56ha.
- To the south of the canal at Collins Bridge, there are a number of detached and terraced houses with accompanying curtilage. These houses are located directly adjacent to the railway line and are located between the railway and the Westmanstown Road.
- Westmanstown Golf Club is located to the east side of the canal and occupies an area of approx. 40ha.
- A number of sports pitches are located adjacent to the railway line to the north of Westmanstown Golf Club. 2 large buildings, Westmanstown Sports & Conference Centre and West Wood Club, another sports club, as well as a large car parking facility are also located here. The sports clubs, car parking, and accompanying pitches occupy an area of approx. 11ha.
- To the south side of the canal and railway at Pakenham Bridge there is a group of agricultural buildings occupying an area of approx. 1ha. Adjacent to these buildings are a number of agricultural fields measuring a total of approx. 11ha and a large, detached house and accompanying curtilage occupying approx. 2ha.
- To the north of the canal at the end of this section by the Hansfield Railway Bridge, there is a large, new residential development, Hansfield, consisting of apartment blocks, duplexes and houses. Closest to the project area, are U-Hansfield, which consists of five apartment blocks, and Pipers Court, consisting of two apartment blocks.
- To the north of the new residential development Hansfield, the older and more established residential areas of Ongar and Hartstown are located. It is at this point in the project area that a transition from a rural character to a more suburban character can be observed.
- The remainder of the contiguous land use along this section of the project consists of agricultural fields containing crops or occasionally livestock, detached houses with generous portions of accompanying curtilage, and a number of agricultural buildings, e.g., barns, garages etc.

Section 2

Hansfield Railway Bridge to Kennan Bridge (Porterstown Road):

- The Irish Rail Western Commuter Train (DART+ West) railway line follows the route of the canal in this section and is located directly adjacent to the canal on its southern side. For the majority of the section the railway is separated from the canal by a continuous hedgerow.
- The land use on the northern side of the project area within this section is entirely composed of residential development and accompanying amenities and facilities, e.g., local greens, tree lined local roads, educational facilities, small shops, and small commercial units. St. Mochtas National School is located to the north of the canal at the east end of this section. To the west of St. Mochtas National school there are several shops, restaurants, and other services that comprise the centre of Clonsilla Village. At the midpoint of this section, by Clonsilla Train Station, there is a petrol station, Apple Green, a large supermarket, Lidl, and a historic church and graveyard, St. Mary's Church.
- To the south of the canal, at the west end of this section, a large area of land (approx. 25ha), comprises a number of community allotments, Beech Park Allotments (approx. 3ha), community gardens (approx. 0.7ha), woodland (approx. 2.8ha), and a public park, Nana Bernie Park, (approx. 5ha). The remainder of the land in this section is land which has been prepared for use as agricultural fields which are associated with the Beechpark Eco Farm. There is a water body of 0.4ha within these lands also; it is located to the south of the aforementioned community gardens, Shackleton Gardens. There is a large period dwelling and accompanying ancillary buildings within this area to the west.

- To the north-east corner of the Beech Park Eco Farm, on an axis with the R121 (Clonsilla Road), Clonsilla Train Station is located.
- To the east of Clonsilla Station, on the south side of the canal and railway, there is a large expanse of agricultural fields (11-12) with an area measuring approx. 47ha. The fields in this area of land are separated by dense hedgerows and tree lines and some of them contain livestock.
- Beyond the agricultural fields, community gardens and allotments, educational campus, and football club located on the south side of the canal a vast area of land measuring approx. 240ha hosts the Luttrellstown Castle Resort. The resort accommodates a variety of land uses, including a golf course measuring approx. 67ha, a number of large and medium sized water bodies, gardens, woodland, lawns, and fields. The resort also hosts the Dublin Falconry centre, which comprises several large barns, a number of other smaller buildings, and a field. The River Liffey forms the southern boundary to the resort and is connected to the Rusk River which runs through the resort in a north westerly-south easterly direction; the Rusk River forms connections with the water bodies located within the resort. The position of Luttrellstown Castle, accompanying outbuildings, woodlands, waterbodies, and fields correspond largely with the positions of the same features which are illustrated on historic 25-inch (1897-1913) and 6-inch (1829-41) Ordnance Survey Ireland maps.
- On the north side of the canal, towards the east end of this section, there is an old school building known as the Old Porterstown National School. To the east of the old school building, there is a detached house with accompanying curtilage.

Section 3

- Kennan Bridge (Porterstown Road) to Talbot Bridge (Old Navan Road):
- The Irish Rail Western Commuter Train (DART+ West) railway line follows the route of the canal in this section and is located directly adjacent to the canal on its southern side. For the majority of the section the railway is separated from the canal by hedgerow.
- To the east of the Kennan Bridge, there is a detached house. The house is located within the boundary of a field measuring approx. 1.3ha; there are several outbuildings on this property also.
- To the east of Kennan Bridge to the south of the canal, between the Porterstown Road and the Diswellstown Road, a number of sports pitches associated with St. Mochtas Football Club are located; football club and associated pitches occupy an area of approximately 2.6ha. To the immediate south of St. Mochtas Football Club, there is an area of scrubland measuring approx. 1.3ha. To the east of St. Mochtas Football Club there is an area of hardcore and concrete being used to store construction waste.; the area is partly overgrown with pioneering vegetation. To the west of St. Mochtas Football Club, there is a small area of traveller accommodation measuring approx. 0.3ha.
- To the south of St. Mochtas Football Club, a large educational campus, in which Scoil Choilm Community National School and Luttrellstown Community College are located, measures approx. 7ha. This campus contains a number of hard-surfaced sports pitches, car parking facilities, internal road infrastructure, and a large field to the south.
- To the east of Diswellstown Road, the land use on the northern and southern side of the project area within this section is entirely composed of residential development and accompanying amenities and facilities, e.g., local greens, tree-lined local roads, educational facilities, small shops, and small commercial units. It is at this point in the project area that a transition from a semi-rural and suburban character to a fully suburban character can be observed. Notable features and land use to the north of the canal at this section include Coolmine Industrial Estate (approx. 14.5ha) and the new Windmill Development (211 apartments, three apartment blocks of 6-8 storeys), both of which are located at the western end of this section. Also located to the north of the canal to the east of this section is Blanchardstown Village; there are a number of shops, restaurants, and other services that comprise the village centre at this location.

Blanchardstown Shopping Centre (approx. 40ha), a large retail campus, is located approximately 1.5km to the north of this section of the project area. To the south of the project area and canal notable land use and features include Castleknock Community College, St. Patrick's National School. Castleknock Golf Club, Castleknock GAA Club, and Castleknock Cricket Club are also located beyond the residential estates, approximately 1.5km to the south of the project area; the three sports facilities have a combined area of approx. 80ha.

- To the east of the eastern end of this section of the project area there is a large piece of road infrastructure where the Navan Road (N3) interfaces with the M50 motorway. It consists of a large, three lane roundabout and several slip roads located above an elevated railway line (Irish Rail Western Commuter Train (DART+ West), aqueduct (Royal Cana) which are located above the M50 motorway.

Local Settlements and Local Residents

The project area is located adjacent to a number of local settlements within the north Dublin City area:

- To the north of the canal at the western section, there are a number of housing estates comprising the large expanse of residential land use in this area, the most notable and largest of which is Ongar. Ongar Village acts as the focal point for facilities and amenities that serve the surrounding residential areas such as Hartstown and Huntstown.
- To the north of the canal in the middle section of the project area, Clonsilla Village acts as the focal point for facilities and amenities that serve the surrounding residential areas such as Hartstown and Coolmine.
- To the north of the canal at the eastern end of the project area Blanchardstown Village acts as the focal point for facilities and amenities that serve the surrounding residential areas and smaller settlements such as Coolmine, Roselawn, Littlepace, and Laurel Lodge.
- To the south of the canal at the eastern section of the project area, settlements such as Carpenterstown and Laurel Lodge are located. Although neither of these settlements have a traditional village centre street layout, each has its own group of local facilities (shops, restaurants, pharmacies, etc.) and can be described as being small independent local centres.
- Castleknock Village is located to the southeast of the project area, beyond Carpenterstown, Laurel Lodge, and the M50 motorway. The village centre serves as a focal point for facilities and amenities that serve the surrounding residential areas such as Laurel Lodge.
- Lucan Village is located approximately 2km to the south of the canal at the western section of the project area.

In addition to local settlements in Dublin, the project area is located 1.5km to the east of Leixlip, a town with a population of 16,733 (CSO, 2022) people located in County Kildare.

10.3.3 Landscape and Visual Amenity Analysis

The majority of the project area is enclosed on either side by hedgerows which support mature and semi-mature trees. This vegetation screens much of the adjacent lands and buildings which contribute to a rural visual aesthetic even when the project area traverses densely populated suburban areas in Section 2 and Section 3.

The hedgerow and tree lines present on either side of the project boundary break down to the west past the Hansfield Railway Bridge on the southern side of the canal. This permits views across the canal to the railway line but also beyond to agricultural fields, hedgerows, large mature trees, the Dublin-Wicklow Mountains, detached residential properties, and agricultural buildings.

There are some very striking views of the Dublin-Wicklow Mountains between Confey and Collins Bridge, particularly at Collins Bridge itself; these views are visible through the gaps in the hedgerow along the southern boundary of the canal.

The landscape and visual quality of the site vary through each section of the Proposed Development. Generally, the landscape and visual quality is higher in Section 1: Confey to Hansfield due to the predominantly rural/ peri-urban landscape character of the site itself and the contiguous landscape, where there has been no substantial disturbance to the tree and hedgerow cover along the Royal Canal boundaries. There are exceptions where there are gaps in the boundaries, particularly adjacent to private residential properties where ornamental shrubs replace native trees and hedgerows, allowing views into and out of these private properties. (*See Figures 10.15, and Plate No. 10.1 to 10.13)*

The towpath along the north side of the Royal is a rough dirt track with a mooring point at Confey slipway for barge and canal amenity users. Some old wooden fences form some local boundaries where scrub has become overgrown. The historical and protected bridge structures add to high quality and value along the route. Topography rises and falls on either side of Collins Bridge .

Where topography rises, there are some open views out to the wider landscape of agricultural fieldscapes to the north. At higher points on Pakenham Bridge, there are views out to the built environment of Hansfield in the distance. (*See Figure 10.16 to Plate No.s 10.14 to 10.20)*

The landscape and visual quality begin lessens as one moves west into Section 2: Hansfield Railway Bridge to Keenan Bridge. The landscape character changes from rural/peri-urban to suburban along this section. The high-density residential developments in Hansfield to the north are visible as one moves through the canal corridor. The Hansfield Railway Bridge infrastructure dominates the views, with graffitied walls, palisade fencing and pockets of derelict lands coming into view. The towpath surface is loose gravel in places, and changes to a tarmac surface as one moves west along the canal corridor. O' Callaghan Bridge (Protected Structure) adds a high visual quality along the route. The Clonsilla Train Station footbridge is located immediately west of O'Callaghan Bridge with associated railings and stepped access. *(See Figure 10.17 and Plates No. 10.21 to 10.38).*

The landscape and visual quality of the route varied between O'Callaghan and Keenan (Porterstown) Bridge. There are some sections with high value and visual enclosure creating by extensive tree and hedgerows. A section of the canal boundary has been removed to facilitate permeability and access to the Weaver's Wood residential development. Part of the Old Schoohouse (Protected Structure) which is in a derelict state, is visible from the towpath. More open views of the Old Schoolhouse (looking west) from Keenan Bridge at Porterstown Road as one moves east. Again, this protected structure (Keenan Bridge) adds a high visual quality to this section of the route. *(See Figure 10.18 and Plates No.10.39 to 10.49).*

The route east along the Royal Canal between Keenan Bridge and Kirkpatrick Bridge has a varied landscape and visual quality. There are section of high quality with substantial visual enclosure created by dense tree and hedgerow planting on both sides of the canal. The quality is greatly reduced in the general environs of Dr. Troy Bridge due to the scale and bulk of its concrete infrastructure. There are views out to the taller elements of the built environment of the Windmill residential estate immediately east of Dr. Troy Bridge. Embankment stabilisation works are apparent south of Sheepmoor Lane where there has been clearance of vegetation, with fencing installed to the top of the embankment *(See Plate 10.55, and 10.56).* More infrastructure works, possibly associated with the rail line are visible on the northern canal embankment immediately west of Kirkpatrick Bridge *(See Plate 10.58 and 10.59)* which substantial reduce the landscape and visual quality of the canal locally. *(See Figure 10.19 and Plates No.10.50 to 10.64).*

A footbridge crosses the Royal Canal at Coolmine Road to provide access to the Coolmine Train Station. The landscape and visual quality increases again from Kirkpatrick Bridge, a protected structure, looking east where there is substantial visual enclosure on either side of the Royal Canal by dense woodland trees and hedgerows. *(See Figure 10.20, and Plates 10.65 to 10.73).*

Although contiguous lands are urbanized, there are lengths of the Royal Canal that retain a high landscape and visual quality, with a rural aesthetic and features with exposed stone walls in places. Between Kirkpatrick Bridge and Granard Bridge, the towpath is located on the south of the Royal Canal, with varying surfaces. There are some open views to the back gardens of private properties on Roselawn Road due to historical removal of trees and hedgerows, with localized encroachment onto the northern bank of the canal for the creation of private allotment and private amenity areas. Some sections of intact woodland and hedgerows remain as one moves further east towards the 12th Lock

and Granard Bridge. There is barge mooring area adjacent to the Castleknock Train Station, which adds animation and colour to the Royal Canal at this location. *(See Figure 10.20, and Plates 10.74 to 10.80).*

10.3.4 The Proposed Development

The Proposed Development consists of the construction of an approximately 8.1km shared pedestrian and cycle greenway along and adjacent to the Royal Canal towpath, extending from the Kildare County Council boundary in the west to Talbot Bridge at the Old Navan Road in the east, where it will tie into the completed Ashtown Greenway and will be completed in three sections. The Proposed Development will provide a high-quality walking, cycling and recreational amenity for local residents and commuters.

- Section 1 – Kildare County Border to Hansfield Railway Bridge
- Section 2 – Hansfield Railway Bridge to Kennan Bridge (Porterstown Road)
- Section 3 – Kennan Bridge (Porterstown Road) to Talbot Bridge (Navan Road)

Development Description

Fingal County Council in accordance with Section 51 of the Roads Act, 1993, as amended hereby gives notice that it proposes to seek the approval of An Coimisiún Pleanála to carry out the development described hereunder.

The Proposed Development consists of the construction of an approximately 8.1km shared pedestrian and cycle greenway along and adjacent to the Royal Canal towpath, extending from the Kildare County Council boundary in the west to Talbot Bridge (Old Navan Road) in the east, where it will tie into the completed Ashtown Greenway. The cycleway is for the exclusive use of pedal cyclists and pedestrians. The Proposed Development will include the following works:

Construction of the Greenway Route including:

- Section 1: 2–3m wide unbound surface from the Kildare County Border to Hansfield Railway Bridge (Ch. 0000m – 3200m)
- Section 2: 3–4m wide bituminous surface from Hansfield Railway Bridge to Kennan Bridge (Ch. 3200m – 5300m), with a section of precast concrete cantilevered boardwalk.
- Section 3: 4m wide bituminous surface from Kennan Bridge to Talbot Bridge (Ch 5300m – 8100m), with in-situ concrete surfacing and raised boardwalks where required by local topography.

- Embankments and retaining structures at various locations to stabilise ground conditions.
- 3 no. toucan signalised crossings (4m wide) and one zebra crossing at road interfaces along the route.
- Lighting installation between Hansfield and the 12th Lock designed in accordance with best practice and sensitive to ecological considerations including bats, birds and mammals.
- Ground level adjustments along the interface with Delwood Park to reduce overlooking, including lowering of path levels and the construction of a 2m high timber palisade fence with anti-climb mesh.
- Installation of the Quarry Bridge, a 30m single-span composite steel and concrete deck bridge spanning a historic quarry on the northern bank of the canal.
- Privacy planting and railings along the Brompton green area to supplement existing boundary fencing.

- Construction of the Landmark Bridge, a steel bridge approximately 185m in length with a maximum single span of 30m, traversing the Royal Canal.
- Construction of an underpass beneath Castleknock Road on the southern side of Granard Bridge (Section 3).
- Development of a Pocket Park at Hansfield, incorporating a wildflower meadow, native hedgerow planting, embankment slide, informal play area, picnic facilities and associated landscaping.
- Demolition of two dwellings and ancillary structures on the approach to Hansfield Road to facilitate the alignment of the scheme and the Pocket Park.
- Landscape works, including removal of certain trees and hedgerows and the provision of extensive compensatory planting using native and naturalised species to enhance and increase woodland.
- All associated and ancillary works, including drainage, diversion of services, fencing, boundaries and 3 no. temporary construction compounds.

An Environmental Impact Assessment Report has been prepared in respect of the Proposed Development. The Proposed Development includes works adjoining and affecting the Royal Canal, which is a Protected Structure (BH-01, RPS 944a, 10th Lock 944b, 11th Lock 944c and 12th Lock 944d) contained within the Record of Protected Structures of the Fingal Development Plan.

10.3.5 Landscape and Visual Baseline Receptors

The Landscape and Visual Baseline assessment has identified the following sensitive receptors. The baseline assessment of the site presents several landscape and visual sensitivities where there may be significant effects of the Proposed Development:

- Local residents
- Local commuters including the rail line
- Local users of adjacent educational, commercial, sport and recreational facilities
- Environmental Designations
- Landscape Character
- Trees and hedgerows
- Habitats and Biodiversity
- Designated Open Spaces and High Amenity Areas
- Protected Structures

Table 10-12 Summary of Baseline Landscape and Visual Environment

Baseline Landscape and Visual Environment		**Sensitivity**
Section 1	**Rural to Peri-Urban Character**	
	Hedgerows and treelines to fieldscapes and canal corridor boundaries	High
	Residents of immediately adjacent privately owned properties and residential areas	High
	Open Space - Royal Canal	High
	Open Space - Barberstown	High
	Proposed Construction Compund Area (Hansfield Open Space)	High
	High Amenity Areas – St. Catherines Park, Westmanstown Golf Course, Luttrellstown Castle Resort	High
	Amenity and recreational users of the Royal Canal	High
	Rail-line Commuters and users of Leixlip/Confey Train Station	High
	Users of local Educational / Sports /Commercial facilities	Medium
	Environmental Designations	

	Royal Canal proposed Natural Heritage Area (pNHA)	High
	Ecological Receptors (Protected Sites, protected habitats, habitats, flora and fauna)	High – Very High
	Protected Structures	
	The Royal Canal (RPS 944a)	High
	Collins Bridge (RPS 713)	High
	Pakenham Bridge (RPS 711)	High
	Other Commuters and users of the local road, pathway and cycling infrastructure	Medium
Section 2	**Suburban Character**	
	Hedgerows, treelines and groups of trees along either side of the boundary of the canal along this section of the route.	High
	Residents of immediately adjacent privately owned properties and residential areas	High
	Open Space – Royal Canal	High
	Open Space – south of Hansfield	High
	Open Space – St Josephs, Clonsilla	High
	Open Space-Old Schoolhouse Lands, Porterstown	High
	Areas of High Amenity south of the canal	High
	Amenity and recreational users of the Royal Canal	High
	Rail-line Commuters and users of Clonsilla and Hansfield Train Stations	High
	Users of local Educational / Sports / Commercial facilities	Medium
	Environmental / Ecological	
	Royal Canal proposed Natural Heritage Area (pNHA)	High
	Ecological Receptors (Protected Sites, protected habitats, habitats, flora and fauna)	High – Very High
	Protected Structures	
	The Royal Canal (RPS 944a)	High
	Callaghan Bridge (RPS 706)	High
	Clonsilla Signal Box & Overbridge (RPS 707)	High
	Former Clonsilla School (RPS 700)	High
	Keenan Bridge (RPS 698)	High
	Keeper's Cottage (RPS 699)	High
	St. Mary's Church of Ireland (RPS 705) (off Clonsilla Road to the north)	High
	Other Commuters and users of the local road,pathway and cycling infrastructure	High
Section 3	**Urban Character**	
	Residents of immediately adjacent privately owned properties and residential areas	High
	Open Space - Royal Canal	High
	Open Space – Sheepmoor Lane	High
	Open Space – Delwood Park	High
	Open Space – Brompton Green	High
	Open Space – south of Roselawn/Royal Canal	High
	Proposed Construction Compund Area (Open Space: Sheepmoor Lane, Castleknock)	High
	Amenity and recreational users of the Royal Canal	High
	Rail-line Commuters and users of Castleknock and Coolmine Train Stations	High
	Users of local Educational / Sports / Commercial facilities	Medium
	Environmental / Ecological	
	Royal Canal proposed Natural Heritage Area (pNHA)	High
	Ecological Receptors (Protected Sites, protected habitats, habitats, flora and fauna)	High – Very High
	Protected Structures	
	The Royal Canal (RPS 944a)	High
	Kirkpatrick Bridge (RPS 697)	High
	Granard Bridge (RPS 696)	High
	Royal Canal 12th Lock (RPS 944d)	High
	Talbot Bridge (RPS 695)	High
	Other Commuters and users of the local road, pathway and cycling infrastructure	Medium

10.3.6 Landscape Plan and Landscape Report

Áit Urbanism and Landscape have prepared Landscape Plans for the entirety of the Proposed Development, including a pocket park at Hansfield, to the south of St. Josephs residential area in Clonsilla. The project landscape architects have liaised with the project engineers, arboricultural consultant and ecologists on all aspects of landscape mitigation, landscape design layout, and planting proposals including pollinator friendly planting species where appropriate. The Landscape Plans are submitted as part of this planning application (Áit Urbanism + Landscape drawings: Royal Canal Urban Greenway, Sheets 0200 – 0227 (west – east)) and should be read in conjunction with Royal Canal Greenway : Landscape Report, by Áit Urbanism and Landscape, (See Appendix 10.2 Landscape Report of this chapter).

Overall Landscape Approach

The landscape approach to the proposed greenway has been developed around the principle of retaining and reinforcing the established character of the Royal Canal corridor, with intervention kept deliberately limited along much of the route. The more detailed landscape proposals are therefore concentrated at specific locations where there is a clear need or opportunity for enhancement.

The principal landscape interventions described in the following sections include:

- Pocket Park
- Nature Development Areas
- Delwood and Brompton Estates
- Badger Mitigation Measures
- Greenway Resting Points
- Planting Strategy
    - Wildflower Meadow Establishment
    - Climbing Planting to Security Fencing
    - Tree Planting

Outside these areas, the landscape treatment will be intentionally light-touch. Existing woodland, hedgerows, grassland and canal-side vegetation will be retained wherever possible, with new planting introduced only where required to provide screening, habitat enhancement, visual amenity or reinforcement of existing landscape structure.

Where construction of the greenway results in unavoidable disturbance to peripheral areas of existing vegetation, these areas will be carefully reinstated and allowed to re-establish in a manner consistent with the surrounding canal landscape. In this way, the landscape strategy seeks to avoid unnecessary intervention and ensure that the established character of the Royal Canal corridor remains the dominant landscape influence along the route.

Pocket Park

An area of public open space, extending to approximately 0.2 ha, will be provided along the greenway route on the northern side of the Royal Canal. The space is located approximately 370 m west of Clonsilla Train Station, 500 m east of Hansfield Station Road and immediately south of St Josephs Residential Estate.

The park will be designed as an informal recreational space incorporating play, seating, planting and biodiversity enhancement. A gently formed earthen mound will provide a central landscape feature and

will incorporate an embankment slide as the principal formal play element. In addition to supporting play, the mound will introduce variation in landform and create opportunities for informal activity, while also increasing the extent of grassland habitat available for badger foraging.

A cluster of large natural stone boulders will provide a further focal element within the space. Set within an area of grass and wildflower meadow, the boulders will support informal and imaginative play, including climbing, balancing, hiding and chasing games, while complementing the naturalistic character of the park.

A perimeter path will extend around the pocket park, providing an alternative route to the main greenway and allowing users to move through and experience the space in a variety of ways. This will help create a greater sense of choice and informality in how the park is accessed and used.

Seating will be concentrated along the side of the park adjoining the principal greenway route, where it will be most accessible to passing users. Solid hardwood timber benches will provide opportunities for short stays and informal rest, while a picnic area will incorporate robust contemporary hardwood picnic tables and benches. The clustering of these facilities along the greenway edge will also help create a more clearly defined social and resting area within the park.

Areas of wildflower meadow will be distributed throughout the open space, providing seasonal colour and visual interest while increasing habitat diversity and supporting pollinators and other wildlife. A substantial planted bed adjoining the seating and picnic area will comprise a mixture of pollinator-friendly perennial groundcover species and ornamental grasses, selected to provide structure, seasonal variation and year-round interest.

Native hedgerow planting will also be introduced along the edge of the park adjoining the existing scrub woodland. This will create an informal landscape boundary while reinforcing the transition between the more managed open space and the adjoining semi-natural vegetation. The hedgerow will also provide additional habitat, shelter and ecological connectivity within the wider greenway corridor.

Nature Development Areas

Three areas designated as Nature Development Areas (NDAs) in the Fingal Development Plan directly adjoin the project area. These comprise: an area to the south of St. Joseph's residential estate which also encompasses the proposed pocket park; an area extending from the Old Schoolhouse, south of Clonsilla Road, towards Lambourn Park; and an area located between Diswellstown Road and Sheepmoor Lane. All three areas are identified as Canal Woodland on the Fingal County Council Development Plan 2023–2029 online viewer.

Within the NDA to the south of St. Joseph's residential estate, the existing woodland structure will be reinforced through targeted native woodland planting and the introduction of wildflower meadow along selected woodland edges. Gaps within the existing canal woodland will be infilled using a dense native planting mix incorporating canopy and tree-layer species, sub-tree and shrub species, together with an appropriate field and herb layer. The margins of these woodland infill areas will be sown with wildflower seed to create a more gradual and species-rich transition between woodland and adjoining open areas.

The NDA extending from the Old Schoolhouse towards Lambourn Park will remain largely undisturbed. The proposed greenway will form a new edge along its southern boundary. In locations where gaps occur within the existing woodland structure, native hedgerow planting will be introduced immediately south of the greenway to strengthen the woodland edge and provide additional understorey vegetation. Limited areas of night-scented planting will also be incorporated to provide supplementary foraging opportunities for local bat populations.

No specific enhancement measures are proposed within the NDA between Diswellstown Road and Sheepmoor Lane. This area already comprises a dense and largely continuous area of canal woodland with limited existing human disturbance. Retaining the area in its current condition is therefore considered the most appropriate approach, avoiding unnecessary intervention within an established habitat.

The southern edge of the NDA to by the Old Schoolhouse will be enhanced by the establishment of earthen berms to increase the surface area of available grassland foraging habitat for badgers. These earthen berms will be located within a 5m wide verge of wildflower meadow and will be separated from each other with generously proportioned planting beds which will host night-scented planting totalling approximately 300-350sqm that will create foraging areas for local bat populations. The earthen berms will also feature a variety of native advanced heavy standard and heavy standard trees. As recommended by the Badger Survey & Management Plan accompanying this application, this section of the greenway will feature a line of native/naturalised fruit/berry bearing hedgerow that will screen the greenway from badgers (reducing disturbance) and enhance foraging habitat. It should be noted that although no works will be undertaken in the Natura 2000 Annex 1 Lowland Hay Meadows Habitat (Code: 6510) area located along this stretch of the greenway, the native/naturalised hedgerow will be planted to the north of this plot to protect it from users on the greenway.

No enhancement measures are proposed for the NDA between Diswellstown Road and Sheepmoor Lane as this NDA already hosts a dense and unbroken area of canal woodland and is undisturbed by human intervention.

Delwood and Brompton Estates

South of the Delwood residential estate, the proposed greenway will be separated from the rear boundaries of existing properties by a planted buffer comprising native and naturalised hedgerow species, supplemented by tree planting where appropriate. The purpose of this planting is to provide effective visual screening between the public greenway route and adjoining private residential gardens, while also reinforcing the vegetated character of the canal corridor.

At Brompton Lawn, the greenway adjoins an existing area of residential open space. Consultation with local residents identified concerns that the presence of the greenway could affect the sense of privacy and enclosure currently associated with this space. In response, native hedgerow planting is proposed along the interface between the greenway and the open space, creating a clear landscape boundary and substantially screening views of the route from within the residential amenity area.

A small rest point will also be provided at this location, comprising one bench and two cycle stands positioned close to the greenway and at the edge of the existing open space. The location provides a natural opportunity for a short stopping point along the route, while the limited scale and careful positioning of these elements is intended to avoid detracting from the existing amenity and character of the green space enjoyed by local residents.

Mitigation of Effects on Badger Habitats in Landscape Proposals

As recommended in the Badger Survey & Management Plan accompanying this application, a number of measures have been incorporated into the landscape proposals to minimise potential impacts on badger habitat and movement patterns.

These measures include the provision of dedicated badger underpasses to maintain established commuting routes and territorial connections across the scheme. The entrances to these underpasses will be associated with appropriate native hedgerow planting to help guide movement and encourage their use.

Fruit-bearing native hedgerows will also be incorporated at selected locations to enhance foraging opportunities. In addition to their ecological function, this planting will provide visual screening between the proposed greenway and more sensitive areas, including locations in proximity to badger setts.

Further details of the proposed mitigation measures are provided in the *Royal Canal Urban Greenway* ***Stage 2*** *Badger Survey & Management Plan* prepared by Triturus Environmental Ltd., which accompanies this planning application.

Resting Points

A series of eight resting points will be provided at key locations along the greenway route. The crossing points associated with the existing canal bridges form natural nodes along the route, where movement,

access and changes in direction are concentrated. These locations therefore provide logical opportunities for seating and other small-scale amenity provision.

The resting points will generally be marked by large solid hardwood timber benches, providing users with opportunities to pause and rest while travelling along the greenway. They are located near the Royal Canal Amenity Group at Confey, Collins Bridge, Pakenham Bridge, the proposed pocket park, Callaghan Bridge opposite Clonsilla Train Station, Keenan Bridge, Kirkpatrick Bridge facing Sheepmoor Lane, and at the edge of the open space adjoining the Brompton Estate.

Most of these locations will also incorporate cycle stands, allowing users to securely leave their bicycles while resting or exploring nearby areas on foot. Collectively, the resting points will reinforce key nodes along the route and provide a consistent level of amenity for greenway users.

Planting Strategy

The planting strategy for the greenway has been developed to reinforce the existing landscape character of the Royal Canal corridor while introducing targeted ecological and amenity enhancements at key locations. Along much of the route, the approach is intentionally restrained, with existing vegetation retained and disturbed areas reinstated in a manner that allows the canal-side landscape to recover naturally.

This emphasis on retention is also reflected on the landscape plans through the notation of tree protection fencing proposed as part of the arboricultural strategy. While these protection measures are not landscape proposals in themselves, they are shown on the landscape drawings to clearly emphasise the physical limits of construction activity and the extent to which existing woodland and vegetation are to be protected from disturbance.

More structured planting is focused at nodal points, including the pocket park, Nature Development Areas and selected resting points, where native trees and hedgerows, wildflower meadow, pollinator-friendly planting and locally appropriate groundcover species are used to strengthen habitat value, provide screening and add seasonal interest.

Overall, the strategy seeks to balance landscape enhancement with the protection and conservation of the established, naturalistic character of the Royal Canal corridor.

Planting and Landscape Establishment

The use of ornamental and groundcover planting along the greenway will be focused primarily at key nodal locations, including the proposed pocket park, Nature Development Areas and selected resting points. Along the majority of the route, the existing canal-side vegetation and established landscape character will be retained with minimal intervention.

Where existing vegetation is disturbed or damaged as a result of construction works, affected areas will be reinstated to support the re-establishment of a naturalistic grassland character. The following methodology will generally apply:

1. Remove all stones, debris and other unwanted material.
2. Cut existing vegetation back to ground level.
3. Remove the existing grass sward where required and cultivate the soil in dry conditions to a depth of approximately 150–200 mm, using a rotavator as necessary to control and remove weeds.
4. Prepare a firm seed bed and rake the surface to achieve a fine, crumbly tilth suitable for seeding.
5. Remove any remaining stones or debris greater than 50 mm.
6. Sow the specified grass seed mixture in accordance with the supplier’s recommendations.

7. Roll the area following sowing to ensure good seed-to-soil contact.
8. Following establishment, allow pioneering and naturally occurring vegetation to recolonise the area so that it gradually assimilates with the surrounding canal landscape.

Where dedicated planting beds are proposed, they will comprise either pollinator-friendly perennial groundcover planting and ornamental grasses, or night-flowering species selected to provide additional foraging opportunities for local bat populations. These planting areas will be concentrated at locations where a more structured landscape treatment is appropriate and will provide seasonal and year-round visual interest while contributing to the ecological value of the greenway corridor.

Wildflower Meadow Establishment

A number of wildflower meadow areas will be established along the route as part of the wider biodiversity enhancement strategy. Wherever practicable, these areas will be created using locally sourced green hay from suitable species-rich grassland within the canal corridor. Donor areas will be selected carefully and cut during the appropriate season, prior to seed drop, with the resulting green hay transferred directly to prepared recipient areas.

This approach will help establish meadow communities that are characteristic of the local canal environment and will support the natural transfer of locally occurring species. Where insufficient donor material is available, supplementary seeding may be undertaken using appropriate species such as Yellow Rattle, Meadow Foxtail (*Alopecurus pratensis*) and Yellow Oat-grass (*Trisetum flavescens*), while retaining opportunities for natural recolonisation.

Further details of the proposed wildflower establishment methodology are provided within the Biodiversity Section of the EIAR prepared by JBA Consulting Ireland Ltd. and accompanying this application.

Climbing Planting to Security Fencing

Climbing vegetation is proposed along approximately 600 m of anti-climb security fencing associated with private rear garden boundaries between Coolmine Road and the Brompton residential area, including Brompton Court. The purpose of this planting is to soften the visual appearance of the fencing and reduce its prominence within the greenway corridor.

Species will include native Honeysuckle (*Lonicera periclymenum*), Common Jasmine (*Jasminum officinale*) and native Ivy (*Hedera helix*). These species have also been selected for their value to pollinators and their suitability as robust climbing plants capable of providing progressive vegetative cover.

Tree Planting

All proposed tree planting will comprise native species appropriate to the character of the Royal Canal corridor. Species will be selected from the following palette: Pedunculate Oak (*Quercus robur*), Alder (*Alnus glutinosa*), Silver Birch (*Betula pendula*), Downy Birch (*Betula pubescens*), Bird Cherry (*Prunus padus*), Hazel (*Corylus avellana*), Crab Apple (*Malus sylvestris*) and Goat Willow (*Salix caprea*).

Where existing trees are removed as a consequence of the proposed works, compensatory planting will be provided using species drawn from this native palette. The location and composition of replacement planting will respond to local site conditions and the existing woodland and canal-side vegetation structure.

The project landscape architects also liaised with JBA Consulting on their Biodiversity Net Gain (BNG) assessment, which is located Chapter 8, Appendix 8.6.

The Biodiversity Net Gain

It is anticipated that the Proposed Development will have a long-term negative impact of 'slight' significance on local biodiversity, primarily due to the loss of woodland habitat from within the Royal Canal ecological corridor.

The Biodiversity Net Gain Assessment concludes as follows:

'However, the commitment of FCC to create a new woodland area within St. Catherine's Park, alongside the Landscape Plan and habitat management measures outlined within this EIAR means overall, there will be net gain in terms of areas and lengths of habitats along and adjacent to the Proposed Development. Furthermore, these measures ensure that habitat connectivity within the Royal Canal ecological corridor is maintained. This is consistent with Objective GINHO9 – Greenways and Net Gain and Objective GINHO30 – Infrastructure and Net Biodiversity Gain of the FCC Development Plan (FCC, 2023) which require all greenway development to achieve an overall biodiversity net gain. While this assessment is primarily qualitative, initial figures support this conclusion. Furthermore, FCC has committed to complete a full BNG assessment using the TII BNG Toolkit (TII, 2025) in the future. The exact details of the long-term management for the greenway are yet to be agreed, although it is understood at this point in time the operational maintenance of the Greenway and the associated landscaped areas will be intermittent and managed through operational arrangements to be made between FCC and WI, including through a memorandum of understanding for the Greenway.'

10.4 Predicted Impacts Construction Stage

Potential Construction Impacts

Potential construction effects are likely to result from the following impacts:

- Establishment of site office and compounds
- Installation of tree protection measures
- Trees and hedgerow removal
- Removal of required properties and boundaries
- Establishment of appropriate traffic control measures
- Proposed demolition works
- Site Clearance and preparation
- Excavation to formation level for new pavement construction
- Preparation of pavement subgrade and placement of pavement / surfacing; import of fill material
- Hard and soft landscaping works following the completion of principal greenway works.
- Enabling Temporary Works for bridge Installation
- Delivery set down and installation of bridge structures
- Removal of Temporary Works

The construction works are anticipated to be carried out in a number of phases over an approximate 2-year construction period. An Outline Construction and Environmental Management Plan (OCEMP) has been prepared by DBFL Consulting Engineers which will inform the Construction and Environmental Management Plan (CEMP) by the site contractor. Possible construction compound locations have been identified at three locations along the Proposed Development route at Hansfield Castleknock (Section 3). (Refer to Outline Construction Environmental Management Plan, Section 4.7 Compound Locations for further details).

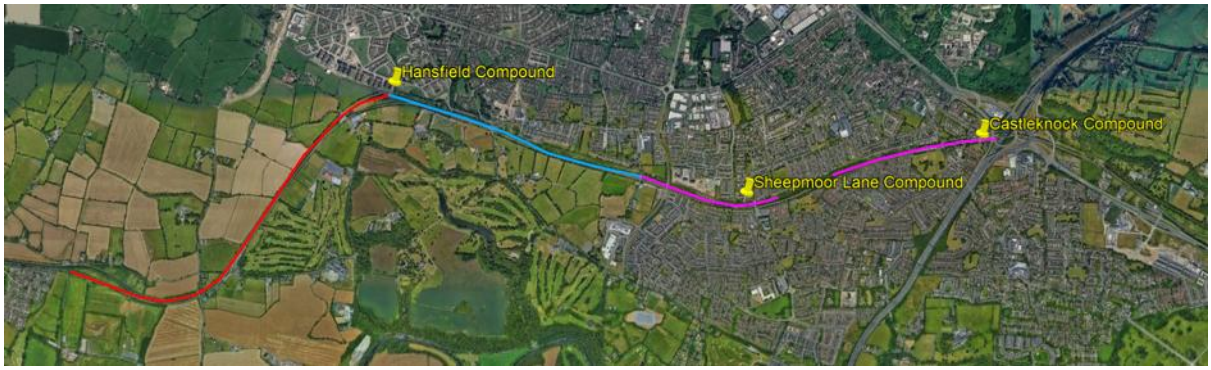


Figure 10-11 Possible Construction Compound Locations (extract from OCEMP, by DBFL Consulting Engineers)

All temporary construction compound works areas will be instated following completion of construction works, including topsoil restoration, reseeding of grassed areas, landscaping, all planting replacement where required in line with the approved landscape plans.

It is anticipated that the Proposed Development will give rise to substantial changes and impacts on the local landscape and on views from properties adjacent to or over-looking the site, as well as from elevated views on bridges located along the route.

10.1.1 Landscape Effects - Construction Stage

The following Table summarises the identified likely significant effects during the construction phase of the Proposed Development before mitigation measures are applied.

Table 10-13 Potential Construction Stage Effects

Section 1	**Rural to Peri-Urban Character**	**Landscape Sensitivity**	**Magnitude of Change (Construction Stage)**	**Significance, Quality, Duration of Landscape Effects**
	Hedgerows and treelines to fieldscapes and canal corridor boundaries	High	High	Significant, Negative, Short-Term
	Residents of immediately adjacent privately owned properties and residential areas	High	Very High	Very Significant, Negative, Short-Term
	Open Space - Royal Canal	High	Very High	Very Significant, Negative, Short-Term
	Open Space - Barberstown	High	High	Significant, Negative, Short-Term
	Proposed Construction Compund Area (Hansfield Open Space)	High	Very High	Very Significant, Negative, Short-Term
	High Amenity Areas – St. Catherines Park, Westmanstown Golf Course, Luttrellstown Castle Resort	High	Medium	Moderate, Negative, Short-Term
	Amenity and recreational users of the Royal Canal	High	Very High	Very Significant, Negative, Short-Term
	Rail-line Commuters and users of Leixlip/Confey Train Station	High	Medium	Moderate, Negative, Short-Term
	Users of local Educational / Sports /Commercial facilities	Medium	Medium	Moderate, Negative, Short-Term
	Environmental Designations			
	Royal Canal proposed Natural Heritage Area (pNHA)	High	*Varies throughout the route*	*Varies throughout the route. See Chapter 8, Biodiversity, S. 8.7.3*
	Ecological Receptors (Protected Sites, protected habitats, habitats, flora and fauna)	High – Very High	*Varies throughout the route*	*Varies throughout the route. See Chapter 8, Biodiversity, S. 8.7.3*
	Protected Structures			*(As per S.9.5.2, Chapter 9, Cultural Heritage)*

	The Royal Canal (RPS 944a)	High	*Medium*	*Moderate, Negative, Short Term*
	Collins Bridge (RPS 713)	High	*Medium*	*Moderate, Negative, Short Term*
	Pakenham Bridge (RPS 711)	High	*Medium*	*Moderate, Negative, Short Term*
	Other Commuters and users of the local road, pathway and cycling infrastructure	Medium	High	Moderate to Significant, Negative, Short Term
Section 2	**Suburban Character**			
	Hedgerows, treelines and groups of trees along either side of the boundary of the canal along this section of the route.	High	Very High	Very Significant, Negative, Short-Term
	Residents of immediately adjacent privately owned properties and residential areas	High	Very High	Very Significant, Negative, Short-Term
	Open Space – Royal Canal	High	Very High	Very Significant, Negative, Short-Term
	Open Space – south of Hansfield	High	High	Moderate to Significant, Negative, Short Term
	Open Space – St Josephs, Clonsilla	High	Very High	Very Significant, Negative, Short-Term
	Open Space-Old Schoolhouse Lands, Porterstown	High	Very High	Very Significant, Negative, Short-Term
	Areas of High Amenity south of the canal	High	Medium	Moderate, Negative, Short-Term
	Amenity and recreational users of the Royal Canal	High	Very High	Very Significant, Negative, Short-Term
	Rail-line Commuters and users of Clonsilla and Hansfield Train Stations	High	Medium	Moderate, Negative, Short-Term
	Users of local Educational / Sports / Commercial facilities	Medium	Medium	Moderate, Negative, Short-Term
	Environmental / Ecological			
	Royal Canal proposed Natural Heritage Area (pNHA)	High	*Varies throughout the route*	*Varies throughout the route. See Chapter 8, Biodiversity, S. 8.7.3*
	Ecological Receptors (Protected Sites, protected habitats, habitats, flora and fauna)	High – Very High	*Varies throughout the route*	*Varies throughout the route. See Chapter 8, Biodiversity, S. 8.7.3*
	Protected Structures			*(As per S.9.5.2, Chapter 9, Cultural Heritage)*
	The Royal Canal (RPS 944a)	High	*Medium*	*Moderate, Negative, Short Term*
	Callaghan Bridge (RPS 706)	High	*Medium*	*Moderate, Negative, Short Term*
	Clonsilla Signal Box & Overbridge (RPS 707)	High	*Medium*	*Moderate, Negative, Short Term*
	Former Clonsilla School (RPS 700)	High	*Medium*	*Moderate, Negative, Short Term*
	Keenan Bridge (RPS 698)	High	*Medium*	*Moderate, Negative, Short Term*
	Keeper's Cottage (RPS 699)	High	*Medium*	*Moderate, Negative, Short Term*
	St. Mary's Church of Ireland (RPS 705) (off Clonsilla Road to the north)	High	Negligible	N/A
	Other Commuters and users of the local road,pathway and cycling infrastructure	High	Medium	Moderate to Significant, Negative, Short Term
Section 3	**Urban Character**			
	Residents of immediately adjacent privately owned properties and residential areas	High	Very High	Very Significant, Negative, Short-Term
	Open Space - Royal Canal	High	Very High	Very Significant, Negative, Short-Term
	Open Space – Sheepmoor Lane	High	Very High	Very Significant, Negative, Short-Term
	Open Space – Delwood Park	High	Very High	Very Significant, Negative, Short-Term

	Open Space – Brompton Green	High	Very High	Very Significant, Negative, Short-Term
	Open Space – south of Roselawn/Royal Canal	High	Very High	Very Significant, Negative, Short-Term
	Proposed Construction Compund Area (Open Space: Sheepmoor Lane, Castleknock)	High	Very High	Very Significant, Negative, Short-Term
	Amenity and recreational users of the Royal Canal	High	Very High	Very Significant, Negative, Short-Term
	Rail-line Commuters and users of Castleknock and Coolmine Train Stations	High	Medium	Moderate, Negative, Short-Term
	Users of local Educational / Sports / Commercial facilities	Medium	Medium	Moderate, Negative, Short-Term
	Environmental / Ecological			
	Royal Canal proposed Natural Heritage Area (pNHA)	High	*Varies throughout the route*	*Varies throughout the route. See Chapter 8, Biodiversity, S. 8.7.3*
	Ecological Receptors (Protected Sites, protected habitats, habitats, flora and fauna)	High – Very High	*Varies throughout the route*	*Varies throughout the route. See Chapter 8, Biodiversity, S. 8.7.3*
	Protected Structures			*(As per S.9.5.2, Chapter 9, Cultural Heritage)*
	The Royal Canal (RPS 944a)	High	*Medium*	*Moderate, Negative, Short Term*
	Kirkpatrick Bridge (RPS 697)	High	*Medium*	*Moderate, Negative, Short Term*
	Granard Bridge (RPS 696)	High	*Medium*	*Moderate, Negative, Short Term*
	Royal Canal 12th Lock (RPS 944d)	High	*Medium*	*Moderate, Negative, Short Term*
	Talbot Bridge (RPS 695)	High	*Medium*	*Moderate, Negative, Short Term*
	Other Commuters and users of the local road, pathway and cycling infrastructure	Medium	High	Moderate to Significant, Negative, Short Term

Construction Phase Mitigation

There are no additional mitigation measures proposed other than the standard best practice construction mitigation outlined below.

The following mitigation measures will be implemented:

- Height of temporary stockpiles to be restricted to a practicable minimum to avoid impacts on local sensitive receptors
- Hoarding will be erected around site boundaries to reduce visual impacts of construction works
- Plant will be held in designated compounds
- Protective fencing will be installed around the RPA's existing boundary trees

Visual effects during the construction phase will be mitigated somewhat by appropriate site management measures and work practices to ensure the site is kept tidy, dust is kept to a minimum, and that public areas are kept free from building material and site rubbish. Appropriate site hoardings will be put in place around the perimeter of the site where required to minimise the landscape and visual impact.

10.4.2 Landscape Effects - Construction Stage

Operational Phase Mitigation

The major visual remediation of the project will be accomplished through the following mitigation measures which have been incorporated into the design:

- Through the positioning of the various elements of the development on site in order to enhance the appearance of the scheme as a whole through the design of the site layout and built form.

- The creation of high-quality public open spaces for the use and amenity of the users of the Proposed Development and the wider community.

- Through the creation of a safe, universally accessible greenway development

- The retention of existing trees and perimeter hedgerows where feasible. Existing planting will be enhanced and strengthened by additional planting of native species

- The retention of existing trees and hedgerows is important for the protection of local foraging and commuting bat populations as well as existing green infrastructure.

- Monitoring, maintenance and management of the existing tree and hedgerow canopy.

The above 'designed in' or incorporated mitigation will ensure that the Proposed Developments' landscape effects will be considered positive once construction phase is completed and the development is operational.

There are no operational phase mitigation measures bar the future maintenance and management of the existing and proposed tree and hedgerow canopy along with all future soft landscaping proposals within the scheme.

Table 10-14 Potential Operational Stage Effects

Section 1	**Rural to Peri-Urban Character**	**Landscape Sensitivity**	**Magnitude of Change (Operational Stage)**	**Significance, Quality, Duration of Landscape Effects**
	Hedgerows and treelines to fieldscapes and canal corridor boundaries	High	Medium	Moderate, Neutral, Long-Term
	Residents of immediately adjacent privately owned properties and residential areas	High	Medium	Moderate, Neutral to Positive, Long-Term
	Open Space - Royal Canal	High	Medium to High	Moderate to Significant, Positive, Long-Term
	Open Space - Barberstown	High	Low	Slight, Neutral, Long-Term
	Proposed Construction Compound Area (Hansfield Open Space)	High	Low	Slight, Neutral, Long-Term
	High Amenity Areas – St. Catherines Park, Westmanstown Golf Course, Luttrellstown Castle Resort	High	Low	Slight, Neutral, Long-Term
	Amenity and recreational users of the Royal Canal	High	High	Significant, Positive, Long-Term
	Rail-line Commuters and users of Leixlip/Confey Train Station	High	Low	Slight, Neutral, Long-Term
	Users of local Educational / Sports /Commercial facilities	Medium	Low	Slight, Neutral, Long-Term
	Environmental Designations			
	Royal Canal proposed Natural Heritage Area (pNHA)	High	*Varies throughout the route*	*Varies throughout the route. See Chapter 8, Biodiversity, S. 8.7.3*
	Ecological Receptors (Protected Sites, protected habitats, habitats, flora and fauna)	High – Very High	*Varies throughout the route*	*Varies throughout the route. See Chapter 8, Biodiversity, S. 8.7.3*

	Protected Structures			*(As per S.9.5.2, Chapter 9, Cultural Heritage)*
	The Royal Canal (RPS 944a)	High	*Negligible*	*Significant, Positive, Long Term*
	Collins Bridge (RPS 713)	High	*Negligible*	*Significant, Positive, Long Term*
	Pakenham Bridge (RPS 711)	High	*Negligible*	*Significant, Positive, Long Term*
	Other Commuters and users of the local road, pathway and cycling infrastructure	Medium	Medium	Moderate to Significant, Positive, Long Term
Section 2	**Suburban Character**			
	Hedgerows, treelines and groups of trees along either side of the boundary of the canal along this section of the route.	High	Medium	Moderate, Negative, Long-Term
	Residents of immediately adjacent privately owned properties and residential areas	High	Medium	Moderate, Negative, Long-Term
	Open Space – Royal Canal	High	Medium to High	Moderate to Significant, Positive, Long-Term
	Open Space – south of Hansfield	High	Medium to High	Moderate to Significant, Positive, Long-Term
	Open Space – St Josephs, Clonsilla	High	Medium to High	Moderate to Significant, Positive, Long-Term
	Open Space-Old Schoolhouse Lands, Porterstown	High	Medium to High	Moderate to Significant, Positive, Long-Term
	Areas of High Amenity south of the canal	High	Low	Slight, Neutral, Long-Term
	Amenity and recreational users of the Royal Canal	High	High	Significant, Positive, Long-Term
	Rail-line Commuters and users of Clonsilla and Hansfield Train Stations	High	Low	Slight, Neutral, Long-Term
	Users of local Educational / Sports / Commercial facilities	Medium	Low	Slight, Neutral, Long-Term
	Environmental / Ecological			
	Royal Canal proposed Natural Heritage Area (pNHA)	High	*Varies throughout the route*	*Varies throughout the route. See Chapter 8, Biodiversity, S. 8.7.3*
	Ecological Receptors (Protected Sites, protected habitats, habitats, flora and fauna)	High – Very High	*Varies throughout the route*	*Varies throughout the route. See Chapter 8, Biodiversity, S. 8.7.3*
	Protected Structures			*(As per S.9.5.2, Chapter 9, Cultural Heritage)*
	The Royal Canal (RPS 944a)	High	*Negligible*	*Significant, Positive, Long Term*
	Callaghan Bridge (RPS 706)	High	*Negligible*	*Significant, Positive, Long Term*
	Clonsilla Signal Box & Overbridge (RPS 707)	High	*Negligible*	*Significant, Positive, Long Term*
	Former Clonsilla School (RPS 700)	High	*Negligible*	*Significant, Positive, Long Term*
	Keenan Bridge (RPS 698)	High	*Negligible*	*Significant, Positive, Long Term*
	Keeper's Cottage (RPS 699)	High	*Negligible*	*Significant, Positive, Long Term*
	St. Mary's Church of Ireland (RPS 705) (off Clonsilla Road to the north)	High	Negligible	N/A
	Other Commuters and users of the local road,pathway and cycling infrastructure	High	Medium	Moderate to Significant, Positive, Long Term
Section 3	**Urban Character**			
	Residents of immediately adjacent privately owned properties and residential areas	High	Medium	Moderate, Negative, Long-Term

	Open Space - Royal Canal	High	Medium	Moderate, Negative, Long-Term
	Open Space – Sheepmoor Lane	High	High	Significant, Positive, Long-Term
	Open Space – Delwood Park	High	High	Significant, Positive, Long-Term
	Open Space – Brompton Green	High	High	Significant, Positive, Long-Term
	Open Space – south of Roselawn/Royal Canal	High	High	Significant, Positive, Long-Term
	Proposed Construction Compound Area (Open Space: Sheepmoor Lane, Castleknock)	High	Low	Slight, Neutral, Long-Term
	Amenity and recreational users of the Royal Canal	High	High	Significant, Positive, Long-Term
	Rail-line Commuters and users of Castleknock and Coolmine Train Stations	High	Low	Slight, Neutral, Long-Term
	Users of local Educational / Sports / Commercial facilities	Medium	Low	Slight, Neutral, Long-Term
	Environmental / Ecological			
	Royal Canal proposed Natural Heritage Area (pNHA)	High	*Varies throughout the route*	*Varies throughout the route. See Chapter 8, Biodiversity, S. 8.7.3*
	Ecological Receptors (Protected Sites, protected habitats, habitats, flora and fauna)	High – Very High	*Varies throughout the route*	*Varies throughout the route. See Chapter 8, Biodiversity, S. 8.7.3*
	Protected Structures			*(As per S.9.5.2, Chapter 9, Cultural Heritage)*
	The Royal Canal (RPS 944a)	High	*Negligible*	*Significant, Positive, Long Term*
	Kirkpatrick Bridge (RPS 697)	High	*Negligible*	*Significant, Positive, Long Term*
	Granard Bridge (RPS 696)	High	*Negligible*	*Significant, Positive, Long Term*
	Royal Canal 12th Lock (RPS 944d)	High	*Negligible*	*Significant, Positive, Long Term*
	Talbot Bridge (RPS 695)	High	*Negligible*	*Significant, Positive, Long Term*
	Other Commuters and users of the local road, pathway and cycling infrastructure	Medium	Medium	Moderate to Significant, Positive, Long Term

Demolition Phase

Landscape

The demolition phase would generally be considered to have a moderate to significant and short-term effect on the landscape resource while demolition works are undertaken.

Visual Impact

The demolition phase would generally be considered to have a moderate to significant, negative visual effect. These effects will temporary while demolition works are undertaken.

Construction Phase

Landscape

The construction phase of the project would generally be considered to have negative and significant effects on the landscape while construction works are ongoing. These will be short term and cease once construction works are completed in full.

Visual Impact

The construction phase of the project would generally be considered to have negative and significant visual effects on the landscape while construction works are ongoing. These will be short term and cease once construction works are completed in full.

Operational Phase

Landscape

The proposed development forms part of the strategic plans for the Dublin to Galway cycle corridor, aiming to complete the missing section between Maynooth and Spencer Dock, which will complete the Royal Canal Greenway through Dublin 15, connecting the wider greenway corridor. The Proposed Greenway development will run along the route of the Royal Canal for approximately 8.1km. 5km of the route is proposed along the existing tow path which has a variety of surfaces including dirt track and loose gravel. 3.1km of the route will be located away from the towpath in order to reduce / minimise the impacts on habitats, trees and hedgerows along the banks of the Royal Canal. The Proposed Development will connect in with recently completed greenway sections at St. Joseph', Clonsilla and Windmill Court (Section 2 of the Proposed Development).

Section 1: The Proposed Development will follow the route of the existing towpath on the north side of the Royal Canal, from Confey to Hansfield Railway Bridge. The existing narrow dirt and gravel surface will be replaced with a 2-3m wide unbound surface. There will be toucan signalised crossings at Collins Bridge and Pakenham Bridge to provide for safe crossing transition points from the existing pedestrian footpath to the Proposed Greenway.

Section 2: This section of the Proposed Development will continue on the north side of Royal Canal from Hansfield to Keena Bridge, via the Old School House lands to the north of the existing towpath, between Callaghan Bridge and Keenan Bridge. The Proposed Development will enter the St. Joseph's Clonsilla open space area to the northeast of the Hansfield Railway Bridge. It will follow the route of a recently completed pedestrian and cycle route through this open space before moving through an area of adjacent woodland. A Pocket Park is proposed at Hansfield to the south of St. Josephs residential area.

In order to construct the 3-4m wide greenway, there will demolition works required of two properties, along with clearance of trees. The remainder of the route will require widening to 3-4m of the existing pedestrian route along the north of the Royal Canal to a sloped section accessing the Old Schoolhouse lands at Porterstown. There will be substantial infrastructure requirements locally including the construction of embankments and retaining structures. Proposed surfaces include bitumen, and precast concrete cantilevered boardwalk to the east of Clonsilla before the Old Schoolhouse lands.

Section 3: The Proposed Development will continue east on the northern side of the canal from Kennan Bridge to Kirkpatrick Bridge via Sheepmoor Lane, to the north of the wooded area along the northern embankment from Kennan Bridge to Sheepmoor Lane. This option will reduce the impact on trees locally.

A bituminous surface is proposed for the majority of the section, with in-situ concrete surfacing and portions of raised boardwalk to naviage local topography challenges. The scheme will follow pedestrian and cycle facilities proposed as part of the Windmill Court Residential Development followed by the existing roadway along Sheepmoor Lane.

The Greenway will be situated on the upper level of the northern embankment, from Coolmine Road (Kirkpatrick Bridge) to the Brompton green area, minimising tree removal and the potential visual impact of the scheme on the Canal.

The Greenway will continue near the top of the northern embankment (adjacent to Delwood Park residential back gardens) and into the open space at Brompton, again minimising the potential impact on highly sensitive trees (Oak-Ash-Hazel Woodland WN2) and local habitats.

The ground level of the route will be lowered from existing levels or lower than the existing ground level of the adjacent back gardens to prevent overlooking of the back gardens of the residents of Delwood Park. A 2m high timber palisade fence and an anti-climb wire mesh fence is also proposed for security. Additional defensive planting will assist in increasing security and reduce any visual intrusion to local residents.

A bridge structure, the proposed 'Quarry Bridge' is proposed to cross a steep section of historic quarry area on the northern embankment. The Proposed Development will continue through an area of open space to the south of Brompton Green and will be 4m wide. A 2m high fence is proposed to be maintained along the southern side of the greenway along the Brompton green area. Planting and railings will be provided on the Brompton side of the greenway through the Brompton green area to provide privacy to the Brompton residents. The scheme will provide further permeability between the Brompton and Roselawn estates.

The route then crosses from the northern side to the southern side of the Royal Canal at chainage (before Roselawn Road). The Greenway will cross the Canal over an architecturally designed pedestrian and cycle bridge – referred to as the 'Landmark Bridge'. The proposed new bridge will be approximately 185m in length and a single span of 30m.

The greenway will continue on the southern side of the Royal Canal, past Castleknock Station and under Castleknock Road through a Proposed Greenway underpass on the southern side of Granard Bridge with sloped embankments required at the proposed underpass at Castleknock.

The Proposed Development will continue as a 4m wide greenway on the southern towpath from Granard Bridge to the 12th Lock Hotel. Due to a pinch point locally, the proposed greenway will reduce to 3m There is a pinch point between the hotel and the canal a 3m wide greenway from the 12th Lock Hotel to Talbot Bridge/Old Navan Road.

The Proposed Development will then tie into the existing Ashtown section of the Royal Canal Greenway at Talbot Bridge providing continued linkage east to Dublin City. Toucan signalised crossings are proposed at Kirkpatrick Bridge and a zebra crossing at Talbot Bridge. New public lighting is prosed along the Proposed Development from Hansfield to the Talbot Bridge. New public lighting is not proposed to be provided on the western section of the greenway from the Kildare/Fingal County Boundary to the Hansfield Railway Bridge due to its rural nature.

The proposed greenway development from Confey to the 12th Lock, will, when complete and in its totality, be seen as a positive addition to the green infrastructure network of Dublin 15, completing the strategic infrastructure of the Royal Canal Greenway between Maynooth and Spenser Dock. The Proposed Development will, when operational provide a high quality, sustainable, accessible and safe walking and cycling corridor in the Dublin 15 area, set within a high quality and valued landscape setting. It will open up this section of the Royal Canal as a new recreational amenity and provide an alternative option for commuters who cycle or walk within the local area.



Figure 10-12 Aerial Map highlighting section from Confey Slipway to Collins Bridge

Plate 10.1 Confey Slipway looking southeast



Plate 10.2 View looking west along towpath towards county boundary



Plate 10.3 View looking east along towpath



Plate 10.4 View looking west along towpath



Plate 10.5 View to canal looking south



Plate 10.6 View looking east along towpath



Plate 10.7 View of private rear garden access from towpath



Plate 10.8 View looking east along towpath close to Collins Bridge



Plate 10.9 View looking east towards Collins Bridge



Plate 10.10 Collins Bridge



Plate 10.11 View looking west from Collins Bridge



Plate 10.12 View looking east from Collins Bridge



Plate 10.13 View looking south from Collins Bridge





Figure 10.13 Aerial Map highlighting section from Collins Bridge to Pakenham Bridge

Plate 10.14 View looking southeast towards Westmanstown



Plate 10.15 View looking southwest along towpath



Plate 10.16 View looking northwest towards hedgerows and adjacent agricultural fields



Plate 10.17 View looking northeast towards Pakenham Bridge



Plate 10.18 View from Pakenham Bridge looking northeast towards Hansfield



Plate 10.19 View from Pakenham Bridge looking southwest



Plate 10.20 View looking west towards Pakenham Bridge





Figure 10.16 Aerial Map highlighting section from Pakenham Bridge to Callaghan Bridge

Plate 10.21 View looking east along towpath



Plate 10.22 View looking northeast towards Hansfield residential estate



Plate 10.23 View looking northeast under railway bridge



Plate 10.24 View underneath railway bridge looking southwest



Plate 10.25 View looking towards Hansfield residential estate



Plate 10.26 View looking southwest towards railway bridge



Plate 10.27 View to pipe crossing canal



Plate 10.28 View looking west along towpath showing material change from asphalt to gravel



Plate 10.29 Access to canal from Clonsilla Road



Plate 10.30 View looking south towards canal bank vegetation



Plate 10.31 View looking west along towpath



Plate 10.32 Callaghan Bridge looking west



Plate 10.33 View under Callaghan Bridge looking west



Plate 10.34 Callaghan Bridge looking east



Plate 10.35 View from Callaghan Bridge looking west



Plate 10.36 View under Callaghan Bridge, looking east



Plate 10.37 Stepped access to towpath near Clonsilla Station

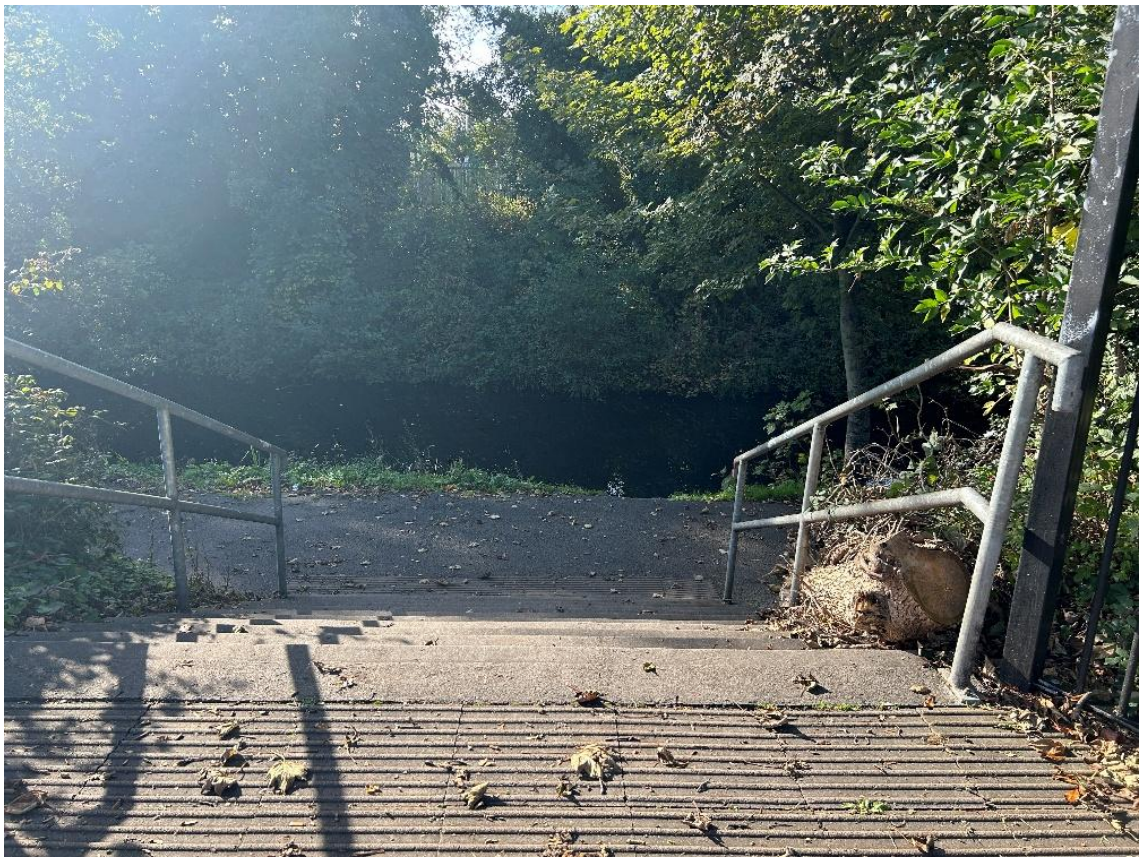


Plate 10.38 Pedestrian bridge at Clonsilla Station





Figure 10.17 Aerial Map highlighting section from Callaghan Bridge to Porterstown

Plate 10.39 View looking west along towpath



Plate 10.40 Pedestrian chicane gate to towpath from Weaver's Wood



Plate 10.41 View looking west along towpath



Plate 10.42 View looking south from towpath



Plate 10.43 View looking east along towpath



Plate 10.44 View looking towards Old Schoolhouse from towpath



Plate 10.45 Keenan Bridge, Porterstown



Plate 10.46 View looking west towards the Old Schoolhouse



Plate 10.47 Keenan Bridge, Porterstown



Plate 10.48 View looking west towards Keenan Bridge



Plate 10.49 View looking west towards Keenan Bridge





Figure 10.18 Aerial Map highlighting section from Porterstown to Kirkpatrick Bridge

Plate 10.50 View looking east



Plate 10.51 View under Dr. Troy Bridge



Plate 10.52 View looking west to Dr. Troy Bridge



Plate 10.53 View looking north towards Windmill residential estate



Plate 10.54 View looking west



Plate 10.55 View looking east



Plate 10.56 View looking west



Plate 10.57 View looking east



Plate 10.58 Kirkpatrick Bridge, Coolmine



Plate 10.59 Kirkpatrick Bridge, Coolmine



Plate 10.60 Kirkpatrick Bridge, Coolmine



Plate 10.61 View from Kirkpatrick Bridge, Coolmine looking east



Plate 10.62 Kirkpatrick Bridge, Coolmine



Plate 10.63 View looking west towards Kirkpatrick Bridge, Coolmine



Plate 10.64 View looking west towards Kirkpatrick Bridge, Coolmine





Figure 10.19 Aerial Map highlighting section from Kirkpatrick Bridge to Granard Bridge

Plate 10.65 View looking west



Plate 10.66 View looking east



Plate 10.67 View looking east



Plate 10.68 View looking west



Plate 10.69 View looking north



Plate 10.70 View looking west



Plate 10.71 View looking north at Castleknock Station



Plate 10.72 View looking west from Castleknock Station



Plate 10.73 View looking east towards Granard Bridge





Figure 10.20 Aerial Map highlighting section from Granard Bridge to 12th Lock

Plate 10.74 View from Granard Bridge looking east



Plate 10.75 View to Granard Bridge looking west



Plate 10.76 View under Granard Bridge looking east



Plate 10.77 View from 12th Lock looking west



Plate 10.78 Talbot Bridge, 12th Lock



Plate 10.79 Famine Way memorial



Plate 10.80 View from 12th Lock



10.4.3 Visual Effects

The 38 photomontages have been prepared from representative sensitive viewpoint locations across the full length of the Proposed Development from Confey at the Kildare border in the west to the 12th Lock in the east. The Proposed Development runs through three distinct landscapes, Section 1 to the west is predominantly rural, Section 2 can be described as suburban; Section 3 is urbanised.

The photomontages provide an accurate visual representation of the changes that are predicted to occur at the operational stage of the project, post construction stage.

Cumulative Effects – DART+West

The DART+ West (Railway Order ABP-314232-22) is a large-scale strategic infrastructure project that will run adjacent to the Proposed Development route along the of the existing rail-line. The Cumulative effects of the Proposed Development and the DART+ West have been assessed based on available design information.

The cumulative effects of the Proposed Development and the proposed DART+ West on the visual amenity of the subject site have been modelled in Photomontage No's 5,21,31,and 33 below, and summarised in Table 10.15 Summary of Potential Visual Effects and Cumulative Effects (DART+West) below.

Photo Locations

The location of each of the 38 views assessed are identified on the View Location Map prepared by GNet 3D and should be read in conjunction with DBFL drawings: Royal Canal Urban Greenway, Preferred Route-Key Plan, Sheets 1 -25 (west – east) and Áit Urbanism + Landscape drawings: Royal Canal Urban Greenway, Sheets 0200 – 0227 (west – east) that accompany this planning application.

There are a variety of both existing and proposed pathway types and widths depicted in the photomontages. These include the following:

- Existing towpath to be retained: variable widths, 2.00m – 4.00m
- Proposed Greenway path: Unbound gravel with concrete edge: widths vary between 2.00m – 4.00m
- Proposed Greenway path: Bound gravel with concrete edge: 3.00m – 4.00m
- Proposed Boardwalk/Cantilevered Path: 3.00m – 4.00m

Proposed Lighting, Fences and Guardrails

All technical drawings are submitted as part of this planning application

Public lighting has been designed by Sabre Electrical Services Ltd. Column heights will vary between 5.00-6.00m

(Refer to Sabre Public Lighting Layouts SES 08322 Sheet 1 & Sheet 2, in conjunction with Outdoor Lighting Report)

Proposed Timber Post and Rail Fence: 1400mm high, weather treated and painted black

(Refer to Transport Infrastructure Ireland (TII) Standard Construction Details – Fencing – Timber Post and Rail Fence – Drawing No: 00301)

Galvanised Steel Railing of varying heights: 1050mm, 1400mm, 1700mm . (Refer to Seán Harrington Architects Drawing, Guardrail Detail Galvanised Steel: Drawing Ref : 358JJ-SHA-XX-XX-DR-A-0611)



Figure 10-21 Viewpoint Location Map (GNet 3D) (See Appendix 10.3)



Figure 10-22 Contextual Viewpoint Map by Áit Urbanism + Landscape Ltd (with GNET 3D Viewpoint)



Figure 10-23 Contextual Location of View locations 1-8, within Section 1 of the Proposed Development

View 1- Existing



This view is taken looking east along the Royal Canal from the canal towpath. The location provides a mooring place for canal barges, with several vessels moored locally. The view depicts a rough gravel surface to the towpath with soft grass verge to the canal itself. Mooring points are located along the canal bank for barges and maintenance crafts. Woodland is visible to the right of view on the south bank of the Royal Canal. There is a variety of boundary treatments to the north of the towpath, including grassed margin, timber post and rail fence, hedge and tree planting. An area of informal grass is located to the left, with a traffic barrier bounding the adjacent R149. A timber bench is located adjacent to the towpath for amenity users of the canal. A mature boundary hedgerow and mature trees located along the northern edge of the R149 are visible in the background of the view.

There have been moderate man-made interventions over the years, with the presence of the rough towpath that appears to be topped up with gravel occasionally. The presence of quite dated standard timber fencing, signage, lighting and bollards add vertical elements into the view and appears as aged, visual clutter, contributing to a utilitarian rural setting. Road signage is also visible on the adjacent road to the left of view (Leixlip Road R148).

The landscape character can be described as rural within a canal character type, with grass verges, hedgerows, tree groups and mature tree lines adjacent to the canal itself. The Royal Canal falls within the River Valleys & Canal Character Type of the Landscape Character Assessment (Fingal Development Plan 2023-2029 (Consolidated Version, March 2026)) which is considered a highly sensitive landscape likely to be susceptible and vulnerable to change. Overall, the sensitivity of this view is considered medium to high.

View No.	Landscape Character Area	Landscape Character Sensitivity	Visual Sensitivity	Overall Sensitivity	Landscape Value	Landscape Capacity
1	River Valleys & Canal Character Type	High	Medium to High	Medium to High	Medium to High	Low to Medium

View 1- Proposed



The Proposed Development will be visible from this viewpoint location (within Section 1 of the Proposed Development– Kildare County Border to Hansfield Railway Bridge (Ch. 0000 – 3200)). It will incorporate a general widening of the towpath with an unbound gravel surface and concrete edge treatment on either side to ensure the new installation retains its shape and structure. To the left of view will be a large solid oak bench offering a resting point along the proposed Greenway route. The new extended cycleway along the line of the towpath will create definition along the edges of the route.

The magnitude of change is considered negligible. The Proposed Development will have a neutral, 'Not Significant' to 'Slight' visual effect on the River Valleys & Canal character of this section of the Royal Canal (Fingal Development Plan 2023-2029 (Consolidated Version, March 2026)). The duration of effect will be long term (See Áit U + L drawing 18FG01-DR-0201 for Landscape Proposals and DBFL DR 170239-X-04-X-XXX-DR-DBFL-CE-1101 Preferred Route - Sheet 1 of 25).

View No.	Magnitude of Change	Quality of Effect	Significance of Effect	Duration of Effect
1	Negligible	Neutral	Not Significant to Slight	Long Term

View 2 – Existing



This view is taken looking south-east along the northern bank of the Royal Canal near the Kildare County border. The existing tow path comprises of an informal dirt path. There are three private properties to the left of view, whose properties bound the towpath. Planting within and adjacent to these properties is predominantly ornamental with coniferous species that contrast starkly with the native hedgerows and trees along the boundary of the canal to the south and right of view which reduces the overall visual sensitivity locally. There is a steep ditch to the left of view with a poorly planted edge treatment.

This section of the Royal Canal falls into the River Valleys & Canal Character Type of the Landscape Character Assessment (Fingal Development Plan 2023-2029 (Consolidated Version, March 2026)) which is considered a highly sensitive landscape likely to be susceptible and vulnerable to change. Given the presence of views into and onto the rear of private properties backing onto the canal's southern bank the overall visual amenity is reduced substantially and can be categorised as semi-rural and less sensitive to change, resulting in an overall medium sensitivity. The sensitivity of local residents is considered high. The magnitude of change during the construction stage is predicted to be very high during the construction stage with very significant, negative, short- term effects.

View No.	Landscape Character Area	Landscape Character Sensitivity	Visual Sensitivity	Overall Sensitivity	Landscape Value	Landscape Capacity
2	River Valleys & Canal Character Type	High	Medium	Medium	Medium	Medium to High

View 2 – Proposed



The Proposed Development will be visible from this viewpoint. The existing informal dirt path will be removed and replaced with a 2.00m wide unbound gravel Greenway, along with a timber post and rail fence which will provide a consistent edge treatment to the north of the route.

The magnitude of change is considered medium in this instance. The Proposed Development will have a neutral, 'Slight to Moderate' visual effect on the River Valleys & Canal character of this section of the Royal Canal. The duration of effect will be long term (See Áit U + L drawing 18FG01-DR-0202-0203 for Landscape Proposals and DBFL DR 170239-X-04-X-XXX-DR-DBFL-CE-1102 Preferred Route - Sheet 2 of 25). The magnitude of change on local residents is predicted to be medium during the operation

stage of the project when all construction works are complete with moderate, neutral to positive effects in the long term.

View No.	Magnitude of Change	Quality of Effect	Significance of Effect	Duration of Effect
2	Medium	Neutral	Slight to Moderate	Long Term

View 3 – Existing



This view is taken looking west along the Royal Canal from Collins Bridge, beneath the Local Road L3004. The historic stone structure of Collins Bridge is visible to the right. The historic kerb stone of the canal edge is also visible in the foreground view.

The wider view depicts a section of the Royal Canal with the waterbody of the canal dominating the view. Marginal aquatic vegetation along with grasses sweep up from the banks of the canal onto drier grass verges with hedgerows and trees lining the zones immediately adjacent to the waterbody. The existing towpath is informal and finished with a rough gravel, visible to the right of view. Some graffiti is visible on the historic stone wall of Collins Bridge on the right. It also appears that chemical weed control is being used along the base of the stone wall and grassed edges as vegetation is burnt off in sections.

This view of the Royal Canal falls into the River Valleys & Canal Character Type of the Landscape Character Assessment (Fingal Development Plan 2023-2029 (Consolidated Version, March 2026)) which is considered a highly sensitive landscape likely to be susceptible and vulnerable to change. The resulting overall sensitivity of this view is considered medium to high.

View No.	Landscape Character Area	Landscape Character Sensitivity	Visual Sensitivity	Overall Sensitivity	Landscape Value	Landscape Capacity
3	River Valleys & Canal Character Type	High	Medium to High	Medium to High	Medium to High	Low to Medium

View 3 – Proposed



The Proposed Development will comprise of a new cycleway in an unbound surface that will rise and cross over Collins Bridge from the east and join the existing towpath location down slope which will be upgraded to a 3.00m wide unbound gravel path. The towpath beneath the bridge will be retained. A new protective timber post and rail fence, is proposed along the woodland edge and new cycling path to the right of view, adding visual value to the context of the proposed Greenway.

The magnitude of change is considered negligible to low. The Proposed Development will have a neutral,' Not Significant' to 'Slight' effect on the River Valleys & Canal character of this section of the Royal Canal. The duration of effect is considered long term (See Áit U + L drawing FG01-DR-0204 for Landscape Proposals and DBFL DR 170239-X-04-X-XXX-DR-DBFL-CE-1104 Preferred Route - Sheet 4 of 25).

View No.	Magnitude of Change	Quality of Effect	Significance of Effect	Duration of Effect
3	Negligible to Low	Neutral	Not Significant to Slight	Long Term

View 4 – Existing



This view is taken looking east north-east from Collins Bridge along the Royal Canal in the opposite direction from View 2A. Part of the historic stone structure of the Collins Bridge is visible to the left of view. The historic kerb stone of the canal edge is also visible in the foreground of view.

The wider view depicts a section of the Royal Canal with the waterbody of the canal again dominating the view. Tree and hedgerow planting form an enclosed edge to the left of view (northern edge of the canal) while the view to south-east is more open.

There are views into several private residential properties and gardens on the southern bank of the canal. Marginal aquatic vegetation along with grasses sweep up from the banks of the canal onto drier grass verges with hedgerows and trees lining the zones immediately adjacent to the waterbody particularly on the northern bank to the left of view. The existing towpath is informal and narrow, finished in a rough gravel. As in the previous view it appears that chemical weed control is being used along the base of the stone wall (out of view) and grassed edges as vegetation is burnt off in sections. Some graffiti is visible on the historic stone wall of Collins Bridge to the left of view.

This section of the Royal Canal falls into the River Valleys & Canal Character Type of the Landscape Character Assessment (Fingal Development Plan 2023-2029 (Consolidated Version, March 2026)) which is considered a highly sensitive landscape likely to be susceptible and vulnerable to change. Given the presence of views into and onto the rear of private properties backing onto the canal's southern bank the overall visual amenity is reduced substantially and can be categorised as semi-rural and less sensitive to change, resulting in an overall medium to high sensitivity.

View No.	Landscape Character Area	Landscape Character Sensitivity	Visual Sensitivity	Overall Sensitivity	Landscape Value	Landscape Capacity
4	River Valleys & Canal Character Type	High	Medium to High	Medium to High	Medium to High	Low to Medium

View 4 – Proposed



The Proposed Development will comprise of a new Greenway in an unbound surface that will rise and cross over Collins Bridge from the east and join the existing towpath location down slope. The treatment beneath the bridge will remain the same. A new protective timber post and rail fence is proposed along the woodland and new sloped cycleway to the left of view adding visual context to the value of this Greenway proposal.

The magnitude of change is considered negligible to low. The Proposed Development will have a neutral, 'Not Significant' to 'Slight' effect on the River Valleys & Canal Type character of this section of the Royal Canal. The duration of effect is considered long term (See Áit U + L drawing FG01-DR-0204 for Landscape Proposals and DBFL DR 170239-X-04-X-XXX-DR-DBFL-CE-1104 Preferred Route - Sheet 4 of 25).

View No.	Magnitude of Change	Quality of Effect	Significance of Effect	Duration of Effect
4	Negligible to Low	Neutral	Not Significant to Slight	Long Term

View 5 – Existing



This view is taken looking south-west along the northern bank of the Royal Canal. The existing towpath consists of an informal dirt path set within a wide grassed area adjacent to the Royal Canal. A steep ditch drops to the right of view to an existing hedgerow with some mature tree planting forming the boundary to the north.

The visual sensitivity of the view is reduced to the large gaps in the tree planting allowing open views into the adjacent agricultural lands, agricultural and private dwellings visible in the distance. The railway line is visible to the left of view on the south of the canal with boundary hedgerows and substantial mature tree planting in the wider rural landscape which gives adds suburban characteristics to the view.

This section of the Royal Canal falls into the River Valleys & Canal Character Type of the Landscape Character Assessment (Fingal Development Plan 2023-2029 (Consolidated Version, March 2026)) which is considered a highly sensitive landscape likely to be susceptible and vulnerable to change.

View No.	Landscape Character Area	Landscape Character Sensitivity	Visual Sensitivity	Overall Sensitivity	Landscape Value	Landscape Capacity
5	River Valleys & Canal Character Type	High	Medium	Medium	Medium	Medium

View 5 – Proposed



The Proposed Development will be visible from this location. The existing informal dirt pathway will be removed and replaced with a 3.00m wide rough gravel Greenway, providing greater accessibility and permeability along this section of the proposed Greenway route.

The magnitude of change is considered low in this instance. The Proposed Development will have a neutral, 'Not Significant to Slight' effect on the River Valleys & Canal character of this section of the Royal Canal. The duration of effect will be long term (See Áit U + L drawing 18FG01-DR-0207 for Landscape Proposals and DBFL DR 170239-X-04-X-XXX-DR-DBFL-CE-1106 Preferred Route - Sheet 6 of 25).

View No.	Magnitude of Change	Quality of Effect	Significance of Effect	Duration of Effect
5	Low	Neutral	Not Significant to Slight	Long Term

View 5 - Cumulative View (Dart + West Railway Infrastructure)



The proposed future railway infrastructure of associated with the DART+ West scheme (Railway Order ABP-314232-22) will be visible to the left of the Royal Canal from this viewpoint. The magnitude of the cumulative visual effects of the Proposed Development and the prwoposed new railway infrastructure

is considered low, with a neutral quality of effect, with a 'Not Significant to Slight' visual effect on the Landscape Character of this viewpoint on the Royal Canal in the long term.

View 6 - Existing



This view is taken looking north-east along the northern bank of the Royal Canal. The existing towpath consists of an informal dirt path set within a wide grassed area adjacent to the Royal Canal. A steep ditch drops to the left of view to an existing hedgerow with mature tree planting forming the boundary to the north.

Many of the trees appear in poor condition. The railway line is visible to the right of view on the south of the canal. A relatively low hedgerow with some occasional trees forms the boundary with Westmanstown Gaels GAA Club with associated sports netting and pitch lighting masts, which reduces the overall visual quality of the view.

The tree and hedgerow planting density increases on the southern boundary of the Royal Canal as one moves north-east. The taller elements of built environment around Hansfield are visible in the distance, centre of view over the canopies of existing trees.

This section of the Royal Canal falls into the River Valleys & Canal Character Type of the Landscape Character Assessment (Fingal Development Plan 2023-2029 (Consolidated Version, March 2026)) which is considered a highly sensitive landscape likely to be susceptible and vulnerable to change. Due to the railway infrastructure and clear signs of suburban activity, the overall sensitivity of this view is considered medium.

View No.	Landscape Character Area	Landscape Character Sensitivity	Visual Sensitivity	Overall Sensitivity	Landscape Value	Landscape Capacity
6	River Valleys & Canal Character Type	High	Medium	Medium	Medium	Medium

View 6 – Proposed



The Proposed Development will be visible from this location. The existing dirt pathway will be removed and replaced with a 3.00m wide rough gravel Greenway, providing greater accessibility and permeability along this section of the proposed Greenway route.

The magnitude of change is considered low in this instance. The Proposed Development will have a neutral, 'Slight to Non Significant' effect on the River Valleys & Canal character of this section of the Royal Canal. The duration of effect will be long term (See Áit U + L drawing 18FG01-DR-0208 for Landscape Proposals and DBFL DR 170239-X-04-X-XXX-DR-DBFL-CE-1107 Preferred Route - Sheet 7 of 25).

View No.	Magnitude of Change	Quality of Effect	Significance of Effect	Duration of Effect
6	Low	Neutral	Not Significant to Slight	Long Term

View 6 - Cumulative View (Dart + West Railway Infrastructure)



The proposed future railway infrastructure associated with the DART+ West scheme (Railway Order ABP-314232-22) will be visible to the right of the Royal from this viewpoint. The magnitude of the cumulative visual effects of the Proposed Development and the new railway infrastructure is considered

low, with a neutral quality of effect, with a 'Not Significant to Slight' visual effect on the Landscape Character of this viewpoint on the Royal Canal.

View 7 – Existing



This view is taken looking south-west from Pakenham Bridge (Barberstown) along the Royal Canal. Part of the historic stone structure of the Pakenham Bridge is visible to the right of view. The historic kerb stone of the canal edge is also visible in the foreground of view.

The wider view depicts a section of the Royal Canal with the waterbody of the canal dominating the view. Marginal aquatic vegetation along with grasses sweep up from the banks of the canal onto drier grass verges with hedgerows and trees lining the zones immediately adjacent to the waterbody. The existing towpath, visible to the right of view is informal and finished with a rough gravel. Faint graffiti is visible on the historic stone wall of Pakenham Bridge to the right of view. Again, it appears that chemical weed control is being used along the base of the stone wall and grassed edges as vegetation is burnt off in sections.

This section of the Royal Canal falls into the River Valleys & Canal Character Type of the Landscape Character Assessment (Fingal Development Plan 2023-2029 (Consolidated Version, March 2026)) which is considered to be a highly sensitive landscape likely to be susceptible and vulnerable to change. The landscape character depicted in this view is rural within a canal character type, resulting in an overall medium to high sensitivity.

View No.	Landscape Character Area	Landscape Character Sensitivity	Visual Sensitivity	Overall Sensitivity	Landscape Value	Landscape Capacity
7	River Valleys & Canal Character Type	High	Medium to High	Medium to High	Medium to High	Low to Medium

View 7- Proposed



The Proposed Development will comprise of a new cycleway in an unbound surface that will rise and cross over Pakenham Bridge from the east and join the existing towpath location down slope. The treatment to the existing towpath beneath the bridge will remain the same. A new protective timber post and rail fence is proposed along the woodland edge and new sloped cycling path to the right of view adding visual context to the value of this Greenway proposal.

The magnitude of change is considered negligible to low. The Proposed Development will have a neutral, 'Not Significant' to 'Slight' effect on the River Valleys & Canal character of this section of the Royal Canal. The duration of effects is considered long term (See Áit U + L drawing 18FG01-DR-0212 for Landscape Proposals and DBFL DR 170239-X-04-X-XXX-DR-DBFL-CE-1109 Preferred Route - Sheet 9 of 25).

View No.	Magnitude of Change	Quality of Effect	Significance of Effect	Duration of Effect
7	Negligible to Low	Neutral	Not Significant to Slight	Long Term

View 8 – Existing



This view is taken looking north-east from Pakenham Bridge (Barberstown) along the Royal Canal beneath Milestown Road. Part of the historic stone structure of Pakenham Bridge is visible to the left of view. The historic kerb stone of the canal edge is also visible in the foreground of view.

The wider view depicts a section of the Royal Canal with the waterbody of the canal dominating the view. Marginal aquatic vegetation along with grasses sweep up from the banks of the canal onto drier grass verges with hedgerows and trees lining the zones immediately adjacent to the waterbody. The existing towpath, visible to the left of view is informal and finished with a rough gravel. Faint graffiti is visible on the historic stone wall of Pakenham Bridge to the left of view. It appears that chemical weed control is being used along the base of the stone wall and grassed edges, and section of the canal bank as vegetation is burnt off in sections.

This view depicts the transition from a rural landscape setting to a peri-urban scenario as the Royal Canal moves north-east towards the edge of the greater metropolitan area of Dublin. The Royal Canal retains its intact character on its northern boundary. The southern boundary appears more fragmented with some derelict buildings visible to the right of view.

The presence of urban multi-storey residential development in the background of view at Hansfield marks the transition from rural to peri-urban/urban, along with some derelict buildings to the right of view, reduce the overall visual sensitivity of the view.

View No.	**Landscape Character Area**	**Landscape Character Sensitivity**	**Visual Sensitivity**	**Overall Sensitivity**	**Landscape Value**	**Landscape Capacity**
8	River Valleys & Canal Character Type	High	Medium	Medium	Medium	Medium

View 8 – Proposed



The Proposed Development will comprise of a new cycleway in an unbound surface that will rise and cross over Pakenham Bridge from the east and join the existing towpath location down slope. The treatment to the existing towpath beneath the bridge will remain the same. A new protective timber post and rail fence is proposed along the woodland edge and new sloped cycleway to the left of view which add visual value in the context of this transport infrastructure proposal.

The magnitude of change is considered low. The Proposed Development will have a neutral, 'Not Significant' to 'Slight' visual effect on the River Valleys & Canal character of this section of the Royal Canal. The duration of effect is considered long term (See Áit U + L drawing 18FG01-DR-0212 for Landscape Proposals and DBFL DR 170239-X-04-X-XXX-DR-DBFL-CE-1109 Preferred Route - Sheet 9 of 25).

View No.	Magnitude of Change	Quality of Effect	Significance of Effect	Duration of Effect
8	Low	Neutral	Not Significant to Slight	Long Term



Figure 10-24 Contextual Location of View locations 9-20, within Section 2 of the Proposed Development

View 9 – Existing



This view is taken looking north-west from the existing pedestrian cycleway north of the railway bridge and south of Hansfield (residential area). This view captures a peri-urban landscape that is very much in transition. Hansfield Bridge, the Royal Canal and a rough gravelled towpath are visible to the left of view with a banked grassed verged area behind a green mesh palisade fence. Additional safety railings have been added to perimeter of Hansfield Bridge for what appears as safety reasons. Graffiti is visible on the stone bridge façade and on the metal support structure beneath the bridge itself. The lands adjacent to the canal retain a rural aesthetic with substantial tree and mature hedgerow coverage.

An existing pathway is visible to the right of view with rough grass margin adjacent to the site hoarding of a construction site (Pipers Court/Park Walk, Hansfield). Broken palisade fencing is visible immediately outside the hoarding line.

However, the visual amenity within this view is very poor due to the fencing, graffiti and unmaintained backlands with a substantial number of man-made interventions, resulting in an overall medium sensitivity.

View No.	Landscape Character Area	Landscape Character Sensitivity	Visual Sensitivity	Overall Sensitivity	Landscape Value	Landscape Capacity
9	River Valleys & Canal Character Type	High	Low	Medium	Medium	High

View 9 - Proposed



The Proposed Development will not result in any changes to the view and, as a result, will not cause any effects. The existing walking and cycling path will be integrated into the proposed greenway (See Áit U + L drawing 18FG01-DR-0213 for Landscape Proposals and DBFL DR 170239-X-04-X-XXX-DR-DBFL-CE-1109 Preferred Route - Sheet 10 of 25).

View No.	Magnitude of Change	Quality of Effect	Significance of Effect	Duration of Effect
9	None	None	None	None

View 10 – Existing



This view is taken looking north-west from the Royal Canal at an access point off Hansfield Road. The Royal Canal is visible to the left with dense mature vegetation on the southern bank of the canal. A section of low metal barrier with graffiti is located at the top of the northern bank of the canal; this is most likely a safety measure at the base of the ramped access to Hansfield Road to the right of view. The existing surface in the foreground is tarmac and changes to a rough gravel on the towpath in the background. Dense mature hedgerow and trees sit within an embankment on the northern boundary of the canal. Although there are substantial trees and hedgerows present within this view, there are also some overhead wires and other transport infrastructure elements present as well as palisade fencing to the right of view along Hansfield Road and some signage and road lighting, signalling the suburban nature of the contiguous lands.

View No.	Landscape Character Area	Landscape Character Sensitivity	Visual Sensitivity	Overall Sensitivity	Landscape Value	Landscape Capacity
10	River Valleys & Canal Character Type	Medium	Medium	Medium	Medium	Medium

View 10 - Proposed



The Proposed Development will be visible from this viewpoint in the form of a bound tarmac path. The Greenway will be edged with in-situ concrete to ensure the stability of the construction and build up. The preferred route alignment will be located to the north of the existing towpath (which will be retained) and will be visible to the right of view and in the middle distance.

As a section of the embankment will need to be removed to facilitate this, a series of planted mounds (appropriate groundcover planting) will be required to stabilise the soil on either side of the Greenway. (Refer to Áit U + L drawing 18FG01-DR-0215). New tree planting is also proposed in the middle distance to compensate for localised tree and hedgerow removal due to the development itself. Proposed light standards will also be also visible within this viewpoint. The existing visually degraded barriers along the canal edge will be removed and replaced with a timber post and rail fence.

The proposal will provide a more coherent infrastructure for cyclists and pedestrians, reinforced by a simple palette of appropriate street furniture in the form of light and fencing and will generally enhance the landscape and visual amenity of the view. The magnitude of change is considered low to medium. The proposal will have a positive, 'Slight' to 'Moderate' effect on the River Valleys & Canal character of this section of the Royal Canal.

The duration of effect is considered long term (See Áit U + L drawing 18FG01-DR-0215 for Landscape Proposals and DBFL DR 170239-X-04-X-XXX-DR-DBFL-CE-1112 Preferred Route - Sheet 12 of 25).

View No.	Magnitude of Change	Quality of Effect	Significance of Effect	Duration of Effect
10	Low to Medium	Positive	Slight to Moderate	Long Term

View 11- Existing



This view is taken further west looking north- east along the northern towpath of the Royal Canal. Similar to View 19A and 19B above, contiguous lands to the north of Royal Canal at this location are predominantly suburban/residential, lands to the south are rural with enclosed fieldscape patterns.

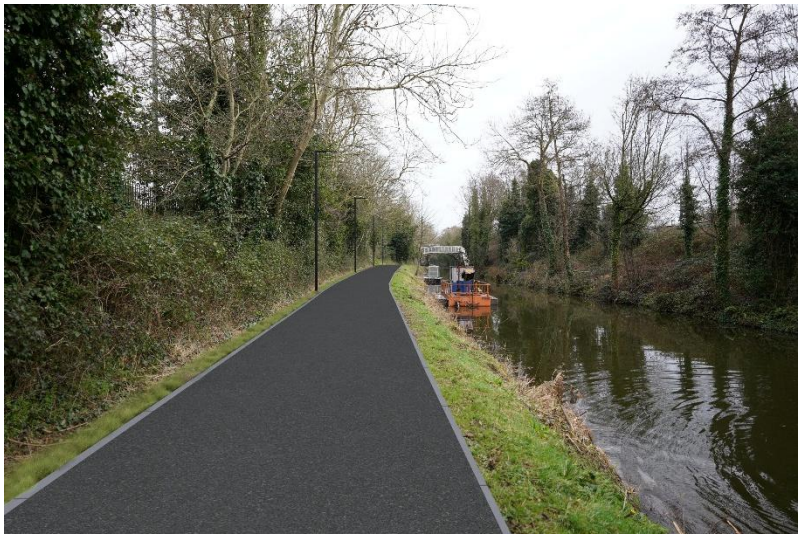
Clonsilla Railway footbridge is visible in the middle distance, blocking views of Callaghan Bridge immediately behind. There are views of the infrastructure of the railway line in the form of fencing and lighting of the Proposed Development to the right of view through gaps in the vegetation to the south of the canal.

The canal embankment to the south of the canal continues to be steep, with trees and vegetation growing to the canal edge to the right of view. To the left of view, the towpath is comprised of a tarmac surface. An embankment with woodland planting is visible to the left of view, with stepped and railed access to Hansfield Road north of the Royal Canal. Waterways Ireland dredging boats are visible in the canal undertaking maintenance work.

The landscape character is rural with a high visual amenity associated with the River Valleys & Canal Character Type of the Landscape Character Assessment (Fingal Development Plan 2023-2029 (Consolidated Version, March 2026)) considered to be a sensitive landscape, likely to be susceptible and vulnerable to change.

View No.	Landscape Character Area	Landscape Character Sensitivity	Visual Sensitivity	Overall Sensitivity	Landscape Value	Landscape Capacity
11	River Valleys & Canal Character Type	High	Medium to High	Medium to High	Medium to High	Low to Medium

View 11 - Proposed



The Proposed Development will be visible from this viewpoint. The existing rough dirt pathway will be removed and replaced with a 3.00m wide bound tarmac Greenway, railing and lighting infrastructure, improving accessibility and user experience along the proposed Greenway route.

The magnitude of change in this view is considered low. The Proposed Development will have a neutral, 'Not Significant to Slight' effect on the River Valleys & Canal character of this section of the Royal Canal. The duration of effect will be long term. (See Áit U + L drawing 18FG01-DR-0215 for Landscape Proposals and DBFL DR 170239-X-04-X-XXX-DR-DBFL-CE-1112 Preferred Route - Sheet 12 of 25).

View No.	Magnitude of Change	Quality of Effect	Significance of Effect	Duration of Effect
11	Low	Neutral	Not Significant to Slight	Long Term

View 12 – Existing



This view is taken looking south-east along the northern towpath of the Royal Canal. Contiguous lands to the north of Royal Canal at this location are predominantly suburban / residential, lands to the south are rural with enclosed fieldscape patterns.

Clonsilla Railway footbridge is visible in the middle distance, blocking views of Callaghan Bridge immediately behind. There is a glimpse view of the built environment and train network signage of Clonsilla Train Station to the right of view. The canal embankment to the south of the canal is steep with trees and vegetation growing to the canal edge to the right of view. To the left of view, the towpath is comprised of a tarmac surface. An embankment with woodland planting is visible to the left of view, with stepped and railed access to Hansfield Road north of the Royal Canal. Waterways Ireland dredging boats are visible in the canal undertaking maintenance work.

The landscape character is rural with a high visual amenity associated with the River Valleys & Canal Character Type of the Landscape Character Assessment (Fingal Development Plan 2023-2029 (Consolidated Version, March 2026)) considered to be a sensitive landscape, likely to be susceptible and vulnerable to change. The overall sensitivity of this view is considered medium to high.

View No.	Landscape Character Area	Landscape Character Sensitivity	Visual Sensitivity	Overall Sensitivity	Landscape Value	Landscape Capacity
12	River Valleys & Canal Character Type	High	Medium to High	Medium to High	Medium to High	Low to Medium

View 12 – Proposed



The Proposed Development will be visible from this viewpoint. The existing rough dirt pathway will be removed and replaced with a 3.00m wide bound tarmac Greenway, railing and public lighting infrastructure.

The magnitude of change in this view is considered low. The Proposed Development will have a neutral, 'Not Significant to Slight' visual effect on the River Valleys & Canal character of this section of the Royal Canal. The duration of effect will be long term (See Áit U + L drawing 18FG01-DR-0215 for Landscape Proposals and DBFL DR 170239-X-04-X-XXX-DR-DBFL-CE-1112 Preferred Route - Sheet 12 of 25).

View No.	Magnitude of Change	Quality of Effect	Significance of Effect	Duration of Effect
12	Low	Neutral	Not Significant to Slight	Long Term

View 13 – Existing



This view is taken looking north-west from beneath Callaghan Bridge (adjacent to Clonsilla Road and Train Station). The wider view depicts a section of the Royal Canal with the waterbody of the canal dominating the view. Substantial mature trees, hedgerow and scrub bound the southern bank of the Royal Canal. The northern bank of the canal is steep in places and meets with the existing towpath, finished in a rough gravel to the right of view. A section of the stone wall of Callaghan Bridge is visible to the right of view with a covering of ivy and bramble.

There is substantial mature tree and hedgerow coverage along the northern edge of the Royal Canal set within an embankment. A stepped access with railings up through the embankment and onto Hansfield Road is partially discernible in the middle distance, right of view.

This section of the Royal Canal falls into the River Valleys & Canal Character Type of the Landscape Character Assessment (Fingal Development Plan 2023-2029 (Consolidated Version, March 2026)) which is considered a highly sensitive landscape likely to be susceptible and vulnerable to change. The landscape character depicted within this view is rural within a canal character type. Although located within a peri-urban/urban area, the density and maturity of hedgerow and tree coverage provide substantial visual enclosure adding to the overall quality of the local visual amenity and resulting in an overall high sensitivity.

View No.	Landscape Character Area	Landscape Character Sensitivity	Visual Sensitivity	Overall Sensitivity	Landscape Value	Landscape Capacity
13	River Valleys & Canal Character Type	High	High	High	Medium to High	Low

View 13 – Proposed



The Proposed Development will be visible from this viewpoint in the form of a 3.00m wide tarmac surfaced Greenway. The new path will be edged with in-situ concrete to ensure the stability of the construction and build up.

Further, proposed 2.00m high light standards will be visible along the right Greenway edge within this viewpoint. A section of railing is proposed beneath Callaghan Bridge as a safety measure, due to the steepness of the canal bank at this location, however, not visible from this view.

The magnitude of change is considered low to medium. The Proposed Development will have a neutral, 'Moderate' likely significant visual effect on the River Valleys & Canal character of this section of the Royal Canal. The duration of effect is considered long term (See Áit U + L drawing 18FG01-DR-0216 for Landscape Proposals and DBFL DR 170239-X-04-X-XXX-DR-DBFL-CE-1113 Preferred Route - Sheet 13 of 25).

View No.	Magnitude of Change	Quality of Effect	Significance of Effect	Duration of Effect
13	Low to Medium	Neutral	Moderate	Long Term

View 14 – Existing



This view is taken looking south-east from beneath Callaghan Bridge (adjacent to Hansfield Road and Train Station). The view depicts a section of the Royal Canal with the waterbody of the canal and substantial mature trees while hedgerow and scrub bound the southern bank of the Royal Canal dominating the view. The maturity of the trees on the northern and southern bank is heightened by the enclosure created by the branch growth over the canal itself particularly in the background of view.

The stonework of Callaghan Bridge is visible to the left of view, with areas of graffiti, and planting visible. Some of the canal kerbstones are visible in the foreground of view, along with semi-aquatic vegetation along the northern bank. The northern bank is steep in places. The existing towpath is surfaced in a rough gravel with soft grassed margins either side as one moves east.

The Royal Canal falls into the River Valleys & Canal Character Type of the Landscape Character Assessment (Fingal Development Plan 2023-2029 (Consolidated Version, March 2026)) which is considered a highly sensitive landscape likely to be vulnerable to change. The landscape character depicted within this view is rural within a canal character type. Although located within a peri-urban/urban area, the density and maturity of hedgerow and tree coverage provide substantial visual enclosure adding to the overall quality of the local visual amenity, resulting in a medium to high overall sensitivity.

View No.	Landscape Character Area	Landscape Character Sensitivity	Visual Sensitivity	Overall Sensitivity	Landscape Value	Landscape Capacity
14	River Valleys & Canal Character Type	High	Medium to High	Medium to High	Medium to High	Low to Medium

View 14 - Proposed



The Proposed Development will be visible from this viewpoint in the form of a 3.00m wide bound tarmac surface Greenway. The path will be edged with in-situ concrete to ensure the stability of the construction and build up. A galvanised steel railing will be installed along steeper sections of the canal bank for safety. Public lighting columns will also be visible along the northern edge of the proposed Greenway route. A hardwood bench will provide a resting point along the route. The proposal will generally enhance the landscape and visual amenity of the view.

The magnitude of change is considered low to medium in this instance. The Proposed Development will have a neutral, ‘Moderate’ visual effect on the River Valleys & Canal character of this section of the

Royal Canal. The duration of effect is considered long term (See Áit U + L drawing 18FG01-DR-0215 for Landscape Proposals and DBFL DR 170239-X-04-X-XXX-DR-DBFL-CE-1113 Preferred Route - Sheet 13 of 25).

View No.	Magnitude of Change	Quality of Effect	Significance of Effect	Duration of Effect
14	Low to Medium	Neutral	Moderate	Long Term

View 15 – Existing



This view is taken looking north-west along the northern towpath of the Royal Canal. Contiguous lands to the north of the Royal Canal at this location are predominantly suburban/residential; lands to the south are rural with enclosed field patterns.

Callaghan Bridge (Protected Structure) is visible in the middle distance. The built environment of Clonsilla Train Station is partially visible behind the bridge, to the left, in the middle distance. The rear of the two-storey old station house and outbuildings are visible on the south bank of the canal adjacent to Callaghan Bridge. The canal embankment to the south of the canal is steep with trees and vegetation growing to the canal edge to the left of view. To the right of view, the towpath is rough without any formal hard surface materials. An embankment with woodland planting is visible to the right of view. There are gaps in the planting allowing views out to the local built environment, which reduces the overall visual quality of the view.

The landscape character is semi-urban with a high visual amenity associated with the River Valleys & Canal Character Type of the Landscape Character Assessment (Fingal Development Plan 2023-2029 (Consolidated Version, March 2026)) considered to be a sensitive landscape, likely to be susceptible and vulnerable to change. This results in an overall considered sensitivity of medium to high in this view.

View No.	Landscape Character Area	Landscape Character Sensitivity	Visual Sensitivity	Overall Sensitivity	Landscape Value	Landscape Capacity
15	River Valleys & Canal Character Type	High	Medium	Medium	Medium	Medium

View 15 – Proposed



The Proposed Development will be visible from this viewpoint. The existing rough dirt pathway will be removed and replaced with a 3.00m wide bound tarmac Greenway, railing and public lighting infrastructure.

The magnitude of change in this view is considered medium. The Proposed Development will have a neutral, 'Moderate' visual effect on the River Valleys & Canal character of this section of the Royal Canal. The duration of effect will be long term (See Áit U + L drawing 18FG01-DR-0216 for Landscape Proposals and DBFL DR 170239-X-04-X-XXX-DR-DBFL-CE-1113 Preferred Route - Sheet 13 of 25).

View No.	Magnitude of Change	Quality of Effect	Significance of Effect	Duration of Effect
15	Medium	Neutral	Moderate	Long Term

View 16 – Existing



This view is taken looking east-southeast along the northern bank of Royal Canal at Clonsilla. The view depicts a section of the Royal Canal with substantial mature trees, hedgerow and vegetation on either side of the existing northern gravelled towpath. The landscape character depicted within this view is rural within a canal character type. The density and maturity of hedgerow and tree coverage provide substantial visual enclosure adding to the overall quality and aesthetic of the local visual amenity. Moving east, the existing towpath is surfaced in a rough gravel with soft grassed margins either side.

The Royal Canal falls into the River Valleys & Canal Character Type of the Landscape Character Assessment (Fingal Development Plan 2023-2029 (Consolidated Version, March 2026)) which is considered a highly sensitive landscape likely to be susceptible and vulnerable to change. The landscape character depicted within this view is rural within a canal character type. Although located within a peri-urban/urban area, the density and maturity of hedgerow and tree coverage provide substantial visual enclosure adding to the overall quality of the local visual amenity, resulting in a medium to high overall sensitivity.

View No.	Landscape Character Area	Landscape Character Sensitivity	Visual Sensitivity	Overall Sensitivity	Landscape Value	Landscape Capacity
16	River Valleys & Canal Character Type	High	Medium to High	Medium to High	Medium to High	Low to Medium

View 16 – Proposed



The Proposed Development will be visible from this viewpoint in the form of a bound tarmac surface Greenway. The path will be edged with in-situ concrete to ensure the stability of the construction and build up. A galvanised steel railing will be installed along steeper sections of the canal bank for safety.

A section of the embankment along with vegetation will be removed to allow for the proposed Greenway infrastructure to be constructed north of the canal, through the Old Schoolhouse Lane lands, in the form of a bound tarmac path. A lighting column will be visible in the middle distance before the proposed Greenway moves north along the preferred route alignment. The existing gravel towpath adjacent to the canal in the background will remain and will be for alternative pedestrian use only. (See Áit U + L drawing 18FG01-DR-0217 for Landscape Proposals). The proposal will generally enhance the landscape and visual amenity of the view.

The magnitude of change is considered medium in this instance. The Proposed Development will have a neutral, ‘Moderate to Significant’ effect on the River Valleys & Canal character of this section of the

Royal Canal. The duration of effect is considered long term (See Áit U + L 18FG01-DR-0215 for Landscape Proposals and DBFL DR 170239-X-04-X-XXX-DR-DBFL-CE-1114 Preferred Route - Sheet 14 of 25).

View No.	Magnitude of Change	Quality of Effect	Significance of Effect	Duration of Effect
16	Medium	Neutral	Moderate to Significant	Long Term

View 17 – Existing



This view is taken looking southeast along a rough access path to the rear of the derelict Old Schoolhouse building on Old Schoolhouse Lane, a protected structure. Porterstown Road is located approximately 90m to the east, and The Village residential enclave is nearby, approx. 20m to the north of this location.

The existing Royal Canal towpath is located approximately 30m to the south of this location. The landscape is comprised of the derelict Old Schoolhouse building, and steel palisade fence. A hedgerow with some tree planting is visible to the right of view. The view presents a 'backlands' aesthetic and reduces the overall sensitivity of the view.

The landscape character is rural with a medium to high visual amenity associated with the River Valleys & Canal Character Type of the Landscape Character Assessment (Fingal Development Plan 2023-2029 (Consolidated Version, March 2026)) considered to be a sensitive landscape, likely to be susceptible and vulnerable to change. The visual sensitivity of this particular viewpoint has been degraded due to local dereliction of the Old Schoolhouse Protected Structure and palisade fence.

View No.	Landscape Character Area	Landscape Character Sensitivity	Visual Sensitivity	Overall Sensitivity	Landscape Value	Landscape Capacity
17	River Valleys & Canal Character Type	High	Medium	Medium	Medium	Medium

View 17 – Proposed



The Proposed Development will be visible from this viewpoint and will comprise of a 3.00m wide bound tarmac cycleway, public lighting infrastructure and hedge planting to the existing palisade fence. The existing towpath to the south (out of view) will be retained and resurfaced for pedestrian use. The proposal will generally improve the landscape and visual amenity of the view.

The magnitude of change is considered medium in this instance. The Proposed Development will have a positive, 'Moderate' visual effect on the River Valleys & Canal character of this section of the Royal Canal. The duration of effect will be long term (See Áit U + L drawing 18FG01-DR-0218-0219 for Landscape Proposals and DBFL DR 170239-X-04-X-XXX-DR-DBFL-CE-1116 Preferred Route - Sheet 16 of 25).

View No.	Magnitude of Change	Quality of Effect	Significance of Effect	Duration of Effect
17	Medium	Positive	Moderate	Long Term

View 18 - Existing



This viewpoint is taken within a derelict piece of land in an area known as The Old Schoolhouse Lands, which is not publicly accessible. The Royal Canal and existing towpath are located approx. 30m to the south of this location. The built environment of The Village residential area in Porterstown is visible to

the left of view. The recently completed Windmill high density residential development in Clonsilla is discernible behind trees in the distance, left of view.

To the right of view in the distance is the elevated infrastructure of Dr. Troy Bridge and Diswelltown Road (Clonsilla). Kennan Bridge (Porterstown Road) is visible in the distance and to the right of view along with road/rail crossing infrastructure. The landscape character is suburban with a low visual amenity. There are a number of large, mature trees along with some native hedgerows in the view but the general local landscape is visually poor and degraded, resulting in a low overall sensitivity. The sensitivity of local residents is considered high. The magnitude of change during the construction stage is predicted to be very high during the construction stage with very significant, negative, short- term effects.

View No.	Landscape Character Area	Landscape Character Sensitivity	Visual Sensitivity	Overall Sensitivity	Landscape Value	Landscape Capacity
18	River Valleys & Canal Character Type	High	Low	Low	Low	Medium to High

View 18 – Proposed



The proposed Greenway will be visible in the middle ground, from right to central view. It will be a 3.00m wide bound tarmac path with in-situ concrete edging, partially screened by maturing grasses and field vegetation. A public lighting post with a centred hardwood bench is visible in central middle ground view.

The magnitude of change is considered medium in this instance. The Proposed Development will have a positive, 'Moderate' visual effect on the River Valleys & Canal character of this section of the Royal Canal. The duration of effect will be long term. The magnitude of change local residents is predicted to be medium during the operation stage of the project when all construction works are complete with moderate, neutral to positive effects in the long term. (See Áit U + L drawing 18FG01-DR-0218-0219 for Landscape Proposals and DBFL DR 170239-X-04-X-XXX-DR-DBFL-CE-1116-1117 Preferred Route - Sheet 16-17 of 25).

View No.	Magnitude of Change	Quality of Effect	Significance of Effect	Duration of Effect

18	Medium	Positive	Moderate	Long Term

View 19 – Existing



This view is taken looking east along lands located to the north of the Royal Canal at Porterstown Road (approx. 50m north of the level crossing). The view is peri-urban depicting a country road, with partial views onto a two-storey cottage and outbuildings, with views of higher density residential development in the background. The green painted metal gate in central view is very much of a country/farm heritage style. There are substantial mature hedgerows and some larger trees along Porterstown Road, on either side of the gated access. Construction works at the Windmill Court residential development have been completed and the tops of multi-storey apartment buildings are discernible against the skyline in the background.

View No.	**Landscape Character Area**	**Landscape Character Sensitivity**	**Visual Sensitivity**	**Overall Sensitivity**	**Landscape Value**	**Landscape Capacity**
19	River Valleys & Canal Character Type	High	Medium	Medium	Medium	Medium

View 19 - Proposed



The Proposed Development will be visible from this viewpoint. The agricultural gates will be removed and the strip of land opened for public use. The alignment of the proposed Greenway will be located to the north of a woodland on the northern bank of the Royal Canal. The benefit of this preferred alignment will be that a minimal amount of tree removal is required. However, some localised tree and hedgerow removal will be necessary for the construction works.

The proposed Greenway will be visible in central view. It will be a 3.00m wide bound tarmac path with in-situ concrete edging. There will be substantial public realm improvements along Porterstown Road at this location which form part of the DART+ West project (Railway Order ABP-314232-22). New tree and shrub planting will also be undertaken as part of the Proposed Development. The proposal will generally enhance the landscape and visual amenity of the view.

The magnitude of change is considered medium in this instance. The Proposed Development will have a neutral, 'Moderate' effect on the River Valleys & Canal character of this section of the Royal Canal. The duration of effect is considered long term (See Áit U + L drawing 18FG01-DR-0219 for Landscape Proposals and DBFL DR 170239-X-04-X-XXX-DR-DBFL-CE-1116 Preferred Route - Sheet 16 of 25).

Note: The area within the red line on the photomontage is subject to detailed designed by others as part of the DART+ West proposal (Railway Order ABP-314232-22).

View No.	Magnitude of Change	Quality of Effect	Significance of Effect	Duration of Effect
19	Medium	Neutral	Moderate	Long Term

View 20 – Existing



This view is taken looking west at Porterstown Road (approx. 50m north of the level crossing) through lands to the north of the Royal Canal. The view depicts a section of rural road with mid-height stone walls and a high industrial metal gate with tall concrete pillars. Parts of disused lands and tree planting are visible behind the gate. The visual degradation of the gate and pillars greatly detracts from the visual amenity of the view in this rural landscape context. To the right, there is a vacant derelict two-storey building.

The landscape character depicted within this view is peri-urban with remnant rural landscape features, such as hedgerows, trees and sections stone boundary walls which add some quality of the local visual amenity. Therefore the landscape sensitivity is considered low-medium.

View No.	Landscape Character Area	Landscape Character Sensitivity	Visual Sensitivity	Overall Sensitivity	Landscape Value	Landscape Capacity
20	River Valleys & Canal Character Type	High	Low to Medium	Low to Medium	Low to Medium	Medium

View 20 – Proposed



The proposal will consist of a resurfaced concrete footpath replacing the existing tarmac road in the foreground and continuing into the right middle ground. The existing gate and posts and the mid-height stone wall with covering and surrounding vegetation will be removed. The disused field in the right fore- and middle ground will be covered with tarmac. A tarmac surfaced Greenway will lead from the foreground towards the central background view and will be accompanied by public lighting masts along its left edge.

The magnitude of change is considered medium to high in this instance. The Proposed Development will have a neutral to positive, and 'Moderate' visual effect on the River Valleys & Canal character of this section of the Royal Canal. The duration of effect is considered long term (See Áit U + L 18FG01-DR-0219 for Landscape Proposals and DBFL DR 170239-X-04-X-XXX-DR-DBFL-CE-1116 Preferred Route - Sheet 16 of 25).

View No.	Magnitude of Change	Quality of Effect	Significance of Effect	Duration of Effect
20	Medium to High	Neutral to Positive	Moderate	Long Term

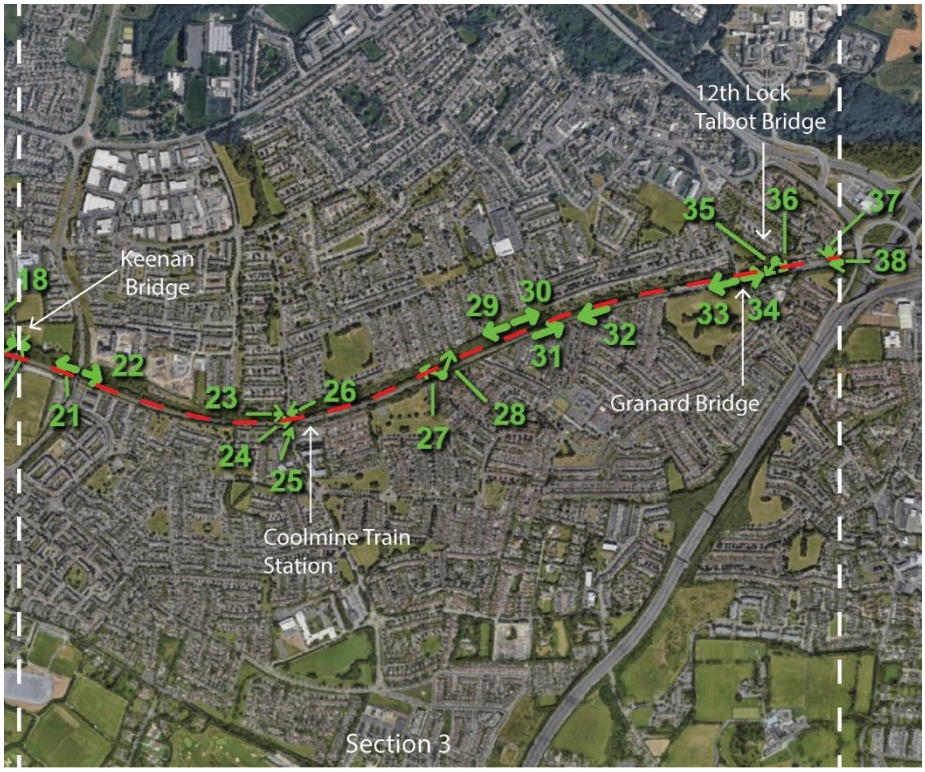


Figure 10-25 Contextual Location of View locations 21-38, within Section 3 of the Proposed Development

View 21- Existing



This elevated view is taken from Dr. Troy Bridge looking north-west over an area of woodland to the north of the Royal Canal (between Diswellstown Road and Porterstown Road). The view of the canopy of the woodland dominates the view. Given the elevation of Dr. Troy Bridge, the view provides a panorama of the tree coverage over the wider landscape of east Dublin and west Kildare. Saint Mochtas Football Club and Pitches are visible to the left background.

The Royal Canal falls into the River Valleys & Canal Character Type of the Landscape Character Assessment (Fingal Development Plan 2023-2029 (Consolidated Version, March 2026)) which is considered a highly sensitive landscape likely to be susceptible and vulnerable to change. The landscape character depicted within this view is of woodlands and sports grounds. Although located

within a semi-urban/suburban area, the setting of trees and hedgerows provide visual context adding to the overall quality of the local visual amenity. The overall sensitivity is considered medium to high.

View No.	Landscape Character Area	Landscape Character Sensitivity	Visual Sensitivity	Overall Sensitivity	Landscape Value	Landscape Capacity
21	River Valleys & Canal Character Type	High	Medium	Medium to High	Medium to High	Medium

View 21 – Proposed



The Proposed Development will be partially visible from this elevated location. Some tree removal will be necessary for the construction of the elevated Greenway, in the form of a tarmac surfaced boardwalk with guardrails in order to reduce any potential effects on the native flora and fauna within the woodland area.

The magnitude of change is considered low in this instance. The Proposed Development will have a neutral, 'Slight' to 'Moderate' effect on the River Valleys & Canal character of this section of the Royal Canal. The duration of effect is considered long term. (See Áit U + L drawing 18FG01-DR-0219 for Landscape Proposals and DBFL DR 170239-X-04-X-XXX-DR-DBFL-CE-1117 Preferred Route - Sheet 17 of 25).

View No.	Magnitude of Change	Quality of Effect	Significance of Effect	Duration of Effect
21	Low	Neutral	Slight to Moderate	Long Term

View 21 – Cumulative (DART+West Infrastructure)



The proposed future railway infrastructure associated with the DART+ West scheme (Railway Order ABP-314232-22) will be partially visible to the left of view from this viewpoint location, along the lines of the existing rail line corridor.

The magnitude of the cumulative visual effects of the Proposed Development and the proposed new railway infrastructure is considered negligible to low, with a neutral quality of effect, with an 'Imperceptible to Not Significant' visual effect on the Landscape Character of this viewpoint on the Royal Canal in the long term.

View 22- Existing



This view is taken looking south-east from Dr. Troy Bridge over the landscape adjacent to the Royal Canal and Proposed Development. The Windmill Apartment development is visible to the left of view, consisting of several building blocks that vary in height from 6-8 storeys surrounded by grassed amenity space. The tree canopies of substantial woodland located on the northern bank of the Royal Canal are visible in the foreground and right of view. Located in Hansfield, the setting of trees and hedgerows add to the visual quality of the view which is considered medium in this urban setting.

View No.	Landscape Character Area	Landscape Character Sensitivity	Visual Sensitivity	Overall Sensitivity	Landscape Value	Landscape Capacity
22	River Valleys & Canal Character Type	High	Medium	Medium	Medium	Medium

View 22 - Proposed



A section of the Proposed Development will be visible from this location on Dr. Troy Bridge. An area of woodland, scrub and fencing will be removed and replaced with a bound tarmac cycleway which will join the existing path/cycleway infrastructure to the south of the open space adjacent to the Windmill apartment development, and north of the woodland area.

The magnitude of change is considered medium. The Proposed Development will have a neutral, 'Slight to Moderate' effect on the River Valleys & Canal Character Type of this section of the Royal Canal. The duration of effect is considered long term (See Áit U + L drawings 18FG01-DR-0219 and -0220 for Landscape Proposals and DBFL DR 170239-X-04-X-XXX-DR-DBFL-CE-1117 Preferred Route - Sheet 17 of 25).

View No.	Magnitude of Change	Quality of Effect	Significance of Effect	Duration of Effect
22	Medium	Neutral	Slight to Moderate	Long Term

View 23 - Existing



This view is taken looking east along Sheepmoor Lane towards Coolmine Road, adjacent to the northern bank of the Royal Canal. The lane is currently used for vehicular and pedestrian access by several property owners along Sheepmoor Lane and is not considered heavily trafficked.

The lane itself is currently comprised of a bound tarmac surface, with grassed margins, embankments and hedgerow planting. Road signage is visible as one approaches Coolmine Road. The suburban urban built environment is partially visible from this viewpoint in the form of boundary walls and residential buildings in the middle distance. There is much visual clutter in the form of ESB poles and overhead wire infrastructure and road signage.

Despite the River Valleys and Canal Character Type area with a high visual amenity associated (Fingal Development Plan 2023-2029 (Consolidated Version, March 2026)) the overall visual sensitivity is considered medium due to the semi-urban nature of the setting.

View No.	**Landscape Character Area**	**Landscape Character Sensitivity**	**Visual Sensitivity**	**Overall Sensitivity**	**Landscape Value**	**Landscape Capacity**
23	River Valleys & Canal Character Type	High	Medium	Medium	Medium	Medium

View 23 - Proposed



The Proposed Development will be visible from this location in the form of public realm improvements such as an improved shared Greenway, improved junction at Coolmine Road, a signalised pedestrian / cyclist crossing with tactile paving, and improved railing infrastructure at the Royal Canal intersection. A hardwood timber bench on the Coolmine Road intersection will provide a resting point along the route.

The magnitude of change is considered low to medium in this instance. The Proposed Development will have a neutral, 'Slight to Moderate' visual effect on the River Valleys & Canal character of this section of the Royal Canal. The duration of effect will be long term (See Áit U + L drawing 18FG01-DR-0221 for Landscape Proposals and DBFL DR 170239-X-04-X-XXX-DR-DBFL-CE-1119 Preferred Route - Sheet 19 of 25).

View No.	Magnitude of Change	Quality of Effect	Significance of Effect	Duration of Effect
23	Low to Medium	Neutral	Slight to Moderate	Long Term

View 24 - Existing



This view is taken looking north-east from Kirkpatrick Bridge (footbridge over the canal) towards the northern bank of the Royal Canal. The view depicts a series of embankments, both grassed and with scrub, trees and hedgerows along the northern bank of the Royal Canal. The terrain appears rough and uneven in places. The Royal Canal itself is partially visible through the branches of trees to the right of view. There is no existing towpath on the northern bank of the canal at this location and only a rough gravel path on an embankment leading to the lower level of the canal is discernible. The vegetation appears generally unmanaged and overgrown in places.

The landscape character depicted within this view is mainly of dense vegetation and overgrown embankments along the canal corridor. Located within an edge of town area in transition, the riparian setting with trees and hedgerows provides visual context and adds to the overall quality of the local visual amenity. Hence, the landscape sensitivity is considered medium, with a medium visual amenity, resulting in an overall medium to high sensitivity.

View No.	Landscape Character Area	Landscape Character Sensitivity	Visual Sensitivity	Overall Sensitivity	Landscape Value	Landscape Capacity
24	River Valleys & Canal Character Type	High	Medium	Medium	Medium	Medium

View 24 – Proposed



The Proposed Development will be visible from this viewpoint with the construction of a 4.00m wide boardwalk with galvanised steel protective railings on either side for safety. Some medium-height public light standards will be visible along the new route. The proposal will generally enhance the landscape and visual amenity of the view.

The magnitude of change is considered medium in this instance. The Proposed Development will have a neutral, 'Moderate' effect on the River Valleys & Canal character of this section of the Royal Canal. The duration of effect is considered long term (See Áit U + L drawing 18FG01-DR-0221 and -0222 for Landscape Proposals and DBFL DR 170239-X-04-X-XXX-DR-DBFL-CE-1119-20 Preferred Route - Sheet 19-20 of 25).

View No.	Magnitude of Change	Quality of Effect	Significance of Effect	Duration of Effect
24	Medium	Neutral	Moderate	Long Term

View 25 – Existing



This view is taken looking north-east from Kirkpatrick Bridge (footbridge over the canal) towards the northern bank of the Royal Canal. The view depicts a series of embankments, both grassed and with scrub, trees and hedgerows along the northern bank of the Royal Canal. The terrain appears rough and

uneven in places. The Royal Canal itself is partially visible through the branches of trees to the right of view. There is no existing towpath on the northern bank of the canal at this location and only a rough gravel path on an embankment leading to the lower level of the canal is discernible. The vegetation appears generally unmanaged and overgrown in places.

The Royal Canal falls into the River Valleys & Canal Character Type of the Landscape Character Assessment (Fingal Development Plan 2023-2029 (Consolidated Version, March 2026)) which is considered a highly sensitive landscape likely to be susceptible and vulnerable to change. The landscape character depicted within this view is mainly of dense vegetation and overgrown embankments along the canal corridor. Located within an edge of town area in transition, the riparian setting with trees and hedgerows provides visual context and adds to the overall quality of the local visual amenity. Hence, the landscape sensitivity is considered medium to high, with a medium visual amenity, resulting in an overall medium to high sensitivity.

View No.	Landscape Character Area	Landscape Character Sensitivity	Visual Sensitivity	Overall Sensitivity	Landscape Value	Landscape Capacity
25	River Valleys & Canal Character Type	Medium to High	Medium to High	Medium to High	Medium to High	Medium

View 25 – Proposed



The Proposed Development will be visible from this viewpoint with the construction of a 4.00m wide boardwalk with galvanised steel protective railings on either side for safety. Some medium-height public light standards will be visible along the new route. The proposal will generally enhance the landscape and visual amenity of the view.

The magnitude of change is considered medium in this instance. The Proposed Development will have a neutral, 'Moderate' effect on the River Valleys & Canal character of this section of the Royal Canal. The duration of effect is considered long term (See Áit U + L drawing 18FG01-DR-0221 and -0222 for Landscape Proposals and DBFL DR 170239-X-04-X-XXX-DR-DBFL-CE-1119-20 Preferred Route - Sheet 19-20 of 25).

View No.	Magnitude of Change	Quality of Effect	Significance of Effect	Duration of Effect
25	Medium	Neutral	Moderate	Long Term

View 26 – Existing



This view is taken from Coolmine Road looking south-west into Sheepmoor Lane. The view depicts a peri-urban landscape. The tarmac road and concrete footpath dominate the foreground view. To the right of view is a two-storey red brick residential dwelling that bounds Sheepmoor Lane. Several private residential dwellings are located on the north of Sheepmoor Lane, one of which is visible in the background. There is a more rural landscape to the left of view with a grassed embankment with scrub, hedgerows and trees. The view is characterised by substantial visual clutter locally with ESB poles, overhead wire infrastructure and various signage, adding to an overall suburban setting. Sheepmoor Lane is a tarmacked narrow single carriageway without footpaths and of rural character.

Despite this view falling into the River Valleys and Canal Character Type of the Landscape Character Assessment (Fingal Development Plan 2023-2029 (Consolidated Version, March 2026 its overall landscape and visual sensitivity is considered low to medium due to the semi-urban nature of the setting, poor public realm and road infrastructure, and visual clutter locally. The sensitivity of local residents is considered high. The magnitude of change during the construction stage is predicted to be very high during the construction stage with very significant, negative, short- term effects.

View No.	Landscape Character Area	Landscape Character Sensitivity	Visual Sensitivity	Overall Sensitivity	Landscape Value	Landscape Capacity
26	River Valleys & Canal Character Type	Low to Medium	Low to Medium	Low to Medium	Low to Medium	Medium to High

View 26 – Proposed



The Proposed Development will be visible from this viewpoint. The Greenway will be directed onto the proposed shared pedestrian/ cycleway facilities as part of the Windmill Apartment development and will merge on Sheepmoor Lane. Cyclists will share Sheepmoor Lane with car users; currently there is a low usage by cars along this route. The surface of the Greenway in this location will be bound coloured tarmac with brick edge treatment on either side to act as a *'rumble strip'* for traffic calming. A new pedestrian/ cyclist junction will be constructed as part of the proposals with a signalised junction. Red tactile paving will be used at the junction crossing.

The magnitude of change is considered low. The Proposed Development will have a neutral, 'Not Significant' to 'Slight' effect on the River Valleys & Canal Type character of this section of the Royal Canal. the duration of effect is considered long term (See Áit U + L drawing 18FG01-DR-0221 for Landscape Proposals and DBFL DR 170239-X-04-X-XXX-DR-DBFL-CE-1119-20 Preferred Route - Sheet 19-20 of 25). The magnitude of change on local residents is predicted to be medium during the operation stage of the project when all construction works are complete with moderate, neutral to positive effects in the long term.

View No.	Magnitude of Change	Quality of Effect	Significance of Effect	Duration of Effect
26	Low	Neutral	Not Significant to Slight	Long Term

View 27 – Existing



View looking north-west from the southern bank of the Royal Canal (north of Maple Residential Estate, Castleknock). The view depicts a section of the Royal Canal with the waterbody of the canal and substantial and dense mature trees, hedgerow and scrub on the northern bank of the Royal Canal dominating the view. The narrow and rough unpaved towpath on the southern bank is visible with a steep bank and gorse visible along the canal edge.

The landscape character is rural with a high visual amenity associated with the River Valleys & Canal Character Type of the Landscape Character Assessment (Fingal Development Plan 2023-2029 (Consolidated Version, March 2026)) which is considered a highly sensitive landscape, likely to be susceptible and vulnerable to change. Therefore, both, the landscape and visual amenity are considered high in this location.

View No.	Landscape Character Area	Landscape Character Sensitivity	Visual Sensitivity	Overall Sensitivity	Landscape Value	Landscape Capacity
27	River Valleys & Canal Character Type	High	High	High	High	Low

View 27 – Proposed



The Proposed Development will not be visible from this viewpoint. The proposed Greenway, indicated by the red line which outlines the Proposed Development in the background of view, will be screened from view by the existing woodlands.

The magnitude of change is considered negligible in this instance. The Proposed Development will have a neutral, 'Imperceptible' effect on the River Valleys & Canal character of this section of the Royal Canal. The duration of effect will be long term. (See Áit U + L drawing 18FG01-DR-0223 for Landscape Proposals and DBFL DR 170239-X-04-X-XXX-DR-DBFL-CE-1121 Preferred Route - Sheet 21 of 25).

View No.	Magnitude of Effect	Quality of Effect	Significance of Effect	Duration of Effect
27	Negligible	Neutral	Imperceptible	Long Term

View 28 – Existing



This view is taken looking northeast from the towpath along the southern bank of the Royal Canal (north of Maple Drive, Castleknock).

The view depicts a section of the Royal Canal with the waterbody of the canal and substantial and dense hedgerow and scrub on the northern bank of the Royal Canal with single mature trees behind it dominating the view. Gorse between the canal and the towpath is visible in the foreground view.

The landscape character is rural with a high visual amenity associated with the River Valleys & Canal Character Type of the Landscape Character Assessment (Fingal Development Plan 2023-2029 (Consolidated Version, March 2026)) which is considered to be a highly sensitive landscape, likely to be susceptible and vulnerable to change. Hence, both, the landscape and visual amenity are considered high in this location.

View No.	Landscape Character Area	Landscape Character Sensitivity	Visual Sensitivity	Overall Sensitivity	Landscape Value	Landscape Capacity
28	River Valleys & Canal Character Type	High	High	High	High	Low

View 28 – Proposed



The Proposed Development will be partially visible from this viewpoint location. Some of the upper elements of the lighting standard/s will be visible over the tree canopies, the remainder of the proposed Greenway will be screened from view by the existing woodland, as indicated by the red line which outlines the Proposed Development in the background of view.

The magnitude of change is considered low in this instance. The Proposed Development will have a neutral, 'Not Significant to Slight' visual effect on the River Valleys & Canal character of this section of the Royal Canal. The duration of effect will be long term. (See Áit U + L drawing 18FG01-DR-0223 for Landscape Proposals and DBFL DR 170239-X-04-X-XXX-DR-DBFL-CE-1121 Preferred Route - Sheet 21 of 25).

View No.	Magnitude of Change	Quality of Effect	Significance of Effect	Duration of Effect
28	Low	Neutral	Not Significant to Slight	Long Term

View 29 – Existing



This view is taken looking southwest through open space to the south of the Brompton housing estate, between Brompton Lawn and Brompton Green. This residential area is located to the north of the Royal Canal. The suburban residential area is located outside of view to the right with some of the semi-detached houses visible in the background. The large area of grassed open space dominates the view and is bounded to the left by a dense linear woodland that forms the northern edge of the canal corridor and vegetation.

The landscape character is rural with a high visual amenity associated with the River Valleys & Canal Character Type of the Landscape Character Assessment (Fingal Development Plan 2023-2029 (Consolidated Version, March 2026)) which is considered a highly sensitive landscape, likely to be susceptible and vulnerable to change.

This view is characteristic of a suburban residential setting and has a landscape and visual sensitivity that is considered medium. The sensitivity of local residents is considered high. The magnitude of change during the construction stage is predicted to be very high during the construction stage with very significant, negative, short- term effects.

View No.	**Landscape Character Area**	**Landscape Character Sensitivity**	**Visual Sensitivity**	**Overall Sensitivity**	**Landscape Value**	**Landscape Capacity**
29	River Valleys & Canal Character Type	High	Medium	Medium	Medium	Medium

View 29 – Proposed



The Proposed Development will be visible from this viewpoint. The preferred route with the least effect on existing trees and habitats will run north and parallel to the canal woodland to the left of view. The 4.00m wide Greenway will be lined on either side with a galvanised steel railing. Light standards will be visible along the length of the route. Low landscape planting will soften the edge of the Proposed Development, allowing passive surveillance for users of the proposed Greenway while screening visibility of the path and preventing access along the Brompton open space in view.

The magnitude of change is considered medium in this instance. The Proposed Development will have a neutral, 'Moderate' visual effect on the River Valleys & Canal character of this section of the Royal Canal and on the residential open space. The duration of effect will be long term (See Áit U + L drawing 18FG01-DR-0224 for Landscape Proposals and DBFL DR 170239-X-04-X-XXX-DR-DBFL-CE-1122 Preferred Route - Sheet 22 of 25). The magnitude of change on high sensitivity of local residents is predicted to be medium during the operation stage of the project when all construction works are complete with moderate, neutral to positive effects in the long term.

View No.	Magnitude of Change	Quality of Effect	Significance of Effect	Duration of Effect
29	Medium	Neutral	Moderate	Long Term

View 30 – Existing



This view is taken looking north-east through an area of open space to the south of the Brompton housing estate, between Brompton Lawn and Brompton Green. This residential area is located to the north of the Royal Canal, with rows of semi-detached two storey houses visible in the left background view. The large area of grassed open space dominates the view and is bounded to the right of view by a dense linear woodland that forms the northern edge to the Royal Canal. A small line of medium size trees is visible to the edge of the grassed open space adjacent to the road, left of view along with road lighting. This view is characterised by a suburban residential setting and has a landscape and visual sensitivity that is considered medium in this instance. The sensitivity of local residents is considered high. The magnitude of change during the construction stage is predicted to be very high during the construction stage with very significant, negative, short- term effects.

View No.	Landscape Character Area	Landscape Character Sensitivity	Visual Sensitivity	Overall Sensitivity	Landscape Value	Landscape Capacity
30	River Valleys & Canal Character Type	High	Medium	Medium	Medium	Medium

View 30 – Proposed



The Proposed Development will be visible from this viewpoint. The preferred route with the least effect on existing trees and habitats will run parallel to the woodland to the right of view. The 4.00m wide Greenway will be lined on either side with a galvanised steel railing. Light standards will be visible along the length of the route. Low soft landscape planting to the north of the railing will soften the edge of the Proposed Development, allowing passive surveillance for users of the proposed Greenway. A new shared access path will be visible from the Brompton Green estate connecting with the proposed Greenway in the middle distance.

The magnitude of change is considered medium in this instance. The Proposed Development will have a neutral, 'Moderate' visual effect on the River Valleys & Canal character of this section of the Royal Canal. The duration of effect will be long term . (See Áit U + L drawing 18FG01-DR-0224 for Landscape Proposals and DBFL DR 170239-X-04-X-XXX-DR-DBFL-CE-1122 Preferred Route - Sheet 22 of 25). The magnitude of change on local residents is predicted to be medium during the operation stage of the project when all construction works are complete with moderate, neutral to positive effects in the long term.

View No.	Magnitude of Change	Quality of Effect	Significance of Effect	Duration of Effect
30	Medium	Neutral	Moderate	Long Term

View 31 – Existing



This view is taken looking north-east along the southern bank of the Royal Canal (north of Castleknock Walk). The wider view depicts a section of the Royal Canal with the waterbody of the canal dominating the view. There are substantial mature trees and hedgerows visible along the northern edge of the Royal Canal with a shallow bank along the canal itself.

A rough narrow dirt towpath is visible on the southern bank of the canal with a soft grass margin and marginal aquatics to the canal bank edge. A narrow embankment with dense scrub and hedgerow is visible to the right of view.

The rural aesthetic captured within this view is reflective of the River Valleys & Canal Character Type of the Landscape Character Assessment (Fingal Development Plan 2023-2029 (Consolidated Version, March 2026)) and is considered a highly sensitive landscape likely to be susceptible and vulnerable to change. Although located within a peri-urban/urban area, the density and maturity of hedgerow and tree

coverage provide substantial visual enclosure adding to the overall quality of the local visual amenity, resulting in a high overall sensitivity. The landscape sensitivity is considered high in this instance.

View No.	Landscape Character Area	Landscape Character Sensitivity	Visual Sensitivity	Overall Sensitivity	Landscape Value	Landscape Capacity
31	River Valleys & Canal Character Type	High	High	High	High	Low

View 31 – Proposed



The Proposed Development will be visible from this viewpoint. Due to restrictions of the existing and contiguous landscape conditions, the proposed Greenway route will cross from the northern side to the southern side of the Royal Canal within approximate chainages 7120-7200. An area of 47.6 sq.m of trees and vegetation will be removed along the bridge crossing alignment on the northern canal bank; with an additional 308.70sq.m of tree and vegetation clearance on the south bank to facilitate the bridge construction.

The bridge design is of modest design, proportions and materiality, all of which have been considered to reduce its overall apparent massing. However, the bridge will require multiple concrete columns to support the span of the bridge across the Royal Canal. Views along the Royal Canal corridor will be interrupted by the bridge infrastructure and the rural aesthetic of this view will be removed and replaced with a suburban character due to its presence from this viewpoint location.

The magnitude of change is considered medium to high. This element of the Proposed Development will have a neutral, 'Moderate to Significant' localised visual effect on the River Valleys & Canal character of this section of the Royal Canal. The duration of effect will be long term. (See Áit U + L drawing 18FG01-DR-0224 for Landscape Proposals and DBFL DR 170239-X-04-X-XXX-DR-DBFL-CE-1122 Preferred Route - Sheet 22 of 25).

View No.	Magnitude of Change	Quality of Effect	Significance of Effect	Duration of Effect
31	Medium to High	Neutral	Moderate to Significant	Long Term

View 31- Cumulative (DART+ West Rail Infrastructure)



The proposed future railway infrastructure associated with the DART+ West scheme (Railway Order ABP-314232-22) will be visible to the right of view from this viewpoint location, over the top of the adjacent stone boundary wall.

The cumulative magnitude of change in this view is considered medium as the rural aesthetic of this view will be reduced and replaced with a peri-urban to suburban character due to the presence of the bridge and adjacent DART + West railway infrastructure.

The magnitude of the cumulative visual effects of the Proposed Development and the proposed new railway infrastructure is considered medium, with a neutral quality of effect, with a 'Moderate' visual effect on the Landscape Character of this viewpoint on the Royal Canal in the long term.

View 32 – Existing



This view is taken looking west along the southern bank of the Royal Canal (north of Castleknock Meadows). The landscape character can be described as rural to peri-urban. The contiguous lands are predominantly residential with private properties backing onto the Royal Canal. The roof tops of two storey houses in Castleknock Meadows are visible to the left of view. To the right of view, north of the

Royal Canal, the rears of two storey houses on Roselawn Road are partially visible through trees and shrubs along the canal bank.

The River Valleys & Canal Character Type of the Landscape Character Assessment (Fingal Development Plan 2023-2029 (Consolidated Version, March 2026)) and is considered a highly sensitive landscape likely to be susceptible and vulnerable to change. However, the views of private properties to the right and left of view reduce the overall sensitivity to medium. This section of the Royal Canal is located within a peri-urban/urban area. There are gaps in hedgerow and tree coverage opening up views into the proximity of adjacent private dwellings reducing the overall quality visual amenity and sensitivity in this view. The sensitivity of local residents is considered high. The magnitude of change during the construction stage is predicted to be very high during the construction stage with very significant, negative, short- term effects.

View No.	Landscape Character Area	Landscape Character Sensitivity	Visual Sensitivity	Overall Sensitivity	Landscape Value	Landscape Capacity
32	River Valleys & Canal Character Type	High	Medium	Medium	Medium	Medium

View 32 – Proposed



The Proposed Development will be visible from this viewpoint. The 4.00m wide bound tarmac Greenway with concrete edging will continue over the proposed *'Landmark Bridge'* in the middle distance. Public lighting and railings will form part of the street furniture palette. The presence of the Greenway infrastructure will permanently alter the landscape character from peri-urban to suburban.

The magnitude of change is considered medium to high in this instance. The Proposed Development will have a neutral, 'Moderate to Significant' localised visual effect on the River Valleys & Canal character of this section of the Royal Canal. The duration of effect will be long term (See Áit U + L drawing 18FG01-DR-0225 for Landscape Proposals and DBFL DR 170239-X-04-X-XXX-DR-DBFL-CE-1123 Preferred Route - Sheet 23 of 25). The magnitude of change on local residents is predicted to be medium during the operation stage of the project when all construction works are complete with moderate, neutral to positive effects in the long term.

View No.	Magnitude of Change	Quality of Effects	Significance of Effects	Duration of Effect
32	Medium to High	Neutral	Moderate to Significant	Long Term

View 32- Cumulative (DART+ West Rail Infrastructure)



The proposed future railway infrastructure associated with the DART+ West scheme (Railway Order ABP-314232-22) will be visible to the left of view from this viewpoint location, over the top of the adjacent stone boundary wall.

The cumulative magnitude of change in this view is considered medium as the rural aesthetic of this view will be reduced and replaced with a peri-urban to suburban character due to the presence of the bridge and adjacent DART + West railway infrastructure.

The magnitude of the cumulative visual effects of the Proposed Development and the proposed new railway infrastructure is considered medium, with a neutral quality of effect, with a 'Moderate' visual effect on the Landscape Character of this viewpoint on the Royal Canal in the long term.

View 33 – Existing



This view is taken looking west along the Royal Canal from Granard Bridge, north of Laurel Lodge public park and immediately north of the Castleknock train station. A cobble-locked paved path leads from the bridge down towards the single storey train station building and access to the railway platforms. While the foreground is dominated by the narrow path and a mix of grassed verges, hedges and trees, the middle ground shows a widened public area outside the train station and railway related infrastructure, including the pedestrian overpass across the tracks. The canal, lined by mature trees either side is visible to the right. In the background, an informal road and car parking is discernible along the continuing towpath and pitched roofs to the left of the train tracks. The canal view into the distance is screened by vegetation. The linear pathway, between the linear canal to the right and the linear railway tracks to the left are the defining elements in this view.

The landscape character is semi-urban / suburban with a medium visual amenity associated with the River Valleys & Canal Character Type of the Landscape Character Assessment (Fingal Development Plan 2023-2029 (Consolidated Version, March 2026)) which is considered a highly sensitive landscape, likely to be susceptible and vulnerable to change. However, this view is characterised by a mix of utilitarian transport infrastructure with a medium overall sensitivity in this instance.

View No.	Landscape Character Area	Landscape Character Sensitivity	Visual Sensitivity	Overall Sensitivity	Landscape Value	Landscape Capacity
33	River Valleys & Canal Character Type	Medium	Medium	Medium	Medium	Medium

View 33 – Proposed



The Proposed Development will be visible in the foreground, forming a new Greenway, leading from the left to a ramped route down towards the canal. The Greenway will be a 4.00m wide tarmac bound path with concrete edging and guardrails. A Greenway underpass will be visible in the middle ground, partially screened by the higher path in foreground view. There will be tree and vegetation removal required to facilitate these works.

The magnitude of change in this view is considered Medium to High. The Proposed Development will have a neutral, ‘Significant’ effect on the River Valleys & Canal character of this section of the Royal Canal. The duration of effect will be long term (See Áit U + L drawing 18FG01-DR-0226 for Landscape Proposals and DBFL DR 170239-X-04-X-XXX-DR-DBFL-CE-1124 Preferred Route - Sheet 24 of 25).

View No.	Magnitude of Change	Quality of Effect	Significance of Effect	Duration of Effect
33	Medium to High	Neutral	Moderate to Significant	Long Term

View 33 - Cumulative (DART+ West Rail Infrastructure)



The proposed future railway infrastructure associated with the DART+ West scheme (Railway Order ABP-314232-22) will be partially visible to the left of view from this viewpoint location, along the lines of the existing rail line corridor.

The magnitude of the cumulative visual effects of the Proposed Development and the proposed new railway infrastructure is considered negligible to low, with a neutral quality of effect, with an 'Imperceptible to Not Significant' visual effect on the Landscape Character of this viewpoint on the Royal Canal in the long term.

View 34 – Existing



This view is taken looking east along the Royal Canal from Granard Bridge. Castleknock Train Station is located on the southern bank of the canal out of view. The view depicts the Royal Canal in a suburban

context with built environment visible in the middle distance to the right and left of view. The most visually prominent features are the historic bridge infrastructure to the right of view leading from Granard Bridge and Castleknock Road (R806, out of view) to the towpath along the southern bank of the Royal Canal. This canal section is a popular mooring point for barges. There is substantial tree and vegetation cover to the right of view. To the left of view, there are large individual trees set within the soft grassed areas south of the Royal Canal. The Mills apartments redevelopment is visible in the middle distance, left of view. The 12th Lock hotel, bar and restaurant is visible on the south of the Royal Canal in the middle distance. Some of the built environment of housing in Woodpark is visible through breaks in the tree line to the left.

The landscape character is semi-urban / suburban with a moderate visual amenity associated with the River Valleys & Canal Character Type of the Landscape Character Assessment (Fingal Development Plan 2023-2029 (Consolidated Version, March 2026)) which is considered a highly sensitive landscape, likely to be susceptible and vulnerable to change. Given the visibility of the built environment in the background, the overall sensitivity of the view is considered medium in this instance.

View No.	Landscape Character Area	Landscape Character Sensitivity	Visual Sensitivity	Overall Sensitivity	Landscape Value	Landscape Capacity
34	River Valleys & Canal Character Type	High	Medium	Medium	Medium	Medium

View 34 – Proposed



The Proposed Development will be visible to the right of view on the southern bank of the Royal Canal. It will comprise of a 4.00m wide Greenway (bound tarmac with concrete edging) along with associated public lighting infrastructure.

The magnitude of change in this view is considered low. The Proposed Development will have a neutral, 'Slight' effect on the River Valleys & Canal character of this section of the Royal Canal. The duration of effect will be long term (See Áit U + L drawing 18FG-DR-0226 and -0227 for Landscape Proposals and DBFL DR 170239-X-04-X-XXX-DR-DBFL-CE-1124 Preferred Route - Sheet 24 of 25).

View No.	Magnitude of Change	Quality of Effect	Significance of Effect	Duration of Effect
34	Low	Neutral	Slight	Long Term

View 35 – Existing



This view is located on a public pathway (The 12th Lock Road) within an area of open space on the northern bank of the Royal Canal between Granard Bridge and the 12th Lock. This view is looking south-west over the sloped embankment towards Granard Bridge. There is substantial mature tree planting locally and in the wider view. Some of the railing and road infrastructure of Castleknock Road is visible in the middle distance. Barges are moored along the southern bank of the Royal Canal. Historical mooring posts are visible along the canal edge.

The landscape character is semi-urban / suburban with a moderate visual amenity associated with the River Valleys & Canal Character Type of the Landscape Character Assessment (Fingal Development Plan 2023-2029 (Consolidated Version, March 2026)) which is considered a highly sensitive landscape, likely to be susceptible and vulnerable to change. The sensitivity of local residents is considered high.

View No.	Landscape Character Area	Landscape Character Sensitivity	Visual Sensitivity	Overall Sensitivity	Landscape Value	Landscape Capacity
35	River Valleys & Canal Character Type	High	High	High	High	Low

View 35 – Proposed





The proposed Greenway development will not be visible from this location due to the local topography. There may be partial glimpse views of some of the taller elements of associated public lighting infrastructure.

The magnitude of change in this view is considered negligible to low. The Proposed Development will have a neutral, 'Not Significant to Slight' effect on the River Valleys & Canal character of this section of the Royal Canal. The duration of effect will be long term (See Áit U + L drawing 18FG01-DR-0227 for Landscape Proposals and DBFL DR 170239-X-04-X-XXX-DR-DBFL-CE-1124-25 Preferred Route - Sheet 24-25 of 25). The magnitude of change on local residents is predicted to be medium during the operation stage of the project when all construction works are complete with moderate, neutral to positive effects in the long term.

View No.	Magnitude of Change	Quality of Effect	Significance of Effect	Duration of Effect
35	Negligible to low	Neutral	Not Significant to Slight	Long Term

View 36 – Existing



This view is located on a public pathway (The 12th Lock Road) adjacent to an area of open space on the northern bank of the Royal Canal between Granard Bridge and the 12th Lock. The view is looking south-east over a grassed sloped margin leading from the canal towpath up to the canal edge. There are individual mature trees in the grassed area, with more larger trees visible in the middle distance on the southern bank of the Royal Canal. The top of barges moored at the canal edge are visible through the middle distance.

Some rooftops of the adjacent built environment along The Old Navan Road (part of the rear façade of The Mills apartments) are visible in the distance to the left, which marginally reduces the overall sensitivity of the view.

The landscape character is semi-urban / suburban with a moderate visual amenity associated with the River Valleys & Canal Character Type of the Landscape Character Assessment (Fingal Development Plan 2023-2029 (Consolidated Version, March 2026)) which is considered a highly sensitive landscape, likely to be susceptible and vulnerable to change. The sensitivity of local residents is considered high. The magnitude of change during the construction stage is predicted to be very high during the construction stage with very significant, negative, short- term effects.

View No.	Landscape Character Area	Landscape Character Sensitivity	Visual Sensitivity	Overall Sensitivity	Landscape Value	Landscape Capacity
36	River Valleys & Canal Character Type	High	Medium	Medium	Medium	Low

View 36 – Proposed





The proposed Greenway development will not be visible from this location due to the local topography. The red line indicates the location of the Proposed Development in background of view. There may be some glimpse views of the upper levels of associated public lighting infrastructure.

The magnitude of change in this view is considered negligible to low. The Proposed Development will have a neutral, 'Not Significant to Slight' effect on the River Valleys & Canal character of this section of the Royal Canal. The duration of effect will be long term. The magnitude of change local residents is predicted to be medium during the operation stage of the project when all construction works are complete with moderate, neutral to positive effects in the long term. (See Áit U + L drawing 18FG01-DR-0227 for Landscape Proposals and DBFL DR 170239-X-04-X-XXX-DR-DBFL-CE-1125 Preferred Route - Sheet 25 of 25).

View No.	Magnitude of Change	Quality of Effect	Significance of Effect	Duration of Effect
36	Negligible to Low	Neutral	Not significant to Slight	Long Term

View 37 – Existing



This view is taken from the Old Navan Road looking south-east towards Talbot Bridge crossing the Royal Canal. The local road infrastructure along with public lighting, ESB poles and overhead wire infrastructure dominate this view. A concrete blockwork wall forms the eastern boundary the Old Navan Road. More natural stone walls are visible to the west of the carriageway along the entrance to the 12th Lock hotel/pub/restaurant, and to the entrance pathway to 'The Old 12th Lock Road' to the right of view. The local public realm is visually poor and dated. Ad hoc parking is visible on the main road left of view while ornamental hedge plantings soften the edges of the access route to the right of view. Substantial larger tree planting is visible through the middle distance on the southern banks of the Royal Canal.

The landscape character is suburban with a medium visual amenity associated with the River Valleys & Canal Character Type of the Landscape Character Assessment (Fingal Development Plan 2023-2029 (Consolidated Version, March 2026)) considered to be a sensitive landscape, likely to be susceptible to change. However, due to the dominant road infrastructure in this view, both, the landscape and visual amenity are considered medium.

View No.	Landscape Character Area	Landscape Character Sensitivity	Visual Sensitivity	Overall Sensitivity	Landscape Value	Landscape Capacity
37	River Valleys & Canal Character Type	High	Medium	Medium	Medium	Medium

View 37 – Proposed



The Proposed Development will be visible from this viewpoint. It will generally consist of traffic calming measures and public realm improvements locally, including resurfacing and realignment of the existing carriageway.

The magnitude of change in this view is considered low. The Proposed Development will have a neutral, 'Slight' effect on the River Valleys & Canal character of this section of the Royal Canal. The duration of effect will be long term (See Áit U + L drawing 18FG01-DR-0227 for Landscape Proposals and DBFL DR 170239-X-04-X-XXX-DR-DBFL-CE-1125 Preferred Route - Sheet 25 of 25).

View No.	Magnitude of Change	Quality of Effect	Significance of Effect	Duration of Effect
37	Low	Neutral	Slight	Long Term

View 38 – Existing



This view is taken looking west towards the 12th Lock and Royal Canal from the Old Navan Road, at Talbot Bridge. The Old Mill apartments are visible to the right of view adjacent to the lock gates and infrastructure of the Royal Canal. An access path to the canal is visible leading from the Old Navan Road. The car park and car park lighting of the 12th Lock hotel/restaurant/pub is visible to the left of view. Public lighting, signage, ESB poles, overhead wire infrastructure and dated public realm materials

detract substantially from the view. Woodland and tree planting on the north and southern banks of the Royal Canal are visible throughout the middle distance.

The landscape character is suburban with a medium visual amenity associated with the River Valleys & Canal Character Type of the Landscape Character Assessment (Fingal Development Plan 2023-2029 (Consolidated Version, March 2026)) considered to be a sensitive landscape, likely to be susceptible to change. However, due to the dominant road infrastructure in this view, both, the landscape and visual amenity are considered medium, resulting in an overall medium sensitivity.

View No.	Landscape Character Area	Landscape Character Sensitivity	Visual Sensitivity	Overall Sensitivity	Landscape Value	Landscape Capacity
38	River Valleys & Canal Character Type	High	Low to Medium	Medium	Medium	Medium

View 38 – Proposed



The Proposed Development will be visible from this viewpoint. It will generally consist of traffic calming measures and public realm improvements locally, including renewed surfaces and a realigned carriageway.

The magnitude of change in this view is considered low. The Proposed Development will have a neutral, 'Slight' effect on the River Valleys & Canal character of this section of the Royal Canal. The duration of effect will be long term (See Áit U + L drawing 18FG01-DR-0227 for Landscape Proposals and DBFL DR 170239-X-04-X-XXX-DR-DBFL-CE-1125 Preferred Route - Sheet 25 of 25).

View No.	Magnitude of Change	Quality of Effect	Significance of Effect	Duration of Effect
38	Low	Neutral	Slight	Long Term

Table 10.-15 Summary of Potential Visual Effects and Cumulative Effects (DART+West)

View No.	Magnitude of Change	Quality of Effect	Significance of Effect	Duration of Effect	Cumulative Visual Effects of DART+West Rail-line Infrastructure
1	Negligible	Neutral	Not Significant to Slight	Long Term	N/A
2	Medium	Neutral	Slight to Moderate	Long Term	N/A
3	Negligible to Low	Neutral	Not Significant to Slight	Long Term	N/A
4	Negligible to Low	Neutral	Not Significant to Slight	Long Term	N/A
5	Low	Neutral	Not Significant to Slight	Long Term	Low, Neutral, Not Significant to Slight, Long Term
6	Low	Neutral	Not Significant to Slight	Long Term	Slight
7	Negligible to Low	Neutral	Not Significant to Slight	Long Term	N/A
8	Low	Neutral	Not Significant to Slight	Long Term	N/A
9	None	None	None	None	N/A
10	Low to Medium	Positive	Slight to Moderate	Long Term	N/A
11	Low	Neutral	Not Significant to Slight	Long Term	N/A
12	Low	Neutral	Not Significant to Slight	Long Term	N/A
13	Low to Medium	Neutral	Moderate	Long Term	N/A
14	Low to Medium	Neutral	Moderate	Long Term	N/A
15	Medium	Neutral	Moderate	Long Term	N/A
16	Medium	Neutral	Moderate to Significant	Long Term	N/A
17	Medium	Positive	Moderate	Long Term	N/A
18	Medium	Positive	Moderate	Long Term	N/A
19	Medium	Neutral	Moderate	Long Term	N/A
20	Medium to High	Neutral to Positive	Moderate	Long Term	N/A
21	Low	Neutral	Slight to Moderate	Long Term	Negligible to Low, Neutral, Imperceptible to Not Significant, Long Term
22	Medium	Neutral	Slight to Moderate	Long Term	N/A
23	Low to Medium	Neutral	Slight to Moderate	Long Term	N/A
24	Medium	Neutral	Moderate	Long Term	N/A
25	Medium	Neutral	Moderate	Long Term	N/A
26	Low	Neutral	Not Significant to Slight	Long Term	N/A
27	Negligible	Neutral	Imperceptible	Long Term	N/A
28	Low	Neutral	Not Significant to Slight	Long Term	N/A
29	Medium	Neutral	Moderate	Long Term	N/A
30	Medium	Neutral	Moderate	Long Term	N/A
31	Medium to High	Neutral	Moderate to Significant	Long Term	Medium, Neutral, Moderate, Long Term
32	Medium to High	Neutral	Moderate to Significant	Long Term	Medium, Neutral, Moderate, Long Term

33	Medium to High	Neutral	Moderate to Significant	Long Term	Negligible to Low, Neutral, Imperceptible to Not Significant, Long Term
34	Low	Neutral	Slight	Long Term	N/A
35	Negligible to low	Neutral	Not Significant to Slight	Long Term	N/A
36	Negligible to low	Neutral	Not Significant to Slight	Long Term	N/A
37	Low	Neutral	Slight	Long Term	N/A
38	Low	Neutral	Slight	Long Term	

10.4.4 Potential Cumulative Effects of the Operational Stage of Proposed Development with other Plans and Projects

Residential Development

A review of planning applications (within a zone of 500 m of the subject site) since February 2021, indicates that a total of 1,838 residential units have been granted planning permission (Fingal County Council Planning Register, reviewed August 2026).

The majority of this residential development activity is concentrated to the north of the proposed route within the Hansfield Strategic Development Zone and surrounding lands. Several large residential schemes exceeding 150 units have been permitted or commenced, including developments at Hansfield Orchard, St. Joseph's Phase 2 and 3, Porterstown and Winterwood. In addition there are a number of medium-sized developments ranging from approximately 40 to 100 units are distributed throughout the study area.

The number of planning applications indicate the rate of residential growth within the Dublin 15 area where the population continues to rise. With a rise in population comes the need for access to recreational open space and amenities, active sustainable travel infrastructure and connectivity to local services and public transport.

The Proposed Development aims to support these growing communities and neighbourhoods by improving access to the Royal Canal corridor and enhancing walking and cycling connections between residential areas, schools, neighbourhood centres, transport facilities, areas of amenity and places of work. The potential cumulative effects of the Proposed Development is presented in Table 10.15 below, and are generally considered positive effects in the provision of new greenway infrastructure and recreational amenity open space for future residents who will live in proximity to the proposed Greenway.

The Proposed Development also connects with and is cognisant of existing and planned active travel infrastructure associated with nearby residential developments. It interfaces with the permitted canal-side pedestrian and cycle route associated with the Hansfield SDZ lands (FCC Reg. Ref. FW17A/0234/E1) and will provide improved connectivity for a number of major residential schemes located along the corridor, including the permitted 419-unit apartment development at Hansfield (FCC Reg. Ref. FW23A/0013).

The Proposed Development is also cognisant of the two adopted local area plans, Barnhill LAP 13.1, and Kellystown LAP 13.B. There is potential for cumulative positive effects in the provision of new greenway infrastructure and recreational amenity open space to serve these future neighbourhoods.

Table 10-16 Potential Cumulative Effects of the Operational Stage of Proposed Development with other Residential Development Projects

Reference	Address	Description	Status	Decision Date	Potential Cumulative Effects
FW21A/0192	The Daughters of Charity, St Joseph's Centre, Clonsilla	Construction of a single-storey building containing two apartments and a staff office. The development is located at the Daughters of Charity, St Joseph's Centre, Clonsilla.	Completed	09/12/2021	None
FW14A/0042/E2	Site bounded by the New Ongar Road to the North, Castlefield Court Estate, to the South, Mount Symon Estate to the West and Charnwood Estate, to the East	Construction of 124 two-storey, three- and four-bedroom houses on a 4.26 ha site. Includes a detached childcare facility serving this scheme and 166 nearby permitted homes. Provides communal and on-curtilage parking, open space and optional roof-mounted solar panels. Vehicular access is from Clonsilla Link Road, with landscaping, drainage and ancillary works.	Plans Granted	28/02/2022	Potential for cumulative positive effects in the provision of new greenway infrastructure and recreational amenity open space
FW21A/0244 [ACP-313792-22]	The Lodge, Clonsilla Road, Clonsilla, Dublin 15	Demolition of the existing house and outbuilding and construction of a 59-unit apartment block. The scheme includes 23 one-bedroom, 34 two-bedroom and 2 three-bedroom apartments with balconies or terraces. Provides undercroft and surface car parking, cycle parking, open space and access from Clonsilla Road. Landscaping, boundary treatments, bin storage, services and ESB infrastructure are included.	Commenced	ACP Grant 15/12/2023	Potential for cumulative positive effects in the provision of new greenway infrastructure and recreational amenity open space
FW22A/0074	52 Beechpark Avenue, Castleknock, Dublin 15	Demolition of the existing dwelling and outbuildings and construction of five three-storey detached houses. Includes realignment of the existing access and a new one-way road with three parking spaces. The exit onto Beechpark Avenue will accommodate the existing Montessori school set-down. New roads, paths, boundaries, landscaping and associated site works are included.	Plans Granted	05/12/2022	Potential for cumulative positive effects in the provision of new greenway infrastructure and recreational amenity open space

Reference	Address	Description	Status	Decision Date	Potential Cumulative Effects
FW22A/0147	townland of Clonsilla Dublin 15 Apartment Developmen t , and is partially occupied by formerly associated with St. Joseph's Hospital., The site is bounded to the south-west by Park Heights road, to the north-west by Park Crescent road, Clonsilla	A residential development comprised of 174 no. apartments and duplex units, together with a childcare facility, on a site measuring c. 3.6 Ha which is part of Zone 5 “Hospital” of the Hansfield Strategic Development Zone (SDZ) Planning Scheme 2006. The application site is in the townland of Clonsilla, Dublin 15, and is partially occupied by buildings formerly associated with St. Joseph’s Hospital. The site is bounded to the south-west by Park Heights road, to the north-west by Park Crescent road, to the north-east by Hansfield Wood Lawn estate, and to the east and south by St Joseph’s Hospital. The proposed development includes for the demolition of existing buildings on site (c. 2,791 sq.m total) and the construction of 174 no. apartments and duplex units, together with a childcare facility, in 8 no. three to six storey blocks…* **Significant F.I notices*	Commenced	14/12/2022	Potential for cumulative positive effects in the provision of new greenway infrastructure and recreational amenity open space
FW22A/0261	Alencon, Weaver's Row, Clonsilla Road, Dublin 15	Construction of seven two-storey, three- and four-bedroom houses. The scheme comprises a terrace of four houses, one detached house and two semi-detached houses. Also includes retention of boundary walls, front hoarding and gate, a stoned entrance and ancillary site works.	Completed	11/01/2023	Potential for cumulative positive effects in the provision of new greenway infrastructure and recreational amenity open space
FW22A/0152	Weavers Row, Clonsilla Rd, Clonsilla, Dublin 15	Mixed-use development comprising a two-storey foodstore, three retail units and provides 191 car spaces, 326 cycle spaces and revised/new access points from Weavers Row. Also includes demolition, signage, landscaping, boundary treatments and ancillary site works… Construction of 72 no. dwellings	Plans Granted	12/01/2023	Potential for cumulative positive effects in the provision of new greenway infrastructure and recreational amenity open space
FW22A/0317	A site area of 0.924ha within Zone 7 of the Hansfield Strategic Developmen t Zone, bounding Barnwell Park, Station Street and Station Road, Hansfield, Dublin 15	Construction of 41 homes within Zone 7 of Hansfield SDZ. The scheme comprises 34 two- and three-storey houses and 7 apartment/duplex units in a three-storey building. Includes private and public car and bicycle parking, landscaped open space and internal roads. Lighting, utilities, drainage, surface-water attenuation and associated infrastructure are included.	Commenced	16/06/2023	Potential for cumulative positive effects in the provision of new greenway infrastructure and recreational amenity open space

Reference	Address	Description	Status	Decision Date	Potential Cumulative Effects
FW17A/0234/E1	Zone 6 Hansfiled, SDZ Lands, Dublin 15	Construction of 155 homes comprising houses, apartments and duplex units within Hansfield SDZ. Includes a four-storey apartment block, two three-storey duplex blocks and a childcare facility. Provides 292 parking spaces, new vehicular access to Hansfield Road and pedestrian/cycle connections. Also includes demolition, public open space, landscaping, lighting and associated works.	Plans Granted	01/11/2023	Potential for cumulative positive effects in the provision of new greenway infrastructure and recreational amenity open space
FW23A/0197	River Road, Dublin 15	Demolition of the existing buildings and construction of three detached dwellings. Includes new vehicular and pedestrian entrances, a roadside boundary wall and new boundaries between houses. Landscaping and ancillary works are also proposed.	Plans Granted	27/11/2023	Potential for cumulative positive effects in the provision of new greenway infrastructure and recreational amenity open space
FW23A/0013	Zone 6 within the Hansfield SDZ Planning Scheme 2006, Formerly part of St. Joseph's Hospital, Clonsilla, Dublin 15	Construction of 419 apartments in four blocks of four to six storeys within Hansfield SDZ. Includes residential amenity space, balconies/terraces and a two-storey childcare facility. Provides 213 car spaces, 1,445 bicycle spaces, five vehicular accesses and public open space. The scheme also amends elements of St Joseph's Phase 1, including buildings and road layout.	Commenced	20/02/2024	Potential for cumulative positive effects in the provision of new greenway infrastructure and recreational amenity open space
ACP-320560	Barberstown, Barnhill and Passifyoucan, Clonsilla, Dublin 15	Ten-year permission for demolition of existing buildings and construction of 1,243 homes. The scheme comprises 804 apartments and 439 houses. A creche and associated site development works are also included.	[Lodged 15/08/26, ACP Decision Due 4/12/24]	NA	Potential for cumulative positive effects in the provision of new greenway infrastructure and recreational amenity open space
LRD0021/S3E [ACP-320886-24]	Lands to the Front & Rear of Clonsilla Inn, Porterstown, Dublin 15	Demolition of existing structures and construction of 170 apartments/duplexes in seven blocks of one to five storeys. Includes a cafe, childcare facility, public park, two plazas, play areas and a nature walk. Provides undercroft and surface car and bicycle parking, internal roads and pathways. Landscaping, lighting, drainage, utilities and Porterstown Road upgrades are included.	ACP Plans Granted	ACP Grant 21/01/2025	Potential for cumulative positive effects in the provision of new greenway infrastructure and recreational amenity open space
FW24A/0287	Site to the rear of 16 Church Avenue, Blanchardstown, Dublin 15	Construction of two semi-detached, two-storey houses to the rear of 16 Church Avenue. Includes associated site works, sustainable drainage and off-street parking.	Plans Granted	03/03/2025	None

Reference	Address	Description	Status	Decision Date	Potential Cumulative Effects
LRD0056/S3E [ACP-322813-25]	Winterwood, Carpenterstown Road, Dublin 15	Demolition of Winterwood house and outbuildings and construction of 175 homes on a 1.87 ha site. The scheme comprises 30 houses and 145 apartments in three six-storey blocks, plus a creche. Provides open space, 111 car spaces, 387 bicycle spaces and a new Carpenterstown Road access. Landscaping, drainage, internal roads, green/blue roofs and photovoltaic panels are included.	ACP Plans Granted	ACP Grant 19/09/2025	Potential for cumulative positive effects in the provision of new greenway infrastructure and recreational amenity open space
FW25A/0219E	Old Cottage Site, Clonsilla Road, Kellystown, Clonsilla, Dublin 15	Construction of four two-storey, three-bedroom terraced houses. Includes new boundary treatments, landscaping and all associated site works.	Commenced	21/10/2025	Potential for cumulative positive effects in the provision of new greenway infrastructure and recreational amenity open space
PARTXI/009/25	Fortlawn, Blanchardstown, Dublin 15	Demolition of four existing houses and construction of 21 homes across two sites. Site A provides 7 terraced houses and 12 apartments; Site B provides 2 semi-detached houses. Works include new roads and footpaths, parking, landscaping and incidental play areas. Associated drainage, utilities, lighting and site development works are also proposed.	Plans Submitted	NA	Potential for cumulative positive effects in the provision of new greenway infrastructure and recreational amenity open space
FW25A/0418E [ACP-PL-500488-DF-25]	Lands in the Townlands of Kellystown and Porterstown, Dublin 15	Construction of 56 dwellings with all associated site works	Commenced	ACP appeal decided 12/06/2026	Potential for cumulative positive effects in the provision of new greenway infrastructure and recreational amenity open space
FW25A/0416E [ACP-PL-500971-DF-26]	Porterstown Road, Dublin	Demolition of structures, construction of 87 dwellings and a creche with all associated site works	ACP Decision awaited	ACP Decision awaited	Potential for cumulative positive effects in the provision of new greenway infrastructure and recreational amenity open space
FW25A/0419E [ACP-PL-500486-DF-25]	Luttrellstown Gate, Lands in the Townlands of Kellystown and Porterstown, Dublin 15	Construction of 47 dwellings with all associated site works	Plans Granted	ACP appeal decided 12/06/2026	Potential for cumulative positive effects in the provision of new greenway infrastructure and recreational amenity open space
LRD0052/S3E [ACP-324182-26	Townland of Porterstown, Clonsilla	Large Residential Development (LRD) Construction of 302 dwellings with all associated site works. EIAR submitted with application	ACP Plans Granted	ACP appeal decided 22/06/2026	Potential for cumulative positive effects in the provision of new greenway infrastructure and recreational amenity open space

10.5 Residual Impacts

There are no landscape or visual mitigation measures outside those that have been designed-in to the scheme as a whole. The residual landscape effects would be the same as those identified Table 10.15 Summary of Potential Visual Effects and Cumulative Effects (DART+West). There will be no significant negative residual impacts on the Landscape and Visual Resource. There will be no significant negative impacts on trees along the route. There will be a moderate positive residual impact on the Landscape and Visual resource when the project is complete and there is a new greenway infrastructure providing access to recreational amenity and open space, with new landscape plantings, and a high-quality public realm. Landscape interventions such as the Pocket Park in Hansfield will be beneficial to the local community.

10.6 Difficulties Encountered

There were difficulties encountered obtaining information on the DART+West project.

10.7 Interactions

This chapter on Landscape and Visual Impact Assessment of the proposed development, has the potential to interact with the following chapters of the EIAR:

Chapter 8: Biodiversity

Chapter 9: Archaeology and Cultural Heritage

Chapter 17: Material Assets: Land Use and Property

There is also potential for interaction with chapters on Population and Human Health, and Climate Change, and Material Assets.

Chapter 8: Biodiversity

Habitats of note have been recorded along the entirety of the project route which is a pNHA with protected species. The retention of the majority of trees and hedgerows within the site is part of the overall green infrastructure strategy of the overall landscape plan and is essential for the retention of the high sensitivity and high landscape value of the landscape associated with the Royal Canal and the aspirations of the proposed development, providing instant visual and landscape amenity value. The proposed landscape and green infrastructure strategies that are proposed for the site along with designed in mitigation measures for the flora and fauna. Landscape and Visual and Biodiversity have the potential to have an interaction that can be described as a significant positive effect in the long term.

Chapter 9: Archaeology and Cultural Heritage

The cultural heritage of the site as a whole, with a substantial number of protected structures along the route, as well as the Royal Canal as an entity, has been considered and reviewed as part of this assessment. The potential effects of the interaction between the archaeological cultural heritage of the Royal Canal site and the landscape and visual effects of the proposed development are considered to be imperceptible and neutral. It is likely that there will be no significant adverse effects on interactions in this instance.

10.8 Monitoring

A suitably qualified arboricultural consultant / Arboricultural Clerk of Works (ACoW) will be employed prior to commencement of demolition and constructions works to monitor and supervise any tree removal and ensure tree protection measures are in place and maintained. Archaeological monitoring will be undertaken during the construction stage of the project.

A suitably qualified Ecological Clerk of Works (ECoW) will be employed prior to commencement of demolition and construction works to provide ecological consultancy to the construction team. Both the ACow and ECow will liaise with each other as there will be interactions between both professions.

10.9 References

Environmental Protection Agency, 2022, Guidelines on the Information to be Contained in Environmental Impact Assessment Reports.

European Commission (2017) Environmental Impact Assessment of Projects – Guidance on the preparation of the Environmental Impact Assessment Report (Directive 2011/92/EU as amended by 2014/52/EU).

Department of Arts, Heritage and the Gaeltacht (2011) Architectural Heritage Protection: Guidelines for Planning Authorities.

Department of the Environment and Local Government (2000) Landscape and Landscape Assessment Draft Guidelines.

Fingal County Council (2023) Fingal Development Plan 2023-2029 (Consolidated Version, March 2026).

Fingal County Council (2023) Fingal Biodiversity Action Plan 2023-2030.

Fingal County Council (2024) Fingal Climate Action Plan 2024-2029.

Landscape Institute and Institute of Environmental Management & Assessment (2013) Guidelines for Landscape and Visual Impact Assessment.

Scottish Natural Heritage (SNH) (2018) Environmental Impact Assessment Handbook – Guidance for competent authorities, consultation bodies, and others involved in the Environmental Impact Assessment process in Scotland.

11 Land, Soils and Geology

11.1 Introduction

This Chapter describes the scope of works and methods applied in the identification and assessment of the likely direct and indirect effects of the construction and operation of the Proposed Development with respect to Land, Soils, and Geology, in accordance with the requirements of Directive 2014/52/EU of the European Parliament and of the Council of 16 April 2014 amending Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment (i.e., the EIA Directive). This Chapter also provides a characterisation of the receiving environment within the Proposed Development.

The Royal Canal Urban Greenway will provide a shared pedestrian and cycle route adjacent to the Royal Canal over an approximate length of 8.1km. This will tie in with the completed Ashtown to Castleknock section of the Royal Canal Greenway to the east and the Kildare County Council greenway section at the County boundary to the west (hereafter referred to as the Proposed Development).

It will provide a high quality, safe, attractive and environmentally sympathetic walking and cycling corridor serving Castleknock, Blanchardstown, Clonsilla, Coolmine and the wider Dublin 15 area. The Proposed Development will encourage recreation while offering an attractive sustainable transport choice for school children and commuters, bringing significant environmental, economic and health benefits to the wider community.

The following works have the potential to affect Land, Soils, and Geology:

- Embankments and Retaining Structures;
- Pre-Cast Concrete Cantilevered Boardwalk;
- Quarry Bridge;
- Landmark Bridge;
- Proposed Underpass.

Refer to the Construction Methodology Report (170239-DBFL-XX-XX-RP-C-0003) for a more detailed description of the above works.

The assessment techniques used are aimed at identifying the likely significant effects, proposing suitable mitigation measures (if required) and identifying the residual effects.

11.2 Contributors/Subject Matter Experts: EIAR Team

Table 11-1 outlines the team of qualified experts who have contributed to preparation of this chapter of the Environmental Impact Assessment Report (EIAR).

Table 11-1: EIA Team for Chapter 11

Chapter	Company	Role & Relevant Experience
Land, Soils, and Geology	DBFL	David Bourke BE, MSc, CEng, MIEI David is a Chartered Civil Engineer and design team lead with over 13 years' experience as a consulting engineer. David has an array of consultancy experience across a number of engineering disciplines, including civil, geotechnical, marine, and subsea engineering. David's academic experience includes civil and environmental engineering, sustainable energy systems (including onshore and offshore renewable energy devices, such as wind, wave and tidal), and structural and geotechnical engineering. David has undertaken the role of design lead, technical advisor, and project manager on a number of high-value strategic infrastructure projects in Dublin Port and Rosslare Europort. David was also involved in the Design and Build (D&B) team for Ulster Canal Phase 2, delivering civil and geotechnical engineering services on this challenging infrastructure project. David also has experience on various roads, active travel, commercial, residential, heritage, offshore (oil & gas), and renewable energy schemes. David is also qualified to undertake the role of PSDP.

11.2.1 Impact Assessment – Scope of Works

This chapter evaluates the effects, if any, which the Proposed Development has had or will have on Land, Soils, Geology as defined in the Environmental Protection Agency (EPA) 'Guidelines on the Information to be contained in Environmental Impact Assessment Reports' (EPA, 2022). The Draft EPA document entitled 'Advice Notes for Preparing Environmental Impact Statements' (EPA, 2015) is also followed in this geological assessment and classification of environmental effects. Due consideration is also given to the guidelines provided by the Institute of Geologists of Ireland (IGI) in the document entitled Guidelines for the Preparation of Soils, Geology Chapters of Environmental Impact Statements' (IGI 2013). In addition, the document entitled 'Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes' by the Transport Infrastructure Ireland (TII, 2009) is referenced where the methodology for assessment of effect is appropriate. Refer to Table 11-3 for the key supplementary guidance.

The assessment of potential effects on land, soils and geology has been undertaken using the methodology described in this Chapter and the general impact assessment framework set out in Chapter 1. The significance of effects has been determined through consideration of receptor sensitivity, the magnitude of the predicted effect, and the relevant effect characteristics including extent, duration, frequency and reversibility, having regard to the EPA Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (EPA, 2022). The duration of each effect is considered to be either momentary, brief, temporary, short-term, medium term, long-term, or permanent. Momentary effects are considered to be those that last from seconds to minutes. Brief effects are those that last less than a day. Temporary effects are considered to be those which are construction related and last less than one year. Short term effects are seen as effects lasting one to seven years; medium-term effects lasting seven to fifteen years; long-term effects lasting fifteen to sixty years; and permanent effects lasting over sixty years. Reversible effects are effects that can be undone, for example through remediation or restoration.

The criteria for rating the magnitude (NRA / TII: Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes) and significance (EPA: Guidelines on the information to be contained in Environmental Impact Assessment Reports (EIAR)) of effect on the geological related attributes at the site during the EIA stage are also relevant in assessing the effect. The principal attributes (and effects on same) to be assessed include the following: Geological heritage sites in the vicinity of the perimeter of the subject site; Landfills, industrial sites in

the vicinity of the site and the potential risk of encountering contaminated ground; Quarries or mines in the vicinity, the potential implications (if any) for existing activities and extractable reserves; and the extent of topsoil and subsoil cover and the potential use of this material on site as well or requirement to remove it off-site as waste for disposal or recovery.

11.2.2 European, National and Regional Policy

Table 11-2 outlines the key European and National legislative policy relevant to this assessment. Various bodies, including Transport Infrastructure Ireland (TII), the Institute of Geologists Ireland (IGI), and the Environmental Protection Agency (EPA) provide detailed guidance on the preparation and content required for an EIAR in relation to the geological environment. The various industry guidance documents referred to as part of this assessment are presented in Table 11-3.

Table 11-2: Key Legislation

Policy	Legislation
EU	Water Framework Directive (2000/60/EC)
	Floods Directive (2007/60/EC)
	Groundwater Directive (2006/118/EC)
	Environmental Quality Standards Directive (2008/105/EC)
	Urban Waste Water Treatment Directive (91/271/EEC)
	Environmental Liability Directive (2004/35/EC)
	Habitats Directive (92/43/EEC).
National	Planning and Development Regulations 2001 (S.I. No. 600 of 2001) (as amended), Schedule 6
	Planning and Development Act 2000 (No. 30 of 2000) (as amended)
	Planning and Development Act 2024 (No. 34 of 2024), where commenced and applicable
	Roads Act 1993 (as amended), s.51
	Waste Management Act 1996 (as amended)
	European Communities (Waste Directive) Regulations 2011 (S.I. No. 126 of 2011)
	European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018 (S.I. No. 296 of 2018)

Table 11-3: Key Supplementary Guidance

Body	Guidance
Transport Infrastructure Ireland (TII)	Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes (NRA, 2008)*
	Design of Earthworks Drainage, Network Drainage, Attenuation & Pollution Control (TII, 2015)
	The Management of Waste From National Road Construction Projects (TII, 2015)
	Road Drainage and the Water Environment (TII, 2015)
Environmental Protection Agency (EPA)	Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (EPA, 2022)
	Best Practice Guidelines for the Preparation of Resource & Waste Management Plans for Construction & Demolition Projects (EPA, 2021)
	EPA GIS Maps (EPA, 2022b)
CIRIA	The SuDS Manual – C753 (CIRIA, 2015a)
	Control of Water Pollution from Construction Sites. Guidance for Consultants and Contractors (CIRIA, 2001)
	Control of Water Pollution from Linear Construction Sites: Technical Guidance (CIRIA, 2006)
	Environmental Good Practice on Site Guide. 4th Edition (CIRIA, 2015b)
FCC	Fingal County Council (FCC) Planning (Planning | Fingal County Council)
Institute of Geologists of Ireland (IGI)	Guidelines for Preparation of Soils, Geology & Hydrogeology Chapters in Environmental Impact Statements (IGI, 2013) – referred to herein as the 'IGI Guidelines'.
Department for Environment, Food and Rural Affairs (UK)	Construction Code of Practice for the Sustainable Use of Soils on Construction Sites (DEFRA, 2009)
Department of Housing, Local Government and Heritage (DHLGH)	Nature-Based Solutions to the Management of Rainwater and Surface Water Runoff in Urban Areas (DHLGH, 2022)
Local Authority Waters Programme (LAWPRO)	Implementation of Urban Nature-based Solutions – Guidance Document for Planners, Developers and Developer Agents (Jan 2025)

*The NRA merged with the Railway Procurement Agency and was effectively dissolved on 1 August 2015. The merger of the two agencies is called Transport Infrastructure Ireland (TII). As a result, all previous NRA documents are now referred to as TII documents.

11.2.3 Local Planning

The relevant County Development Plan (CDP) and Local Area Plan (LAP) objectives, are set out in Chapter 3 (Planning Policy Context) of this EIAR. These include the objectives from the Fingal County Development Plan 2023-2029, Kellystown Local Area Plan (LAP 13B) (adopted January 2021) and the Barnhill Local Area Plan (LAP 13A) (February 2019).

11.3 Assessment Methodology

This assessment has been undertaken using a qualitative assessment based on experienced professional judgement and assessment of compliance with statutory and industry guidance, including a number of site visits.

11.3.1 Study Area

The study area for the Land, Soils and Geology assessment has been defined based on the potential zone of influence of the Proposed Development and the nature of the receptors being assessed. As the potential effects vary depending on the environmental aspect under consideration, different study areas have been adopted where appropriate.

The primary study area comprises the footprint of the Proposed Development, including all permanent and temporary works, construction compounds, access routes, excavation areas, retaining structures and any other areas where direct impacts on land, soils or geological materials may occur.

A study area extending c. 500m from the Proposed Development has been adopted for the characterisation of the local soils, superficial deposits, bedrock geology, geological features and historical land use. This area is considered sufficient to identify the geological and soil conditions that could influence or be affected by the Proposed Development.

A wider c. 1km study area has been used to identify geohazards, including recorded landslide events and areas of geological instability. The larger search area reflects the potential influence of regional geological conditions on the assessment and ensures that any relevant geological constraints are identified.

A c. 5km study area has been used for the review of designated sites. This wider study area ensures that sites designated are identified and considered where appropriate, and that any potential source-pathway-receptor relationships can be screened out at an early stage. Refer to Section 11.4.1 for further information on designated sites.

The assessment also considers the vertical extent of the receiving environment. The vertical study area extends from existing ground level through all layers of made ground (an area of land where natural soil has been altered, raised, or replaced by artificial, man-made materials through human activity), topsoil, subsoil, and underlying bedrock. This is particularly relevant where the assessment considers the distribution and thickness of superficial deposits, geological strata and depth to bedrock. The vertical extent therefore encompasses all geological materials that could be disturbed, removed, altered or otherwise affected during construction and operation of the Proposed Development.

11.3.2 Limitations and Assumptions

This assessment has been prepared using published geological and soils mapping, historical mapping, site walkover surveys, available ground investigation data and the design information for the Proposed Development. The information reviewed provides a sufficient basis to characterise the existing land, soils and geological environment and to assess the likely significant effects of the Proposed Development.

The interpretation of subsurface conditions has been informed by available site investigation data and published geological information. As with any site investigation, information is obtained from discrete locations and interpreted in conjunction with published datasets and professional judgement. The available information provides an appropriate representation of the ground conditions throughout the study area for the purposes of this assessment.

The assessment has been undertaken on the basis of the Proposed Development as described in this EIAR and assumes implementation of the mitigation measures and environmental commitments identified within this Chapter and elsewhere in the EIAR.

A ground investigation was undertaken by Ground Investigations Ireland Ltd between February and June 2020. Given the elapsed period since completion of the investigation, the continued applicability of the recorded ground conditions has been reviewed as part of this assessment. No evidence of significant ground disturbance within the study area has been identified from available information sources or site walkovers.

11.3.3 Desktop Study

The desktop study involved collation and assessment of the relevant information from the following information sources.

- Utility and Local Authority infrastructure record drawings;
  - BT; Eir; Enet; ESB; GNI; Inland Fibre Telecom; Irish Water; Virgin Media
- Geological Survey Ireland (GSI) online mapping service (Data and maps (gsi.ie));
- Geological Survey Ireland Spatial Resources[1] (https://dcenr.maps.arcgis.com/home/index.html):
  - Including: Geo-hazard Database, Geological Heritage Sites & Sites of Special Scientific Interest, Bedrock Memoirs and 1:100,000 mapping; Teagasc soil and subsoil database;
- Environmental Protection Agency (EPA) online maps and information (https://gis.epa.ie/EPAMaps/);
- National Parks and Wildlife Services (NPWS) – Protected Site Register (Protected Sites in Ireland | National Parks & Wildlife Service);
- Ordnance Survey Ireland - aerial photographs and historical mapping;
- Site surveys including topographic, underground utilities, orthophotography and geotechnical site investigations – specifically the 2020 ground investigation, which is described in Section 11.4.4;
- Fingal County Council - illegal landfill information.

11.3.4 Site Walkover

A number of site walkovers were undertaken between 2020 and 2025, with the purpose of identifying and verifying site characteristics. Refer to Section 11.4.4 for a description of the ground investigation works carried out to date.

The site walkovers encompassed the Proposed Development area, with emphasis placed upon areas likely to be affected by proposed earthworks in order to fully assess potential issues with regards to land and soil.

The purpose of the site walkovers was to gain an appreciation for the condition of the existing towpath corridor including:

- The path width;
- The slope gradient between the towpath and the canal;
- The ground conditions;
- The proximity to the railway line;
- Any retaining structures supporting the railway line.

[1] Now integrated with GeoHive, the state's free Geospatial Data Hub developed by Tailte Éireann (GeoHive Hub).

11.3.5 Scoring Matrix for Impact Assessment

Impact assessment has been carried out with reference to the IGI Guidelines (IGI, 2013), EPA's Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (EPA, 2022), and relevant current TII drainage and water environment guidance, including Road Drainage and the Water Environment (TII, 2015).

The significance of the identified potential impacts is acknowledged by the combination of the sensitivity of the receptor and the magnitude of the potential impact.

Receptor Sensitivity

The sensitivity of the receiving environment has been categorised on a scale from "very high" to "low", as defined in Table 11-4, which is based on:

- National Road Authority (NRA) / TII, 2008 – PE-ENV-01116 – Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes – Box 4.1;
- Institute of Geologists of Ireland (IGI), 2013 – Guidelines for the Preparation of Soils, Geology and Hydrogeology Chapters of Environmental Impact Statements – Table C2.

Table 11-4: Receptor Value / Sensitivity (based on NRA / TII's Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes)

Sensitivity of Environment	Criteria	Examples
Very High	Attribute has a high quality, significance or value on a regional or national scale. Degree or extent of soil contamination is significant on a national or regional scale. Volume of peat and/or soft organic soil underlying route is significant on a national or regional scale.	Geological feature rare on a regional or national scale (NHA). Large existing quarry or pit Proven economically extractable mineral resource.
High	Attribute has a high quality, significance or value on a local scale. Degree or extent of soil contamination is significant on a local scale. Volume of peat and/or soft organic soil underlying route is significant on a local scale.	Contaminated soil on site with previous heavy industrial usage. Large recent landfill site for mixed wastes. Geological feature of high value on a local scale (County Geological Site). Well drained and/or high fertility soils. Moderately sized existing quarry or pit. Marginally economic extractable mineral resource.
Medium	Attribute has a medium quality, significance or value on a local scale. Degree or extent of soil contamination is moderate on a local scale. Volume of peat and/or soft organic soil underlying route is moderate on a local scale.	Contaminated soil on site with previous light industrial usage. Small recent landfill site for mixed wastes. Moderately drained and/or moderate fertility soils. Small existing quarry or pit. Sub-economic extractable mineral resource.

Sensitivity of Environment	Criteria	Examples
Low	Attribute has a low quality, significance or value on a local scale. Degree or extent of soil contamination is minor on a local scale. Volume of peat and/or soft organic soil underlying route is small on a local scale.	Large historical and/or recent site for construction and demolition wastes. Small historical and/or recent landfill site for construction and demolition wastes. Poorly drained and/or low fertility soils. Uneconomically extractable mineral resource.

Magnitude of Effect

The magnitude of effect has been categorised on a scale from "large adverse" to "major beneficial" as defined in Table 11-5, which is based on:

- National Road Authority (NRA) / TII, 2008 – PE-ENV-01116 – Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes – Box 5.1;
- Institute of Geologists of Ireland (IGI), 2013 – Guidelines for the Preparation of Soils, Geology and Hydrogeology Chapters of Environmental Impact Statements – Table C4.

The examples included in Table 11-5 are generic examples derived from TII guidance and are provided for context only. The assessment of the Proposed Development has been undertaken using professional judgement having regard to the scale, extent, duration, reversibility and nature of the effects identified for the specific receptors present within the study area.

Table 11-5: Magnitude of Effect Criteria (based on NRA / TII's Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes)

Magnitude of Effect	Criteria	Examples (non-exhaustive)
Large Adverse	Results in loss of attribute	Loss of high proportion of future quarry or pit reserves. Irreversible loss of high proportion of local high fertility soils. Removal of entirety of geological heritage feature. Requirement to excavate / remediate entire waste site. Requirement to excavate and replace high proportion of peat, organic soils and/or soft mineral soils beneath alignment.
Moderate Adverse	Results in impact on integrity of attribute or loss of part of attribute	Loss of moderate proportion of future quarry or pit reserves. Removal of part of geological heritage feature. Irreversible loss of moderate proportion of local high fertility soils. Requirement to excavate / remediate significant proportion of waste site. Requirement to excavate and replace moderate proportion of peat, organic soils and/or soft mineral soils beneath alignment.

Magnitude of Effect	Criteria	Examples (non-exhaustive)
Small Adverse	Results in minor impact on integrity of attribute or loss of small part of attribute	Loss of small proportion of future quarry or pit reserves. Removal of small part of geological heritage feature. Irreversible loss of small proportion of local high fertility soils and/or high proportion of local low fertility soils. Requirement to excavate / remediate small proportion of waste site. Requirement to excavate and replace small proportion of peat, organic soils and/or soft mineral soils beneath alignment.
Negligible	Results in an impact on attribute but of insufficient magnitude to affect either use or integrity	No measurable changes in attributes.
Minor Beneficial	Results in minor improvement of attribute quality	Minor enhancement of geological heritage feature
Moderate Beneficial	Results in moderate improvement of attribute quality	Moderate enhancement of geological heritage feature
Major Beneficial	Results in major improvement of attribute quality	Major enhancement of geological heritage feature

Table 11-6: Types of Effects (from TII Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes)

Potential Effect	Description
Direct Effect	The existing geological environment is altered in whole or in part as a consequence of the Proposed Development construction or operations.
Indirect Effect	The existing geological environment beyond the proposed route corridors is altered by activities related to Proposed Development construction and/or operation.
No Predicted Effect	The Proposed Development corridor has neither a negative nor a positive impact on the geological environment.

Table 11-7: Duration and Frequency of Effects (EPA, 2022: Guidelines on the information to be contained in Environmental Impact Assessment Reports (EIAR))

Duration	Description
Momentary	Effects lasting seconds to minutes.
Brief	Effects lasting less than a day.
Temporary	Effects lasting less than a year.

Short-Term	Effects lasting one to seven years.
Medium Term	Effects lasting seven to fifteen years.
Long Term	Effects lasting fifteen to sixty years.
Permanent	Effects lasting over sixty years.
Reversible	Effects that can be undone, for example through remediation or restoration.
Frequency of Effects	Describe how often the effect will occur (once, rarely, occasionally, frequently, constantly – or hourly, daily, weekly, monthly, annually).

Table 11-8: Significance of Effects (EPA, 2022: Guidelines on the information to be contained in Environmental Impact Assessment Reports (EIAR))

Significance	Description
Imperceptible	An effect capable of measurement but without significant consequences.
Not Significant	An effect which causes noticeable changes in the character of the environment but without significant consequences.
Slight Effects	An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.
Moderate Effects	An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline trends.
Significant Effects	An effect which, by its character, magnitude, duration or intensity, alters a sensitive aspect of the environment.
Very Significant	An effect which, by its character, magnitude, duration or intensity, significantly alters most of a sensitive aspect of the environment.
Profound Effects	An effect which obliterates sensitive characteristics.

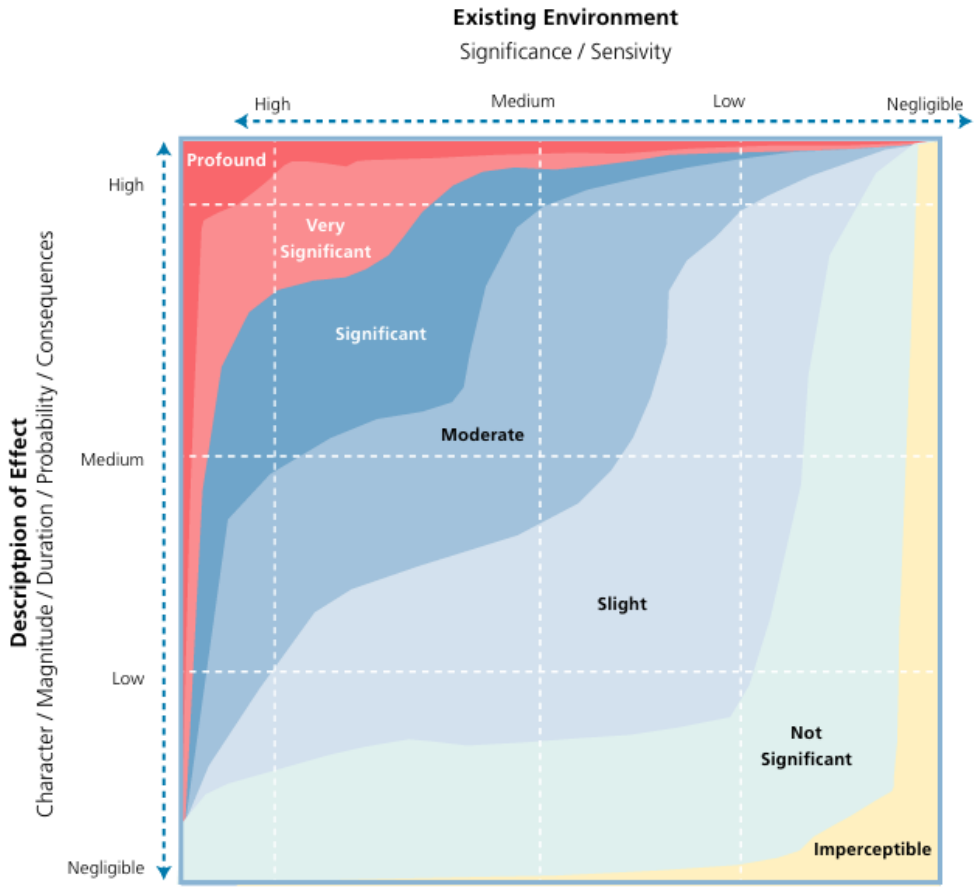


Figure 11-1: Chart Showing Typical Classifications of the Significance of Effects (EPA, 2022: Guidelines on the information to be contained in Environmental Impact Assessment Reports (EIAR))

11.4 Baseline Environment

This section characterises the existing receiving environment in respect of land, soils and geology. It describes the baseline conditions within the study area, including topography, historical land use, ground investigation findings, geology, soils, geological heritage features and geohazards. The identified receptors and their sensitivities form the basis for the assessment of likely significant effects presented in the subsequent sections of this Chapter.

11.4.1 Site Development

Refer to Chapter 2 (Description of the Proposed Development) for a more detailed description of the Proposed Development.

Designated Sites

Table 11-9 details designated sites within 5km of the Proposed Development. These include any statutory designated sites, such as special areas of conservation (SAC) and special protection areas (SPA) and non-statutory sites such as proposed natural heritage areas (hereinafter referred to as pNHAs). The Royal Canal falls under the designation of a pNHA. Figure 11-2 illustrates the extents of the Royal Canal pNHA relative to the red line boundary. Careful environmental management of the bedrock, soils, and geology will be required, particularly during the construction stage, as described in subsequent sections. There are no SACs or SPAs within the site extents. The nearest SAC to the

proposed works is the Rye Water Valley/Carton SAC, which is over 1km from the western site extents, as illustrated in Figure 11-3, however this SAC is noted as being upstream from the Royal Canal. The North Dublin Bay SAC and the South Dublin Bay SAC are both located downstream of the Royal Canal and are further discussed in Chapter 8 (Biodiversity), noting no anticipated effects on the listed Natura 2000 sites above.

The nearest SPAs include the South Dublin Bay and River Tolka Estuary SPA, North Bull Island SPA and the North-west Irish Sea SPA which are almost 10km away from the proposed works, and therefore the effects of the Proposed Development on the SPAs noted above will be negligible. This is detailed further in Chapter 8 (Biodiversity) with regards to their hydrological connection status and the Appropriate Assessment Screening Report for the Proposed Development.

Table 11-9: Designated Sites (within 5km)

Station ID	Name	Designation	Distance	Commentary
002103	Royal Canal	Proposed NHA	<0.1km	The ecological value of the canal lies more in the diversity of species it supports along its linear habitats than in the presence of rare species. Located in part within the Proposed Development extents and potentially sensitive to soils/geological impacts at the site.
000128	Liffey Valley	Proposed NHA	>1 km	Important site because of the diversity of habitats within the site, ranging from aquatic to terrestrial. Not within Proposed Development extents or sensitive to soils/geological effects at the site. The site is located more than 1 km from the Proposed Development. No direct land, soil or geological impact pathway has been identified and the site is therefore not considered sensitive within the context of this assessment.
001398	Rye Water Valley/Carton SAC	Proposed NHA, SAC	>1 km	The conservation importance of the site lies in the presence of several rare and threatened plant and animal species, and the presence of petrifying springs, a habitat type listed on Annex I of the EU Habitats Directive (92/43/EEC). Not within Proposed Development extents or sensitive to soils/geological effects at the site. The site is located more than 1 km from the Proposed Development. No direct land, soil or geological impact pathway has been

Station ID	Name	Designation	Distance	Commentary
				identified and the site is therefore not considered sensitive within the context of this assessment.
002104	Grand Canal	Proposed NHA	>4.5 km	The ecological value of the canal lies more in the diversity of species it supports along its linear habitats than in the presence of rare species. Not within Proposed Development extents or sensitive to soils/geological effects at the site. The site is located more than 1 km from the Proposed Development. No direct land, soil or geological impact pathway has been identified and the site is therefore not considered sensitive within the context of this assessment.

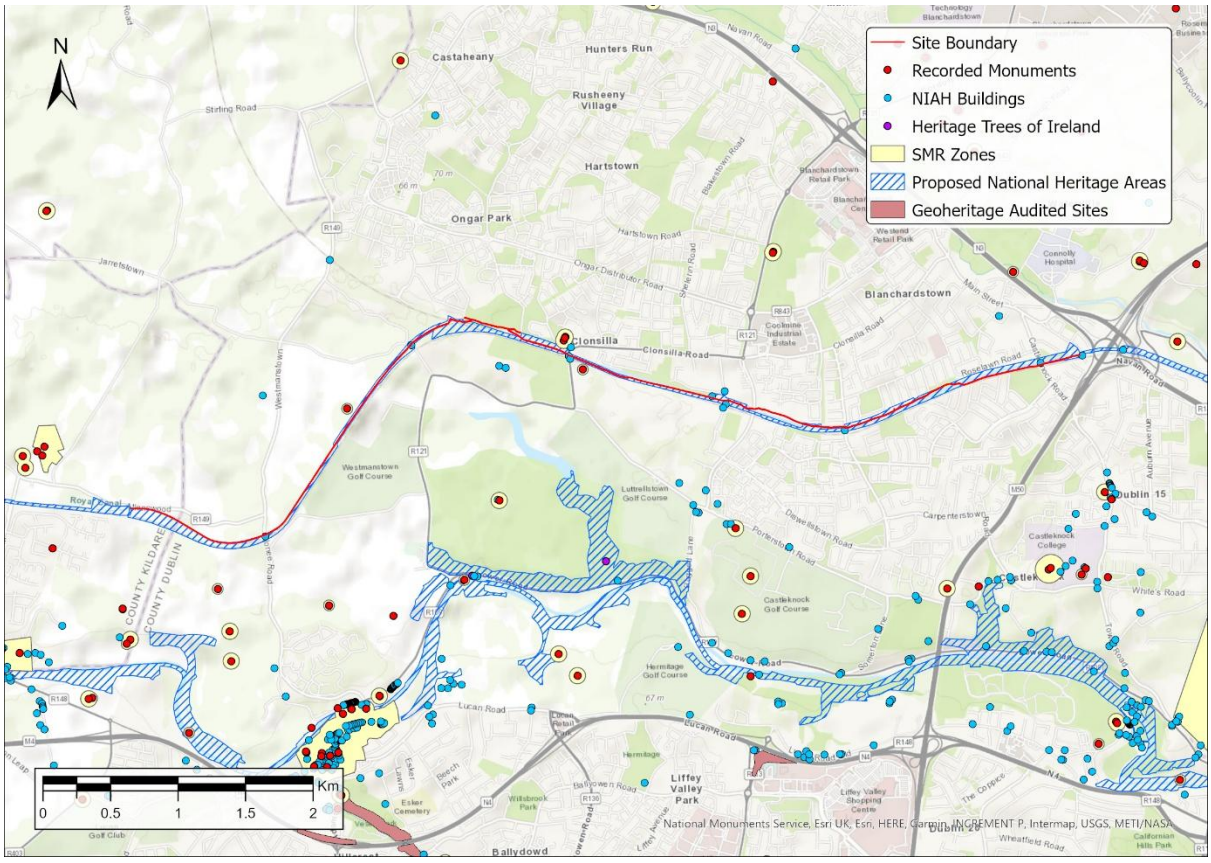


Figure 11-2: Proposed Natural Heritage Areas (EPA, 2022b)

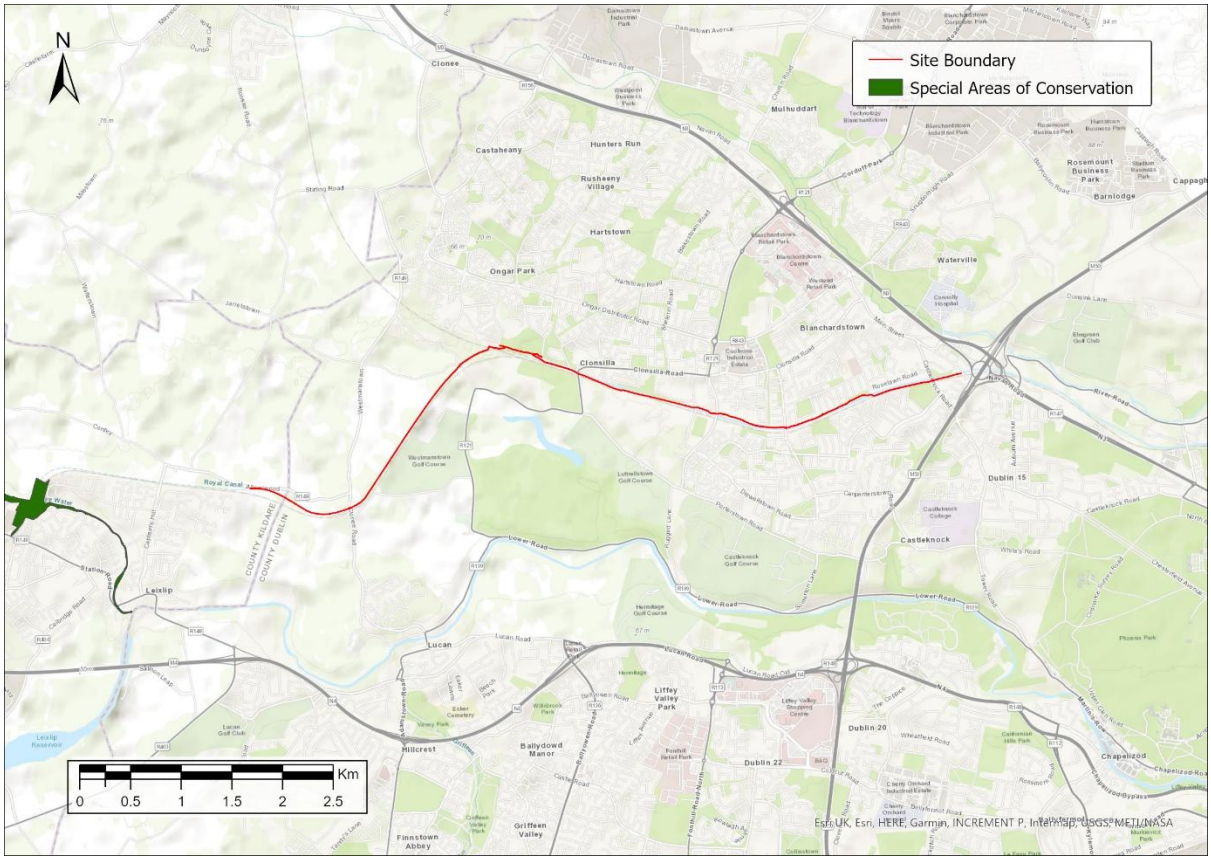


Figure 11-3: Special Areas of Conservation (EPA, 2022b)

11.4.2 Site Topography

The overall topography of the Proposed Development and its surrounding landscape is generally flat. Refer to Chapter 1 (Introduction) for further detail on topographical features.

11.4.3 Historic Land Use

Waste Facilities

The EPA retains a database of waste facilities (available at EPA Licensee Waste Data | Environmental Protection Agency). The only licensed waste facility in operation within the vicinity of the site is Huntstown Inert Waste Recovery Facility (Reg: W0277). Huntstown is a soil recovery facility situated to the northeast of River Tolka over 3km to the northeast of the Proposed Development's eastern extents. In addition, the Dunsink landfill (Reg: W0127) is a, now closed, historic waste facility located 1.5km northeast of the Proposed Development's eastern extents. As of 2025, the post-closure remediation and restoration phases of the landfill have now been completed. The Fingal County Development Plan (2023-2029) has zoned this facility as an 'Open Space' with a zoning vision to "*provide recreational and amenity resources for urban and rural populations subject to strict development controls*". Environmental monitoring of the closed landfill is carried out on an on-going basis with Annual Environmental Reports (AER) prepared on an annual basis to track the waste facility's aftercare and maintenance.

Quarries, Mines and Minerals

There are no quarries or mines affected by the Proposed Development. The nearest quarry is the Huntstown quarry, which is in excess of 3km to the northeast of the Proposed Development's eastern extents. Mineral localities in the vicinity of the Proposed Development extents are illustrated in Figure 11-4. An instance of a clay deposit being found is shown on historical mapping on the southern banks

of the Royal Canal, outside the Proposed Development extents, to the southeast of Clonsilla Station. This is shown by the red diamond adjacent to the red line boundary in Figure 11-4. Similarly, traces of galena, lead, and copper in quartz veins were noted to have been found in the Calp on the southern banks of the Royal Canal, outside the Proposed Development extents, to the southeast of Porterstown Road bridge. This is shown by the green diamond adjacent to the red line boundary in Figure 11-4.

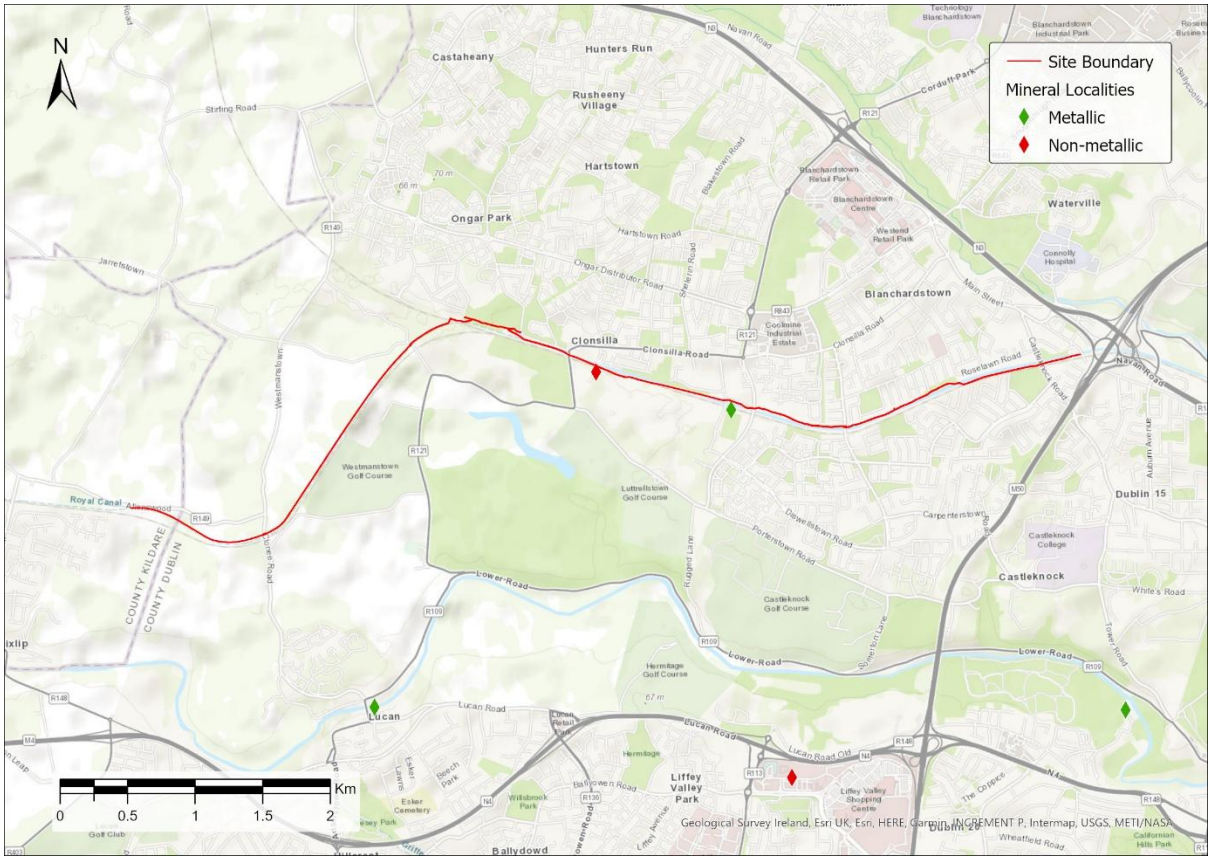


Figure 11-4: Mineral Localities (EPA, 2022b)

11.4.4 Ground Investigation

A ground investigation was undertaken by Ground Investigations Ireland (GII) Ltd between February and June, 2020 (Ground Investigations Ireland, 2020). The works comprised of the following:

79 No. total exploratory holes including:

- 47 No. slit trenches to a maximum depth of 1.5m BGL;
- 3 No. rotary core (RC) boreholes to a maximum depth of 23.20m BGL;
- 11 No. hand diamond drilled cores to a maximum depth of 0.5m BGL;
- 18 Angled Rotary Core Boreholes from a barge on the canal to a maximum depth of 5.5m;
- Plate load testing and TRL (Transport Research Laboratory) probe testing;
- A geophysical survey completed by Apex Geophysics along the subject section of the Proposed Development;

- A suite of geotechnical and environmental laboratory testing carried out on selected disturbed and undisturbed samples from the exploratory holes.

The extents of the ground investigation are illustrated in Figure 11-5.

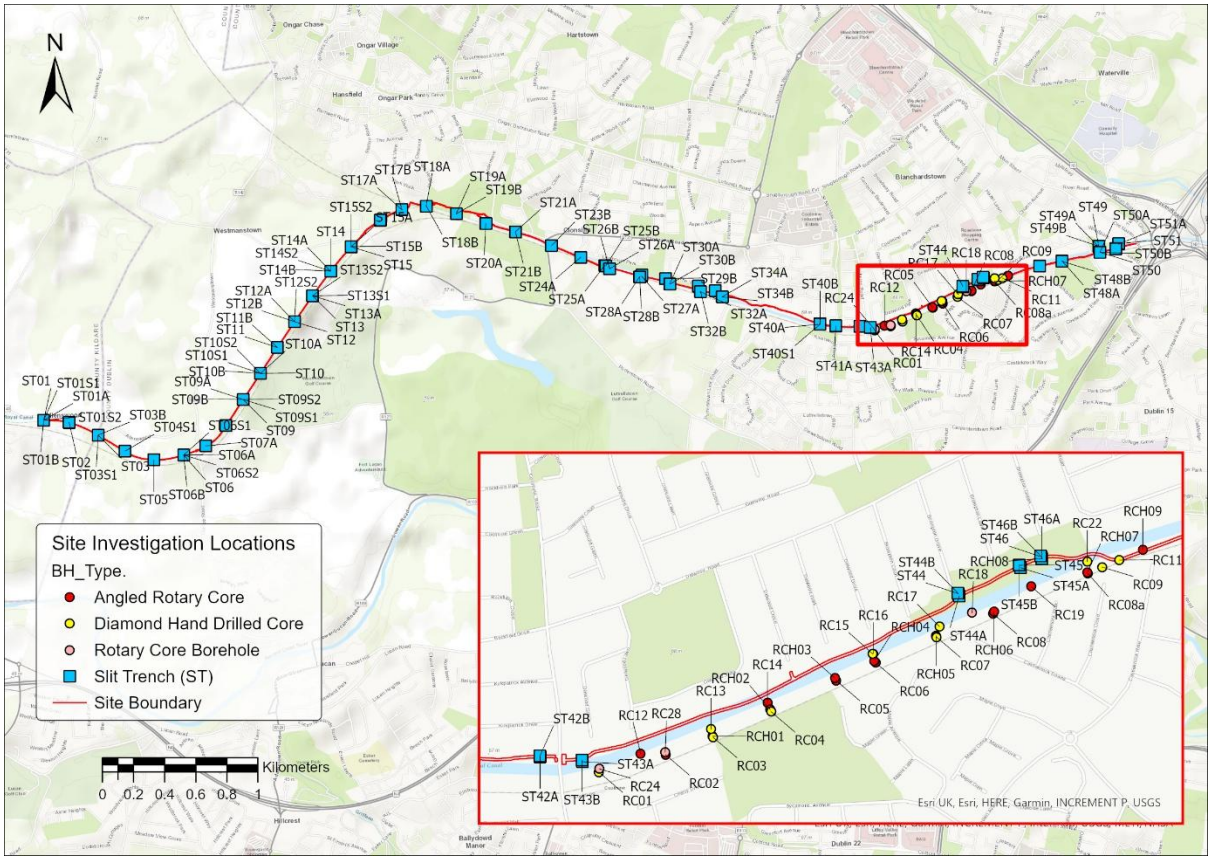


Figure 11-5: Ground Investigation Extents

Full details of the procedures implemented, as well as results of the field and laboratory work, are contained within the relevant Ground Investigation Report (GIR): ''GI Report – Royal Canal Urban Greenway 31-07-20 Rev B" (Ground Investigations Ireland, 2020), which is provided in the planning application pack.

The ground conditions encountered during the investigation are summarised below with reference to insitu and laboratory test results. The full details of the strata encountered during the ground investigation are provided in the exploratory hole logs included in the appendices of the GIR (refer to Appendices 2 to 6 of the GIR).

The sequence of strata encountered were variable across the site and generally comprised the following:

- Topsoil/surfacing;
- Made ground;
- Cohesive deposits;
- Granular deposits;
- Bedrock.

Topsoil / Surfacing

The ground conditions at the existing ground level along the Proposed Development consisted of either topsoil, tarmacadam or gravel surfacing. Topsoil was generally described as dark brown/brown slightly sandy gravelly clay with the depth varying from 0.1m to 0.2m Below Ground Level (BGL). Tarmacadam was encountered in ST42, on the existing paved sections to a depth of 0.06m and 0.12m BGL. Gravel surfacing was described as angular to subangular fine to course sandy gravel with depths between 0.1m and 0.19m BGL placed on top of a geotextile separator layer.

Made Ground

Made Ground deposits were encountered beneath the Topsoil/Surfacing in the majority of the slit trenches. Made Ground was typically present between 0.2m BGL and 0.6m BGL with a maximum depth of 1.4m BGL. These deposits were described as dark brown/brown slightly sandy gravelly clay or occasionally as a grey sandy angular fine to coarse gravel. Occasional cobble and boulder content was noted on the exploratory hole logs. In several slit trenches, the made ground contained waste materials including fragments of concrete, red brick, glass, ceramic, wood, and plastic.

Cohesive Deposits

Cohesive Glacial Tills were encountered beneath made ground and were generally described as brown/greyish slightly sandy gravelly clay. The gravel was described as angular to subrounded fine to coarse. Deposits occasionally contain angular to subrounded cobbles and boulders. The cohesive glacial tills were present at depths ranging between 1.5m and 17.2 m BGL. Based on Standard Penetration Test (SPT) N values which vary from 8 to 29 and a maximum of 50, the cohesive glacial tills are anticipated to have medium strength increasing to high strength with depth. The strength of the deposit should be sufficient for a working platform installation.

Granular Deposits

Granular deposits were encountered within rotary borehole RC24 only underlying the Cohesive Glacial Tills and were described as grey, brown clayey gravelly fine to coarse sand or sandy fine to coarse gravel. There was limited recovery of these materials from the rotary cored holes between depths of 8.2m and 23.2m BGL. Based on the SPT N values from RC24 which varies from 25 to 50, the deposits are typically dense to very dense.

Rock

Rock was generally recovered in the angled rotary cored boreholes as weak to strong grey/dark grey fine to medium grained limestone with calcite veins. According to a geophysical survey, along the Coolmine and Castleknock Stations the depth to rock is generally shallow but varies at depths of between 0.5 and 3.5m BGL with an average of 1.0m BGL.

It was noted that rotary coring towards Castleknock Station at the eastern end of the subject section (RC16, RCH09 and RC19) did not encounter rock nor was rock recovered from RC06 and RCH04. This was confirmed in RC24 and RC28 that drilled vertically from the towpath to depths of 23.20m and 17.20m BGL, respectively, without encountering rock. At the location of RCH04 and RC06 rock was also not encountered, and this has been interpreted as being a possible fault zone.

Groundwater Conditions

Groundwater strikes were recorded where encountered during slit trenching operations, typically as a slow seepage. Water strikes were encountered along the subject section in holes ST45, ST46, ST48 and ST49 generally between 0.9m to 1.5m BGL. Refer to Chapter 12 for discussion on groundwater and hydrogeology.

11.4.5 Geology

Bedrock Geology

The 1:100,000 scale GSI bedrock geology map indicates that the Proposed Development is underlain for the most part by Dark Limestone and Shale (`calp) (Lucan Formation), with the eastern most approximately 650m being underlain by Calcareous shale, limestone conglomerate (Tober Colleen Formation). The bedrock geology was imported to ArcGIS software, with the relevant 100k map illustrated in Figure 11-6.

The bedrock within the Lucan Formation is described in geological mapping as a Carboniferous Limestone of Late Chadian to Asbian Stage. This formation underlies much of central and north Dublin. The bedrock within the Tober Colleen Formation is described in geological mapping as a Carboniferous Calcareous shale, limestone conglomerate of Chadian Stage. The map also indicates bedrock outcrops alongside the canal over a number of sections.

A fault is identified on the 1:100,000 GSI bedrock geology map traversing the proposed scheme approximately 165m west of Porterstown Road, as shown on Figure 11-6. The mapped fault trends obliquely to the canal in the vicinity of the proposed Quarry Bridge and Landmark Bridge. The bridge foundations will be designed to accommodate local variations in bedrock profile and rock mass conditions that may occur in the vicinity of the fault. The presence of the fault does not represent an unusual geological hazard in the context of the regional geology.

In general, the rock encountered during the ground investigation is consistent with the published geology for the area, with the rotary core boreholes carried out between Coolmine and generally recovering medium strong to very strong grey/dark grey fine to medium grained limestone with calcite veins. The geophysical survey undertaken suggested the bedrock is generally between 0.5 and 3.5m deep in the Coolmine area, and then deepens towards Castleknock Station towards the eastern end of the section within the range 2.5m to 25mBGL.

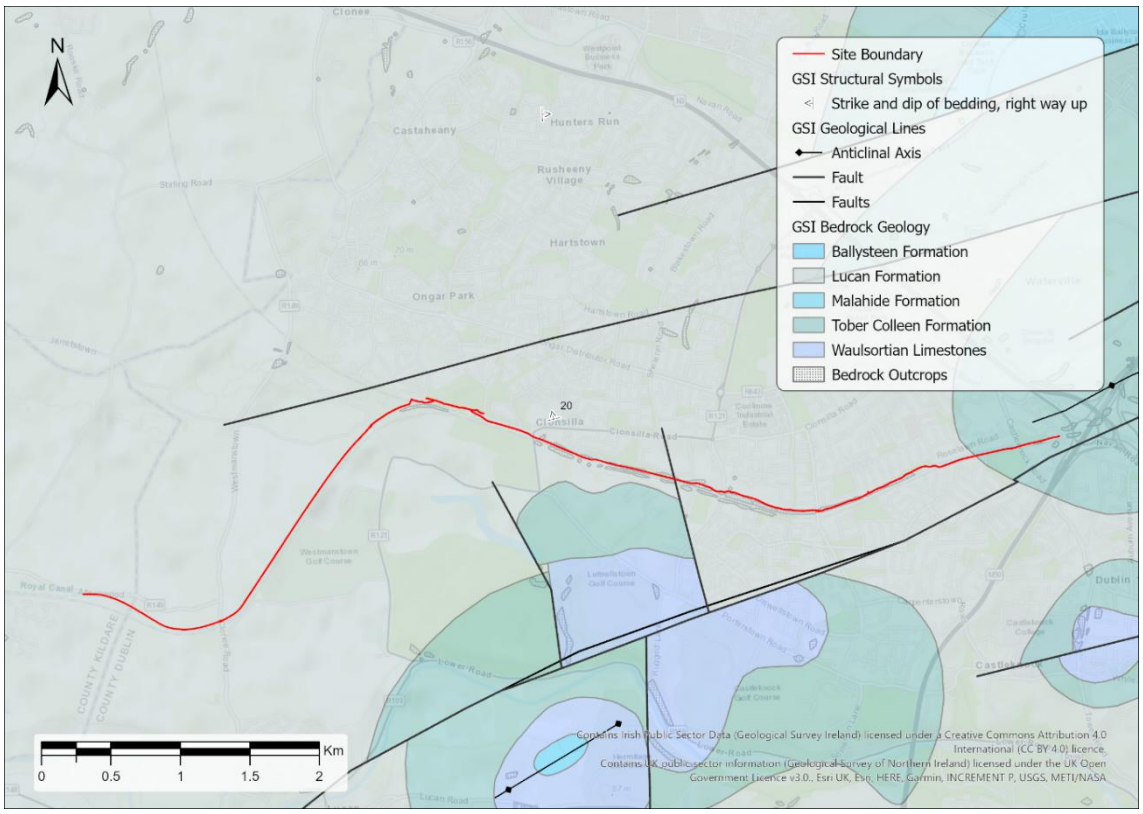


Figure 11-6: Bedrock Geology 100k Map (GSI data, 2026)

Unstable Ground and Geohazards

The underlying bedrock is primarily dark limestone and no Karst features are recorded in the vicinity of the Proposed Development on the GSI database. There is no evidence from online mapping or site investigations of significant peat deposits in the area.

The GSI holds a database of historical landslides in Ireland. No records in this database lie within 1km vicinity of the Proposed Development. The GSI landslide susceptibility map is illustrated in Figure 11-7, which illustrates a low landslide potential across the site extents.

No records of historical canal breaches or failures were identified within the vicinity of the Proposed Development. Existing canal embankments appear stable and there is no evidence from available mapping or site inspections of instability or seepage issues that would present a significant geohazard risk to the Proposed Development.

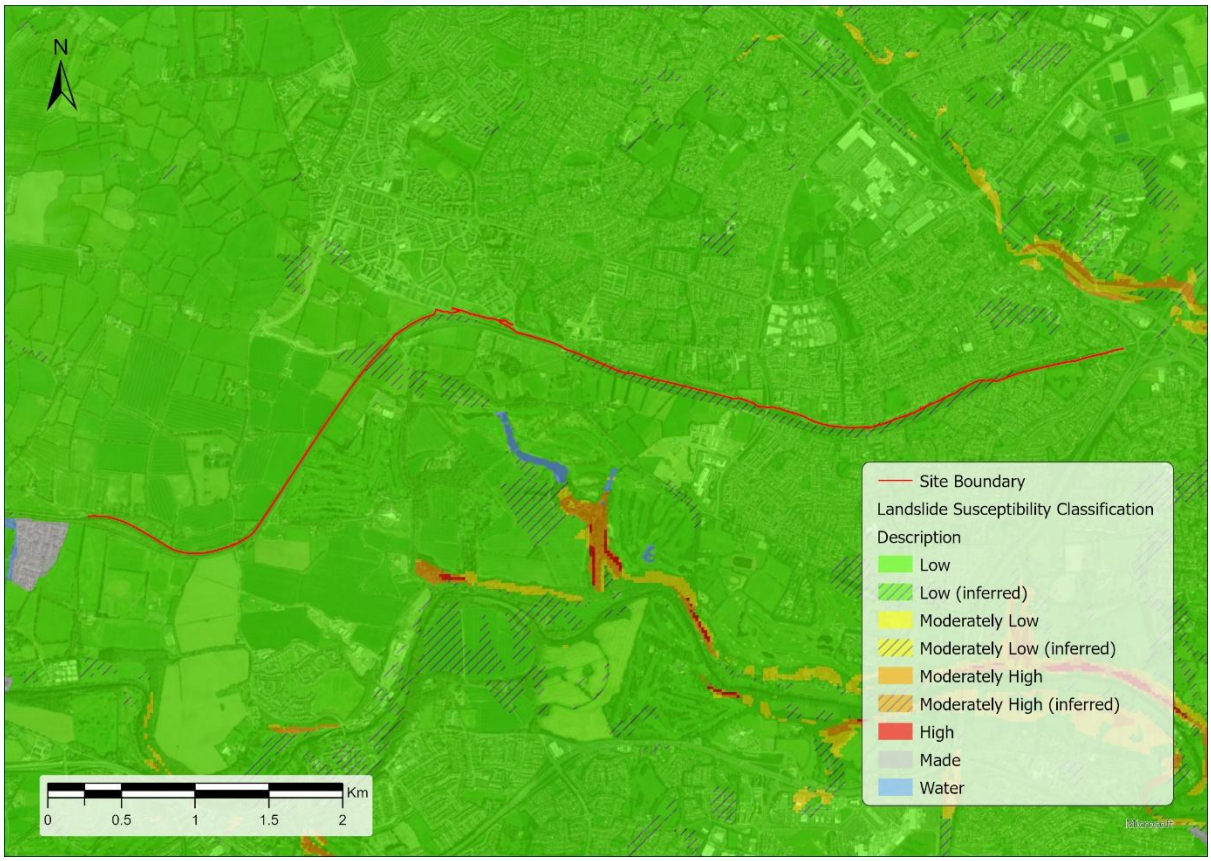


Figure 11-7: Landslide Susceptibility Classification (GSI data, 2026)

Geological Heritage Sites

The GSI hold a database of Geological Heritage Sites. No heritage sites are within the Proposed Development extents (red line boundary). The closest identified site is Phoenix Park which is located over 2km outside the Proposed Development's eastern extents, as illustrated by Figure 11-8.

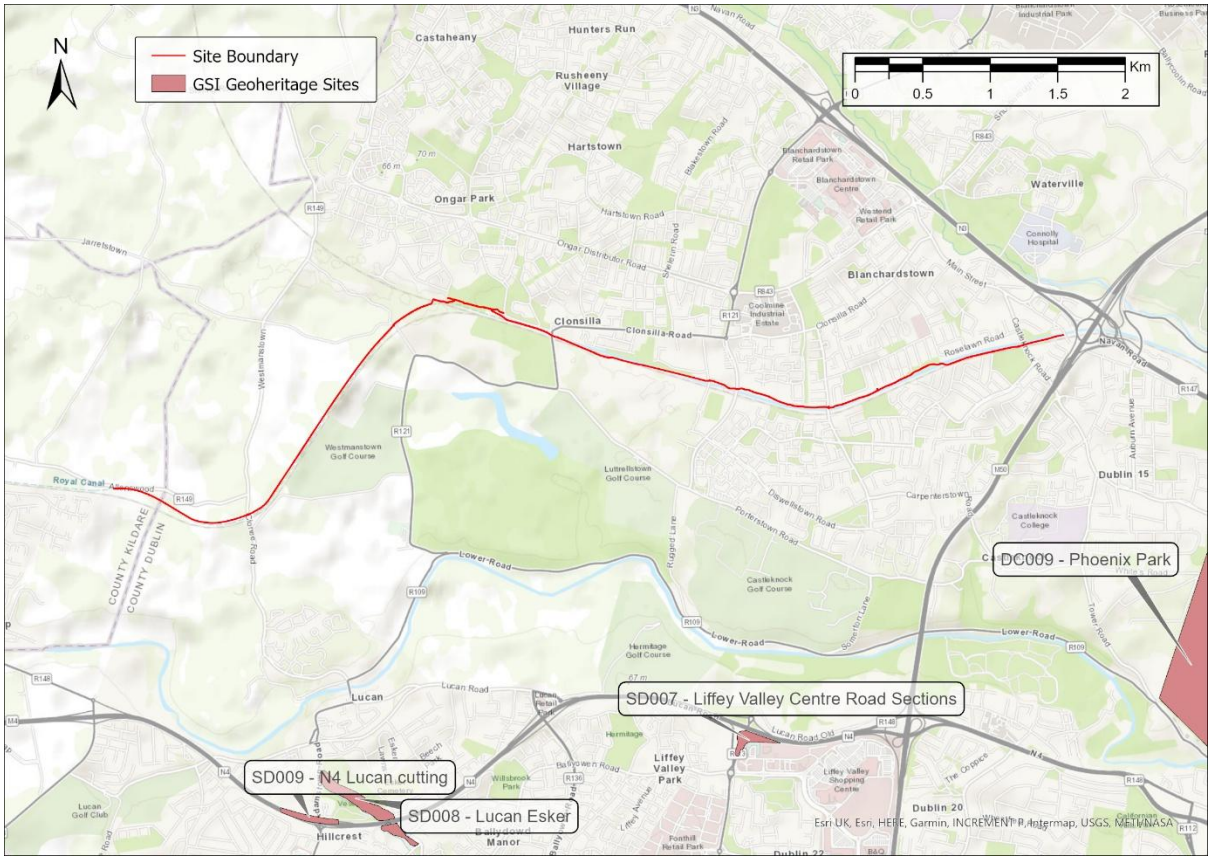


Figure 11-8: Geological Heritage Sites (GSI data, 2026)

11.4.6 Soils

Superficial Geology (Soils)

The subsoils underlying the majority of the route are comprised of quaternary aged glacial till (boulder clay). GSI Quaternary sediment mapping indicates that the route is underlain by tills and gravel derived from limestone, along with isolated areas of alluvium, and sections of subcropping/outcropping bedrock. The bedrock outcrops/subcrops are mainly located along the eastern extents of the Proposed Development. An extract from GSI mapping is presented in Figure 11-9.

Soil strata encountered were typically topsoil (to a maximum depth of 0.2m BGL), surfacing consisting of sandy angular to sub angular fine to coarse gravel to depths of between 0.1m and 0.19m BGL placed on top of geotextile, or tarmacadam (ranging in depth from 0.05m to 0.12m BGL). These topsoil/surfacing areas were underlain by made ground deposits to a depth of between 0.2m and 1.5m BGL in the majority of the slit trenches carried out. The majority of classifications were as a brown sandy slightly gravelly clay. Cobbles and boulders were encountered in some locations. In some slit trenches the made ground contained occasional fragments of concrete, red brick, glass, ceramic, wood and plastic.

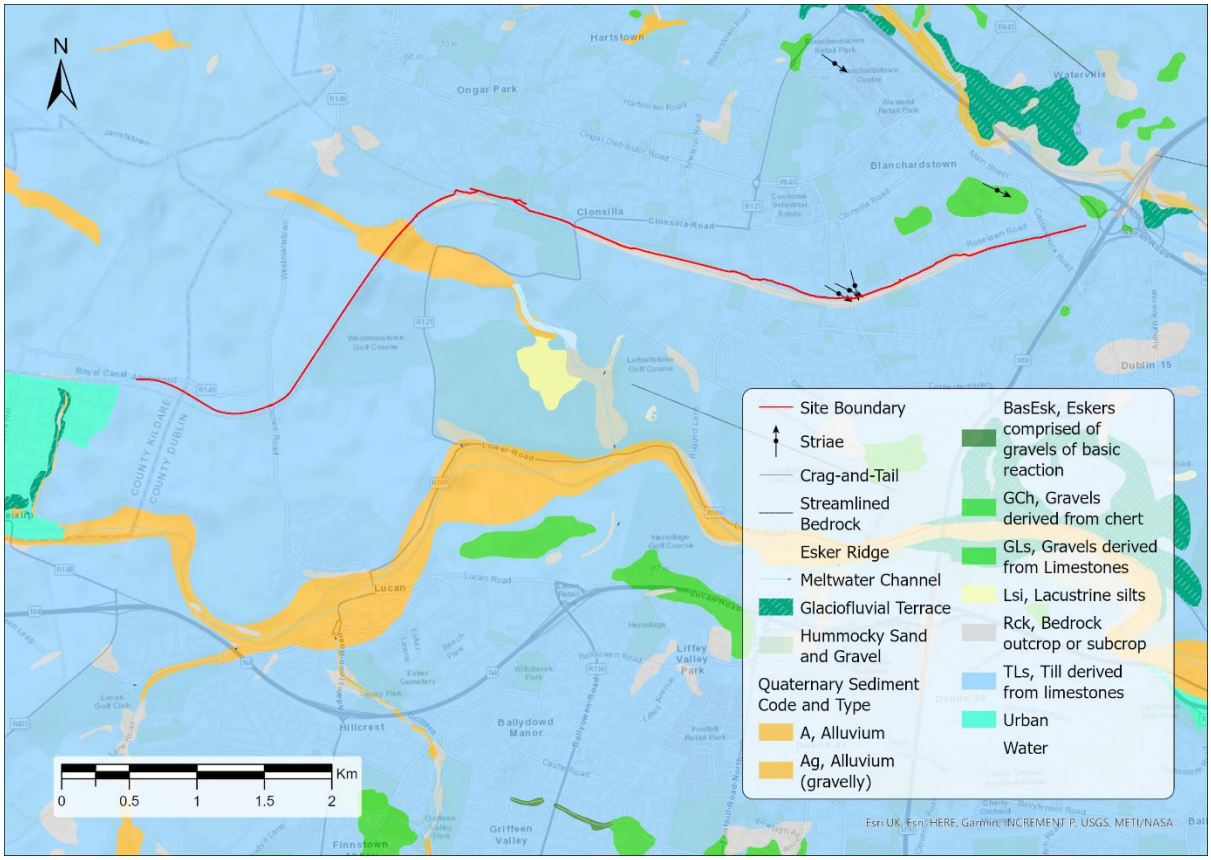


Figure 11-9: Quaternary Sediments (GSI data, 2022)

Contaminated Ground

Ground investigations undertaken by Ground Investigations Ireland (2020) identified areas of made ground within the Proposed Development footprint. Materials recorded within the made ground included concrete, brick, glass, ceramics, wood and plastic. pH and sulphate testing undertaken as part of the investigation indicated near-neutral pH values and low water-soluble sulphate concentrations relative to the guideline values presented in BRE Special Digest 1 (BRE, 2005), with the tested samples classifying as Design Sulphate Class DS-1. Preliminary assessment of the results indicated that no special precautions would be required for concrete foundations to prevent sulphate attack.

The available laboratory testing relates to pH and sulphate concentrations and has been considered in the assessment of concrete durability and sulphate attack potential.

11.4.7 Characteristics of the Proposed Development

Site development works will include stripping of the top 0.2m (approximate) thick topsoil / surfacing layers. Approximately 80% of stripped topsoil will be reused on site (incorporated into landscaping). It is envisaged that all of the bituminous / concrete surfacing materials will be re-purposed as fill material, subject to testing. The remaining material will be disposed of at a licenced waste receiving facility (subject to the approval of the facility operator in accordance with their facility permit or licence). As noted in Chapter 15 (Material Assets: Resource & Waste Management) where possible, the waste hierarchy supports the need to achieve efficient use of material resources by minimising the amount of waste produced (or otherwise increase its value as a resource) and reduce, as far as possible, the amount of waste that is disposed to landfill. Refer to Section 11.5.1 for further information.

Excavation of subsoil layers will be required in order to allow pavement construction, Quarry Bridge and Landmark Bridge constructions, boardwalk constructions, underpass construction, construction of

retaining structures, drainage and utilities installation. Refer to Chapter 2 (Description of the Proposed Development) for a description of the key elements of the works.

Importation of fill will be required beneath pavements and structural foundations (structural fill). Where possible, the designed pavement levels have been designed to follow the natural topography of the site, therefore minimising the need for cut / fill operations to enable development. Further information regarding importation of fill is included in 11.5.1 below. This material will be sourced from quarries that have all required licenses and planning permissions.

Earthworks excavation forms part of the Proposed Development and includes topsoil stripping, excavation of subsoil, local formation works, drainage and utility trenches, and excavations associated with retaining structures, bridges, boardwalk supports and the underpass. Earthworks shall be undertaken in a sequenced manner, the extent and duration of exposed ground shall be minimised, temporary excavations shall be stabilised as required, and disturbed areas shall be backfilled, covered or reinstated as soon as practicable in order to prevent erosion, instability and sediment mobilisation.

Storage of soils and aggregates forms part of the construction phase. Topsoil, subsoil and imported granular materials shall be stored separately in designated areas to prevent cross-contamination and unnecessary handling. Stockpiles shall be limited to the minimum volume and duration required for the works, shall not be located in drainage paths or adjacent to water features, and shall be protected as necessary to prevent erosion, dust generation and sediment-laden runoff.

Storage of hazardous materials forms part of the construction phase due to the use of fuels, oils, hydraulic fluids, paints and similar substances. Hazardous materials shall be stored only in designated bunded areas on impermeable surfaces. Spill kits shall be maintained at all such locations. Refuelling shall be undertaken only in controlled locations. Plant shall be maintained to prevent leaks and spills, and any accidental release shall be contained and managed immediately in accordance with the emergency response procedures set out in the Construction Environmental Management Plan.

Import and export of materials forms part of the Proposed Development. Imported materials shall comprise engineered fill, aggregates and construction materials. Exported materials shall comprise surplus excavated soil, unsuitable material and waste materials not suitable for beneficial reuse. The volume of imported and exported material is minimised through design optimisation and reuse of suitable excavated material on site. All off-site material movements shall be undertaken by appropriately authorised contractors. Surplus materials and wastes shall be removed to appropriately authorised recovery or disposal facilities.

During operation, effects on land, soils, and geology will be limited. The principal permanent change will be the increase in hardstanding associated with the Proposed Development pavement, boardwalk approaches, bridge tie-ins, underpass works and associated surfaces. This will result in the permanent covering of existing soil and shallow subsoil within the footprint of the Proposed Development. The increase in hardstanding is confined to the route corridor and is largely located within the existing canal towpath and adjoining disturbed lands. Operational runoff will be managed by the permanent drainage measures incorporated into the Proposed Development. Disturbed verges and landscaped areas will be reinstated on completion of the works. Operational maintenance will include minor pavement repairs, vegetation management, drainage cleaning, winter maintenance and localised replacement of surface materials. These activities will be periodic, small in scale and undertaken in accordance with standard maintenance procedures.

11.4.8 Baseline Summary and Sensitivities

A range of land, soils and geological receptors were identified during the baseline assessment. Each receptor was screened to determine its sensitivity and whether a credible impact pathway exists between the Proposed Development and the receptor. The outcome of this screening exercise is presented in Table 11-10.

Only receptors for which a credible impact pathway was identified were taken forward for detailed assessment. Table 11-11 identifies these receptors and the associated impact pathways that have been assessed in subsequent sections.

Table 11-10: Baseline Features and Scoping Determination

Baseline Feature	Present within Study Area	Assessed Further?	Justification
Soils/subsoils	Yes	Yes	Directly affected by excavation and earthworks
Limestone bedrock	Yes	Yes	Potentially affected by foundation and excavation works
Made ground	Yes	Yes	Present across site and directly disturbed by works
Potential contamination	Potentially	Yes	Made ground identified and only limited environmental testing undertaken
Canal embankments	Yes	Yes	Adjacent to works and potentially affected by construction activities
Geological heritage sites	No within footprint	No	No direct impact pathway
Mineral resources	No economically viable resource affected	No	No sterilisation or loss of resource
Mapped fault	Yes	No	Engineering consideration rather than environmental receptor

Table 11-11: Receptors Carried Forward for Assessment

Receptor	Sensitivity	Reference
Soils/subsoils	Low	Section 11.4.6
Limestone bedrock	Low	Section 11.4.5
Made ground	Medium	Section 11.4.4
Potentially contaminated material	Medium	Section 11.4.6
Canal embankments and slopes	Medium	Section 11.4.5

11.5 Predicted Impacts

11.5.1 Construction Stage

The construction phase impacts are those associated with the significant excavations, soil movement, aggregate import and construction plant usage. Reference should be made to DBFL's Construction Methodology Report (170239-DBFL-XX-XX-RP-C-0003), where the construction activities have been outlined in detail, including the construction of the Quarry Bridge (and associated raised boardwalk sections) and the Landmark Bridge that spans over the canal (and the associated ramped sections). The sections below represent the likely potential impacts, and the effects of those impacts, in the absence of mitigation. Mitigation measures to reduce the impact are discussed in Section 11.6.

The main impacts arising from construction activities are listed in Table 11-12. It is noted that there is interaction and interrelationships with land and soils impacts discussed in other chapters of this assessment.

The potential impacts are described in the sub-headings below.

Table 11-12: Predicted Impacts – Construction Phase

Receptor	Sensitivity	Impact Pathway / Source	Potential Consequence
Soils and subsoils	Low	Topsoil stripping, excavation of subsoils, temporary stockpiling, reuse or disposal of excavated materials, importation of fill, operation of construction plant and machinery.	Temporary disturbance and permanent loss of soils and subsoils within the construction footprint.
Limestone bedrock	Low	Excavation for foundations, bridge structures, retaining structures and other below-ground works.	Localised disturbance and removal of bedrock.
Made ground	Medium	Excavation, handling, stockpiling, reuse or off-site disposal of made ground materials.	Disturbance and movement of made ground materials during construction activities.
Potential contamination	Medium	Excavation and handling of made ground and underlying soils; accidental release of fuels, oils, concrete or other construction materials.	Encountering previously unidentified contamination or localised deterioration in soil quality.
Canal embankments	Medium	Construction activities adjacent to the Royal Canal, including excavation, earthworks and operation of plant.	Localised effects on canal embankment stability or integrity.

Stripping of Topsoil / Surfacing

Removal of the existing topsoil and surfacing layers (Tarmacadam or gravel surfacing) will be required. The majority of the excavated material in the upper layers is topsoil, typically described as sandy gravelly material. This material can be classified as "Low" importance as it is not unique and is abundant in the wider landscape. As noted in Section 11.4.7, approximately 80% of stripped topsoil will be reused on site (incorporated into landscaping). It is envisaged that all of the bituminous surfacing materials will

be re-purposed as fill material, subject to testing. The remaining material will be disposed of at a licenced waste receiving facility (subject to the approval of the facility operator in accordance with their facility permit or licence). The estimated topsoil volumes are presented in Table 11-13.

Stripping of topsoil will result in exposure of the underlying subsoil layers to the effects of weather and construction traffic and may result in subsoil erosion and generation of sediment laden runoff.

Table 11-13: Preliminary Estimated Topsoil Volumes (+/- 10%)

Source	Volume (m^3)
Topsoil / Surfacing Strip	4,255
Topsoil / Surfacing Reuse (landscaping, etc.)	3,404
Disposal of Topsoil / Surfacing	**851**

Excavation of Subsoil Layers

Excavation of subsoil layers will be required in order to allow pavement construction, Quarry Bridge and Landmark Bridge constructions, and drainage and utilities installation. In general, the designed pavement levels follow the natural topography of the site, therefore, minimising the need for cut / fill operations to enable development. The estimated subsoil volumes are presented in Table 11-14.

Underlying soil layers generally comprise of cohesive glacial tills, as outlined in Section 11.4. The works generally follow the existing contours of the site. However, there are locations where the cut is significant (e.g. for construction of underpass, where levels need to be lowered locally for security and to prevent overlooking), and also where the fill requirement is significant (e.g. filling to structures, filling of voids/hollows in Delwood area). Therefore, a good balance has been found between the cut and fill volumes, as outlined in Table 11-14. Surplus material will be removed from the site to a licenced waste receiving facility (subject to the approval of the facility operator in accordance with their facility permit or licence).

The pH and sulphate testing carried out as part of the 2020 site investigations indicates that pH values are generally near neutral and that water-soluble sulphate concentrations are low when compared to the guideline values presented in BRE Special Digest 1 (BRE, 2005). These results indicate a low aggressivity classification for concrete durability purposes. However, the testing programme was limited to pH and sulphate analysis and did not comprise a comprehensive assessment of potential contamination. While no evidence of contamination was identified from the available site investigation data, areas of made ground were encountered during the ground investigation and the potential remains for previously unidentified contaminated or otherwise unsuitable material to be encountered during excavation works.

Table 11-14: Excavation of Subsoil / Reuse of Excavated Material (+/- 10%)

Source	Volume (m^3)
Cut (excavation of subsoil layers as described above)	12,480
Excavated Material for Reuse	10,563
Disposal of Excavated Subsoil	**1,918**

Imported Fill

Materials imported to site for use as fill will be natural stones sourced from locally available quarries [Q/12/006 - Huntstown Quarry (licence number W02770); or Q/12/005 – Feltrim Quarry (regulated by Fingal County Council – not required to hold an EPA licence)], or materials that have been approved as by-products by the EPA in accordance with the EPA's criteria for determining a material is a by-product, per the provisions of article 27(1) of the European Communities (Waste Directive) Regulations, 2011.

Imported fill materials will be granular in nature and used in the construction of pavement and bridge foundations, and drainage / utility bedding and surrounds.

Materials will be brought to site and placed in their final position in the shortest possible time. Any imported material will be kept separate from the indigenous arisings from the site.

All excavation to accommodate imported material will be precisely co-ordinated to ensure no surplus material is brought to site beyond the engineering requirement.

Refer to Table 11-15 for the estimated imported granular fill material volume.

Table 11-15: Imported Granular Material (+/- 10%)

Source	Volume (m^3)
Imported Fill (granular material beneath pavement, structures, drainage and utility bedding / surrounds)	**9,732**

Construction Traffic / Operation of Construction Plant

Earthworks plant (e.g. dump trucks) and vehicles delivering construction materials to site (e.g. road aggregates, concrete deliveries, etc.) have potential to cause rutting and deterioration of the topsoil layer and any exposed subsoil layers, resulting in erosion and generation of sediment laden runoff.

This issue can be particularly noticeable at site access points (resulting in deposition of mud and soil on the surrounding road network). Dust generation can also occur during extended dry weather periods as a result of construction traffic.

Accidental Spills and Leaks

During the construction phase there is a risk of accidental pollution from the sources noted below. Accidental spills and leaks may result in contamination of the soils underlying the site.

- Storage of oils and fuels on site;
- Oils and fuels leaking from construction machinery;
- Spillage during refuelling and maintenance of construction machinery;
- Use of cement and concrete during construction works.

Geological Environment

The minimum proposed finished level within the Proposed Development is 59.382mOD at the Brompton area. Ground investigation data (refer to Section 11.4.4) indicates that the shallowest proven bedrock level in this area is 56.68mOD, recorded at location RC14. Given a proposed pavement build-up of approximately 275mm, excavation is not expected to extend to bedrock in this area. The highest recorded rock level from the ground investigation is 61.36mOD at location RC04. It is noted that RC04 comprises a shallow diamond core, and confirmation of intact bedrock level is uncertain. The ground investigation records indicate that the encountered material may represent a boulder rather than continuous bedrock. As such, this level is considered a conservative estimate of the shallowest potential bedrock horizon across the site. In the vicinity of RC04, the minimum proposed finished level is 64.177mOD, which provides a clear vertical separation between the underside of the pavement construction and the potential bedrock level.

Excavation works will result in the removal and disturbance of existing soils, subsoils and, where encountered, bedrock within the construction footprint. Bedrock excavation is anticipated to be limited; however, where excavation is required, this will permanently alter the existing geological profile and result in the localised loss of bedrock material. Excavated bedrock will be crushed and processed for reuse within the Proposed Development. The excavation and handling of bedrock will temporarily expose fresh rock surfaces and permanently modify the existing geological resource within the affected areas.

Human Health

Risks to Human Health associated with works during the construction phase in relation to land and soils include:

- Work which puts persons at risk of burial under earthfall, e.g. working near slopes or in deep excavations for bridge foundation constructions.
- Works that could undermine existing foundations;
- Contact with existing underground services, e.g. gas leaks or electrocution;
- Access and egress from the site and interface with site staff and / or the public e.g. risk of slips, trips and falls;
- Dust generation;
- Use of machinery and plant e.g. risk of injury to personnel and damage to plant and machinery due to improper use.

Connolly Hospital Blanchardstown is located approximately 700 m from the eastern extent of the Proposed Development. Construction activities involving soil disturbance, vegetation clearance and excavation have the potential to generate airborne dust containing naturally occurring fungal spores, including Aspergillus species.

Notwithstanding this, the hospital is located outside the immediate zone of construction influence and no direct works are proposed within hospital grounds or in the immediate vicinity of hospital buildings or air intake infrastructure. The separation distance, combined with the temporary and localised nature of the construction activities, significantly limits the potential for exposure.

11.5.2 Unmitigated Significance – Construction Phase

Magnitudes of identified effects, and associated unmitigated significance of those effects, are determined in accordance with the rationale previously described and are presented in Table 11-16. The impact significance is obtained by identifying the receptor sensitivity and impact magnitude (as summarised in Table 11-16) and using Figure 11-1 to identify the corresponding impact significance.

Mitigated significance is presented in Table 11-19.

Table 11-16: Unmitigated Significance – Construction Phase

Receptor	Sensitivity	Impact pathway	Magnitude of Effect	Significance of Effect	Rationale
Soils and subsoils	Low	Topsoil stripping, excavation of subsoils, temporary stockpiling, reuse or disposal of excavated materials, importation of fill, operation of construction plant and machinery	Small Adverse	Slight	Construction activities will result in localised disturbance and permanent loss of soils and subsoils within the footprint of the Proposed Development. Effects are confined to a relatively small area and involve common soil resources.
Limestone bedrock	Low	Excavation for foundations, bridge structures, retaining structures and other below-ground works	Negligible to Small Adverse	Imperceptible to Slight	Any interaction with bedrock will be highly localised and limited to excavation associated with specific structures. No geological features of particular importance will be affected.
Made ground	Medium	Excavation, handling, stockpiling, reuse or off-site disposal of made ground materials	Small Adverse	Slight	Existing made ground will be disturbed during construction and may require classification, segregation and management. Effects are limited to the construction footprint.

Receptor	Sensitivity	Impact pathway	Magnitude of Effect	Significance of Effect	Rationale
Potential contamination	Medium	Excavation and handling of made ground and underlying soils; accidental release of fuels, oils, concrete or other construction materials	Small Adverse	Slight	There is potential to encounter previously unidentified contaminated or unsuitable material and for localised contamination to arise from accidental spillages. The potential effect is localised and confined to construction activities.
Canal embankments	Medium	Construction activities adjacent to the Royal Canal, including excavation, earthworks and operation of plant	Small Adverse	Slight	Construction activities have the potential to affect embankment stability locally if not appropriately controlled. Effects would be temporary and localised in nature.

11.5.3 Operational Stage

The operational impacts considered in this assessment comprise those associated with the completed Proposed Development, including final surface treatments, traffic usage, routine inspection and maintenance activities, and associated ancillary works. Unlike the construction phase, operational activities are not expected to involve significant excavation or earthworks. Potential effects on land, soils and geological receptors are therefore limited to occasional maintenance-related interactions with the ground environment. Table 11-17 summarises the predicted operational phase effects.

Table 11-17: Predicted Impact – Operational Phase

Receptor	Sensitivity	Impact Pathway / Source	Potential Consequence
Soils and subsoils	Low	Routine maintenance activities including pavement repairs, resurfacing, drainage maintenance, vegetation management, localised excavation and renewal of buried services.	Temporary disturbance and localised loss of soils and subsoils within maintenance work areas.

Receptor	Sensitivity	Impact Pathway / Source	Potential Consequence
Limestone bedrock	Low	Occasional excavation associated with maintenance or replacement of drainage infrastructure, structures and buried services.	Localised disturbance or removal of bedrock where excavation extends to rock level.
Made ground	Medium	Localised excavation, handling and temporary storage of made ground during maintenance, repair and renewal works.	Disturbance and movement of made ground materials during operational maintenance activities.
Potentially contaminated material	Medium	Excavation and handling of made ground or underlying soils during maintenance works; accidental release of fuels, oils, hydraulic fluids or other maintenance materials.	Encountering previously unidentified contaminated material or localised deterioration in soil quality.
Canal embankments and slopes	Medium	Inspection, repair and maintenance activities adjacent to the Royal Canal, including local excavation, drainage maintenance and plant movements.	Localised effects on canal embankment or slope stability and integrity.

11.5.4 Unmitigated Significance – Operational Phase

Magnitudes of identified impacts, and associated unmitigated significance of those impacts, are determined in accordance with the rationale previously described and are presented in Table 11-18. Mitigated significance is presented in Table 11-20.

Table 11-18: Unmitigated Significance – Operational Phase

Receptor	Sensitivity	Impact pathway	Magnitude of Effect	Significance of Effect	Rationale
Soils and subsoils	Low	Routine maintenance activities including pavement repairs, resurfacing, drainage maintenance, vegetation management, localised excavation and renewal of buried services.	Negligible to Small Adverse	Imperceptible to Slight	Operational activities are infrequent, localised and limited in extent. Any disturbance to soils and subsoils would occur within small maintenance areas and would not materially affect the wider soil resource.
Limestone bedrock	Low	Occasional excavation associated with maintenance or replacement of drainage infrastructure, structures and buried services.	Negligible	Imperceptible	Routine operation does not require significant excavation into bedrock. Any interaction would be highly localised and confined to isolated maintenance works.
Made ground	Medium	Localised excavation, handling and temporary storage of made ground during maintenance, repair and renewal works.	Negligible	Imperceptible	Existing made ground may occasionally be encountered during maintenance activities; however, disturbance would be temporary, localised and restricted to small work areas.

Receptor	Sensitivity	Impact pathway	Magnitude of Effect	Significance of Effect	Rationale
Potentially contaminated material	Medium	Excavation and handling of made ground or underlying soils during maintenance works; accidental release of fuels, oils or maintenance materials.	Negligible to Small Adverse	Imperceptible to Slight	There is a limited potential to encounter previously unidentified contaminated material or cause localised soil contamination during maintenance activities. Any such effects would be confined to a small area and occur infrequently.
Canal embankments and slopes	Medium	Inspection, repair and maintenance activities adjacent to the Royal Canal, including local excavation, drainage maintenance and plant movements.	Negligible to Small Adverse	Imperceptible to Slight	Maintenance activities adjacent to the canal would be small-scale and temporary. Any effect on embankment or slope stability would be localised and limited to the immediate maintenance area.

11.5.5 Do Nothing Scenario

In the absence of the Proposed Development, no direct land take, excavation, earthworks or construction-related disturbance would occur within the study area as a result of the Proposed Development. The land, soils and geological environment would therefore remain unaffected by the specific activities assessed in this Chapter.

The receiving environment would not, however, remain static. Future changes in land use within the wider study area may occur in accordance with the Fingal County Development Plan 2023-2029, the Barnhill Local Area Plan and the Kellystown Local Area Plan. In addition, the former Dunsink landfill has undergone remediation and restoration and is now zoned as open space. These and other permitted developments may result in localised changes to land use, ground conditions and soil resource utilisation over time.

Notwithstanding this likely baseline evolution, the absence of the Proposed Development would avoid the construction and operational activities assessed in this Chapter, including topsoil stripping, excavation, material importation, disturbance of made ground and works adjacent to canal embankments. Accordingly, there would be no direct effects on land, soils or geological receptors arising from the Proposed Development under the Do-Nothing scenario.

The Do-Nothing scenario is therefore assessed as resulting in a Neutral effect in respect of land, soils and geology when compared with the future baseline in the absence of the Proposed Development.

11.6 Mitigation Measures

11.6.1 Construction Stage

Mitigation Measures – Preamble

From the assessment of potential impacts during construction and operation, the following key issues have demonstrated potential effect significance and so require particular attention for mitigation and management:

- Chemical pollution of geological receptors;
- Loss of soil value;
- Material generation.

The greatest risk to the environment is during the construction period, coinciding with the greatest amount of activity on site. In addition, effects unmitigated during construction have the potential to extend into the operational phase.

Mitigation Through Procedures

In order to facilitate the integration of environmental issues into the Proposed Development planning, construction and operation, an Outline Construction Environmental Management Plan (OCEMP), 170239-DBFL-XX-XX-RP-C-0004, has been produced which shall be adapted to a final Construction Environmental Management Plan (CEMP) for the Construction Phase. This shall be prepared and maintained by the contractor. This represents a best practice guide for considering the environment for the construction life cycle of the Proposed Development.

The OCEMP has been designed to assist the main contractor in preventing, managing and/or minimising significant environmental impacts during the construction phase. To achieve this objective the final CEMP shall:

- Comprehensively incorporate all environmental commitments set out in the contract documents, planning documents (including this EIAR), any conditions and/or modifications imposed by An Coimisiún Pleanála or the local authority.
- Provide a method of documenting compliance with these environmental commitments and conditions/modifications;
- Itemise relevant environmental legislative requirements and best practice guidance. The OCEMP should also provide a method of documenting compliance with these requirements,
- Outline methods by which construction work will be managed to prevent, reduce or compensate for potential adverse effects on the environment;
- Incorporate procedures for communicating with the public, statutory consultees, local authority and relevant site-personnel;
- Incorporate procedures for environmental awareness training for the main contractor's staff;
- Incorporate monitoring procedures and responses to monitoring results, where contractually required;
- Provide for a system of audit with regard to the effectiveness of the OCEMP during the construction life cycle of the project;
- Include an emergency response plan (ERP) detailing the procedures to be undertaken in the event of a spillage of chemical, fuel or hazardous wastes, fires or flood events.

TII have published "Guidelines for the Creation, Implementation and Maintenance of an Environmental Operating Plan" (NRA, 2007), which has been used as a basis for the creation of the OCEMP.

The OCEMP shall be co-ordinated with all other environmental procedural documents required which include a Construction Management Plan, Construction and Demolition Waste Management Plan and a Pollution Prevention Plan.

Any stockpiled material will be managed in accordance with best practice guidelines, such as Construction Code of Practice for the Sustainable Use of Soils on Construction Sites (DEFRA, 2009).

Specific Mitigation Measures – Stripping of Topsoil / Surfacing

Stripping of topsoil will be carried out in a controlled and carefully managed way. As noted previously, approximately 80% of stripped topsoil will be reused on site (incorporated into landscaping). It is envisaged that all of the bituminous / concrete surfacing materials will be re-purposed as fill material, subject to testing. This material will be stockpiled in line with the mitigations below. The remaining material will be disposed of at a licenced waste receiving facility (subject to the approval of the facility operator in accordance with their facility permit or licence).

At any given time, the extent of topsoil strip (and consequent exposure of subsoil) will be limited to the immediate vicinity of active work areas.

Topsoil stockpiles will be protected for the duration of the works and not located in areas where sediment laden runoff may enter existing surface water drains. Short-term stockpiling, i.e. less than six weeks, shall be adopted by the contractor as much as practicable. The stockpiles will be covered with geotextile (or seeded if the material is to be stockpiled for more than six months, although this shall be avoided as much as practicable) to prevent runoff and should be place a minimum of 20m away from any watercourse or drain. Topsoil stockpiles shall be restricted to a height of 2m to protect the soil structure and to prevent degradation. Topsoil stockpiles will also be located so as not to necessitate double handling.

Specific Mitigation Measures – Excavation of Subsoil Layers

The need to excavate existing subsoil layers has been minimised as the proposed pavement levels have been designed to follow the natural topography of the site as much as practicable.

Disturbed subsoil layers will be stabilised as soon as practicable, e.g. backfill of service trenches, construction of pavement capping layers, construction of foundations, and completion of landscaping. The duration that subsoil layers are exposed is to be minimised in order to mitigate against weather effects.

Similar to comments regarding stripped topsoil, stockpiles of excavated subsoil material will be protected for the duration of the works. Stockpiles of subsoil material will be located separately from topsoil stockpiles.

Measures will be implemented to capture and treat sediment laden surface water runoff, e.g. surface water inlet protection.

Specific Mitigation Measures – Imported Fill

Materials imported to site for use as fill will be natural stones sourced from locally available quarries (as outlined under Section 11.5.1), or materials that have been approved as by-products by the EPA in accordance with the EPA's criteria for determining a material is a by-product, per the provisions of article 27(1) of the European Communities (Waste Directive) Regulations, 2011.

No large or long-term stockpiles of fill material will be held on the site. At any time, the extent of fill material held on site will be limited to that needed in the immediate vicinity of the active work area.

Smaller stockpiles of fill, where required, will be suitably protected to ensure no sediment laden runoff enters existing surface water drains. Such stockpiles are to be located in order to avoid double handling. Protection measures shall include:

- Locating stockpiles away from the canal, existing watercourses, drainage ditches, gullies and surface water drains.
- Limiting the size of stockpiles to the minimum required for construction activities.
- Surrounding stockpiles with silt fencing or earth bunds where there is a risk of sediment migration.
- Covering stockpiles with tarpaulins or geotextiles during periods of heavy rainfall or prolonged inactivity.
- Positioning stockpiles on level ground and away from overland flow paths.
- Inspecting stockpiles and associated sediment controls regularly, particularly following heavy rainfall, and undertaking repairs where necessary.
- Reinstating disturbed areas and removing temporary stockpiles as soon as practicable.

Specific Mitigation Measures – Construction Traffic

Earthworks plant and vehicles delivering construction materials to site will be confined to predetermined haul routes around the site and designated delivery areas. This mitigates the risk of rutting and deterioration of the topsoil layer and any exposed subsoil layers.

Vehicle wheel wash facilities will be installed in the vicinity of any site entrances and road sweeping implemented as necessary in order to maintain the road network in the immediate vicinity of the site.

Dust suppression measures (e.g. dampening down) will be implemented as necessary during dry weather periods.

Specific Mitigation Measures – Accidental Spills and Leaks

In order to mitigate against spillages contaminating underlying soils, all oils, fuels, paints and other chemicals will be stored in a secure bunded hardstand area, which will be located away from any watercourses and drainage.

Refuelling and servicing of construction machinery will take place in a designated hardstand area (when not possible to carry out such activities off site).

A response procedure will be put in place to deal with any accidental pollution events and spillage kits will be available and construction staff will be familiar with the emergency procedures and use of the equipment. Spill kits shall also be provided within cabins of machinery as well as compounds and works areas.

Concrete batching will take place off site when possible, to minimise the risk of ground contamination on site during the concrete batching process. Pouring of concrete including wash down and washout of concrete from delivery vehicles will be controlled in a secure bunded hardstand area to prevent contamination.

Specific Mitigation Measures – Geological Environment

Excavations associated with development have been designed to be as shallow as possible. Bedrock excavations are expected to be minimal, as outlined above. Where bedrock is encountered it will be crushed, screened and tested for use within the designed works. Excavation of rock will have negative effects from the exposure of the bedrock to adverse weather conditions resulting in erosion of the rock layers.

Specific Mitigation Measures – Risks to Human Health

- Contractor / Project Supervisor Construction Stage (PSCS) to implement safe systems of construction including but not limited to battering the sides of trench excavations and installation of excavation shoring systems.
- Full precautions to be taken when working in vicinity of boundary structures for protection of same. Method and sequence of construction to be agreed with design team prior to commencement of work. Contractor's Temporary Works Designer to prepare Method Statement and Temporary Works Cert to ensure stability of excavations and adjacent structures.
- Contractor to obtain utility company network plans and arrange observation as required.
- Contractor to locate and record all services on site prior to commencement of excavations.
- Contractor to prepare and implement a Construction Traffic Management Plan that will be agreed with the Design Team and local authority and which will ensure the safety of the public during construction.
- Contractor must supervise vehicle movements to and from the site during construction in order to ensure that this traffic management plan is fully implemented. Traffic management plan to include deliveries to the site, staff parking, works outside the defined site such as utility connections.
- Public pedestrian routes to be established at site entrance as required.
- All personnel using machinery/plant to have undergone training on the use of said machinery/plant. Ongoing site supervision to be undertaken to ensure all use of machinery/plant is in accordance with the training undertaken.
- Contractor’s employees to be provided with all required PPE in accordance with Safety, Health and Welfare at Work Act, 2005.

Specific Mitigation Measures – Chemical Pollution

- Environmental good practice for control of water pollution arising from construction activities shall be carried out by the contractor in accordance with CIRIA C532 (Control of Water Pollution From Construction Sites: Guidance for Consultants and Contractors, 2001).

- Foul drainage from all site offices and facilities will be contained and disposed of in an appropriate matter to prevent pollution, in accordance with the relevant statutory bodies.

- Refuelling of construction machinery shall be undertaken in designated areas located away from surface water drainage in order to minimise potential contamination effects. Spill kits shall be kept in these areas in the event of spillages. Construction plant will be regularly inspected and maintained to prevent leaks. Drip trays will be placed beneath stationary plant and equipment, and spill kits and absorbent pads ("oil nappies") will be available and deployed, as required, during refuelling, maintenance activities and where plant is operating in proximity to watercourses or drainage infrastructure. An Environmental Response Plan shall be implemented by the appointed contractor.

- Oil and fuel stored on site for construction should be stored in designated impermeable hardstand areas. These areas shall be designed in accordance with relevant guidelines and codes of best practice and shall be bunded (to min 110% of chemical volume). Cleaning operations shall also be carried out in designated impermeable hardstand areas.

- Pouring of concrete including wash down and washout of concrete from delivery vehicles to be controlled in an appropriate facility to prevent contamination

- Regular samples to be taken from soils affected by earthworks which shall be analysed for contamination.

- Avoiding excessive removal of overlying subsoils, particularly impermeable ones, subject to detailed geotechnical analyses.

Specific Mitigation Measures – Loss of Soil Value

- Vegetation should be established as soon as possible on all exposed soils;

- Due consideration will be given to the prevailing ground and weather conditions when programming the execution of the works;

- SuDS features to be in place prior to the main construction works. SuDS features to be designed to limit soil erosion;

- Construction machinery shall minimise tracking over soils to minimise compaction;

- Exposed soil should be covered or seeded as soon as possible;

- Topsoil should be stripped and stockpiled separately for reuse and landscaping material;

- All disturbed areas to be reinstated with suitable soils to ensure future growth. All verges and boulevard areas to have sufficient topsoil depths.

Specific Mitigation Measures – Material Generation

A significant earthworks element is inevitable for the construction of the Proposed Development to achieve the required geometry and foundation conditions. A preliminary indication of material quantities associated with the Proposed Development is presented in Chapter 15 (Material Assets: Resource and Waste Management). Material excavated on-site will be stockpiled, screened and tested to minimise the importation of fill material and capping. Material quantity estimates are based on the preliminary design and will be refined during detailed design.

All fill and aggregate for the Proposed Development will be sourced from reputable suppliers per the project Contract and Procurement Procedures. All suppliers will be vetted for: Aggregate compliance certificates/declarations of conformity for the classes of material specified for the Proposed Development; Environmental Management status; and Regulatory and Legal Compliance status of the Company.

Many of the measures outlined in Section 11.6.1 are relevant to material generation. Additional measures to be implemented to reduce the effect of material generation include:

- Areas of stripped soils to be minimised to those required for the project earthworks;
- All soil handing to be in line with best practice guidance and in line with mitigation measures to protect the water environment;
- Excavated soils to be adequately separated to maximise reuse as embankment/ramp infill material, landscape fill, trench fill, or pavement construction material;
- Imported materials to be suitably separated to avoid contamination or mixing;
- The use of soil screening or other treatments should be used on site where it is possible to process materials, which would otherwise be classified as unacceptable, into materials suitable for use in the project;
- For imported materials, the use of local quarries or locally available material should be prioritised;
- All materials exported from site to be in accordance with the Waste Management Acts;
- Any potential for use of surplus material within local sites shall be pursued at construction and detailed design stage (subject to compliance with Waste Management Acts). If any material is to be reused on another site as a by-product (and not a waste), this will be done in accordance with Article 27 of the Waste Directive Regulations.

11.6.2 Operational Stage

Specific Mitigation Measures – Reinstatements

All temporary construction compounds and site entrances, as noted in Section 3.1 of DBFL's Construction Methodology report (170239-DBFL-XX-XX-RP-C-0003), are to be removed upon completion of the construction phase. Such areas are to be reinstated in accordance with the landscape architects' plan and engineer's drawings.

All construction waste and / or scrapped materials are to be removed from site on completion of the construction phase.

Oil / fuel storage areas are to be decommissioned on completion of the construction phase. Any remaining liquids are to be removed from site and disposed of at an appropriate licenced facility.

Specific Mitigation Measures – Maintenance

All maintenance works shall be confined to established paths, verges, hardstanding areas and defined access routes. No excavation, trafficking or storage shall be permitted outside these limits, thereby avoiding disturbance of adjacent undisturbed soils and underlying strata.

Drainage maintenance, including clearance of channels, gullies and filter systems, generates silt and fine material with potential for re-mobilisation. All removed material shall be controlled at source and removed from the drainage network. No stockpiling is permitted at canal margins or drainage interfaces, preventing re-entry of sediment and avoiding indirect erosion of soils.

Where local excavations are required, all excavated material is to be inspected, segregated and managed in a controlled manner. Contaminated or unsuitable soils are isolated and removed off site, preventing lateral or vertical migration of contaminants within the soil profile.

Temporary storage of excavated soils and arisings results in a risk of sediment dispersion, dust generation and contamination spread. Stockpiles are minimised in extent and duration, located away from sensitive ground interfaces, and contained to prevent loss of fine material. This controls sediment transport and preserves adjacent soil structure and permeability.

All plant movements shall be restricted to designated access routes and hardstanding areas where available. Small plant shall be used for routine maintenance, such as light maintenance vehicles. This limits axle and track loads, reducing the risk of soil compaction, shear failure and slope failures.

Handling and storage of fuels, oils and chemicals introduces a risk of localised soil contamination. All substances are to be contained within bunded systems and controlled environments, with spill containment in place. This prevents infiltration of hydrocarbons or chemicals into soils and protects underlying geological receptors.

Removal and replacement of path pavement and edge restraints generates construction arisings, including asphalt, concrete and granular material. All materials shall be segregated and removed from site or directed to controlled reuse pathways. All imported aggregates for maintenance works will be sourced from reputable suppliers.

11.7 Residual Impacts

11.7.1 Construction Stage

As a consequence of compliance with the construction mitigations, as outlined in Section 11.6.1, there will not be a significant residual impact on the identified land, soils, and geology receptors. Any residual impacts would be short-term.

The impact on land, soils, and geology from accidental spillages of fuel and lubricants used during the construction phase of the development is predicted to be minimal when stored and used in a responsible manner. After implementation of the mitigation measures recommended in Section 11.6.1 for the construction phase, the Proposed Development will not give rise to any significant long term adverse impacts.

Magnitudes of identified impacts, and associated significance of those impacts following adoption of the preceding mitigation have been determined. This assessment is in accordance with the rationale previously described, and is presented in 11.6.1. Post mitigation impact significance for all identified impacts has been determined as Not Significant.

Table 11-19: Mitigated Significance – Construction Stage

Receptor	Receptor Sensitivity	Potential Impact	Magnitude of Effects	Mitigation Measures	Significance of Effect (post mitigation)
Soils and subsoils	Low	Disturbance and permanent loss of soils and subsoils within the construction footprint	Negligible to Small Adverse	Topsoil segregation, controlled stripping, reuse of soils, stockpile management, erosion and sediment controls	Not Significant
Limestone bedrock	Low	Localised disturbance and removal of bedrock associated with excavations and foundations	Negligible	Minimisation of excavation depths, reuse of excavated rock where suitable, controlled excavation methods	Not Significant
Made ground	Medium	Disturbance, handling, classification and management of made ground materials	Negligible to Small Adverse	Segregation of materials, controlled excavation, appropriate reuse or disposal, environmental management controls	Not Significant
Potential contamination	Medium	Encountering previously unidentified contamination and accidental contamination from construction activities	Negligible to Small Adverse	Bunded fuel storage, designated refuelling areas, spill response procedures, pollution prevention measures and monitoring	Not Significant
Canal embankments and slopes	Medium	Localised effects on canal embankment stability or integrity due to adjacent construction activities	Negligible to Small Adverse	Sequenced earthworks, temporary works design, excavation controls, drainage management and environmental monitoring	Not Significant

11.7.2 Operational Stage

Following implementation of the mitigation measures described in Section 11.6.2, no likely significant residual effects on land, soils or geological receptors are predicted during the operational phase. Magnitudes of identified impacts, and associated significance of those impacts following adoption of the preceding mitigation have been determined. This assessment is in accordance with the rationale previously described, and is presented in Table 11-20. Post mitigation impact significance for all identified impacts has been determined as Not Significant.

Table 11-20: Mitigated Significance – Operational Stage

Receptor	Receptor Sensitivity	Potential Impact	Magnitude of Effects	Mitigation Measures	Significance of Effect (post mitigation)
Soils and subsoils	Low	Temporary disturbance or localised loss of soils and subsoils arising from pavement repairs, drainage maintenance, vegetation management, service renewal or other maintenance activities involving local excavation.	Negligible. Maintenance works will be infrequent, localised and confined to defined work areas.	Maintenance works will be confined to established paths, verges, hardstanding areas and defined access routes. Excavated soils will be inspected, segregated and managed appropriately. Stockpiles will be limited in extent and duration, contained to prevent loss of fine material and located away from sensitive ground interfaces.	Imperceptible
Limestone bedrock	Low	Localised disturbance or removal of bedrock where maintenance excavations extend to rock level.	Negligible. Interaction with bedrock will be limited to isolated maintenance or replacement works and will not affect the wider geological resource.	Excavation will be limited to that required for the maintenance works and confined to defined work areas. Excavated materials will be inspected, segregated and directed to suitable reuse,	Imperceptible

Receptor	Receptor Sensitivity	Potential Impact	Magnitude of Effects	Mitigation Measures	Significance of Effect (post mitigation)
				recovery or disposal routes.	
Made ground	Medium	Disturbance, handling and temporary storage of made ground during maintenance, repair or renewal works.	Negligible. Any disturbance will be temporary, localised and restricted to small maintenance areas.	Excavated made ground will be inspected, segregated and managed in a controlled manner. Temporary storage will be minimised and contained to prevent sediment dispersion, dust generation and the spread of unsuitable material.	Imperceptible
Potentially contaminated material	Medium	Encountering previously unidentified contaminated material during excavation, or localised deterioration in soil quality due to accidental releases of fuels, oils, hydraulic fluids or other maintenance materials.	Negligible. The potential for interaction is limited by the small scale and infrequent nature of operational maintenance works and the application of material-handling and pollution-control measures.	Potentially contaminated or unsuitable material will be isolated and removed to an appropriately authorised facility. Fuels, oils and chemicals will be stored and handled within controlled, bunded systems, with spill-containment measures available during maintenance activities.	Imperceptible
Canal embankments and slopes	Medium	Localised effects on the stability or integrity of canal embankments and slopes arising from excavation,	Negligible. Maintenance activities will be small-scale, temporary and confined to defined access routes	Plant movements will be restricted to designated access routes and hardstanding areas where available. Small	Imperceptible

Receptor	Receptor Sensitivity	Potential Impact	Magnitude of Effects	Mitigation Measures	Significance of Effect (post mitigation)
		drainage maintenance, temporary storage or plant movements.	and work areas.	plant will be used for routine maintenance. Excavation and storage will be confined to defined work areas, and removed drainage material will not be stockpiled at canal margins or drainage interfaces.	

11.8 Cumulative Effects

A cumulative effects assessment has been undertaken to identify whether the effects of the Proposed Development on land, soils and geology could interact with those arising from other existing, permitted, approved or reasonably foreseeable developments within the wider area.

The cumulative assessment considers the potential for overlapping construction activities, concurrent demands on soil and aggregate resources, simultaneous excavation works, disturbance of made ground, and the generation and movement of excavated materials. The assessment has regard to both the construction and operational phases of the Proposed Development and is not limited to residual effects.

The spatial scope of the cumulative assessment comprises the Proposed Development and the wider area within which other developments could give rise to shared land, soils or geological receptors, common construction supply chains, overlapping earthworks activities or cumulative disturbance of the receiving environment. The temporal scope considers both the construction period of the Proposed Development and any overlapping construction or operational periods associated with other developments.

A review of available planning and development information identified a number of plans and projects within the wider area that may have potential for cumulative interaction with the Proposed Development. These include:

- DART+ West;
- Development lands identified within the Barnhill Local Area Plan;
- Development lands identified within the Kellystown Local Area Plan;
- Greenway development west of the study area associated with the Kildare County Council section of the Royal Canal Greenway; and
- The completed Ashtown to Castleknock section of the Royal Canal Greenway to the east.

These projects have been identified as potential cumulative receptors only and no assumptions are made regarding their planning, approval or construction status for the purposes of this assessment.

Potential cumulative pathways relate principally to:

- Concurrent excavation and earthworks activities;
- Simultaneous demand for imported aggregates and engineered fill;
- Management, transport and disposal of surplus excavated materials;
- Disturbance of made ground and existing soils;
- Temporary construction compounds, haul routes and material storage areas; and
- Localised interaction with canal-side embankments and existing ground conditions.

Refer to Table 11-21 and Table 11-22 for a project-by-project assessment of the cumulative effects.

The effects identified for the Proposed Development are generally localised and confined to the construction footprint. The majority of excavated materials are intended to be reused within the Proposed Development where suitable, thereby reducing demand for imported materials and off-site disposal. No regionally or nationally important soils, mineral resources, geological heritage sites or significant geological features have been identified within the construction footprint that could be subject to cumulative loss or degradation.

While overlapping construction activities associated with other projects could temporarily increase demand for borrow materials, aggregate resources, waste recovery facilities and construction logistics networks, these effects would not be expected to result in significant cumulative effects on land, soils or geological receptors within the study area. Any cumulative disturbance of soils, made ground or geological materials would remain localised to the individual project footprints and would be managed through project-specific construction and environmental management measures.

Accordingly, no likely significant cumulative effects on land, soils or geology are predicted to arise from the interaction of the Proposed Development with other identified plans or projects during either the construction or operational phase.

Table 11-21: Cumulative Assessment of Land, Soils and Geology Effects

Project / Plan	Potential Cumulative Receptor	Potential Cumulative Pathway	Spatial Overlap	Temporal Overlap	Assessment	Conclusion
DART+ West	Soils, made ground, imported aggregates, waste facilities	Major earthworks, excavations, aggregate demand, spoil management	Localised overlap within wider Dublin 15 corridor	Potential overlap during construction	Both projects may generate demand for imported fill and recovery facilities. Effects managed through established supply chains and project-specific environmental controls.	No likely significant cumulative effect

Project / Plan	Potential Cumulative Receptor	Potential Cumulative Pathway	Spatial Overlap	Temporal Overlap	Assessment	Conclusion
Barnhill LAP Lands	Existing soils, made ground, aggregate resources	Concurrent residential development earthworks and material imports	Potential overlap within study area	Dependent on programme	Development may result in localised demand for construction materials and waste acceptance facilities. Effects dispersed across separate sites and receptors.	No likely significant cumulative effect
Kellystown LAP Lands	Soils, subsoils, construction materials	Excavation, filling and material transport	Potential overlap	Dependent on programme	Similar receptor types but effects remain confined to individual sites. No shared sensitive geological receptors identified.	No likely significant cumulative effect
Royal Canal Greenway (KCC Section)	Canal-side soils, embankments	Similar construction activities along same corridor	Direct corridor continuation	Potential overlap	Potential cumulative disturbance of canal-side soils and embankments. Controls and construction management measures are project-specific and localised.	No likely significant cumulative effect
Ashtown-Castleknock Greenway	None identified	Operational interaction only	Connected route	No construction overlap	Completed scheme forms part of receiving environment. No overlapping construction effects occur.	No cumulative effect

Table 11-22: Assessment of Potential Cumulative Effect Pathways

Potential Cumulative Effect	Projects Relevant	Assessment	Conclusion
Concurrent earthworks	DART+ West, Barnhill, Kellystown	Temporary increase in excavation activity across wider area. Effects remain site-specific.	Not significant
Demand for imported aggregates	All active construction projects	Increased demand for fill and aggregates may occur but supplies are sourced from established licensed suppliers.	Not significant
Disposal of excavated material	DART+ West, Barnhill, Kellystown	Shared use of recovery and disposal facilities possible. Existing authorised facilities serve large regional market.	Not significant
Disturbance of made ground	Barnhill, Kellystown	Effects confined to individual sites and receptors.	Not significant
Canal embankment works	KCC Greenway section	Effects are localised and managed independently within each project footprint.	Not significant

11.9 Monitoring

11.9.1 Construction Stage

Proposed monitoring during the construction phase in relation to the soil and geological environment are as follows:

- Adherence to the Construction Methodology Report (170239-DBFL-XX-XX-RP-C-003) and Outline Construction and Environment Management Plan (170239-DBFL-XX-XX-RP-C-004):
    - Responsibility: Contractor (Environmental Manager), audited by Employer's Representative.
    - Frequency: Weekly site inspections and monthly compliance audits.
    - Reporting / Action: Non-conformances recorded and corrective actions implemented.
- Construction monitoring of the works (e.g. inspection of existing ground conditions on completion of cut to road formation level in advance of placing capping material, stability of excavations, etc.):
    - Responsibility: Contractor (Site Foreman / Site Engineer / Geotechnical Specialist).
    - Frequency: Daily during excavation works and following significant rainfall events.

  - Reporting / Action: Records maintained on site and issues rectified before progressing works. Immediate action where instability, slippage or erosion is observed.

- Inspection of fuel / oil storage areas:
  - Responsibility: Contractor.
  - Frequency: Weekly formal inspections and daily visual checks by site staff.
  - Reporting / Action: Inspection records maintained. Defects rectified immediately.
- Monitoring cleanliness of adjacent road network, implementation of dust suppression and provision of vehicle wheel wash facilities:
  - Responsibility: Contractor.
  - Frequency: Daily during dry weather and during earthworks activities.
  - Reporting / Action: Additional suppression measures implemented where necessary.
- Monitoring of contractor's stockpile management (e.g. protection of excavated material to be reused as fill, protection of soils for removal from site from contamination):
  - Responsibility: Contractor.
  - Frequency: Weekly and after significant rainfall events.
  - Reporting / Action: Repair or replacement of protection measures where required.

11.9.2 Operational Stage

No ongoing monitoring is proposed on completion of the construction phase.

11.10 Difficulties Encountered

This assessment has been prepared using published geological mapping, historical mapping, site walkovers, available ground investigation information and the design information available at the time of assessment. While the information reviewed provides a sufficient basis for assessment of likely significant effects, a number of limitations and assumptions are acknowledged.

The primary source of site-specific subsurface information is the ground investigation undertaken between February and June 2020. Although no evidence of significant alteration of ground conditions within the study area has been identified from available information sources or site inspections, a period of approximately six years has elapsed between completion of the investigation and preparation of this EIAR. The assessment therefore assumes that the ground conditions identified during the 2020 investigation remain broadly representative of those currently present within the study area.

Environmental testing undertaken as part of the 2020 ground investigation was limited principally to pH and sulphate testing for assessment of concrete aggressivity. A comprehensive geochemical characterisation of soils, made ground and groundwater was not undertaken. Consequently, while no evidence of significant contamination was identified during the available investigations, the potential remains for previously unidentified contaminated or otherwise unsuitable material to be encountered during construction.

A geological fault is shown on published Geological Survey Ireland mapping approximately 165 m west of Porterstown Road. The available investigation data does not conclusively confirm the precise location, extent or characteristics of this feature. Accordingly, the assessment of potential effects

associated with the mapped fault has been based on published geological information and available ground investigation records.

A number of site walkovers were undertaken between 2020 and 2025 to inform the assessment. While these inspections have been used to verify baseline conditions, detailed records of all walkover dates are not available within this Chapter.

Notwithstanding the limitations described above, the available desk study information, published geological datasets, site investigations and walkover surveys are considered sufficient to characterise the baseline environment and to assess the likely significant effects of the Proposed Development on land, soils and geology. Additional site investigations, contamination testing and detailed geotechnical design assessments will be undertaken as required during the detailed design and construction stages of the Proposed Development.

11.11 Summary of Interactions

11.11.1 Air Quality & Climate

During the construction phase, construction dust emissions have the potential to impact air quality. Dust emissions will primarily occur as a result of site preparation works, earthworks and the movement of trucks on site and exiting the site. There is also the potential for engine emissions from site vehicles and machinery to impact air quality. Further details including any potential issues and mitigation measures are outlined in Chapter 5 (Air Quality).

11.11.2 Noise and Vibration

Development of the site will result in a level of noise and vibration related effects on the surrounding environment during the construction phase. An OCEMP has been developed. The mitigations proposed in the OCEMP will be developed further prior to construction in order to minimise the disturbance caused by construction activities and associated traffic. Further details including any potential issues and mitigation measures are outlined in Chapter 7 (Noise and Vibration).

11.11.3 Biodiversity

The removal of the existing topsoil layer will be required across the site as well as removal of some trees, vegetation, and hedgerows. Further details including any potential issues and mitigation measures are outlined in Chapter 8 (Biodiversity).

11.11.4 Water and Hydrology

Stripping of topsoil will result in exposure of the underlying subsoil layers to the effects of weather and construction traffic and may result in subsoil erosion and generation of sediment laden surface water runoff. During the construction phase a site-specific CEMP will manage site water and will mitigate the risk of surface contaminants infiltrating into the underlying geology and hydrogeology. Works are to be carefully coordinated with FCC and IFI to minimise disruption to the existing canal. Further details including any potential issues and mitigation measures are outlined in Chapter 12 (Water).

11.11.5 Traffic and Transport

Delivery of materials to site (e.g. aggregates for road construction, concrete for foundations, delivery of construction plant to site) and removal of excavated topsoil / subsoil will lead to potential impact on the surrounding road network. Further details including any potential issues and mitigation measures are outlined in Chapter 14 (Material Assets – Traffic and Transportation).

11.11.6 Waste Management

Oil, fuel etc. storage areas are to be decommissioned on completion of the construction phase. Any remaining liquids are to be removed from site and disposed of at an appropriate licensed facility.

Topsoil not being reused on site and excavated subsoil materials may be reused on another site as by-product (and not as a waste), this will be done in accordance with Regulation 27 of the EC (Waste Directive) Regulations (2011). Should reuse opportunities be unavailable such material will be removed

from site to a licenced waste receiving facility (subject to the approval of the facility operator in accordance with their facility permit or licence).

11.11.7 Utilities

Trench excavations to facilitate site service installation will result in exposure of subsoils to potential erosion.

11.12 References

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12 Water

12.1 Introduction

This Chapter of the Environmental Impact Assessment Report (EIAR) assesses and describes the likely significant effects, if any, which the Proposed Development will have on Hydrology during the construction phase and operational phase.

In accordance with the requirements of Directive 2011/92/EU of the European Parliament and of the Council of 13 December 2011 on the assessment of the effects of certain public and private projects on the environment) as amended by Directive 2014/52/EU (EIA Directive), this Chapter describes and assesses the likely direct and indirect significant effects of the Proposed Development on Hydrology. This Chapter also provides a characterisation of the receiving hydrological environment within the subject site of the Proposed Development and within a wider study area in the vicinity of the Proposed Development.

This chapter follows the Environmental Protection Agency (EPA) 'Guidelines on the Information to be contained in Environmental Impact Assessment Reports' (EPA, 2022). In addition, the document entitled 'Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes' by the Transport Infrastructure Ireland (TII, 2009, previously NRA) is referenced where the methodology for assessment of impact is appropriate. The description of the significance of effects on the hydrological environment is based on the standard EIAR "Description of Effects" table included in Chapter 1 of this EIAR. When describing the likely significant effects of the Proposed Development on Hydrology, this Chapter takes account of the quality, significance, extent, probability, duration, frequency and type of effect characteristic identified (in accordance with impact assessment criteria provided in the EPA Guidelines (2022) publication). The TII criteria for rating the magnitude and significance of impacts and the importance of hydrological attributes at the site during the EIA stage are also relevant in assessing the likely significant effects.

The objective of this assessment is to assess and evaluate the potential impacts of the Proposed Development on the hydrological aspects of the Subject Site (8.77ha) of the Proposed Development. The site is located within the Liffey and Dublin Bay Catchment (c. 1624 km^2) and lies between the Liffey_SC_100 and Tolka_SC_020 sub-catchments respectively. The bedrock aquifer underlying the majority of the Proposed Development is classified by GSI as a Locally Important Aquifer, with vulnerability ranging from Moderate to Extreme.

In assessing likely potential and predicted effects, account is taken of both the importance of the attributes and the predicted scale and duration of the likely effects on the receiving environment.

The Royal Canal Urban Greenway, hereafter referred to as the 'Proposed Development', is a pedestrian and cycle route approximately 8.1km in length to be constructed along and adjacent to the Royal Canal. The route extends eastwards from the Kildare County Boundary to the Old Navan Road, near the 12th Lock, where it will connect with the previously constructed Ashtown Greenway. Fingal County Council is the scheme promoter, in conjunction with the National Transport Authority as the funding body and Waterways Ireland as the principal property owner.

The Royal Canal links the River Shannon in County Longford to the River Liffey in Dublin City's Docklands. It passes close to a number of towns, including Mullingar, Kilcock, Maynooth and Leixlip, before entering Fingal where it passes through the built-up areas of Clonsilla, Coolmine, Castleknock and Blanchardstown on its way towards Dublin city.

The Proposed Development will provide a continuous, high-quality active travel corridor serving the communities of Clonsilla, Coolmine, Castleknock and Blanchardstown and will improve accessibility to schools, public transport, employment centres, recreational amenities and local services. The scheme will encourage a modal shift towards walking and cycling, while supporting recreation, health and

wellbeing, sustainable transport objectives and climate action policies at national, regional and local level.

A full description of the Proposed Development is outlined in Chapter 2 'Background to the Scheme' of this EIAR.

The Proposed Development is divided into three sections as follows – and as generally indicated in Figure 12-1:

- Section 1 – Kildare County Border to Hansfield Railway Bridge (Ch. 0000 – 3200)
- Section 2 – Hansfield Railway Bridge to Kennan Bridge (Ch. 3200 – 5300)
- Section 3 – Kennan Bridge to Talbot Bridge (Chainage 5300 – 8100)

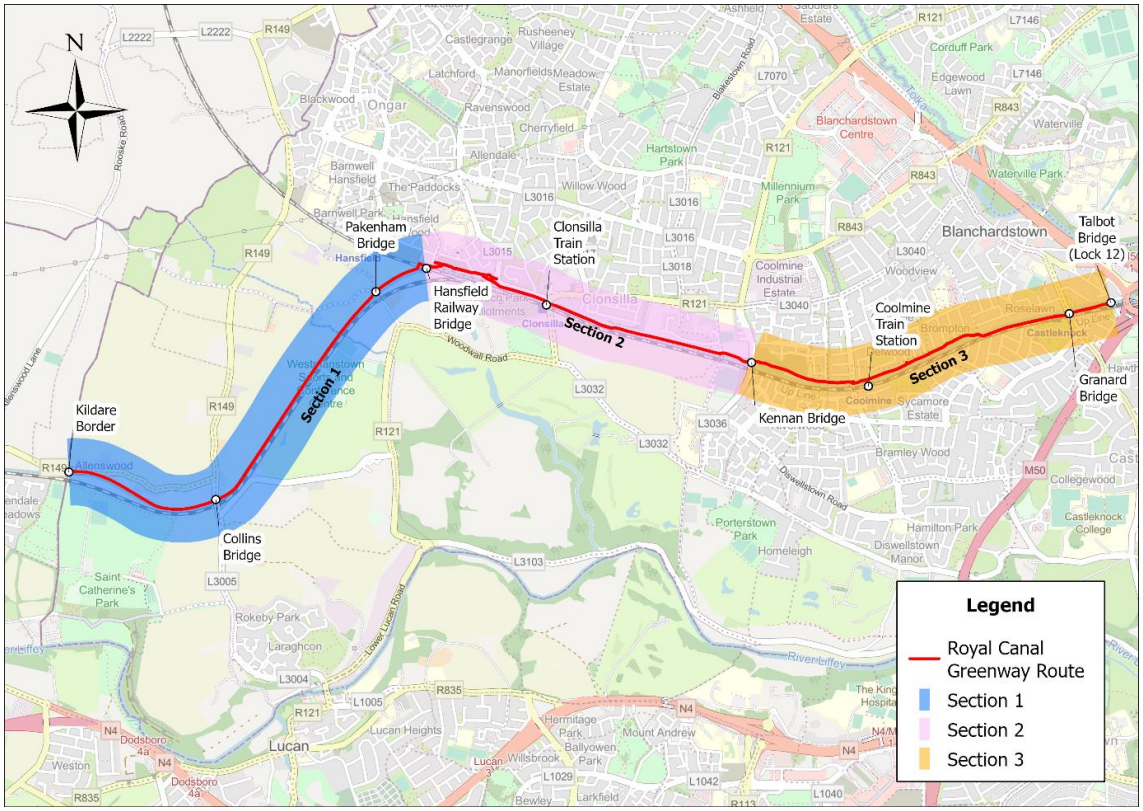


Figure 12-1 Study Area Sections

The Royal Canal runs alongside the Proposed Development, and it discharges into the River Liffey downstream of the Proposed Development. In addition, there is one other watercourse in the direct vicinity of the scheme, as noted above, being the Rusk River/Watercourse which is a tributary of the River Liffey. The Rusk River traverses the Royal Canal via a culvert. The Rusk River, which runs through Luttrellstown Golf Course downstream of the culvert crossing below the Royal Canal. An artificial lake within the Luttrellstown Golf Course, into which the Rusk River flows, located c. 535m from the Proposed Development at its closest point. An outlet from this lake discharges back into the Rusk River.

There are a number of surface water drainage networks in the vicinity of the Proposed Development. In general the infrastructure follows existing roads and therefore primarily traverses the Proposed Development at the bridge crossings and junctions, with the exception of a number of standalone crossings and outfalls directly into the canal.

The purpose of the drainage design has been to replicate, and improve upon where practicable, the existing situation. Surface water runoff from the proposed unbound and bituminous flexible pavement

and concrete surfaced sections of the greenway (including boardwalks) will generally run over the edge and soak naturally to the underlying soil or to a filter drain for treatment and storage. The raised section of bridges will drain off to the underlying soil or canal. Drainage types such as Filter Drainage and Over the Edge Drainage have taken precedence over piped systems given the lack of opportunities to connect to existing piped drainage networks – although piped drainage was required in certain scenarios, such as linear drainage channels and piped outfalls. The Drainage layouts can be found on DBFL drawings, 170239-X-05-X-XXX-DR-DBFL-CE-1301 to CE-1305.

12.1.1 Impact Assessment - Scope of Works

The report identifies and assesses the potential effects on the following:

- Existing natural drainage patterns;
- Runoff rates and volumes;
- Flooding and impediments to flows;
- Water quality of receiving waters;
- Aquifer systems and their vulnerability.

To quantifiably assess the preceding, this chapter will:

- Outline relevant policy and legislation relating to the water environment.
- Provide a description of the baseline environment and identify sensitive receptors.
- Identify potential effects, including potential cumulative effects.
- Assess the significance of any adverse impacts and resulting effects based on the magnitude of the impact and the sensitivity of the receptors.
- Outline detailed mitigation measures where required.
- Provide a residual impact assessment.

12.1.2 European, National and Regional Policy

Key European and National legislative policy relevant to this assessment are contained within

Table 12-1.

Table 12-1: Key Legislation

Policy	Legislation
EU	Directive 2011/92/EU of the European Parliament and of the Council of 13 December 2011 on the assessment of the effects of certain public and private projects on the environment as amended by Directive 2014/52/EU (EIA Directive).
	Directive 2000/60/EC establishing a framework for Community action in the field of water policy (as amended) (Water Framework Directive)
	Floods Directive (2007/60/EC)
	Groundwater Directive (2006/118/EC)
	Environmental Quality Standards Directive (2008/105/EC)
	Urban Waste Water Treatment Directive (91/271/EEC)
	Directive 2004/35/EC of the European Parliament and of the Council of 21 April 2004 on environmental liability with regard to the prevention and remedying of environmental damage (as amended) (Environmental Liability Directive)
National	Climate Action Plan 2025
	Planning and Development Regulations 2001 (S.I. No. 600 of 2001) (as amended)
	European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018 (S.I. No. 296 of 2018).
	Local Government (Water Pollution) Acts 1977 - 2007
	European Communities Environmental Objectives (Surface Waters) Regulations 2009 (S.I. No. 272 of 2009) (as amended)
	European Communities Environmental Objectives (Freshwater Pearl Mussel) Regulations 2009 (S.I. No. 296 of 2009)
	Planning and Development Act 2024 (No. 34 of 20024); where commenced and applicable
	European Union (Water Policy) Regulations 2003 to 2025.
	European Communities Environmental Objectives (Groundwater) Regulations 2010 (S.I. No. 9 of 2010), as amended, including the European Union Environmental Objectives (Groundwater) (Amendment) Regulations 2025..
	Roads Act, 1993 (as amended)
	Roads Regulations 1994 (as amended) (S.I. No. 119 of 1994)

In addition, other regional and leading supplementary industry guidance referred to as part of this assessment are as follows in

Table 12-2:

Table 12-2: Key Supplementary Guidance

Body	Guidance
Transport Infrastructure Ireland (TII)	Water Impact Assessment for National Roads, Light Rail, Metro and Rural Cycleways – Overarching Technical Document (PE-ENV-01202)
	Environmental Impact Assessment of National Road Schemes – A Practical Guide (TII PE-ENV-01114)
	Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes (TII PE-ENV-01116)
	Guidelines for The Crossing of Watercourses During the Construction of National Road Schemes (TII CC-ENV-01101)
	Guidelines for the Creation, Implementation and Maintenance of an Environmental Operating Plan (NRA, 2025)*
	Road Drainage and the Water Environment (TII DN-DNG-03065)
	Design of Earthworks Drainage, Network Drainage, Attenuation & Pollution Control (TII DN-DNG-03066)
	Drainage Design for National Road Schemes - Sustainable Drainage Options (TII RE-CPI-07001)
	Drainage Systems for National Roads (TII DN-DNG-03022)
Office of Public Works (OPW)	The Planning System and Flood Risk Management Guidelines for Planning Authorities (OPW, 2009)
	OPW Flood Hazard Mapping and CFRAM datasets
Environmental Protection Agency (EPA)	Guidelines On The Information To Be Contained In Environmental Impact Assessment Reports (EIAR) (EPA, 2022)
	Guidance on the Authorisation of Discharges to Groundwater (EPA, 2011)
Department of Housing, Local Government and Heritage	River Basin Management Plan 2022- 2027
	Nature-Based Management of Urban Rainwater and Urban Surface Water Discharges - A National Strategy (2024)
	Nature-based Solutions to the Management of Rainwater and Surface Water Runoff in Areas - Water Sensitive Urban Design Best Practice Interim Guidance Document
Inland Fisheries Ireland (IFI)	Guidelines on protection of fisheries during construction works in and adjacent to waters (Inland Fisheries Ireland 2016)
CIRIA	The SUDS Manual (CIRIA C753)
	Control of Water Pollution from Construction Sites. Guidance for Consultants and Contractors (CIRIA C532)
	Control of Water Pollution from Linear Construction Sites (CIRIA C648)
	Development and Flood Risk – Guidance for the Construction Industry (CIRIA 624)
	The Control of Water Pollution from Construction Sites. Guidance for Consultants and Contractors (C532) (2001)
	Environmental Good Practice on Site Guide (C741) (2015)
Dublin City Council (DCC)	The Greater Dublin Strategic Drainage Study [GDSDS] (Dublin City Council et al., 2005)
Fingal County Council (FCC)	Fingal County Council (FCC) Development Plan 2023-2029 (https://www.fingal.ie/planningservices)
Institute of Geologists Ireland (IGI)	Guidelines for Preparation of Soils, Geology & Hydrogeology Chapters in Environmental Impact Statements. (2013) – referred to herein as the 'IGI Guidelines'.
Environment Agency (UK) EA	GPP 5: Works and Maintenance in or near Water (UK Guidance Note)

*The NRA merged with the Railway Procurement Agency and was effectively dissolved on 1 August 2015. The merger of the two agencies is called Transport Infrastructure Ireland (TII). As a result, all previous NRA documents are now referred to as TII documents.

The water framework directive requires all EU Member States to protect and improve water quality in all waters so that we achieve good ecological status by latest 2027. The Directive requires that River Basin Management Plans (RBMP) be established as a structured management tool for the same.

RBMPs are plans RBMPs are plans to protect and improve the water environment. They are prepared and reviewed every six years. The first RBMPs covered the period 2010 to 2015. The second cycle plan covers the period 2018-2021 and was published by the government on 17 April 2018. A public consultation on the draft RBMP for the period 2022-2027 was opened on 28 September 2021. Building on the work of the previous two Plans, the next RBMP will again set out the actions that Ireland will take to protect and improve water quality.

12.2 Assessment Methodology

This assessment has been undertaken using a qualitative assessment based on experienced professional judgement and assessment of compliance with statutory and industry guidance, including a number of site visits.

12.2.1 Study Area

The study area chosen for assessment is described in the TII guidance document (PE-ENV-01202) as a Zone of Influence (ZOI). It is recommended that the ZOI be chosen at an offset of 500m from the site extents, in this case the Redline boundary. Figure 12-2 below shows the red line boundary for the Proposed Development.



Figure 12-2 Proposed Development Red Line Boundary

12.2.2 Desktop Study

The desktop study involved collation and assessments carried out in the study area detailed in Figure 12-1. Relevant information from the following information sources were used to establish baseline conditions:

- Mapping and aerial photography to assess land usage on the site and its environs and to identify water features and watercourse catchments
- Site surveys including topographic, underground utilities, orthophotography and site geotechnical investigations
- Utility & Local Authority infrastructure record drawings
- EPA Geo Portal (https://gis.epa.ie/EPAMaps/)
- Office of Public Works National Flood Hazard Mapping (http://www.floodinfo.ie/).
- Water Quality Monitoring Databases and Reports. (https://gis.epa.ie/EPAMaps/Water)
- Information of the hydrology and drainage of the study area from EPA (www.epa.ie)

- Geological Survey Ireland Data Viewer (https://www.gsi.ie)

12.2.3 Site Surveys

Site surveys relevant to the assessment of water, hydrology and hydrogeology were undertaken within the study area. These included site inspections, ecological surveys undertaken for the Biodiversity assessment, review of drainage infrastructure, and other field investigations undertaken as part of the design and environmental assessment process.

12.2.4 Water Framework Directive Assessment

A Water Framework Directive (WFD) Assessment [257501.0270WR01] has been prepared for the Proposed Development and forms part of the planning documents submitted.

The overall objective of this WFD assessment is to determine if any specific components or activities associated with the Proposed Development will compromise WFD Article 4 objectives, cause a deterioration in the status of any surface water or groundwater body and/or jeopardise the attainment of good surface water or groundwater status.

This assessment also aims to identify any waterbodies with the potential to be impacted, describe the proposed mitigation measures if required and define any residual potential impacts.

The risk based WFD assessment determined that, in the absence of mitigation, certain construction activities could give rise to potential pathways to the receiving surface water and groundwater environment. With the implementation of the standard design embedded measures and the construction and operational phase mitigations outlined in this report, no deterioration of status will occur in any hydrologically connected waterbody.

Accordingly, the Proposed Development will not affect compliance with the EU Water Framework Directive, the European Communities (Environmental Objectives) (Surface Waters) Regulations 2009 (S.I. No. 272 of 2009, as amended), or the European Communities (Environmental Objectives) (Groundwater) Regulations 2010 (S.I. No. 9 of 2010, as amended).

WFD Article 4 Objectives:

The assessment demonstrates that the Proposed Development adheres to the Article 4 objectives of the WFD. The Proposed Development will not cause deterioration in the status of any hydrologically connected waterbody and will not compromise the objective to achieve good status or good ecological potential. Applying the precautionary principle and a worst case scenario, no adverse effects on the status of surface water or groundwater bodies have been identified.

The incorporation of Sustainable Drainage Systems (SuDS) and appropriate management of construction and operational stage runoff will prevent deterioration and maintain high status where it exists, while contributing to the progressive reduction of pollution in line with WFD objectives.

Since none of the Article 4(7) conditions are triggered, no Article 4(7) derogation assessment is required, and the Proposed Development may be authorised in accordance with the WFD.

The assessment also confirms that waterbodies associated with Protected Areas will not be subject to significant adverse effects, and the Proposed Development does not conflict with the environmental objectives set for such areas. Overall, the Proposed Development is fully compliant with the WFD objectives and supports the overarching goal of achieving good status by 2027 while maintaining the integrity of the water environment.

12.2.5 Scoring Matrix for Impact Assessment

Impact assessment has been carried out with reference to the, EPA's "Guidelines On The Information To Be Contained In Environmental Impact Assessment Reports (May 2022)" & the TII "Water Impact Assessment for National Roads, Light Rail, Metro and Rural Cycleways - Overarching Technical Document, Dec 2025)".

The significance of the identified potential impacts is acknowledged by the combination of the sensitivity of the receptor and the magnitude of the potential impact.

Receptor Sensitivity

The sensitivity of the receiving environment has been categorised on a scale from “high” to “negligible” as defined in Table 12-3. This has been informed by descriptions tabulated in TII Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes (Table 3.1). Sensitivity criteria have been based on:

- Vulnerability of a receptor to a particular pressure (degree of environmental response to any particular impact); and

- The ‘value’ of the receptor (e.g. an area of international importance should be considered more sensitive to the impact than an area of little or no conservation value.

Table 12-3: Receptor Sensitivity TII PE-ENV-01202 – Table 3.1, (2025)

Value and Criteria	Hydrological Examples	Hydrogeological Examples	Flood Risk Examples
Very High Receptor has a high quality or value on a regional, national, or international scale	River, wetland or surface water body protected by EC legislation (e.g., 'European sites' designated under the Habitats Regulations such as SAC, SPA, or Ramsar sites, or 'Salmonid waters' designated under the European Communities (Quality of Salmonid Waters) Regulations,1988), or national habitat legislation (e.g. ASSI (transboundary), Natural Heritage Areas (NHA), Drinking Water Protection Areas). A watercourse or surface water feature (with hydrological importance, or as a result of water quality) which supports sensitive and protected ecosystems of national importance7; No or limited anthropogenic pressures on the waterbody not significantly affecting the aims of the WFD.8 • Regionally important potable water source.	Groundwater supports river, wetland or surface water body ecosystem protected by EU legislation (e.g. SAC or SPA status) or national legislation (e.g. NHA or ASSI (transboundary) status). A groundwater body of hydrogeological importance to a habitat of very high value. Groundwater provides significant baseflow to very high value surface water body. Inner source protection area for regionally important water source.	Essential infrastructure or highly vulnerable development
High Receptor has a high quality or value on a local or county scale	Locally important potable water source supplying a larger number of homes. A watercourse or surface water feature (with hydrological importance, or as a result of water quality) which supports sensitive and protected ecosystems of local importance.	Regionally Important Aquifer Locally important potable water source. Outer source protection area for regionally important water source. Inner source protection area for locally important water source. Groundwater provides significant baseflow to high value surface water body	More vulnerable development

Value and Criteria	Hydrological Examples	Hydrogeological Examples	Flood Risk Examples
Medium Receptor has a medium quality and rarity	Coarse fishery. Potable water source supplying a smaller number of homes. A watercourse or surface water feature with some but limited hydrological or water quality importance to protected ecosystems, or habitat of medium value.	Locally Important Aquifer. Outer source protection area for locally important water source. Water source supplying large scale agriculture or industry. • Potable water source with 'moderate' or 'low' yield. A groundwater body of hydrogeological importance to a habitat of medium value. Groundwater provides significant baseflow to medium value surface water body.	Less vulnerable development
Low to Negligible Receptor has a low or no quality or value on a local scale	Designated as a Heavily Modified Water Body (HMWB) or Artificial Water Body (AWB). Water source (e.g. for agricultural use) supplying a very small number of homes. Fish sporadically present or restricted; no species of conservation concern. A watercourse with minimal hydrological importance to sensitive or protected ecosystems.	Poor Bedrock Aquifer with minimal abstractions. A groundwater body which makes minimal contribution to sensitive or protected ecosystems.	Water compatible development

Impact Magnitude

The Impact Magnitude of an effect is a function of its extent, intensity, complexity, probability, duration, frequency and reversibility as depicted in Table 12-4 below.

Table 12-4: Categories for describing effects (TII, PE-ENV-01202 – Table 3.2, 2025)

Magnitude	**Category**						
	Extent	**Intensity**	**Complexity**	**Probability**	**Duration**	**Frequency**	**Reversibility**
Very High	Widespread	Intense	Complex	Likely	Long-term	Often	Permanent
High							
Medium							
Low							
Negligible	Localised	Mild	Simple	Unlikely	Momentary	Rare	Temporary

Typical descriptions of effects of different magnitudes are provided for receptors in Table 12-5. These examples are not exhaustive and are provided as a guide to what types of impact would result in a specific magnitude.

Table 12-5 Impact Magnitude Criteria (TII, PE-ENV-01202 – Table 3.3, 2025)

Magnitude of Impact	Criteria	Hydrological example	Hydrogeological example	Flood risk example of effect
Very High Major alteration to, or complete loss of, a receptor. Effects likely to be widespread, considered permanent and irreversible.	Negative Effect	Total loss of fishery. Total loss of amenity value. Total loss of a surface water dependent ecosystem. Reduction in WFD status. Contribution to failure to achieve water body WFD status of good.	Total loss of aquifer. Changes to aquifer or zone of contribution resulting in total loss of existing water supply springs and wells, river baseflow or GWDTEs. Impact affects groundwater body and WFD status.	
High Notable permanent or longer-term change to a receptor.	Negative Effect	Extensive loss of fishery. Extensive reduction in amenity value. • Notable change of a surface water dependent ecosystem. In relation to Road projects specifically: • Failure of both soluble and sediment-bound pollutants in HEWRAT (Method A, Annex I) and compliance failure with relevant standard (Method B). • Calculated risk of serious pollution incident >2% annually10.	Removal of large proportion of aquifer. Changes to aquifer or zone of contribution resulting in extensive change to existing water supply springs and wells, water quality, river baseflow or GWDTEs. Potential high risk of pollution to groundwater from routine run-off. In relation to Road projects specifically: • Calculated risk of serious pollution incident >2% annually10.	Increase in predicted peak flood level >100mm.
	Positive Effect	WFD surface water ecological or chemical status increases or contribution to maintenance of good status. Increase in productivity or size of fishery.	WFD groundwater qualitative or quantitative status increase or contribution to maintenance of good status.	Creation of flood storage and reduction in predicted peak flood level >100mm.

Magnitude of Impact	Criteria	Hydrological example	Hydrogeological example	Flood risk example of effect
Medium	Negative Effect	Partial loss of fishery. Impact affects waterbody, but no effect on the WFD status. In relation to Road projects specifically: • Failure of both soluble and sediment-bound pollutants in HEWRAT (Method A, Annex I) but compliance with relevant standard values. • Calculated risk of serious pollution incident >1% annually10 • Partial reduction in amenity value.	Removal of moderate proportion of aquifer. Changes to aquifer or zone of contribution resulting in moderate change to existing water supply springs and wells, water quality, river baseflow or GWDTEs. Impact affects groundwater body, but no effect on the WFD status. • Potential medium risk of pollution to groundwater from routine run-off. In relation to Road projects specifically: • Calculated risk of serious pollution incident >1% annually10.	Increase in predicted peak flood level of 50-100mm.
	Positive Effect	Measurable increase in surface water ecological or chemical quality or flow with potential for WFD element status to be improved. In relation to Road projects specifically: • Calculated reduction in pollution risk of 50% or more where existing risk is >1% annually10.	Measurable increase in the yield or quality of an aquifer, benefitting existing users, with potential for WFD element status to be improved. In relation to Road projects specifically: • Calculated reduction in pollution risk of 50% or more where existing risk is >1% annually10.	Creation of flood storage and reduction in predicted peak flood level >50mm.
Low Minor short- or medium-term change over a restricted extent or a minor permanent change in a receptor.	Negative Effect	Minor loss of fishery. Slight reduction in amenity value. Impact does not affect waterbody, and WFD status remains unchanged. In relation to Road projects specifically: • Failure of either soluble or sediment-bound pollutants in HEWRAT.	Removal of small proportion of aquifer. Changes to aquifer or zone of contribution resulting in minor change to water supply springs and wells, water quality, river baseflow or ecosystems. Impact does not affect groundwater body, and WFD status remains unchanged. Potential low risk of pollution to groundwater from routine run-off. • In relation to Road projects specifically:	

Magnitude of Impact	Criteria	Hydrological example	Hydrogeological example	Flood risk example of effect
		• Calculated risk of serious pollution incident >0.5% annually10 .	• Calculated risk of serious pollution incident >0.5% annually10 .	
	Positive Effect	Measurable increase in surface water ecological or chemical quality or flow, not affecting or changing WFD element status. In relation to Road projects specifically: • Calculated reduction in pollution risk of 50% or more where existing risk is	Measurable increase in yield or quality of aquifer, not affecting existing users or changing WFD element status. In relation to Road projects specifically: • Calculated reduction in pollution risk of 50% or more where existing risk is	Creation of flood storage and reduction in predicted peak flood level >10mm.
Negligible Minor momentary change over a localised extent or imperceptible change to a receptor.	Negative Effect	In relation to Road projects specifically: • Calculated risk of serious pollution incident. • No risk identified by HEWRAT (Pass both soluble and sediment-bound pollutants).	In relation to Road projects specifically: • Calculated risk of serious pollution incident.	Negligible change in predicted peak flood level.

Impact Significance

The significance of the identified potential impacts is acknowledged by the combination of the magnitude of the potential impact (**Error! Reference source not found.**) and sensitivity of the receptor (Table 12-3). The generalised significance terms used in this assessment is in line with the EPA guidance reproduced in Figure 12-3 below

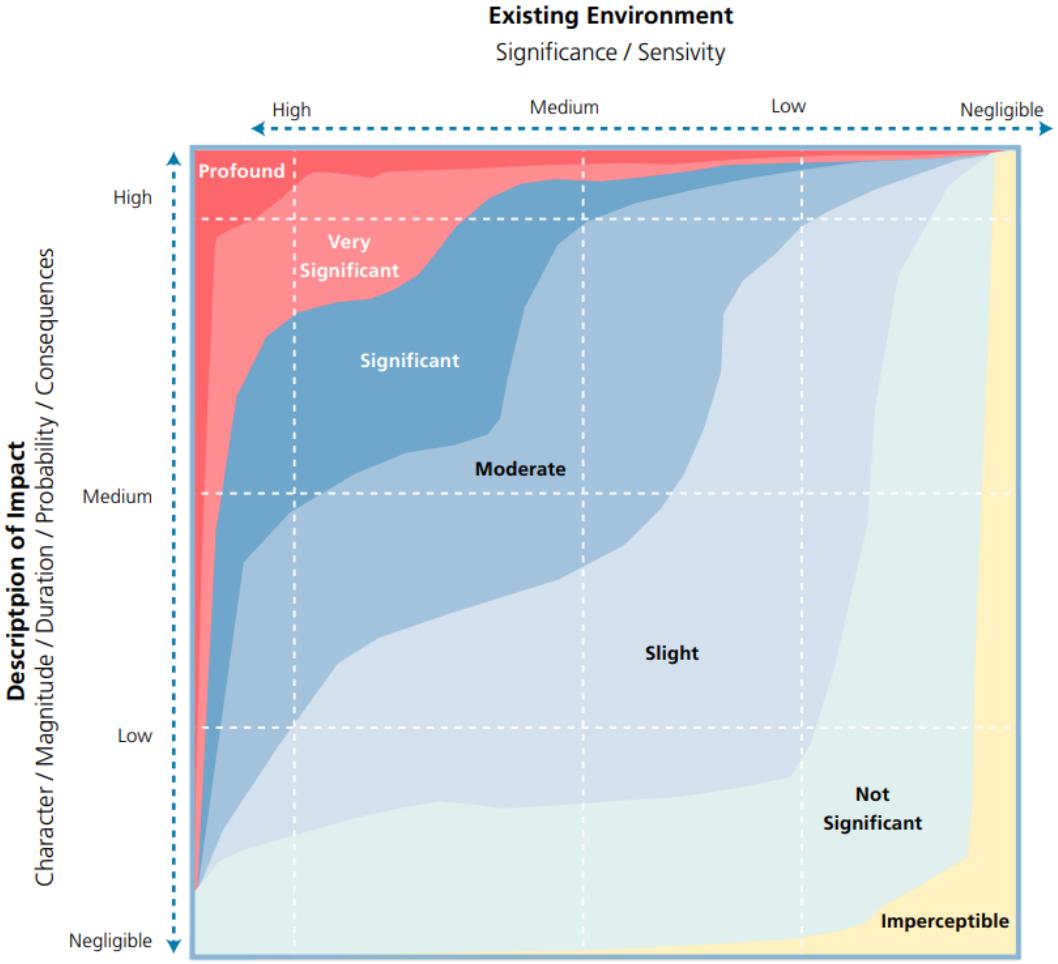


Figure 12-3: Significance Effect Matrix

In addition to significance, the effect on the receiving environment may be Positive, Neutral or Adverse.

12.3 Baseline Environment

12.3.1 Hydrological Setting

The Royal Canal Urban Greenway lies entirely within the Liffey and Dublin Bay Catchment (09). The study area affects two primary hydrological sub-catchments. The western portions of the scheme (approx. 5.7km) are within the “Liffey” Sub-catchment (Liffey_SC_100) associated with the River Liffey (EPA Ref: IE_EA_09L012350). While the eastern portions (approx. 2.4km) are within the “Tolka” sub-catchment (Tolka_SC_020) associated with the Tolka River (EPA Ref: IE_EA_09T011000). The Proposed Development does not cross either the River Liffey or the Tolka River, but is traversed by the Rusk Watercourse (EPA Ref: IE_EA_09L012350), which joins the River Liffey downstream of the Proposed Development. Both the River Liffey and the Tolka River discharge to the Irish Sea at Dublin Bay, with the Tolka River discharging into the South Dublin Bay and River Tolka Estuary SPA. These networks are shown in Figure 12-4.

For further context of the Proposed Development in relation to sensitive environments refer to Chapter 8: Biodiversity of this EIAR and Appropriate Assessment report (HMK-JBAI-XX-XX-RP-BD-0001-S3-P07) submitted alongside this EIAR.

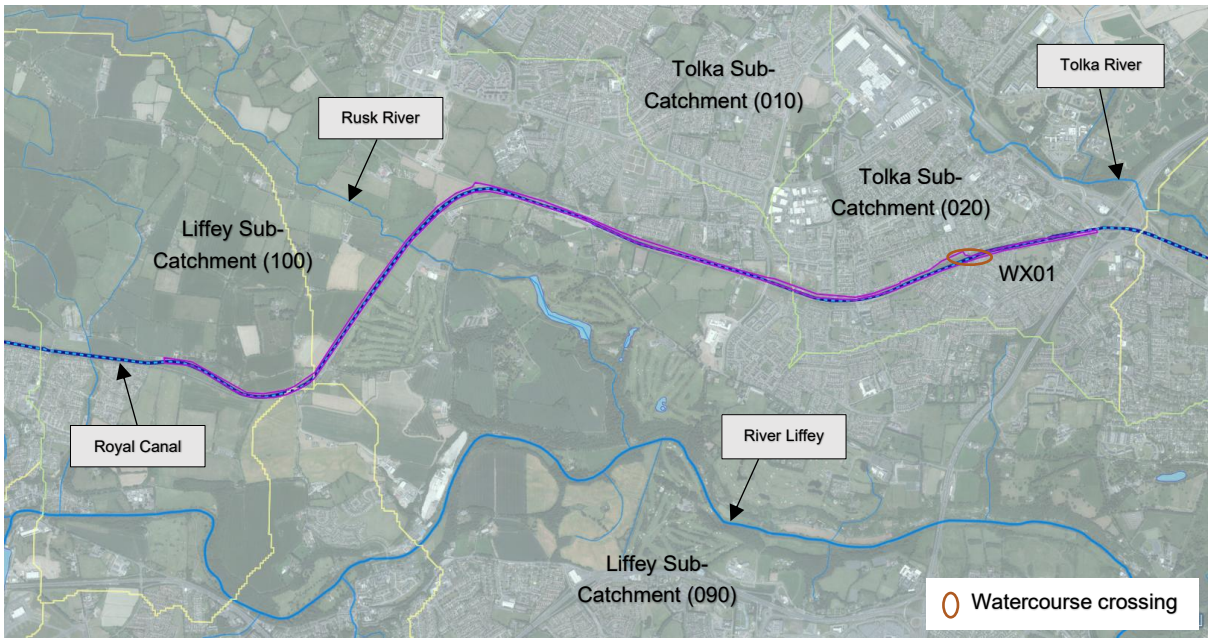


Figure 12-4: Hydrological Catchments (Source: https://gis.epa.ie/EPAMaps/default)

The baseline environment with regards to hydrogeological setting for the site was obtained from the GSI (2020) online mapping databases for Groundwater Aquifers and Groundwater Vulnerability is set out in Chapter 13 Lands, Soils, Geology, and Hydrogeology of this EIAR.

12.3.2 Watercourses

The Royal Canal (IE_09_AWB_RCMLE) (Royal Canal Main Line (Liffey and Dublin Bay)) is the closest surface waterbody to the Proposed Development, running alongside the scheme, and it discharges into the River Liffey approximately 10km downstream of the eastern end of the Proposed Development.

In addition, there is one other watercourse in the direct vicinity of the scheme, as noted above, being the Rusk River/Watercourse which is a tributary of the River Liffey. The Rusk River, which runs through Luttrellstown Golf Course downstream of crossing the Proposed Development. The river crosses below the Royal Canal and the Maynooth Railway through a culvert. An artificial lake within the Luttrellstown Golf Course, into which the Rusk River flows, located c. 535m from the Proposed Development at its closest point. An outlet from this lake discharges back into the Rusk River. The Water Framework Directive (**2000/60/EC)** ("WFD") status 2010-2012 for the Rusk River is 'Unassigned'. There are no monitoring stations downstream of the Proposed Development on the River Rusk. The main local hydrological features are presented in Figure 12-4.

The Proposed Development will require a new crossing of the Royal Canal, referred to as the 'Landmark Bridge'. The steel Landmark Bridge will be approximately 185m in length and will have a max single span of 30m across the Royal Canal itself. The foundation arrangement shall comprise appropriately sized piled foundations to the dense sands and gravels or bedrock where available, outside of the extents of the Royal Canal. Further information on how this will be constructed is provided in the Construction Methodology Report (170239-DBFL-XX-XX-RP-C-0003) for the Proposed Development which has been submitted as part of the planning documentation.

EPA mapping indicates that the Liffey and Tolka sub-catchments are not designated Salmonid watercourses (https://gis.epa.ie/geonetwork/srv/eng/catalog.search - /metadata/0200389b-61d5-4c57-a8ac-abb88402cdb8).

12.3.3 Drainage and Water Supply Networks

There are surface water drainage sewers in the vicinity of the Proposed Development throughout the overall area and, in some cases, identified in the utility survey information. In general, the drainage / surface water infrastructure follows existing roads and therefore primarily traverses the Proposed Development at the bridge crossings and junctions, with the exception of a number of standalone crossings and outfalls directly into the canal. The potential interactions identified are listed in Table 12-6.

Table 12-6: Potential Surface Water Drainage Network Interactions

Location	Chainage	Description
South of Pakenham Bridge	+2460	• 1000mm diameter storm drain (culverted beneath canal)
West of Callaghan Bridge	+3580	• 300mm diameter outfall to canal
West of Callaghan Bridge	+3640 to 3750	• 1500mm diameter storm drain (assumed to be culverted beneath canal)
Kennan Bridge	+5340	• 1 no. 225mm diameter storm drain
Kirkpatrick Bridge	+6250	• Multiple 150mm to 225mm diameter storm drains
Talbot Bridge	+8100	• 1 no. 1200mm diameter storm drain

There are foul water drainage sewers in the vicinity of the Proposed Development throughout the overall area and, in some cases, identified in the utility survey information. In general, the infrastructure follows existing roads either side of the Royal Canal (and generally outside the Proposed Development extents) with one crossing over the canal at Granard Bridge. The potential interactions identified are listed in Table 12-7.

Table 12-7: Potential Foul Water Drainage Network Interactions

Location	Chainage	Description
West of Callaghan Bridge	+3930 to +4115	• 1 no. 450mm diameter foul drain
Callaghan Bridge	+4115	• 1 no. 300mm diameter foul drain • 1 no. 375mm diameter foul drain
West of Granard Bridge	+7820	• 1 no. 525mm diameter foul drain

There are Uisce Éireann watermains in the vicinity of the Proposed Development throughout the overall area and, in some cases, identified in the utility survey information. In general, the infrastructure follows existing roads and therefore primarily traverses the Proposed Development at the bridge crossings and junctions, with the exception of some standalone crossings. The potential interactions identified are listed in Table 12-8.

Table 12-8: Potential Watermain Network Interactions

Location	Chainage	Description
West of Collins Bridge	+0820	• 2 no. 1000mm diameter watermain (assumed to be crossing beneath canal – not oversailing)
Collins Bridge	+1090	• Multiple 100mm - 200mm diameter watermains
Pakenham Bridge	+2875	• 1 no. 100mm diameter watermain • Multiple undefined watermain
West of Callaghan Bridge	+3570	• 2 no. 1000mm diameter watermain (assumed to be oversailing canal)
Callaghan Bridge	+4115	• 1 no. 5” diameter watermain
Kennan Bridge	+5340	• 1 no. 4” diameter watermain
Dr Troy Bridge	+5550	• Multiple 150mm to 200mm diameter watermain* *[not identified on GPR survey – assumed to be within bridge structure oversailing the scheme]
Along Sheepmore Lane	+6000 to +6250	• 1 no. 3” diameter watermain

Location	Chainage	Description
Kirkpatrick Bridge	+6250	• 1 no. 4" diameter watermain
Granard Bridge	+7790	• 1 no. 9" diameter watermain
Talbot Bridge	+8100	• 1 no. 12" diameter watermain

12.3.4 Water Quality

EPA Q Value

The Environmental Protection Agency (EPA) undertakes biological monitoring of rivers and streams throughout Ireland as part of its Water Framework Directive (WFD) monitoring programme. Biological water quality is assessed using the EPA Q-value classification system, which is based on the composition and abundance of aquatic macroinvertebrate communities present within a watercourse.

EPA Q-values (biotic indices) are derived from biological sampling undertaken at monitoring stations (see **Error! Reference source not found.**). The assigned Q-value reflects the relative abundance of pollution-sensitive and pollution-tolerant macroinvertebrate species and provides an indication of the biological water quality and ecological condition of a watercourse. Q-values contribute to the assessment of ecological status under the WFD. Refer to Table 12-9 for the EPA Q-value classification scale and associated water quality interpretation.

Table 12-9: Q Value Biotic Indices – Interpretation as of 2025

*(https://epawebapp.epa.ie/qvalue/webusers/?_gl=1*tg7yw3*_ga*Njc5MTAzNjQwLjE3MjEyMTI0MDc.*_ga_TPK2CK9KEX*czE3ODg0NDUyMzAkbzc3JGcxJHQxNzg4NDQ4MzE5JGoxJGwwJGgw)*

Q Value	WFD Status	Pollution Status
Q5, Q4-5	High	Unpolluted
Q4	Good	Unpolluted
Q3-4	Moderate	Slightly polluted
Q3, Q2-3	Poor	Moderately polluted
Q2, Q1-2, Q1	Bad	Seriously polluted

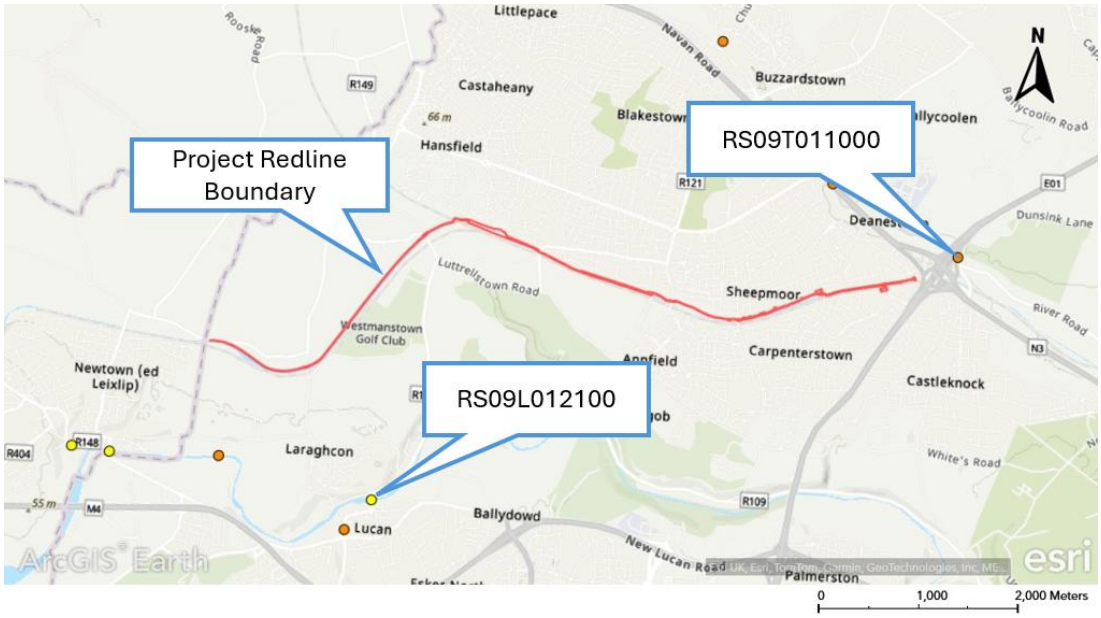


Figure 12-5: Water Quality Monitoring Stations (Source: gis.epa.ie)

Q-Value data is available for the River Liffey upstream of the proposed development, and for the Tolka River downstream of the proposed development, refer to Table 12-10 and Figure 12-5 for results.

Table 12-10: EPA Water Quality Monitoring Q-Rating Values as of 2025

(https://gis.epa.ie/EPAMaps/)

Waterbody	Station	Location E/N	Year	EPA Q-Rating
River Liffey	RS09L012100 (upstream)	303497.53 / 235516.95	2025	3-4 (Moderate)
Tolka River	RS09T011000 (downstream)	309219.66 / 238385.22	2025	3 (Poor)

12.3.5 Water Framework Directive

WFD Classification - Surface Water Bodies

The Water Framework Directive (2000/60/EC) establishes a framework for the protection and improvement of surface water and groundwater bodies throughout Europe. Waterbodies are assigned an ecological status (or ecological potential in the case of artificial or heavily modified waterbodies) and a chemical status.

The Royal Canal is classified as an artificial waterbody and is therefore assessed against ecological potential. The objective for artificial waterbodies is to achieve and maintain Good Ecological Potential and Good Chemical Status.

Current Water Framework Directive classifications and objectives for waterbodies within the vicinity of the Proposed Development have been reviewed as part of this assessment. A detailed Water Framework Directive Assessment has been undertaken to assess the potential for the Proposed Development to result in deterioration in the status or potential of any waterbody, or to compromise the achievement of Water Framework Directive objectives. The findings of that assessment are presented in the accompanying Water Framework Directive Assessment Report, which should be read in conjunction with this chapter.

Current Water Framework Directive classifications for a number of relevant River waterbodies and artificial (Heavily Modified Waterbodies (HMW)) waterbodies within the vicinity of the Proposed Development are presented in Table 12-11 and Figure 12-6.

Table 12-11: WFD Surface Water Classifications as of 2025 (https://gis.epa.ie/EPAMaps/)

Waterbody	European Code	Status	Assessment Technique
River Liffey	IE_EA_09L012350	Poor	Modelling
Tolka River	IE_EA_09T011000	Poor	Monitoring
Royal Canal Main Line	IE_09_AWB_RCMLE	Good	Monitoring

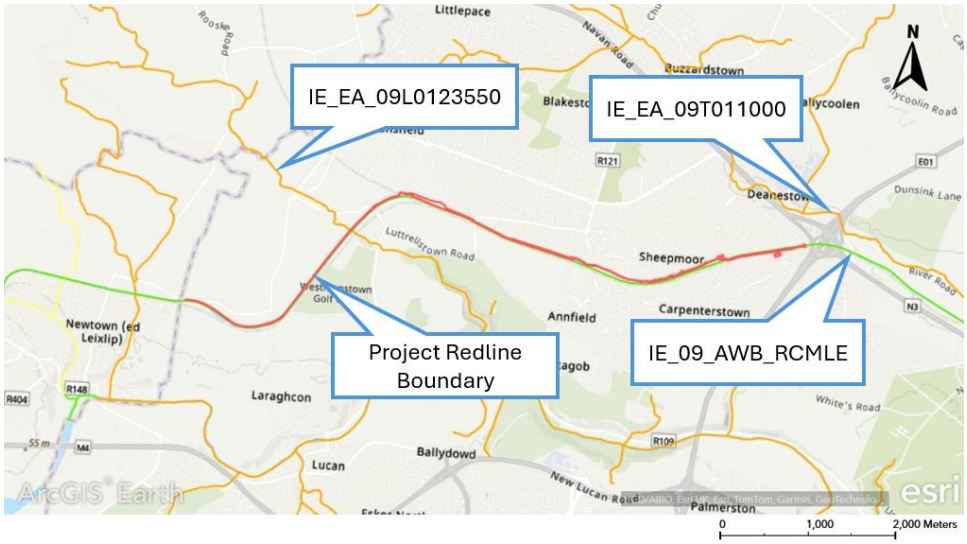


Figure 12-6: WFD Waterbody Status (Source: gis.epa.ie)

Given the Royal Canals *Good* status, it should be noted that specific surveys were conducted that mapped active colonies of the endangered glutinous snail (*Myxas glutinosa*). The survey conducted by Tritius in June 2025, *"Royal Canal Urban Greenway glutinous snail (Myxas glutinosa) survey 2025*", recommended that, given the species sensitivity to changes in stream bed level, siltation control during construction be prioritised. See Chapter 8 – Biodiversity for further detail.

WFD Classification - Groundwater

The Proposed Development is located within the Dublin Groundwater Body (IE_EA_G_008), which is currently assigned Good Groundwater Status under the Water Framework Directive. Good Groundwater Status indicates that both groundwater quantity and groundwater quality objectives are being achieved and that the groundwater body is not subject to significant pollution or over-abstraction. Protection of this status is a key objective of the Water Framework Directive and the associated River Basin Management Plan. Accordingly, the assessment considers the potential for the Proposed Development to adversely affect groundwater quality, groundwater-dependent receptors and the achievement of Water Framework Directive objectives. Further detail is provided in the accompanying **Water Framework Directive Assessment**.

Figure 12-7 shows the Proposed Development in context of the Dublin waterbody

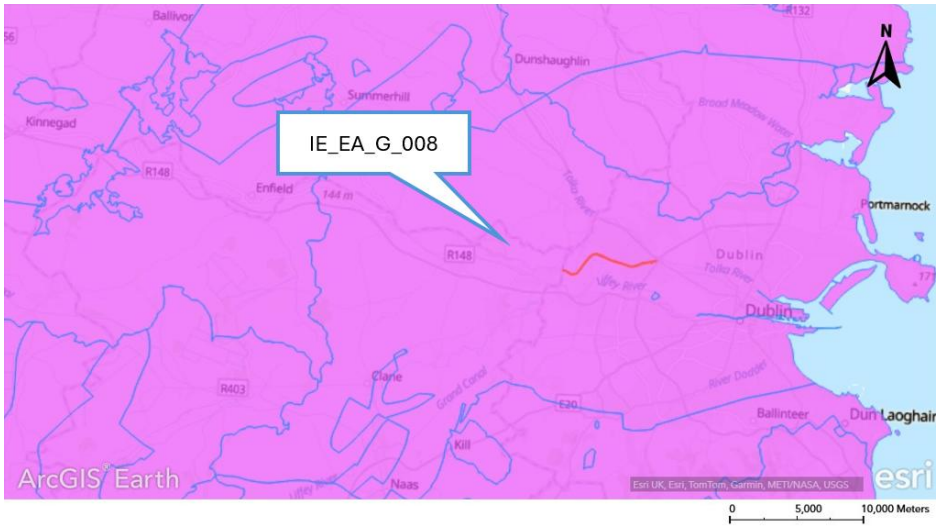


Figure 12-7: WFD Groundwater body status (Source: gis.epa.ie)

A detailed assessment of compliance with Water Framework Directive objectives, including consideration of groundwater status, groundwater quality, groundwater quantity and potential for deterioration, is provided in the accompanying Water Framework Directive Assessment.

12.3.6 Meteorological Data Summary

Rainfall data for the area has been extracted from Met Eireann Data Charts, the annual rainfall data from 1991-2020 (source: https://storymaps.arcgis.com/stories/93cbad5530054f58a6246a44920aa3f3 -n-1VadDr) indicates the long term average annual rainfall in the vicinity of the scheme is between 600-800mm.

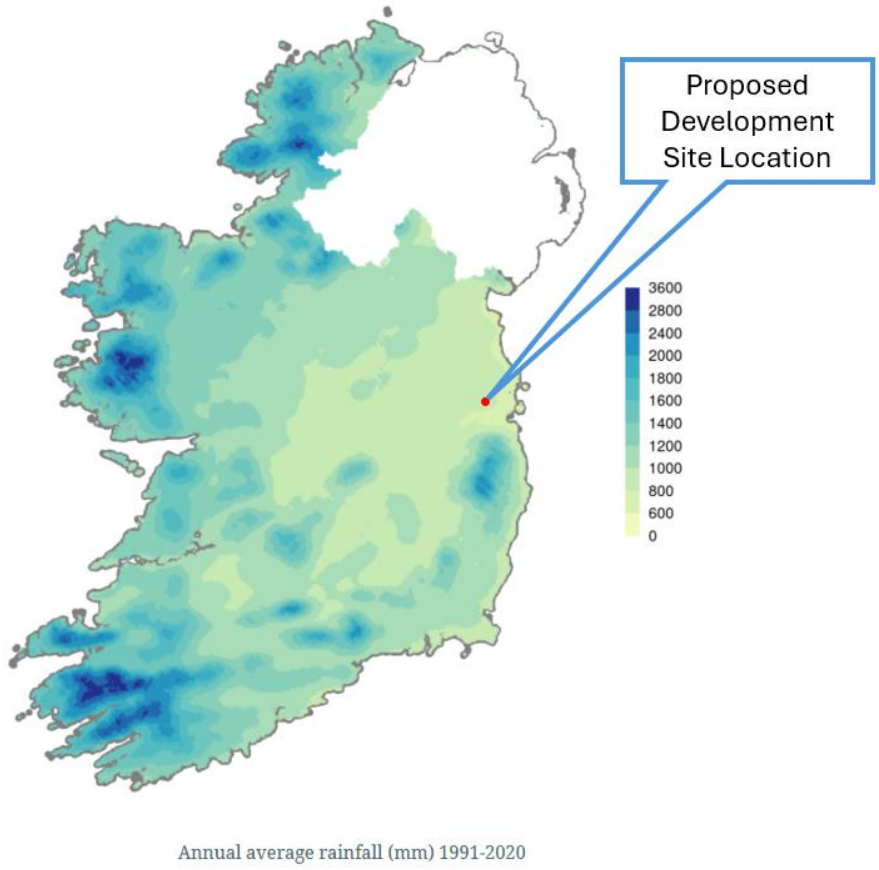


Figure 12-8: Annual Average Rainfall (Source: Ireland's Climate Averages)

12.3.7 Flood Risk

Flood Zones

The Planning system and Flood Risk Management – Guidelines for Planning Authorities (Nov, 2009) defines flood zones as "geographical areas within which the likelihood of flooding is in a particular range and they are a key tool in flood risk management within the planning process as well as in flood warning and emergency planning."

There are three levels of flood zone defined in the guidance document namely:

- Flood Zone A – where the probability of flooding from rivers and the sea is highest (greater than 1% or 1 in 100 for river flooding or 0.5% or 1 in 200 for coastal flooding);
- Flood Zone B – where the probability of flooding from rivers and the sea is moderate (between 0.1% or 1 in 1000 and 1% or 1 in 100 for river flooding and between 0.1% or 1 in 1000 year and 0.5% or 1 in 200 for coastal flooding); and

- Flood Zone C – where the probability of flooding from rivers and the sea is low (less than 0.1% or 1 in 1000 for both river and coastal flooding). Flood Zone C covers all areas of the plan which are not in zones A or B.

The Flood Risk assessment conducted for this Chapter is based on the Proposed Development impact in relation to these flood zones and is covered in more detail within the Site-Specific Flood Risk Assessment (SSFRA) (17023-X-X-XXX-RP-DBFL-CE-0002) accompanying the planning documentation submitted alongside this EIAR.

Historical Flood Data

As part of the desktop study, historic and predicted flood risk mapping published by the OPW on the Flood Hazard Mapping Website http://www.floodinfo.ie/ was reviewed.

The Eastern Catchment Flood Risk Assessment and Management (CFRAM) study details the predicted risk for a variety of fluvial and coastal flood scenarios. The mapping does not include the watercourse reaches traversing the Proposed Development and only maps downstream flooding.

There is flooding indicated on the Leixlip Fluvial Flood Extents maps (no. E09LEI_EXFCD_F2_08) which appears to relate to a tributary of the River Liffey with flooding of adjacent fields approximately 0.5km northwest of the of the western extent of the Proposed Development, as shown in Figure 12-9..

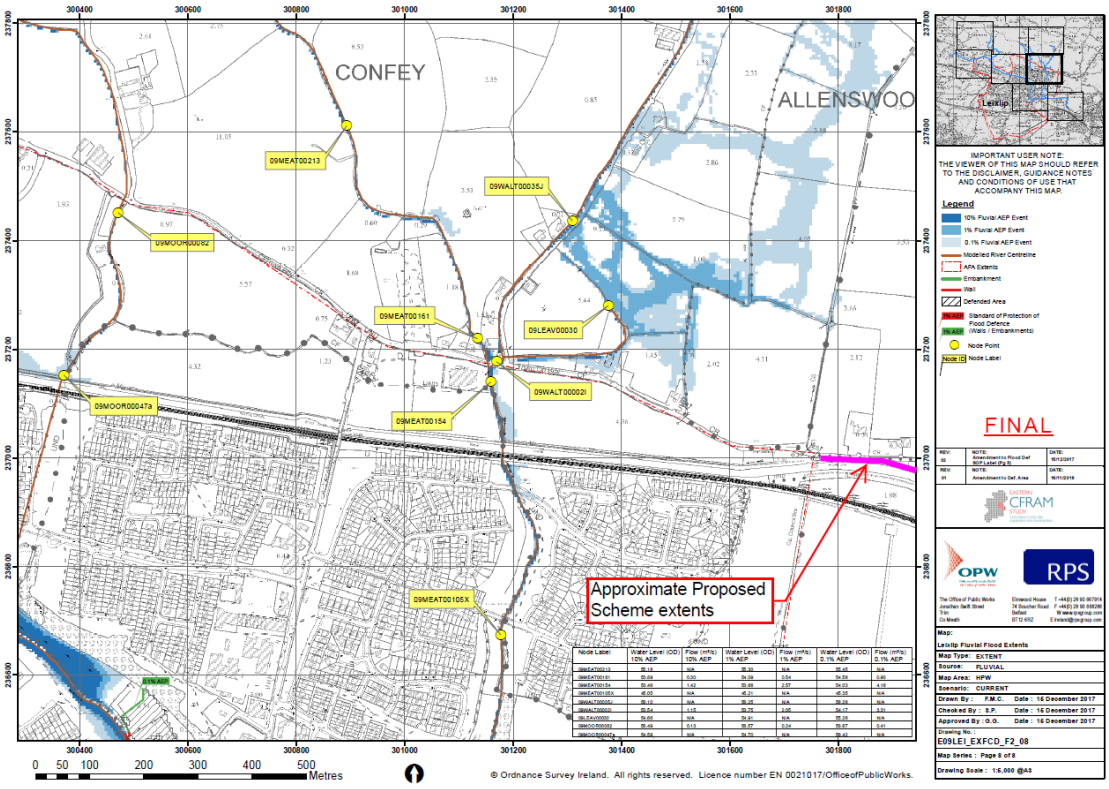


Figure 12-9: Extract from Leixlip Fluvial Flood Extents maps (no. E09LEI_EXFCD_F2_08) showing the Proposed Development

There is National Indicative Fluvial Mapping (NIFM) data which indicates Medium Probability and Low Probability flooding associated with the Rusk River in the vicinity of the Proposed Development. Refer to Figure 12-10 for an extract from the OPW mapping at www.floodinfo.ie showing the NIFM flooding extents.

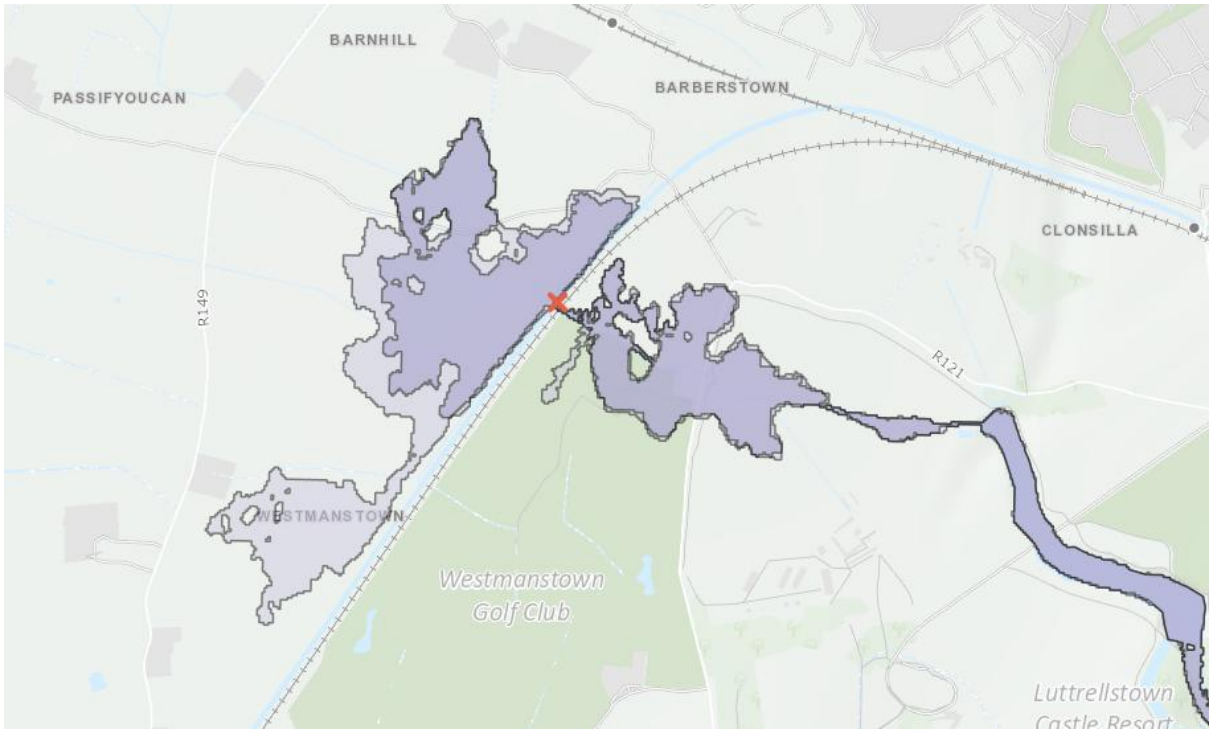


Figure 12-10: NIFM flooding extents associated with the Rusk River (Source: www.floodinfo.ie)

However, it is noted that the NIFM are described as not being the best achievable representation of flood extents and they are not as accurate as the Flood Maps produced under the CFRAM programme. The guidance notes (https://www.floodinfo.ie/map/nifm_user_guidance_notes/) associated with the data note that the maps should not be used to assess the flood risk associated with individual properties or point locations, or to replace a detailed site-specific flood risk assessment. It is also noted that at this location the Rusk River is culverted beneath the Royal Canal, with the recorded river water level in May 2018 at +53.98mAOD immediately upstream of the culvert, and the existing levels of the Royal Canal towpath in the order of +57.25mAOD at this location – an edge embankment to a level in the order of +57.65mAOD. The NIFM predicted flooding in this area is shown to be contained outside of this embankment, with the flooded area being the fields northwest and southeast of the Royal Canal as opposed to the existing tow path and/or the canal banks.

Historical flood maps/data indicate there is one recorded flood event within the Study Area of the Proposed Development extents. The recorded report relates to a flood event in 2000 in the Clonsilla area approximately halfway along the Proposed Development to the north of the Royal Canal. The flood event at this location was attributed to surcharging in the foul sewerage system in the area on low lying properties, with no relation to the Royal Canal indicated. The report also notes that remedial works were since carried out and no properties were flooding in a later flood event in 2002 as a result.

There are no areas within the site or immediately downstream of it mapped as “Benefiting Lands”. These are defined by the OPW as lands that might benefit from the implementation of Arterial (Major) Drainage Schemes (under the Arterial Drainage Act 1945) and can indicate areas of land subject to flooding or poor drainage.

The Strategic Flood Risk Assessment for the Fingal Development Plan 2023-2029 (FDP SFRA) provides an assessment of all types of flood risk within the County and assisted Fingal County Council (FCC) to make informed strategic land-use planning decisions and formulate flood risk policies. A review of available flood risk information was undertaken to identify any flooding or surface water management issues related to the County that warranted further investigation.

There are several sources of relevant flood risk information presented therein for FCC and this information was used to generate the fluvial flood zone maps as shown in Appendix A of the FDP SFRA. Relevant maps showing the Proposed Development extents (no. 23 and 24) have been extracted and

are presented in and, respectively. As indicated on the mapping, the Proposed Development primarily falls outside the extents of both Flood Zone A and B – with any instances of it sitting within either expanded upon herein and within the SSFRA.

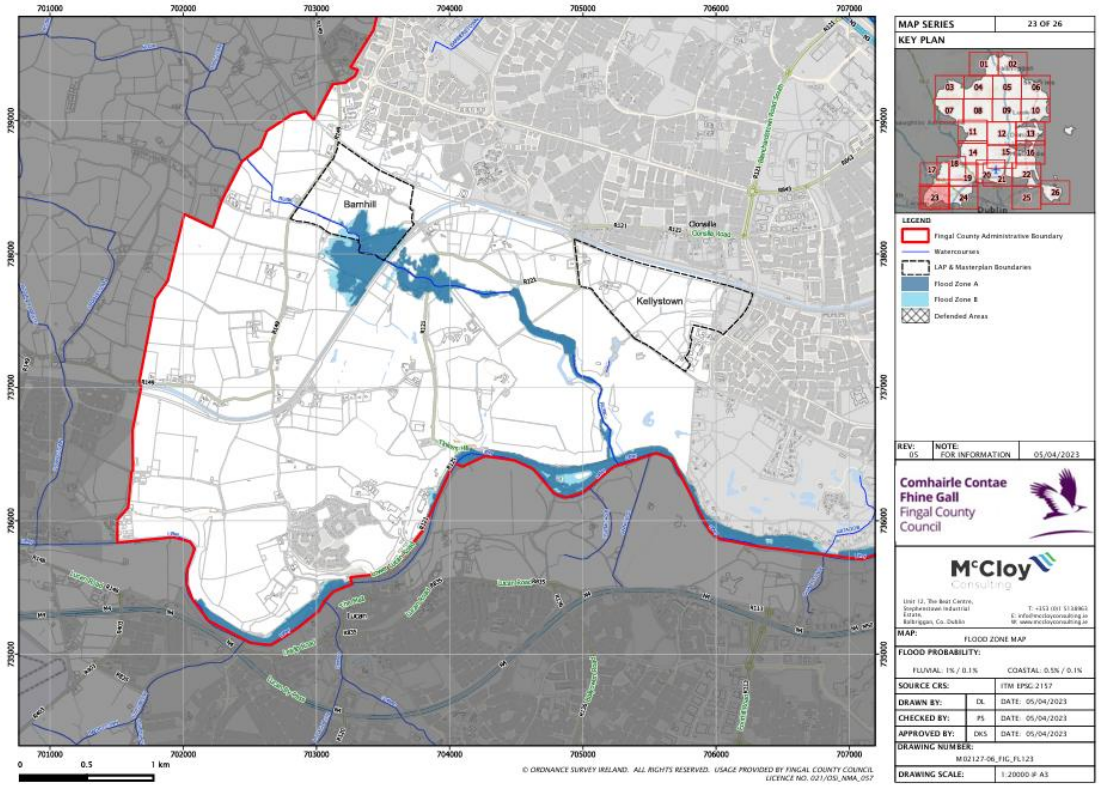


Figure 12-11: Extract from Strategic Flood Risk Assessment for the Fingal Development Plan 2023-2029 Map 23

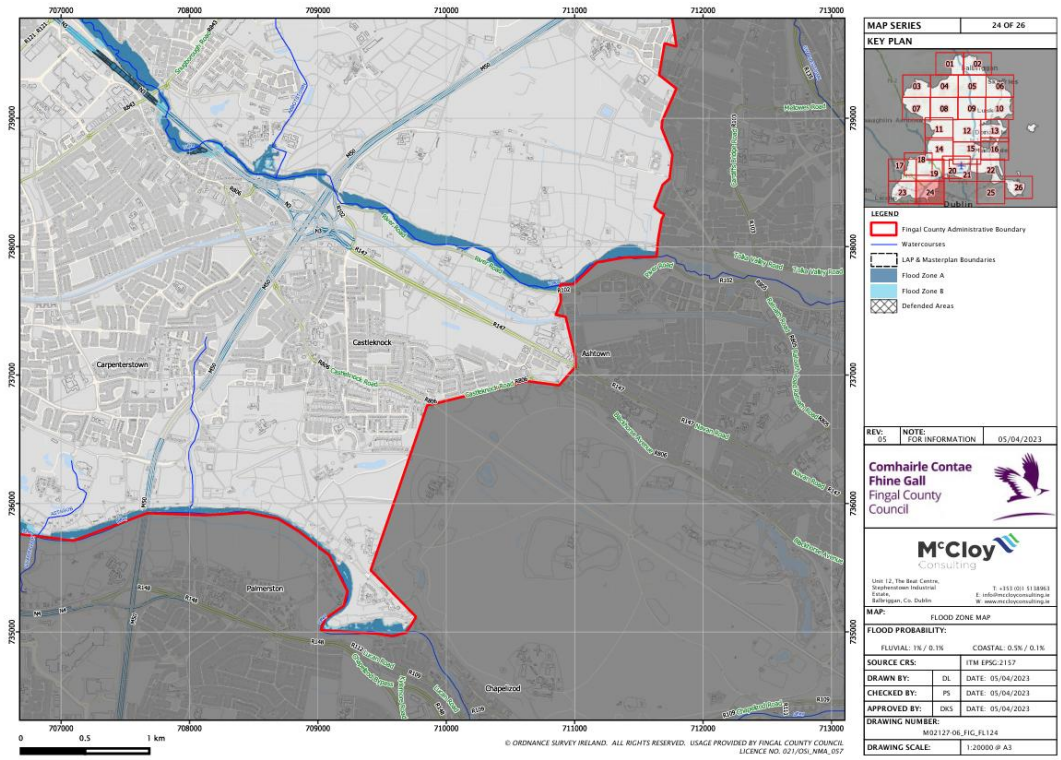


Figure 12-12: Extract from Strategic Flood Risk Assessment for the Fingal Development Plan 2023-2029 Map 24

As of 30th March 2026, Variation 2 of the Fingal County Development Plan took effect. The variation includes for development of lands within Barnhill, south of Barberstown Road. The variation included a detailed flood risk assessment by JBA, evaluating flood risk for the Áras Mhuire Field development. The report assesses previous flood risk assessments and establishes the model that JBA have used as the most recent and detailed assessment of flooding in the area.

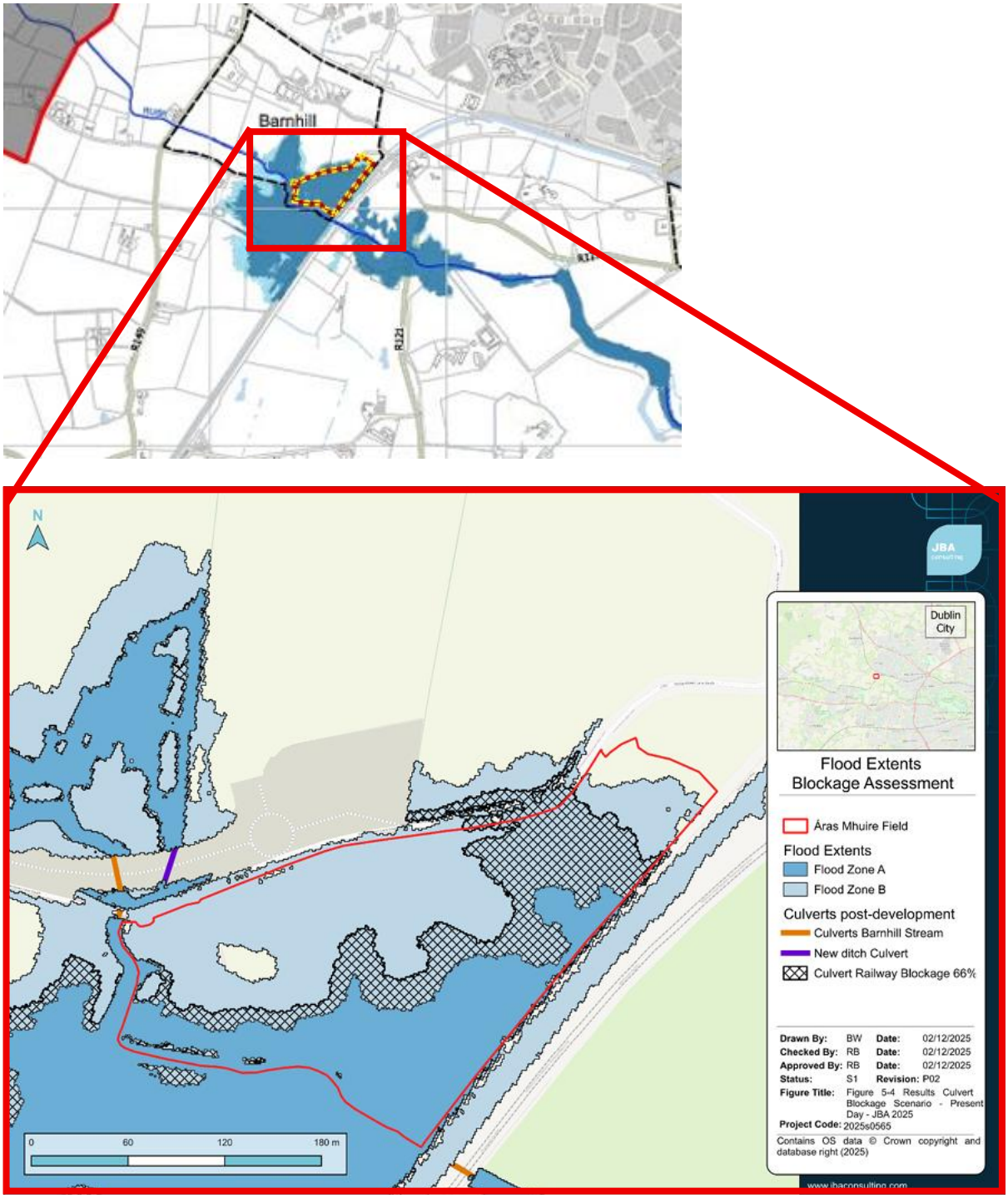


Figure 12-13 Figure 5-1 Extracted from Variation 2 – Fingal Development Plan 2023-2029, Appendix 3 Strategic Flood Risk Assessment

Figure 12-13 shows flood extents for the 1% AEP and 0.1% AEP, outlining Flood Zones A and B respectively. The flood model shows that a portion of the Royal Canal and so the existing towpath at the Barnhill Site potentially falls within Flood Zone B.

Site Specific Flood Risk Assessment

To adequately assess the potential impact of the scheme on flood risk a separate site-specific flood risk assessment (SSFRA) has been prepared for the scheme and is included with DBFL document reference 170239-DBFL-X-X-XXX-RP-DBFL-CE-0002. The SSFRA report assesses the Proposed Development in accordance with the requirements of "The Planning System and Flood Risk

Management Guidelines for Planning Authorities" determining the Flood Zone category along the route and presents information which would facilitate an informed decision of the planning application in the context of flood risk and level of vulnerability. The SSFRA determined the following:

- The proposed greenway can be classified both as less vulnerable when considered as a local transport link and water compatible when considered as a leisure-based amenity.
- It is clear from the above flooding analysis that the proposed site is not at significant risk from fluvial, tidal, pluvial or groundwater flooding due to its geographic location and topography. There is particularly negligible or no predicted coastal flooding risk.
- The most prominent flood risk associated with the greenway route is the section of the Proposed Development apparently across the 0.1% AEP flood zone at Barnhill within Flood zone B, in the vicinity of the Rusk River Crossing. A level analysis revealed that existing towpath levels (+57.25m OD) were above the modelled flood levels (+56.981m OD).
- Pluvial flooding associated with proposed piped drainage networks is another potential flood risk. To reduce the potential impact on the greenway and surrounding environment, these will be designed in accordance with the regulations e.g. Greater Dublin Strategic Drainage Strategy (GDSDS) and the Local Authorities Water Programme, Water Sensitive Urban Design Best Practice Interim Guidance Document.
- The construction forms, irrespective of location, will be robust and resilient requiring limited maintenance following a flood event. This ensures that the 'Mitigation principle' has been applied in accordance with The Planning System and Flood Risk Management Guidelines Sequential Approach. Further detail on construction form is provided in the Construction Methodology Report submitted as part of this application.
- The Planning System and Flood Risk Management Guidelines Sequential Approach has been followed through this assessment and in the preparation of the Proposed Development design.

In conclusion, the Proposed Development is considered to be in compliance with The Planning System and Flood Risk Management Guidelines for Planning Authorities.

12.3.8 Surface Water Abstractions

As part of the desktop study for this assessment EPA mapping indicates there are no registered surface water abstractions within the downstream hydrological catchment of the site.

The EPA holds information relating to private water supplies registered in accordance with the European Communities (Drinking Water) (No.2) regulations 2007 (S.I. No. 278 of 2007). The online maps available indicate no private water supplies abstracting downstream of the scheme.

Ground water abstractions within the study area are considered separately in Section 12.3.9.

12.3.9 Groundwater Abstractions

GSI hold datasets on Drinking Water Protection Areas and National Federation of Group Water Schemes, neither of which identified records within the vicinity of the Proposed Development. The GSI groundwater wells and springs dataset identifies one borehole potentially located downgradient of the Proposed Development (2923SEW001). This borehole dates from 1899 and is recorded as being for agricultural use only. Given its location within the Castleknock urban area, which is served by the public water supply network, the borehole is considered unlikely to be utilised as a drinking water source.

Surface water abstractions within the study area are considered separately in Section 12.3.8.

12.3.10 Hydrogeological Setting

Limestone bedrock underlies the entire scheme, made up for the most part by Dark Limestone and Shale (`calp) (Lucan Formation) along with Calcareous shale, limestone conglomerate (Tober Colleen Formation. The bedrock aquifer underlying the majority of the Proposed Development is classified by

GSI as a “Locally Important Aquifer – Bedrock which is Moderately Productive only in Local Zones”, with the exception of the easternmost 700m which are underlain by a “Poor Aquifer – Bedrock which is Generally Unproductive except for Local Zones”. This is shown in Figure 12-1.

Groundwater vulnerability describes the intrinsic geological and hydrogeological characteristics that determine the ease with which groundwater may be contaminated by human activities. Groundwater vulnerability is varied across the Proposed Development extents, ranging from "moderate” to “extreme”, as illustrated by Figure 12-1. The areas of highest vulnerability correspond to the locations where rock is at or near the surface, or where there is only a thin covering of soil. It is noted that the aquifer vulnerability classification does not consider the nature of the underlying ‘receiving’ aquifer with respect to resource value or significance of pollution occurring and is only a reflection on the protection afforded to the aquifer by overlying deposits.

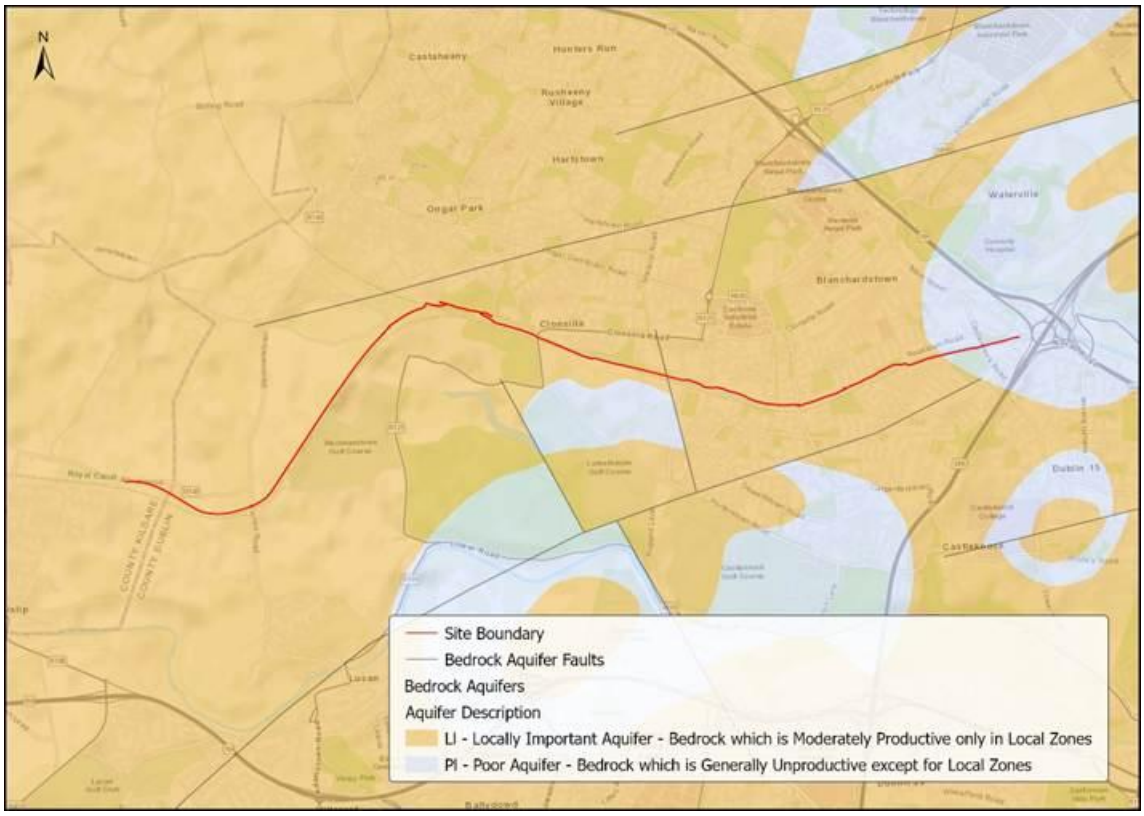


Figure 12-14: Groundwater Resources (GSI data, 2026)

12.3.11 Topography

The route of the Proposed Development largely follows the banks of the Royal Canal, and while the banks themselves generally undulated along the route, the level of the Royal Canal banks remains relatively constant at approximately 56mAoD to 57mAoD.

A detailed topographical survey of all lands, watercourses (including a detailed survey of the Royal Canal), and existing surface infrastructure affected by the proposed works has been carried out to inform the design for the scheme.

Survey data indicates the highest existing elevations along the route of the scheme are approx. 66mAoD (generally where the route follows the upper level of the embankments such as in the Delwood area) and lowest elevations are approx. 57mAoD (generally where the route follows the existing canal-side towpaths).

12.3.12 Designated Sites

Designated sites (sites designated as conservation areas under Irish or EU legislation) within 5 km of the Proposed Development or within the hydrological catchment and / or hydrologically connected to the scheme are indicated in Table 12-12 below.

Table 12-12: Designated Sites

*(Source:https://gis.epa.ie/EPAMaps/Water?_gl=1*q9t8qt*_ga*Njc5MTAzNjQwLjE3MjEyMTI0MDc.*_ga_TPK2CK9KEX*czE3ODA1NjUwNjkkbzYwJGcxJHQxNzgwNTY1MjcyJGoxNCRsMCRoMA..)*

Site Code	Name	Designation	Distance	Commentary
002103	Royal Canal	Proposed NHA	<0.1km	The ecological importance and conservation interests of the Royal Canal Proposed NHA are described in Chapter 8: Biodiversity. The Royal Canal is located immediately adjacent to the Proposed Development and therefore represents a key hydrological receptor. Potential pathways for interaction are associated with surface water runoff, drainage discharges and accidental pollution events during construction. The sensitivity of the canal to hydrological and water quality impacts has been considered within this assessment.
000128	Liffey Valley	Proposed NHA	>1 km	The ecological importance and conservation interests of the Liffey Valley Proposed NHA are described in Chapter 8: Biodiversity. The site is located south of the Proposed Development within the Liffey sub-catchment. However, no direct hydrological connection between the Proposed Development and the designated site has been identified. Consequently, the site is considered to have low sensitivity to potential hydrological impacts arising from the Proposed Development.

Site Code	Name	Designation	Distance	Commentary
001398	Rye Water Valley/Carton SAC	Proposed NHA, SAC	>1 km	The ecological importance and qualifying interests of the Rye Water Valley/Carton SAC and Proposed NHA are described in Chapter 8: Biodiversity and the Natura Impact Statement. The designated site is located within a separate hydrological sub-catchment from the Proposed Development, and no direct hydrological pathway has been identified. Accordingly, the site is not considered sensitive to hydrological impacts arising from the Proposed Development..
002104	Grand Canal	Proposed NHA	>4.5 km	The ecological importance and conservation interests of the Grand Canal Proposed NHA are described in Chapter 8: Biodiversity. The designated site is located within a separate hydrological sub-catchment from the Proposed Development, with the nearest point located approximately 4.5 km from the scheme. No direct hydrological connection has been identified and therefore the site is not considered sensitive to hydrological impacts arising from the Proposed Development.

Based on the above review the Royal Canal pNHA is the only designated site considered to be potentially sensitive to hydrological impacts at the subject site.

12.3.13 Water Dependant Ecology

Existing vegetation buffers that protect against bank erosion, particularly along the banks of the Royal Canal are to be considered. These form a safety buffer for Canal users. Water dependant fauna has also formed part of the EIAR assessment and are covered in more detail in Chapter 8: Biodiversity.

12.3.14 Amenity

Another baseline factor to consider is the existing use of the Royal canal as an amenity feature. As highlighted in the introductory chapters of these EIAR, current uses of the canal for anglers, walkers and barges are to be protected.

12.3.15 Baseline Summary and Sensitivities

The baseline assessment identified two hydrological receptors that have the potential to demonstrate sensitivity to the development proposed, namely the Royal Canal (as a watercourse and pNHA) and the Rusk River.

Sensitivity of the receptors identified are set out in Table 12-13.

The sensitivity assessment is based on the methodology provided in Section 12.2.5 and has regard to the receptor's WFD status, hydrological function, ecological value, designation status and susceptibility to change. The sensitivity rating is not solely dependent upon project-specific sampling data.

Table 12-13: Baseline Summary

Type	Receptor	Sensitivity	Rationale
Hydrological	Royal Canal pNHA	High	Artificial waterbody currently assigned Good Ecological Potential under the Water Framework Directive. The Royal Canal is located immediately adjacent to, and in places within, the Proposed Development corridor and represents the principal surface water receptor within the study area. The canal forms a direct hydrological pathway and could be sensitive to impacts arising from surface water runoff, sediment mobilisation, accidental spills or pollution incidents during construction. The canal also performs an important drainage, navigation and amenity function and therefore has a limited capacity to accommodate deterioration in water quality or hydromorphological condition. Accordingly, a High sensitivity rating has been assigned.
Hydrological	Rusk River	Medium	Water Framework Directive waterbody with a Moderate ecological status classification. The Rusk River forms a natural watercourse crossing the Proposed Development corridor and drains to the River Liffey catchment. While not subject to statutory ecological designation within the study area and of lower strategic importance than the Royal Canal, the watercourse remains sensitive to changes in water quality, sediment mobilisation and alterations to existing drainage pathways. Accordingly, a Medium sensitivity rating has been assigned.

Impacts on biodiversity are assessed in more detail in the Appropriate Assessment submitted alongside this EIAR as well as Chapter 8: Biodiversity of this EIAR.

12.4 Predicted Impacts

The section considers Predicted Impacts in the Do-Nothing Scenario, Construction Phase, and Operational Phase in line with the overall reporting. The need for assessment of a Decommissioning Phase has been scoped out in line with the overall EIAR methodology.

12.4.1 Do-Nothing Scenario

In the absence of the Proposed Development, the existing hydrological and hydrogeological environment would continue to evolve in response to natural processes, climate change, catchment-scale land use change and the implementation of measures under the River Basin Management Plan 2022-2027. Existing drainage networks, watercourses and groundwater systems would continue to operate under current management regimes and would remain subject to ongoing maintenance and improvement works by the relevant authorities.

Other committed developments and infrastructure projects within the wider study area may also influence the future water environment independently of the Proposed Development. Accordingly, the baseline water environment is expected to remain broadly consistent with that described in Section 12.3, while continuing to undergo normal hydrological, hydraulic and water quality changes over time

12.4.2 Construction Phase

Construction activities can pose a significant risk to the watercourse receptors identified in Section 12.3 and comprise impacts associated with the significant excavations, soil movement, aggregate import and construction plant usage.

This section presents the likely potential impacts of the construction activities on the Hydrological environment, in the absence of mitigation. It should be noted that where mention is made of the water environment within the table it is implied that the receptors identified in Section 12.3 apply.

12.4.2.1 Chemical Pollution of Hydrogeological Receptors

Construction activities have the potential to adversely affect groundwater quality through the accidental release of contaminants to the underlying soils and groundwater environment. Potential sources of contamination include fuels, oils and lubricants associated with construction plant and equipment, cementitious materials used during construction works, sediment-laden runoff arising from earthworks activities, and wastewater generated from temporary welfare facilities.

Where contaminants infiltrate to the subsurface environment, there is potential for localised deterioration in groundwater quality and contamination of soils. Potential consequences include impacts on groundwater quality, groundwater-dependent receptors and, where contamination is significant, the requirement for remediation or disposal of affected materials.

The underlying Dublin Groundwater Body is currently assigned Good Status under the Water Framework Directive and the principal groundwater receptor within the study area is the underlying bedrock aquifer. In the absence of mitigation measures, contamination arising from construction activities could adversely affect groundwater quality within the immediate vicinity of the Proposed Development. The impact magnitude is therefore assessed as **Medium** and, having regard to the **Medium sensitivity** of the receiving groundwater receptor, the resulting effect is assessed as ***adverse, moderate and short-term***.

12.4.2.2 Chemical Pollution of Surface Water Receptors

Construction works have the potential to result in the accidental release of contaminants to nearby surface water receptors including the Royal Canal, the Rusk Watercourse, existing drainage infrastructure and associated receiving waters. There will be physical construction work on the RC bank, with works in the riparian corridor. Such construction activities directly adjacent to the Royal Canal, including earthworks, drainage installation, embankment works and construction access activities, have the potential to result in the accidental release of fuels, oils, concrete washings and other contaminants to the receiving water environment immediately adjacent.

Potential contaminant sources include fuels, oils and lubricants, concrete and cementitious materials, wastewater generated during construction activities and welfare facilities, and other potentially polluting substances associated with construction operations.

Where contaminated runoff or effluent enters surface water receptors, there is potential for deterioration in water quality and adverse effects on aquatic habitats and species. Pollution incidents could alter the physical, chemical or biological characteristics of receiving waters and adversely affect ecological functioning.

The Royal Canal represents the principal surface water receptor within the study area and is located immediately adjacent to the Proposed Development for much of its length. In the absence of mitigation measures, accidental pollution events have the potential to adversely affect surface water quality. The impact magnitude is assessed as **Medium** and, having regard to the **High sensitivity** of the Royal Canal receptor, the resulting effect is assessed as ***adverse, significant and short-term***.

For the Rusk Watercourse and other indirectly connected surface water receptors, the impact magnitude is assessed as **Medium**. Having regard to the **Medium sensitivity** of these receptors, the resulting effect is assessed as ***adverse, moderate and short-term*.**

12.4.2.3 Pollution of Surface Waters by Suspended Solids

Earthworks associated with the Proposed Development (including earthworks associated with the greenway alignment, embankment regrading, drainage installation and construction activities within the canal corridor), comprise vegetation clearance, topsoil stripping, excavation works, stockpiling of construction materials, temporary haul routes and construction traffic movements. These have the potential to generate sediment-laden runoff. Additional sources of suspended solids may arise from dewatering operations associated with excavations and drainage works.

Sediment-laden runoff may enter nearby drainage systems, watercourses or the Royal Canal. Elevated concentrations of suspended solids can increase turbidity, reduce light penetration, alter substrate conditions and result in sediment deposition within sensitive aquatic habitats. Such effects may adversely affect aquatic ecology and reduce habitat quality.

Given the direct hydrological connectivity between the Proposed Development and the Royal Canal, uncontrolled release of suspended solids could adversely affect water quality and aquatic habitats. The impact magnitude is assessed as **Medium** and, having regard to the **High sensitivity** of the Royal Canal receptor, the resulting effect is assessed as ***adverse, significant and short-term***.

For the Rusk Watercourse and other indirectly connected surface water receptors, the impact magnitude is assessed as **Medium**. Having regard to the **Medium sensitivity** of these receptors, the resulting effect is assessed as ***adverse, moderate and short-term***.

12.4.2.4 Changes to Stream Channels

The Proposed Development includes works within the Royal Canal corridor, including localised embankment works, installation of drainage infrastructure, edge treatments and works adjacent to existing water conveyance features. These activities have the potential to result in localised alteration of bank conditions, habitat structure, channel margins and drainage pathways and temporary disturbance of existing water conveyance features.

Potential effects include localised alteration of channel morphology, disturbance of bed and bank materials, temporary reductions in hydraulic conveyance and impacts on habitat continuity. Physical changes may also affect sediment transport processes and temporarily influence the movement of aquatic species through affected sections of watercourse.

The proposed works are limited in extent and are not anticipated to result in permanent alteration of the hydrological function of watercourses. Nevertheless, temporary impacts may arise during construction. The impact magnitude is assessed as **Low** and, having regard to the **High sensitivity** of the Royal Canal receptor, the resulting effect is assessed as ***adverse, slight and short-term***.

For the Rusk Watercourse, the impact magnitude is assessed as **Low** and, having regard to the **Medium sensitivity** of the receptor, the resulting effect is assessed as ***adverse, slight and short-term***.

12.4.2.5 Changes to runoff, and flow patterns

Construction activities have the potential to temporarily alter existing drainage patterns and surface water runoff characteristics through earthworks, vegetation clearance, excavation works and the establishment of temporary construction compounds and working areas. These activities may modify local infiltration rates and affect the rate and volume of runoff generated during rainfall events.

Changes to runoff patterns may result in localised increases in runoff velocities, increased erosion potential and temporary alterations to existing drainage pathways. Existing flow routes may be modified during construction, potentially affecting downstream hydrological conditions on a temporary basis.

The anticipated changes are localised and temporary in nature and are largely confined to the active construction period. The impact magnitude is therefore assessed as **Low**. Having regard to the **High sensitivity** of the Royal Canal receptor, the resulting effect is assessed as ***adverse, slight and short-term***.

For the Rusk Watercourse and other indirectly connected receptors, the resulting effect is assessed as ***adverse, slight and short-term***.

12.4.3 Operational Phase

The predicted impacts of the operational phase are those associated with the completed greenway and associated infrastructure including final surface treatments, conveyance of traffic flows and all operation and maintenance activities of the road and associated works including the road drainage system.

12.4.3.1 Chemical Pollution of Hydrogeological Receptors

During operation, the Proposed Development has the potential to affect groundwater quality through the infiltration of contaminated surface water runoff to the underlying soils and groundwater environment. Potential contaminant sources include hydrocarbons, suspended solids, trace pollutants associated with surface wear and degradation of construction materials, and the use of de-icing materials during winter maintenance activities.

The principal groundwater receptor is the Dublin Groundwater Body (IE_EA_G_008), which is currently assigned **Good Status** under the Water Framework Directive. In the event that contaminants infiltrate to the subsurface environment, there is potential for localised deterioration in groundwater quality and associated effects on groundwater resources.

The Proposed Development comprises a greenway and associated public realm infrastructure and is not anticipated to generate significant pollutant loads during operation. Furthermore, the scale of the Proposed Development and the limited intensity of use reduce the likelihood of significant groundwater contamination. Accordingly, the impact magnitude is assessed as **Low** and, having regard to the **Medium sensitivity** of the Dublin Groundwater Body, the resulting impact is assessed as **adverse, slight and long-term.**

12.4.3.2 Chemical Pollution of Surface Water Receptors

During operation, surface water runoff from paved and hard-surfaced areas may contain contaminants derived from normal use of the greenway. These contaminants may include hydrocarbons, suspended solids and trace pollutants arising from the gradual deterioration of surfacing materials. In addition, winter maintenance activities, including the application of salt where required, may increase salinity, conductivity and dissolved solids within runoff discharged to receiving waters.

The principal hydrological receptors comprise the Royal Canal pNHA and the Rusk River. The introduction of contaminated runoff to these receptors could adversely affect water quality and, in turn, aquatic habitats and species dependent on the water environment.

Given the limited scale of the Proposed Development, the relatively low intensity of greenway use and the incorporation of a dedicated surface water drainage network, the magnitude of impact is assessed as **Low**. Having regard to the **High sensitivity** of the Royal Canal and the **Medium sensitivity** of the Rusk Watercourse, the resulting impact is assessed as **adverse, slight and long-term.**

12.4.3.3 Pollution of Surface Waters by Suspended Solids

During operation, the potential for sediment generation is substantially lower than during construction. However, localised erosion of drainage features, unbound surfaces or landscaped areas could result in the mobilisation of small quantities of sediment and suspended solids during rainfall events.

Should sediment enter receiving waters, there is potential for localised deposition within drainage channels and watercourses. Such sedimentation could temporarily affect aquatic habitats and contribute to minor blockage of culverts or drainage infrastructure.

Given the limited extent of exposed soils during operation and the low potential for sediment mobilisation, the magnitude of impact is assessed as **Negligible**. Accordingly, the resulting impact is assessed as **adverse, imperceptible and long-term**.

12.4.3.4 Changes to Stream Channels

The Proposed Development includes works within the Royal Canal corridor, including localised embankment works, installation of drainage infrastructure, edge treatments and works adjacent to existing water conveyance features. These activities have the potential to result in localised alteration of bank conditions, habitat structure, channel margins and drainage pathways. Any deficiencies in the design, sizing or long-term performance of these elements could alter local hydraulic conditions or affect the conveyance of water within receiving channels.

Potential effects could include localised erosion, scour or changes to stream morphology at outfall locations. Alterations to channel form could also affect aquatic habitats and, in some instances, the movement of fauna through the watercourse corridor.

Given the scale of the proposed works and the limited extent of direct modification to watercourses, the magnitude of impact is assessed as **Low**. Having regard to the sensitivity of the receiving environment, the resulting impact is assessed as **adverse, slight and long-term**.

12.4.3.5 Changes to runoff, and flow patterns

The introduction of additional hard surfacing and associated drainage infrastructure has the potential to modify local runoff characteristics. Potential effects include increased runoff rates, altered flow pathways and the diversion of runoff from existing catchment areas.

Such changes could increase pressures on downstream drainage systems and receiving waters, potentially resulting in localised erosion, scour or increased flood risk if inadequately controlled. Climate change may also increase rainfall intensities over the operational life of the Proposed Development, placing additional pressure on drainage infrastructure.

The Proposed Development incorporates a drainage design intended to manage runoff and maintain appropriate flow control. Nevertheless, in the absence of mitigation, changes to runoff and drainage characteristics have the potential to affect downstream receptors.

The magnitude of impact is assessed as **Low** and, having regard to the sensitivity of the receiving environment, the resulting impact is assessed as **adverse, slight and long-term**.

12.4.4 Summary of Predicted Impacts

Magnitudes of identified impacts, and associated unmitigated significance of those impacts, are determined in accordance with the rationale previously described and are presented i**Error! Reference source not found.**n Table 12-14 in relation to the Construction Phase.

Table 12-14: Unmitigated Significance – Construction Phase

Receptor	Sensitivity	Potential Impact	Magnitude	Significance	Duration
Royal Canal pNHA	High	Chemical Pollution of Surface Water Receptors	Medium	Significant Adverse	Short-Term
Royal Canal pNHA	High	Pollution by Suspended Solids	Medium	Significant Adverse	Short-Term
Royal Canal pNHA	High	Changes to Stream Channels	Low	Slight Adverse	Short-Term
Royal Canal pNHA	High	Changes to Runoff and Flow Patterns	Low	Slight Adverse	Short-Term
Rusk River	Medium	Chemical Pollution of Surface Waters	Medium	Moderate Adverse	Short-Term
Rusk River	Medium	Pollution by Suspended Solids	Medium	Moderate Adverse	Short-Term
Rusk River	Medium	Changes to Stream Channels	Low	Slight Adverse	Short-Term
Rusk River	Medium	Changes to Runoff and Flow Patterns	Low	Slight Adverse	Short-Term
Dublin Groundwater Body / Bedrock Aquifer	Medium	Chemical Pollution of Hydrogeological Receptors	Medium	Moderate Adverse	Medium-Term

Magnitudes of identified impacts, and associated unmitigated significance of those impacts, are determined in accordance with the rationale previously described and are presented in Table 12-15 in relation to the Operational Phase.

Table 12-15: Unmitigated Significance – Operational Phase

Receptor	Sensitivity	Potential Impact	Magnitude	Significance	Duration
Royal Canal pNHA	High	Chemical Pollution of Surface Water Receptors	Low	Slight Adverse	Long-Term
Royal Canal pNHA	High	Pollution of Surface Waters by Suspended Solids	Negligible	Imperceptible Adverse	Long-Term
Royal Canal pNHA	High	Changes to Stream Channels	Low	Slight Adverse	Long-Term
Royal Canal pNHA	High	Changes to Runoff and Flow Patterns	Low	Slight Adverse	Long-Term
Rusk River	Medium	Chemical Pollution of Surface Water Receptors	Low	Slight Adverse	Long-Term

Receptor	Sensitivity	Potential Impact	Magnitude	Significance	Duration
Rusk River	Medium	Pollution of Surface Waters by Suspended Solids	Negligible	Imperceptible Adverse	Long-Term
Rusk River	Medium	Changes to Stream Channels	Low	Slight Adverse	Long-Term
Rusk River	Medium	Changes to Runoff and Flow Patterns	Low	Slight Adverse	Long-Term
Dublin Groundwater Body / Bedrock Aquifer	Medium	Chemical Pollution of Hydrogeological Receptors	Low	Slight Adverse	Long-Term

12.5 Mitigation Measures

12.5.1 Mitigation Measures - Preamble

The assessment identified a number of potential impacts on the hydrological environment during the Construction Phase. The principal impact pathways relate to:

- Chemical Pollution of Hydrogeological Receptors
- Chemical Pollution of Surface Water Receptors
- Pollution of watercourses by silt / suspended solids
- Changes to Stream Channels
- Changes to runoff and flow patterns

The most sensitive receptor within the study area is the Royal Canal, which is located immediately adjacent to the Proposed Development for much of its length and therefore has direct hydrological connectivity with the works.

The mitigation measures set out below have been incorporated into the design of the Proposed Development, the Outline Construction Environmental Management Plan (OCEMP), the Outline Construction Methodology Report and the Construction Management Report (CMR). These measures shall be implemented by the appointed Contractor throughout the Construction Phase.

No offsetting or compensatory measures are proposed. All identified impacts are addressed through avoidance, prevention, reduction and restoration measures.

12.5.2 Environmental Management Framework

In order to facilitate the integration of environmental considerations into the planning, construction and An Outline Construction Environmental Management Plan (OCEMP) has been prepared as part of the planning application. The OCEMP establishes the environmental management framework for construction of the Proposed Development and identifies the procedures, responsibilities, mitigation measures, monitoring requirements and emergency response procedures required to protect the water environment.

Prior to commencement of works, the Contractor shall prepare a project-specific Construction Environmental Management Plan (CEMP). The CEMP shall be consistent with, and give effect to, the

commitments, mitigation measures and monitoring requirements contained within the OCEMP. All Contractors and Sub-Contractors shall comply with the requirements of the approved CEMP throughout the Construction Phase.

12.5.3 Specific Mitigation Measures – Do-Nothing Scenario

No mitigation measures are proposed in relation to water and the hydrological environment if the development does not proceed.

12.5.4 Specific Mitigation Measures – Construction Phase

The following mitigation measures relating to the protection of biodiversity, hydrology and hydrogeology will apply during the construction phase of the Proposed Development.

12.5.4.1 Chemical Pollution of Hydrogeological and Surface Water Receptors

To prevent accidental pollution of groundwater, the Royal Canal, the Rusk Watercourse and associated drainage infrastructure:

- Refuelling of construction plant shall only take place within designated refuelling areas located away from the Royal Canal, watercourses and drainage features.
- Bulk fuel, oils, lubricants, chemicals and other potentially polluting substances shall be stored within bunded storage areas providing a minimum storage capacity of 110% of the largest container.
- Mobile plant shall be regularly inspected and maintained to minimise the risk of leaks.
- Spill kits appropriate to the activities being undertaken shall be maintained at all active work locations.
- Drip trays shall be used beneath stationary plant and equipment where there is a risk of leakage.
- Concrete washout, concrete cutting and cement handling areas shall be located away from surface water receptors and drainage systems.
- Washout of concrete wagons shall not be permitted within the site.
- No discharge of untreated water arising from construction activities shall be permitted to the Royal Canal, the Rusk Watercourse or any drainage system.
- Welfare facilities shall be connected to temporary storage tanks, with wastewater removed off-site by a licensed contractor, unless a temporary network connection has been approved.

12.5.4.2 Pollution of Surface Waters by Suspended Solids

Construction activities adjacent to the Royal Canal corridor have the greatest potential to generate sediment-laden runoff.

To minimise the release of suspended solids:

- Construction works shall be undertaken on a phased basis to minimise the extent of exposed ground at any one time.
- Earthworks within the canal corridor shall be sequenced to minimise the duration of exposure of bare soils.
- Temporary stockpiles shall be located away from the canal edge, watercourses, drainage paths and overland flow routes.

- Silt fencing, settlement measures, check dams, sediment traps and other appropriate sediment control measures shall be installed where required.
- Existing vegetation adjacent to the canal shall be retained wherever practicable to provide erosion protection.
- Exposed surfaces shall be stabilised as soon as practicable following completion of works.
- Temporary drainage measures shall be maintained and inspected regularly throughout the construction period, particularly following heavy rainfall events.
- Any pumped water arising from excavations shall be treated, where necessary, prior to discharge.

12.5.4.3 Physical Modification of the Royal Canal Corridor, Watercourses and Drainage Features

Works within the Royal Canal corridor shall be undertaken in a manner that minimises disturbance to the canal environment and existing hydraulic conditions.

Accordingly:

- The Landmark Bridge shall comprise a clear-span structure avoiding permanent encroachment into the active canal channel.
- Existing canal banks shall be retained wherever practicable.
- Temporary works within the canal corridor shall be limited to the minimum extent necessary.
- Construction access routes adjacent to the canal shall be carefully managed to minimise disturbance to canal banks and riparian areas.
- Any temporary disturbance to canal banks shall be reinstated upon completion of the works.
- Drainage and crossing works shall be undertaken in a manner that maintains flow conveyance and avoids adverse impacts on channel stability.
- Existing culverts, drains and outfalls shall remain operational unless otherwise agreed with the relevant authority.

12.5.4.4 Changes to Runoff and Flow Regimes

The Proposed Development has been designed to manage runoff close to source and minimise changes to existing drainage characteristics.

Accordingly:

- Temporary construction drainage shall be provided where necessary to divert runoff away from active work areas.
- Existing drainage patterns shall be maintained where practicable throughout construction.
- Surface water shall be directed to appropriate treatment and attenuation measures prior to discharge.
- Temporary drainage infrastructure shall be inspected and maintained throughout the works.
- Construction compounds and hardstanding areas shall incorporate appropriate runoff management measures.

12.5.4.5 Water Quality Monitoring

Water quality monitoring shall be undertaken during construction at locations adjacent to active works within the Royal Canal corridor and at other locations where identified within the CEMP.

Monitoring shall include:

- Visual inspections;
- Turbidity monitoring, where appropriate;
- Inspection of sediment control measures;
- Inspection of drainage controls and pollution prevention infrastructure.

If monitoring identifies elevated turbidity, visible pollution, hydrocarbon contamination or failure of sediment control measures attributable to construction activities, then:

- the relevant activity shall cease immediately;
- the source of contamination shall be identified;
- corrective measures shall be implemented;
- monitoring shall be repeated to confirm effectiveness prior to recommencement of works.

The Contractor shall be responsible for implementation of monitoring requirements. Monitoring records shall be maintained on site and made available to FCC, the Employer's Representative and the Environmental Clerk of Works.

The following additional mitigation measures relating to the protection of water quality will apply:

- As set out in the OCEMP prepared alongside this EIAR, the CEMP to be prepared by the contractor shall detail procedures for the control, treatment and disposal of potentially contaminated surface water including monitoring systems and oversight required throughout the construction phase.
- An Outline Construction Methodology Report has been prepared as part of this application and the mitigation measures and best practice policies set out therein are to be implemented during the construction phase. Site inductions will include reference to the procedures and best practice as outlined therein.
- The contractor will be required to implement industry best practice pollution prevention measures in accordance with guidance documents (for example CIRIA Guideline Document C532 Control of Water Pollution from Construction Sites), during both construction and operation in order to control the risk of pollution to surface waters. In addition, pollution of aquatic systems during the construction phase will be reduced by the implementation of the protection measures as outlined in relation to biodiversity.

12.5.5 Specific Mitigation Measures – Operational Phase (Mitigation Through Design)

The Proposed Development layout has evolved in order that the design avoids conflict with the water environment. Design evolution to minimise environmental impact has been prioritised throughout the various design stages. This is detailed in Chapter 3 Consideration of Alternatives, as well as the Route Options Assessment Report and has been continued throughout the planning stage and design phases.

The alignment of the greenway at the new watercourse crossing (the Landmark Bridge) is such that it facilitates the construction of the crossing structures outside the active canal channel by utilising a clear span crossing (bridge) which can be constructed while maintaining the canal banks.

The scheme is primarily outside Flood Zone A and generally avoids encroaching into any flood zones to minimise impact on flood conveyance and floodplain storage. There is one apparent encroachment into Flood Zone B identified, which has been assessed and mitigated through the SSFRA.

The drainage system allows recharge to groundwater at all filter trench and open channel / over the edge drainage locations. Piped drainage is not the primary mechanism chosen, and instead drainage types such as Filter Drainage and Over the Edge Drainage has taken precedence. Where filter drains and linear drainage channels are necessary, they will be sized accordingly for the area being drained, in accordance with the regulations e.g. Greater Dublin Strategic Drainage Strategy (GDSDS), taking account of flood exceedance e.g. for storms return periods over 1% AEP and incorporating 20% climate change.

Following completion of the Proposed Development, routine operation and maintenance activities will be undertaken by the relevant asset owner in accordance with applicable environmental management procedures, statutory requirements and best practice guidance. These procedures will assist in minimising the potential for adverse effects on surface water, groundwater, drainage infrastructure and flood conveyance during the operational life of the scheme.

No specific mitigation measures are proposed in relation to foul drainage however, all new foul drainage lines where required will be pressure tested and be subject to a CCTV survey in order to identify any possible defects prior to being made operational (in accordance with Uisce Éireann's QA Field Inspection Requirement Manual).

No specific mitigation measures are proposed in relation to water supply, however all watermains where required will be designed and installed in line with the Uisce Éireann Code of Practice for Water Infrastructure.

12.6 Residual Impact

Implementation of the measures outlined in Section 0 will substantially reduce the potential for adverse effects on the water environment. Pollution prevention measures, sediment control measures, water quality monitoring, drainage management measures and mitigation-by-design elements have been specifically developed to address the significant unmitigated impacts identified for the Royal Canal and associated water receptors. As a result, all residual effects are reduced to Imperceptible or Slight Adverse levels, and no Significant residual effects are predicted during the Construction Phase.

The surface water drainage design has been developed in accordance with the GDSDS and incorporates Sustainable Drainage Systems (SuDS) as part of a treatment train approach. Accordingly, residual impacts on the hydrological and hydrogeological environment during the Operational Phase are also predicted to be Imperceptible or Slight Adverse.

Summaries of the predicted residual impacts for the Construction and Operational Phases, following implementation of the mitigation measures outlined in Section 0 are set out in Table 12-16 and Table 12-17, respectively.

Following implementation of the mitigation measures no Significant, Very Significant or Profound residual effects on the water environment are predicted during either the Construction or Operational Phases.

Table 12-16: Summary of Predicted Residual Impacts – Construction Phase

Receptor	Assessment Topic	Predicted Impact (Pre- Mitigation)	Residual Impact (Post Mitigation)
Royal Canal pNHA	Chemical Pollution of Surface Water Receptors	Significant Adverse, and Short-Term	Imperceptible Adverse, and Short-Term

Receptor	Assessment Topic	Predicted Impact (Pre- Mitigation)	Residual Impact (Post Mitigation)
	Pollution by Suspended Solids	Significant Adverse, and Short-Term	Imperceptible Adverse, and Short-Term
	Changes to Stream Channels	Slight Adverse, and Short-Term	Slight Adverse, and Short-Term
	Changes to Runoff and Flow Patterns	Slight Adverse, and Short-Term	Slight Adverse, and Short-Term
Rusk River	Chemical Pollution of Surface Waters	Moderate Adverse, and Short-Term	Imperceptible Adverse, and Short-Term
	Pollution by Suspended Solids	Moderate Adverse, and Short-Term	Imperceptible Adverse, and Short-Term
	Changes to Stream Channels	Slight Adverse, and Short-Term	Imperceptible Adverse, and Short-Term
	Changes to Runoff and Flow Patterns	Slight Adverse, and Short-Term	Imperceptible Adverse, and Short-Term
Dublin Groundwater Body / Bedrock Aquifer	Chemical Pollution of Hydrogeological Receptors	Moderate Adverse, and Medium-Term	Imperceptible Adverse, and Medium-Term

Table 12-17: Summary of Predicted Residual Impacts – Operational Phase

Receptor	Assessment Topic	Predicted Impact (Pre- Mitigation)	Residual Impact (Post Mitigation)
Royal Canal pNHA	Chemical Pollution of Surface Water Receptors	Slight Adverse, and Long-Term	Imperceptible Adverse, and Long-Term
	Pollution by Suspended Solids	Imperceptible Adverse, and Long-Term	Imperceptible Adverse, and Long-Term
	Changes to Stream Channels	Slight Adverse, and Long-Term	Slight Adverse, and Long-Term
	Changes to Runoff and Flow Patterns	Slight Adverse, and Long-Term	Slight Adverse, and Long-Term
Rusk River	Chemical Pollution of Surface Waters	Slight Adverse, and Long-Term	Imperceptible Adverse, and Long-Term
	Pollution by Suspended Solids	Imperceptible Adverse, and Long-Term	Imperceptible Adverse, and Long-Term
	Changes to Stream Channels	Slight Adverse, and Long-Term	Imperceptible Adverse, and Long-Term
	Changes to Runoff and Flow Patterns	Slight Adverse, and Long-Term	Imperceptible Adverse, and Long-Term
Dublin Groundwater Body / Bedrock Aquifer	Chemical Pollution of Hydrogeological Receptors	Slight Adverse, and Long-Term	Imperceptible Adverse, and Long-Term

12.7 Cumulative impact

The cumulative assessment has considered the Proposed Development in combination with existing, permitted and reasonably foreseeable developments within the study area, including the other sections of the Royal Canal Greenway and other developments identified in Chapter 1 of this EIAR.

During the Construction Phase, cumulative effects on the hydrological and hydrogeological environment could arise where construction activities associated with the Proposed Development occur concurrently with other nearby developments. Potential cumulative effects relate principally to sediment release, accidental pollution incidents and temporary deterioration in surface water quality arising from earthworks, excavation and construction runoff.

Major infrastructure projects within the wider area, including DART+ West, have also been considered. While temporary construction-stage interactions may occur where works overlap in time, no significant cumulative effects on water quality, hydrology or hydrogeology are predicted due to the localised nature of the works and the implementation of project-specific mitigation measures.

The Proposed Development has been assessed on the basis that construction works will be undertaken in accordance with the mitigation measures set out in the OCEMP and Construction Methodology Report submitted with this application, and the final CEMP to be prepared by the Contractor. Similar environmental controls would be expected to apply to other permitted developments. Furthermore, construction-related impacts would be temporary, localised and limited to discrete sections of the greenway corridor. Accordingly, significant cumulative impacts on the Royal Canal, the Rusk River or the wider hydrological environment are not anticipated during the Construction Phase.

During the Operational Phase, the Proposed Development incorporates surface water drainage measures designed in accordance with the Greater Dublin Strategic Drainage Study (GDSDS) and Sustainable Drainage Systems (SuDS) principles. The drainage design is intended to control runoff rates and maintain water quality prior to discharge. While other existing, permitted and reasonably foreseeable developments may also generate runoff and surface water discharges, these developments are similarly required to comply with applicable drainage standards and environmental protection objectives.

The Proposed Development will not result in significant increases in runoff volumes, pollutant loading or flood risk, either individually or in combination with other developments. Consequently, significant cumulative impacts on surface water quality, hydrology, hydrogeology or flood risk are not anticipated during the Operational Phase.

12.8 Difficulties Encountered

The assessment has been undertaken using the best available information at the time of writing, including EPA datasets, OPW flood mapping, Geological Survey Ireland datasets, available drainage records, site investigations and ecological survey information prepared for the Proposed Development.

The assessment relies on information obtained from a range of third-party sources, including statutory bodies and publicly available environmental datasets. While these information sources are considered suitable for the purposes of the assessment, it is recognised that some datasets may be updated periodically following future monitoring, assessment or survey programmes.

The assessment has been undertaken at planning stage and therefore detailed construction methodologies and temporary works arrangements have not yet been finalised. Where works are proposed within the Royal Canal corridor and adjacent riparian areas, the precise construction methodologies, temporary works arrangements and sequencing of activities will be confirmed during detailed design and construction planning. This uncertainty has been addressed through the

assessment of reasonable worst-case scenarios and the incorporation of mitigation measures within the OCEMP and Outline Construction Methodology Report.

Notwithstanding the above, no limitations have been identified that would materially affect the findings, conclusions or mitigation measures presented in this chapter.

12.9 Summary of Interactions

12.9.1 Air Quality

Interactions between Water and Air Quality arise during the Construction Phase through the management of exposed soils, excavations and stockpiles. Measures used to control dust emissions, including damping down of exposed surfaces and earthworks areas, may generate surface water runoff if not appropriately managed. Conversely, water quality protection measures implemented to manage runoff and sediment transport may also contribute to dust suppression. Accordingly, there is an interaction between the control of airborne dust emissions and the management of surface water runoff during construction. Further details are provided in Chapter 5: Air Quality.

12.9.2 Climate

Interactions between Water and Climate arise through both climate adaptation and climate resilience. Future increases in rainfall intensity associated with climate change have been considered within the drainage design and flood risk assessment for the Proposed Development. In addition, the adoption of infiltration drainage, filter drains and over-the-edge drainage seeks to replicate existing hydrological processes and maintain groundwater recharge where practicable. Potential climate-related effects on surface water runoff, flood risk and drainage capacity are considered in both this chapter and Chapter 6: Climatic Factors.

12.9.3 Noise and Vibration

Interactions between Water and Noise and Vibration arise during the Construction Phase where works within the Royal Canal corridor, adjacent drainage features and watercourse crossing locations generate construction-related noise and vibration. Construction activities that have the potential to affect water quality, including excavation, earthworks and drainage installation, are also the principal sources of construction noise and vibration. These effects have been assessed in Chapter 7: Noise and Vibration.

12.9.4 Biodiversity

The strongest interaction identified is between Water and Biodiversity. Water quality, hydrology and aquatic habitat conditions within the Royal Canal directly influence aquatic and riparian ecological receptors, including protected and notable species identified within Chapter 8: Biodiversity. Impacts relating to sediment release, accidental pollution, changes to flow regimes and physical disturbance of the canal corridor have the potential to affect ecological receptors. Chapter 8: Biodiversity and Appropriate Assessment Report assess the ecological consequences of these water-related effects.

12.9.5 Archaeology & Cultural Heritage

Interactions between Water and Archaeology & Cultural Heritage arise where excavation works are undertaken within areas of archaeological potential and where historic water-related features are present. Water management measures, dewatering activities and drainage works may influence archaeological investigations, while archaeological constraints may influence the design and construction of drainage and water infrastructure. Further details are provided in Chapter 9: Archaeological, Architectural & Cultural Heritage.

12.9.6 Landscape and Visual

Interactions between Water and Landscape & Visual arise through the incorporation of drainage features, swales, filter drains, over-the-edge drainage and other SuDS elements within the Proposed Development. Water management infrastructure forms part of the overall landscape character of the scheme and contributes to its visual appearance. These interactions are considered within Chapter 10: Landscape, Townscape & Visual.

12.9.7 Land, Soils and Geology

Interactions between Water and Land, Soils & Geology are significant. Construction activities have the potential to alter soil stability, generate sediment-laden runoff and affect infiltration characteristics. Geological and hydrogeological conditions influence groundwater flow, groundwater vulnerability and the effectiveness of infiltration-based drainage measures. Effects associated with erosion, sediment release, infiltration and groundwater recharge are therefore closely linked to the assessments presented in both this chapter and Chapter 11: Land, Soils, and Geology.

12.9.8 Population and Human Health

Interactions between Water and Population & Human Health arise through the protection of water quality, flood risk management and the maintenance of a healthy aquatic environment. Construction-phase pollution events, sediment release or flooding could affect users of the canal corridor and surrounding communities. Conversely, improved drainage arrangements and appropriate water management contribute positively to public amenity, recreation and overall environmental quality. Further details are provided in Chapter 13: Population & Human Health.

12.9.9 Material Assets – Traffic and Transport

Interactions between Water and Traffic & Transport arise through the design of surface water drainage infrastructure associated with the transport network. The effective management of runoff from cycleways, roads, crossings and hardstanding areas is required to avoid flooding, maintain safe operation of the transport network and protect receiving waterbodies. These interactions have been considered as part of both the drainage design and the assessment contained in Chapter 14: Traffic & Transport.

12.9.10 Material Assets – Waste Management

Interactions between Water and Waste Management arise during the Construction Phase through the excavation, handling, storage and disposal of soil, subsoil and construction materials. Inappropriate storage or management of waste materials could result in sediment release or contamination of surface water and groundwater receptors. The implementation of waste management and pollution prevention measures contributes to the protection of the water environment. Further details are provided in Chapter 15: Material Assets – Waste Management.

12.9.11 Material Assets – Utilities

Interactions between Water and Utilities arise where existing drainage networks, water supply infrastructure, wastewater infrastructure and utility crossings interface with the Proposed Development. Damage to existing utility infrastructure or drainage systems has the potential to affect surface water management and water quality. Conversely, groundwater conditions and drainage requirements may influence utility construction methodologies and protection measures. Further details are contained within Chapter 16: Material Assets - Utilities.

12.10 References

This assessment was carried out in accordance with the following guidance and established best practice:

Legislation

- Directive 2000/60/EC of the European Parliament and of the Council Establishing a Framework for Community Action in the Field of Water Policy (Water Framework Directive).
- Directive 2004/35/EC of the European Parliament and of the Council on Environmental Liability with Regard to the Prevention and Remedying of Environmental Damage.
- Planning and Development Act 2000, as amended.

- Planning and Development Regulations 2001 (S.I. No. 600 of 2001), as amended.
- European Communities (Water Policy) Regulations 2003 (S.I. No. 722 of 2003), as amended.
- European Communities Environmental Objectives (Surface Waters) Regulations 2009 (S.I. No. 272 of 2009), as amended.
- European Communities Environmental Objectives (Groundwater) Regulations 2010 (S.I. No. 9 of 2010), as amended.
- Local Government (Water Pollution) Act 1977, as amended.
- Local Government (Water Pollution) (Amendment) Act 1990, as amended.

Guidance and Policy

- Environmental Protection Agency (2022), Guidelines on the Information to be Contained in Environmental Impact Assessment Reports.
- Environmental Protection Agency (2011), Guidance on the Authorisation of Discharges to Groundwater.
- River Basin Management Plan for Ireland 2022-2027.
- Nature-Based Management of Urban Rainwater and Urban Surface Water Discharges: A National Strategy (2024).
- Nature-Based Solutions to the Management of Rainwater and Surface Water Runoff in Urban Areas: Water Sensitive Urban Design Best Practice Interim Guidance Document.
- The Planning System and Flood Risk Management Guidelines for Planning Authorities (2009).
- Water Impact Assessment for National Roads, Light Rail, Metro and Rural Cycleways - Overarching Technical Document.
- Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes (2009).
- Road Drainage and the Water Environment (DN-DNG-03065).
- Design of Earthworks Drainage, Network Drainage, Attenuation and Pollution Control (DN-DNG-03066).
- Drainage Design for National Road Schemes - Sustainable Drainage Options (RE-CPI-07001).
- Drainage Systems for National Roads (DN-DNG-03022).
- Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters (2016).
- The SuDS Manual (CIRIA C753).
- Control of Water Pollution from Linear Construction Sites (CIRIA C648).
- Control of Water Pollution from Construction Sites: Guidance for Consultants and Contractors (CIRIA C532).
- Environmental Good Practice on Site Guide (CIRIA C741).

- Groundwater Protection Schemes (1999) published by the Geological Survey of Ireland, Environmental Protection Agency and Department of the Environment and Local Government.
- Institute of Geologists of Ireland (2013), Guidelines for the Preparation of Soils, Geology and Hydrogeology Chapters of Environmental Impact Statements.
- Greater Dublin Strategic Drainage Study (GDSDS) Final Strategy Report (2005), Dublin City Council et al.
- Pollution Prevention Guidelines (PPG5): Works and Maintenance In or Near Water

Online Data Sources:

- National Parks and Wildlife Service (NPWS) Register of Protected Sites. Available at: https://www.npws.ie/protected-sites
- Environmental Protection Agency Mapping Services (EPA Maps). Available at: https://gis.epa.ie/EPAMaps/
- Geological Survey Ireland Data Viewer. Available at: https://www.gsi.ie
- Office of Public Works Flood Information Service. Available at: https://www.floodinfo.ie

13 Population and Human Health

13.1 Introduction

This Chapter of the Environmental Impact Assessment Report (EIAR) assesses the likely direct and indirect significant effects of the Proposed Development on population and human health during the Construction Phase and Operational Phase.

This Chapter describes and assesses the likely direct and indirect significant effects of the Proposed Development on population and human health in accordance with the requirements of Directive 2014/52/EU of the European Parliament and of the Council of 16 April 2014 amending Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment (i.e. the EIA Directive). This Chapter also provides a characterisation of the receiving environment.

Population effects are assessed through consideration of socio-economic and community factors, including population change, employment, access to services and facilities, amenity, recreation and quality of life. Human health effects are considered in accordance with the World Health Organisation (WHO) definition of health as *"a state of complete physical, mental and social wellbeing and not merely the absence of disease or infirmity*". The assessment has been undertaken having regard to relevant legislation, policy and guidance relating to population and human health, including the Environmental Impact Assessment Directive and current national guidance.

This chapter has been prepared by Maria Rochford BSc (Hons), MRUP MIPI, Associate Director at KPMG Planning. Maria has 15 years of professional experience as a Town Planner. Maria has coordinated multiple EIAs for development projects and has authored introductory chapters, cumulative impact assessments, Population and Human Health assessments and Land Use and Property assessments for inclusion in EIARs.

13.2 The Proposed Development

The Royal Canal Urban Greenway, hereafter referred to as the 'Proposed Development', is a pedestrian and cycle route approximately 8.1km in length to be constructed along and adjacent to the Royal Canal. The route extends eastwards from the Kildare County Boundary to the Old Navan Road, near the 12th Lock, where it will connect with the previously constructed Ashtown Greenway. Fingal County Council is the scheme promoter, in conjunction with the National Transport Authority as the funding body and Waterways Ireland as the principal property owner.

The Royal Canal links the River Shannon in County Longford to the River Liffey in Dublin City's Docklands. It passes close to a number of towns, including Mullingar, Kilcock, Maynooth and Leixlip, before entering Fingal where it passes through the built-up areas of Clonsilla, Coolmine, Castleknock and Blanchardstown on its way towards Dublin city.

The Proposed Development will provide a continuous, high-quality active travel corridor serving the communities of Clonsilla, Coolmine, Castleknock and Blanchardstown and will improve accessibility to schools, public transport, employment centres, recreational amenities and local services. The scheme will encourage a modal shift towards walking and cycling, while supporting recreation, health and wellbeing, sustainable transport objectives and climate action policies at national, regional and local level.

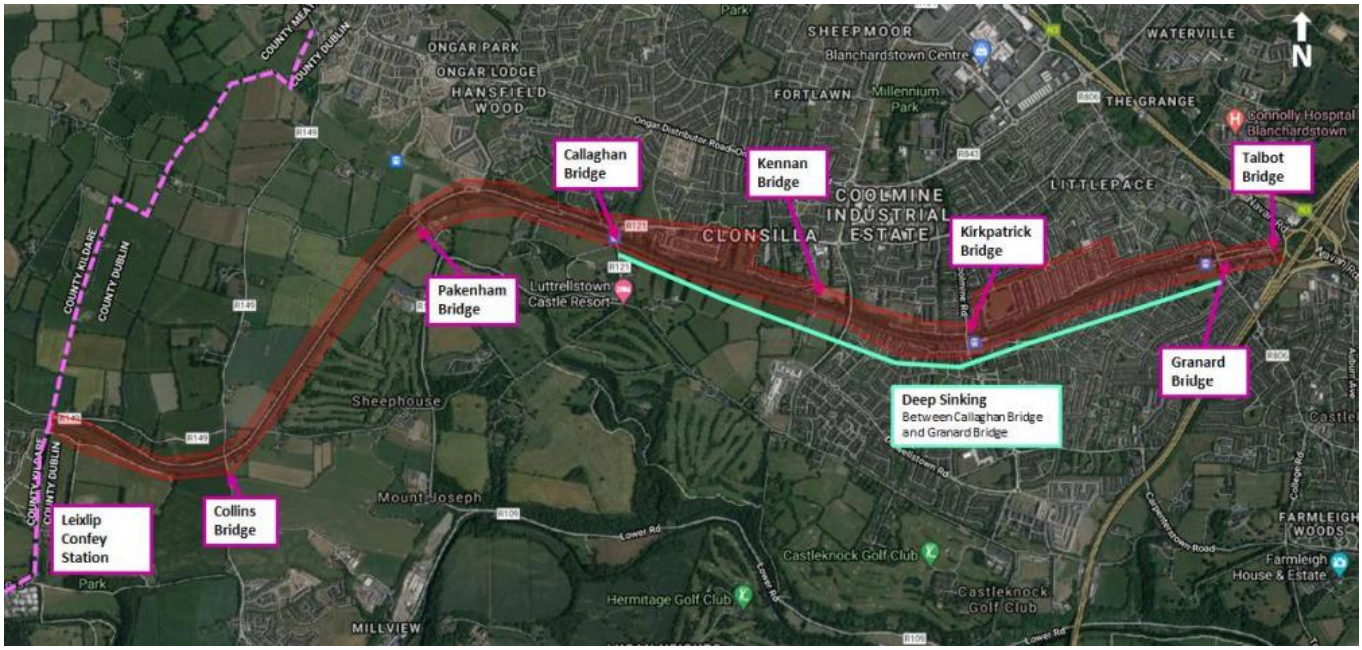


Figure 13-1 Aerial view of the entire Royal Canal Greenway (Source: Royal Canal Urban Greenway – Public Consultation Document)

The scheme has been divided into three distinct sections based on their different geographical and physical characteristics to simplify the assessment process as follows:

- Section 1 – Kildare County Border to Hansfield Railway Bridge (Ch. 0000m – 3200m)
- Section 2 – Hansfield Railway Bridge to Kennan Bridge (Ch. 3200m – 5300m)
- Section 3 – Kennan Bridge to Talbot Bridge (Ch 5300m – 8100m)



Figure 13-2 Proposed Scheme by Section (aerial view)

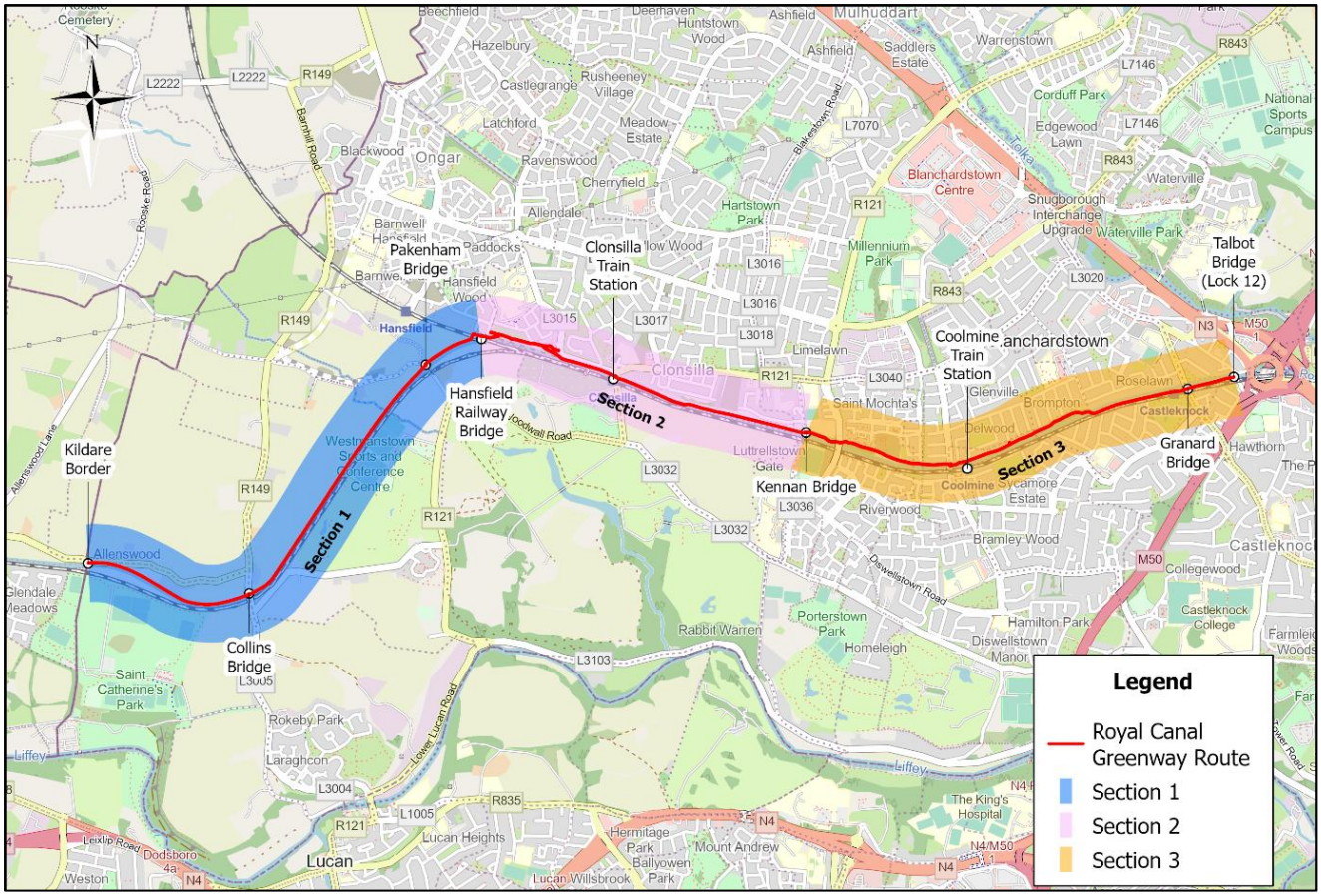


Figure 13-3 Proposed Scheme by Section (map view)

Section 1 – Kildare County Border to Hansfield Railway Bridge

Section 1 extends from the Kildare/Dublin County Boundary to Hansfield Railway Bridge. This section is rural/peri-urban in nature and is predominantly characterised by farmland, with local amenities including Westmanstown Golf Club and Westmanstown Sports Centre located nearby.

Section 2 – Hansfield Railway Bridge to Kennan Bridge

Section 2 extends from Hansfield Railway Bridge, through Clonsilla under Callaghan Bridge to Kennan Bridge at Porterstown Road. In Section 2, the character of the area changes from rural to predominantly suburban in nature. This section is predominantly residential on the northern side of the canal with farmlands on the southern side.

Section 3 – Kennan Bridge to Talbot Bridge

Section 3 runs from Kennan Bridge (Porterstown Road) to Talbot Bridge (Old Navan Road). This section is predominantly urban with extensive residential catchments on both sides of the Canal.

13.3 Relevant Guidelines, Policy and Legislation

This chapter has been prepared in accordance with the EIA Directive, the European Commission Guidance on the Preparation of the Environmental Impact Assessment Report (2017), the Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (2018), and the EPA Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (2022). The assessment has also been informed by relevant Transport Infrastructure Ireland (TII) guidance, including the Population and Human Health Assessment of

Proposed National Roads – Standard (PE-ENV-01108), together with a range of population and human health-specific guidance documents, as set out below.

- European Commission (2017) Environmental Impact Assessment of Projects: Guidance on the Preparation of the Environmental Impact Assessment Report.
- Department of Housing, Planning and Local Government (2018) Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment.
- Environmental Protection Agency (2022) Guidelines on the Information to be Contained in Environmental Impact Assessment Reports.
- World Health Organization (2018) Environmental Noise Guidelines for the European Region.
- Transport Infrastructure Ireland (2025) Population and Human Health Assessment of Proposed National Roads Standard (PE-ENV-01108).
- Institute of Public Health (2021) Health Impact Assessment Guidance: A Manual – Standalone Health Impact Assessment and Health in Environmental Assessment.
- Institute of Sustainability and Environmental Professionals (2022a) Guide to: Effective Scoping of Human Health in Environmental Impact Assessment.
- Institute of Sustainability and Environmental Professionals (2022b) Guide to: Determining Significance for Human Health in Environmental Impact Assessment.
- Department of Health (2021) Healthy Ireland Strategic Action Plan 2021–2025.
- Department of Health (2022) Healthy Ireland Outcomes Framework.

The guidance documents listed above represent the principal guidance documents currently relevant to population and human health assessment in Ireland. Health-based standards relating to environmental pathways, including air quality, noise and water quality, have been considered within the relevant specialist assessments and have informed the population and human health assessment, where relevant.

Article 3 of the EIA Directive (2014/52/EU) identifies population and human health as factors requiring environmental assessment and recognises their interaction with biodiversity, land, soil, water, air, climate, material assets, cultural heritage and landscape. The assessment of population and human health effects in this chapter has been undertaken having regard to the findings of the relevant environmental topic chapters of this EIAR and the pathways though which environmental, social and economic changes may influence health and wellbeing. In particular, potential effects on population and human health have been considered through review of the assessments presented in Chapter 5 Air Quality, Chapter 6 Climate, Chapter 7 Noise and Vibration, Chapter 8 Biodiversity, Chapter 10 Landscape and Visual, Chapter 11 Land and Soils, Chapter 12 Water, Chapter 14 Material Assets: Traffic and Transportation, Chapter 16 Material Assets: Utilities and Chapter 17 Material Assets: Land Use and Property. The findings of those chapters have informed the assessment of potential effects on health determinants including environmental quality, physical activity, accessibility, recreation, social interaction, amenity and overall wellbeing.

13.4 Baseline Information - Data and Information Sources

The assessment is informed by recognised determinants of health and wellbeing, as set out in Table 13.1. A range of datasets and information sources has been used to establish the baseline characteristics of the receiving environment within the Study Area, comprising a 500m buffer either side of the Proposed Development, in relation to these determinants.

Socio-economic and demographic data from Census 2016 and Census 2022 has been used to identify changes in the characteristics of the area over time and to establish baseline information relating to population, employment, education, vulnerability and self-reported health.

The assessment also has regard to the healthy placemaking objectives of the Fingal County Development Plan 2023–2029, including those relating to active travel, accessibility, social inclusion, public realm, open space, recreation and greenway connectivity. In this regard, the built environment is recognised as an important determinant of health and wellbeing, influencing opportunities for physical activity, recreation, social interaction and access to services. Accordingly, the receiving environment includes an assessment of existing community infrastructure, amenities, open space and active travel infrastructure within the area.

Datasets analysed include:

- Population and Household Data derived from CSO Census 2016 and Census 2022 (SAPMAP)
- Economic, Education and Employment Data derived from CSO Census 2016 and Census 2022 (SAPMAP)
- General Human Health Data derived from CSO Census 2022, including self-reported health, disability status, caring responsibilities and smoking prevalence
- GeoDirectory Q1 2025 commercial activity data
- Department of Education school and educational facilities data (2025)
- Pobal HP Deprivation Index (2022)

Other information sources include:

- Site visits/walkovers of route (March 2025)
- Review of aerial photography (Google Maps/ Street View and Aerial)

Table 13-1 Health and Wellbeing Determinants Relevant to the Assessment (adapted from EPA, TII, IPH and ISEP

Determinant	*Relevance to Proposed Development*
Socio-economic conditions	Potential to meet the needs of the local population, key demographic and socio-economic groups, and the economic base of the area, as referred to in Section 13.6.1.
Equality and Inclusion	Potential to contribute to population and human health outcomes for all user groups, including vulnerable groups, persons with disabilities and minority communities, and to improve accessibility and inclusivity, as considered in Section 13.6.2.
Environmental and Public Health	Potential to influence population and human health through environmental quality factors including air quality, noise and water quality, as considered in Section 13.6.2.
Social Infrastructure and Social Engagement	Potential to support and influence opportunities for social interaction, recreation, community participation, public spaces and amenities, as considered in Section 13.6.3 Social Infrastructure and Accessibility.
Accessibility and Connectivity	Potential to influence connectivity between residential areas, schools, services, public transport and employment locations, as considered in Section 13.6.3 Social Infrastructure and Accessibility.

The health determinants used to inform this assessment are derived from the wider determinants of health and wellbeing framework and have been informed by the EPA Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (2022), the TII Population and Human Health Assessment of Proposed National Roads Standard (PE-ENV-01108, 2025), the Institute of Public Health's Health Impact Assessment Guidance (2021) and the Institute of Sustainability and Environmental Professionals (ISEP) guidance on Human Health in Environmental Impact Assessment (2022). The determinants have been adapted to reflect the characteristics of the Proposed Development and the principal pathways through which population and human health effects may arise.

In the case of publicly available data, the most recent and up-to-date data source has been used. Data of this nature represents a snapshot in time and cannot capture more recent population and human health changes but nevertheless represents the most robust basis for assessment.

13.5 Assessment Methodology

The Population and Human Health assessment has been undertaken in accordance with the EPA Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (2022) and has been informed by the TII Population and Human Health Assessment of Proposed National Roads Standard (PE-ENV-01108, 2025) and other standards and guidelines, as referred to in Section 13.3.

These documents advocate consideration of the wider determinants of health and wellbeing and the pathways through which environmental, social and economic changes may influence population health. Accordingly, the assessment considers the potential effects of the Proposed Development on population and human health through a range of determinants, including socio-economic conditions, equality and inclusion, environmental and public health, social infrastructure and social engagement, and accessibility and connectivity, as set out in Table 13.1. These determinants reflect the principal pathways through which the Proposed Development may influence population health, wellbeing and quality of life.

The focus of the assessment is on identifying whether the Proposed Development has the potential to influence the health, wellbeing, quality of life and socio-economic characteristics of people and communities within the Study Area. The assessment therefore considers both environmental health pathways, such as noise, air quality and water quality and broader determinants of health including access to employment, services and amenities, active travel opportunities, recreation, social inclusion, community cohesion and accessibility. Particular regard is given to how the Proposed Development may affect different population groups and whether benefits or adverse effects may be experienced disproportionately by more vulnerable members of the community.

The assessment adopts a source–pathway–receptor approach, whereby potential project activities or characteristics are examined to identify the pathways through which effects may arise and the population groups, communities or sensitive receptors that may experience those effects.

Sensitive receptors include residential communities, schools, healthcare facilities, community facilities, businesses, recreational users, visitors, older persons, children and young people, and persons with disabilities or reduced mobility. Potential effects are considered both directly and indirectly and include effects on population and socio-economic conditions, environmental and public health, equality and inclusion, and social infrastructure and accessibility. The assessment also considers the interaction between Population and Human Health and other environmental factors assessed within the EIAR, recognising that effects on population, wellbeing and quality of life can arise through environmental pathways. In this regard, consideration is given to findings from Chapter 5 Air Quality, Chapter 6 Climate, Chapter 7 Noise and Vibration, Chapter 8 Biodiversity, Chapter 10 Landscape and Visual, Chapter 11 Land and Soils, Chapter 12 Water, Chapter 14 Material Assets: Traffic and Transportation, Chapter 16 Material Assets: Utilities, Chapter 17 Material Assets: Land Use and Property, the Major Accidents and Disasters assessment, and the Flood Risk Assessment, where relevant. The assessment draws upon the conclusions of these specialist assessments in identifying potential pathways through which effects on population and human health may occur.

The significance of effects has been determined having regard to the relevant population, socio-economic, health or wellbeing determinant affected, the magnitude and duration of the change, and the sensitivity of the affected population or receptor group. Consideration is given to effects on population,

socio-economic conditions, accessibility and connectivity, equality and inclusion, social infrastructure, community amenity, health and wellbeing.

The impact assessment methodology used is in alignment with the descriptive terminology set out in '*Description of Effects'* Table 3.4 of the Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (EPA, 2022). Effect significance is determined through professional assessment and judgement, having regard to the characteristics of the receiving environment, the nature of the proposed change and the sensitivity of the affected population.

Table 13-2 Description of Effects

Quality of Effects	
Positive	A change which improves the quality of the environment.
Neutral	No effects or effects that are imperceptible, within normal bounds of variation or within the margin of forecasting error.
Negative	A change which reduces the quality of the environment.
Significance of Effects	
Imperceptible	An effect capable of measurement but without significant consequences.
Not Significant	An effect which causes noticeable changes in the character of the environment but without significant consequences.
Slight	An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.
Moderate	An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline trends.
Significant	An effect which, by its character, magnitude, duration or intensity alters a sensitive aspect of the environment.
Very Significant	An effect which, by its character, magnitude, duration or intensity significantly alters most of a sensitive aspect of the environment.
Profound	An effect which obliterates sensitive characteristics.
Duration and Frequency of Effects	
Momentary Effects	Effects lasting from seconds to minutes.
Brief Effects	Effects lasting less than a day.
Temporary	Effects lasting less than a year.
Short-term	Effects lasting one to seven years.
Medium-term	Effects lasting seven to fifteen years.
Long-term	Effects lasting fifteen to sixty years.
Permanent	Effects lasting over sixty years.
Reversible	Effects that can be undone, for example through remediation or restoration

For the purposes of this assessment, effects assigned a significance rating of Significant, Very Significant or Profound are considered to constitute likely significant effects in EIA terms. Effects assessed as Moderate, Slight, Not Significant or Imperceptible are not considered likely significant effects, although they are reported where relevant to provide a comprehensive assessment.

The assessment considers direct, indirect, cumulative, residual and synergistic effects, where relevant. Residual effects are those remaining following the implementation of mitigation measures identified within the EIAR.

13.5.1 The Study Area

The study area ('Study Area') selected for this assessment comprises a 500m buffer either side of the route of the Proposed Development, as depicted below in Figure 13.4. The Study Area has been defined having regard to the nature and scale of the Proposed Development, the characteristics of the receiving environment and the potential pathways through which effects on population and human health may arise. The 500m buffer captures the communities, businesses, schools, healthcare facilities, recreational amenities and other sensitive receptors most likely to experience direct or indirect effects associated with the Proposed Development. It also reflects the area within which changes to accessibility, connectivity, recreation opportunities, community amenity and environmental quality are most likely to be experienced. To analyse the effects of the Proposed Development on Population and Human Health, the Study Area including nine Electoral Divisions (EDs) intersecting or adjoining the corridor has been assessed in detail. The Study Area provides a representative basis for understanding the socio-economic, demographic and health characteristics of the population most likely to be influenced by the Proposed Development.

With the Proposed Development route extending over an area of 8.1km in length, a description of the study area is set out below in three sections, as follows and shown in Figure 13-4.

Section 1 – Greenway along the northern side of the Royal Canal from the Kildare County Boundary to Hansfield Railway Bridge. This section extends through a predominantly rural and peri-urban environment west of Clonsilla and Hansfield, characterised by agricultural lands, open countryside and dispersed development. The route passes in proximity to recreational facilities including Westmanstown Golf Club and Westmanstown Sports Centre and forms the transition between the rural setting at the county boundary and the more developed suburban areas further east.

Section 2 – Greenway along the northern side of the Royal Canal from Hansfield Railway Bridge to Kennan Bridge (Porterstown Road) via the former Porterstown School House lands. This section traverses the suburban communities of Hansfield, Clonsilla and Porterstown. The character of the area changes from peri-urban to predominantly suburban in nature, with established and emerging residential neighbourhoods located on the northern side of the canal and agricultural lands remaining on parts of the southern side. The route also passes in proximity to Hansfield and Clonsilla railway stations and a number of schools, community facilities and local services.

Section 3 – Greenway on the northern side of the Royal Canal from Kennan Bridge (Porterstown Road) to Talbot Bridge (Old Navan Road). This section passes through the established suburban and urban communities of Coolmine, Carpenterstown, Roselawn and Castleknock. It is characterised by extensive residential catchments on both sides of the canal and contains a high concentration of schools, community facilities, recreational amenities, public transport infrastructure and local services. This section provides the strongest connectivity to the wider active travel network and to existing communities within the Dublin 15 area.

The Study Area is described by section to assist understanding of the varying characteristics of the receiving environment along the route; however, the assessment of population and human health effects is undertaken for the Study Area as a whole.

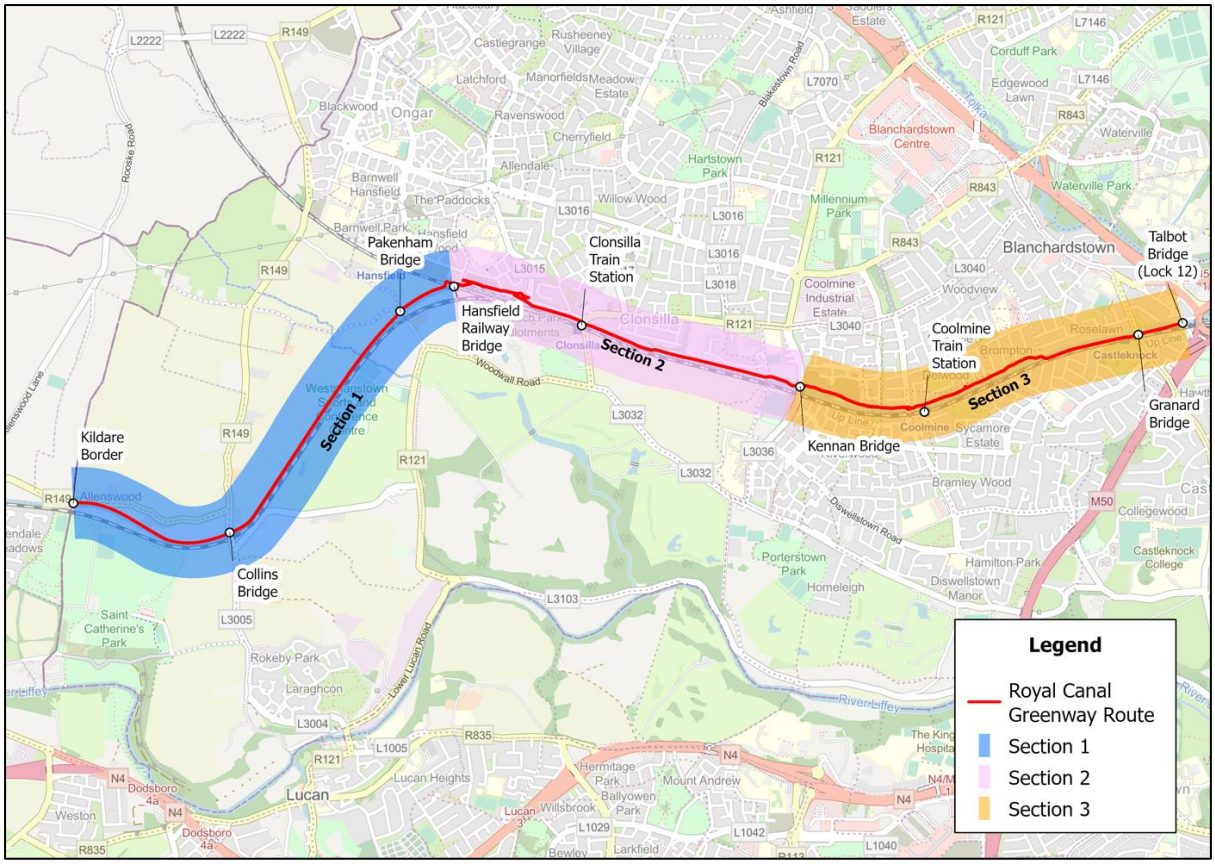


Figure 13-4 Study Area by section (map view)

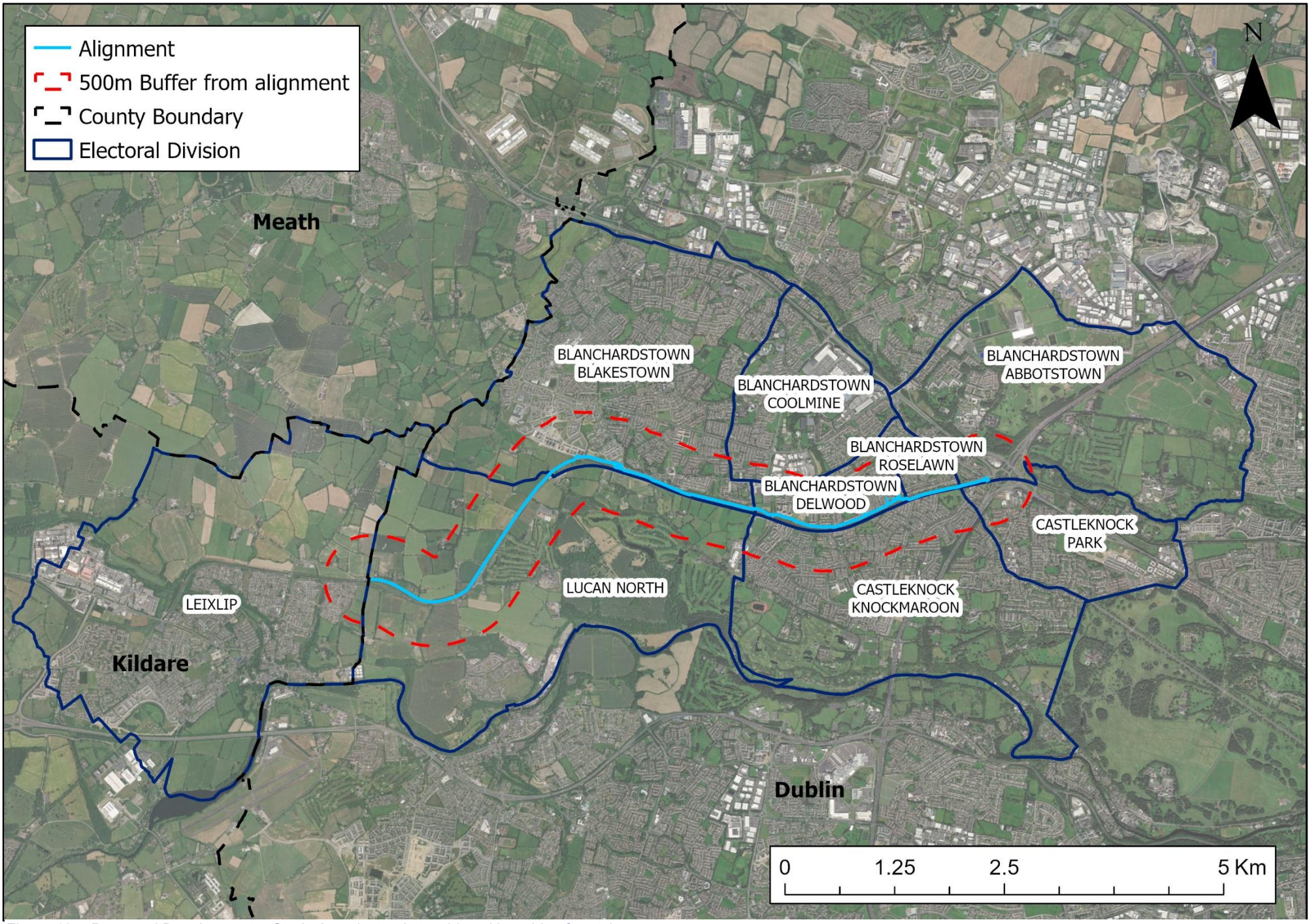


Figure 13-5 Proposed Development – Study Area (extends to 500m either side of route)

13.6 Receiving Environment

This section presents the baseline conditions of the receiving environment from the perspective of population and human health. The receiving environment is considered having regard to socio-economic conditions, equality and inclusion, environmental and public health, social infrastructure and social engagement, and accessibility and connectivity. The conditions and characteristics described across these determinants form the baseline against which the likely significant effects of the Proposed Development are assessed.

Overall, the receiving environment is characterised by a growing residential population, a high proportion of family households, an increasing older population, an extensive network of community facilities, recreational amenities and open spaces, and an existing canal corridor that already supports recreation, social interaction and local movement.

Sensitive Receptors

Sensitive receptors are those individuals, groups, communities, facilities or land uses that may be particularly susceptible to changes arising from the Proposed Development due to their location, characteristics or reliance on environmental quality, accessibility, community infrastructure or recreational amenities.

Based on the characteristics of the receiving environment, the principal sensitive receptors identified within the Study Area include:

- Residential communities and properties adjoining the route, including those within Hansfield, Clonsilla, Porterstown, Coolmine, Carpenterstown, Roselawn and Castleknock;
- Children and young people, older persons, and persons with disabilities or reduced mobility;
- Users of schools, healthcare facilities, community facilities and recreational amenities within the Study Area;
- Users of the Royal Canal corridor for walking, cycling, recreation and other leisure activities;
- Users of public transport services and active travel infrastructure;
- Businesses and service providers located within the Study Area; and
- Existing and future residents of permitted and planned residential developments within the Study Area.

These receptors have been considered throughout the assessment having regard to their sensitivity to changes in accessibility, connectivity, environmental quality, amenity, recreation opportunities, social interaction and overall health and wellbeing.

13.6.1 Population and Socio Economics

Population

Data analysis on the Study Area, Dublin Area and State region show differing trends in the distribution of the population in various age cohorts. For example, the Study Area has a noticeably larger proportion of its population in the 5-14-years and 35-44-years age groups, and a comparatively smaller proportion in the 20-29 and 80+ age groups, compared to Dublin Region figures.

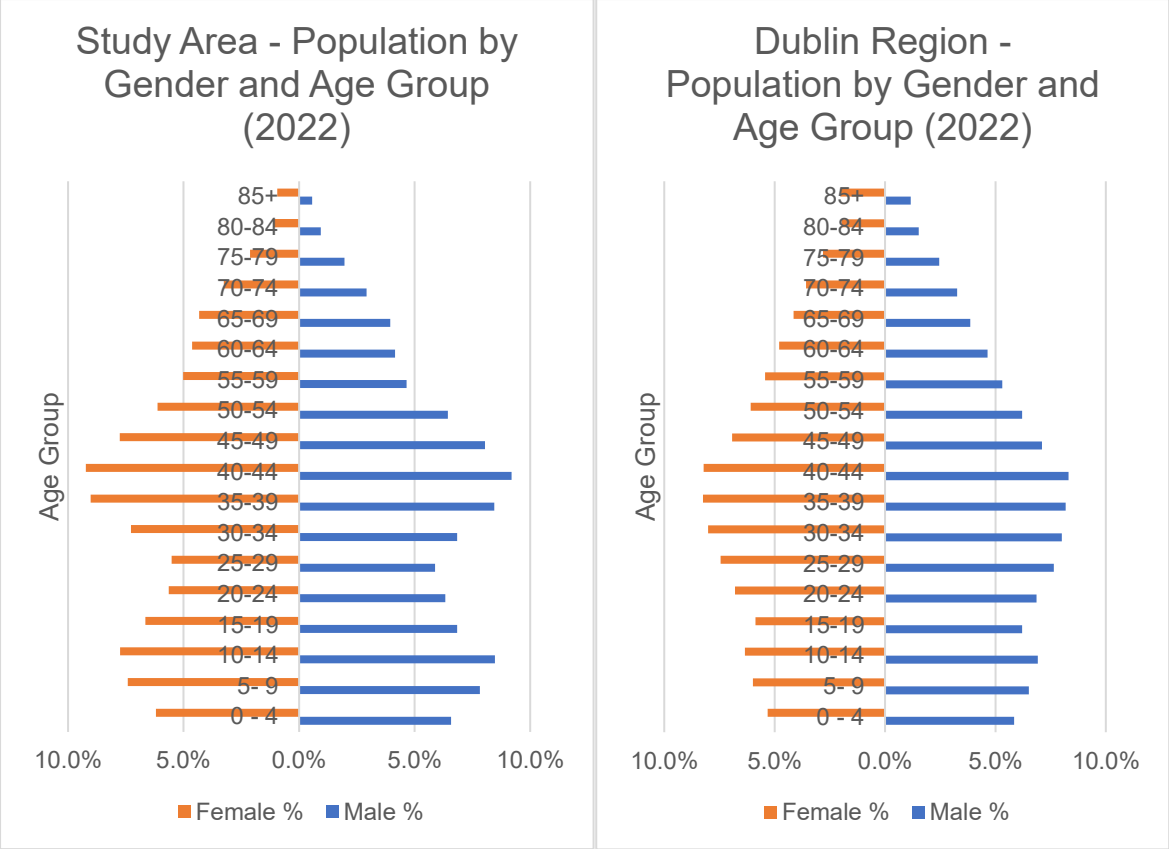


Figure 13-6 Study Area and Dublin Region Population Pyramids

The CSO Census results (Census 2022) indicate that there were 114,360 residents in the Eds intersecting the Study Area, which increased by 9.3% from 104,618 as recorded in the 2016 Census.

Table 13-3 Study Area, Dublin Region, and State Population by Age Group (Summary)

Age	Study Area				Dublin Region	State
	2016 No.	2022 No.	% Change	2022%	2022%	2022%
0-4	8,890	16008	80.07%	14%	5.58%	6%
5-19	22,849	16993	-25.63%	15%	18.90%	20.48%
20-34	22,735	21420	-5.78%	19%	22.38%	18.16%
35-64	41,706	47292	13.39%	41%	39.72%	40.55%
65+	8,438	12647	49.88%	11%	13.42%	15.08%
Total	**104,618**	**114,360**	**9.31%**	**100%**	**1,458,154**	**5,149,139**

The largest proportion of the population within the Study Area was recorded in the 35-64 age group. This age cohort saw an increase of 13.4%. The 0-4 age group showed the largest percentage change, with an increase of 80%. The 65+ age group also saw considerable growth (49.9%) between 2016 and 2022. However, the 5-19 and 20-34 age groups saw decreases of 25.6% and 5.8% respectively.

While the majority of the population in both the Study Area and Dublin Region are Irish nationals (78% each), there is also a notable presence of other nationalities as seen in Figure 13.7 below.

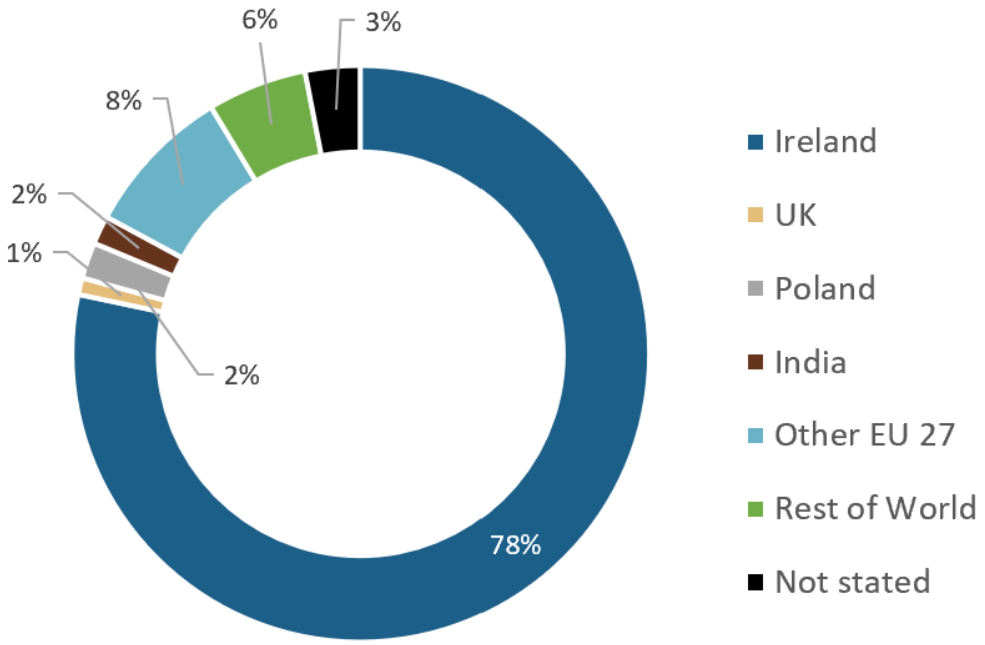


Figure 13-7 Nationality of Population within the Study Area

At Study Area level in 2022, 'Other EU 27' nationals and people from the 'Rest of the World' make up 8% and 6% of the total population. In addition to the previously mentioned nationalities, the Study Area also consisted of several other nationalities including UK, Poland and India.

The number of foreign nationals in the Study Area increased by 4,954 between 2016 and 2022 with the largest increase in the 'Not Stated' group (47%). Foreign nationals in the Dublin Region make up 22% of the population, compared to 26% foreign nationals in the State according to the 2022 census data.

Household Characteristics

Trends in household data from the intercensal period for the Study Area are summarised in the table below.

Table 13-4 Study Area Household Composition

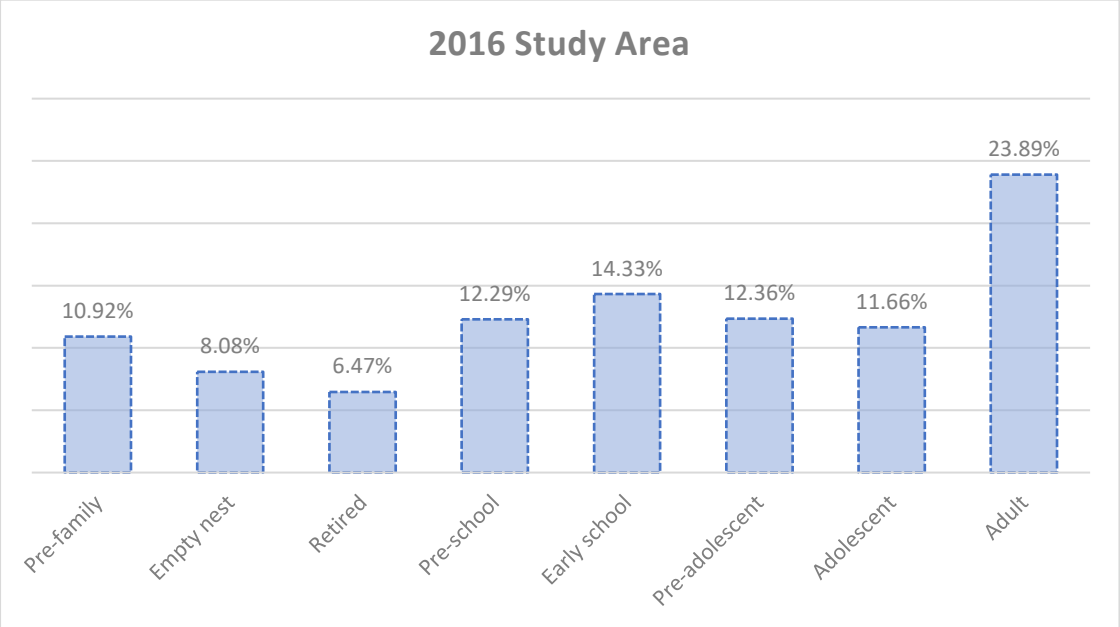
	Study Area				Dublin	State
Composition of Households	**2016**	**2022**	**Change**	**2022%**	**2022%**	**2022%**
Single person	4,710	5,288	12.27%	14.36%	22.12%	23.14%
Married couple	4,475	5,110	14.19%	13.88%	13.29%	14.90%
Cohabiting couple	1,447	1,503	3.87%	4.08%	5.34%	4.34%
Married couple and children	12,927	13,407	3.71%	36.42%	26.08%	29.42%
Cohabiting couple and children	1,462	1,647	12.65%	4.47%	3.79%	4.26%
Father and children	424	462	8.96%	1.25%	1.25%	1.46%
Mother and children	2,806	3,073	9.52%	8.35%	8.75%	8.45%
Couple and others	626	812	29.71%	2.21%	2.19%	1.51%
Couple children and others	1,181	1,378	16.68%	3.74%	2.53%	2.20%
Father children and others	93	136	46.24%	0.37%	0.31%	0.27%

Mother children and others	484	580	19.83%	1.58%	1.57%	1.20%
Two or more family units	610	690	13.11%	1.87%	1.43%	1.24%
Non-family households and relations	585	751	28.38%	2.04%	2.82%	2.23%
Two or more non-related persons	1,686	1,978	17.32%	5.37%	8.53%	5.39%
Total Households	33,516	36,815	**9.84%**	**100%**	**519,023**	**1,841,152**

The most common household composition in the Study Area is 'Married couple and children', which comprises 36.4% of all households. This compares with 26% in the Dublin region and 29.44% in the state.

The household composition with the largest percentage change in the Study Area in the 2016-2022 intercensal period was 'Father children and others', with an increase of 46.2%. However, as this is the least numerous household composition, this represents an increase of only 43 households. The household compositions with the largest absolute change were 'Married couple' (+635, 14.2% change) and 'Single person' (+578, 12.3% change).

As identified in the population and households' statistics, the Study Area characteristics highlight a majority adult population with a tendency to live in 'Married Couple and Children' households. There was also a significant increase of 49.9% in the population aged 65 years and over. This trend is seen in the change in family cycles in the Study Area, with an increase in pre-adolescent, adult, and retired families in the intercensal period.



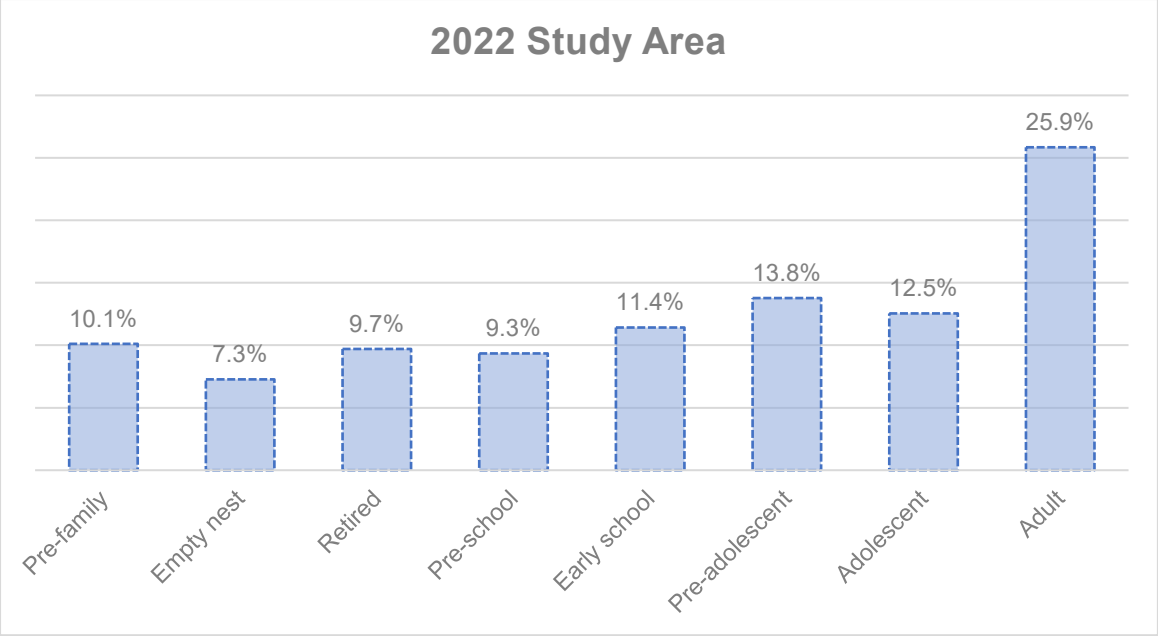


Figure 13-8 Study Area Family Cycle Stages

Education

Among residents of the Study Area aged 15 and over, a total of 52.2% hold some form of Third Level qualification (Level 6 or above), which is higher than the national average of 44.9%.

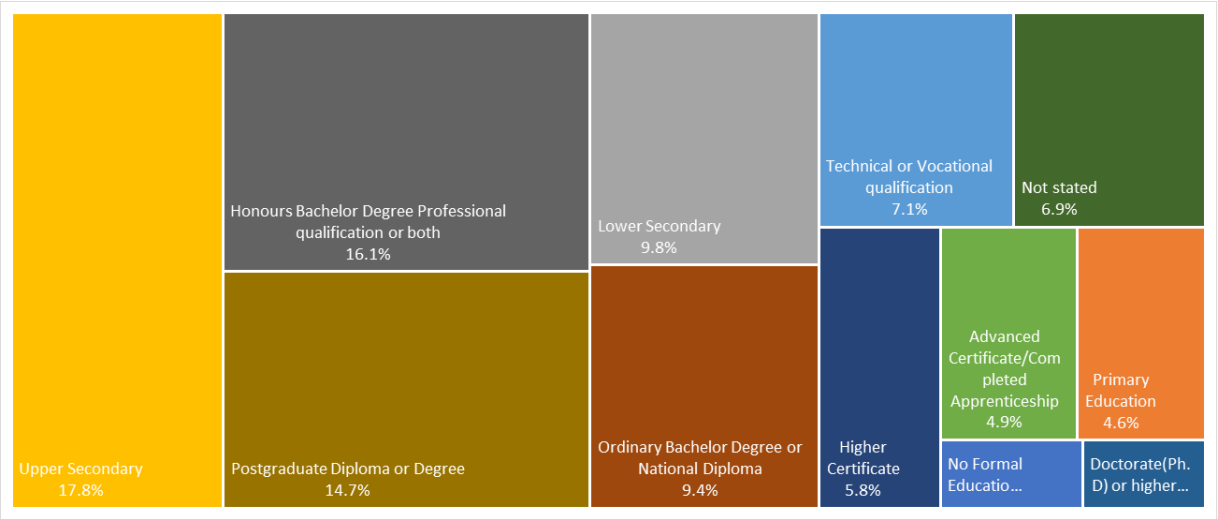


Figure 13-9 Study Area Educational Attainment

The level of Third Level (NFQ Level 6+) educational qualification attainment in the Study Area has increased by 16% in the 2016-2022 intercensal period, with a 4% decrease in people achieving less than 'Upper Secondary' qualifications (i.e. not achieving Leaving Certificate).

Economic Status

The principal economic status, as captured by the CSO, provides a breakdown for the number of people aged 15 years and older in the labour force who are economically active and inactive, unemployed, or those looking for their first job. Persons or groups over 15 years of age not participating in the labour force are typically students, home makers, retirees, and persons unable to work due to illness or

disability and they are therefore considered not to be economically active. The following table provides an overview of the labour force in the Study Area.

Table 13-5 Population Aged 15 years and Over by Principal Economic Status

	Study Area			Dublin Region	State	
Principal Economic Status	**2016**	**2022**	**Change**	**2022%**	**2022 %**	**2022%**
At work	48,275	54,325	12.53 %	60.99%	58.77%	56.09%
Looking for first regular job	703	846	20.34 %	0.95%	0.87%	0.83%
Unemployed having lost or given up previous job	5,102	3,653	-28.40 %	4.10%	4.38%	4.26%
Student	8,762	10,124	15.54 %	11.37%	11.34%	11.10%
Looking after home/family	5,801	5,491	-5.34%	6.16%	5.74%	6.58%
Retired	7,827	11,173	42.75 %	12.54%	14.44%	15.90%
Unable to work due to permanent sickness or disability	2,499	2,986	19.49 %	3.35%	3.84%	4.58%
Other	181	479	164.64 %	0.54%	0.62%	0.65%
Total	79,150	89,077	12.54 %	n/a	n/a	n/a

Based on CSO Census 2016 and Census 2022 data on Principal Economic Status, unemployment decreased by 28%, accounting for 4.1% of the population of the Study Area in 2022. The number of people 'At work' grew by 13%, making up 61% of the population. Those 'Looking for their first regular job' increased by 20%, though they represented just 1% of population. The number of students rose by 16%, while those 'Looking after home/family' declined by 5%, comprising 6.2% of population. The retired population increased significantly by 43%, representing 12.5% of population, while those 'Unable to work due to permanent sickness or disability' grew by 19%, accounting for 3.4%. The 'Other' category had the largest relative increase of 164.6%, but it remained the smallest group at 0.5%. Overall, the data indicates a relatively strong labour market profile within the Study Area, characterised by increasing employment levels, declining unemployment and a growing retired population. The reduction in the number of persons recorded as "Unemployed having lost or given up previous job" is indicative of improving employment conditions during the intercensal period.

Deprivation score - The Pobal Deprivation Index is Ireland's primary tool for measuring the relative affluence or disadvantage of geographic areas. It uses data from the national census to analyse factors such as educational attainment, employment status, and household composition. The index assigns a score to small areas, highlighting levels of deprivation or affluence. The Deprivation Index scores for the Electoral Divisions (EDs) in the study area indicate a trend towards 'Marginally Above Average' to 'Affluent' status, with 2 of the 9 EDs receiving a status of 'Marginally Below Average' are shown on Figure 13.10 below

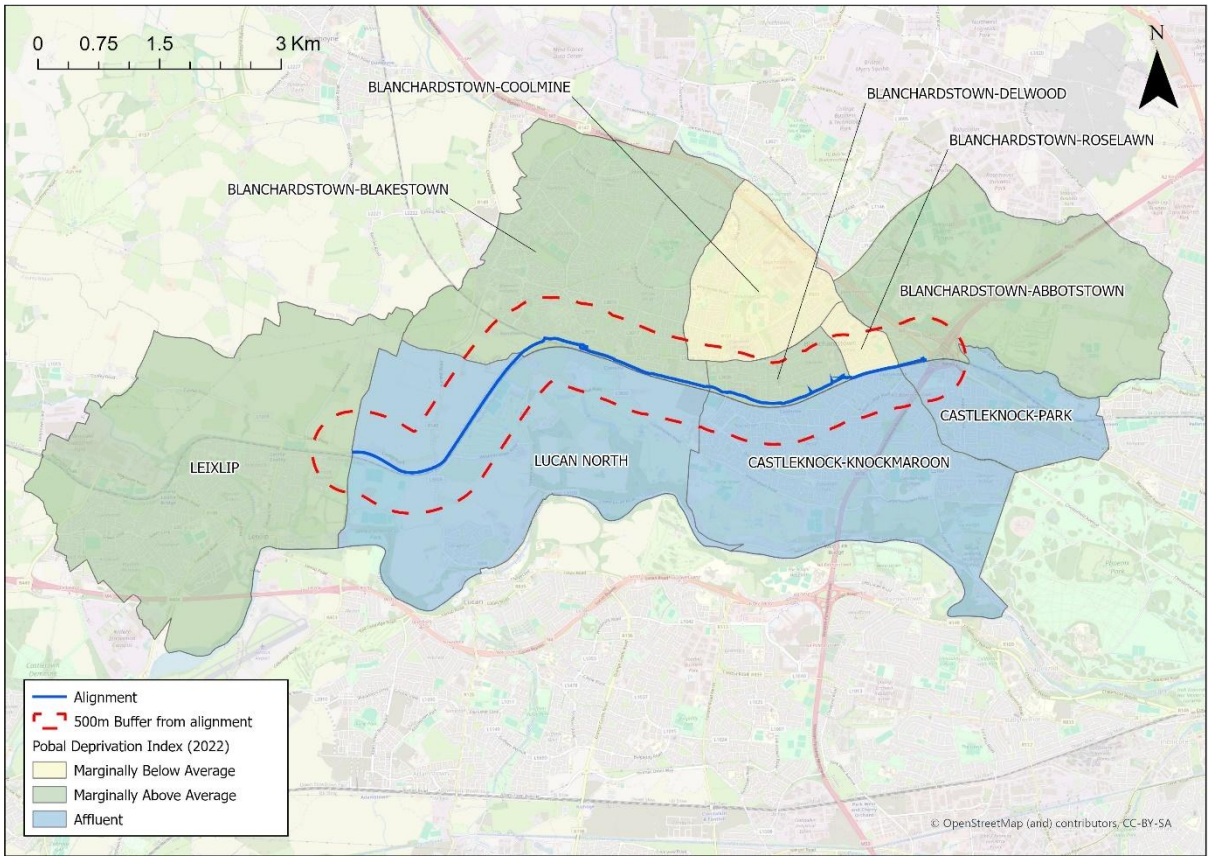


Figure 13-10 Deprivation Index scores in the Study Area

Business Activity

The nature of commercial activity within the study area was considered on analysis of the GeoDirectory database, which lists commercial activity and sectoral base / provisions of services in any given location at a specific point in time (Q1 2025). There are 325 no. commercial activity points within the Study Area, as categorised by European Industry Activity Classification (NACE Codes). Dominant commercial sectors active in the area fall into the NACE categories Section Q, 'Human Health and Social Work Activities', Section S, 'Other Service Activities' and Section G, 'wholesale and retail trade, repair of motor vehicles'. 'Other Service Activities' includes a broad range including hairdressing and beauty related services, physical well-being services, repair of household goods services, washing/dry cleaning services, other personal service activities. The locations and proximity to the proposed works of business activity within the study area is shown on Figure 13.11.

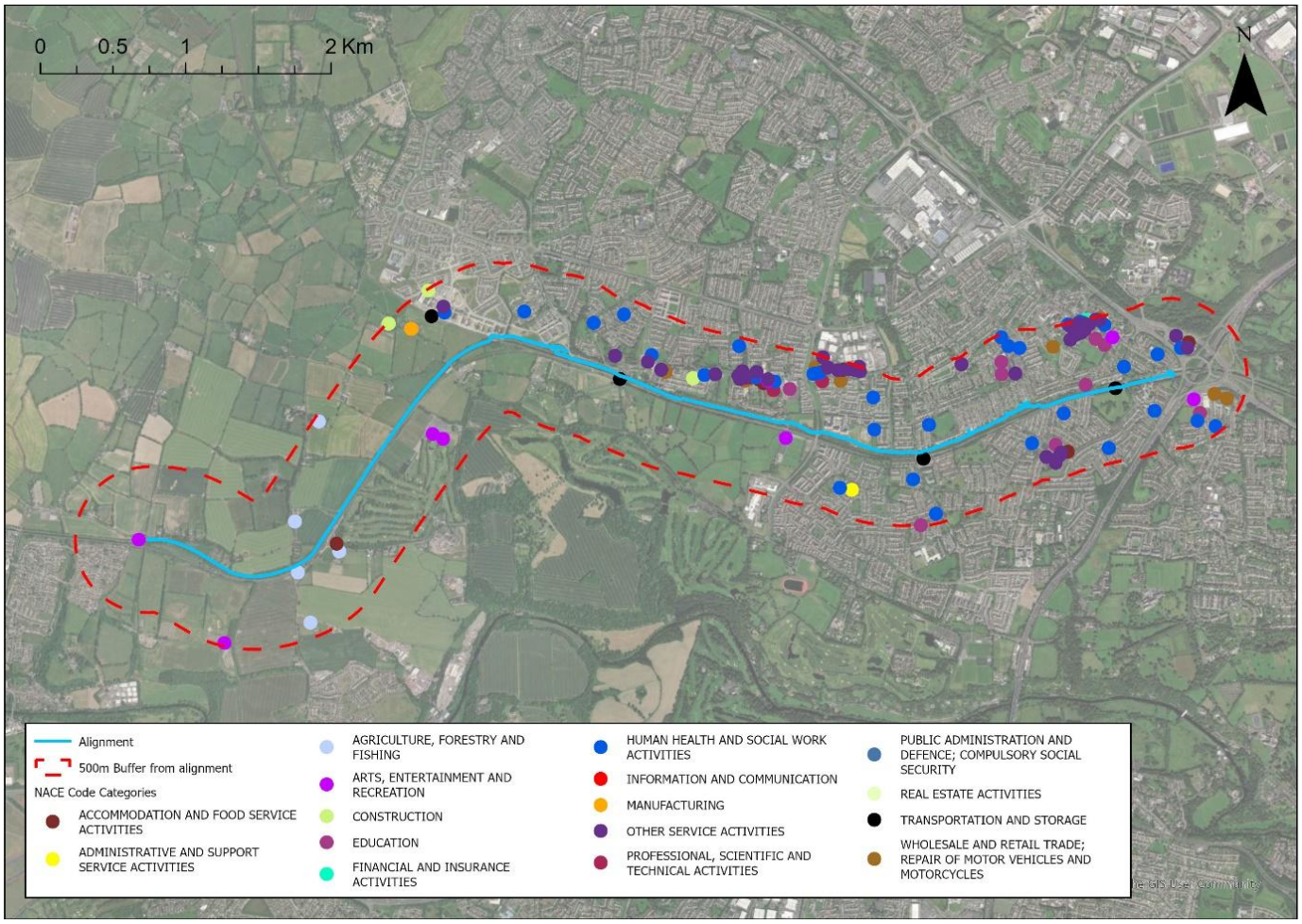


Figure 13-11 Sectoral Base/Business activity in study area (Source: GeoDirectory Q1 2025)

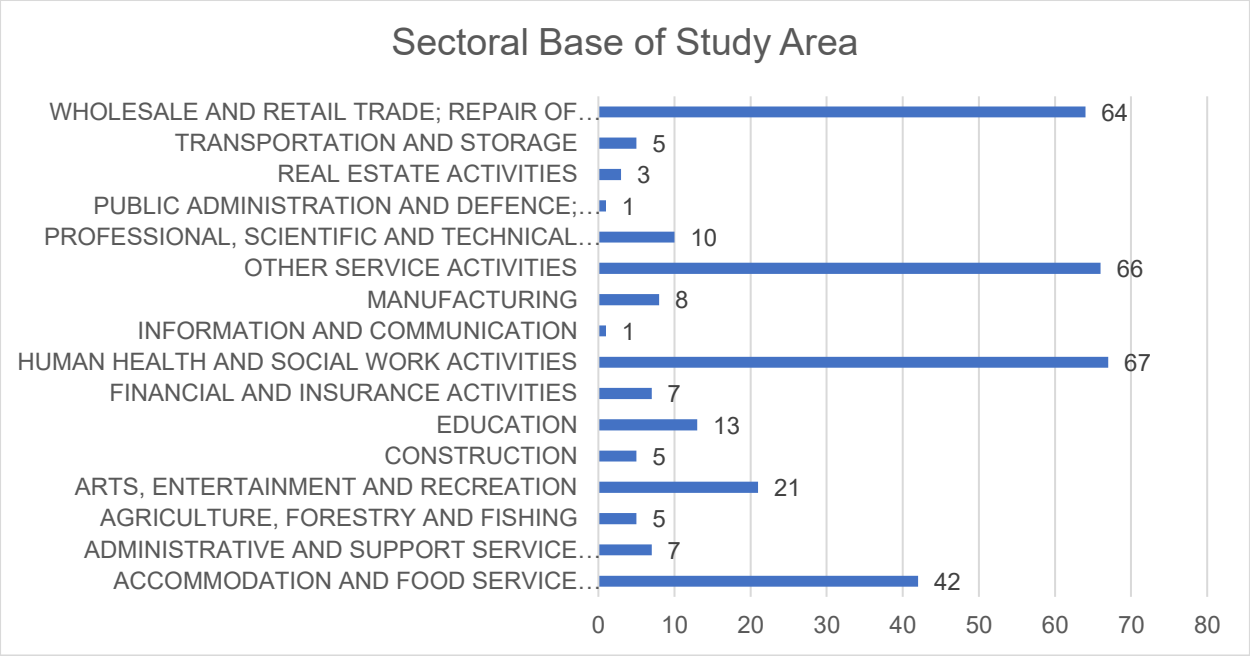


Figure 13-12 Sectoral Base (Source: GeoDirectory Q1 2025)

Recent Development and Planning Applications

A record of planning permissions granted within and adjoining the Study Area indicates substantial residential development activity in recent years (Fingal County Council and ACP Planning Records). Between November 2020 and August 2026, permission was granted for approximately 1,838 residential units within 500 m of the Study Area, with a significant proportion of these developments having already commenced construction. The majority of residential schemes permitted since 2020 are located to the north of the proposed route, principally within the Hansfield Strategic Development Zone and surrounding lands. Several large residential schemes exceeding 150 units have been permitted or commenced, including developments at Hansfield Orchard, St. Joseph's Phase 2 and 3, Porterstown and Winterwood. The locations of permitted developments, including completed, commenced and uncommenced schemes, are shown in Figure 13.13.

In addition to residential development, a number of transport, community and mixed-use developments have been permitted within the surrounding area. These include the BusConnects Blanchardstown to City Centre Core Bus Corridor Scheme and DART+ West, both of which will enhance public transport accessibility within the wider area. Other permitted developments include neighbourhood and community facilities within the Hansfield Strategic Development Zone, recreational and sports facilities, and mixed-use commercial developments that will support the growing residential population.

The scale of permitted and commenced development in the vicinity of the Proposed Development indicates that the local population is expected to continue increasing over the coming years. This population growth will contribute to demand for recreational amenities, active travel infrastructure and accessible open space within the Study Area.

Further details on the planning history and development context of the area are provided in Chapter 1 Introduction – Section 1.10 ‘Other Projects and Plans’.

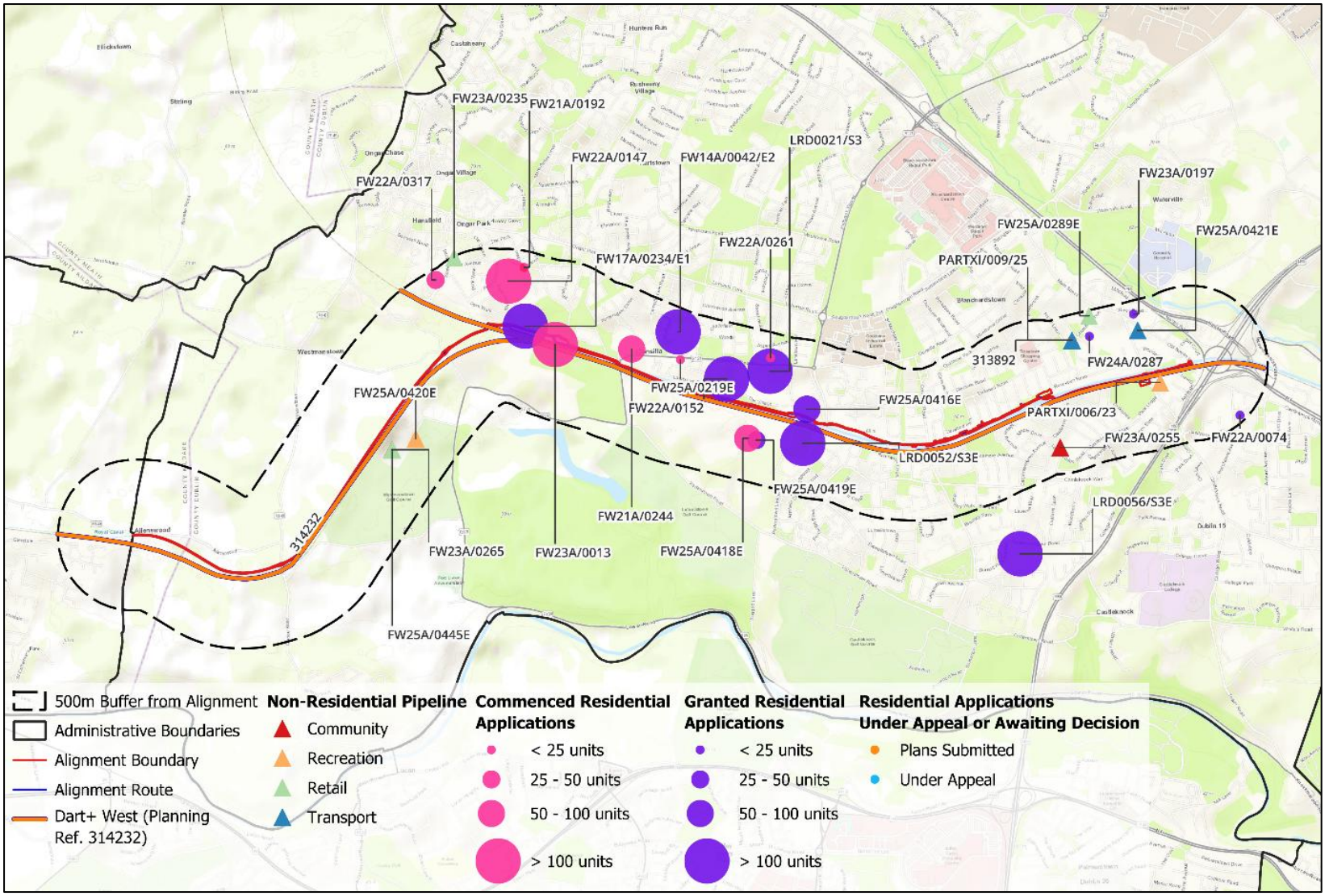


Figure 13-13 Residential and non-residential planning activity within 500m of the proposed development from Nov 2020 to August 2026 ((Fingal County Council Planning Records, ACP Records)

13.6.2 Environmental and Public Health, Equality and Inclusion

The baseline assessment presented in this section considers a range of indicators relevant to population and human health, equality and inclusion. These include health status, vulnerable groups, persons with disabilities, smoking prevalence and healthy life years. The assessment also considers aspects of environmental quality, including air quality, noise and water quality, as determinants of public health.

Health Status of Population

The Census records the self-evaluated general health status of respondents (as opposed to the health status confirmed by medical practitioners). In terms of general health and wellbeing, disparate changes were recorded throughout the spectrum as seen in Table 13.6 below.

Table 13-6 Study Area Population by General Health and Gender

	Male			Female			Total			
General Health	2016	2022	% Change	2016	2022	% Change	2016	2022	% Change	2022%
Very good	32,530	31,730	-2.46%	32,847	31,883	-2.93%	65,377	63,613	-2.70%	55.63 %
Good	13,517	16,195	19.81%	14,194	16,827	18.55%	27,711	33,022	19.17%	28.88 %
Fair	2,748	3,609	31.33%	3,465	4,403	27.07%	6,213	8,012	28.96%	7.01%
Bad	504	548	8.73%	575	730	26.96%	1,079	1,278	18.44%	1.12%
Very bad	104	110	5.77%	124	165	33.06%	228	275	20.61%	0.24%
Not stated	2,075	4,258	105.20 %	1,935	3,902	101.65 %	4,010	8,160	103.49 %	7.14%
Total	51,478	56,450	9.66%	53,140	57,910	8.98%	104,618	114,360	9.31%	

Of the health statuses reported, most of the study area population (55.6%) reported as 'Very good', which is a 2.7% decrease from 2016. Those reporting 'Good' health in 2022 increased by 19.2%, comprising 28.9% of the population. Reports of 'Fair' and 'Bad' health status reports saw increases of 29% and 18.4%, respectively. The 'Very bad' health status reports increased by 20.6%, though it accounted for only 0.2% of responses in 2022. The largest percentage change in self-reported health status in the study area is the 'Not stated' category, with an increase of 103.5%, representing 7.14% of the total. The overall trend demonstrates a slight downward perception in self-reported health status in the 2016-2022 intercensal period.

Vulnerable Population Groups

Certain groups within the population may be more sensitive to changes in environmental and social conditions and may therefore experience disproportionate effects. These groups include children and young people, older persons, persons with disabilities, individuals with long-term illness or reduced mobility, users of healthcare and educational facilities, households experiencing socio-economic disadvantage and those who rely on walking, cycling or public transport for daily journeys. The assessment has also had regard to the social inclusion objectives of the Fingal County Development Plan 2023–2029, including the integration and accessibility needs of minority communities.

Census 2022 data outlined above indicates that the Study Area contains a significant proportion of family households with children, a growing population aged 65 years and over, and a notable proportion of residents with disabilities. These groups often require access to a range of services and facilities, including schools, healthcare services, community infrastructure and recreational amenities, and may be more sensitive to changes in accessibility, mobility, environmental quality and recreational opportunities. Accordingly, these characteristics have been considered in identifying sensitive receptors and assessing the potential effects of the Proposed Development on population and human health.

Population with Disabilities

Approximately 17.8% of the Study Area population have some form of disability. This is less than the average for Dublin (20.9%) and the State (21.5%). The proportion of people with disabilities appears to be slightly higher for females (18.6%) compared to males (16.8%).

Figure 13.14 illustrates the proportion of persons with any extent of disability as a percentage of the total population of the study area, broken out by age group. As expected, there is a direct correlation between the proportion of the population with a disability and their age. A comparatively higher portion of people in the age profile 65 years and over have a disability to some extent, compared to those below 65 years.

According to the World Health Organisation (WHO, 2022), persons with disabilities are generally more susceptible to poorer health, mortality, and experience increased limitations in everyday functioning than others. Poverty, exclusion from education and employment, and poor living conditions all add to the risk of poor health and unmet health care needs among persons with disabilities.

In that regard, as per Census 2022, the total number of carers for the Study Area was recorded at around 5% of the total population. This is an average of one carer for every 3.7 disabled persons within the Study Area.

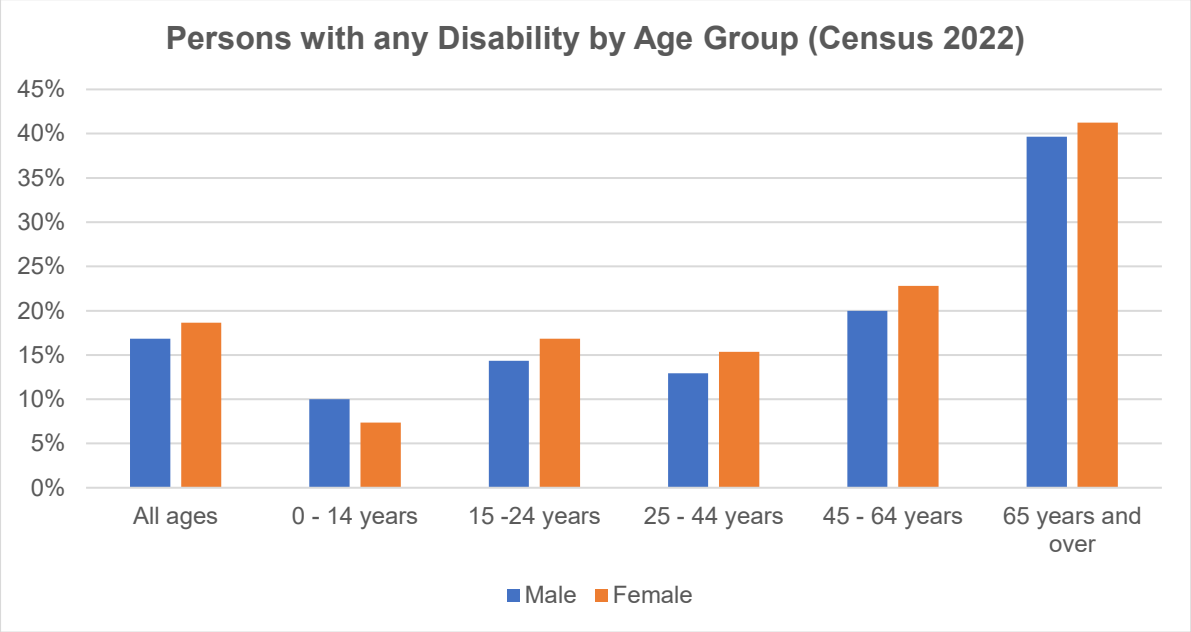


Figure 13-14 Persons with any Disability by Age as a percentage of total population (Census 2022)

Smoking Prevalence

As per the Healthy Ireland Outcomes Framework (Department of Health, 2022), lifestyle factors such as smoking, alcohol consumption, physical inactivity and obesity can adversely affect population health outcomes and undermine progress in improving overall health and wellbeing. The Framework notes that, based on findings from the 2021 Healthy Ireland Survey, smoking rates increased slightly between 2019 and 2021 following a period of steady decline.

The Study Area, as per Census 2022, has around 11.2% of the total population that smoke and about 80.9% that do not smoke. The Study Area has a comparatively lower proportion of smokers than the Dublin NUTS3 region and the State, where 13.4% and 13.1% of people smoke, respectively.

Table 13-7 Persons that smoke and do not smoke within the Study Area as of Census 2022

Category	Persons	% of Total
Persons who smoke tobacco products (Daily and Occasionally)	12,762	11.2%
Persons who don't smoke tobacco products (Never and have given up)	92,567	80.9%
Smoking status not stated	9,031	7.9%
Total	**114,360**	**100.0%**

A number of smoking related health issues have been noted in the Healthy Ireland Outcomes Framework (2022), which states that while much progress has been made in tackling smoking in Ireland, there is a continuing toll of smoking-related disease, especially for groups with higher past or present smoking rates.

Healthy Life Years

According to the Central Statistics Office (CSO) Healthy Life Years dataset (CSO, 2023), national Healthy Life Years (HLY) at birth observed an overall increase (in both sexes), between 2016 and 2019 from 68.5 to 69.6 years. However, there is a visible decline during 2020, to 66.2 years (Table 13.8). This is a drop of around 3.4 years between 2019 and 2020. Healthy life years are generally higher for females than males at State level.

Table 13-8 National Healthy Life Years (HLY) at Birth (Source: CSO Healthy Life Years Dataset)

Year	Both Sexes	Male	Female
2016	68.5	67.2	69.8
2017	68.6	67.9	69.3
2018	69.4	68.3	70.4
2019	69.6	68.6	70.5
2020	66.2	65.3	67.1
2021	67.2	66.4	68.0
2022	66.0	65.2	66.8

Healthy Life Year at birth is a measure used across EU and is defined as the average number of years that a new-born child can expect to live in a healthy condition and free from disability (Healthy Ireland Outcomes Framework 2022). A major contributor to reduced healthy life years / falling life expectancy in Ireland in 2020 can be associated with the Covid19 Pandemic, which was also observed for most countries throughout 2020.

Water Quality

As described in Chapter 12 Water and Hydrology, the Study Area is centred on the Royal Canal, which is the principal water feature within the receiving environment and is classified as having **Good** Ecological Potential under the Water Framework Directive. The wider water environment includes the River Liffey, the Tolka River and the Rusk River, while the underlying groundwater body is also classified as **Good** status. No significant flood risk has been identified along the route. Overall, the baseline water environment is considered to be of generally good quality and contributes to the environmental quality, recreational value and amenity of the Study Area, which are relevant determinants of population health and wellbeing.

Air Quality

Existing air quality conditions within the Study Area are described in Chapter 5. No significant air quality constraints affecting population and human health were identified. Air quality effects are therefore considered through the findings of Chapter 5 and their relevance to health determinants and sensitive receptors.

Noise and Vibration

Baseline noise conditions are described in Chapter 7. Existing noise levels within the Study Area are influenced primarily by road traffic, rail infrastructure and urban activity. Potential health pathways associated with noise are considered through the findings of Chapter 7.

Health Care Facilities

A social infrastructure analysis of the area identified a number of healthcare facilities, as shown in Figure 13.15. These healthcare facilities include a healthcare and social care, three dentistry practices, three pharmacies and five GP practices.

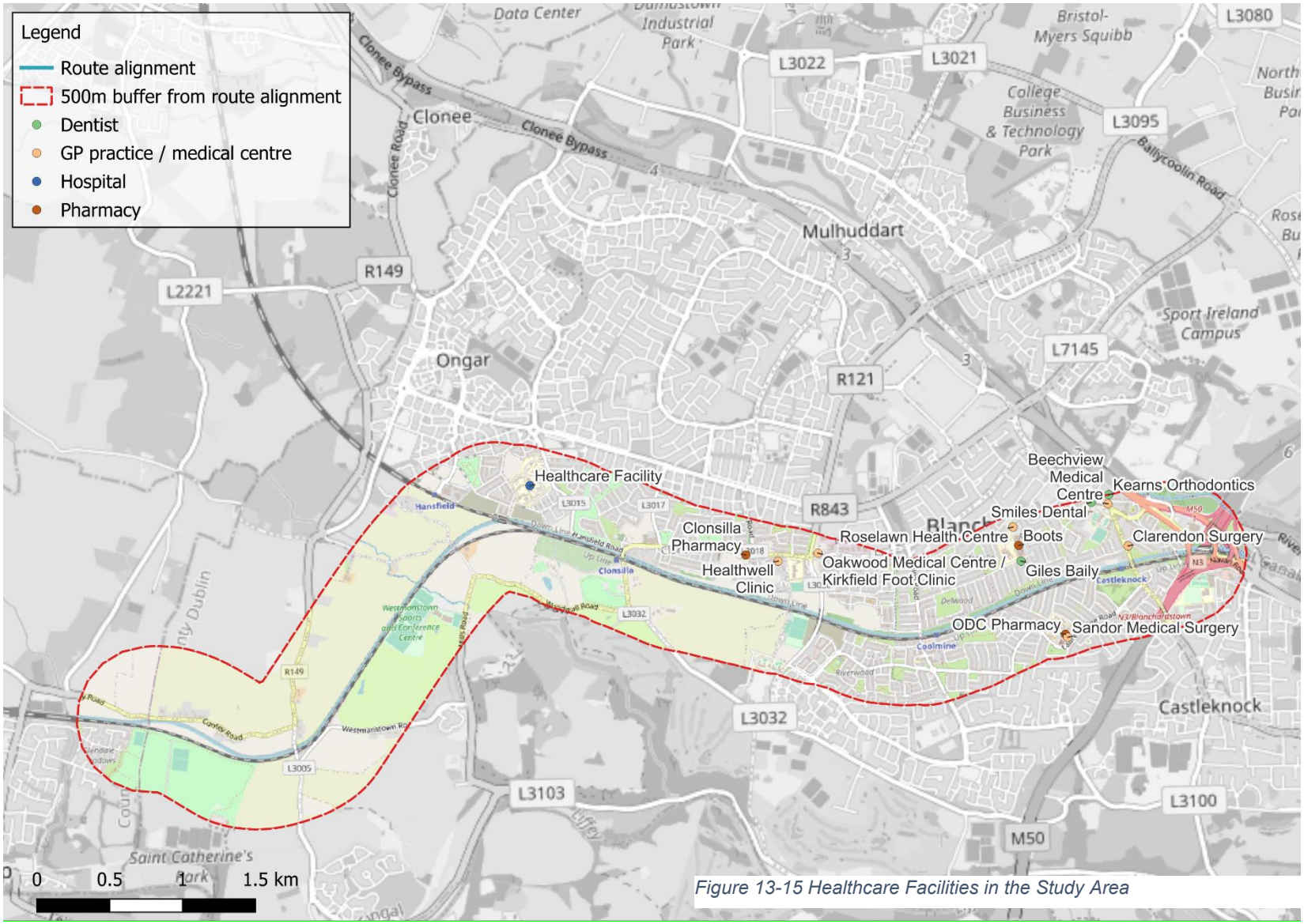


Figure 13-15 Healthcare Facilities in the Study Area

13.6.3 Social Infrastructure and Accessibility

Social Infrastructure (SI) is defined by the European Association of Long-Term Investors[2] as a subcategory of infrastructure that are physical assets in the social sector that provide personal (individual/household) benefits and community benefits to increase social cohesion. The figures below provide an overview of the social infrastructure available within proximity to the subject site.

As Figures 13.16 - 13.18 indicate, a variety of different Social Infrastructure (SI) and Amenity facilities are situated within close proximity to the Proposed Development within the Study Area. Table 13.9 below lists the number of SI facilities within 500m. This provides a basis on which to consider population and human health determinants such as social engagement and interaction, accessibility and amenity.

[2] Fransen, L., del Bufalo, G., Reviglio, E. (2018). Boosting Investment in Social Infrastructure in Europe, Report of the High-Level Task Force on Investing in Social Infrastructure in Europe 2018. [PDF File]. Retrieved from: https://ec.europa.eu/info/sites/info/files/economy-finance/dp074_en.pdf

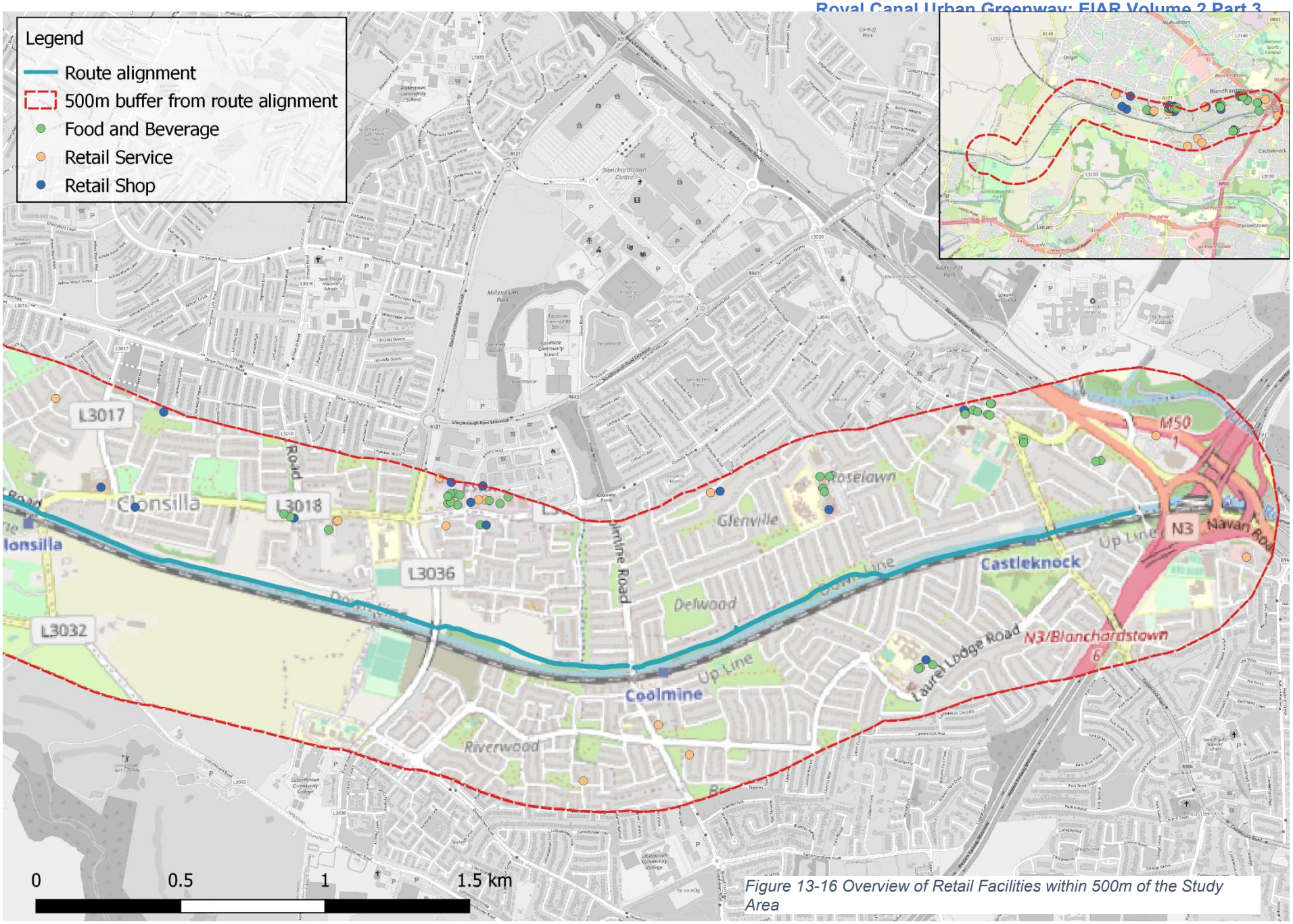


Figure 13-16 Overview of Retail Facilities within 500m of the Study Area

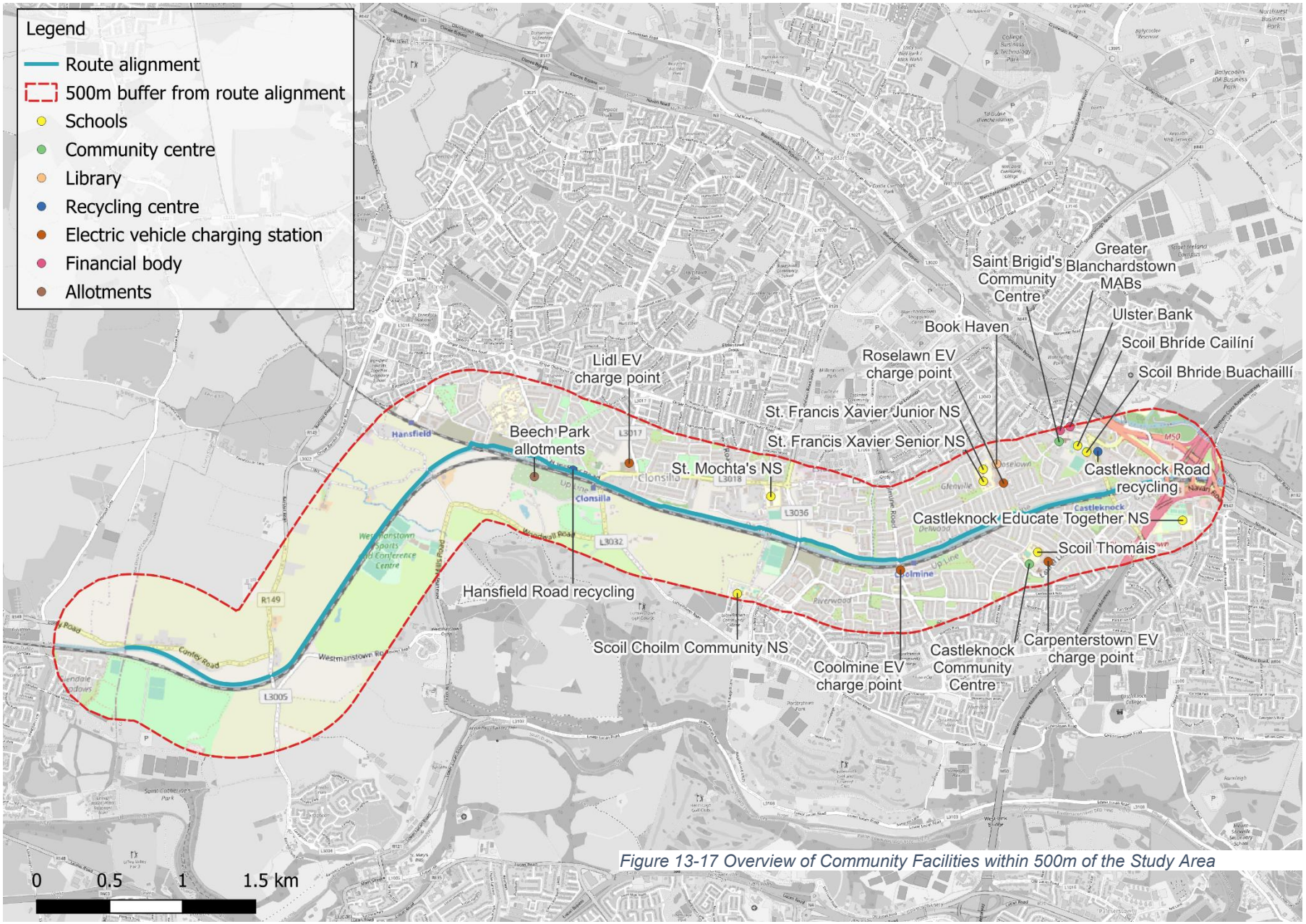


Figure 13-17 Overview of Community Facilities within 500m of the Study Area

Figure 13-18

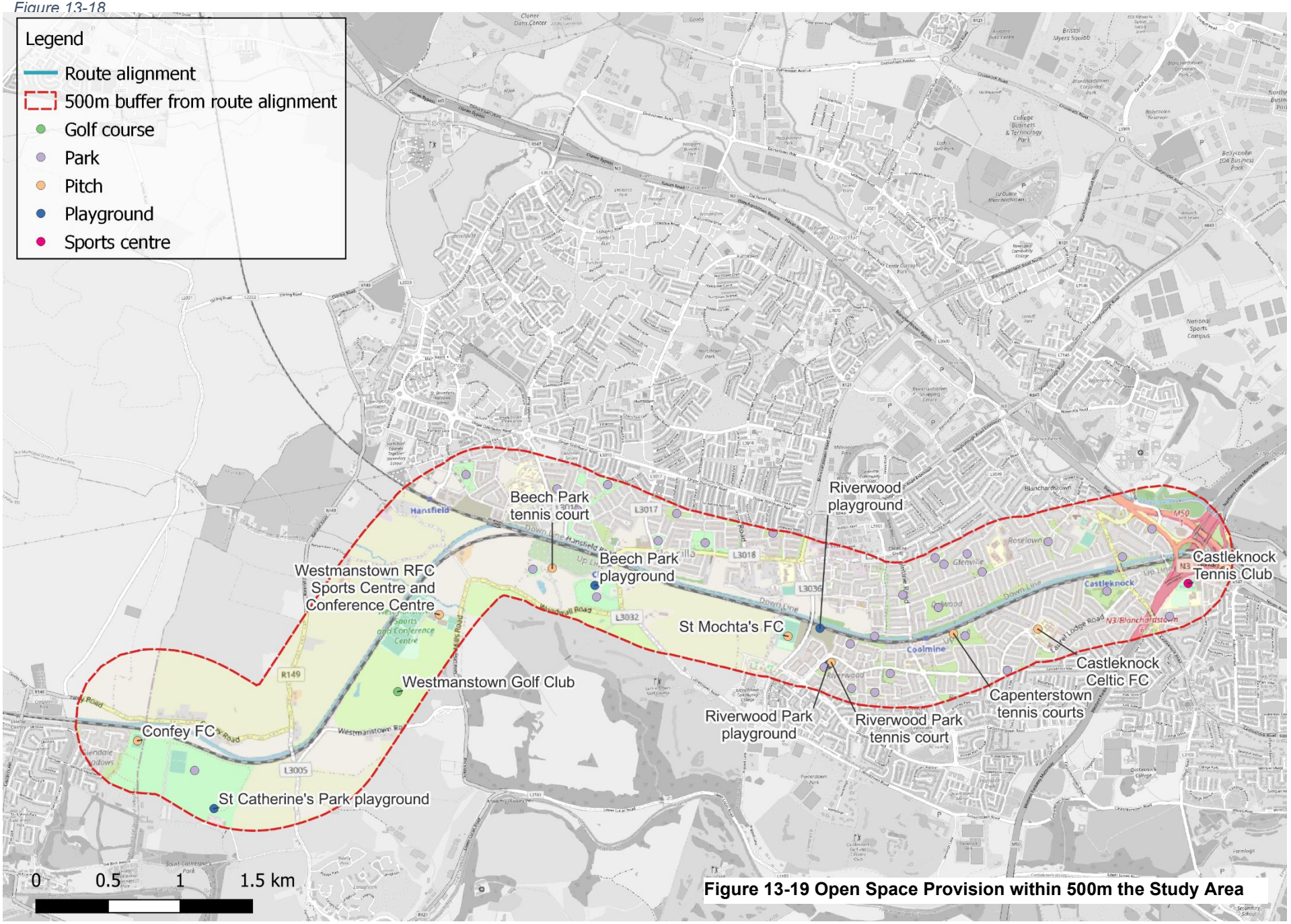


Figure 13-19 Open Space Provision within 500m the Study Area

Table 13-9 Social Infrastructure and Amenities Within 500m from Proposed Development

Electric Vehicle (EV) Charging Points	3
Recycling Centre	2
Library	1
Community Centre	2
Golf Club	1
Sports Clubs	9
Playgrounds	3
Retail	58
Schools	8

A range of healthcare facilities are accessible in the Study Area, in addition to 43 no. open space and recreation facilities (of which 9 are pitches or sports facilities). There are 8 schools identified as located within the Study Area.

In addition, a varied retail offer serves the Study Area. As seen Figure 13.16 above, there are multiple food/grocery retail offerings with a range of restaurants and bars.

Accessibility

While the Royal Canal corridor already functions as an important recreational and walking route, sections of the existing towpath are characterised by uneven or informal surfaces, constrained widths, varying accessibility standards and discontinuities in provision. Connectivity between local residential areas, schools, community facilities, public transport services and recreational destinations is also influenced by bridge crossings, local road interfaces and access arrangements along the corridor. In addition, Chapter 14 Traffic and Transportation identifies a number of existing barriers to active travel, including constrained crossing locations, limited permeability in some areas due to the Royal Canal and adjoining rail corridor, and the need for improved connections between residential communities and local destinations. These conditions can result in longer and less convenient walking and cycling journeys and have therefore been identified as relevant considerations in the assessment of accessibility as a determinant of health and wellbeing.

13.7 Identification of Likely Significant Impacts

This section describes the likely direct and indirect significant effects of the Proposed Development on population and human health during both the construction and operational phases. The assessment considers the pathways through which environmental, social and economic changes arising from the Proposed Development may influence population and human health, having regard to the determinants identified in Table 13.1. Potential impacts are assessed under the following headings: Population and Socio-Economic Conditions; Environmental and Public Health; Equality and Inclusion; and Social Infrastructure and Accessibility, including Social Engagement and Spaces for Interaction.

13.7.1 Impact on Population and Socio-Economic Conditions

Impact on Population

Construction Phase

Construction activities may result in temporary effects on the local population through traffic management measures, changes to access arrangements, temporary diversions, noise, dust and general construction-related activity. Potential sensitive receptors include residents and businesses adjoining the route, pedestrians and cyclists using the Royal Canal towpath, users of nearby schools, community and recreational facilities, and rail passengers accessing Clonsilla, Coolmine and Castleknock railway stations. Receptors likely to experience the greatest level of disruption are those located in the vicinity of road crossing works, including at Granard Bridge, Kennan Bridge, Kirkpatrick Bridge and Callaghan Bridge, together with residents and users of community and recreational facilities in the Hansfield, Porterstown, Castleknock and Laurel Lodge areas.

As outlined in Chapter 14 Traffic and Transportation, temporary restrictions to pedestrian, cyclist and local traffic movements will be required during construction, including lane restrictions, footpath diversions, alternating one-way traffic arrangements and short-term closures where necessary. Temporary disruption to access, connectivity and amenity may therefore arise for nearby residents, businesses, schools, community facilities and users of the Royal Canal corridor. Construction traffic associated with the Proposed Development is expected to be relatively low and the effects will be localised to discrete work areas and limited in duration. Effects on the local population are expected to be Negative, Moderate and Short Term.

Table 13-10 Construction Impacts on Population

Probability	Quality	Significance	Duration
Likely	Negative	Moderate	Short Term

Operational Phase

The operational phase of the Proposed Development is expected to result in a significant positive effect on local population and socio-economic conditions within the Study Area. The Royal Canal will be transformed into a fully usable greenway, providing a safe, accessible amenity and active travel resource for residents and visitors. In a limited number of locations adjoining residential properties, particularly along sections adjoining the rear boundaries of residential areas such as Delwood Park, increased use of the greenway may result in changes to activity levels and perceptions of privacy. These effects may arise where Greenway users have the potential to obtain views towards private residential gardens or where increased pedestrian and cyclist activity occurs in proximity to residential boundaries. Design measures including level adjustments, boundary treatments, fencing and defensive planting have been incorporated into the scheme to minimise any such effects.

The Proposed Development will enhance the attractiveness and usability of the Royal Canal corridor and support increased use of the area for recreation, leisure and sustainable travel. The Electoral Divisions (EDs) intersecting or adjoining the Study Area have a combined population of approximately 114,360 persons. These areas are characterised by a high proportion of family households, an increasing older population and extensive residential communities within Hansfield, Clonsilla, Porterstown, Coolmine, Carpenterstown, Roselawn and Castleknock.

The Proposed Development will provide a continuous 8.1km walking and cycling corridor linking these communities with schools, community facilities, healthcare services, railway stations, employment locations and recreational amenities along the Royal Canal corridor. As identified in Chapter 14 Material Assets: Traffic and Transportation, the scheme will improve accessibility and permeability along the corridor through the provision of a continuous active travel route, new access points, upgraded crossing facilities and improved connections to existing walking, cycling and public transport networks.

The Proposed Development is expected to appeal to a broad range of users, including the large number of families with children residing within the Study Area, and will provide benefits for both recreational use and everyday journeys. It will improve access to schools, community facilities, public transport services and other local destinations, supporting more sustainable travel choices and increasing opportunities for recreation and social activity.

Improvements to amenity, accessibility and connectivity are expected to contribute positively to quality of life for existing and future residents and enhance the overall attractiveness and vitality of the area. The Proposed Development will also support planned population growth within the area by providing enhanced recreational infrastructure, improved access to services and greater connectivity between residential communities and key destinations. Given the scale of the population within the Study Area, the extensive residential communities served by the route, and the long-term improvements in accessibility, active travel opportunities, recreation and connectivity that will be delivered by the scheme, the resulting effect on population and socio-economic conditions is considered Positive, Significant and Permanent.

Table 13-11 Operational Impacts on Population

Probability	Quality	Significance	Duration
Likely	Positive	Significant	Permanent

Impact on Economic Activity and Employment Base

Construction Phase

The construction of the Proposed Development is likely to have a positive effect on economic activity and employment. In the short term, the construction works will require a range of construction, engineering, environmental, professional and technical services and, as a result, are expected to generate temporary employment and economic activity during the construction period. Economic benefits will arise for businesses directly involved in the construction of the scheme, as well as those operating within the wider supply chain, including building materials suppliers and professional and technical services. The construction phase may also generate indirect benefits through expenditure by construction workers in local retail and hospitality businesses. While these benefits will be temporary in nature, they will contribute positively to economic activity and employment throughout the construction period. Chapter 14 identifies temporary diversion routes that may be required to facilitate construction works. However, these are not anticipated to be of a scale that would adversely affect the local economy and the economic benefits associated with the construction phase are expected to outweigh any temporary effects arising from traffic disruption or diversions. The impact of the construction phase on economic activity and employment is therefore considered to be Likely, Positive, Slight and Short Term.

Table 13-12 Construction Impacts on Economic Activity and Employment

Probability	Quality	Significance	Duration
Likely	Positive	Slight	Short Term

Operational Phase

Once operational, the Proposed Development is expected to increase footfall and cycle activity within the area, in turn supporting local spending and benefiting a range of existing businesses and services. Increased use of the Royal Canal corridor may also create opportunities for additional visitor-focused commercial activity, subject to market demand and compliance with applicable land use planning and zoning provisions. As a result, the Proposed Development has the potential to strengthen the local retail, food and beverage offer and contribute positively to the vitality of the area.

The increased footfall in the area may also create additional demand for ancillary services from day trips spent at local shops, bars and restaurants etc. The Proposed Development, functioning as a key destination and attractor to the area, may encourage more people to visit the area. With that, there is potential to increase the number of overnight stays in the area, which will have positive economic benefits for local hospitality providers such as hotels and accommodation providers. Seasonal and niche businesses (bike repair, guided tours/ tour operators, recreation related enterprises) may also be supported contributing positively to local employment.

The operational phase will also positively impact residents from the perspective of reducing household expenditure on transport related costs. As outlined in Chapter 14 Traffic and Transportation, the Proposed Development will improve opportunities for walking and cycling, enhance accessibility and connectivity, and strengthen connections to public transport services, including Clonsilla, Coolmine and Castleknock railway stations. By providing an alternative means of travel, the Proposed Development has the potential to reduce transport-related expenditure for some local journeys and reduce reliance on private car travel. In addition, evidence from comparable greenway and active travel projects indicates that proximity to high-quality walking and cycling infrastructure can contribute to increased residential desirability due to improved accessibility and lifestyle appeal.

The impact of the fully operational Proposed Development on economic activity and employment is likely Positive, Moderate and Permanent.

Table 13-13 Operational Impacts on Economic Activity and Employment

Probability	Quality	Significance	Duration
Likely	Positive	Moderate	Permanent

13.7.2 Impact on Environmental and Public Health, Equality and Inclusion

Environmental and Public Health

Construction Phase
Potential public health effects during construction are primarily associated with environmental pathways including air quality, noise and vibration, traffic and transport, water quality, and general construction disturbance. Temporary adverse effects may arise through dust emissions, increased noise and vibration levels, construction traffic, temporary access restrictions, changes to accessibility and connectivity, and potential effects on local environmental quality. These pathways have the potential to affect residential amenity, wellbeing and the use of community and recreational facilities during the construction phase.

Air Quality
As set out in Chapter 5, construction activities have the potential to generate dust emissions and air pollutants associated with earthworks, material handling, construction traffic and plant operation. In the absence of mitigation measures, these emissions may temporarily affect local air quality and sensitive receptors in close proximity to construction activities, with associated implications for amenity and well- being.

Noise and Vibration
As detailed in Chapter 7, Construction activities have the potential to affect nearby residents and other sensitive receptors through increased noise and vibration levels associated with earthworks, traffic management measures, construction plant, bridge construction and boardwalk installation works. In the absence of mitigation, these effects may temporarily affect amenity, wellbeing and the use of outdoor spaces by nearby residents and community receptors.

Traffic and Transport
As discussed in Chapter 14, construction activities have the potential to affect accessibility, connectivity and movement patterns through traffic management measures, temporary diversions, lane restrictions, footpath diversions and temporary restrictions to pedestrian and cycle movements. These effects may influence access to homes, schools, community facilities, businesses, recreational facilities and public transport services.

Water
As outlined in Chapter 12, construction activities have the potential to affect the water environment through sediment release, runoff from disturbed ground, accidental spillages of fuels or chemicals, and works within or adjacent to watercourses. Such impacts could affect water quality and aquatic ecosystems and, if unmanaged and unmitigated, could have indirect implications for population and human health through impacts on environmental quality and amenity.

Taken together, these environmental pathways have the potential to give rise to temporary adverse effects on population health and wellbeing during the construction phase, primarily through reductions in amenity, temporary restrictions to accessibility and connectivity, and changes in local environmental quality. These effects are expected to be localised and temporary in nature.

Table 13-14 Construction Impacts on Environmental and Public Health

Probability	Quality	Significance	Duration
Likely	Negative	Slight	Temporary

Operational Phase

The Proposed Development will actively encourage physical activity and healthy, active travel, which will benefit existing and future residents within the Study Area. By providing a convenient and attractive route for local journeys, the Proposed Development will improve access to the Royal Canal corridor and its recreational opportunities for residents, visitors and the wider community. Increased opportunities for walking, cycling and recreation are recognised contributors to improved physical health and mental wellbeing, as recognised in the National Physical Activity Framework 2024-2040 (refer to Chapter 3). In addition, Chapter 14 identifies improved accessibility and increased participation in active travel for active travel, while Chapter 5 identifies the potential for air quality benefits associated with reduced reliance on private car travel. Chapter 12 identifies the continued provision of a high-quality water environment and amenity resource. Given the scale of the catchment served by the Proposed Development, the strategic connectivity improvements provided, and the permanent enhancement in opportunities for active travel and recreation, these improvements will contribute positively to wider health and wellbeing outcomes for users and the local community. The impact is therefore assessed as Positive, Moderate and Permanent.

Table 13-15 Operational Impacts on Environmental and Public Health

Probability	Quality	Significance	Duration
Likely	Positive	Moderate	Permanent

Equality and Inclusion

Construction Phase

The construction phase has the potential to give rise to slight, temporary effects on equality and inclusion through changes in accessibility, mobility and ease of movement within the Study Area. Temporary effects may arise from construction traffic, localised access restrictions, altered pedestrian and cyclist routes, and general construction activity. Certain groups, including children and young people, older persons, persons with disabilities, individuals with reduced mobility and those reliant on walking, cycling or public transport, may be more sensitive to such temporary disruption. Access to homes, community facilities, schools, businesses and public transport services will generally be maintained throughout the construction period, and any diversions or restrictions will be temporary in nature and limited to discrete sections of the route as works progress. These likely effects are expected to be localised and reversible. Collectively, the effects on equality and inclusion are assessed as Negative, Slight and Temporary.

Table 13-16 Construction Impacts for Equality and Inclusion

Probability	Quality	Significance	Duration
Likely	Negative	Slight	Temporary

Operational Phase

The Proposed Development has been designed to promote accessibility and inclusivity for a broad range of users, including children, older persons, persons with disabilities and those with reduced mobility. The Proposed Development will provide improved pedestrian and cyclist connectivity between existing and planned communities, community facilities, schools, public transport services, employment areas, recreational amenities and open space, through the delivery of a continuous active travel route and associated crossing, access and connectivity improvements, as described in Chapter 14 Traffic and Transport. In this way, the Proposed Development will support more equitable access to opportunities and services within the Study Area.

These benefits are expected to be particularly relevant for children and young people, older persons, persons with disabilities and those who rely on walking, cycling or public transport for everyday journeys. Improved permeability and connectivity along the Royal Canal corridor will enhance access to schools, community facilities, recreational amenities and public transport services and support more inclusive participation in recreation, active travel and community life.

Safe pedestrian and cyclist access has been prioritised throughout the design, with key access points from local roads supported by appropriate traffic calming and crossing measures, including toucan crossings. Landscaping and lighting proposals, together with passive surveillance opportunities maximised wherever possible, will contribute to the attractiveness, accessibility and perceived safety of the route. Although increased use of the route may contribute to additional demand at nearby public transport facilities, as noted in Chapter 14 Traffic and Transport, the overall effect of the Proposed Development will be to improve accessibility, permeability and connectivity for a broad range of users throughout the Study Area.

By improving accessibility, connectivity and inclusivity, the Proposed Development has the potential to reduce barriers to movement and participation for a wide range of population groups. The scheme will facilitate more equitable access to recreation, active travel opportunities, community facilities and sustainable transport options. Given the strategic nature of the route and the permanent enhancement of access to key destinations and services, the Proposed Development is therefore expected to result in a Positive, Significant and Permanent effect on equality and inclusion.

Table 13-17 Operational Impacts for Equality and Inclusion

Probability	Quality	Significance	Duration
Likely	Positive	Significant	Permanent

13.7.3 Impact on Social Infrastructure and Accessibility

Construction Phase

Existing social infrastructure within the Study Area will not generally be impacted by the construction of the Proposed Development. There may be some temporary, slight effects such as noise, generation of dust and localised traffic diversions. These may result in temporary disturbance or nuisance to users of existing facilities which may impact convenience of access or quality of experience. Temporary changes to access arrangements may also affect journeys to and from nearby schools where construction activities occur in proximity to existing pedestrian, cycle or vehicle routes. However, works will be phased and managed to minimise disruption and maintain safe access to educational facilities throughout the construction period. Facilities located within closest proximity to the proposed works will be most likely to experience adverse, slight impacts over a temporary period. These include Confey Football Club, Riverwood Playground, Carpenterstown Tennis Club and various facilities at Westmanstown.

Table 13-18 Construction Impacts on Social Infrastructure and Accessibility

Probability	Quality	Significance	Duration
Likely	Negative	Slight	Temporary

Operational Phase

The Proposed Development will introduce a major new sustainable mobility and recreational amenity to the area, greatly enhancing existing facilities for walking and running along the canal and opening access to the waterside environment. It will provide a safe and healthy alternative to motorised transport and will have a broad appeal as a key social infrastructure asset not only for the immediate locality but also for the wider Dublin and eastern region.

The Proposed Development will improve connectivity between existing residential communities, schools, public transport facilities, open spaces and community infrastructure within the area. Once operational, the Greenway will address number of existing constraints identified within the receiving environment. In particular, it will replace sections of poor quality and at times disconnected walking and cycling infrastructure with a continuous, easily accessible greenway corridor.

Accessibility to the Royal Canal amenity and pedestrian/cycle route will be greatly enhanced with several new access points and the upgrade of existing access points greatly improving permeability and connectivity to the canal for local residents. The resulting effect on social infrastructure and accessibility is considered Positive, Significant and Permanent.

Table 13-19 Operational Impacts on Social Infrastructure and Accessibility

Probability	Quality	Significance	Duration
Likely	Positive	Significant	Permanent.

Social Engagement and Spaces for Interaction

Construction Phase

Although the construction phase may temporarily affect access to public spaces used for social engagement and interaction, including sections of the existing Royal Canal amenity, any such effects will be localised, short-term and limited to the construction period. Temporary disruption may arise as a result of construction activities, traffic management measures or changes to access arrangements. The resulting impact on social engagement and opportunities for community interaction is considered Negative, Slight and Temporary.

Table 13-20 Construction Impacts

Probability	Quality	Significance	Duration
Likely	Negative	Slight	Temporary

Operational Phase

The operational phase of the Proposed Development will result in positive effects with enhanced social engagement and opportunities for community interaction. The Greenway will transform the Royal Canal corridor into a high-quality, accessible and attractive public amenity for walking, cycling, informal recreation and social activity.

New and enhanced areas of public open space, together with improved access to the canal corridor, will support greater use of the area by residents and visitors. Enhanced permeability, new and upgraded access points and improved connectivity will make the amenity more accessible to a wider range of users and encourage increased participation in outdoor recreation and community activity.

The Proposed Development will also contribute positively to the character and attractiveness of the area through sensitive landscape design and planting. As the landscaping matures, it will further enhance the quality of the public realm and provide attractive spaces that facilitate social interaction, recreation and wellbeing. A more detailed assessment of landscape and visual effects is provided in Chapter 10 Landscape and Visual. The resulting effect on social engagement, recreation and opportunities for community interaction is considered Positive, Significant and Permanent.

Table 13-21 Operational Impacts

Probability	Quality	Significance	Duration
Likely	Positive	Significant	Permanent

Local Attractions and Tourism Activities

Construction Phase

Construction activities are not expected to result in significant adverse effects on local attractions or tourism activities within the Study Area. Nearby attractions, including Dublin Falconry and the recreational and sporting facilities at Westmanstown, are located outside the immediate works area and will remain accessible throughout the construction period. Temporary disturbance may arise from construction activities with some minor potential inconvenience to visitors and tourism-related activities. Accordingly, the resulting impact on local attractions and tourism activities is considered Negative, Slight and Temporary.

Table 13-22 Construction Impacts on Local Attractions and Tourism Activities

Probability	Quality	Significance	Duration
Unlikely	Negative	Slight	Temporary

Operational Phase

The Proposed Development is expected to attract increased levels of walking and cycling activity, which will benefit existing local amenities and visitor attractions. The greenway itself will become an important recreational and tourism asset, enhancing the existing visitor offer and complementing nearby amenities and facilities. Increased visitor numbers may also contribute positively to the vitality and viability of existing businesses and attractions, as noted in the economic impacts section earlier.

Table 13-23 Operational Impacts on Local Attractions and Tourism Activities

Probability	Quality	Significance	Duration
Likely	Positive	Moderate	Permanent

13.8 Do Nothing Scenario

This section considers the potential impacts should the construction of the Proposed Development not take place. In a 'Do Nothing' scenario, the receiving environment would continue to evolve in accordance with the applicable statutory planning framework, planned population growth and permitted development within the Study Area. Ongoing residential and mixed-use development associated with the Hansfield SDZ, Barnhill LAP, Kellystown LAP and other planned growth areas within Dublin 15 would continue, together with the delivery of other permitted and planned transport, community and infrastructure projects. As a result, population growth, demand for community facilities and use of existing transport and recreational infrastructure would continue to increase in accordance with regional and local planning policy objectives.

In the absence of the Proposed Development, existing and future residents would continue to rely on the current walking and cycling infrastructure available in the area and would not benefit from the enhanced active travel, connectivity and recreational opportunities that the Proposed Development will bring. Opportunities to enhance accessibility and connectivity for vulnerable groups would not be realised. Several national, regional and local policy objectives relating to active travel, sustainable transport, accessibility, public health, social inclusion and recreational amenity, as outlined in Chapter 3, would therefore not be advanced through implementation of the Proposed Development.

13.9 Mitigation Measures

The development has been designed to avoid negative impacts on population and human health through the design and provision of physical and social infrastructure as described in Chapter 4 'Alternatives Considered' of this EIAR. Mitigation measures proposed throughout the various chapters of this EIAR are designed to avoid significant adverse impacts. These measures contribute to the protection of population and human health by minimising temporary construction effects and maximising the accessibility, connectivity, safety and recreational benefits of the completed greenway.

During construction, mitigation measures include:

- Implementation of the Outline Construction Environmental Management Plan (OCEMP) and Outline Construction Traffic Management Plan (OCTMP);
- Measures to minimise noise, vibration, dust and air quality impacts on nearby residents, schools, healthcare facilities and other sensitive receptors including controls on construction working hours, careful selection and management of construction plant, dust suppression measures, construction traffic management measures, and ongoing monitoring and implementation of mitigation measures identified in Chapters 6 and 7;

- Maintenance of safe pedestrian, cyclist and vehicular access throughout the construction period, including temporary traffic management and signage;
- Management of construction traffic, working hours and material storage locations to minimise disturbance to local communities through the implementation of relevant mitigation measures set out in Chapter 14 and in the OCEMP and OCTMP;
- Protection of water quality and implementation of pollution prevention measures;
- Community notification and stakeholder engagement measures to inform residents and facility users of construction activities and temporary access arrangements.

The Proposed Development has also been designed to promote positive population and human health outcomes during operation through:

- Provision of a continuous, accessible walking and cycling route along the Royal Canal corridor;
- Improved connectivity between residential communities, schools, community facilities, public transport services, open spaces and recreational destinations;
- New and upgraded crossing points to improve permeability and reduce barriers to movement;
- Universal accessibility measures to support use by children, older persons and people with reduced mobility;
- Landscaping, planting and public realm enhancements that contribute to amenity, passive surveillance and user experience;
- Wayfinding, signage, lighting and associated infrastructure to support safe and attractive use of the route;
- Increased opportunities for active travel, recreation, social interaction and community use of the corridor.

Having regard to the embedded mitigation measures and the design of the Proposed Development, no additional population and human health mitigation measures are considered necessary. Readers are referred to Chapter 19 for a consolidated schedule of mitigation measures arising from the EIAR.

13.10 Residual Impacts

Any adverse effects on population and human health will be avoided, reduced or managed through the implementation of the mitigation measures identified throughout this EIAR and the relevant specialist chapters. During the construction phase, residual effects may remain in relation to temporary changes in accessibility and connectivity, temporary disturbance associated with construction activity, and short-term changes in environmental quality and amenity. However, these effects will be localised, temporary in nature and limited through the implementation of the identified mitigation measures. Positive effects are also likely to arise during the construction phase through employment generation and associated economic activity. Accordingly, the residual effects of the construction phase on population and human health are considered to be Negative, Slight and Temporary, with separate Positive, Slight and Short-Term effects arising from construction-related employment and expenditure.

The Proposed Development will result in positive residual effects on population and human health through improved accessibility and connectivity, enhanced opportunities for active travel, recreation and social interaction, improved access to community facilities and services, and increased use and enjoyment of the Royal Canal corridor. The scheme will support existing and future communities within the area and contribute positively to socio-economic conditions, environmental and public health, equality and inclusion, and social infrastructure and accessibility. Having regard to the scale of the population catchment served, the permanent enhancement of active travel and recreational infrastructure, and the improved connectivity provided by the scheme, the overall residual effect of the operational phase is considered to be Positive, Significant and Permanent.

13.11 Cumulative Impacts

As noted, planning permissions granted between November 2020 and August 2026 provide for approximately 1,838 residential units within 500 m of the Proposed Development, of which approximately 780 units had commenced construction. The majority of these developments are located within or adjoining the Hansfield

Strategic Development Zone (SDZ), Clonsilla, Porterstown and Kellystown areas and include a number of significant residential schemes such as the 419-unit apartment development at Hansfield (FW23A/0013), the 174-unit St. Joseph's Phase 2 development (FW22A/0147), the 170-unit Clonsilla Inn development (ACP-320886-24), the 175-unit Winterwood development (ACP-322813-25), the 155-unit Hansfield SDZ development (FW17A/0234/E1) and the 302-unit Porterstown LRD (ACP-324182-26). These schemes are located within the wider catchment served by the Proposed Development and will contribute to increased demand for recreational amenities, active travel infrastructure and sustainable transport connections.

At construction phase, the Proposed Development may overlap with the construction of a number of these residential developments and associated infrastructure projects. In such circumstances, cumulative effects may arise in relation to temporary increases in construction traffic, dust, noise, vibration, exhaust emissions, localised access restrictions and general construction disturbance. Given the dispersed nature of the identified developments, the temporary duration of construction activities and the implementation of standard construction management and mitigation measures, these cumulative construction effects are considered to be Negative, Slight and Temporary.

At operational phase, the Greenway will provide a valuable new resource, greatly enhancing the recreational and amenity appeal of the area. With the growing number of residential developments in adjoining areas like Hansfield, Kellystown, Porterstown, Clonsilla and Castleknock, demand for recreational amenities, outdoor open spaces and sustainable travel infrastructure is expected to increase. Given the proximity of existing and permitted residential developments to the Royal Canal corridor, the Proposed Development will provide a significant recreational and amenity asset for existing and future residents. In addition, the Proposed Development will support and encourage more active and sustainable modes of travel by improving accessibility and connectivity throughout the area.

The Proposed Development will act cumulatively with existing and permitted residential development, public transport improvements and active travel schemes within the area, including Dart+ West and BusConnects, both of which support sustainable mobility objectives and will improve connectivity between local communities, employment centres and public transport services.

In combination with these projects, the Proposed Development will strengthen integration between walking, cycling and public transport modes and support active travel, improved accessibility and connectivity. With this, healthier and more sustainable travel behaviours throughout the Dublin 15 area will be encouraged.

From a population and human health perspective, the cumulative interaction between the Proposed Development, the significant residential growth planned within Hansfield, Kellystown, Porterstown and Clonsilla, and strategic transport infrastructure projects such as DART+ West and BusConnects, is expected to increase opportunities for physical activity, improve access to employment, education, community facilities and services, strengthen social and recreational connections and support healthier and more sustainable travel behaviours. The additional footfall associated with the Proposed Development is also expected to support the vitality and viability of local businesses, community facilities and recreational amenities throughout the Study Area.
Overall, the cumulative impacts arising from the Proposed Development in combination with permitted residential development, strategic public transport projects and active travel initiatives are considered as Positive, Significant and Permanent. These cumulative effects reinforce the positive influence of the Proposed Development on key health determinants identified in the assessment, including socio-economic conditions, environmental quality, accessibility and connectivity, social infrastructure, recreation, social interaction, equality and inclusion, and overall health and wellbeing.

13.12 Interactions Arising

There are numerous inter-related environmental topics described throughout this EIAR that are relevant to population and human health. Population and human health effects may arise directly or indirectly through changes to environmental, social and economic determinants of health. Key interactions are described below.

Air Quality and Climate (Chapter 5 and Chapter 6)
Interactions occur with Chapter 5 Air Quality and Chapter 6 Climate. During construction, temporary air quality effects may arise through dust emissions, construction traffic and plant operation. These effects have the potential to influence environmental quality, residential amenity and wellbeing. During operation, the Proposed Development has the potential to contribute positively to health determinants through increased active travel and reduced reliance on private car travel. The findings of Chapters 5 and 6 have informed the assessment of environmental and public health effects presented in this chapter.

Noise and Vibration (Chapter 7)
Interactions occur with Chapter 7 Noise and Vibration. During construction, noise and vibration associated with earthworks, traffic management measures, construction plant, bridge works and boardwalk installation have the potential to influence residential amenity, wellbeing and the use of outdoor spaces and recreational amenities. These pathways have been considered as part of the assessment of environmental and public health effects.

Water (Chapter 12)
During construction, potential effects on the water environment may arise through sediment release, runoff from disturbed ground, accidental spillages and works adjacent to watercourses. Such effects have the potential to indirectly influence population and human health through changes in environmental quality and amenity. The Royal Canal also represents an important recreational, environmental and amenity asset which contributes to health and wellbeing within the Study Area. The findings of Chapter 12 have therefore informed the assessment of environmental and public health determinants.

Landscape and Visual (Chapter 10)
During construction, temporary visual disturbance may influence amenity and recreation. During operation, enhancements to the public realm, visual amenity, landscape character and access to green infrastructure have the potential to contribute positively to wellbeing, recreation and quality of life. These pathways have been considered in the assessment of social infrastructure, recreation and overall wellbeing.

Land and Soils (Chapter 11)
Interactions occur with Chapter 11 Land and Soils through construction activities involving excavation, earthworks and temporary disturbance of ground conditions. The findings of Chapter 11 have been reviewed in identifying any potential pathways through which effects on population and human health could arise. No significant population and human health effects are anticipated through this pathway.
Traffic and Transportation (Chapter 14)
Traffic and Transportation represents one of the principal interaction pathways for population and human health. During construction, interactions may arise through temporary traffic disruption, changes to accessibility and connectivity, temporary diversions and access restrictions. These factors have the potential to influence health determinants such as accessibility, mobility, environmental quality, amenity and wellbeing. During operation, the Proposed Development is expected to interact positively with Chapter 14 through improvements in active travel infrastructure, accessibility, permeability, connectivity and access to community facilities, public transport services and recreational destinations. The findings of Chapter 14 have informed the assessment of population, equality and inclusion, social infrastructure and health and wellbeing effects.

Material Assets: Land Use and Property (Chapter 17)
Interactions occur with Chapter 17 Land Use and Property through changes in accessibility, connectivity, recreation opportunities, open space provision and relationships between existing and planned communities. As identified in Chapter 17, the Proposed Development will enhance the recreational and active travel function of the Royal Canal corridor and strengthen connections between existing and future communities. These outcomes have informed the assessment of accessibility, social infrastructure, social engagement and overall wellbeing.

13.13 Monitoring

In relation to the impact of the development on population and human health, it is considered that the monitoring measures outlined in the chapters of this EIAR which address other environmental matters such as water, air quality and climatic factors, landscape and visual impact and noise sufficiently address monitoring requirements. These measures will assist in ensuring that any effects on key health determinants, including socio-economic conditions, environmental quality, accessibility and connectivity, recreation and amenity, social engagement, equality and inclusion, and overall health and wellbeing, are appropriately monitored and managed throughout the construction and operational phases of the Proposed Development. No additional monitoring measures specific to population and human health are considered necessary.

13.14 Difficulties Encountered

There were no significant difficulties encountered in compiling the information contained in the Population and Human Health Chapter.

13.15 References

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14 Traffic and Transport

14.1 Introduction

This chapter of the Environmental Impact Assessment Report (EIAR) aims to assess the likely significant effects of the Proposed Development on the receiving environment in terms of traffic conditions, transport routes and facilities, and general traffic safety during the construction and operational phases.

This chapter was prepared by Mark Kelly (BA (Hons), BAI, MSc, MA, PGDipPM, CEng, MIEI) under the direction of Robert Kelly (BA, BAI (Hons), MA, PG Dip Const Law, CEng, MIEI). Both are Chartered Engineers with extensive experience in transport planning, traffic engineering and active travel infrastructure. Further details of their qualifications and experience are provided in Section 1.14 of this EIAR.

This Chapter describes and assesses the likely direct and indirect significant effects of the Proposed Development on Traffic and Transportation in accordance with the requirements of Directive 2014/52/EU of the European Parliament and of the Council of 16 April 2014 amending Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment (i.e., the EIA Directive) (European Union 2014a). This Chapter also provides a characterisation of the receiving environment within the Proposed Development.

The Proposed Development comprises an approximately 8.1 km shared pedestrian and cycle greenway along and adjacent to the Royal Canal, extending from the Kildare County Council boundary in the west to Talbot Bridge (Old Navan Road) in the east, where it will connect with the completed Ashtown Greenway. At the western boundary, it will connect with the completed Kildare County Council section, including the Confey–Maynooth Greenway, and thereby form part of the wider Royal Canal Greenway, which currently extends from Leixlip in County Kildare to Cloondara in County Longford. The Proposed Development will also form part of EuroVelo 2, the long-distance cycle route connecting Dublin and Galway. A detailed description of the Proposed Development is provided in Chapter 2 of this EIAR.

14.2 Assessment Methodology

This assessment has been undertaken using a combination of desk studies, examination of existing traffic count data and reference to existing reports and studies commissioned as part of the project as well as consultation with statutory agencies and local authority representatives in line with current best practice and policy advice. The assessment methodology is summarised in Figure 14.1.

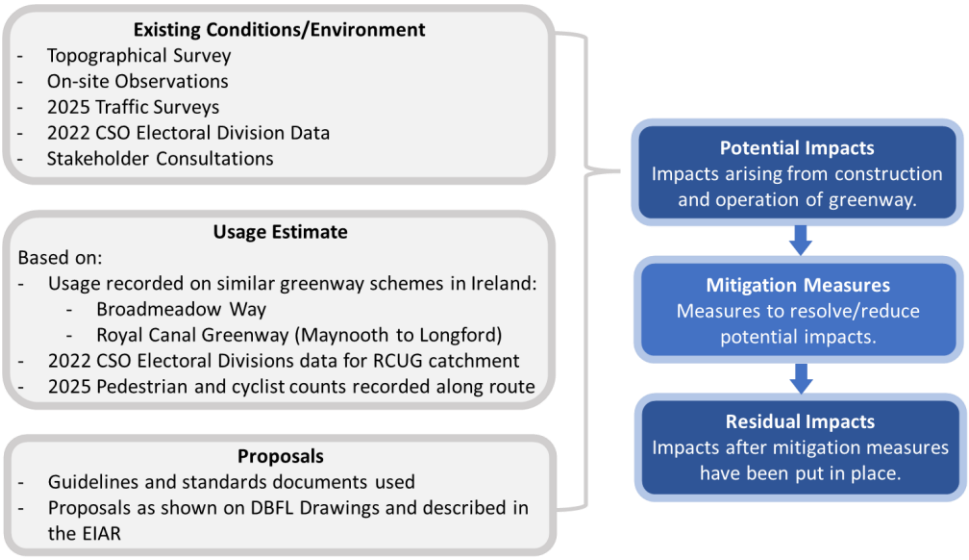


Figure 14.1 Project-Specific Traffic and Transport Assessment Methodology (Source: DBFL, informed by EPA 2022)

14.2.1 Existing Conditions/Environment

A review of the existing transport infrastructure along the proposed route was undertaken in order to establish a baseline environment for the traffic assessment. The review of the environment included existing data and procurement of new surveys and data, such as:

- Topographical survey along the whole length of the route;
- Traffic surveys at selected locations (see Table 14.1);
- Parking surveys on residential streets in the Delwood, Brompton and Roselawn areas adjoining potential access points to the Proposed Development (see Appendix 14.2);
- 2022 CSO Electoral Division data;
- On-site visual observations along length of route; and
- Stakeholder consultations.

Table 14.1: Traffic Survey Locations

Day/Time	Pedestrian & Cyclist Count Surveys
Tuesday 4th March 2025 07:00 – 19:00	(1) Crossing the footbridge, crossing level crossing, crossing at each junction arm, using canal towpath, entering/egressing canal towpath using steps between towpath and road (western junction arm). (2) Crossing Kennan bridge, crossing level crossing, entering/egressing canal towpath at north and south side of bridge. (3) Crossing footbridge, crossing level crossing, entering/egressing canal towpath (between level crossing and canal), cyclists crossing Kirkpatrick bridge.

Day/Time	Pedestrian & Cyclist Count Surveys
	(4) Entering/egressing towpath north side of canal and east of Granard Bridge. Entering/egressing canal towpath using steps and ramp on the southern side of the canal, including using the canal towpath under Granard bridge. Ped/cycle movements across Granard Bridge. (5) Entering/egressing towpath on the northern and southern side of canal. Access/egress to the Ashtown Greenway. Pedestrian/cycle movements across Talbot Bridge. Ped/cycle movements over the Railway overbridge.

The traffic survey locations are shown in Figure 14.2.



Figure 14.2 : Location of 2025 Surveys on the east of the Royal Canal Route

14.2.2 Guidance Documents

This assessment should be read in conjunction with Chapter 2, which describes the Proposed Development, its need, strategic function and the design principles applied, and Chapter 3, which sets out the relevant planning and transport policy context. These chapters identify the Proposed Development's role in completing a missing section of the wider Royal Canal Greenway and its relationship with EuroVelo 2, the Greater Dublin Area Cycle Network Plan, the National Cycle Network Plan and the relevant Fingal Development Plan objectives for walking, cycling, greenways and sustainable mobility. These matters are relevant to this assessment because they establish the scheme's intended active travel function, strategic connectivity role and policy basis.

The following guidance documents and design standards informed the development of the Proposed Development and this traffic and transport assessment. They provide the relevant principles and requirements for cycle route design, pedestrian and cyclist priority, permeability, road and junction design, traffic signs, road safety and temporary traffic management. They are therefore relevant to the assessment of effects on active travel users, public transport, general traffic, road safety and the operation of the surrounding transport network:

- *The Cycle Design Manual (2023)*
- *Traffic Management Guidelines,* DoELG, DoT, DTO (publish 2019 and last updated 2022);
- *Traffic Signs Manual,* DoELG (2025);
- *Design Manual for Urban Roads and Streets,* DoELG (2019);
- *Permeability Best Practice Guide*, National Transport Authority (2015);
- *Rural Cycleway Design (Offline & Greenway)*, Transport Infrastructure Ireland (2025);

14.3 Baseline Environment

The study area has been divided into three distinct sections based on their different geographical and physical characteristics to inform the assessment process as illustrated below in Figure 14.3:

- Section 1 – Kildare County Border to Hansfield Railway Bridge (Ch. 0000 – 3200)
- Section 2 – Hansfield Railway Bridge to Kennan Bridge (Ch. 3200 – 5300)
- Section 3 – Kennan Bridge to Talbot Bridge (Ch. 5300 – 8100)

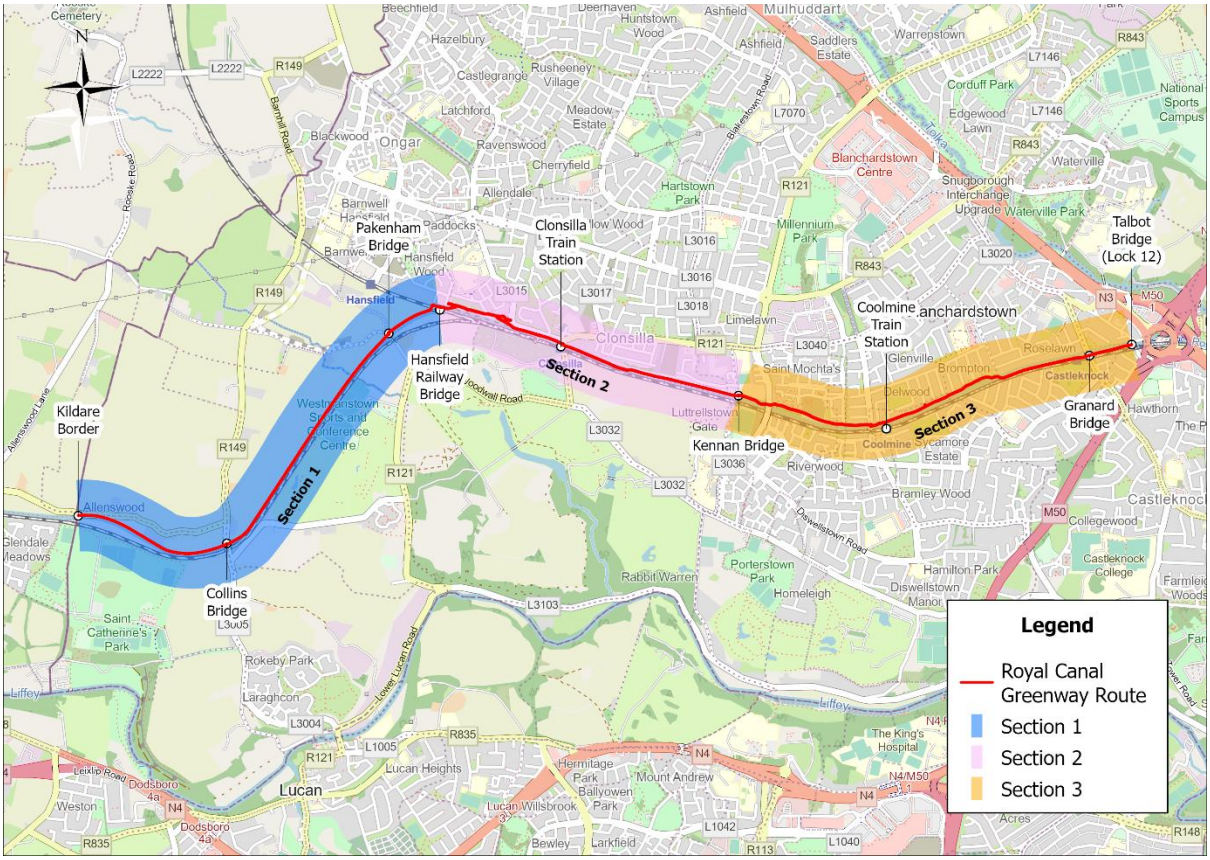


Figure 14.3: Study Area Sections

14.3.1 Section 1

Section 1 extends from the Kildare County Council boundary line (Royal Canal Amenity Group premises) to Hansfield Railway Bridge. This section is rural/peri-urban in nature, predominantly farmlands, however, it also adjoins local amenities such as the Westmanstown Golf Club and Westmanstown Sports Centre. The existing towpath is present along the northern embankment.

14.3.2 Section 2

Section 2 extends from Hansfield Railway Bridge to Kennan Bridge (Porterstown Road). The character of the Study Area changes from rural to predominantly suburban in nature. This section is predominantly residential on the northern side of the canal with farmlands on the southern side.

Currently, there are three different surface finishes along the existing towpath which is on the northern side of the Royal Canal for Section 2. From Hansfield Railway Bridge to Hansfield Road service access there is no surfacing provided, from Hansfield Road service access to Callaghan Bridge there is asphalt surfacing provided and from Callaghan Bridge to Kennan Bridge quarry dust surfacing has been provided, photographs of the existing surfaces are illustrated below in Figure 14.4 .

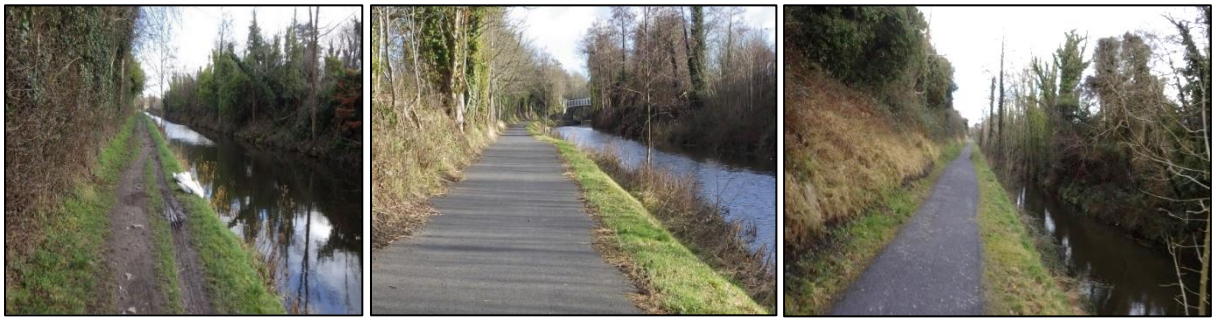


Figure 14.4 Existing surfacing along the northern towpath of Section 2

14.3.3 Section 3

Section 3 extends from Kennan Bridge (Porterstown Road) to Talbot Bridge (Old Navan Road). This section is predominately urban with extensive residential catchments on both sides of the Canal. The existing towpath for Section 3 from Kennan Bridge to Granard Bridge is on the southern side of the Royal Canal directly adjacent to the railway line/stations. For the majority of this section, there is no surface finish along the existing towpath, see Figure 14.5 below. The towpath generally comprises a 2–3 m wide track located on a varying height embankment, with a deep cutting (approximately 1.0–9.0 m) to the canal and constrained by the adjacent Dublin–Maynooth railway. As a result, a number of pinch points occur where the available width is significantly reduced, including a 1.9 m wide section over approximately 50 m between Dr. Troy Bridge and Kirkpatrick Bridge where the towpath and railway converge, as well as further localised constraints (as narrow as 1.5 m) associated with retaining walls and other structures.

For further information on the existing environment and Proposed Development refer to the EIAR Chapter 2 - Background to the Scheme.



Figure 14.5: Existing surfacing along the towpath for Section 3

14.3.4 Car Parking

A parking survey was undertaken on Thursday 8 February 2024 on residential streets in the Delwood, Brompton and Roselawn areas adjoining potential access points to the Proposed Development. Surveys were undertaken

at 15-minute intervals during the morning period from 07:30 to 09:30 and the evening period from 16:15 to 18:15. Parking within the surveyed area was generally informal, with no designated spaces or controls. The parking survey is included in Appendix 14.2.

The surveyed streets generally recorded low levels of parking stress and substantial remaining on-street capacity. The principal exception was the eastern side of Roselawn Road, where average parking stress reached 67% during the evening survey period. The survey provides a localised baseline for assessing potential operational parking effects in the Delwood and Brompton area and is not representative of conditions at every access point along the route.

14.3.5 Ecology

The Study Area adjoins and, in places, passes through ecological features associated with the Royal Canal corridor. The biodiversity baseline, including the relevant Zone of Influence, designated sites, habitats and protected species, is described in Chapter 8, Biodiversity. In particular, Section 8.7.2, Table 8-11 and Figure 8-9 identify the proposed Natural Heritage Areas within the biodiversity Zone of Influence. Chapter 8 also assesses the likely significant biodiversity effects of the Proposed Development and identifies the associated mitigation measures and residual effects. Potential effects on European sites are considered separately in the Screening for Appropriate Assessment submitted with the application.

14.3.6 Rail Network

The Dublin–Maynooth rail line follows the southern side of the Royal Canal for the extent of the Proposed Development. As part of the proposed DART+ West scheme, the railway line is due to be electrified to provide enhanced capacity to the west of Dublin. The existing level crossings relevant to the study area include those at Clonsilla Road, Porterstown Road/Kennan Bridge, Coolmine Road/Kirkpatrick Bridge and Castleknock Road/Granard Bridge. The Proposed Development has been developed having regard to these planned rail upgrades, including level crossing closures, replacement pedestrian and cycle bridges, overhead electrification infrastructure and associated rail clearance requirements. Measures will be required to minimise effects on the live rail system, including settlement or slope stability impacts.

14.3.7 Architectural Heritage

There are a number of Protected Structures within the Study Area. The Record of Protected Structures is compiled and maintained by Fingal County Council. The Royal Canal itself is the main protected structure along with the following single-arched limestone bridges Collins Bridge, Pakenham Bridge, Callaghan Bridge, Kennan Bridge, Kirkpatrick Bridge, Granard Bridge and Talbot Bridge. Within Section 2 & 3 the Royal Canal is a man-made channel cut into the landscape in the 18th century as a navigation route and has earthen banks and a towpath running alongside.

More details on Architectural Heritage are provided in **Chapter 9** of this EIAR.

14.3.8 Road Safety Records

Reference was made to the Road Safety Authority's website to ascertain the safety record of the surrounding area. The RSA collision tracker recorded the following collisions between 2016 and 2024 along the Proposed Development alignment. The location of these is illustrated below in Figure 14.6 and Figure 14.7.

Section 1:

- 2 non-serious injuries at the L30005 bridge involving a pedestrian and a motor vehicle;
- 1 serious injury at the L30005 bridge involving a motorcyclist.

A further 3 non-serious injuries were recorded at the R149/L30005 and Westmanstown Rd/L30005 junctions on both sides of the canal involving motor vehicles.

Section 2:

- 2 non-serious injuries involving motor vehicles along Hansfield road, parallel to the Proposed Development;
- 1 serious injury involving a pedestrian.

Additionally, there were 18 non-serious injury clusters recorded involving a mix of motor vehicles, pedestrians and cyclists along Clonsilla Road in the proximity of the Proposed Development.

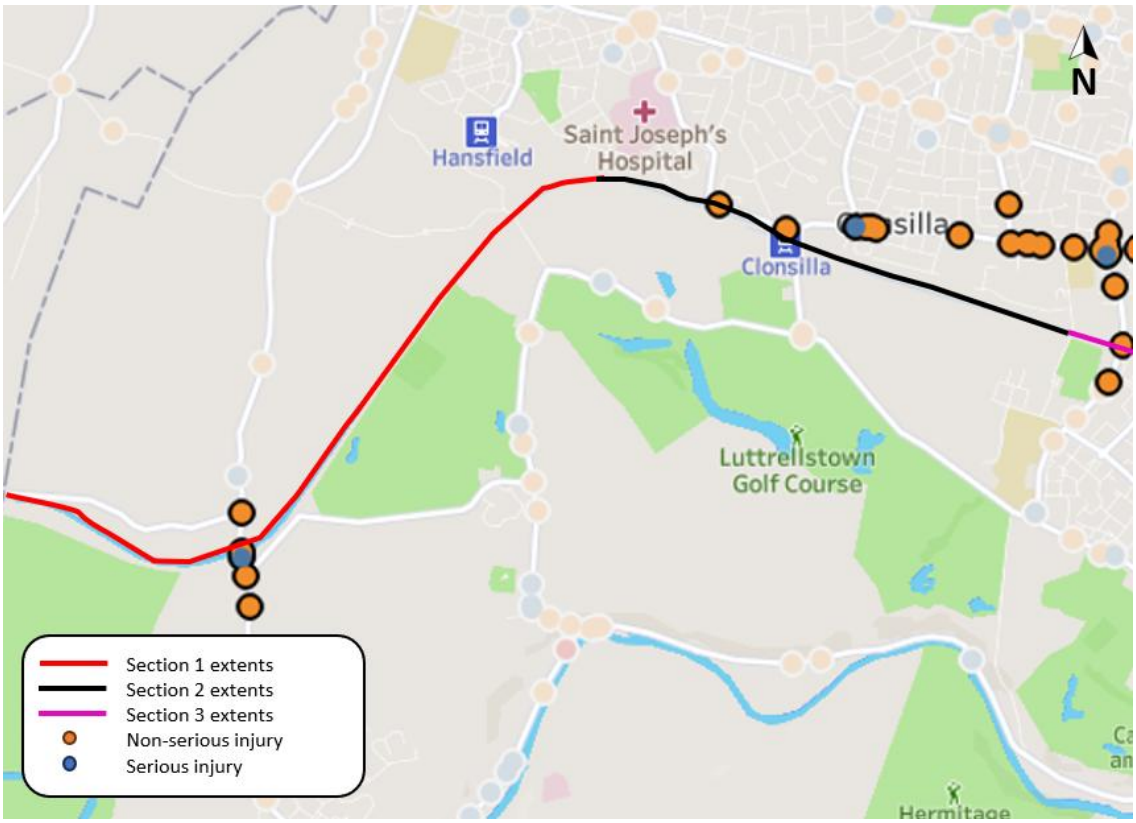


Figure 14.6 Road collision data in the vicinity of Sections 1 and 2 of the Proposed Development (Source: RSA, data valid as of 08/06/2026)

Section 3:

- 1 non-serious injury involving a motor vehicle at the Dr Troy Bridge;
- 2 serious injuries at the Kirkpatrick Bridge involving pedestrians;
- 1 serious injury on Roselawn Rd involving a pedestrian;
- 1 non-serious injury on Roselawn Rd involving a motor vehicle and 2 further non-serious injuries at the junction between Roselawn Rd and Castleknock Rd involving cyclists;
- 1 serious injury on the Granard Bridge involving a pedestrian.

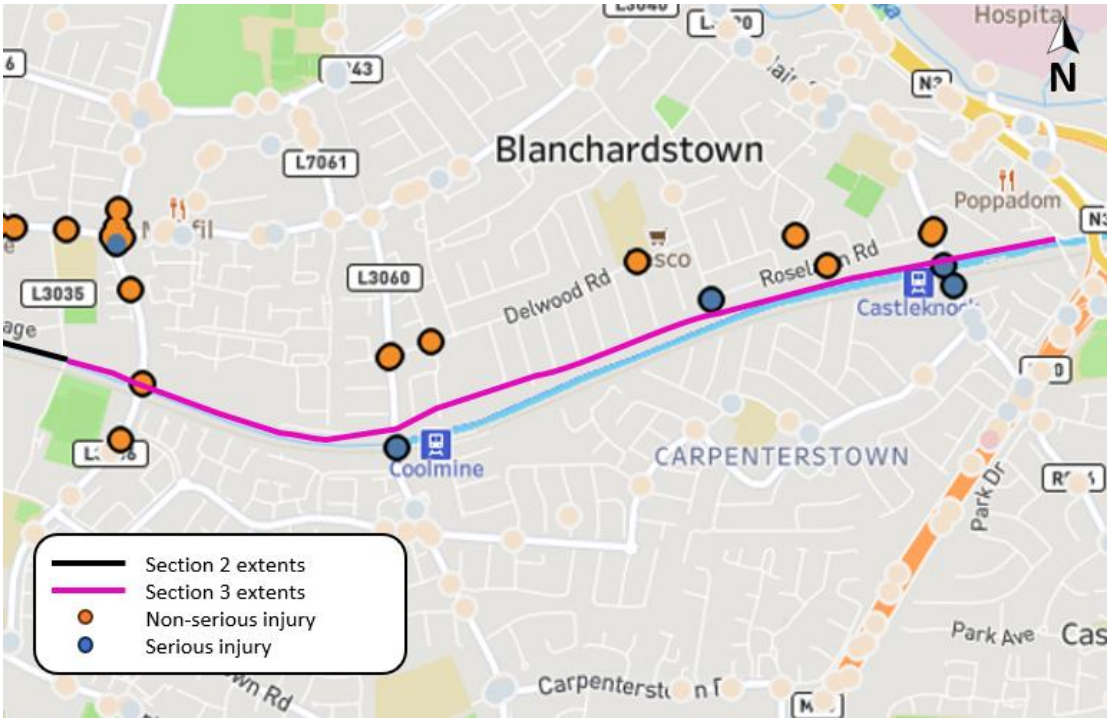


Figure 14.7 Road collision data in the vicinity of Section 3 of the Proposed Development (Source: RSA, data valid as of 08/06/2026)

The analysis identified a number of locations where pedestrian and cyclist collisions have occurred, reflecting the constrained nature of existing active travel infrastructure and interactions with vehicular traffic.

The Proposed Development will provide dedicated pedestrian and cyclist facilities, upgraded crossing points and improved route continuity. Accordingly, the Proposed Development is expected to have a beneficial effect on road safety for vulnerable road users.

14.4 Demand Analysis

14.4.1 Baseline and Assumptions Used

When seeking to predict future potential travel behaviour for new schemes, it is useful to reference existing local travel characteristics within that area. Therefore, with the objective of establishing baseline local travel characteristics in the immediate environments of the Proposed Development extents, reference has been made to the traffic survey data collected in March 2025, as well as the 2022 Census Data for Electoral Divisions in the Royal Canal Greenway catchment.

14.4.1.1 2025 Traffic Survey Data

Pedestrian and cyclist counts were obtained from traffic surveys carried out on Tuesday 4 March 2025, by specialist survey company Tracsis. The surveys were conducted over a 12-hr period from 07:00 – 19:00 at 5 no. key nodes along the Proposed Development. Based on the pedestrian and cyclist counts conducted along the sites at the Royal Canal Urban Greenway, Table 14.2 below shows the existing daily flows for a weekday.

Table 14.2: 2025 Recorded Weekday 12-Hour Pedestrian & Cyclist Flows

Site	Location	User	Pedestrians		Cyclists		Aggregated Two-way Flows	Average Pedestrians	Average Cyclists
		Direction	East	West	East	West			
1	Clonsilla Train Station/Callaghan Bridge		78	67	11	8	164	916	137
2	Kennan Bridge		99	105	15	11	230		
3	Kirkpatrick Bridge		1046	462	10	11	1508		
4	Granard Bridge		923	959	80	75	2045		
5	Talbot Bridge		421	418	243	222	1304		
Estimated Baseline Users								**1053**	



Figure 14.8: Location of 2025 Surveys along Royal Canal Route

Traffic surveys indicate that average flows across the sites establish an estimated baseline of 916 pedestrians and 137 cyclists along the route, resulting in a total weekday demand of 1,053 users under the "Do Nothing" scenario.

14.4.1.2 2022 Census Data

The analysis was supported using the SAPMAP[3] tool (Small Area Population Map), an interactive census mapping application developed by the Central Statistics Office (CSO) to provide access to Small Area Population Statistics (SAPS). In this study, the SAPMAP dataset (Travel to Work, School or College) was used to interrogate the findings of the 2022 Census. A total of 18 electoral divisions (ED) which could potentially use the proposed greenway for commuting were included in the analysis, the indicative boundaries of each of these electoral divisions are shown in Figure 14.9. The associated journey characteristics for each of these areas was then established.

[3] SAPmap Interactive Data Visualisations | CSO Ireland

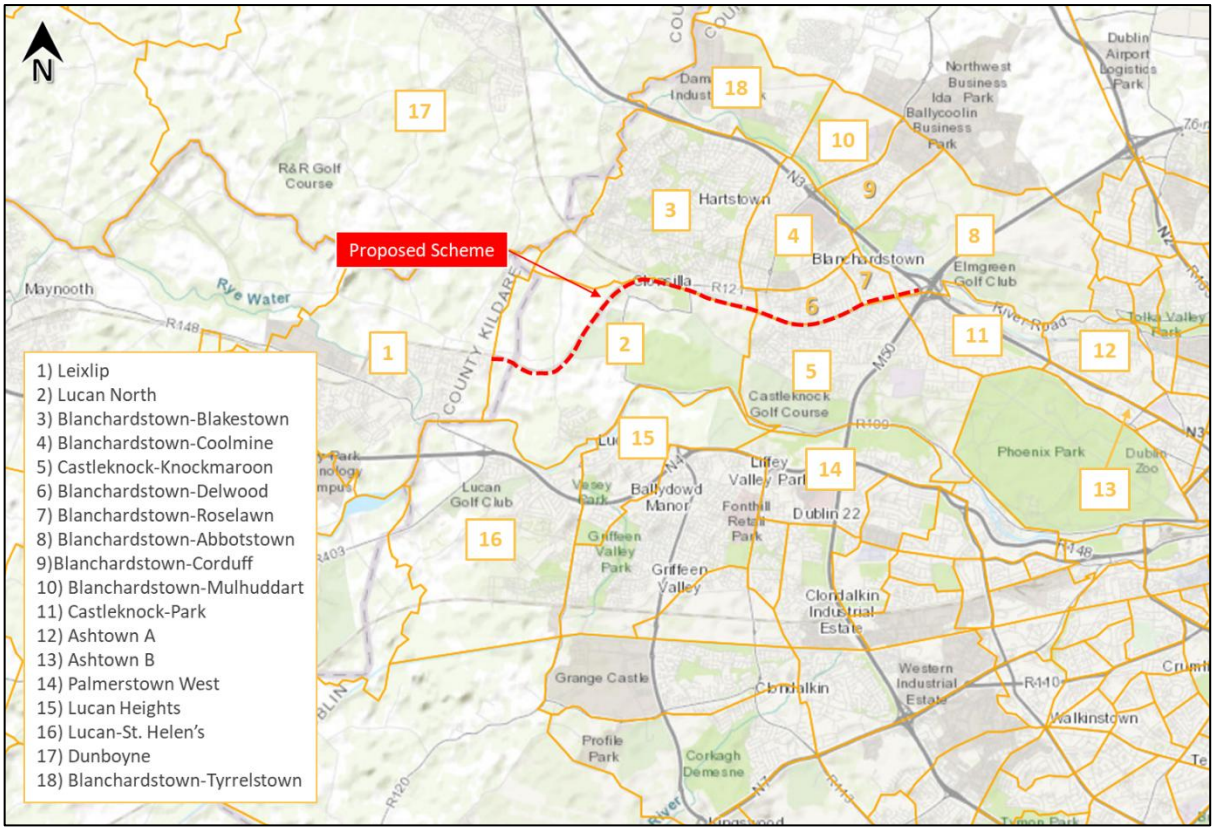


Figure 14.9: Studied Electoral Divisions Surrounding Proposed Development Extents

The distance from each ED centroid to the Proposed Development was calculated to determine the likelihood of commuters from each ED using the greenway. It was assumed that the greater distance a route origin is away from the Proposed Development, the less likely it is to use it. A correlation between distance and the type of user i.e. walker or cyclist, was determined by inversing the origin centroid distance from the Proposed Development to produce a reducing factor (RF). Anything less than 1km was left as a factor of 1.

The modal splits for each ED were extracted from the CSO 2022 commuting data, and the reducing factor for each ED applied.

It is acknowledged that the Study Area contains substantial areas of residentially zoned land, both developed and undeveloped, which will benefit from connectivity to the Proposed Development. The potential demand arising from these areas has been incorporated through the application of appropriate growth rates. Refer to Section 14.4.3, which set out the assumptions relating to incremental growth, demand uplift associated with implementation of the Proposed Development, and network effects.

14.4.1.3 Baseline Trips at Royal Canal Greenway

The modal split data retrieved for the electoral divisions was used, with RF applied, to determine a baseline figure for the number of pedestrian and cyclist commuters along the Royal Canal in a 'Do Nothing' scenario. The following daily average commuters (two-way trips) were estimated to be using the existing canal towpath.

- Pedestrians: 1109
- Cyclists: 255

The above figures indicate a total baseline demand of **1,364** users along the Royal Canal Greenway. The use of CSO data provides a more robust baseline for the analysis, as the Traffic Survey data captures only existing

usage of the towpath. In contrast, the CSO data reflects broader active travel patterns across multiple electoral divisions and better represents the potential number of users who may be inclined to use the route once it is developed.

Having reviewed both methodologies for establishing baseline demand on the Royal Canal Greenway, the baseline derived from the 2022 CSO Electoral Division data will be adopted for all subsequent assessments. This dataset considers a wider catchment area, has been appropriately adjusted, and is considered more representative of commuter travel behaviour.

14.4.2 Trips Recorded on Other Existing Walking/Cycling Routes

14.4.2.1 Literature Review & Case Studies

A comprehensive review of pedestrian and cyclist usage along similar greenways, i.e. walking/cycling routes, operating in Ireland as well as recent applications for greenway schemes and their methodologies in estimating demand was conducted to estimate the number of users that can be expected upon completion of the Proposed Development. The reference to each case study can be found in Section 14.11 References.

Table 14.3: Similar Walking/Cycling Routes for Comparison of Usage/Methodologies

Location	Characteristics
Great Western Greenway	Completed in 2010, recording up to 265,000 users annually
Waterford Greenway	Completed in 2017, recording 284,000 users in 2019
Baldoyle-Portmarnock Greenway	Completed, recording a total daily demand of 1,296 users in 2021
Royal Canal Greenway, Maynooth to Longford	Completed 130km route section in March 2021, recording 640,000 trips in 2021
Broadmeadow Way	Proposed between Malahide Demesne and Newbridge Demesne in Fingal County Council, using an additional future demand of 1,200 trips/day
Sutton to Malahide Pedestrian and Cycle Scheme	Proposed in Fingal County Council, uses 2016 Census Electoral Divisions to determine future demand
Galway to Athlone National Cycleway Scheme	Proposed and forming part of EuroVelo 2 route as RCG, uses a series of growth rates to calculate low, central and high scenarios of demand

The Broadmeadow Way Environmental Impact Assessment Report (Clifton Scannell Emerson Associates Consulting Engineers), approved by An Coimisiún Pleanála (Ref. PL06F.304624), was used as a reference as it comprises a detailed overview of Irish greenway schemes and their consequential impact. Table 14.4 below shows the greenways considered in order to determine a usage estimate for the Broadmeadow Way scheme.

Table 14.4: Greenways Considered for Broadmeadow Way Scheme

Location	Characteristics
(a) Cork City: Greenway along disused Passage West railway line between Blackrock and Mahon.	3km length; urban catchment; recreational route, and commuting route only during longer daylight times.
(b) Cork City: Blackrock/Mahon coastal greenway/amenity route	3km length; urban catchment; recreational route.
(c) Cork County: Passage West to Rochestown Greenway	5km length; urban catchment on both ends; recreational route and commuting route.
(d) Co. Mayo: Great Western Greenway between Mulranny-Newport.	18km length; scenic rural environment; recreational route, popular with cyclist-tourists, with commuter usage.
(e) Northern Ireland: Comber Greenway between Comber and centre of East Belfast.	7 miles length; urban catchment; recreational route, and commuting route only during longer daylight times.
(f) Northern Ireland: Lagan & Lough Cycleway along Lagan canal towpath between Union Locks in Lisburn and Stranmillis Weir in Belfast	11 miles length; scenic rural environment; recreational route.

14.4.2.2 Broadmeadow Way

The Broadmeadow Way EIAR (Clifton Scannell Emerson Associates Consulting Engineers, 2019) used the average daily trips retrieved from a number of similar Irish greenways in order to reach an estimated average usage of 1,200 trips/day in both directions. Further locality-based distinctions were made to determine the proportion of cyclists and pedestrians comprised within the estimated usage figure or commuting trips to recreational trips.

14.4.2.3 Royal Canal Greenway (Maynooth to Longford)

In March 2021, a 130km route section of the Royal Canal Greenway opened connecting Maynooth to Longford. Research conducted in December 2021, along the length of the greenway (Figure 14.10), ascertained that more than 640,000 trips were made on the greenway in the 9 months subsequent to its completion. Comparatively, the Great Western Greenway recorded 484,000 trips in its fifth year after opening.

The research undertaken by Tracsis for Waterways Ireland along the Royal Canal Greenway, sought to limit double counting between sites. As such, data for certain user types at a small number of Royal Canal Greenway sites have not been used in creating the aggregated route data set. Factors were also applied to the data to counter the percentage of return trips made as well as faulty counter devices.

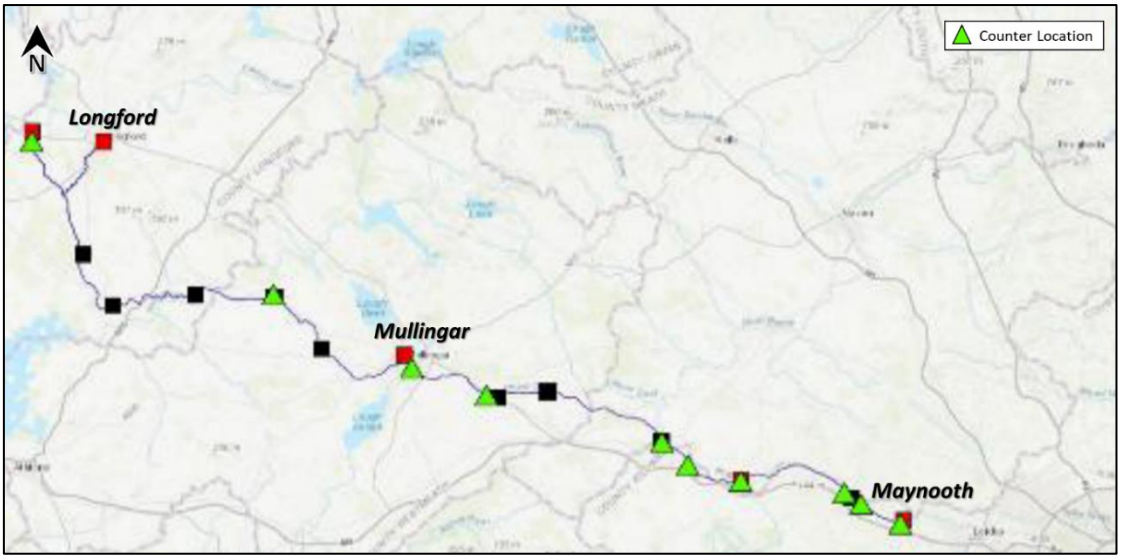


Figure 14.10 Counter Locations along Maynooth to Longford Royal Canal Greenway Scheme

Due to its proximity to the Proposed Development and its location in tying into the existing scheme, the December 2021 findings from the Royal Canal Greenway (Maynooth to Longford) are likely a representative forecast of the expected demand created by the Proposed Development. In addition, the results represent post-Covid cycling uptake. The research found almost 60% of visitors live within 10km; for the Proposed Development, similar proportions of local users are expected due to the large number of residential developments bordering the scheme.

Extrapolating the findings from the Royal Canal Greenway, on average 1,750 trips per day occur along the route. Although the Maynooth to Longford scheme spans a distance of 130km, the Proposed Development (8.1km) is anticipated to attract a greater catchment due to the population density characteristics along the Proposed Development. This projected user demand would be in addition to the average demand found at the Maynooth to Longford scheme as both schemes will be tying in to one another.

The forecast of 1,750 trips per day takes into account the results of the Broadmeadow Way EIAR, which estimated average usage of 1,200 trips per day. The higher forecast for the Proposed Development reflects its role as part of the wider Royal Canal Greenway and EuroVelo 2 route, together with the substantial residential catchment and its potential use for both commuting and recreation. On this basis, an average demand in the range of 1,200 to 1,750 trips per day is considered appropriate for the Proposed Development.

14.4.3 Demand and Estimated Number of Trips

A comprehensive demand assessment is provided in Appendix 14.1, which details the underlying assumptions and calculations. The following sections provide a high-level summary of the methodology and key outputs, while full details are contained in Appendix 14.1.

14.4.3.1 Incremental Growth

An incremental yearly increase was applied to the baseline demand trips (see Section 14.4.1) to estimate the Proposed Development's forecast user numbers for the opening year (2028). These cyclist growth rates are based on weighted averages derived from ten eco-counters and their respective percentage increase recorded between 2022 and 2025. Pedestrian growth rate was assumed to be more conservative, and kept at 1% (further details on the demand projection calculations are provided in section 2.2.1 in Appendix 14.1):

- Cyclists: An annual growth rate of 5.05% was applied to the Baseline Demand trips from the design year to the opening year, resulting in a cumulative growth of 28% over the period 2022–2027.

- Pedestrians: An annual growth rate of 1.0% was applied over the same period, resulting in a total growth of 5.1% between 2022 and 2027.

Beyond 2028, a more conservative annual growth rate of 1.0% was assumed for both cyclists and pedestrians, reflecting steady long-term growth once the initial impacts of the Proposed Development have been realised.

14.4.3.2 Uplift with Project Implementation

Substantial direct increases in pedestrian and cyclist volumes are projected following the Proposed Development's completion (by 2028). These uplift factors are informed by observed usage increases on comparable Irish active travel schemes.

- **Pedestrians:** +101.7%, derived from recorded pedestrian increases associated with the Great Western Greenway and Limerick Greenway.

- **Cyclists:** +80.4%, derived from recorded cyclist increases associated with the Great Western Greenway and Limerick Greenway.

These uplift percentages reflect the immediate increase in usage attributable to the provision of improved infrastructure and do not account for background annual growth. Further detail is provided in section 2.2.2 in **Appendix 14.1**.

14.4.3.3 Network effect

In addition to the direct uplift, the Proposed Development is anticipated to generate a "network effect," whereby enhanced connectivity within the wider transport network encourages increased walking and cycling activity.

- **Pedestrians:** +1.3%, derived using the findings of Hwang et al. (2022), *Exploring the Impact of Bike Infrastructure on Mode Choice: Simulation-Based, Route-Level Analysis*.

- **Cyclists:** +2.15%, derived using Wałdykowski et al. (2021), *Sustainable Urban Transport—Why a Fast Investment in a Complete Cycling Network Is Most Profitable for a City*, and proportionately scaled to the 8.1 km Proposed Development.

Further details on the demand calculations are provided in section 2.2.3 in Appendix 14.1**.**

14.4.4 Opening year growth rates

The cyclist and pedestrian demand for the opening year has been estimated by applying an annual incremental growth rate between the 2025 baseline year and the 2028 opening year, as described in Section 14.4.3.1 of this chapter and Section 2.2.1 of Appendix 14.1.

Subsequently, the percentage uplift associated with the implementation of the Proposed Development was combined with the increase attributable to the network effect to derive an overall growth rate. This combined growth rate was then applied to the opening year forecasts for the Proposed Development (see Sections 14.4.3.2 and 14.4.3.3 of this chapter and Sections 2.2.2 and 2.3.3 of Appendix 14.1 for further details).

Table 14.5 below summarises the resulting average daily pedestrian and cyclist trips forecast for the opening year (2028) under the low, central and high scenarios. The low and high scenarios have been derived by applying a variation of ±30% to the central forecast.

Table 14.5 Potential Future Pedestrian & Cyclist Demand at Royal Canal Urban Greenway

Users (Two-way Flows)	Existing Scenario	Future Daily Trips – Year 2028 Opening Year		
		Low Scenario	Central Scenario	High Scenario
Average Daily Pedestrian Trips	1109	2012	2366	2719
Average Daily Cycling Trips	255	497	596	695

Figure 14.11 and Figure 14.12 below show the projected growth in the number of pedestrians and cyclists respectively for low, medium, and high scenarios at the Royal Canal Urban Greenway, over a 30-year lifecycle. User growth along the route is expected to increase gradually commencing at the Proposed Development completion, as new cyclists and pedestrians within the scheme catchment are attracted to the use of the Proposed Development. Years subsequent to the scheme opening will see a large initial uplift followed by progressive growth in user numbers as nearby residents experience steady behavioural changes towards active travel and mode shift from private vehicles to utilising the route.

After the opening of the Proposed Development, growth stabilises and continues at a more consistent, linear pace of around 1% across all three scenarios. This pattern reflects the anticipated long-term effects of the greenway, where the most significant benefits are realised shortly after opening, followed by sustained, incremental growth as the area develops and attracts more users over time.

This growth trend is typical of infrastructure projects, where the immediate impact is most pronounced right after launch, with ongoing growth as the project matures and becomes fully integrated into the community and its surroundings.

While the initial values in the year of opening are based on data from existing schemes, the values in the following years are estimates and projections that may fluctuate depending on future conditions.

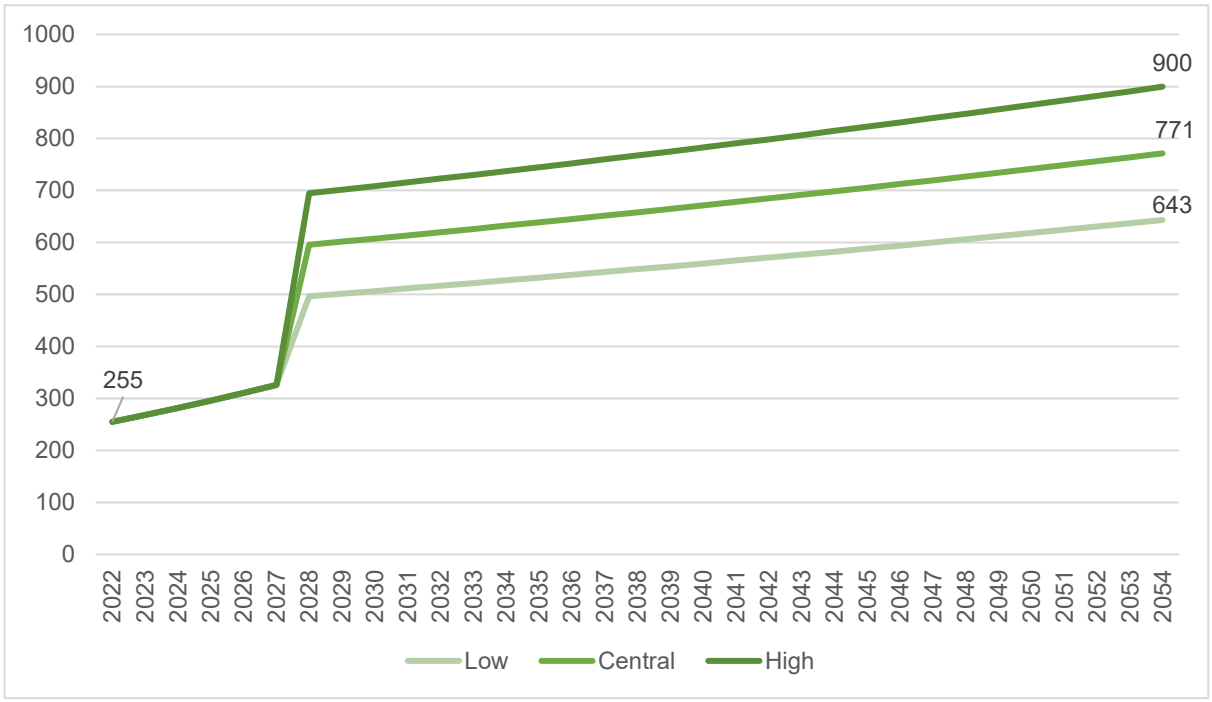


Figure 14.11: Annual Average Cyclist Demand for the Proposed Development

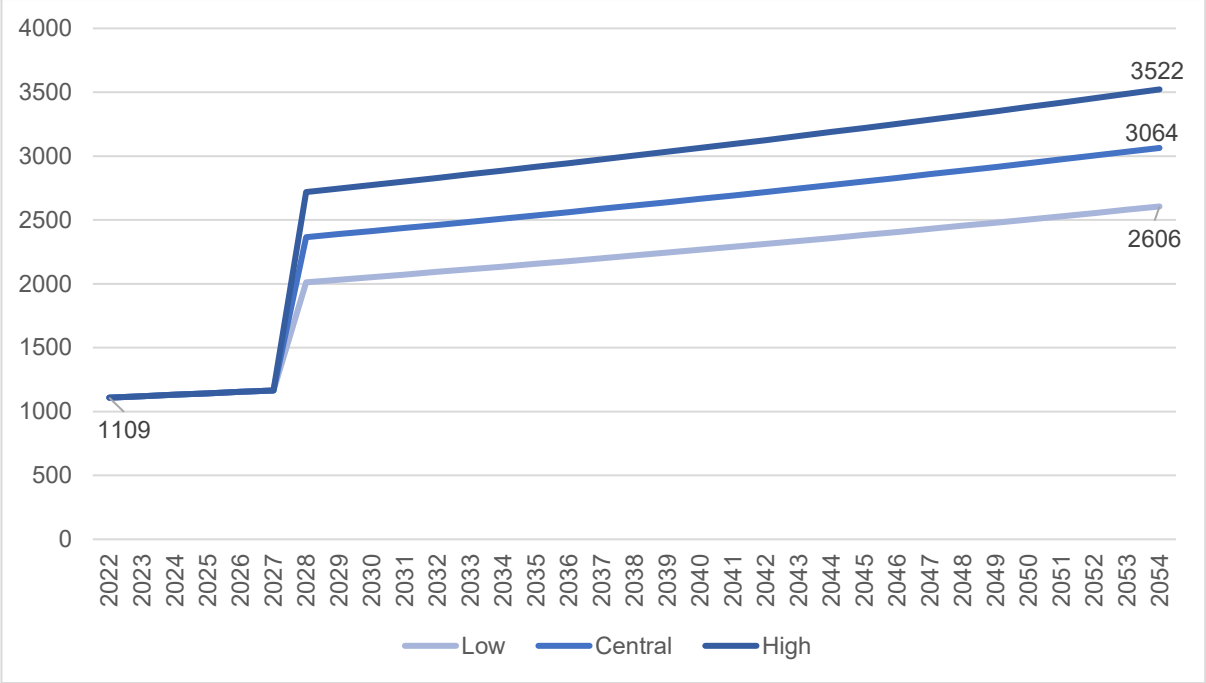


Figure 14.12: Annual Average Pedestrian Demand for the Proposed Development

14.4.5 Trips Purposes

14.4.5.1 Commuter Trips

The 2025 survey data referred to in section 14.4.1.1 was utilised to determine the utility to recreational trips ratio. For the weekday surveys, all trips conducted in the AM peak period, 07:00 – 10:00, and the PM peak period, 16:00 – 19:00, were assumed to be commuting trips. Within the 12-hour survey window, all other non-utility trips were calculated as recreational trips. Using this methodology, **62%** of all trips on the route are anticipated to be for commuting purposes. These findings were confirmed using the modal split data from the 18 electoral divisions surrounding the greenway, which exhibit similar utility-to-recreational trip ratios.

Due to the dense urban nature of the residential developments along large parts of the route, as well as the 3 no. train stations, the Proposed Development is expected to be a key link for commuters in the area of all ages.

14.4.5.2 Recreational Trips

The Proposed Development will form part of the wider Royal Canal Greenway and EuroVelo 2, providing a strategic walking and cycling connection between Dublin and Galway. It is also identified within the Greater Dublin Area Cycle Network Plan as part of the Royal Canal Greenway corridor serving the city centre, Cabra, Ashtown, Castleknock, Coolmine and Clonsilla. Further details of this strategic context are provided in Chapter 2 of this EIAR.

As such, the recreational use of the greenway will not be underrepresented with **38%** of existing trips estimated as leisure and recreational trips along the route.

Table 14.6: Expected Trips Purposes on the Proposed Development

Estimated Average Usage on the Proposed Development (Central Scenario)	Commuter Trips	Recreational Trips
2312 pedestrians trips/day	1443 pedestrians trips/day	869 pedestrians trips/day

	(62%)	(38%)
515 cyclists trips/day	321 cyclist trips/day (62%)	194 cyclist trips/day (38%)

14.4.6 Modal Splits

As outlined above in section 14.4.1.2, the initial analysis considered the mode of travel used by residents living in each of the above 18 electoral divisions, identified in the Census 2022, when travelling to school, college and work. A total of 123,933 people reside in the electoral divisions (ED) included in the analysis. The distance from each ED centroid to the greenway was calculated to determine the likelihood of commuters from each ED using the greenway. It was assumed that the greater distance a route origin is away from the greenway, the less likely it is to use the greenway. A correlation between distance and the type of user i.e. walker or cyclist, was determined by inversing the origin centroid distance from the greenway to produce a reducing factor (RF). Anything less than 1km was left as a factor of 1. With the respective reduction factors applied to each electoral division's data the population catchment of the Royal Canal Greenway is considered to be approximately 76,230. Of these residents, the overall average principal mode of travel used across all the EDs is illustrated in **Figure 14.13**.

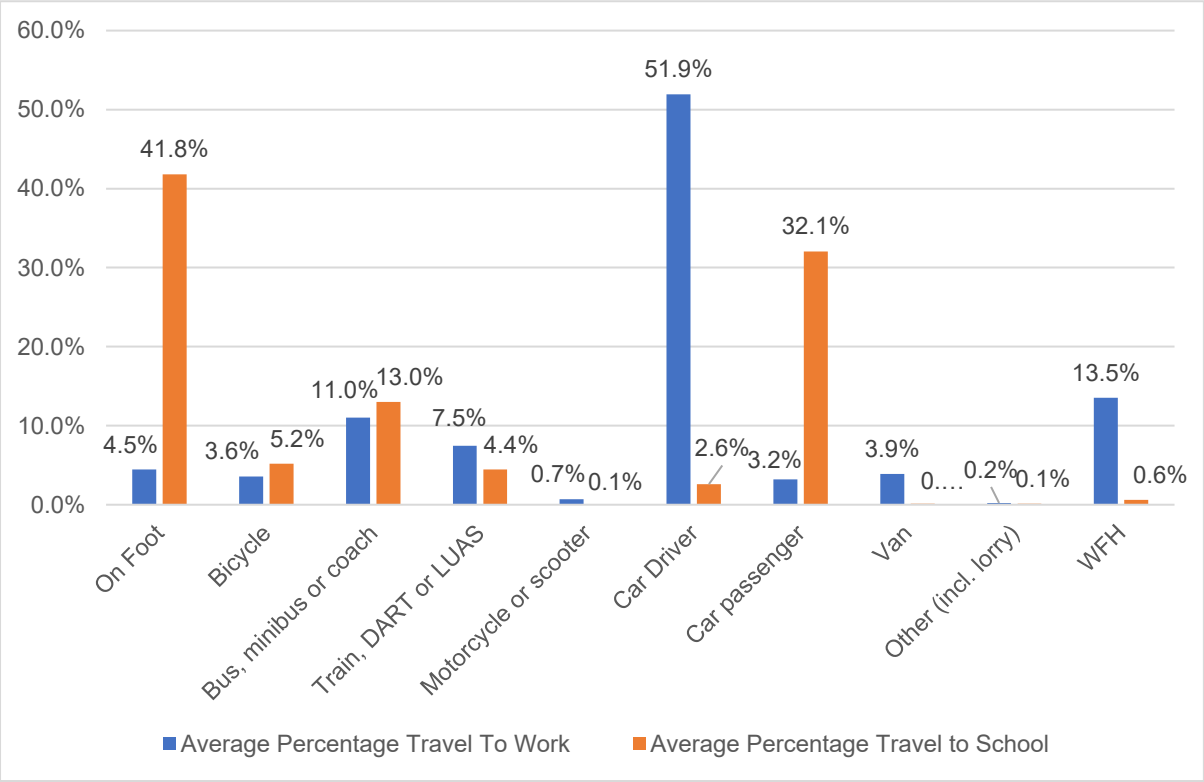


Figure 14.13 Modes of Travel: Electoral Divisions Studied [RF Applied – Reference Section 14.4.1.2]

The results indicate that a large proportion of school children in the catchment area commute to school on foot, at an average of 41.8%. The next highest mode share for travel to school is recorded as car passengers, at 32.1%. The dominant mode share for travel to work amongst the EDs is by private vehicle at 51.9%, with active modes representing under 10% of the modal split.

The implementation of the Proposed Development has significant potential in influencing a mode shift to active modes in the greenway's catchment area and shifting further trips onto public transport modes as it will provide connections to Clonsilla, Coolmine and Castleknock train stations.

In terms of public transport, the study area has bus mode shares of approximately 12.0%. Although the overall study area mode share for Train, DART and Luas comes to 7.5% for those commuting to work, this is variable along the proposed route with some small areas showing a maximum of 14% for this public transport mode. Electoral divisions in close proximity to the rail stations (Clonsilla, Coolmine, Castleknock) predictably showed the highest uptake in heavy rail usage, with the increasing distance to the interchanges being inversely proportional to the likelihood of using these services to commute.

Electoral divisions with lower mode shares for public transport within the study area are likely a reflection of the limited public transport availability in those areas or the lack of connectivity to these public transport interchanges.

In summary the results indicate that despite the deficiencies in the pedestrian / cyclist infrastructure, a considerable portion of the existing population, particularly schoolchildren, in the areas surrounding the Proposed Development commute to school by sustainable modes with 41.8% on foot and 17.4% by public transport.

14.5 Potential Impacts

14.5.1 'Do Nothing Scenario'

The 'Do Nothing' scenario for the Proposed Development is that pedestrians and cyclists will continue to walk and cycle along the existing narrow and unsurfaced towpath. The towpath along the 'Deep Sinking' section is very dangerous. This section typically consists of a 2-3m wide track, with local pinch points of approximately 1.3m, flanked by a deep cutting of 1.0-9.0m to the canal. Also, mature tree roots cross the towpath, creating trip hazards.

Accessibility to the greenway on the southern embankment is restricted between Kennan Bridge and Kirkpatrick Bridge (approximately 900m) and between Kirkpatrick Bridge and Granard Bridge (approximately 1.5km) due to the railway line on the southern side of the towpath, thereby preventing permeability and linkages from residential catchments, resulting in less passive surveillance and security for users.

The existing towpath results in an environment that is not safe, not comfortable and not attractive for pedestrians and cyclists. The latent commuter and recreational user demand will continue to be suppressed by the existing poor walking and cycling environment along the towpath (particularly within the 'Deep Sinking' section).

In the context of human health, the benefits of walking and cycling are well documented and include improved cardiovascular fitness, chronic disease prevention, improved mental health wellbeing, strengthened immune system and a reduced risk of cancer, obesity and coronary heart disease. These benefits to Fingal County and its people will not be realized in the 'Do Nothing' scenario.

In the 'Do Nothing' scenario, the long-standing objectives of the Fingal Development Plan to deliver the Proposed Development will not be realized.

Based on the reasons outlined above, the 'Do Nothing' scenario will essentially result in a lost opportunity.

14.5.2 'Do Something' Scenario

The 'Do Something' scenario represents the likely conditions of the Study Area with the Proposed Development in place. The layout of the full scheme and its sections can be seen in **Figure 14.3.** The following paragraphs outline the route option description for each of the sections in the Study Area in the 'Do Something' scenario. Adequate lighting will be provided throughout at pedestrian crossings at bridges and public road spaces. Further

information on the options assessment and alternative designs can be found in Chapter 4 'Alternatives Considered'.

14.5.2.1 Section 1:

A 2-3m wide greenway with an unbound pavement surface which follows the existing towpath along the northern side of the Royal Canal from the Kildare County Council boundary line to Hansfield. The greenway will continue through the existing pedestrian underpass by Hansfield Railway Bridge.

14.5.2.2 Section 2:

The Proposed Development will follow the existing pedestrian and cycle route via Pipers Court and St. Joseph's, before reconnecting to the towpath. Adequate lighting will be provided at pedestrian crossings at the bridges and public road spaces. It also includes widening the existing pedestrian route along the northern side of the Royal Canal from Hansfield Road to the proposed ramp within the Porterstown Old School House lands. A cantilevered boardwalk is proposed between Callaghan Bridge and the Old School House lands.

A greenway ramp, together with associated earthworks, would be required to provide access from the towpath to the higher level of the Old School House lands. A paved cycle route is also proposed within the School House lands.

14.5.2.3 Section 3:

Sub-section 3a

The Greenway will progress along the northern side of the Royal Canal from Kennan Bridge to Kirkpatrick Bridge via Sheepmoor Lane.

To minimise impacts on highly sensitive trees, the proposed route is positioned to the north of the wooded area along the northern embankment between Kennan Bridge and Sheepmoor Lane, with the route passing beneath Dr Troy Bridge.

The Greenway will connect to the existing pedestrian and cycle facilities within the Windmill Court Residential Development. Where feasible, a paved greenway is proposed as the primary solution, with a standard 4 m wide boardwalk structure used as a secondary solution in areas of steep terrain.

Along Sheepmoor Lane, Greenway users would share the road carriageway with vehicles, reflecting the low volume of vehicular traffic on the route.

Sub-section 3b

The Greenway will be installed along the northern side of the Royal Canal, routed north of the wooded area at Delwood and Brompton to minimise impacts on existing trees, before crossing to the southern canal bank via a proposed new pedestrian and cycle bridge (Landmark Bridge). The route then continues along the southern embankment to Granard Bridge.

Sub-section 3c

A paved 4m wide greenway will be provided on the southern towpath from Granard Bridge to the 12th Lock Hotel. Due to a pinch point between the hotel and the canal a 3m wide greenway is only feasible from the 12th Lock Hotel to Talbot Bridge/Old Navan Road (150m). An underpass is proposed at Granard Bridge. A zebra crossing will be provided at Talbot Bridge.

14.5.3 Options Assessment

The route options appraisal and assessment of reasonable alternatives are set out in Chapter 4: Alternatives Considered. That chapter describes the options assessment process, including the use of the Common Appraisal Framework and multi-criteria analysis, and explains the reasons for selecting the preferred route. This

chapter therefore assesses the likely traffic and transport effects of the selected Proposed Development during the construction and operational phases.

14.5.4 Construction Phase

This section considers the potential temporary traffic and transport effects of constructing the Proposed Development within the Study Area defined in Section 14.3 and on the surrounding transport network, including roads used for construction access, deliveries, haul routes and temporary diversions.

Construction details relevant to this assessment are summarised in Chapter 2 of this EIAR and set out in the Construction Methodology Report, included as Appendix A to the Outline Construction Environmental Management Plan (OCEMP) submitted with the planning application. The Construction Methodology Report describes the preliminary construction approach and principal activities, including construction sequencing, compounds, plant, equipment and associated site operations. The assessment in this section is based on that information. The methodology will be developed further by the appointed contractor before construction, subject to the mitigation measures and commitments set out in the EIAR and OCEMP.

A standalone Outline Construction Environmental Management Plan (OCEMP) (170239-DBFL-XX-XX-RP-C-0004) has been prepared to accompany the planning application. The OCEMP incorporates the construction mitigation measures identified in this EIAR and includes the Construction Methodology Report as Appendix A and the Outline Construction Traffic Management Plan (Outline CTMP) as Appendix B. Following appointment, the contractor will prepare a detailed construction-stage Construction Environmental Management Plan (CEMP), incorporating the requirements of the OCEMP, this EIAR and any conditions attached to the planning decision.

The construction-stage CEMP will be implemented by the appointed contractor and will comply with the requirements and mitigation measures contained in the EIAR and OCEMP.

The Outline CTMP, included as Appendix B to the OCEMP, sets out the planning-stage framework for managing construction traffic, temporary traffic management, public access, delivery movements, construction compounds, worker parking and stakeholder notification. The appointed contractor will be required to develop this into a detailed Construction Stage Temporary Traffic Management Plan (CSTTMP) before works commence.

The Outline CTMP identifies the potential construction compound locations and the planning-stage construction access strategy. Detailed ingress and egress routes, including access arrangements for compounds and active work areas, will be developed by the appointed contractor within the CSTTMP and agreed with Fingal County Council before works commence.

In preparing the CSTTMP for the proposed works, the appointed contractor will be required to facilitate the safe and efficient movement of people during the construction period through implementing the following hierarchy of transport mode users:

- Pedestrians;
- Cyclists;
- Public Transport; and
- General Traffic.

Access will be maintained for emergency vehicles along the Proposed Development, throughout the Construction Phase.

14.5.4.1 Construction Compounds

Temporary construction compound space will be required to provide stores, offices, material storage, parking and welfare facilities for the contractor and Employer's Representative. Compound locations are presented in **Figure 14.14**, and are as follows:

- Hansfield area – An existing grassed / planted area between the existing towpath and the adjacent third-party lands. The area is to be cleared and excavated to facilitate the Proposed Development works, impacts on existing trees will be minimised. The area can be accessed from Clonsilla Road and will require the demolition of the two existing properties to be carried out prior to full establishment of the compound. Once established this will operate as the main compound for the remaining works. A portion of this compound will be developed as a pocket park as part of the Proposed Development.
- Sheepmore Lane site – An open grassed area has been acquired by Fingal County Council for the intent of using this space for maintenance and storage. During the construction phase this area may be used as a satellite compound / storage area.
- Castleknock area – A grassed section of the Laurel Lodge Park, accessed via Park Lodge. This will be a satellite compound for storage of materials associated with the adjacent works and access for HGVs and large plant will be limited.



Figure 14.14: Possible Construction Compound Locations (Source: Google Maps)

The construction compounds will be the main storage for the bulk material and construction plant during the construction phase. The materials and machinery will be taken to the active work area as required on a periodic basis.

The construction workers will be provided with parking at the Hansfield compound exclusively, and the operatives will be transported from the compound to the designated work area. No parking will be allowed within the temporary works area.

Once the construction is completed, the compound areas will be cleared, all construction materials will be removed and the areas will be reinstated.

Further details of the potential construction compound locations are provided in the Outline CTMP, included as Appendix B to the OCEMP.

14.5.4.2 Construction Works

An overview of the principal construction activities associated with the Proposed Development is provided below. All works will be undertaken in accordance with the mitigation measures set out in this EIAR, the OCEMP and the Outline CTMP.

Preliminary material quantities are provided in Chapter 15, Material Assets – Resource and Waste Management. Further details of the proposed construction works are set out in the Construction Methodology Report, included as Appendix A to the OCEMP submitted with the planning application.

The principal construction activities are anticipated to comprise:

1. Fencing of construction areas and establishment of site compounds.
2. Implementation of traffic management measures.
3. Establishment of temporary surface water management measures.
4. Stripping of topsoil and/or existing surfacing, as required by the construction phasing. Stripped topsoil will be stockpiled on-site for re-use, with any excess material removed off-site.
5. Earthworks to formation level, including excavation of on-site materials and placement of either excavated or imported material to form the required profile. This will also include the export of unsuitable or surplus materials and the import of capping and fill materials, where required.
6. Clearance of selected trees and vegetation, where required.
7. Construction of the pedestrian/cycle bridge known as Quarry Bridge and associated boardwalk sections.
8. Construction of the pedestrian/cycle bridge known as Landmark Bridge and associated ramped sections.
9. Excavation works at Granard Bridge to facilitate construction of the proposed underpass, followed by backfilling and road construction works.
10. Installation, diversion and protection of utilities and services, including trenching, ducting and drainage works.
11. Importation, placement and compaction of pavement foundation materials, concrete surfaces, kerbs and surfacing.
12. Implementation of environmental mitigation measures, including mammal pass structures and compensatory planting.
13. Ancillary roadworks, including signage, public lighting, road markings and traffic signals.
14. Accommodation works associated with affected properties, including fencing and planting.
15. Landscaping works, including the formation of verges, embankments, together with the planting of trees and shrubs, placement of soils, seeding and construction of permanent boundary treatments.

The construction activities and preliminary quantities described above form the basis of the construction traffic assessment. Subsequent refinement of construction sequencing, access arrangements and working methods will be required to remain within the parameters assessed and comply with the mitigation measures set out in this EIAR, the OCEMP and the Outline CTMP. Such refinements are not expected to materially alter construction traffic volumes or the significance of the traffic and transport effects assessed in this chapter.

Construction access will use the existing local and regional road network. The Outline CTMP identifies the indicative construction compound locations, planning-stage access principles and potential access points. Detailed ingress and egress routes, haul routes and access arrangements for compounds and active work areas will be confirmed by the appointed contractor in the CSTTMP and agreed with Fingal County Council before

works commence. These arrangements will be required to remain within the parameters assessed in this EIAR and to minimise disruption to local traffic, active travel users and surrounding communities.

Construction traffic associated with the Proposed Development is expected to be relatively low. HGV movements are estimated at a maximum of nine per day and, where practicable, will be scheduled outside peak traffic periods. Given the low volume of construction traffic, the dispersed nature of the works and the use of the existing road network for access, no material impact on the operational performance of the surrounding road network is anticipated during the construction phase.

14.5.4.3 Duration of the Works

Following award of the tender to the successful contractor, it is anticipated that the construction duration for the Proposed Development would be approximately 24 months. References to phasing relate to the sequencing of construction activities and work areas, rather than to separate construction contracts. The Proposed Development is currently anticipated to be delivered under a single construction contract, with the appointed contractor required to prepare a detailed construction programme prior to commencement of works. This programme will set out the sequence, duration and management arrangements for each work area, having regard to construction methodology, access arrangements, environmental constraints, utility interfaces, stakeholder requirements and temporary traffic management approvals.

Construction will be progressed through sequenced work areas supported by defined compound access, limited-duration road crossing works, off-peak delivery arrangements where practicable, protection of vulnerable road users and advance stakeholder notification. The sequencing will seek to avoid excessive concurrent temporary traffic management along significant lengths of the canal corridor, particularly in constrained residential and canal-side locations.

14.5.4.4 Temporary Traffic Management

The Proposed Development shall be constructed in a manner that minimises disruption to road users, canal towpath users, local residents and businesses. The contractor shall prepare a Construction Stage Temporary Traffic Management Plan (CSTTMP), in consultation with Fingal County Council, Kildare County Council, An Garda Síochána, Iarnród Éireann and other relevant stakeholders, before construction commences. The CSTTMP shall be developed having regard to the Outline CTMP included as Appendix B to the OCEMP and the constraints set out in the tender documentation. Key considerations to be addressed include:

- All construction works will be undertaken within clearly delineated work areas. The CSTTMP will identify and show the specific entry and exit points for construction traffic, in accordance with the access principles and potential access points identified in the Outline CTMP.
- Local roads to be maintained as minimum one-way alternating traffic during works at road crossings (e.g. construction of toucan crossings and the construction of the Granard Bridge underpass) with the exception of short-term closures for critical works. Two-way traffic flow to be achieved where practicable with durations of one-way systems to be minimised.
- Construction traffic arising from the site shall be managed in accordance with a method statement for the management of the construction phase in accordance with an agreed site-specific Construction Traffic Management Plan that fully accords with requirements of the Council's Traffic Section Operations Department.
- A record of daily checks that the works are being undertaken in accordance with the site-specific Construction Traffic Management Plan shall be kept for inspection by the Planning Authority.
- All relevant processes such as Road Opening licences, Abnormal Load licences, Road Closures and procedures for road closures, lane closures, setting out construction working hours, etc. which will be required to be submitted within the appropriate time periods prior to the commencement of construction works for the proposed project.

- Construction sequencing will be planned to avoid works taking place concurrently along significant sections of the existing canal banks, where practicable, while still allowing the Proposed Development to be delivered under a single construction contract.
- Maintain access along the towpath for emergency towing of barges, and for access to designated fishing points if practicable.
- All temporary diversions, lane closures, one-way systems, signage and temporary safety measures to be in accordance with the Traffic Signs Manual.

14.5.4.5 Temporary Impacts on Schools, Residents and Businesses

There are a number of schools in the vicinity of the Proposed Development. To minimise impacts on school traffic, works in the vicinity of schools will, as far as reasonably practicable, be programmed during school holiday periods, including the summer months when schools are closed. Where works are required during the school term, the appointed contractor will be required to implement temporary traffic management measures to minimise disruption during school drop-off and pick-up periods.

Temporary impacts on schools, residents, businesses and users of the existing towpath may arise from construction vehicle movements, temporary lane restrictions, short-duration road or towpath closures, pedestrian and cyclist diversions, and temporary changes to local access arrangements. These activities may result in short-term delays, altered access routes and increased interaction between construction traffic and local road users, particularly during school drop-off and pick-up periods and at works close to residential or commercial properties.

There will be a minor effect on residents and businesses during the works, particularly where road crossings are constructed. Traffic will be managed using appropriate temporary traffic management measures, including advance information signs and alternative route information where necessary. The CSTTMP will set out how traffic will be safely managed and disruption minimised, having regard to the Outline CTMP included as Appendix B to the OCEMP. Temporary traffic management measures shall be designed and installed in accordance with Chapter 8 of the Traffic Signs Manual and the Guidance for the Control and Management of Traffic at Road Works.

14.5.4.6 Temporary Traffic Management at Road Crossings

Temporary Traffic Management (TTM) will be required at road crossing locations to facilitate the safe construction of the proposed crossing infrastructure and associated tie-ins to the Proposed Development. The TTM measures will be designed to maintain the safe operation of the road network while protecting construction personnel and road users.

All Temporary Traffic Management measures will be designed, implemented and maintained by suitably qualified and competent personnel in accordance with the **Guidance for the Control and Management of Traffic at Road Works** and any requirements of Fingal County Council.

As the Proposed Development is predominantly located off-road, Temporary Traffic Management will be required only at discrete road crossing locations and for limited durations. The extent and duration of any traffic management measures will be minimised insofar as practicable to reduce disruption to vehicular traffic, pedestrians and cyclists.

Construction materials will be delivered to the crossing locations as required and managed in accordance with the CEMP. Any temporary lane restrictions, footpath diversions or traffic control measures required during the construction of the crossings will be of limited duration and will be coordinated to minimise impacts on the operation of the surrounding road network.

Further information is provided in the Construction Methodology Report, included as Appendix A to the OCEMP submitted with the planning application.

14.5.4.7 Potential Construction Impact

The potential construction effects assessed include both direct effects arising from temporary closures, access restrictions and construction traffic movements, and indirect effects arising from diverted pedestrian, cyclist and vehicular movements and associated changes to the operation of the surrounding transport network.

Table 14.7 below presents a summary of the potential effects of the Proposed Development during the Construction Phase. The effects ratings have been determined using the standard descriptive terminology set out in the EPA Guidelines on the information to be contained in Environmental Impact Assessment Reports (2022), having regard to the quality of the effect, significance of the effect and duration of the effect. The significance rating for each assessment topic has been determined by considering the nature and extent of the temporary disruption, the sensitivity of the affected transport users or receptors, the availability of alternative routes or access arrangements, the likely duration of the works, and the mitigation measures secured through the Construction Methodology Report, OCEMP and Outline CTMP. On this basis, effects have been described as negative, neutral or positive, with significance ratings such as slight or moderate and duration ratings such as temporary, as appropriate to the likely construction phase effect.

Table 14.7: Summary of Potential Construction Phase Effects

Assessment Topic	Impact	Potential Effect
Walking	Restrictions to pedestrians along the Proposed Development and the lack of connectivity/permeability during different construction stages.	Negative, Moderate and Temporary
Cycling	Restrictions to cyclists along the Proposed Development, leading cyclists onto the adjacent road network for the duration of the construction works along each section.	Negative, Slight and Temporary
Rail	Restrictions to public transport accessibility along the Proposed Development for nearby residential communities depending on the phase of construction works.	Negative, Moderate and Temporary
General Traffic	Restrictions to residential traffic immediately adjacent to the Proposed Development.	Negative, Slight and Temporary
	Congestion on the local road network as a result of HGVs and construction traffic flows during the construction stage.	Negative, Moderate and Temporary
	Additional HGVs required due to improper storage, material damage or lack of reuse of construction materials.	Negative, Moderate and Temporary

14.5.5 Operational Phase

The potential operational effects assessed include both direct effects arising from the provision of improved walking and cycling infrastructure, connectivity and access, and indirect effects arising from changes in travel behaviour, mode shift, public transport integration and reduced reliance on private car travel.

The Proposed Development may attract some recreational users who travel by car to access points along the route. However, most forecast demand is expected to arise from the substantial adjoining residential catchment

and from trips connecting with existing walking, cycling and public transport networks. The route is intended primarily as a local active travel and recreational corridor rather than a drive-to destination, and no dedicated visitor car parks are proposed. Any additional vehicle movements associated with recreational access are therefore expected to be dispersed across the route and are not anticipated to result in a significant effect on the operation of the surrounding road network. Potential localised parking effects are assessed in Section 14.6.2.1.

Table 14.8 below presents a summary of the potential effects of the Proposed Development during the Operational Phase. The effect ratings have been determined using the same EPA-based terminology and assessment approach described above for the Construction Phase. For the Operational Phase, the ratings have been determined by considering the extent to which the Proposed Development will improve walking and cycling conditions, enhance permeability and accessibility, support public transport connectivity, influence mode shift, affect parking demand and reduce reliance on private car travel. The ratings also take account of the forecast pedestrian and cyclist demand, the permanent nature of the infrastructure, and the embedded design measures forming part of the Proposed Development.

Table 14.8: Summary of Potential Operational Phase Effects

Assessment Topic	Impact	Potential Effect
Pedestrian Infrastructure	Improvements to the quality of the pedestrian infrastructure along the Proposed Development in the way of directness, accessibility and segregation from vehicular routes.	Positive, Very Significant and Long-term
	New pedestrian and cyclist crossings (5) proposed along the length of the route represent a significant improvement in permeability for the affected communities.	Positive, Moderate and Long-term
Cycling Infrastructure	Improvements to the quality of the cycling infrastructure along the Proposed Development in respect of the towpath surfacing and width of the greenway, as well as providing a continuous link segregated from vehicular traffic.	Positive, Very Significant and Long-term
Rail Infrastructure	The Proposed Development will improve walking and cycling access to Clonsilla, Coolmine and Castleknock stations and may support a modest increase in rail use. Demand is expected to be dispersed between stations and across the day and is not anticipated to materially affect rail capacity or station operation. The approved DART+ West scheme will provide increased service frequency and passenger capacity along the adjoining rail corridor.	Positive, Slight and Long-term
Parking	Some additional parking demand may arise at railway station car parks and other access points during weekends and peak	Negative, Slight and Long-term

	recreational periods. Additional vehicle trips are expected to be low and dispersed across the route.	
People Movement	Increases to the total number of people travelling through the Proposed Development representing multiple health and community benefits.	Positive, Very Significant and Long-term
General Traffic Network Performance Indicators	Reduction in general traffic flows along the Proposed Development and the surrounding road network due to increases active and sustainable travel.	Positive, Moderate and Long-term

14.6 Mitigation Measures

14.6.1 Construction Phase

A standalone Outline Construction Environmental Management Plan (OCEMP) (170239-DBFL-XX-XX-RP-C-0004) has been prepared to accompany the planning application. The OCEMP includes the Construction Methodology Report as Appendix A and the Outline Construction Traffic Management Plan (Outline CTMP) as Appendix B. Together, these documents provide the planning-stage framework for managing construction effects, including construction worker travel, construction vehicle movements, delivery timing, construction access, compound parking, haul routes, temporary traffic management and stakeholder notification. The appointed contractor will prepare a detailed construction-stage CEMP and CSTTMP before works commence.

The construction-stage CEMP will incorporate the requirements of the OCEMP, the mitigation measures set out in this EIAR and any conditions attached to the planning decision.

The appointed contractor will be required to prepare a detailed CSTTMP, based on the Outline CTMP, prior to commencement of works. The CSTTMP will confirm the detailed construction access arrangements, delivery management procedures, worker parking controls, workforce travel arrangements, haul routes, temporary traffic management layouts, inspection procedures and any approvals required from Fingal County Council and other relevant stakeholders. This approach ensures that the potential impacts associated with construction workers' travel and delivery vehicles have been considered at planning stage and will be managed through construction-stage controls. The following initiatives will be implemented to avoid, prevent or reduce any identified significant adverse effects on the environment arising as a result of the construction period:

- During the pre-construction phase, the site will be securely fenced off/hoarded off from adjacent properties, public footpaths and roads;
- Appropriate on-site parking (temporary parking for the duration of construction works) and compound area will be provided to prevent overflow onto the local network;
- Construction operatives shall park at the Hansfield main compound and shall be transported from the compound to active work areas by vans, minibuses or other managed transport. No construction worker parking shall be permitted within temporary work areas or on adjoining public roads. Prior to commencement of construction, the appointed contractor shall prepare and implement a Construction Mobility Management Plan to encourage shared travel and sustainable modes and minimise construction worker trip generation.

- Construction deliveries shall be managed through a booking and scheduling system and spread across the working day. HGV deliveries shall be scheduled outside peak traffic periods where practicable. The assessed construction traffic level is a maximum of nine HGV movements per day. These requirements shall be incorporated into the CSTTMP prepared prior to commencement of construction.

- Truck wheel washes will be installed at construction entrances;

- Any specific recommendations with regard to construction traffic management made by Fingal County Council will be adhered to;

- Potential localised traffic disruption during construction will be managed through the CSTTMP. Measures will include temporary lane restrictions or one-way alternating traffic where required, signed diversion routes, temporary pedestrian and cyclist arrangements, controlled construction access points, traffic marshals where necessary, advance warning signage and stakeholder notification. The extent and duration of temporary restrictions will be minimised. All temporary traffic management measures will be designed, implemented and maintained by suitably qualified personnel in accordance with Chapter 8 of the Traffic Signs Manual and the Guidance for the Control and Management of Traffic at Road Works.

- Material storage zones will be established in the compound area and will include material recycling areas and facilities;

- 'Way finding' signage will be provided to route staff / deliveries into the site and to designated compound / construction areas;

- Transportation of site machinery and materials will be scheduled outside peak traffic periods where practicable and will not take place between 19:00 and 07:00 unless otherwise agreed for specific exceptional activities. Where works are required in the vicinity of schools during the school term, deliveries, plant movements and temporary traffic management changes will be restricted during school drop-off and pick-up periods;

- Dedicated construction haul routes will be identified and agreed with Fingal County Council prior to commencement of activities on-site; and

- On completion of the works, all construction materials, debris, temporary hardstands etc. from the site compound will be removed off-site and the site compound area reinstated in full on completion of the works.

14.6.2 Operational Phase

As the Proposed Development is expected to result in positive effects for both walking and cycling, no further mitigation or monitoring measures are considered necessary beyond those already incorporated into the Proposed Development.

14.6.2.1 Car Parking

Some additional parking demand may arise at railway station car parks and other access points during weekends and peak recreational periods. However, most greenway users are expected to travel from the adjoining catchment on foot or by bicycle. No dedicated visitor parking is proposed. Additional vehicle trips are therefore expected to be low, dispersed across the route and unlikely to result in a significant traffic effect.

The localised parking survey indicates substantial available on-street capacity in the Delwood and Brompton area, except on the eastern side of Roselawn Road during the evening survey period. Fingal County Council will keep parking conditions at railway stations, greenway access points and nearby streets under review. If material parking issues arise, proportionate parking management measures will be considered.

Following implementation of these measures, the residual parking effect is assessed as negative, slight and long-term.

14.6.2.2 Public Transport

The potential effect on public transport has been assessed having regard to the forecast greenway demand, the expected predominance of local walking and cycling trips, and the improved connections to Clonsilla, Coolmine and Castleknock stations. The Proposed Development may support a modest increase in rail use, particularly during peak recreational periods. This demand is expected to be dispersed between stations and across the day and is not anticipated to materially affect rail capacity or station operation. In addition, the approved DART+ West scheme will provide increased service frequency and passenger capacity along the adjoining rail corridor, increasing peak passenger capacity from approximately 5,000 to 13,200 passengers per hour per direction. The effect on rail infrastructure is therefore assessed as positive, slight and long-term. No specific mitigation is required, although demand will remain subject to normal monitoring by Iarnród Éireann.

14.7 Cumulative Effects

The potential cumulative traffic and transport effects of the Proposed Development have been considered in combination with the existing, permitted and planned developments identified in Section 1.11 of this EIAR. The assessment considers whether these developments could interact with the Proposed Development through overlapping construction activities, construction traffic, temporary traffic management, changes in travel demand or improvements to the wider walking, cycling and public transport network.

14.7.1 Construction Phase

Where the construction programme for the Proposed Development overlaps with other permitted or planned developments, temporary cumulative effects could arise from additional construction traffic, HGV movements, temporary traffic management measures, road or lane restrictions and pedestrian or cyclist diversions. Particular consideration has been given to the potential interaction with the DART+ West scheme and other works affecting the Royal Canal corridor, adjoining railway infrastructure and the surrounding road network.

Construction traffic associated with the Proposed Development is expected to be relatively low, with a maximum of nine HGV movements per day. The works will also be undertaken through sequenced work areas, rather than concurrently along the full route. The Construction Stage Temporary Traffic Management Plan will require the appointed contractor to consult with Fingal County Council, Iarnród Éireann and other relevant stakeholders and to coordinate construction access, haul routes, delivery times and temporary traffic management arrangements with other planned works. This will reduce the potential for conflicting diversions, concurrent restrictions and excessive disruption at individual locations.

Following implementation of the mitigation measures set out in Section 14.6, the cumulative Construction Phase effect on pedestrians, cyclists, public transport and the surrounding road network is assessed as negative, slight and temporary. No significant adverse cumulative Construction Phase traffic and transport effects are anticipated.

14.7.2 Operational Phase

During the Operational Phase, the Proposed Development will form part of the wider Royal Canal Greenway and EuroVelo 2 and will connect with the completed greenway sections at the Kildare County Council boundary

and Ashtown. In combination with existing and planned walking and cycling infrastructure, the Proposed Development will improve the continuity, accessibility and attractiveness of the wider active travel network.

The Proposed Development will also improve walking and cycling access to Clonsilla, Coolmine and Castleknock railway stations. In combination with the approved DART+ West scheme, this will support improved interchange between active travel and rail services. Any increase in passenger demand attributable to the Proposed Development is expected to be modest, dispersed between stations and accommodated within the additional service frequency and passenger capacity associated with DART+ West.

Other permitted and planned development within the surrounding catchment may increase the number of potential users of the route. However, the Proposed Development is intended to accommodate increased pedestrian and cyclist demand and to support a shift from private car travel to walking, cycling and public transport. While some additional recreational parking demand may arise at access points and railway stations, this demand is expected to be low and dispersed. The parking management measures described in Section 14.6.2.1 will apply if material localised issues arise.

The cumulative Operational Phase effect is assessed as positive, moderate and long-term, reflecting improved active travel network continuity, public transport accessibility and opportunities for sustainable travel. No significant adverse cumulative Operational Phase traffic and transport effects are anticipated.

14.8 Residual Impacts

14.8.1 Pedestrian and Cyclist Impacts

The Proposed Development will have a significant positive effect in terms of enhancing the existing pedestrian and cyclist environment along the Royal Canal and adding new amenity walking and cycling routes to the area. Likewise pedestrian and cyclist permeability will be improved by measures such as the new toucan crossings to be built along the proposed route.

14.8.2 Public Transport

The effects of the Proposed Development on public transport are considered to be positive in both the short and longer term. The Proposed Development will improve opportunities for walking and cycling and may encourage some trips currently undertaken by private car or public transport to be made by active modes via the proposed greenway. This has the potential to contribute to a reduction in traffic volumes on the local road network, which could in turn improve bus journey times and service reliability for existing and future bus services. Evidence from the NTA Dublin Metropolitan Area Walking and Cycling Index 2025 indicates that 64% of residents would be encouraged to cycle more if more traffic-free cycle paths, such as routes through parks and along waterways, were provided. This suggests that the Proposed Development has the potential to support a shift towards active travel and reduce reliance on private car use for shorter trips.

Research by Hwang et al. (2022)[4], Exploring the Impact of Bike Infrastructure on Mode Choice, assessed the travel behaviour associated with over 100,000 trips using a range of variables, including weather conditions, trip purpose, income, age, gender and proximity to public transport. The study found that the provision of improved cycling infrastructure increased the share of non-automobile travel modes by 3.0% across the overall sample and by 9.9% amongst frequent public transport users, defined as individuals who use public transport at least once per week. The findings indicate that high-quality cycling infrastructure can support a broader shift towards sustainable travel modes and complement public transport use.

The Proposed Development will also improve walking and cycling access to Clonsilla, Coolmine and Castleknock stations and may support a modest increase in rail use, particularly during peak recreational

[4] *Exploring the Impact of Bike Infrastructure on Mode Choice: Simulation-Based, Route-Level Analysis, Hwang et. Al, April 2022*

periods. This demand is expected to be dispersed between stations and across the day and is not anticipated to materially affect rail capacity or station operation. The approved DART+ West scheme will independently provide increased service frequency and passenger capacity along the adjoining rail corridor, increasing peak passenger capacity from approximately 5,000 to 13,200 passengers per hour per direction. The residual effect on rail infrastructure is therefore assessed as positive, slight and long-term.

14.8.3 Traffic Impacts

The Proposed Development is anticipated to have a positive long-term effect on traffic conditions within the surrounding road network. By providing a continuous, attractive and accessible walking and cycling route, the Proposed Development will enhance opportunities for active travel for both commuting and recreational journeys. The scheme is expected to encourage some residents to substitute trips currently made by private car with walking and cycling, particularly for shorter local journeys and for journeys involving access to public transport services.

The resulting reduction in private vehicle demand has the potential to contribute to improved traffic conditions on the surrounding road network, particularly during peak periods. Reduced traffic volumes may help alleviate pressure at key junctions, improve journey time reliability and contribute to a safer road environment for all users.

The *Walking and Cycling Index 2025* (NTA) recorded the percentage of residents who would like to use different types of transport more or less in the future. The survey found that 45% of residents of the Dublin Metropolitan Area feel that they would like to walk or wheel more and 34% would like to cycle more. 50% of the residents agreed that they often use a car because no other transport options are available.

Further evidence of the potential for cycling infrastructure to influence travel behaviour is provided by *Hwang et al. (2022) in Exploring the Impact of Bike Infrastructure on Mode Choice*. The study assessed mode choice across more than 100,000 trips using variables including weather conditions, trip purpose, income, age, gender and proximity to public transport. The findings indicated that improved cycling infrastructure increased the share of non-automobile travel modes by approximately 3.0% across the full sample and by 9.9% amongst frequent public transport users. These findings demonstrate the role that high-quality cycling infrastructure can play in encouraging a shift towards more sustainable travel patterns and reducing dependency on private car travel.

14.8.4 Construction

Some delays and inconvenience may be experienced by road users during non-peak hours when machinery and materials are being transported. However, these effects are expected to be temporary and localised and will be minimised by implementing the traffic management measures contained in the TTMP.

14.9 Difficulties Encountered

There were no material difficulties encountered in compiling or assessing the data for this EIAR that would prevent an assessment of the potential likely significant effects on traffic and transportation of the Proposed Development.

14.10 Interactions

Traffic and Transportation has the potential to interact with a number of other environmental topics during the construction and operational phases of the Proposed Development. The assessment of effects arising within each environmental topic is provided in the relevant specialist chapters of this EIAR. This section identifies the principal interactions relevant to Traffic and Transportation.

14.10.1 Noise and Vibration

During construction, traffic and transport interactions with noise and vibration may arise from construction vehicle movements, temporary traffic management, plant movements and works at road crossings. During operation, any changes in vehicle movements associated with access to the greenway are expected to be limited and dispersed. The assessment of noise and vibration effects is provided in Chapter 7, Noise and Vibration.

14.10.2 Air Quality and Climate

During construction, traffic and transport interactions with air quality and climate may arise from construction traffic, plant movements, material deliveries and worker travel. During operation, the Proposed Development may support a shift towards walking, cycling and public transport. The air quality and climate assessments, including the treatment of construction traffic and operational traffic emissions, are provided in Chapter 5, Air Quality, and Chapter 6, Climate.

14.10.3 Biodiversity

Traffic and transport interactions with biodiversity may arise during construction through temporary access arrangements, construction compounds, traffic management, lighting, vegetation clearance and works close to the Royal Canal corridor. During operation, interactions may arise from the use of the greenway by pedestrians and cyclists, lighting and maintenance access. The assessment of biodiversity effects and mitigation is provided in Chapter 8, Biodiversity.

14.10.4 Land, Soil and Geology

Traffic and transport interactions with land, soils and geology are limited to construction phase activities associated with the movement of excavated material, imported construction materials and construction vehicle access. The physical effects on land, soils and geology are assessed separately in Chapter 11. No separate traffic and transport assessment of land, soils and geology effects is required in this chapter.

14.10.5 Water

Traffic and transport interactions with water are limited to construction phase activities such as plant movements, construction access, haulage and potential sediment or contaminant mobilisation at works areas near the Royal Canal and drainage features. The assessment of water effects, including construction drainage and pollution prevention measures, is provided in Chapter 12, Water.

14.10.6 Waste Management

Traffic and transport interactions with resource and waste management arise during construction through the movement of imported materials, excavated material and waste requiring recovery, recycling or disposal. The traffic effect of construction vehicle movements is assessed in this chapter, while the resource and waste management assessment is provided in Chapter 15.

14.10.7 Population and Human Health

Traffic and transport interactions with population and human health arise through temporary construction disruption, changes to access and movement, pedestrian and cyclist diversion arrangements, and the long-term provision of improved active travel infrastructure. The population and human health assessment, including effects on amenity, accessibility, recreation and health, is provided in Chapter 13.

14.10.8 Material Assets: Land Use and Property

Traffic and transport interactions with land use and property may arise during construction through construction access, haul routes, temporary traffic management, construction compounds and temporary restrictions affecting access to adjoining properties and landholdings. During operation, interactions may arise from permanent access arrangements and improved walking and cycling connectivity and permeability. Land

acquisition, property interests and land use effects are assessed in Chapter 17, Material Assets: Land Use and Property, while the associated traffic and access effects are assessed in this chapter

14.11 References

Cycle Design Manual, National Transport Authority (NTA), 2023

Transport Strategy For The Greater Dublin Area (2022 – 2042), National Transport Authority, 2022

National Investment Framework for Transport in Ireland, Department of Transport, 2021

Rural Cycleway Design (Offline and Greenway), DN-GEO-03047, TII, February 2025

Department of Transport and Department of Housing, Planning and Local Government (2019). Design Manual for Urban Roads and Streets (DMURS)

Fingal County Development Plan 2023-2029, Fingal County Council (2023),

Fingal County Council Climate Action Plan (2024 – 2029)

Department of Climate, Energy and the Environment (2025) DECC Climate Action Plan 2025 Main Report.

National Sustainable Mobility Policy, DoT, 2022 (updated 2026)

Greater Dublin Area Cycle Network Plan, National Transport Authority, 2023

Strategy for the Future Development of National and Regional Greenways, Department of Tourism, Transport and Sport, July 2018

Broadmeadow Way Proposed Greenway Between Malahide Demesne and Newbridge Demesne Volume 2 EIAR, Fingal County Council, May 2019

Royal Canal Greenway, Visitor Monitoring Project, Waterways Ireland, 16th – 19th September 2021

Great Western Greenway – Economic Impact Case Study, Fáilte Ireland, October 2011

Waterford Greenway Intercept Survey 2017, Waterford County Council, December 2017

Sutton to Malahide Pedestrian and cycle scheme, Preliminary Business Case, Fingal County Council, November 2022

Baldoyle-Portmarnock Greenway user counts (eco counter), Fingal County Council, January 2021

Galway to Athlone Castle National Cycleway Scheme – Project Appraisal Report, June 2022

Exploring the Impact of Bike Infrastructure on Mode Choice: Simulation-Based, Route-Level Analysis, Hwang et. Al, April 2022

Sustainable Urban Transport—Why a Fast Investment in a Complete Cycling Network Is Most Profitable for a City, Wałdykowski et. Al, December 2021

15 Material Assets: Resource & Waste Management

15.1 Introduction

This chapter assesses the likely significant effects of the Proposed Development associated with material resource consumption and waste generation arising during the demolition, excavation, construction and operational phase. This chapter describes and assesses the likely direct and indirect effects of the Proposed Development on resource and waste management, in accordance with the requirements of Directive 2014/52/EU of the European Parliament and of the Council of 16 April 2014 amending Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment (the "**EIA Directive**"). This chapter also provides a characterisation of the receiving environment.

The Royal Canal Urban Greenway, hereafter referred to as the 'Proposed Development', is a pedestrian and cycle route approximately 8.1km in length to be constructed along and adjacent to the Royal Canal. The route extends eastwards from the Kildare County Boundary to the Old Navan Road, near the 12th Lock, where it will connect with the previously constructed Ashtown Greenway. Fingal County Council is the scheme promoter, in conjunction with the National Transport Authority as the funding body and Waterways Ireland as the principal property owner.

The Royal Canal links the River Shannon in County Longford to the River Liffey in Dublin City's Docklands. It passes close to a number of towns, including Mullingar, Kilcock, Maynooth and Leixlip, before entering Fingal where it passes through the built-up areas of Clonsilla, Coolmine, Castleknock and Blanchardstown on its way towards Dublin city.

The Proposed Development will provide a continuous, high-quality active travel corridor serving the communities of Clonsilla, Coolmine, Castleknock and Blanchardstown and will improve accessibility to schools, public transport, employment centres, recreational amenities and local services. The scheme will encourage a modal shift towards walking and cycling, while supporting recreation, health and wellbeing, sustainable transport objectives and climate action policies at national, regional and local level.

A full description of the Proposed Development is outlined in Chapter 2 'Background to the Scheme' of this EIAR.

The Proposed Development is divided into three sections as follows – and as generally indicated in Figure 12-1:

- Section 1 – Kildare County Border to Hansfield Railway Bridge (Ch. 0000 – 3200)
- Section 2 – Hansfield Railway Bridge to Kennan Bridge (Ch. 3200 – 5300)
- Section 3 – Kennan Bridge to Talbot Bridge (Chainage 5300 – 8100)

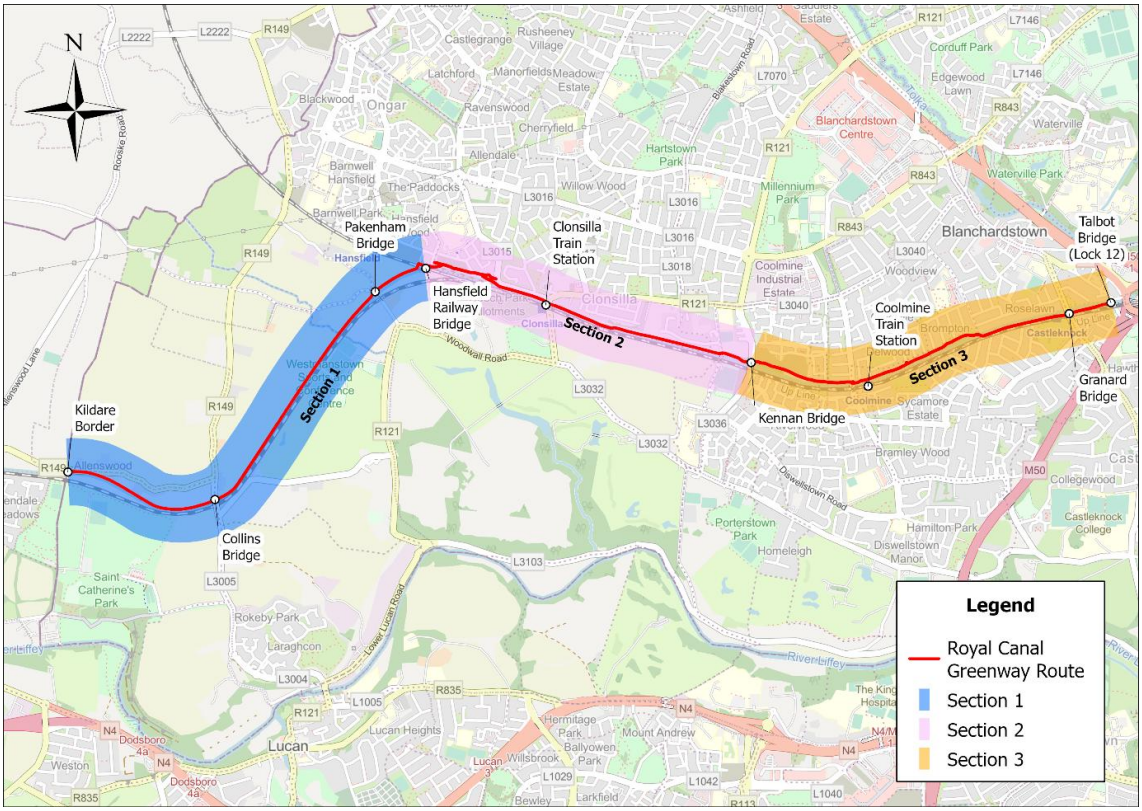


Figure 15-1 Study Area Sections

A Site-Specific Resource and Waste Management Plan (RWMP) (See AWN reference 257501.270WMR01) has been developed alongside this Chapter in accordance with European Commissions Guidelines, Guidance on the preparation of the Environmental Impact Assessment Report (2017), the EPA EIA Report Guidelines 2022 and the EU Commission Notice on changes and extensions to projects, 2021. This chapter should be read in conjunction with the RWMP, which and has informed the assessment of construction and demolition waste arisings and the associated mitigation measures set out below. These documents ensure the management of wastes arising at the Development Site in accordance with legislative requirements and best practice standards.

The principal objective of sustainable resource use and waste management is to use material resources more efficiently, ensuring that the value of products, materials and resources is maintained within the economy for as long as possible while minimising the generation of waste. In the context of infrastructure projects, this includes the efficient use, recovery and reuse of construction materials and excavated material, where feasible. To achieve resource efficiency, there is a need to move from a traditional linear economy to a circular economy (see Figure 15-2).

The Department of Climate, Energy and the Environment, (DCEE) A Waste Action Plan for a Circular Economy – Ireland's National Waste Policy 2020 – 2025 (hereafter referred to as the National Waste Action Plan) (DCEE 2020) notes that:

> *'In a circular economy the value of products and materials is maintained for as long as possible; waste and resource use are minimised, and resources are kept within the economy when a product has reached the end of its life, to be used again and again to create further value.'*

The European Union (EU) Circular Economy Action Plan (European Commission 2020) notes that:

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

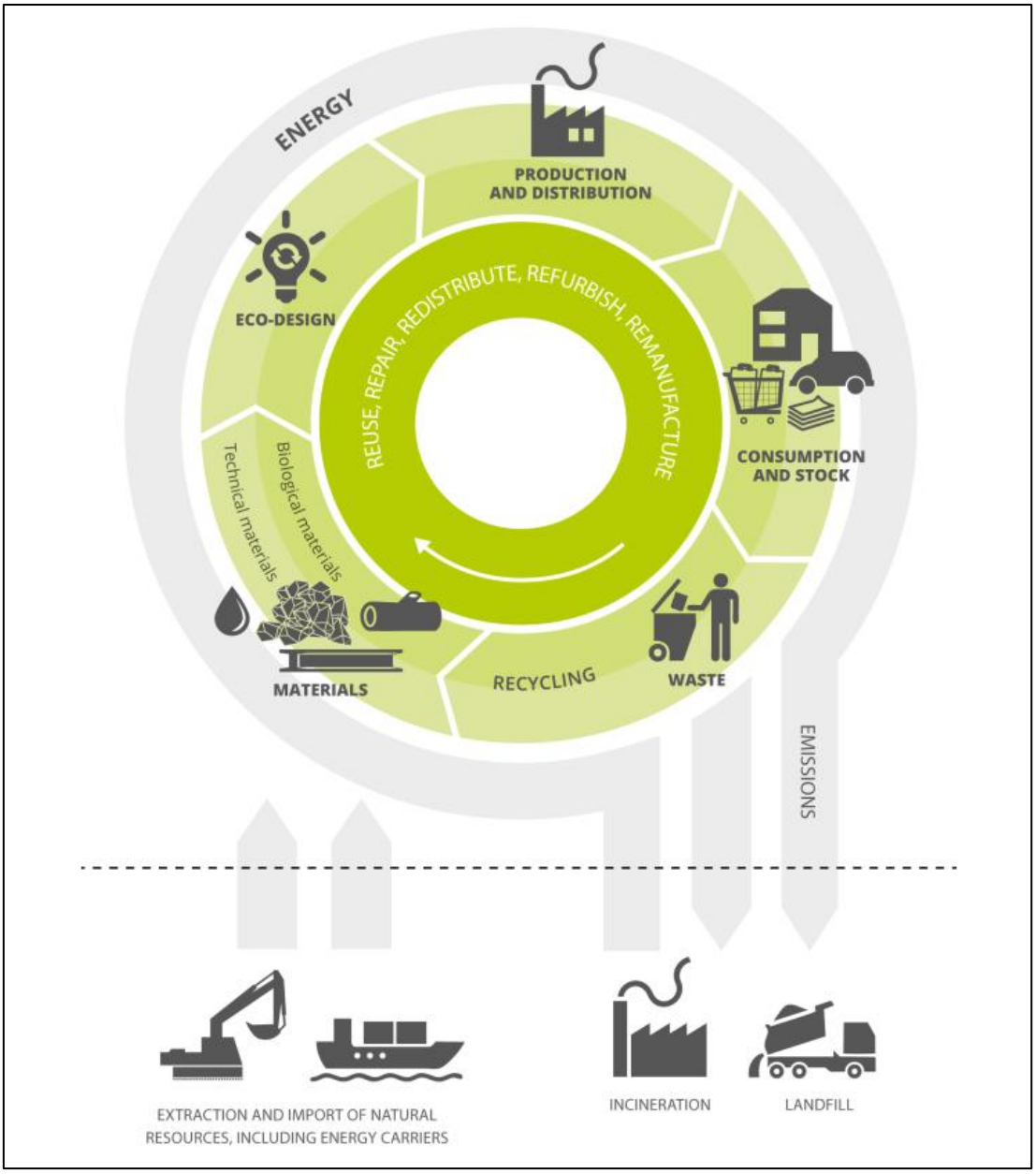


Figure 15-2: Simplified Model of the Circular Economy for Materials and Energy (European Environment Agency (EEA) 2016)

Where residual waste generation is unavoidable, it will be managed in accordance with the waste hierarchy, as illustrated in Figure 15-3, and as set out in Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste and repealing certain Directives, as amended by Directive (EU) 2018/851 of the European Parliament and of the Council of 30 May 2018 (hereafter referred to as the Waste Framework Directive).

The waste hierarchy promotes the efficient use of material resources, the prevention and minimisation of waste generation, increased reuse and recycling, and the reduction, insofar as possible, of waste requiring disposal to landfill.



Figure 15-3: Waste hierarchy under the Waste Framework Directive, as amended

This chapter of the EIAR examines the potential environmental effects associated with the consumption of material resources and the generation and management of waste streams arising from the Proposed Development, in the context of the existing local, regional and national resource and waste management environment. The Proposed Development is located within the administrative area of Fingal County Council (FCC) and the Eastern-Midlands Waste Region.

15.2 Assessment Methodology

15.2.1 Study Area

The study area for the waste assessment comprises the Proposed Development footprint and the surrounding waste management infrastructure likely to be used for the collection, recovery, recycling, treatment and disposal of wastes generated during the construction and operational phases. The assessment considers waste management capacity at local, regional and national levels, as appropriate. Figure 12-2 below shows the red line boundary for the Proposed Development.



Figure 15-4 Proposed Development Red Line Boundary

15.2.2 General

The Proposed Development is described in Chapter 1 'Introduction' and Chapter 2: Background to the Scheme of this EIAR. This section sets out the methodology followed in carrying out this resource and waste impact assessment, which considers the following aspects:

- The legislative context;
- The construction phase, including excavation, demolition and construction waste arisings;
- The operational phase.

A review was undertaken which included the following tasks:

- Review of relevant policy and legislation which creates the legal framework for resource and waste management in Ireland;
- Description of waste generation during the construction and operational phases; and
- The Proposed Development was systematically reviewed to identify mitigation and move waste management up the waste hierarchy through implementation of best practice (refer to the Figure 15-3).

15.2.3 Guidance and Legislation

Resource and waste management takes place in a policy and legislative framework. A review of relevant legislation, policy and best practice guidance was undertaken to inform the impact assessment and recommended mitigation.

The key components of EU, national and local policy, legislation and guidance relevant to the Proposed Scheme are summarised as follows;

- Prevention of waste is the preferred option such that the value of products, materials and resources are maintained in the economy for as long as possible and the generation of waste minimised;
- Where construction waste is generated, it should be source separated to facilitate reuse, recycling and maximise diversion of waste from landfill;
- Where waste may not be prevented, reused or recycled it should be transported and disposed of in accordance with applicable legislation and without causing environmental pollution;
- Waste may only be transferred from the Proposed Development by a waste collection permit holder and delivered to an authorised waste facility (a facility which holds a certificate of registration, waste facility permits or waste license); and
- Businesses must keep footpaths, pavements and gutters adjacent to premises litter free. Organisers of major events also have responsibilities in relation to collection and management of litter resulting from events.

The following Legislation, Policy and Guidance documents were used to inform this chapter:

15.2.3.1 Legislation

European Legislation

Directive 2008/98/EC of the European Parliament and the Council of 19th November 2008 on waste and repealing certain Directives.

Directive 2008/98/EC, known as the "Waste Framework Directive", came into force on 12th December 2008 and Ireland had two years from this date to implement it into national law. It provides for a general framework of waste management requirements and sets the basic waste management definitions for the EU. The Directive 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.

In addition, the Directive also deals with the issue of 'end of waste' and clarifies the definitions of recovery, disposal and by-product. The Directive states that, "*the recovery of waste and the use of recovered material as raw materials should be encouraged in order to conserve natural resources*."

Directive (EU) 2018/851 amending Directive 2008/98/EC on waste

This Directive amends the Waste Framework Directive or Directive 2008/98/EC. It provides a number of updated waste management definitions. The Directive allows Member States to use economic instruments including taxes and levies as an incentive for the application of the waste hierarchy. The Directive was transposed into national law in August 2020 - S.I. No. 322 of 2020.

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

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

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

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/EU) [referred to hereafter as 'The List of Waste (LoW)']. Waste Classification is also based on Commission Regulation (EU) No 1357/2014 of 18 December 2014, replacing Annex III to Directive 2008/98/EC of the European Parliament and of the Council on waste and repealing certain Directives and Council Regulation (EU) 2017/997 of 8 June 2017 amending Annex III to Directive 2008/98//EC of the European parliament and of the Council as regards the hazardous property HP 14 'Ecotoxic.'

Decision 2000/532/EC establishing a list of wastes

This decision and regulation consolidates the legislation relating to waste classification and allows the generators of waste to classify the waste as hazardous or non-hazardous and in the process assigning the correct list of Waste entry. Each List of Waste entry is a three digit code which is closely linked to the list of the main characteristics which render waste hazardous contained in Annex III to the Waste Framework Directive. It is noted that Council Regulation (EU) 2017/997 of 8 June 2017 amending Annex III to Directive 2008/98//EC of the European parliament and of the Council as regards the hazardous property HP 14 'Ecotoxic' provides additional criteria in relation to determining whether ecotoxicity of wastes would result in a hazardous classification.

Commission Delegated Decision 2025/934 amending Decision 2000/532/EC

This decision is a significant legislative update to the list of wastes established in Decision 2000/532/EC. The update waste driven by the rapid evolution of battery chemistries and the need for better traceability in the circular economy.

The decision added new waste codes to differentiate battery related waste streams that allow for hazardous components to be handled appropriately.

National Legislation

Waste Management Acts, 1996, as amended, and Regulations Made under the Acts

The Waste Management Act 1996, as amended, provides the primary legislative framework for waste management in Ireland. The Act establishes the responsibilities of waste producers, waste collectors, local authorities and the Environmental Protection Agency (EPA), and sets out provisions relating to waste prevention, reuse, recovery, recycling and disposal.

The Act has been amended by a number of subsequent legislative measures, including the Waste Management (Amendment) Act 2001, the Protection of the Environment Act 2003, the European Union (Waste Directive) Regulations 2020 (S.I. No. 323 of 2020), and the Circular Economy and Miscellaneous Provisions Act 2022.

These amendments transpose and implement evolving European Union waste policy, including the circular economy package and strengthened requirements relating to waste prevention, recycling and resource efficiency.

The waste management strategy for the proposed development has been prepared in accordance with the requirements of the Waste Management Acts, as amended, and the waste hierarchy established under Article 4 of the Waste Framework Directive (Directive 2008/98/EC, as amended)..

The acts included in this group are as follows:

- Waste Management Act 1996 (No. 10 of 1996), as amended;
- Waste Management (Amendment) Act 2001 (No. 36 of 2001);
- Protection of the Environment Act 2003 (No. 27 of 2003), insofar as it relates to waste management;
- Waste Management (Registration of Brokers and Dealers) Regulations 2008 (S.I. No. 113 of 2008);
- European Communities (Waste Directive) Regulations 2011 (S.I. No. 126 of 2011), as amended;
- European Union (Waste Directive) Regulations 2020 (S.I. No. 323 of 2020);
- European Union (Single Use Plastics) Regulations 2021 (S.I. No. 516 of 2021), as amended; and
- Circular Economy and Miscellaneous Provisions Act 2022 (No. 26 of 2022).

The Waste Management Acts, as amended:

- Prohibit the holding, transport, recovery or disposal of waste in a manner that causes or is likely to cause environmental pollution;
- Require waste producers to take all reasonable steps to prevent and minimise waste generation;
- Require the application of the waste hierarchy in waste management activities;
- Prohibit the transfer of waste to any person other than an appropriately authorised waste collector or waste facility;
- Provide for national, regional and local waste management planning;
- Establish the regulatory and enforcement functions of local authorities and the EPA;
- Promote circular economy objectives through improved resource efficiency, reuse and recycling; and
- Provide for penalties and enforcement actions in cases of non-compliance with waste management legislation.

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. Waste collection permits are granted in accordance with the Waste Management (Collection Permit) Regulations, 2007 as amended. 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 Trans Frontier Shipment (TFS) Office within Dublin City Council must be notified. Certain financial guarantees must be in place and a certificate issued by the National TFS Office prior to the waste movement taking place.

S.I. No. 323/2020 - European Union (Waste Directive) Regulations 2020 amending European Communities (Waste Directive) Regulations 2011, S.I. No.0126 of 2011

The amended regulations which were adopted in 2011 significantly changed the provisions of the Waste Management Acts, 1996 to 2008.

The 2011 regulations are now amended by S.I. No. 323/2020 - European Union (Waste Directive) Regulations 2020 giving effect to Directive 2018/8511 of the European Parliament and of the Council of 30 May 2018 on waste as per the above. This amends definition of “waste” and “non-hazardous waste”. The Regulations define “waste disposal” and “waste recovery” as well as setting out tests which must be complied with in order for material to be described as a “by-product” or achieve “end of waste” status.

The regulations formally set out the following waste hierarchy (as illustrated in Figure 15-3) which shall apply as a priority order in waste prevention and management legislation and policy;

a) Prevention;

b) Preparation for re-use;

c) Recycling;

d) Other recovery (including energy recovery); and

e) Disposal.

The regulations require that all waste management plans and hazardous waste management plans in existence at the commencement of the Regulations shall be evaluated by 31st December 2012 and where appropriate be revised to be brought into line with Directive 2006/12/EC on waste.

The regulations also require the Environment Agency to establish a waste prevention programme by December 2013.

European Union (Waste Directive) Regulations 2020 S.I. No. 323/2020

These regulations give effect to Directive 2018/851 of the European Parliament and of the Council of 30 May 2018 on waste as per the above.

This provides new definitions for a number of key terms including “waste” and “non-hazardous waste”, “bio-waste”, “waste management”, “waste prevention”, “backfilling” and “construction and demolition waste”.

15.2.3.2 Policy

European Policy

The following documents have been viewed as part of the European Policy side for waste management:

- Communication from the Commission: The European Green Deal (COM(2019) 640 final) (European Commission, 2019);
- Strategic Agenda, 2024-2029 (European Council, 2024)
- Roadmap to a Resource Efficient Europe, EC (European Commission, 2011);
- 8th Environment Action Programme (EAP) to 2030 (European Parliament and Council, 2022); and
- A New Circular Economy Action Plan: For a Cleaner and More Competitive Europe (European Commission, 2020).

It is also noted that the Circular Economy Act is due for adoption in 2026

National Policy

The first national waste policy statement was published by the Department of the Environment and Local Government in 1998. Since then, a number of policy documents have been prepared with the aim of reducing waste generation, promoting resource efficiency, increasing recycling and recovery rates, and supporting Ireland's transition to a circular economy. Key policy documents relevant to this assessment include:

- A Waste Action Plan for a Circular Economy: Ireland's National Waste Policy 2020-2025 (Government of Ireland, 2020);
- Whole of Government Circular Economy Strategy 2026-2028: Accelerating Action (Department of Climate, Energy and the Environment (DCEE), 2026); and
- National Hazardous Waste Management Plan 2021-2027 (Environmental Protection Agency, 2021).

Whole of Government Circular Economy Strategy 2026-2028: Accelerating Action

The Whole of Government Circular Economy Strategy 2026-2028 establishes a framework for reducing material consumption, improving resource efficiency and supporting the transition to a circular economy across all sectors of the Irish economy. The strategy includes a number of targets relevant to the construction and demolition sector, including:

- A 45% reduction in greenhouse gas emissions from commercial and public buildings by 2030 relative to 2018 levels (Target T5);
- A 12% reduction in construction and demolition waste arisings by 2030 (Target T6); and
- A requirement for a minimum of 10% recycled content, by weight, in construction materials procured by public bodies by 2028 (Target T7).

The Proposed Development will support these objectives through the application of the waste hierarchy, minimisation of construction waste generation, segregation of waste streams, and the reuse and recycling of materials where practicable.

Regional & Local Policy

National Waste Management Plan for a Circular Economy (NWMPCE) (2024–2030).

The Proposed Development is located in the Local Authority area of FCC, in proximity to the boundary with Kildare County Council; however, waste management policy and planning requirements are governed by FCC for the purposes of the Proposed Development

The *Eastern Midlands Region (EMR) Waste Management Plan 2015 – 2021*, which was previously the applicable regional waste management plan in the FCC area, has been replaced at a national level (as of March 2024) by the *NWMPCE 2024 – 2030,* the national waste management plan for Ireland (the Plan).

The Plan does not dissolve the three regional waste areas. The Plan establishes a national framework for waste management and sets an objective of achieving zero waste growth per person over the lifetime of the Plan, including waste from commercial activities and the construction and demolition waste. The Plan promotes sustainable consumption, waste prevention, improved material capture, and circular economy principles.

The Plan sets out the following targets relevant to the Proposed Development:

National Targets

- 1B. (Construction Materials) 12% Reduction in Construction & Demolition Waste Generated by 2030.
- 3B. (Reuse Facilities) Provide for reuse at 10 Civic Amenity Sites, minimum.

Municipal landfill charges in Ireland are weight-based, with costs approximately €140-160 per tonne, including an €85 per tonne landfill levy under the *Waste Management (Landfill Levy) (Amendment) Regulations 2015*. In addition, the *Circular Economy (Waste Recovery Levy) Regulations 2024* will apply a €10 per tonne levy to waste accepted for recovery, including backfilling.

Fingal Development Plan

At a local level, waste management is further guided by the *Fingal Development Plan 2023 – 2029* (2023) (the Development Plan), which promotes sustainable waste management practices and a transition to the circular economy.

The Development Plan includes a number of policies and objectives of relevance to construction and demolition waste management:

- ***Policy CAP25 – Circular Economy****: Support the shift towards the circular economy approach as set out in the National Waste Policy for 2020–2025.*
- ***Policy CAP26 – Waste Management Plans for Construction and Demolition Projects:*** *Have regard to existing Best Practice Guidance on Waste Management Plans for Construction and Demolition Projects as well as any future updates to these Guidelines in order to ensure the consistent application of planning requirements.*
- ***Objective DMSO241 – Construction and Demolition Waste Management Plan:*** *Require that Construction and Demolition Waste Management Plans be submitted as part of any planning application for projects in excess of any of the following thresholds:*
    - *New residential development of 10 units or more.*
    - *New developments other than above, including institutional, educational, health and other public facilities, with an aggregate floor area in excess of 1,250 sqm.*
    - *Demolition / renovation / refurbishment projects generating in excess of 100m^3 in volume of C&D waste.*
    - *Civil engineering projects in excess of 500m^3 of waste materials used for development of works on the site.*
- ***Policy IUP21 – Environmental Policy, Legislation and Guidance:*** *Have regard to European Union, National and Regional waste and related environmental policy, legislation, guidance and codes of practice to improve management of material resources and wastes.*
- ***Policy IUP22 – Transition From A Waste Economy Towards A Green Circular Economy:*** *Support the principles of transition from a waste economy towards a green circular economy and implement good waste management and best practices to enable Fingal to become self-sufficient in terms of resource and waste management and to enhance employment and increase the value recovery and recirculation of resources, in accordance with the Whole of Government Circular Economy Strategy 2022.*
- ***Objective IUO28 – Eastern Midlands Region Waste Management Plan:*** *Implement the provisions of the Eastern Midlands Region Waste Management Plan 2015–2021 or any subsequent Waste Management Plan applicable within the lifetime of the Development Plan. All prospective developments in the County will be expected to take account of the provisions of the Regional Waste Management Plan and adhere to the requirements of that Plan.*
- ***Objective IUO30 – Hazardous Waste:*** *Adhere to the recommendations of the National Hazardous Waste Management Plan 2014–2020** [sic] *and any subsequent plan, and to co-operate with the EPA and other agencies in the planning, organisation and supervision of the disposal of hazardous waste streams, including hazardous waste identified during construction and demolition projects. To continue to promote the use of clean technology and minimization of hazardous waste production in all development within the County.*

*Wording as per the Development Plan, however noted that National Hazardous Waste Management Plan has been updated to 2021 – 2027.

The above policy and legislative framework informs the approach to waste prevention, reuse, recycling and recovery adopted within this Chapter and the RWMP.

National Construction and Demolition Waste Management Capacity Study (Regional Waste Management Planning Offices, 2020)

This study was commissioned by the Regional Waste Management Planning Offices (RWMPOs) to assess the capacity of the Irish waste management sector to manage existing and projected construction and demolition (C&D) waste arisings. The study reviewed the available infrastructure for the collection, recovery, treatment and disposal of C&D waste and assessed future capacity requirements based on projected construction activity to 2029.

The study concluded that sufficient national treatment capacity exists for many C&D waste streams; however, continued growth in construction activity may place additional pressure on available recovery and disposal infrastructure for certain materials, particularly soil and stone. The report highlights the importance of waste prevention, material reuse, recycling and effective capacity planning to support achievement of circular economy objectives and sustainable waste management practices.

The Proposed Development will seek to minimise waste generation and maximise the reuse and recovery of materials in accordance with the waste hierarchy, thereby reducing demands on existing waste management infrastructure.

15.2.3.3 Guidance

- EPA, Waste Classification: List of Waste and Determining if Waste is Hazardous or Non-hazardous (2019, applicable from 5 July 2025);
- EPA, Best Practice Guidelines for the Preparation of Resource and Waste Management Plans for Construction and Demolition Projects (2021);
- EPA, Guidance on Soil and Stone By-products (2024);
- Department of Climate, Energy and the Environment, Construction and Demolition (C&D) Waste (2024); and
- TII, GE-ENV-01101 The Management of Waste from National Road Construction Projects (2017).

15.2.4 Impact Assessment Methodology

Impact significance and ratings have been determined having regard to the EPA *Guidelines on the Information to be Contained in Environmental Impact Assessment Reports* (2022), as described in Chapter 2 of this EIAR. In addition, the assessment has been informed by the Institute of Environmental Management and Assessment (IEMA) *Guide to: Materials and Waste in Environmental Impact Assessment* (2020), which provides sector-specific guidance for assessing waste generation, resource use and effects on waste management infrastructure.

The assessment considers the likely waste arisings associated with the Proposed Development during the construction and operational phases and evaluates the capacity of existing waste management infrastructure to accommodate those arisings.

The principal receptors considered are:

- The waste management industry and associated collection, treatment, recovery and disposal infrastructure;
- Authorised soil recovery and disposal facilities;
- Available regional and national waste management capacity; and
- Material resources that may be consumed or conserved through reuse, recovery and recycling.

Impact Magnitude

Impact magnitude has been determined with reference to:

- The quantity of waste likely to be generated;

- The proportion of waste requiring off-site management;
- The availability of suitable authorised recovery, recycling and disposal facilities;
- The extent to which the waste hierarchy can be applied;
- The opportunity for reuse and recovery of excavated materials; and
- The likely demand on existing regional and national waste management infrastructure.

Impacts are considered to be of greater magnitude where substantial quantities of waste are generated requiring disposal, or where waste generation gives rise to increased demand on limited waste management capacity. Impacts are considered to be of lower magnitude where waste generation is minimised and opportunities for reuse, recovery and recycling are maximised. The assessment considers both the quantity of waste generated and the capacity of available authorised waste infrastructure. Accordingly, large waste volumes do not necessarily result in significant effects where sufficient treatment, recovery and disposal capacity exists and the waste hierarchy is implemented

Impact magnitude criteria have been informed by the IEMA Guide to Materials and Waste in Environmental Impact Assessment (2020), as presented in Table 15-1. In accordance with IEMA guidance, inert and non-hazardous wastes have been assessed against available regional waste management capacity, while hazardous wastes have been assessed against available national capacity owing to the limited number of authorised hazardous waste management facilities in Ireland.

Table 15-1 Impact Magnitude descriptions as per IEMA guide to: Materials and Waste in Environmental Impact Assessment

Category	No Change	Negligible	Minor	Moderate	Major
Inert and Non-Hazardous Waste	Zero waste generation and disposal from the Proposed Development.	Waste generated by the Proposed Development will reduce regional* landfill void capacity baseline** by <1%	Waste generated by the Proposed Development will reduce regional* landfill void capacity baseline** by 1-5%.	Waste generated by the Proposed Development will reduce regional* landfill void capacity baseline** by 6-10%.	Waste generated by the Proposed Development will reduce regional* landfill void capacity baseline** by >10%.
Hazardous Waste	Zero waste generation and disposal from the Proposed Development.	Waste generated by the Proposed Development will reduce national landfill void capacity baseline** by <1%	Waste generated by the Proposed Development will reduce national landfill void capacity baseline** by 1-5%.	Waste generated by the Proposed Development will reduce regional* landfill void capacity baseline** by 6-10%.	Waste generated by the Proposed Development will reduce regional* landfill void capacity baseline** by >10%.

* or where justified, national
**forecast as the worst-case scenario, during a defined construction and/or operational phase.

Impact Significance

For consistency with the assessment methodologies within this EIAR, the above IEMA magnitude criteria have been related to EPA significance criteria for this assessment as per Table 15-2. Assessment of significance considered both the quantity of waste generated and the availability of authorised recovery, recycling, treatment and disposal infrastructure. Large waste volumes do not necessarily result in significant effects where sufficient capacity exists, and the waste hierarchy is implemented.

Table 15-2 Relationship between IEMA Impact Magnitude Criteria and EPA Significance Ratings

IEMA Impact Magnitude Criteria	No Change	Negligible	Minor	Moderate	Major
EPA Significance Criteria	Imperceptible	Not Significant	Slight	Moderate	Significant / Very Significant / Profound

Receptor Sensitivity

The sensitivity of the receiving environment is considered to be High where waste management infrastructure has limited available capacity and limited alternative management routes available; Medium where capacity is constrained but authorised management facilities remain available; and Low where substantial authorised recovery, treatment and disposal capacity exists. Significance of effect has been determined through consideration of receptor sensitivity and impact magnitude in accordance with the EPA Guidelines (2022).

15.3 Baseline Environment

15.3.1 Existing Waste Environment

The study area for the waste assessment comprises the Proposed Development footprint and the immediate surrounding area. Further details on the study area are provided in Sections 15.1 and 15.2.1.

A review of survey information identified three public litter bins located on the public footpath network adjacent to, but outside, the proposed canal-side greenway route. No waste recovery, waste treatment, transfer, recycling or disposal facilities were identified within the immediate study area.

The Royal Canal corridor is managed by Waterways Ireland, which is responsible for the maintenance, operation and environmental protection of the canal and associated lands. This includes the management of litter, illegal dumping and waste-related issues that may arise along the canal and its banks.

Ecological surveys undertaken between 2022 and 2026 identified the presence of invasive plant species at a number of locations along the Proposed Development corridor, particularly within disturbed habitats and riparian areas adjacent to the Royal Canal. While invasive plant species are primarily considered within the Biodiversity assessment, their presence is also relevant to the Resource and Waste Management assessment, as disturbance of invasive plant material and associated soils during construction may generate waste requiring specialist handling, storage, transport and treatment. Management of invasive plant species is addressed within the project-specific Invasive Species Management Plan (ISMP).

Given the nature of the Proposed Development, the principal waste receptors comprise the regional and national waste management infrastructure that would receive, recover, recycle, treat or dispose of wastes generated during the construction and operational phases.

Waste generated by the Proposed Development would be managed through authorised waste collection services and transferred to appropriately authorised recovery, recycling, treatment and disposal facilities in accordance with the requirements of the Waste Management Acts, as amended. The assessment therefore considers the capacity of existing regional and national waste management infrastructure to accommodate the forecast waste arisings associated with the Proposed Development.

15.3.2 Existing Waste Infrastructure

The Proposed Development is located within the Dublin Region where an established network of authorised waste management infrastructure is available for the collection, recovery, recycling and disposal of waste. Waste facilities operating within the wider Dublin region include EPA-licensed waste recovery facilities, transfer stations, recycling facilities, soil recovery facilities and landfill facilities authorised to receive construction and demolition (C&D) waste streams.

Given the scale and nature of the Proposed Development, it is anticipated that construction and operational wastes generated would be accepted at appropriately authorised facilities in accordance with the Waste Management Acts, as amended. Based on the availability of authorised waste infrastructure within the Dublin Region, no constraints in relation to waste management capacity have been identified at this stage.

A review of waste management infrastructure identified a number of authorised facilities within the wider Dublin Region capable of accepting construction and demolition waste streams arising from the Proposed Development. Facilities initially identified as a reference included:

- Huntstown Facility (Roadstone) – approximately 13km by road from a reference mid-point along the Proposed Development route;
- Grange Facility (Panda) – approximately 7km by road from a reference mid-point along the Proposed Development route; and
- Other suitably authorised recovery, recycling, treatment and disposal facilities available at the time of construction.

The specific facilities to be utilised will be determined by the appointed Contractor and identified within the Construction Environmental Management Plan (CEMP) and associated Construction and Demolition Resource and Waste Management Plan (CDRWMP).

15.3.3 Construction and Operational Waste

In order to establish the baseline waste environment and assess the capacity of existing waste management infrastructure to accommodate waste generated by the Proposed Development, a review of published Environmental Protection Agency (EPA) waste statistics was undertaken. Data presented in this section has been sourced from the EPA Construction and Demolition Waste Statistics for Ireland dataset (available here: https://www.epa.ie/our-services/monitoring--assessment/waste/national-waste-statistics/construction--demolition/).

The Proposed Development comprises an approximately 8.1 km greenway located within Fingal County Council's administrative area, extending along or adjacent to the Royal Canal from the Kildare/Dublin county boundary to the 12th Lock between Castleknock Road and Old Navan Road, Castleknock. Construction of the Proposed Development will generate construction and demolition (C&D) waste, while only minimal waste arisings are anticipated during operation associated with routine maintenance activities

At the peak of the economic and construction boom in 2007, approximately 17.8 million tonnes of C&D waste was generated nationally. This fell to approximately 3.0 million tonnes in 2011 before increasing steadily in line with renewed construction activity. Current EPA data indicate that national C&D waste generation remains significant, with approximately 7.85 million tonnes managed during 2024.

C&D waste comprises a wide range of materials. The separation of these materials either at source or at authorised waste facilities is necessary to facilitate reuse, recycling and recovery. Soil, stones and dredging spoil comprised the largest proportion of C&D waste generated in 2024, accounting for approximately 77% of the total waste stream. Mixed construction and demolition waste accounted for approximately 11%, followed by concrete, brick, tile and gypsum (7%), metal (3%), waste bituminous mixtures (1%) and segregated wood, glass and plastic (1%).

Most final treatment of C&D waste in 2024 occurred within Ireland, with approximately 95% managed domestically and only 5% exported for treatment abroad. Most exported material comprised metal waste destined for recycling. Backfilling remained the dominant treatment route due to the high proportion of soil and stones within the waste stream. EPA statistics indicate that Ireland exceeded the European Union recovery target, with 81% of non-hazardous C&D waste, excluding soil and stones, prepared for reuse, recycled or otherwise materially recovered during 2024.

An indicative breakdown of the composition of C&D waste generated in Ireland during 2024 is presented in Table 15-3. These figures should be considered indicative only, as waste arisings can vary considerably depending on the nature, scale and construction methodologies associated with a particular development.

Table 15-3 Material Categories of C&D Waste Generated in Ireland (EPA, 2024)

Material from C&D sources	Quantity (tonnes)	% in reference to total
Soils, stones and dredging spoil	6,059,978	77%
Mixed construction and demolition waste	845,936	11%
Concrete, brick, tile and gypsum	578,053	7%
Metal	208,252	3%
Waste bituminous mixtures	99,313	1%
Segregated wood, glass and plastic	60,862	1%
Total	**7,852,393**	**100%**

The EPA reported that approximately 396,651 tonnes of hazardous waste was generated in Ireland during 2024. Hazardous waste streams relevant to the construction sector may include contaminated soils, asbestos-containing materials and construction materials contaminated by hazardous substances. Such wastes require specialist handling, transport and treatment at appropriately authorised facilities.

The Waste Framework Directive established a target of 70% material recovery for non-hazardous C&D waste, excluding soil and stones. EPA statistics for 2024 demonstrate that Ireland continues to exceed this target, achieving an 81% recovery rate through reuse, recycling and other material recovery operations.

List of Waste (LoW) codes are the standard classification system used to identify waste types and determine whether a waste is hazardous or non-hazardous. These are set out in the EPA publication *Waste Classification: List of Waste and Determining if Waste is Hazardous or Non-hazardous* (2019, applicable from 5 July 2025). For the purposes of the Proposed Development, the most relevant codes are those contained within Chapter 17 of the List of Waste, relating to construction and demolition wastes, including excavated material from contaminated sites. These codes will be used during construction to classify, segregate, record and track waste arisings and to ensure that all waste is transferred to appropriately authorised waste contractors and facilities.

15.3.4 Municipal Waste

Municipal waste comprises household waste as well as commercial and other wastes that, because of their nature or composition, are similar to household waste.

According to EPA statistics, Ireland generated approximately **3.13 million tonnes of municipal waste in 2023**, of which **42% was recycled**. Municipal waste is managed through a network of authorised collection, transfer, recovery, recycling, treatment and disposal facilities operating throughout Ireland. Municipal waste policy is guided by the waste hierarchy, which prioritises prevention, preparation for reuse, recycling and recovery ahead of disposal.

Biodegradable Municipal Waste (BMW) comprises those elements of the municipal waste stream that are capable of undergoing biological decomposition, including food waste, garden and park waste, paper and cardboard. Under the Landfill Directive, Ireland is required to minimise the disposal of BMW to landfill. EPA statistics indicate that **169,864 tonnes of BMW were disposed of to landfill in 2023**, representing approximately **32.6% of all municipal waste sent to landfill**. The separate collection of biowaste became mandatory from the end of 2023 under the revised Waste Framework Directive ((EU) 2018/851) and is expected to contribute to a further reduction in the quantity of BMW disposed of at landfill.

Within the study area, three public litter bins were identified on the public footpath network adjacent to, but outside, the proposed canal-side greenway route. The Royal Canal corridor is managed by Waterways Ireland, which is responsible for the maintenance and environmental protection of the canal and associated lands, including the management of litter and illegal dumping along the canal and its banks.

Municipal waste arising within the study area is managed through existing local authority and authorised waste collection services. Information on municipal waste infrastructure and licensed waste facilities within the Eastern and Midlands Waste Region is maintained by the National Waste Collection Permit Office and Regional Waste Management Planning Offices. Available infrastructure includes material recovery facilities, composting and anaerobic digestion facilities, waste-to-energy facilities, landfill facilities and other authorised waste treatment and recovery facilities.

15.3.5 Existing Waste Management Capacity

A review of authorised waste management infrastructure within the Dublin Region was undertaken to establish the capacity of available facilities to accommodate wastes potentially arising from the Proposed Development.

A number of authorised waste recovery, recycling, treatment and disposal facilities operate within the wider Dublin Region, including the Roadstone facility at Huntstown and the Greenstar facility at Grange, together with other suitably authorised facilities operating within the Eastern and Midlands Waste Region.

Available infrastructure includes material recovery facilities, soil recovery facilities, transfer stations, composting and anaerobic digestion facilities, waste-to-energy facilities and landfill facilities. These facilities provide capacity for the management of construction, demolition, excavation and municipal waste streams.

EPA national waste statistics indicate that approximately 7.85 million tonnes of construction and demolition waste were managed in Ireland during 2024, with 95% treated domestically. The continued operation of authorised facilities within the region demonstrates the availability of established waste management infrastructure capable of accepting and treating construction and demolition wastes.

Having regard to the relatively limited scale of the Proposed Development and the availability of authorised waste management infrastructure within the Dublin Region, the existing waste management network provides the baseline against which potential construction and operational phase impacts have been assessed

15.4 Predicted Impacts

15.4.1 Characteristics of the Proposed Development in the Context of Waste

The principal waste streams associated with the Proposed Development are expected to arise during the demolition, excavation and construction phases. These include demolition waste from two residential properties and ancillary structures, excavated topsoil, Made Ground and natural soils, surplus aggregates, concrete, asphalt, metals, timber, packaging waste, mixed residual construction waste and small volumes of municipal-type waste from construction staff and welfare facilities.

The waste estimates set out in this chapter are based on the current design information, the Site-Specific RWMP included as Appendix 15.1, the preliminary cut and fill assessment prepared by DBFL Consulting Engineers Ltd. and the ground investigation information available for the Proposed Development. The ground investigation identified that much of the route is underlain by Made Ground over cohesive deposits, with occasional anthropogenic inclusions such as concrete, brick, glass, wood and plastic recorded in some locations. Environmental testing undertaken as part of the ground investigation indicates that the soils are predominantly non-hazardous, although localised areas of contamination may be encountered during excavation.

Until final materials, detailed design and construction methodologies have been confirmed, it is difficult to predict with a high level of accuracy the construction waste that will be generated. Exact materials and quantities may be subject to some change during the construction process. The estimates presented in this chapter are therefore considered suitable for the purposes of the EIAR, noting that final quantities will be refined during detailed design and construction-stage preparation of the updated RWMP.

The Site-Specific RWMP estimates that approximately 402.0 tonnes of demolition waste and approximately 644.7 tonnes of construction waste, excluding excavated material, will be generated. The preliminary cut and fill assessment identifies an estimated total excavation volume of approximately 14,776m³, of which approximately 11,899m³ is expected to be reused on site and approximately 2,880m³ is expected to require off-site removal, subject to classification and suitability for reuse, recovery or disposal.

All waste leaving the site will be transported by suitably authorised waste contractors and brought to suitably licensed, permitted or registered facilities. Waste movements will be recorded and supporting documentation will be retained by the appointed contractor. Hazardous waste, if encountered, will be segregated, stored in a designated secure area and removed from site by an authorised hazardous waste contractor. Further details on waste classification, reuse, recycling, recovery, off-site waste management, tracking, documentation and contractor responsibilities are provided in the Site-Specific RWMP included at Appendix 15.1, which will be implemented and updated by the appointed contractor before works commence and during the construction phase, as required.

15.4.2 Do Nothing Scenario

Under the Do-Nothing Scenario, the Proposed Development would not be constructed, and the existing environment would remain substantially unchanged. The Royal Canal corridor would continue to be managed by Waterways Ireland, including the management of litter and illegal dumping along the canal and its banks, and municipal waste would continue to be managed through existing local authority and authorised waste collection arrangements.

No construction activities would occur and, therefore, no construction and demolition waste, excavated material, surplus soil and stone, or associated construction-related waste streams would be generated. Consequently, there would be no additional demand on local, regional or national waste management infrastructure arising from the Proposed Development.

Similarly, the operational phase of the Proposed Development would not occur, and no operational waste arisings associated with the use or maintenance of the greenway would be generated. Existing waste generation patterns and waste management practices within the study area would therefore remain unchanged.

As the Do-Nothing Scenario would not result in any material change to existing waste generation, resource consumption or demand on waste management infrastructure, the effect on Resource and Waste Management is assessed as **Neutral (Imperceptible)**.

15.4.3 Construction Phase

15.4.3.1 Demolition Waste

Demolition works are required as part of the Proposed Development, including the demolition of two residential properties and associated ancillary structures on the approach to Hansfield Road. The Site-Specific RWMP identifies a total Gross Floor Area of approximately 670 sqm associated with these demolition works and provides project-specific estimates of the anticipated demolition waste arisings.

The RWMP estimates that approximately 402.0 tonnes of demolition waste will be generated. This estimate replaces the earlier benchmark-based estimate and is considered more appropriate for the Proposed Development as it is based on the specific demolition works identified for the scheme.

The estimated demolition waste comprises glass, concrete, bricks, tiles and ceramics, plasterboard, asphalt, metals, slate and timber. These materials will be segregated on site where practicable and directed towards reuse, recycling or recovery, with disposal used only where no higher-order waste management option is reasonably available. Table 15-4 presents the estimated demolition waste quantities based on the RWMP.

Table 15-4 Estimated off-site Reuse, Recycle and Disposal Rates for Demolition Waste

Waste Type	Quantity (tonnes)	Reuse / Recover		Recycle		Disposal	
		%	Tonnes	%	Tonnes	%	Tonnes
Glass	36.2	0	0.0	85	30.8	15	5.4
Concrete, Bricks, Tiles, Ceramics	205.0	85	174.3	5	10.3	10	20.5
Plasterboard	16.1	30	4.8	60	9.6	10	1.6
Asphalts	4.0	25	1.0	70	2.8	5	0.2
Metals	60.3	5	3.0	80	48.2	15	9.0
Slate	32.2	0	0.0	85	27.3	15	4.8
Timber	48.2	10	4.8	60	28.9	30	14.5
Total	**402.0**		**187.9**		**158.0**		**56.1**

The estimated quantity of demolition waste represents less than 1% of available regional waste management capacity and is therefore classified as a **Negligible** magnitude impact in accordance with the methodology set out in Section 15.2. The receiving environment is of **Low sensitivity** due to the availability of multiple authorised waste recovery, recycling and disposal facilities within the Eastern and Midlands Waste Region.

Accordingly, the potential effect of demolition waste generation during the Construction Phase, prior to mitigation, is assessed as **Not Significant Adverse and Short-Term**.

15.4.3.2 Excavation

Based on the preliminary cut and fill assessment carried out and reported in the Resource and Waste Management Plan (RWMP), the total volume of material to be excavated is estimated to be approximately 14,776m^3 – as demonstrated in Table 15-5. It is currently envisaged that approximately 11,899m^3 of suitable excavated material will be reused on site for fill and engineering purposes, including stabilised material. The remaining volume of approximately 2,880m^3 will be removed off site, subject to material classification and suitability for reuse, recovery or disposal.

The Proposed Development has been designed to maximise the beneficial reuse of excavated materials within the Site where practicable. Generally, 80% to 90% of excavated material is currently anticipated to be reused within the Proposed Development footprint for engineering and fill purposes, thereby minimising the quantity of material requiring off-site management. presents the anticipated excavated material types, indicative waste classifications and proposed management routes.

Table 15-5 Anticipated Excavated Material Types, Classification and Management Routes

Material Category	Source Activity	Volume (m^3)	Indicative LoW Code	Classification	Anticipated Reuse / Recovery (%)	Anticipated Management Route
Soil and Stones	Ground/Soil Excavation	2,454.5	17 05 04	Non-Hazardous	80	Direct reuse on site where suitable; surplus material to authorised recovery or disposal facility
Soil and Stones	Bulk Excavation	7,151.3	17 05 04	Non-Hazardous	80	Direct reuse on site where suitable; surplus material to authorised recovery or disposal facility
Topsoil	Topsoil Excavation	3,537.8	17 05 04	Non-Hazardous	80	Reuse in landscaping and reinstatement works; surplus material to authorised recovery facility
Crushed Rock / Gravel	Gravel/Stone Excavation	781.5	17 05 04	Non-Hazardous	90	Reuse on site or recovery at an authorised facility
Bituminous Mixtures	Asphalt Excavation	197.8	17 03 02	Non-Hazardous	80	Recycling/recovery at an authorised asphalt recovery facility
Concrete	Concrete Excavation	148.9	17 01 01	Non-Hazardous	80	Crushing and recovery at an authorised facility
Soil and Stones	Structural Excavation	504.0	17 05 04	Non-Hazardous	80	Reuse on site where suitable; surplus material to authorised recovery or disposal facility
Total		**14,776**				

Where excavated material is reused directly within the Proposed Development footprint for a clearly defined engineering purpose, is suitable for that purpose and does not require waste treatment prior to reuse, such material may not constitute waste and may be managed as part of the construction process. The final determination regarding material status will be made during detailed design and construction planning having regard to material suitability, geotechnical requirements, environmental testing results and the proposed end use.

Where excavated material is unsuitable for direct reuse, requires processing prior to reuse, cannot be incorporated into the Proposed Development, or otherwise fails to satisfy the relevant regulatory criteria, the material will be managed in accordance with the Waste Management Acts, as amended. Depending on the material characteristics and proposed end use, excavated materials may be managed as waste, by-product material under Article 27 of the European Union (Waste Directive) Regulations 2011, as amended, or recovered material under Article 28 where the relevant regulatory requirements are satisfied.

Ground investigation undertaken along the Proposed Development corridor identified that much of the route is underlain by Made Ground over cohesive deposits. Occasional anthropogenic inclusions, including concrete, brick, glass, wood and plastic, were recorded at some locations. Environmental testing undertaken as part of the ground investigation indicates that the soils are predominantly non-hazardous, although localised areas of contamination may be encountered during excavation.

The estimated off-site surplus material volume of approximately 2,880m^3 is anticipated to comprise predominantly excavated soil and stone. Assuming a typical bulk density of 1.8-2.0 t/m^3, the surplus volume of 2,880 m^3 equates to approximately 5,200-5,800 tonnes of material potentially requiring off-site management.

The final quantity may vary depending on the nature and condition of the materials encountered during construction.

Based on the available site investigation and environmental testing information, significant quantities of hazardous waste are not anticipated to arise from excavation works. No asbestos-containing materials have been identified during the investigations undertaken to date. Notwithstanding this, should contaminated materials, asbestos-containing materials or other hazardous wastes be encountered during construction, they will be appropriately segregated, classified and transferred by authorised waste contractors to suitably authorised facilities for treatment and disposal.

The estimated quantity of excavated material requiring off-site management represents a very small proportion of the available authorised waste management capacity within the Eastern and Midlands Waste Region. The receiving environment is considered to be of low sensitivity due to the availability of authorised soil recovery, recycling, treatment and disposal facilities within the region. Accordingly, the generation of excavation waste requiring off-site management during the Construction Phase gives rise to a **Negligible magnitude impact** and, prior to mitigation, a **Not Significant Adverse, Short-Term effect**.

15.4.3.3 Construction Waste

Construction works, site offices and temporary works facilities are also likely to generate waste. Construction waste can vary significantly from site to site but typically would include the following non-hazardous fractions:

- Soil and stone;
- Concrete, brick, tiles and ceramics;
- Bituminous mixtures;
- Metals;
- Wood;
- Municipal type wastes generated by construction employees; and
- Other.

Also included within this definition are surplus and damaged products and materials arising in the course of construction work or used temporarily during the course of on-site activities.

The Construction Phase will require the importation and use of construction materials, including bituminous mixtures, concrete, precast concrete, aggregates and structural steel. To provide context in terms of volumes of materials being handled, Table 15-6 provides an estimate of the main construction materials required for the Proposed Development. The use of materials will be managed through detailed design, procurement and construction-stage controls to avoid unnecessary material consumption and to maximise the use of suitable recycled, secondary and site-won materials, where practicable.

Table 15-6 Estimated Quantities of Major Imported Construction Materials Required by the Proposed Development

Description	Quantity (tonnes)
Bituminous Mixtures	4,830
Concrete	1,872
Precast Concrete	1,416
Aggregates	15,470
Structural Steel	2,407
Imported Fill Material	To be confirmed at detailed design stage
Total	**25,995**

Note: The requirement for imported fill material will be confirmed during detailed design and construction-stage preparation of the updated RWMP. Imported fill has therefore not been included in the total presented in Table 15-4. Where imported fill is required, the material will be tested and certified, where required, to confirm its

engineering and environmental suitability for the proposed end use. Suitable recycled, secondary or site-won materials will be used where practicable, subject to specification, testing and regulatory requirements.

The RWMP presents an estimate of construction waste generation for the Proposed Development (excluding excavated materials), based on an adjusted waste generation rate and modified waste composition appropriate for infrastructure projects. estimates that approximately 644.7 tonnes of construction waste, excluding excavated materials, will be generated during the construction phase. This includes concrete, asphalt, aggregates, metals, timber, packaging / other waste and mixed residual waste. The RWMP estimates that approximately 149.3 tonnes will be reused, 408.9 tonnes will be recycled or recovered, and 86.5 tonnes will require disposal. Final quantities will depend on the detailed design and construction methodology adopted by the appointed contractor.

As also noted previously, the estimated off-site surplus material volume of approximately 2,880m^3 is anticipated to comprise predominantly excavated soil and stone. Assuming a typical bulk density of 1.8-2.0 t/m^3, the surplus volume of 2,880 m^3 equates to approximately 5,200-5,800 tonnes of material potentially requiring off-site management. The final quantity may vary depending on the nature and condition of the materials encountered during construction. Based on the available Ground Investigation information, this material is anticipated to comprise predominantly non-hazardous soil and stones. The principal List of Waste (LoW) code anticipated to apply is 17 05 04 (soil and stones other than those mentioned in 17 05 03). The final classification, characterisation and management route will be confirmed during detailed design and construction planning. Subject to compliance with applicable regulatory requirements, the material will be prioritised for reuse and recovery at appropriately authorised facilities in accordance with the waste hierarchy.

The construction waste quantities presented above are based on the project-specific RWMP and are considered sufficient for the purposes of this assessment. Construction waste will be minimised through material ordering controls, careful storage, reuse of suitable materials and segregation of recyclable waste streams.

Accordingly, the impact magnitude is assessed as **Negligible** and, prior to mitigation, the effect is assessed as **Not Significant Adverse and Short-Term**.

15.4.3.4 Potential Hazardous Waste Arisings

A range of hazardous waste streams could potentially arise during the Construction Phase of the Proposed Development. These may include:

- Waste electrical and electronic equipment (WEEE);
- Batteries, including lead-acid, nickel-cadmium and lithium-ion batteries;
- Fuels, oils and contaminated absorbents associated with plant and equipment maintenance;
- Paints, adhesives and other hazardous construction products;
- Contaminated soils, should such materials be encountered during excavation works;
- Asbestos-containing materials (ACMs), should any previously unidentified ACMs be encountered during construction; and
- Other construction materials contaminated with hazardous substances.
- Waste electrical and electronic equipment (WEEE) components;

Ground investigation undertaken for the Proposed Development indicates that the soils are predominantly non-hazardous and no widespread contamination was identified. Environmental testing undertaken as part of the ground investigation found the underlying soils to be generally suitable for classification as non-hazardous materials. Nevertheless, given the presence of Made Ground containing anthropogenic materials, there remains potential for localised contamination to be encountered during excavation activities.

Based on the investigations undertaken to date, significant quantities of hazardous waste are not anticipated during construction and hazardous waste arisings are expected to comprise only a small proportion of the overall

construction waste stream. No asbestos-containing materials were identified during the ground investigation works. However, where demolition works are required, pre-demolition asbestos surveys will be undertaken prior to commencement of works. Any ACMs identified will be removed by appropriately qualified contractors and managed in accordance with applicable health and safety and waste legislation.

Waste oils, fuels, paints, adhesives, batteries and WEEE may arise from routine construction activities and temporary site compounds. These waste streams are anticipated to occur in relatively small quantities and will be segregated at source, stored in appropriately designated containers and transferred by authorised waste contractors to suitably authorised recovery, treatment or disposal facilities.

The final classification of all hazardous waste streams will be undertaken in accordance with the EPA publication *Waste Classification: List of Waste and Determining if Waste is Hazardous or Non-Hazardous* and the appropriate List of Waste (LoW) codes.

Any hazardous wastes generated during construction will be transported by authorised waste contractors to suitably authorised hazardous waste recovery, treatment or disposal facilities. While many hazardous waste streams can be managed within Ireland, certain specialised treatment and disposal facilities are not available nationally. Consequently, some hazardous wastes may require export to appropriately authorised facilities outside the State in accordance with applicable Waste Shipment Regulation requirements and transboundary waste shipment controls.

Given the limited quantities of hazardous waste anticipated, the availability of established hazardous waste management infrastructure and the regulatory controls governing the transport, treatment and disposal of hazardous wastes, the potential effect on hazardous waste management capacity during the Construction Phase is assessed as **Negligible in magnitude** and **Not Significant, Adverse and Short-Term** prior to mitigation.

15.4.3.5 Municipal Waste

It is anticipated that approximately 15 to 25 construction personnel, increasing to a peak workforce of up to approximately 30 personnel, will be employed during the Construction Phase of the Proposed Development. Small quantities of municipal waste will be generated from site offices, welfare facilities and staff activities. Typical waste streams are expected to comprise mixed municipal waste, recyclable paper and cardboard, plastics, metals and food waste.

Segregated waste receptacles will be provided within all site compounds and welfare facilities to maximise recycling and recovery opportunities in accordance with the waste hierarchy. Municipal waste generated during construction will be collected by an authorised waste contractor and transported to appropriately authorised recovery, recycling or disposal facilities.

As outlined in Sections 15.3.1 and 15.3.2, the Dublin Region is served by an established network of authorised waste management infrastructure with capacity to receive and manage municipal waste streams.

Given the limited quantity of municipal waste anticipated, the availability of existing municipal waste collection services and the capacity of the receiving waste infrastructure, the potential impact associated with municipal waste generated during the Construction Phase is assessed as **adverse, not significant and short-term**.

15.4.3.6 Invasive Species

Ecological surveys undertaken between 2022 and 2026 identified the presence of invasive plant species at a number of locations along the Proposed Development corridor, particularly within disturbed habitats and riparian areas adjacent to the Royal Canal. Disturbance of invasive plant species and associated soils during construction activities has the potential to generate invasive plant material and contaminated soils which are classified as waste.

Potential waste streams may comprise:

- Above-ground invasive plant material;
- Rhizomes, roots and propagules;

- Excavated soils containing invasive plant propagules; and
- Other materials contaminated during removal and handling activities.

In the absence of mitigation, construction activities could result in the movement and redistribution of invasive plant material and associated soils both within and beyond the Site. This could restrict opportunities for reuse of excavated materials and result in additional quantities of waste requiring specialist management and treatment.

Having regard to the localised nature of the identified infestations, the limited quantities of material likely to arise and the availability of authorised facilities capable of accepting such materials, the impact magnitude is assessed as **Minor,** and the effect is assessed as **Slight Adverse and Short-Term**.

15.4.4 Operational Phase

15.4.4.1 Operational Maintenance Waste

During the Operational Phase, waste will be limited to material removed during inspection, repair and maintenance of the greenway, carriageway, pavements, surfacing, drainage, signage, lighting and associated infrastructure. Operational maintenance wastes will be segregated, where practicable, and removed from the site by authorised waste collection contractors for recovery, recycling, treatment or disposal at appropriately authorised facilities. The timing and frequency of such maintenance will depend on the service life of the materials, observed condition, weathering, wear, vandalism and local authority maintenance requirements. Routine inspections and minor repairs are expected to generate negligible waste. More substantial waste arisings may occur only when surfacing, kerbs, signs, ducts or other infrastructure elements are replaced at intervals over the operational life of the Proposed Development.

Operational maintenance waste is therefore expected to be small in scale, intermittent and managed through operational maintenance arrangements to be agreed between FCC and Waterways Ireland, including through a memorandum of understanding for the Greenway. Where waste is generated, it will be removed from the route and managed by FCC, Waterways Ireland or authorised contractors undertaking the works. Materials that may arise during maintenance include small quantities of bituminous mixtures, gravel surfacing, concrete, kerbs, metals, ducts, signage and similar materials. Some of these materials may fall within construction and demolition waste List of Waste codes, but they would arise from maintenance of the completed scheme rather than from construction works.

Potential pollution effects associated with accidental spillages during maintenance activities are assessed separately within the Biodiversity and Water chapters of this EIAR and are not considered further as part of the Resource and Waste Management assessment.

The quantities of maintenance waste likely to arise during the operational phase are expected to be infrequent and small relative to the available waste management capacity within the Eastern and Midlands Waste Region. The receiving environment is considered to be of low sensitivity due to the availability of established waste collection, recovery, recycling, treatment and disposal infrastructure. Accordingly, the impact magnitude is assessed as **Negligible** and the effect, prior to mitigation, is assessed as **Not Significant Adverse and Long-Term**.

15.4.4.2 Municipal Waste

No public litter bins are proposed immediately along the Royal Canal active travel route and greenway. This approach is consistent with the intended operation of the route on a "Leave No Trace" basis, whereby users are encouraged to take litter and other waste generated during their visit away with them for appropriate disposal off-site. Existing public litter bins are available on the surrounding public footpath network at a number of locations adjacent to, but outside, the proposed canal-side route.

Routine operational municipal waste generation associated with bin servicing is therefore not expected. Any litter arising along the route would be managed through the agreed operational maintenance arrangements between Fingal County Council and Waterways Ireland, including routine inspection, cleansing and maintenance activities.

It is anticipated that the route will be used by pedestrians, cyclists and dog walkers. No dedicated dog-waste bins are proposed as part of the Proposed Development. Users will be required to remove and appropriately dispose of dog waste off-site. Information signage may be provided at access points to encourage responsible waste management practices, including adherence to the "Leave No Trace" principle and the removal of dog waste.

The principal waste-related effect during operation is therefore limited to occasional littering or the improper disposal of waste by users. Such waste arisings would be small in scale and would be managed through existing local authority and Waterways Ireland maintenance arrangements. Waste generated during routine maintenance activities would be removed by authorised waste contractors and transferred to suitably authorised recovery, recycling, treatment or disposal facilities, as appropriate.

The quantity of municipal waste likely to arise during operation is expected to be very small relative to the available municipal waste management capacity within the Eastern and Midlands Waste Region. The receiving environment is considered to be of low sensitivity due to the availability of established waste collection, recovery, recycling, treatment and disposal infrastructure. Accordingly, the impact magnitude is assessed as **Negligible** and the effect, prior to mitigation, is assessed as **Not Significant Adverse and Long-Term**.

15.4.5 Summary of Predicted Impacts

A summary of the predicted impacts, in the absence of mitigation, for the Construction and Operational Phases is set out in Table 15-7.

Table 15-7 Summary of Predicted Impacts

Phase	Assessment Topic	Predicted Impact
Construction	Demolition Waste	Adverse, Not Significant and Short-Term
	Excavation Waste	Adverse, Not Significant and Short-Term
	Construction Waste	Adverse, Not Significant and Short-Term
	Potential Hazardous Waste Arisings	Adverse, Not Significant and Short-Term
	Municipal Waste	Adverse, Not Significant and Short-Term
	Invasive Species	Adverse, Slight and Short-Term
Operational	Operational Maintenance Waste	Adverse, not significant and long-term
	Municipal Waste	Adverse, Not Significant and Long-Term

15.5 Mitigation Measures

This section sets out the mitigation and management measures that will be implemented to reduce waste generation, manage unavoidable waste responsibly, and minimise potential environmental effects during the Construction and Operational Phases. The measures are based on the waste hierarchy outlined in Section 15.2 and Figure 15-3, with priority given to waste prevention and reduction, followed by reuse, recycling, recovery and, as a last resort, disposal.

15.5.1 Construction Phase

The Construction Phase is not predicted to give rise to significant adverse effects following implementation of mitigation. The appointed contractor will manage waste arisings in accordance with the waste hierarchy, the Site-Specific RWMP included at Appendix 15.1 and the provisions of the Waste Management Acts, 1996, as amended.

Proposed mitigation measures for excavation, construction and demolition during the construction phase of the Proposed Development are as follows:

- **Construction and Demolition Resource and Waste Management Plan:** The Site-Specific RWMP included at Appendix 15.1 will be adopted, reviewed, updated and implemented in full by the appointed contractor before works commence. The contractor's updated RWMP shall meet the requirements of the EPA *Best Practice Guidelines for the Preparation of Resource and Waste Management Plans for Construction and Demolition Projects* and shall set out the procedures for waste prevention, reuse, recycling, recovery, disposal, tracking and reporting of construction, demolition and excavation waste.

Prior to commencement, the appointed contractor will refine and update the RWMP in agreement with FCC and in compliance with any planning conditions, or submit an addendum to the RWMP where required. The updated RWMP will include specific measures to minimise waste generation and resource consumption, and will identify the proposed waste contractors, authorised receiving facilities and intended management route for each waste stream. The RWMP will be treated as a live document and updated during the construction phase as waste quantities, reuse opportunities, waste destinations and contractor proposals are confirmed.

Project specific resource and waste management targets for the site have not yet been set, and this information will be updated for these targets once these targets have been confirmed by the Client. However, it is expected for projects of this nature that a minimum of 70% of waste is fully reused, recycled or recovered.

- **Pre-demolition audit:** A pre-demolition audit will be undertaken before demolition works commence. The audit will identify opportunities for deconstruction, segregation, salvage, reuse and recycling, and will include checks for potentially hazardous materials including asbestos-containing materials.
    - **Resource Manager:** A suitably qualified Resource Manager will be appointed by the contractor to implement the RWMP, maintain waste records, review waste performance, undertake waste checks / audits and promote reuse, recycling and recovery of materials.
    - **Excavated material and contaminated material:** Excavated material will be segregated, tested and classified where required before off-site movement. Made Ground and any suspect or potentially contaminated material will be segregated from clean or inert material and classified in accordance with the EPA Waste Classification guidance before reuse, recovery or disposal.
    - **Asbestos and hazardous waste:** Pre-demolition asbestos surveys will be undertaken before demolition works. Any asbestos-containing materials or other hazardous wastes will be removed by suitably competent contractors and transported by authorised waste collectors to appropriately authorised facilities. Hazardous wastes will be stored in secure, clearly labelled and bunded areas pending collection.
    - **Waste tracking and audit:** The contractor will maintain records for all waste movements from the site, including date, time, waste contractor, collection permit number, vehicle registration, docket number, waste type, LoW code and quantity. Waste facility permits, certificates of registration, EPA licences and waste collection permits will be retained on site and made available for inspection.
    - **Consultation with FCC:** Details of proposed waste destinations for each waste stream will be provided to the FCC Waste Regulation Unit before removal of C&D waste from the site, where required.
    - **Authorised Facilities**: Prior to commencement of works, the Contractor shall identify the authorised waste collectors, recovery facilities, recycling facilities and disposal facilities proposed for each waste stream. The Contractor shall verify that the selected facilities possess the necessary permits, licences, certificates of registration and available capacity to receive the anticipated waste quantities arising from the Proposed Development.

The following measures will be implemented during construction by the appointed contractor, to ensure the maximum quantity of material is reused on the Proposed Development and to contribute to achieving the objectives set out in the National Waste Action Plan as follows:

- Stockpiling of existing sub-base, capping layer and topsoil material generated on-site in the proposed construction compound for direct reuse in the Proposed Development where practicable (subject to material quality testing to ensure it is suitable for its proposed end use); and
- Recycled aggregates and reclaimed bituminous mixtures will be specified in the Proposed Development where practicable. For example, suitable recycled aggregates and appropriate site-won material may be specified in the proposed road base / binder layers, sub-base layers under footpaths / cycle tracks, and capping layer material within the road, footpath and cycle track pavement, subject to testing to ensure material is suitable for its proposed use.

The following management measures will be implemented in so far as reasonably practicable:

- Clean non-hazardous excavated material will be assessed for reuse within the Proposed Development in the first instance. Material that cannot be reused within the Proposed Development will be directed to appropriately authorised recovery facilities or reuse schemes in accordance with the waste hierarchy. Disposal will only be considered where reuse or recovery is not feasible.
- Where excavated material cannot be reused within the Proposed Development, it will be sent to appropriately authorised recovery or recycling facilities. Disposal will only occur where recovery or recycling is not technically feasible or where required by waste acceptance criteria.
- **Source Segregation:** Waste materials will be segregated at source during demolition, excavation, construction and maintenance activities to maximise opportunities for reuse, recycling and recovery. Where physical segregation of particular waste streams is not feasible due to volume, space constraints or health and safety requirements, wastes will be separated at an appropriately authorised waste recovery facility.
- **Waste storage and training:** Waste storage areas, skips, stockpiles, hazardous waste storage areas and material laydown areas will be located outside the Royal Canal corridor and away from surface waters, drainage ditches, surface water outfalls and other sensitive water receptors. Hazardous materials and hazardous wastes will be stored within appropriately bunded and clearly labelled storage areas. Construction staff will receive site-specific instruction on the waste management procedures set out in the RWMP.
- **Material Management**: 'Just-in-time' delivery will be used so far as is reasonably practicable to minimise material wastage.
- **Material management and procurement:** Materials will be selected and ordered to reduce waste where practicable, including through efficient design, accurate ordering, 'just-in-time' delivery and protection of materials during storage and handling.
- General construction waste and by-products will be reused within the Proposed Development, where practicable, or appropriately reused (in accordance with Article 27 of the Waste Directive Regulations), recovered, recycled or disposed of off-site, as arranged by the appointed contractor; and
- Any hazardous waste arising will be managed by the appointed contractor in accordance with the applicable legislation.

Invasive Species: Where invasive plant species are encountered during construction, management measures will be implemented in accordance with the Guidelines on the Management of Noxious Weeds and Non-native Invasive Plant Species on National Roads (NRA, 2010), the Wildlife Acts 1976-2021, and the project-specific Invasive Species Management Plan (ISMP).

Invasive plant material and associated soils will be identified, segregated, handled, transported and disposed of in accordance with the requirements of the ISMP. Reuse of contaminated materials in unaffected areas will not be permitted.

Plant material and contaminated soils will be segregated from other excavated materials and managed in accordance with the approved ISMP. Reuse of invasive plant material or contaminated soils within uncontaminated areas of the Proposed Development will not be permitted.

The principal waste classifications likely to apply are expected to include:

Waste Material	Indicative LoW Code
Plant tissue waste	20 02 01 (Biodegradable waste)
Soil and stones containing invasive plant material	17 05 04 (Soil and stones other than those mentioned in 17 05 03*)
Mixed excavation material requiring specialist management	To be confirmed following site-specific assessment and classification

Waste Monitoring: Monthly records of waste generation, reuse, recovery, recycling and disposal shall be maintained throughout the Construction Phase. Waste performance shall be reviewed periodically by the Resource Manager and corrective measures implemented where project targets are not being achieved.

Waste Auditing and Reporting: The contractor will record the quantity and type of waste and materials leaving the development site during the construction phase. The name, address and authorisation details of all facilities and locations to which waste and materials are delivered will be recorded, along with the quantity delivered to each facility and whether the material is reused, recycled, recovered or disposed of. A final waste management report will be prepared at project completion, summarising the waste management outcomes achieved and confirming implementation of the RWMP.

Where Article 27 notifications are required in relation to the Proposed Development, the appointed contractor will complete and submit these Article 27 notifications to the EPA for by-product reuse.

Any off-site interim storage or waste management facilities for excavated material will have the appropriate EPA licence, Waste facility permit or Certificate of Registration, as appropriate, in place.

The relevant appropriate waste authorisation will be in place for all facilities that wastes are delivered to (i.e. EPA Licence, Waste Facility Permit or Certificate of Registration).

On-site crushing of waste material is not currently envisaged; however, if proposed by the appointed contractor, the appropriate mobile waste facility permit will be obtained before such works are undertaken.

15.5.2 Operational Phase

Operational Phase waste generation is expected to be limited to intermittent maintenance waste and incidental litter. Operational maintenance responsibilities for the Greenway will be agreed between FCC and Waterways Ireland, including through a memorandum of understanding. Where maintenance waste arises, it will be segregated where practicable into appropriate waste streams, stored in suitable labelled receptacles or vehicles, and transferred only by authorised waste collectors to suitably authorised facilities for reuse, recycling, recovery or disposal, as appropriate. Records of waste removed from maintenance activities will be retained where required. No public litter bins are proposed along the Royal Canal active travel route and greenway, which will operate on a ‘Leave No Trace’ basis. Any incidental litter will be managed through the agreed operational maintenance, cleansing and maintenance arrangements.

15.6 Residual Impacts

A summary of the predicted residual impacts for the Construction and Operational Phases, following implementation of the appropriate management measures is set out in Table 15-8.

Table 15-8 Summary of Predicted Residual Impacts Post-Mitigation

Phase	Assessment Topic	Predicted Impact	Residual Impact (Post-Mitigation)
Construction	Demolition Waste	Adverse, Not Significant and Short-Term	Adverse, Not Significant and Short-Term
	Excavation Waste	Adverse, Not Significant and Short-Term	Adverse, Not Significant and Short-Term
	Construction Waste	Adverse, Not Significant and Short-Term	Adverse, Not Significant and Short-Term
	Potential Hazardous Waste Arisings	Adverse, Not Significant and Short-Term	Adverse, Not Significant and Short-Term
	Municipal Waste	Adverse, Not Significant and Short-Term	Adverse, Not Significant and Short-Term
	Invasive Species	Adverse, Slight and Short-Term	Adverse, Not Significant and Short-Term
Operational	Operational Maintenance Waste	Adverse, Not significant and long-term	Adverse, Not significant and long-term
	Municipal Waste	Adverse, Not Significant and Long-Term	Adverse, Not Significant and Long-Term

The final waste destinations, waste contractors and receiving facilities will be confirmed by the appointed contractor through the updated RWMP prior to commencement of construction works. Based on the mitigation measures proposed and the available waste management capacity within the Eastern and Midlands Waste Region, the Proposed Development is not expected to result in any significant residual effects on resource and waste management.

15.7 Cumulative Impacts

Construction of the Proposed Development will generate construction and demolition (C&D) waste, excavated materials and small quantities of municipal waste. These waste streams will require collection, recovery, recycling, treatment or disposal at appropriately authorised facilities within the Dublin Region and wider Eastern-Midlands Waste Region.

A review of other existing, permitted and proposed developments identified within the cumulative assessment area indicates that a number of projects may be under construction during a similar timeframe to the Proposed Development. These include major transport and active travel infrastructure projects such as **DART+ West**, **BusConnects**, together with residential, commercial and mixed-use developments within Fingal and the wider Dublin Metropolitan Area. These developments have the potential to generate construction wastes that may be managed through the same regional waste infrastructure network.

The Proposed Development is, however, modest in scale relative to many of these developments and is anticipated to generate comparatively small quantities of waste. Waste arisings from the Proposed Development will be managed in accordance with the Waste Management Acts, as amended, the Construction Environmental Management Plan (CEMP) and the Construction and Demolition Resource and Waste Management Plan (CDRWMP), with priority afforded to waste prevention, reuse, recycling and recovery in accordance with the waste hierarchy.

As outlined in Sections 15.3.1 and 15.3.2, the Dublin Region is served by an established network of authorised waste recovery, recycling, treatment and disposal facilities. The appointed Contractor will identify appropriately authorised waste contractors and receiving facilities prior to commencement of works and will verify that the selected facilities possess the necessary permits, licences and available capacity to receive the anticipated waste quantities arising from the Proposed Development.

While DART+ West, BusConnects schemes and ongoing residential and commercial developments may contribute to an increase in demand for waste management services during overlapping construction periods, the anticipated waste quantities arising from the Proposed Development represent a small proportion of the overall waste throughput managed by the regional waste sector. Furthermore, waste generated by these

developments would be distributed across a range of authorised recovery, recycling, treatment and disposal facilities rather than relying on a single receiving facility.

Having regard to:

- the relatively small scale of the Proposed Development;
- the availability of established waste management infrastructure within the Dublin Region;
- the implementation of the CDRWMP and associated waste management measures;
- the requirement for wastes to be managed by authorised contractors and facilities; and
- the available regional capacity for the management of construction, demolition and municipal waste streams,

No significant cumulative effects on waste management infrastructure, waste recovery capacity, recycling capacity or landfill capacity are anticipated as a result of the Proposed Development in combination with other permitted and planned developments within the study area.

Therefore, the cumulative effect on waste management infrastructure is assessed as **adverse, not significant and temporary**.

15.8 Difficulties Encountered

No significant difficulties were encountered in compiling this chapter. The assessment has been prepared using the site-specific Resource and Waste Management Plan (RWMP), available design information, preliminary cut and fill estimates, ground investigation information, EPA waste statistics, and relevant waste legislation, policy and guidance. The material quantities used within this assessment are also consistent with those used in the carbon assessment presented in the Climate chapter of this EIAR.

At this stage, the demolition and construction contractors have not been appointed and final contractor-specific waste destinations, waste contractors, waste permits and receiving facility details have not yet been confirmed. In addition, the suitability of construction and demolition materials, excavated soil and stone, and other materials for direct reuse, recovery, by-product classification or disposal will be confirmed through further testing, classification and assessment undertaken during detailed design and construction planning.

Final waste quantities, material classifications, reuse opportunities and management routes may therefore be refined during detailed design and construction. These matters will be confirmed by the appointed contractor through an updated RWMP prior to commencement of works and before any waste is removed off site.

Notwithstanding these matters, sufficient information was available to undertake a robust assessment of the likely resource and waste management effects associated with the Proposed Development. No significant data gaps, technical deficiencies or limitations were identified that would materially affect the conclusions of this assessment.

15.9 Summary of Interactions

15.9.1 Air Quality

There is an interaction between this chapter and **Chapter 5 Air Quality** arising from excavation, stockpiling, material handling, waste management activities and construction traffic associated with the import of materials and removal of surplus waste. Measures implemented through the OCEMP and RWMP to manage material storage, waste handling, dust generation and vehicle movements will contribute to the management of potential air quality effects.

15.9.2 Climate

There is a direct interaction between this chapter and **Chapter 6 Climatic Factors**. Resource consumption, material imports, waste generation and waste transportation contribute to embodied and transport-related greenhouse gas emissions associated with the Proposed Development. The material quantities and waste

arisings assessed in this chapter are consistent with those used in the carbon assessment presented in Chapter 6.

The application of the waste hierarchy and implementation of the RWMP will minimise the consumption of virgin materials and maximise opportunities for reuse, recycling and recovery. In particular, the beneficial reuse of suitable excavated materials within the Proposed Development reduces the requirement for imported materials and limits the quantity of material requiring off-site transport, recovery or disposal. These measures contribute to reducing embodied carbon and transport-related greenhouse gas emissions associated with the Proposed Development.

15.9.3 Noise and Vibration

There is an interaction between this chapter and **Chapter 7 Noise and Vibration** arising from demolition, excavation, waste and material handling activities and HGV movements associated with the import of materials and export of waste. Construction traffic associated with waste management and material deliveries forms part of the overall assessment of construction-related noise and vibration.

15.9.4 Biodiversity

There is an interaction between this chapter and **Chapter 8 Biodiversity** where vegetation clearance, topsoil stripping, excavation, material storage, waste handling, invasive species management and the management of contaminated materials have the potential to influence ecological receptors within and adjacent to the Proposed Development, including the Royal Canal corridor.

During operation, interactions arise through the management of litter, maintenance waste and invasive species, where present. Waste management measures and biodiversity protection measures are therefore closely linked.

15.9.5 Archaeology & Cultural Heritage

There is an interaction between this chapter and **Chapter 9 Archaeological, Architectural and Cultural Heritage** through excavation works and other ground disturbances. Any archaeological mitigation measures may influence excavation methodologies, material handling and management of excavated materials.

15.9.6 Landscape and Visual

There is an interaction between this chapter and **Chapter 10 Landscape, Townscape and Visual** as landscape design, earthworks, route levels, retaining structures and planting proposals influence excavation volumes, imported material requirements and opportunities for reuse of site-won material.

15.9.7 Land, Soils and Geology

There is a strong interaction between this chapter and **Chapter 11 Land, Soils and Geology**. Soil and geological conditions influence the quantity, classification and management of excavated materials, including opportunities for reuse, recovery and disposal. Ground investigation findings have informed the assessment of excavated material management presented in this chapter.

15.9.8 Water

There is an interaction between this chapter and **Chapter 12 Water** arising from excavation, dewatering, runoff management, waste storage and the handling of contaminated or potentially contaminated materials. The management of excavated materials, hazardous wastes and contaminated soils has the potential to influence water quality protection measures implemented during construction.

15.9.9 Population & Human Health

There is an interaction between this chapter and **Chapter 13 Population and Human Health** through construction traffic, waste handling, litter management, site housekeeping and the management of hazardous or contaminated materials. During operation, interactions arise through maintenance waste management and the potential for user-generated litter.

15.9.10 Material Assets – Traffic and Transport

There is an interaction between this chapter and **Chapter 14 Material Assets: Traffic and Transportation** arising from the import of construction materials, the export of surplus excavated material and waste, and movements associated with waste contractors. The quantities of materials and wastes identified in this chapter inform the assessment of construction-related HGV movements presented in Chapter 14.

15.9.11 Material Assets – Utilities

There is an interaction between this chapter and **Chapter 16 Material Assets: Utilities** through utility diversions, utility protection works and the installation of new utility infrastructure associated with the Proposed Development. Such works may generate excavated material, surplus construction materials and waste requiring management in accordance with the RWMP. Conversely, utility requirements may influence construction methodologies, material requirements and excavation quantities assessed within this chapter.

15.10 References

This assessment was carried out in accordance with the following guidance and established best practice:

European Legislation, Policy and Guidance

- European Commission, *European Green Deal* (2019).
- European Commission, *A New Circular Economy Action Plan: For a Cleaner and More Competitive Europe* (2020).
- European Union, *8th Environment Action Programme to 2030* (Decision (EU) 2022/591).
- European Commission, *Guidelines for Waste Audits Before Demolition and Renovation Works of Buildings* (2018).
- Council Decision 2003/33/EC establishing criteria and procedures for the acceptance of waste at landfills pursuant to Article 16 of and Annex II to Directive 1999/31/EC.
- Directive 2008/98/EC on Waste (Waste Framework Directive), as amended.
- Directive 1999/31/EC on the Landfill of Waste, as amended.

National Legislation

- Waste Management Act 1996, as amended.
- Environmental Protection Agency Act 1992, as amended.
- Litter Pollution Act 1997, as amended.
- Planning and Development Act 2000, as amended.
- Circular Economy and Miscellaneous Provisions Act 2022.
- European Union (Waste Directive) Regulations 2011 (S.I. No. 126 of 2011), as amended.
- Waste Management (Collection Permit) Regulations 2007, as amended.
- Waste Management (Facility Permit and Registration) Regulations 2007, as amended.
- Waste Management (Shipments of Waste) Regulations, as amended.
- Waste Management (Landfill Levy) Regulations 2015, as amended.
- Circular Economy (Waste Recovery Levy) Regulations 2024.
- Safety, Health and Welfare at Work (Exposure to Asbestos) Regulations 2006-2010.

National and Regional Policy

- Regional Waste Management Planning Offices, *National Waste Management Plan for a Circular Economy 2024-2030*.
- Department of Communications, Climate Action and Environment (DCCAE), *Waste Action Plan for a Circular Economy: Ireland's National Waste Policy 2020-2025*.
- Department of the Environment, Climate and Communications (DECC), *Whole-of-Government Circular Economy Strategy 2026-2028: Accelerating Action*.
- Fingal County Council, *Fingal Development Plan 2023-2029* (2023).

EPA Guidance and Publications

- Environmental Protection Agency (EPA), *Best Practice Guidelines for the Preparation of Resource and Waste Management Plans for Construction and Demolition Projects* (2021).

- Environmental Protection Agency (EPA), *Waste Classification: List of Waste and Determining if Waste is Hazardous or Non-Hazardous* (2019, applicable from 5 July 2025).
- Environmental Protection Agency (EPA), *Guidance on Soil and Stone By-Products in the Context of Article 27 of the European Communities (Waste Directive) Regulations 2011* (latest version).
- Environmental Protection Agency (EPA), *Construction and Demolition Waste Statistics for Ireland 2024*.
- Environmental Protection Agency (EPA), *National Waste Statistics and Circular Economy Reports* (latest available editions).

Construction and Demolition Waste Guidance

- Department of the Environment, Heritage and Local Government, *Best Practice Guidelines on the Preparation of Waste Management Plans for Construction and Demolition Projects* (2006).
- National Roads Authority (NRA), *Guidelines on the Management of Noxious Weeds and Non-Native Invasive Plant Species on National Roads* (2010).
- Local Government Ireland, *Best Practice Guidance for Handling Asbestos* (2023).

16 Material Assets: Utilities

16.1 Introduction

This chapter assesses the likely significant effects of the Proposed Development on Material Assets (Utilities) during the construction phase and operational phase. This chapter described and assessed the likely direct and indirect effects of the Proposed Development on Material Assets (utilities), in accordance with the requirements of Directive 2014/52/EU of the European Parliament and of the Council of 16 April 2014 amending Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment (the "**EIA Directive**"). This chapter also provides a characterisation of the receiving environment.

The Royal Canal Urban Greenway, hereafter referred to as the 'Proposed Development', is a pedestrian and cycle route approximately 8.1km in length to be constructed along and adjacent to the Royal Canal. The route extends eastwards from the Kildare County Boundary to the Old Navan Road, near the 12th Lock, where it will connect with the previously constructed Ashtown Greenway. Fingal County Council is the scheme promoter, in conjunction with the National Transport Authority as the funding body and Waterways Ireland as the principal property owner.

The Royal Canal links the River Shannon in County Longford to the River Liffey in Dublin City's Docklands. It passes close to a number of towns, including Mullingar, Kilcock, Maynooth and Leixlip, before entering Fingal where it passes through the built-up areas of Clonsilla, Coolmine, Castleknock and Blanchardstown on its way towards Dublin city.

The Proposed Development will provide a continuous, high-quality active travel corridor serving the communities of Clonsilla, Coolmine, Castleknock and Blanchardstown and will improve accessibility to schools, public transport, employment centres, recreational amenities and local services. The scheme will encourage a modal shift towards walking and cycling, while supporting recreation, health and wellbeing, sustainable transport objectives and climate action policies at national, regional and local level.

A full description of the Proposed Development is outlined in Chapter 2 'Background to the Scheme' of this EIAR.

The Proposed Development is divided into three sections as follows – and as generally indicated in Figure 12-1:

- Section 1 – Kildare County Border to Hansfield Railway Bridge (Ch. 0000 – 3200)
- Section 2 – Hansfield Railway Bridge to Kennan Bridge (Ch. 3200 – 5300)
- Section 3 – Kennan Bridge to Talbot Bridge (Chainage 5300 – 8100)

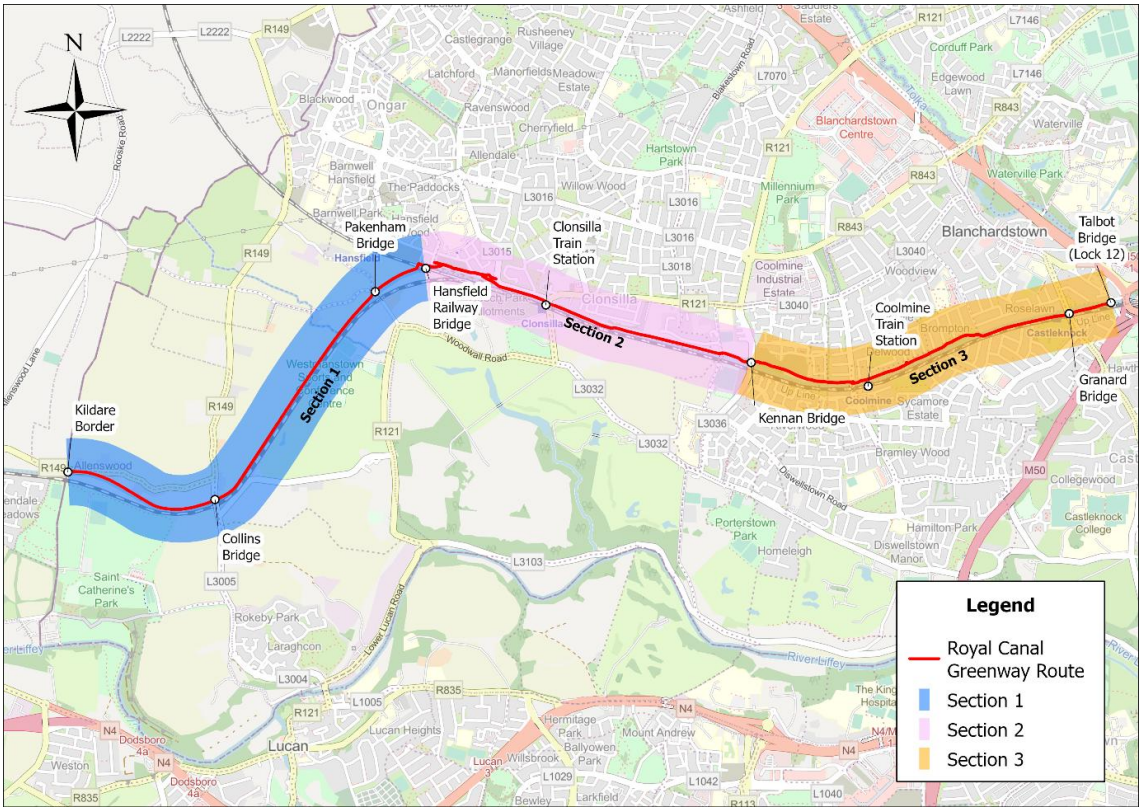


Figure 16-1 Study Area Sections

16.2 Methodology

Material assets are defined in the EPA Guidelines on Information to be contained in Environmental Impact Assessment Reports (EPA, 2022) as:

> *'The meaning of this factor is less clear than others. In Directive 2011/92/EU it included architectural and archaeological heritage. Directive 2014/52/EU includes those heritage aspects as components of cultural heritage. Material assets can now be taken to mean built services and infrastructure. Traffic is included because in effect traffic consumes road infrastructure. Sealing of agricultural land and effects on mining or quarrying potential come under the factors of land and soils.'*

More generally, major infrastructure and utilities that contribute to the functioning, character and use of a particular area are referred to as 'material assets'. For the purposes of this EIAR, material assets include transportation infrastructure, utility networks, water services infrastructure, and imported material, excluding the materials which will be covered in Chapter 15 (15.Material Assets: Resource & Waste Management).

The purpose of this section is to assess the predicted impacts of the Proposed Development on the existing utility network which we have identified, includes the following infrastructure, and to assess their effects on the receiving environment:

- euNetworks Strategic Fibre (formerly owned by Inland Fibre Telecom Ltd.)
- Electricity;
- Water Supply Infrastructure;
- Surface Water Drainage;
- Sewerage (Foul Water Drainage);
- Gas;
- General Telecommunications (including broadband, traffic, and TV).

This Chapter should be read in conjunction with the following Chapters, and their Appendices, which present relating impacts arising from the proposed Project and proposed mitigation measures to ameliorate the predicted impacts:

- Other material assets of human origin are addressed separately in Chapter 17 'Material Assets: Land Use and Property'.
- Material assets of natural origin are addressed in Chapter 19 'Archaeological, Architectural and Cultural Heritage', Chapter 11 'Land, Soils, Geology, & Hydrogeology' and Chapter 15 'Material Assets: Resource & Waste Management'.
- The Proposed Development is described in detail in Chapter 1, 'Introduction'.

Further, a Construction Methodology Report (CMR) [170239-DBFL-XX-XX-RP-C-0003] and an Outline Construction Environmental Management Plan (OCEMP) [170239-DBFL-XX-XX-RP-C-0004] have also been developed and submitted alongside this EIAR.

16.2.1 Study Area

The study area with regard to predicted effects relating to major infrastructure and utilities is as per the Study Area defined in Chapter 1 'Introduction'.

Refer to Section 16.2.3 Data Collection and Collation regarding the record mapping request extents.

16.2.2 Relevant Guidelines, Policy and Legislation

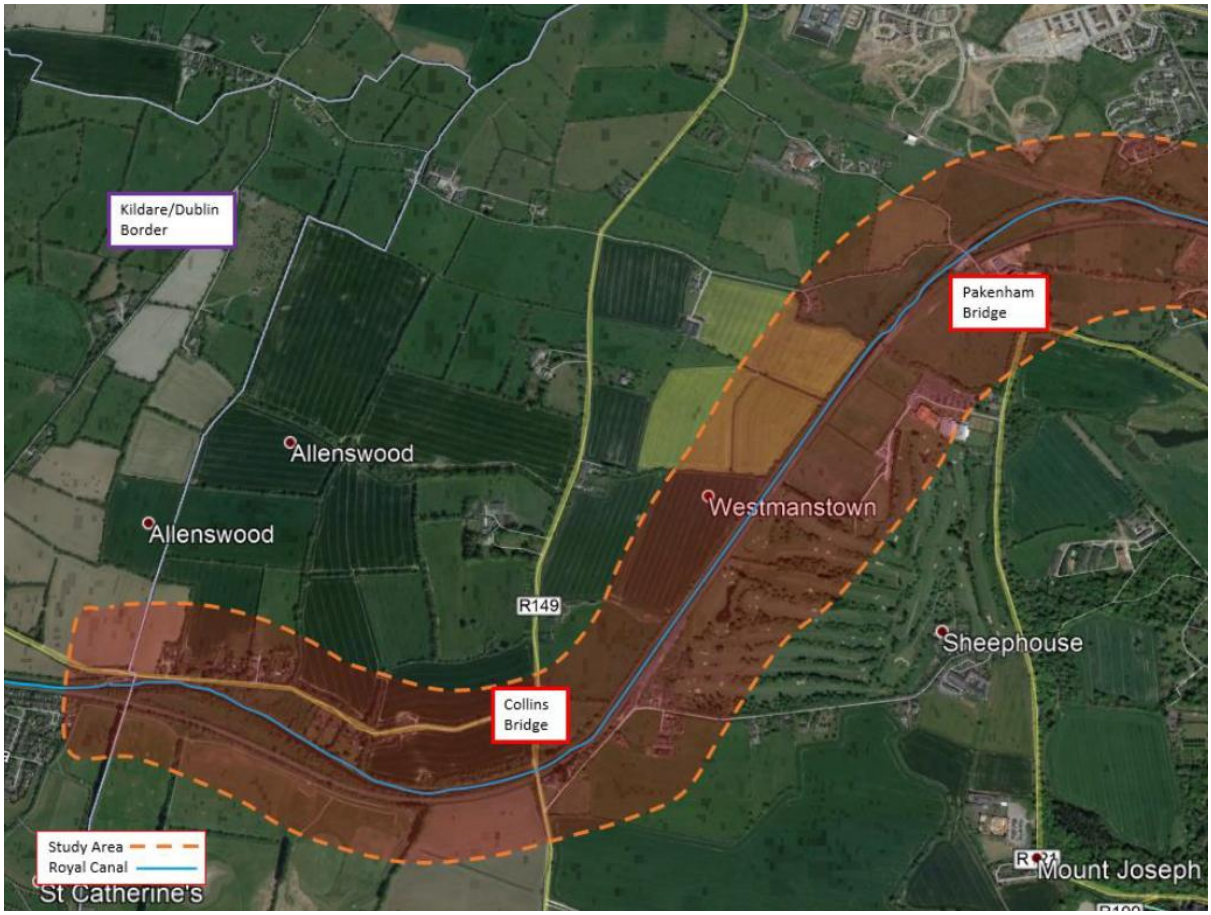
This Chapter has been prepared having regard to:

- Directive 2011/92/EU as amended by Directive 2014/52/EU;
- Planning and Development Acts 2000-2025, as amended;
- EPA Guidelines on the Information to be Contained in Environmental Impact Assessment Reports;
- Environmental Impact Assessment of Projects, Guidance on the Preparation of the Environmental Impact Assessment Report (European Commission, 2017); and
- Relevant infrastructure and utility policies and objectives contained within the Fingal Development Plan 2023-2029.

16.2.3 Data Collection and Collation

Existing utility information has been collated from the utility service providers and was reviewed as part of the assessment, as well as informing any design requirements set out in the Preliminary Design Report (PDR) [170239-DBFL-XX-XX-RP-C-0001] submitted as part of this application. Figure 16-2 shows the boundary issued to the utility providers as part of the records request issued. It is noted that many of the maps included information beyond the request boundary due to the nature of the service providers mapping system. The following service providers were contacted:

- euNetworks Strategic Fibre (formerly owned by Inland Fibre Telecom Ltd.)
- ESB;
- Uisce Éireann (formerly Irish Water);
- Gas Networks Ireland;
- Eir;
- BT;
- ENet; and
- Virgin Media


Kildare/Dublin Border
Pakenham Bridge
Allenswood
Allenswood
Westmanstown
R149
Sheephouse
Collins Bridge
Study Area
Royal Canal
St Catherine's
Mount Joseph


Clonsilla
Callaghan Bridge
Clonsilla Train Station
Kellystown
Kennan Bridge
Porterstown
Study Area
Royal Canal
R843
R121
Clonsilla
Porters Rd
Clonsilla Rd



Figure 16-2 Request Boundary Issued to Utility Providers

A targeted utility survey, including GPR (Ground Penetrating Radar), was commissioned to investigate accessible areas along the route (generally in the vicinity of the bridge crossings) – particularly where high value assets were identified on the record drawings. This detailed underground utility and ground penetrating radar survey was carried out in 2018 to verify mapped services and identify any unmapped services.

In addition, an extensive ground investigation was carried out in 2020, which included 47 slit trenches along the route of the Proposed Development within which utilities were physically identified and surveyed where encountered.

16.2.4 Consultation with Utility Service Providers

Where deemed necessary, consultation with all relevant utility service providers was undertaken - primarily in the form of information and mapping requests and informing them of the Proposed Development. Specific liaison took place with euNetworks Strategic Fibre. The fibre had been indicated on record drawings, and while not encountered in the utility surveys carried out, it was subsequently located through the slit trenches forming part of the Ground Investigation. It was noted to be at a relatively shallow depth. The Proposed Development proposals were outlined to them and scenarios where utility infrastructure might be impacted by the Proposed Development were discussed.

The asset owner was able to provide as-built drawings and information on appropriate construction practices to be employed which were used in the design development to ensure that the risk of impact to the asset is minimised. It was agreed in principle that in the event of any works being carried out on the tow path along the route of the fibre the duct network should be located by careful hand excavation in the presence of representative from the utility owner.

16.2.5 Limitations and Difficulties

This assessment has been undertaken using the information gathered during the design development, including utility records obtained from relevant service providers, a Ground Penetrating Radar (GPR) survey undertaken in 2018 and slit trench investigations undertaken in 2020.

While the utility survey information predates the planning application, the proposed development principally comprises a greenway within the existing canal corridor, with direct interfaces with public utility infrastructure generally confined to a limited number of road crossings and tie-in locations. As such, the available information is considered sufficient to identify the principal utility constraints relevant to the assessment.

The precise locations of some underground services cannot be confirmed without further site investigation, and certain utility alignments have been interpreted based on available records and survey information. Such uncertainty is typical of utility assessments at the planning stage and is not considered to materially affect the conclusions of this assessment.

In addition, ownership of certain telecommunications infrastructure could not be definitively confirmed from the available records. However, this does not affect the identification of the infrastructure or the assessment of potential effects thereon.

Having regard to the nature of the proposed development and the available information, no limitations have been identified that would materially affect the findings or conclusions of the assessment.

16.2.6 Significance Criteria

The assessment of the potential impact of the Proposed Development on material assets has been undertaken having regard to the EPA EIAR Guidelines (EPA 2022) Significance Levels. No appropriate guidance is available describing the specific criteria relating to the level of significance, therefore professional judgement and consultation with utility providers has determined the significance criteria used in this section.

The following issues have been considered as part of the assessment of impacts:

- Potential for impacts on major infrastructure and public utilities and the need to adequately protect them during the Construction Phase; and
- Requirement for connections to public utilities by the Proposed Development during both the Construction and Operational Phases.

Each potential impact has been categorised based on:

- Magnitude of the impact;
- Significance of the impact; and
- Duration of the impact.

The definition of these impact characteristics is set out in Chapter 1 (Introduction). These characteristics have been used to assess the quality and duration of all impacts. Figure 16-1, extracted from the EPA EIAR Guidelines (EPA, 2022), and Table 16-1 provide the significance criteria used to identify the significance of impacts on major infrastructure and utilities.

Impacts rated Significant, Very Significant or Profound are considered significant. The criteria in Table 16-1 have been developed for the utilities assessment using the EPA terminology for significance, with the likely duration of utility interruption, change in utility demand and disruption to major infrastructure used to inform the significance rating.

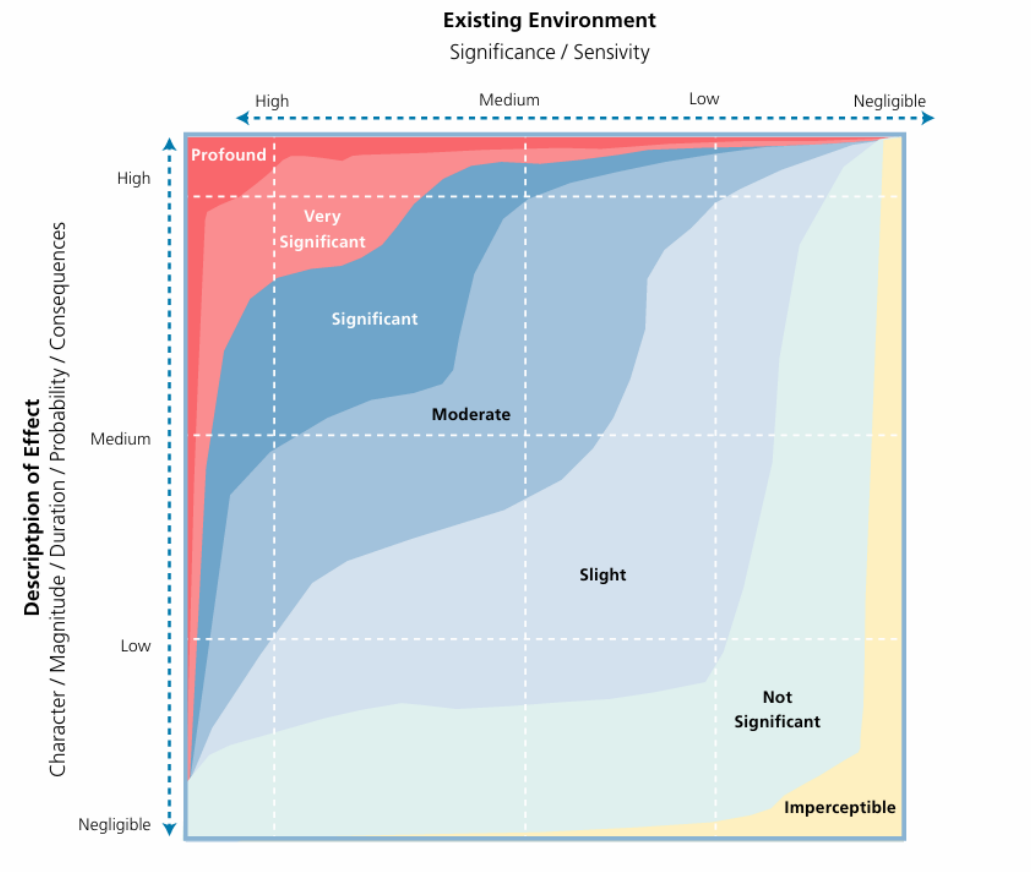


Figure 16-3 Significance Effects Matrix

Table 16-1 Bespoke Significance Criteria for Material Assets: Utilities (Applying EPA EIAR Guidelines 2022 Significance Terminology)

Significance Level	Criteria*
Profound	Where there is a continuous utility interruption of more than a week; Where additional demand on a utility would consume all remaining capacity; or Where there is a permanent disruption* of a major piece of infrastructure.
Very Significant	Where there is a continuous utility interruption of more than 48 hours; Where additional demand on a utility would significantly reduce the available capacity of that utility; or Where there is long-term disruption* of a major piece of infrastructure.
Significant	Where there is a continuous utility interruption of more than 24 hours; Where there is significant additional demand on a utility; or Where there is a medium-term disruption* of a major piece of infrastructure.
Moderate	Where there are discrete utility interruptions of no more than eight hours for up to seven consecutive days; Where the additional demand on a utility is relatively large; or Where there is a short-term disruption* of a major piece of infrastructure.
Slight	Where there are discrete utility interruptions of no more than eight hours for up to three days; Where additional demand on a utility is relatively small; or Where there is a temporary disruption** of a major piece of infrastructure.

Significance Level	Criteria*
Not Significant	Where there is a utility interruption of no more than eight hours on a single day; Where additional demand on a utility is quantifiable but is too small to have any impact on capacity; or Where there is a brief disruption* of a major piece of infrastructure.
Imperceptible	Where there is no utility interruption during diversion works; Where additional demand on a utility has no material change; or Where there are minor changes on a major piece of infrastructure which has no material impact on its usability.
*The EPA Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (EPA, 2022) provide standard significance descriptors to be used in EIAR assessments. However, the Guidelines do not prescribe specific assessment thresholds for utility infrastructure. Accordingly, bespoke significance criteria were developed for this assessment, having regard to the nature of utility networks and infrastructure, including the extent and duration of service interruptions, impacts on available network capacity, and effects on major utility assets. The criteria are considered appropriate to assess the potential construction and operational effects of the Proposed Development on water supply, wastewater, electricity, telecommunications and other utility infrastructure, while applying the EPA (2022) significance terminology.	
** Disruption with respect to major infrastructure refers to the closure or significant reduction in usability of the infrastructure.	

16.3 Baseline Environment

There is an extensive network of utilities of a variety of service providers, which provide services to domestic, commercial and industrial customers in the areas surrounding the Proposed Development. However, the majority of utilities are located beneath public roads and footpaths and not along the Royal Canal tow path itself within the Study Area. The main interactions occur at bridges along with a number of localised crossings.

The following sections describe the general existing utility network infrastructure identified on the data collated within the Study Area.

16.3.1 euNetworks Strategic Fibre

There is a strategic fibre optic service operated by euNetworks (formerly owned by Inland Fibre Telecom Ltd.) – which connects to various facilities and data centres throughout Ireland and Europe – running along the existing towpath from the western extent of the Proposed Development, past Collins Bridge, to Pakenham Bridge. This is a fibre optic service which connects to various facilities and data centres throughout Ireland and Europe.

The depth of cover to the duct has been indicated by the operator as approximately 400mm and this was verified through the site investigation and GPR survey carried out, with the ducting being encountered and surveyed within a number of slit trenches. While layout drawings have been received by the operator, it is noted that this route is also identified as part of the Virgin Media network on the record and survey drawings. The predicted interactions identified are listed in Table 16-2

Table 16-2: Potential euNetworks Strategic Fibre Interactions

Location	Chainage	Description
Tow path from start of scheme to Pakenham Bridge*	+0000 to +2895	• 3 no. euNetworks Strategic Fibre ducts along one route
Pakenham Bridge*	+2895	• 1 no. euNetworks Strategic Fibre ducts route

*Identified on GPR Survey and Site investigation

16.3.2 Electricity

Despite extensive high voltage transmission lines and local distribution infrastructure being identified in within the utility mapping assessed (comprising a mix of overhead and underground cables), there is minimal existing infrastructure within the extents of the Proposed Development. The following networks are located throughout the overall area and, in some cases, identified in the utility survey information:

- ESB Green-MV (10KV/20KV) Overhead Lines;
- ESB Blue-LV (400V/230V) Overhead Lines;
- ESB Cyan-38KV and Higher Voltage Underground Cable Routes;
- ESB Red-MV/LV (10KV/20KV/400V/230V) Underground Cable Routes; and
- Other electrical supply ducts and overhead lines (identified on underground utility survey).

In general, the electricity infrastructure follows existing roads and therefore only interfaces with the Proposed Development at bridge crossing locations and other discrete crossing points. The potential interactions that have been identified through review of surveys and record information are listed in Table 16-3.

Table 16-3: Potential Electrical Network Interactions

Location	Chainage	Description
East of Collins Bridge*	+1250	• 2 no. Green-MV (10KV/20KV) Overhead Lines
Pakenham Bridge*	+2850 to + 2900	• Multiple Blue-LV (400V/230V) Overhead Lines • Multiple other electrical supply ducts
West of Callaghan Bridge*	+3740	• 1 no. Blue-LV (400V/230V) Overhead Lines
Callaghan Bridge*	+4100 to + 4130	• Multiple Blue-LV (400V/230V) Overhead Lines • Multiple other electrical supply ducts
Kennan Bridge*	+5340	• 1 no. other overhead line
Dr Troy Bridge*	+5550	• Multiple Cyan-38KV and Higher Voltage Underground Cable Routes ****[not identified on GPR survey – assumed to be within bridge structure oversailing the scheme]
Along Sheepmore Lane*	+5940 to +6250	• 1 no. other overhead line
Kirkpatrick Bridge*	+6250	• 1 no. Blue-LV (400V/230V) Overhead Lines • Multiple other electrical supply ducts
Granard Bridge*	+7790	• Multiple Red-MV/LV (10KV/20KV/400V/230V) Underground Cable Routes • 1 no. other overhead line
Talbot Bridge*	+8100	• 1 no. Blue-LV (400V/230V) Overhead Lines • Multiple Red-MV/LV (10KV/20KV/400V/230V) Underground Cable Routes

*Identified on GPR Survey

16.3.3 Water Supply Infrastructure

There are Uisce Éireann watermains in the vicinity of the Proposed Development throughout the overall area and, in some cases, identified in the utility survey information. In general, the infrastructure follows existing roads and therefore primarily traverses the Proposed Development at the bridge crossings and junctions. The potential interactions identified are listed in Table 16-4.

Table-16-4: Potential Watermain Network Interactions

Location	Chainage	Description
West of Collins Bridge*	+0820	• 2 no. 1000mm dia. watermain (assumed to be crossing beneath canal – not oversailing)
Collins Bridge*	+1090	• Multiple 100mm - 200mm dia. watermains
Pakenham Bridge*	+2875	• 1 no. 100mm dia. watermain • Multiple undefined watermain
West of Callaghan Bridge*	+3570	• 2 no. 1000mm dia. watermain (assumed to be crossing beneath canal – not oversailing)
Callaghan Bridge*	+4115	• 1 no. 5" dia. watermain
Kennan Bridge*	+5340	• 1 no. 4" dia. watermain
Dr Troy Bridge*	+5550	• Multiple 150mm to 200mm dia. watermain** **[not identified on GPR survey – assumed to be within bridge structure oversailing the scheme]
Along Sheepmore Lane*	+6000 to +6250	• 1 no. 3" dia. watermain
Kirkpatrick Bridge*	+6250	• 1 no. 4" dia. watermain
Granard Bridge*	+7790	• 1 no. 9" dia. watermain
Talbot Bridge*	+8100	• 1 no. 12" dia. watermain

*Identified on GPR Survey

16.3.4 Sewerage (Foul Water Drainage)

There are foul water drainage sewers in the vicinity of the Proposed Development throughout the overall area and, in some cases, identified in the utility survey information. In general, the infrastructure follows existing roads either side of the Royal Canal (and generally outside the Proposed Development extents) with four crossings over the canal identified. The potential interactions identified are listed in Table 12-7.

Table 16-5: Potential Foul Water Drainage Network Interactions

Location	Chainage	Description
West of Callaghan Bridge*	+3930 to +4115	• 1 no. 450mm dia. foul drain
Callaghan Bridge*	+4115	• 1 no. 300mm dia. foul drain • 1 no. 375mm dia. foul drain
West of Granard Bridge*	+7820	• 1 no. 525mm dia. foul drain

*Identified on GPR Survey

16.3.5 Surface Water Drainage

There are surface water drainage sewers in the vicinity of the Proposed Development throughout the overall area and, in some cases, identified in the utility survey information. In general, the infrastructure follows existing roads and therefore primarily traverses the Proposed Development at the bridge crossings and junctions, with the exception of standalone crossings and outfalls directly into the canal. The potential interactions identified are listed in Table 12-6.

Table 16-6: Potential Surface Water Drainage Network Interactions

Location	Chainage	Description
South of Pakenham Bridge	+2510	• 1000mm dia. storm drain (culverted beneath canal)
West of Callaghan Bridge	+3580 to +3585	• 1500mm dia. storm drain (oversailing canal) • 300mm dia. outfall to canal
Kennan Bridge	+5340	• 1 no. 225mm dia. storm drain
Kirkpatrick Bridge	+6250	• Multiple 150mm to 225mm dia. storm drains
Talbot Bridge	+8100	• 1 no. 1200mm dia. storm drain

16.3.6 Gas

There are gas supply networks in the vicinity of the Proposed Development throughout the overall area and, in some cases, identified in the utility survey information. In general, the infrastructure follows

existing roads either side of the Royal Canal (and generally outside the Proposed Development extents). The potential interactions identified are listed in Table 16-7.

Table 16-7: Potential Gas Network Interactions

Location	Chainage	Description
South of Pakenham Bridge	+2530	• 1 no. 200mm ST 40 bar crossing (crossing beneath canal) [High Pressure]
North of Callaghan Bridge*	+4115	• 1 no. 180 PE 4 bar gas main
Dr Troy Bridge	+5550	• 1 no. 900mm ST 70 bar crossing* • *[not identified on GPR survey – assumed to be within bridge structure oversailing the scheme]
Kirkpatrick Bridge*	+6250	• 1 no. Medium Pressure Strategic Pipe
North of Granard Bridge*	+7790	• Multiple 180 PE-80 25 mbar gas mains
Talbot Bridge*	+8100	• 1 no. 90 PE-80 [12 In] 25 mbar gas main

*Identified on GPR Survey

16.3.7 Telecommunications

There are a number of telecommunications networks in the vicinity of the Proposed Development. The following service provider networks are located throughout the overall area and, in some cases, identified in the utility survey information:

- eNet Open Access Networks;
- Virgin Media;
- OpenEir; and
- Traffic communications ducting.

In general, the infrastructure follows existing roads either side of the Royal Canal (and generally outside the Proposed Development extents). The potential interactions identified are listed in Table 16-8.

Table 16-8: Potential Telecommunications Network Interactions

Location	Chainage	Description
Collins Bridge	+1090	• 1 no. Eir duct route
Pakenham Bridge	+2895	• 1 no. eNet duct route • 1 no. Eir duct route • Multiple Traffic duct routes
Callaghan Bridge	+4115	• Multiple Eir duct routes • Multiple Traffic duct routes
Kennan Bridge	+5340	• 1 no. Eir duct route • Multiple Traffic duct routes
Dr Troy Bridge	+5550	• 1 no. Eir duct route* • 1 no. Virgin Media duct route* *[not identified on GPR survey – assumed to be within bridge structure oversailing the scheme]
Along Sheepmore Lane	+5930 to +6250	• 1 no. Eir overhead line
Kirkpatrick Bridge	+6250	• Multiple Eir duct routes • Multiple Traffic duct routes
Granard Bridge	+7790	• Multiple Eir duct routes • Multiple Virgin Media duct routes • Multiple Traffic duct routes
Talbot Bridge	+8100	• Multiple Eir duct routes

16.4 Predicted Impacts

The section considers Predicted Impacts in the Do-Nothing Scenario, Construction Phase, and Operational Phase in line with the overall reporting. The need for assessment of a Decommissioning Phase has been scoped out in line with the overall EIAR methodology.

The section includes assessments relating to the indicative Construction compound locations. Thes are identified on DBFL drawing numbers 170239-X-90-X-XXX-SK-DBFL-CE-0001, 170239-X-90-X-XXX-SK-DBFL-CE-0002, 170239-X-90-X-XXX-SK-DBFL-CE-0003.

16.4.1 Do-Nothing Scenario

In the absence of the Proposed Development, the existing utility networks and infrastructure within the study area would continue to operate and evolve in accordance with the asset management, maintenance, renewal and upgrade programmes of the relevant service providers. Utility demands within the area would also be expected to change over time as a result of permitted developments, future development permitted under the statutory planning framework, population growth and changing patterns of service demand.

Subject to the implementation of planned maintenance and upgrade works by the relevant utility providers, the baseline utility environment is expected to remain generally consistent with the conditions described in Section 16.3, while continuing to undergo normal operational and capacity-related changes over the assessment period. In addition, other strategic infrastructure projects within the wider area, including DART+ West, may result in localised utility diversions, protection measures, upgrades and modifications to existing utility infrastructure as part of their independent delivery programmes. These activities would be undertaken separately to the Proposed Development and in consultation with the relevant utility providers.

With the exception of known committed developments and infrastructure projects, detailed information regarding other specific future utility reinforcement, replacement or upgrade projects within the study area was not available at the time of assessment. Consequently, the assessment assumes that utility providers will continue to manage, maintain and upgrade their respective networks in accordance with their statutory functions and investment programmes.

Accordingly, under the Do-Nothing scenario, the Proposed Development would not give rise to any additional demand on utility infrastructure, nor would it require utility diversions, connections or infrastructure upgrades associated with the Proposed Development.

16.4.2 Construction Phase

The following outlines the key predicted impacts on major infrastructure and utilities as a result of the Construction Phase of the Proposed Development, including the worst-case scenario effects of the project to the receiving environment in respect of each major utility identified.

Major utilities include the strategic fibre, major electricity overhead lines and underground cables, water distribution and foul and surface water infrastructure, gas mains and telecommunications infrastructure. Additionally, there will be some demand on existing utilities by the construction activities (i.e., by the Construction Compounds or equipment), which is also addressed as relevant in the following sections.

The predicted impacts of the Proposed Development on each utility described below has been assessed against the criterion defined in Table 16-1.

16.4.2.1 euNetworks Strategic Fibre

No connection to the existing euNetworks strategic fibre network will be required to facilitate construction of the Proposed Development. Accordingly, the Proposed Development is not predicted to result in any increase in demand on the network during the Construction Phase and the effect in this regard will be not significant.

The Proposed Development traverses this existing strategic fibre network and, given the shallow depth at which the ducts were encountered, there is potential for interaction between the construction works

and the fibre infrastructure. The ducts were identified at depths ranging between approximately 350mm and 450mm below existing ground level.

The proposed build-up for the 3m wide greenway at this location, primarily in Section 1 of the Proposed Development (Chainage +0000 to +2895) is approximately 230mm and comprises sub-base, binder and unbound surface grit. Existing ground levels will be retained, insofar as practicable, and only limited excavation is anticipated. On this basis, diversion or lowering of the existing fibre network is not anticipated. It was however noted that during the site investigations carried out that there were locations whereby no appropriate warning marker tape was encountered. Where the ducting is unearthed during excavations and there is no such warning marker tape, the Contractor shall retrospectively install such tape at the appropriate cover (approximately 200mm) as part of the proposed pavement build-up.

Notwithstanding the above, construction activities undertaken in the vicinity of the fibre network have the potential to result in accidental damage to the ducting and associated infrastructure. Such damage could result in disruption to a strategic telecommunications asset forming part of a wider European fibre network.

Given the strategic importance of the asset and the potential for service disruption extending beyond the immediate vicinity of the Proposed Development, accidental damage to the fibre network during construction would constitute an ***adverse, significant and medium-term impact***.

16.4.2.2 Electricity

Construction compounds will require electricity to power temporary office and welfare facilities during the construction phase, estimated to be around 2-years. Power for the construction compounds will be supplied through a connection into the electricity network (with ESB record maps demonstrating that networks exist in the vicinity of each indicative compound location considered). Where such a connection is unavailable or a connection agreement cannot be obtained, compound would be powered via generators. Temporary electricity provision for works areas along the Proposed Development to power items such as temporary lighting, temporary traffic signals and other construction equipment will be provided through generators, as required.

The electricity demand during the construction phase is considered to be an ***adverse, not significant, short-term impact.***

A number of interfaces between the existing electricity infrastructure and the Proposed Development have been identified, as outlined in Table 16-3. Some local diversions and / or new connections may be required to these power supplies to accommodate the construction works which may require temporary outages.

For example, new lighting will be provided along the greenway from Hansfield to the Old Navan Road (Talbot Bridge). Connections to the existing network will therefore be required in order to supply this proposed public lighting network over sections of the scheme. Lighting is not intended to be provided on the western section of the greenway from the Kildare/Fingal County Boundary to the Hansfield Railway Bridge due to its rural nature.

There is also a risk of accidental damage to existing underground utility infrastructure during construction. Such incidents could result in temporary service interruptions affecting the existing network. Given the limited number of interfaces and duration of the construction works, any such disruptions would generally be temporary and localised in nature.

As a result of these diversions, connections, and potential accidental incidents there may be temporary local interruptions to the electricity provision during works on that infrastructure. While electricity interruptions, if required, will generally only occur for a set number of hours per day (no more than eight hours where reasonably practicable), the exact number of interruption days for particular customers for each diversion cannot be ascertained at this stage, so a worst-case scenario of 3 days has been assessed.

Where diversion of an electricity line is required which will result in the planned interruption of electricity provision and noting that there is no major infrastructure potentially being impacted, the worst-case potential impact will be ***adverse, slight and temporary.***

16.4.2.3 Water Supply Infrastructure

Construction compounds will require a water supply for welfare facilities, as well as for dust suppression. The appointed contractor shall apply for a temporary connection with Uisce Éireann when erecting construction compounds. Construction compounds will be connected into the local mains water supply where possible and a connection offer granted by Uisce Éireann (with record maps demonstrating that networks exist in the vicinity of each indicative compound location considered). Where a mains connection is not available or practicable, water tankers may be utilised.

The construction water demand associated with welfare facilities and dust suppression will be temporary in nature and limited to the duration of the Construction Phase. The demand will be supplied through existing water supply infrastructure and is not anticipated to require upgrades to the network or result in any material reduction in the level of service provided to existing users. Accordingly, while the Proposed Development will result in a temporary increase in demand on the water supply network, the resulting effect is assessed as ***adverse, not significant and short-term***.

A number of interfaces between the existing water infrastructure and the Proposed Development have been identified, as outlined in Table 12-8. Some local diversions and / or new connections may be required to water supplies to accommodate the construction works.

There is also a risk of accidental damage to existing underground utility infrastructure during construction. Such incidents could result in temporary service interruptions affecting the existing network. Given the limited number of interfaces and duration of the construction works, any such disruptions would generally be temporary and localised in nature.

As a result of these diversions, connections, and potential accidental incidents there may be temporary local interruptions to the water supply during works on that infrastructure. While water supply interruptions, if required, will generally only occur for a set number of hours per day (no more than eight hours where reasonably practicable), the exact number of interruption days for particular customers for each diversion cannot be ascertained at this stage, so a worst-case scenario of 3 days has been assessed.

Where diversion of a watermain is required which will result in the planned interruption of water provision and noting that there is no major infrastructure potentially being impacted, the worst-case potential impact will be ***adverse, slight and temporary***.

16.4.2.4 Sewerage (Foul Water Drainage)

There will be wastewater generated by welfare facilities associated with the construction compounds and construction areas. The appointed Contractor shall apply for a temporary connection with Uisce Éireann when establishing construction compounds. Construction compounds will be connected to the local foul and/or combined sewer network where feasible and subject to agreement with Uisce Éireann (with record maps demonstrating that networks exist in the vicinity of each indicative compound location considered). Where a connection is not available, on-site storage tanks will be provided for the collection of foul wastewater, which will be emptied by suction tanker and transported to a suitably licensed wastewater treatment facility. Temporary welfare facilities, such as portable toilets, may also be utilised where required, with wastewater collected and disposed of at appropriately licensed facilities.

Wastewater generation associated with the Construction Phase will be temporary in nature and limited to that arising from construction personnel and site welfare facilities. Where connections to the public sewer network are provided, the resulting discharge volumes are anticipated to be small in comparison to the capacity of the existing network and are not expected to adversely affect the operation of the existing foul drainage infrastructure. Where connections are not available, wastewater will be contained and removed from site for off-site treatment, thereby avoiding any demand on the local sewerage network.

Accordingly, while the Proposed Development will result in a temporary increase in wastewater generation during the Construction Phase, the effect on the existing foul drainage network is assessed as ***adverse, not significant, short-term impact***.

While a number of interfaces between the existing foul water drainage infrastructure and the Proposed Development have been identified, as outlined in Table 16-5, their cover levels are such that no major interference by the Proposed Development on the existing foul water drainage network requiring diversion works is expected.

There is also a risk of accidental damage to existing underground utility infrastructure during construction. However, given the nature of the network being gravity sewers, it is not expected that such accidental damage would result in an interruption to operation of the system.

Therefore, it is predicted that there will be ***no significant impact*** to the foul water drainage network as a result of diversions during construction of the Proposed Development.

16.4.2.5 Surface Water Drainage

There will be surface water runoff generated by the construction compounds and construction areas. Surface water run-off will emanate from any areas of the construction compounds and construction areas which form part of the works and are likely to increase run-off.

There will be limited upgrade works required to the surface water drainage network to facilitate the changes to the existing greenway and road alignments and the impermeable surface area. Much of this work will involve the construction of new road gullies to align with the new kerb line at junctions and the provision of filter drains along the greenway to control flow of surface water. All surface water will continue to drain into existing networks and outfalls. Such connections would likely not result in any disruption to the existing network.

There is also a risk of accidental damage to existing underground utility infrastructure during construction. However, given the nature of the network being gravity sewers, it is not expected that such accidental damage would result in an interruption to operation of the system.

Therefore, the impact is expected to be ***adverse, not significant, short-term impact***.

Refer to Chapter 12 (Water & Hydrology) for further information on surface water drainage impacts during the Construction Phase of the Proposed Development.

16.4.2.6 Gas

There will be no requirement for a connection to existing gas infrastructure during the construction phase of the Proposed Development. Therefore, ***no significant impacts*** associated with gas demand are predicted during the construction phase.

A number of interfaces between the existing gas infrastructure and the Proposed Development have been identified, as outlined in Table 16-7. Localised diversions to existing gas supplies may be required to facilitate the construction works and could necessitate temporary service outages.

There is also a risk of accidental damage to existing underground utility infrastructure during construction. Such incidents could result in temporary service interruptions affecting the existing network. Given the limited number of interfaces and duration of the construction works, any such disruptions would generally be temporary and localised in nature.

As a result of these diversions and potential accidental incidents there may be temporary local interruptions to gas supply during works affecting this infrastructure. While any planned interruptions to gas supply would generally occur for limited periods each day (typically no more than eight hours, where reasonably practicable), the exact duration and number of interruption days affecting individual customers cannot be confirmed at this stage. Therefore, a worst-case scenario of up to three days has been assessed.

It is noted that, while major gas mains cross the Proposed Development, their depth and location are such that significant interference from the Proposed Development is not anticipated and major diversion works are therefore not expected.

Where diversion of a gas main is required and results in a planned interruption to gas supply and noting that no major gas infrastructure is expected to be affected, the worst-case potential impact is predicted to be ***adverse, slight and temporary.***

16.4.2.7 Telecommunications

Telecommunications services will be required at the main Construction Compounds to support site administration, communications and project delivery activities during the Construction Phase.

The demand generated by the Construction Compounds will be temporary in nature and limited to typical office and welfare facility telecommunications requirements. Given the extensive capacity of the existing fixed and mobile telecommunications networks serving the area, the additional demand arising from the Proposed Development is not anticipated to require network upgrades, affect network performance or reduce the level of service available to existing users.

Accordingly, the impact on the telecommunications network during the Construction Phase is considered to be an ***adverse, imperceptible and short-term impact***.

A number of interfaces between the existing telecommunications infrastructure and the Proposed Development have been identified, as outlined in Table 16-8. Some local diversions may be required to telecommunication supplies to accommodate the construction works which may require temporary outages. New telecommunications services will be required for traffic signals at the junctions and new ducting will be provided along the greenway route to future proof for connections to CCTV, etc. Connections to the existing network will therefore be required in order to provide the required supply over sections of the scheme.

There is also a risk of accidental damage to existing underground utility infrastructure during construction. Such incidents could result in temporary service interruptions affecting the existing network. Given the limited number of interfaces and duration of the construction works, any such disruptions would generally be temporary and localised in nature.

As a result of these diversions, connections, and potential accidental incidents there may be temporary local interruptions to the local telecommunications networks during works on that infrastructure. While telecommunications interruptions, if required, will generally only occur for a set number of hours per day (no more than eight hours where reasonably practicable), the exact number of interruption days for particular customers for each diversion cannot be ascertained at this stage. However, the existing routes in the locations outlined are part of a robust wider network, and as such a worst-case scenario of 1 day interruption has been assessed.

Where diversion of a telecommunications line is required and results in the planned interruption of telecommunications services, the worst-case potential impact will be ***adverse, not significant and temporary.***

16.4.3 Operational Phase

The main impacts on major infrastructure and utilities will be associated with the Construction Phase. However, there will be some demand on utilities by the Proposed Development once operational. These impacts are outlined in the following sections.

16.4.3.1 euNetworks Strategic Fibre

The Proposed Development will not require any connection to, or interaction with, the existing fibre network during the Operational Phase.

Site investigations identified locations where the existing fibre ducting was not provided with warning marker tape. During construction, where fibre ducting is exposed and warning marker tape is absent, appropriately located warning tape will be installed above the ducting prior to reinstatement. This will improve the long-term identification and protection of the fibre infrastructure and reduce the risk of accidental damage during future third-party excavation works.

As a result, the Proposed Development will provide a minor betterment to the protection of the existing strategic fibre network. Therefore, a ***positive, slight and long-term impact*** is predicted during the Operational Phase

16.4.3.2 Electricity

Power will be required for public lighting, information displays, traffic signals and other ancillary equipment during the Operational Phase of the Proposed Development. The resulting electricity demand will be limited in scale and will be supplied through the existing electricity distribution network. The demand associated with the Proposed Development is not anticipated to require significant reinforcement of the wider electricity network, reduce available network capacity or adversely affect the level of service provided to existing users.

Accordingly, the increase in electricity demand arising from the Proposed Development is considered to be imperceptible and the predicted effect on the electricity network is ***adverse, imperceptible and long-term***.

16.4.3.3 Water

The Proposed Development will not result in any additional water provision being required after the construction phase is completed. Therefore, there is ***no significant operational phase impact*** anticipated on water infrastructure as a result of the Proposed Development.

16.4.3.4 Foul Water Drainage

The Proposed Development will not require any foul water drainage connection to operate. Therefore, there is ***no significant Operational Phase impact*** anticipated on foul water drainage infrastructure as a result of the Proposed Development.

16.4.3.5 Surface Water Drainage

Once the Proposed Development is constructed, the hardstanding surface area will be larger in some locations. This larger surface area will result in additional surface water runoff. The effects of climate change may also increase the frequency and intensity of rainfall events, resulting in increased runoff volumes over time. Drainage upgrades and SuDS measures have been included as part of the design of the Proposed Development. Impacts on watercourses and water quality as a result of any potential increases in surface water runoff through existing outfalls are assessed in Chapter 12 (Water and Hydrology).

No Significant Impact on existing surface water infrastructure is predicted.

16.4.3.6 Gas

The Proposed Development will not require any gas connection to operate. Therefore, there is no significant Operational Phase impact anticipated on gas infrastructure as a result of the Proposed Development.

16.4.3.7 Telecommunications

Once the Proposed Development is operational, telecommunications links will be required for such equipment as traffic signal controllers at the proposed road crossings. Generally, this equipment will be connected to the local fibre optic cable network via ducting connected to fibre cabinets. This type of infrastructure is already in operation at relevant locations on the Proposed Development route. Therefore, any additional telecommunications requirements by any new infrastructure will be minimal.

Therefore, the anticipated impact on telecommunications demand during the Operational Phase will be ***adverse, imperceptible and long-term.***

16.4.4 Summary of Predicted Impacts

A summary of the predicted impacts for the Construction and Operational Phases is set out in Table 15-7.

Table 16-9 Summary of Predicted impacts

Phase	Assessment Topic	Potential Impact
Construction	Strategic Fibre	Adverse, significant and short-term
	Electricity – Demand	Adverse, Not Significant, Short-Term
	Electricity – Interruption	Adverse, Slight and Temporary
	Water Supply Infrastructure – Demand	Adverse, Not Significant and Short-Term
	Water Supply Infrastructure – Interruption	Adverse, Slight and Temporary
	Sewerage (Foul Water Drainage) – Demand	Adverse, Not Significant, Short-Term
	Sewerage (Foul Water Drainage) – Interruption	No significant impact
	Gas – Demand	No significant impact
	Gas – Interruption	Adverse, Slight and Temporary
	Telecommunications – Demand	Adverse, Not Significant, Short-Term
	Telecommunications – Interruption	Adverse, Not Significant and Temporary
Operational	Strategic Fibre	Positive, slight, long-term
	Electricity	Adverse, imperceptible and long-term
	Water Supply Infrastructure	No significant impact
	Sewerage (Foul Water Drainage)	No significant impact
	Gas	No significant impact
	Telecommunications	Adverse, imperceptible and long-term

16.5 Mitigation Measures

The potential for the Proposed Development to impact or interrupt utility supply has been assessed.

The following sections outline the measures that will be implemented to avoid, reduce or manage predicted impacts on material assets during the Construction and Operational Phases of the Proposed Development.

The mitigation measures identified in this chapter are reflected within the Construction Methodology Report (CMR) [170239-DBFL-XX-XX-RP-C-0003] and the Outline Construction Environmental Management Plan (OCEMP) [170239-DBFL-XX-XX-RP-C-0004], as appropriate, and shall form part of the environmental management requirements applicable to the Contractor during the Construction Phase. A detailed Construction Environmental Management Plan (CEMP) will be prepared by the Contractor prior to the commencement of works and will be required to be consistent with the commitments and mitigation measures set out in the OCEMP.

No specific operational monitoring measures are considered necessary in respect of material assets and utilities. While an adverse significant effect has been identified in relation to accidental damage to the euNetworks strategic fibre network under the unmitigated scenario, the implementation of the mitigation measures described in Section 16.5.1, including utility record verification, confirmation of utility locations, consultation with the utility owner and supervised works in the vicinity of the asset, will substantially reduce the likelihood of such an occurrence.

As the residual effect is not predicted to be significant, no specific monitoring measures are considered necessary.

16.5.1 Construction Phase

The Contractor shall obtain the most up-to-date utility information available from the relevant utility owners prior to commencement of construction works and shall be responsible for establishing the completeness and adequacy of the utility information available in relation to all identified utilities. The Contractor shall also investigate any subsequently identified utilities and establish the relevant utility owner's requirements in relation to such infrastructure.

Where required, utility locations shall be verified through appropriate survey and investigation measures, including utility detection surveys, trial holes, slit trenches and consultation with the relevant utility providers. The requirement for any utility diversions, protection measures or specific construction methodologies shall be confirmed following completion of these investigations.

The Contractor shall implement appropriate measures to ensure that existing utility services are maintained throughout the Construction Phase, unless otherwise agreed in advance with the relevant utility owner and, where applicable, the relevant local authority. All works in the vicinity of utility infrastructure shall be undertaken in consultation with the relevant utility owner and in accordance with their requirements, standards and safe working procedures.

Where utility diversions are required, these shall be undertaken in accordance with utility owner requirements and approved construction methodologies. Any planned service interruptions required to facilitate utility diversion or tie-in works shall be agreed in advance with the relevant utility owner and communicated to affected customers and stakeholders as appropriate.

Where new utility connections are required to facilitate construction activities, including construction compounds, the Contractor shall obtain all necessary approvals and connection agreements from the relevant utility provider and shall comply with the associated requirements and conditions.

In the vicinity of the euNetworks strategic fibre network, the Contractor shall, prior to commencement of excavation works, verify the location and depth of the fibre ducting through appropriate utility detection and verification measures, including non-intrusive surveys and, where required, controlled hand excavation.

No mechanical excavation shall be undertaken within the identified exclusion zone surrounding the fibre ducting until the location of the asset has been confirmed and appropriate protection measures have been implemented.

All works in the vicinity of the fibre network shall be undertaken in consultation with euNetworks and in accordance with the asset owner's requirements and approved safe systems of work.

These measures will ensure that the location of the fibre network is confirmed prior to excavation and that construction activities are undertaken under controlled conditions in the vicinity of the asset, thereby minimising the potential for accidental damage to the strategic fibre network and associated service interruptions.

The mitigation measures identified in this chapter are reflected within the Construction Management Report (CMR) and the Outline Construction Environmental Management Plan (OCEMP), as appropriate, and shall form part of the environmental management requirements applicable to the Contractor during the Construction Phase.

16.5.2 Operational Phase

The Proposed Development has been designed to avoid, where practicable, impacts on existing utility infrastructure and to incorporate appropriate utility protection measures, drainage infrastructure and crossing arrangements.

Any utility infrastructure diverted, upgraded or replaced as part of the Proposed Development shall be designed and constructed in accordance with the requirements of the relevant utility owner and applicable standards. Following completion of the works, such infrastructure shall be incorporated into the relevant utility owner's operation, maintenance and asset management programmes.

No specific operational mitigation measures are considered necessary in respect of material assets and utilities, as no significant residual effects on utility infrastructure are predicted during the Operational Phase

16.6 Residual Impacts

A summary of the predicted residual impacts for the Construction and Operational Phases, following implementation of the mitigation measures outlined in Section 16.5, is set out in Table 16-10. Residual effects on material assets and utilities are predicted to range from No Significant Impact to Slight Adverse.

Residual effects associated with planned, short-duration interruptions to electricity, water supply, gas and telecommunications services may remain adverse and temporary in nature; however, these effects are localised, short-term and are not predicted to result in significant disruption to service provision. In the case of the euNetworks strategic fibre network, implementation of the identified mitigation measures removes the credible pathway for accidental damage during construction and reduces the residual effect to No Significant Impact. Accordingly, no Significant, Very Significant or Profound residual effects on material assets and utilities are predicted during either the Construction or Operational Phases.

Table 16-10 Summary of Residual Impacts

Phase	Assessment Topic	Predicted Impact (Pre-Mitigation)	Residual Impact (Post-Mitigation)
Construction	Strategic Fibre	Adverse, significant and medium-term	No significant impact
	Electricity – Demand	Adverse, Not Significant, Short-Term	Adverse, Not Significant, Short-Term
	Electricity – Interruption	Adverse, Slight and Temporary	Adverse, Slight and Temporary
	Water Supply Infrastructure – Demand	Adverse, Not Significant and Short-Term	Adverse, Not Significant and Short-Term
	Water Supply Infrastructure – Interruption	Adverse, Slight and Temporary	Adverse, Slight and Temporary
	Sewerage (Foul Water Drainage) – Demand	Adverse, Not Significant, Short-Term	Adverse, Not Significant, Short-Term
	Sewerage (Foul Water Drainage) – Interruption	No significant impact	No significant impact
	Surface Water Drainage	Adverse, Not Significant, Short-Term	Adverse, Not Significant, Short-Term
	Gas – Demand	No significant impact	No significant impact
	Gas – Interruption	Adverse, Slight and Temporary	Adverse, Slight and Temporary
	Telecommunications – Demand	Adverse, Imperceptible and Short-Term	Adverse, Not Significant, Short-Term
	Telecommunications – Interruption	Adverse, Not Significant and Temporary	Adverse, Not Significant and Temporary
Operational	Strategic Fibre	Positive, slight, long-term	Positive, slight, long-term
	Electricity	Adverse, imperceptible and long-term	Adverse, imperceptible and long-term
	Water Supply Infrastructure	No significant impact	No significant impact
	Sewerage (Foul Water Drainage)	No significant impact	No significant impact
	Surface Water Drainage	No significant impact	No significant impact
	Gas	No significant impact	No significant impact
	Telecommunications	Adverse, imperceptible and long-term	Adverse, imperceptible and long-term

Following implementation of the mitigation measures outlined in Section 16.5, no Significant, Very Significant or Profound residual effects on material assets and utilities are predicted during either the Construction or Operational Phases. Residual effects are assessed as ranging from No Significant Impact to Slight Adverse and are considered acceptable in the context of the Proposed Development.

16.7 Cumulative Impacts

The cumulative assessment has considered the Proposed Development in combination with other permitted, approved and reasonably foreseeable developments within the study area for utilities. For the purposes of this assessment, the cumulative study area comprises the Proposed Development

corridor and surrounding lands within which utility networks may be shared, diverted or upgraded, including developments identified in Chapter 1 of this EIAR.

Relevant developments considered include committed residential and mixed-use developments identified in Chapter 1 of this EIAR, proposed BusConnects infrastructure schemes and the approved DART+ West project. Residential and commercial developments have the potential to contribute to cumulative demand on water supply, wastewater, electricity and telecommunications networks, while major infrastructure projects such as DART+ West and BusConnects may require utility diversions, protection works and temporary service interruptions during construction.

During the Construction Phase, cumulative effects could arise where utility diversion works, new service connections, utility upgrades or maintenance activities associated with these developments occur concurrently with construction of the Proposed Development. In particular, utility diversion and protection work associated with DART+ West may occur within the same general utility corridors as the Proposed Development, while residential and commercial developments may generate additional temporary demand associated with construction compounds and welfare facilities.

Notwithstanding this, utility diversion works are subject to approval and coordination by the relevant utility providers, who manage service continuity requirements across their networks. Where temporary service interruptions are required, these would be managed through consultation with utility providers, coordination of works programmes and advance notification to affected customers. Accordingly, the cumulative Construction Phase effect on utilities is assessed as ***adverse, not significant and temporary***.

During the Operational Phase, the Proposed Development will generate only limited utility demand associated primarily with public lighting, traffic signals, signage and ancillary infrastructure. No significant demand for water supply, wastewater or gas infrastructure will arise. While other permitted and approved developments within the study area will also generate operational utility demands, these demands are expected to be accommodated through the normal planning, connection and network reinforcement processes of the relevant utility providers. Consequently, a material reduction in available network capacity or service provision is not anticipated. The cumulative Operational Phase effect is therefore assessed as ***adverse, imperceptible and long-term***.

16.8 Summary of Interactions

Interactions between the material assets for utilities are likely to occur with other environmental elements assessed as part of the EIAR process. This chapter summarises these interaction which are further detailed and assessed in Chapter 18: Interrelationships, Interactions and Indirect Effects.

16.8.1 Air Quality

Interactions with Air Quality arise during the Construction Phase when excavations are undertaken on site. An Outline Construction Environmental Management Plan (OCEMP) [170239-DBFL-XX-XX-RP-C-0003] has been developed to minimise disturbance caused by excavations required for the installation or diversion of utilities. Dust control measures identified in the OCEMP and Chapter 5 (Air Quality) will be implemented during construction to minimise dust emissions arising from excavation and utility work.

16.8.2 Climate

Interactions with Climate arise through operational electricity demand associated with public lighting and traffic signals and through the design of drainage infrastructure having regard to projected climate change rainfall allowances. These impacts are anticipated to be adverse, imperceptible and long-term.

16.8.3 Noise and Vibration

Development of the Proposed Development will result in construction noise and vibration effects associated with excavation and utility works. Construction-related utility excavation works form part of the construction activities assessed in Chapter 7 (Noise and Vibration). Potential effects and associated mitigation measures are detailed therein. Noise and vibration control measures identified in the OCEMP implemented during construction in order to minimise disturbance caused by construction activities.

16.8.4 Biodiversity.

Interactions with Biodiversity may arise during the Construction Phase where vegetation clearance, groundworks or utility works occur near habitats or watercourses. Further details, including potential effects and mitigation measures, are outlined in Chapter 8 Biodiversity.

16.8.5 Archaeology & Cultural Heritage

Interactions with Archaeology and Cultural Heritage arise during the Construction Phase where groundworks are undertaken. Archaeological monitoring of relevant groundworks will be implemented by an appointed archaeologist, as set out in Chapter 9.

16.8.6 Landscape and Visual

Interactions with the landscape and visuals are related to the above ground infrastructure installed for public lighting and traffic signals. These will be considered as part of the visual impact study conducted for this EIAR, with appropriate mitigations as detailed in Chapter 10.

16.8.7 Land, Soils and Geology

Interactions with Land, Soils and Geology arise during the construction phase in that excavations are required for the installation of utility infrastructure. Potential effects associated with excavation, stockpiling, re-use and disposal of excavated materials are assessed in Chapter 11 (Land, Soils and Geology).

16.8.8 Water

Interactions with Water and Hydrology arise during the Construction Phase when excavations are undertaken and where groundwater or surface water pathways may be encountered. Protection measures contained within the OCEMP and Chapter 12 (Water and Hydrology), including pollution prevention, sediment control and surface water management measures, will be implemented during construction to minimise disturbance caused by excavations on site.

16.8.9 Population & Human Health

Interactions with Population and Human Health arise during the Construction Phase where excavation or utility diversion works could cause temporary disturbance or short-duration service interruptions. The mitigation measures set out in the OCEMP will be implemented to minimise disturbance caused by excavations required for the installation or diversion of utilities.

16.8.10 Material Assets – Traffic and Transport

Interactions with Traffic and Transport arise during the Construction Phase where utility works require temporary traffic management, and during the Operational Phase where electricity and telecommunications connections are required for traffic signalling. These interactions are addressed in Chapter 14 (Material Assets: Traffic and Transport.

16.8.11 Material Assets – Waste Management

Interactions with Waste Management arise during the Construction Phase where soil, subsoil or redundant utility materials are generated from excavation works. The management, recovery and disposal of excavated material and redundant utility infrastructure is assessed in Chapter 15 (Material Assets - Waste Management).

16.9 References

This assessment was carried out in accordance with the following guidance and established best practice:

- Environmental Protection Agency (EPA) Guidelines on the information to be contained in the EIAR (May 2022);
- Fingal County Council Development Plan 2023-2029;
- Utility records obtained from Uisce Éireann, Eir, ESB Networks, Gas Networks Ireland, Virgin Media, eNet and euNetworks.

17 Material Assets: Land Use and Property

17.1 Introduction

This chapter assesses the likely significant effects of the Proposed Development on Material Assets: Land Use and Property during the construction phase and operational phase. This chapter describes and assesses the likely direct and indirect effects of the Proposed Development on land use and property, in accordance with the requirements of Directive 2014/52/EU of the European Parliament and of the Council of 16 April 2014 amending Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment (the "EIA Directive"). The assessment considers current land use patterns within the study area and evaluates the effects of the Proposed Development on permanent and temporary land take, land acquisition, property interests, access, severance, land use compatibility, planned development lands and future development potential. This chapter also provides a characterisation of the receiving environment.

The Royal Canal Urban Greenway, hereafter referred to as the 'Proposed Development', is a pedestrian and cycle route approximately 8.1km in length. It will be constructed along and adjacent to the Royal Canal, extending eastwards from the Kildare County Boundary to the Old Navan Road, near the 12th Lock, where it will connect with the previously constructed Ashtown Greenway. A full description of the Proposed Development is outlined in Chapter 1 (Section 1.4) of this EIAR.

This chapter has been prepared by Maria Rochford BSc (Hons), MRUP MIPI, Associate Director at KPMG Planning. Maria has 15 years of professional experience as a Town Planner. Maria has coordinated multiple EIARs for development projects and has authored introductory chapters, cumulative impact assessments, Population and Human Health assessments and Land Use and Property assessments for inclusion in EIARs.

17.2 Methodology

17.2.1 Legislation, Policy and Guidance

This chapter has been prepared having regard to the requirements of Directive 2011/92/EU, as amended by Directive 2014/52/EU (the EIA Directive), which requires the assessment of the likely significant effects of certain projects on the environment. The information presented in this chapter has been prepared in accordance with Annex IV of the EIA Directive and the corresponding information requirements set out in Schedule 6 of the Planning and Development Regulations 2001 (as amended), insofar as they relate to the assessment of Material Assets: Land Use and Property.

The Proposed Development constitutes a road development and is being advanced by Fingal County Council pursuant to Section 51 of the Roads Act 1993 (as amended), which provides the statutory consenting route for the scheme. The Proposed Development is subject to Environmental Impact Assessment and this chapter forms part of the Environmental Impact Assessment Report prepared in support of that consent process. Further details of the statutory and procedural framework applicable to the Proposed Development are provided in Chapter 1 of this EIAR.

The assessment considers the nature and extent of land take and land use requirements associated with the Proposed Development during both the construction and operational phases. The Proposed Development will require the acquisition of a range of land and property interests, including permanent and temporary land requirements. Where required, land acquisition may be facilitated through the exercise of compulsory acquisition powers under Section 76 of the Housing Act 1966 (as amended), the Planning and Development Act, 2000 (as amended) and other relevant statutory provisions governing the acquisition of land and property rights for public infrastructure projects.

In addition, having regard to the function of the Proposed Development as a strategic greenway and active travel corridor, the assessment considers potential effects on existing and planned land uses, land use compatibility and future development potential within the study area.

This chapter has also been prepared having regard to the European Commission Guidance on the Preparation of the Environmental Impact Assessment Report (2017), the Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (2018), the EPA Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (2022), and the TII publication *Environmental Impact Assessment of Rural Cycleways (Offline & Greenway) – A Practical Guide* (2024). A full list of references is provided in Section 17.10.

17.2.2 Information Sources

This assessment has been informed by a review of the Proposed Development design drawings, CPO maps and schedules, land acquisition plans, Ordnance Survey mapping, aerial photography, site inspections, planning policy documents and land use zoning information contained within the Fingal County Development Plan 2023-2029. Please refer to the 'Compulsory Purchase Order – CPO Drawing Pack' submitted with this application for full context on permanent and temporary CPO areas via the CPO maps and drawings. The assessment has also had regard to available planning information relating to lands within and adjoining the study area.

The assessment of likely effects on land use and property is based primarily on the extent of permanent and temporary land take identified within the CPO schedules and drawings, together with the existing land use characteristics observed during desk-based review and site inspections. Professional judgement has been applied in assessing the significance of effects having regard to the nature of the affected lands, existing and planned land uses, land ownership requirements and the scale of the Proposed Development.

No significant information gaps or technical deficiencies were identified that would prevent an assessment of the likely significant effects on Material Assets: Land Use and Property. While certain lands are identified as unregistered within the CPO schedules, sufficient information was available to assess the likely effects of land acquisition and land use change arising from the Proposed Development. The assessment is also based on the preliminary design and construction information available at the time of preparation of this EIAR. Detailed construction methodologies and programme information were not available at the time of assessment and may be refined during subsequent design stages; however, this is not considered likely to materially alter the conclusions of the assessment. A full list of references is provided in Section 17.10.

17.2.3 Assessment Methodology

The impact assessment methodology used is in alignment with the assessment of the likely significant effects as set out in 'Description of Effects' Table 3.4 of the Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (EPA, 2022). In accordance with the EPA Guidelines, the impact assessment focuses on likely, significant effects of the Proposed Development.

The impact assessment is therefore focused on identifying the likely significant effects of the Proposed Development, as categorised according to quality, significance and duration and frequency. The extent, context and frequency of effects have been considered in the assessment process, where relevant. The relevant terms listed in Table 17.1 are used to describe specific effects under each category. This is based on Table 3.4 of the EPA Guidelines referred to above. As stated in the Guidelines, all categories set out in Table 3.4 do not need to be used for every effect.

Table 17-1 Description of Effects

Quality of Effects	
Positive	A change which improves the quality of the environment.
Neutral	No effects or effects that are imperceptible, within normal bounds of variation or within the margin of forecasting error.
Negative	A change which reduces the quality of the environment.
Significance of Effects	
Imperceptible	An effect capable of measurement but without significant consequences.
Not Significant	An effect which causes noticeable changes in the character of the environment but without significant consequences.
Slight	An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.
Moderate	An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline trends.
Significant	An effect which, by its character, magnitude, duration or intensity alters a sensitive aspect of the environment.
Very Significant	An effect which, by its character, magnitude, duration or intensity significantly alters most of a sensitive aspect of the environment.
Profound	An effect which obliterates sensitive characteristics.
Duration and Frequency of Effects	
Momentary Effects	Effects lasting from seconds to minutes.
Brief Effects	Effects lasting less than a day.
Temporary	Effects lasting less than a year.
Short-term	Effects lasting one to seven years.
Medium-term	Effects lasting seven to fifteen years.
Long-term	Effects lasting fifteen to sixty years.
Permanent	Effects lasting over sixty years.
Reversible	Effects than can be undone, for example through remediation or restoration

The EPA Guidelines note that the significance of effects is usually understood to mean the importance of the outcome of the effects (the consequences of the change). Significance is determined by a combination of objective scientific and subjective social concerns.

The assessment of likely significant effects has been based on professional analysis, assessment, judgement, and experience. In so far as possible, the impact assessment describes the basis of these judgements so that the varying degrees of significance attributed to different factors can be understood. Significance ratings are determined having regard to the sensitivity and importance of the affected land use or property receptor and the magnitude of the change arising from the Proposed Development. This includes consideration of the scale, extent, duration and reversibility of the effect, together with any implications for land ownership, land use, access arrangements, severance and the future development potential of the affected lands.

The significance and magnitude of effects are also described as follows and as relevant:

- Direct effects – these are directly lost, created and/or supported by the Proposed Development.

- Indirect effects – these are effects which are dependent on, or result from, the direct effects of the project.

For the purposes of this assessment, effects assigned a significance rating of Significant, Very Significant or Profound are considered to constitute likely significant effects in EIA terms. Effects assessed as Moderate, Slight, Not Significant or Imperceptible are not considered likely significant effects, although they are reported where relevant to provide a comprehensive assessment of environmental effects. This approach is consistent with the EPA Guidelines, which distinguish between effects that alter a sensitive aspect of the environment and those that do not.

Potential cumulative, do-nothing, worst case, indeterminable, irreversible, residual, and synergistic effects of the Proposed Development are also described, where relevant.

For the purposes of this assessment, a worst-case scenario has been assumed whereby all permanent and temporary land acquisition requirements identified within the CPO schedules and drawings are required, all temporary working areas and construction compounds are occupied concurrently during the construction phase, and all associated vegetation clearance, access restrictions and land use changes identified for the Proposed Development are implemented. This represents the maximum foreseeable extent of land take and disturbance associated with the Proposed Development and forms the basis of the assessment presented in this chapter.

The residual impacts (Section 17.6) set out the final effects which occur after the proposed mitigation measures (measures designed to avoid, prevent, reduce or, if possible, offset significant adverse effects) are implemented.

Land Use and Property Issues Considered

The assessment focused on the potential effects of the Proposed Development on existing and planned land uses within the study area, including the compatibility of the Proposed Development with applicable planning policy and land use zoning objectives contained within the Fingal County Development Plan 2023-2029.

Particular consideration was given to:

- Permanent and temporary land acquisition requirements associated with the Proposed Development, including lands subject to Compulsory Purchase Order (CPO);
- Potential effects on property interests, land ownership, access arrangements and land use arising from the Proposed Development;
- Potential effects on community, recreational and amenity land uses, including public open spaces and the Royal Canal corridor;
- Potential effects on agricultural lands arising from permanent or temporary land take;
- The consistency of the Proposed Development with relevant planning policy, land use zoning objectives and local area plans; and
- Potential cumulative interactions with other permitted, approved or proposed developments insofar as they relate to land use and development patterns within the study area.

17.2.4 Public Consultation Process & Documents

A comprehensive programme of stakeholder and public consultation was undertaken during the development of the Royal Canal Urban Greenway. Two rounds of non-statutory public consultation were carried out, comprising an Emerging Preferred Route consultation in 2019 and a Preferred Route consultation in 2021. Engagement included public information events, consultation websites, webinars, leaflet drops, meetings with elected members and residents' groups, and opportunities for written submissions.

Particular emphasis was placed on engagement with potentially affected landowners and property occupiers. During both consultation phases, FCC issued letters directly to individuals whose lands or properties could be affected by the Proposed Development. These communications provided information on the project and offered one-to-one meetings to discuss potential impacts, access requirements, land acquisition issues, and any concerns arising from the proposals. This targeted engagement helped inform the ongoing route development and refinement process.

The consultation process generated a significant level of public participation. A total of 602 submissions were received during the 2019 Emerging Preferred Route consultation. The 2021 Preferred Route consultation also generated significant public engagement, with submissions received across a range of themes including environmental considerations, traffic and access, safety and anti-social behaviour, and scheme design.

While submissions raised a range of issues relating to route alignment, land requirements, access arrangements and local environmental considerations, the consultation process informed the ongoing refinement of the Proposed Development.

Consultation responses, including engagement with affected landowners and occupiers, assisted in identifying land use and property issues relevant to the design development process. Submissions of relevance to this chapter primarily related to land acquisition requirements and property impacts in the Hansfield area, route alignment through the Kirkpatrick Bridge to Granard Bridge section, access arrangements for adjoining landowners and residents, and the potential effects of the Proposed Development on existing land uses and future development lands along the corridor. These matters were considered during the design development process and have informed the assessment set out in this chapter. Further information on stakeholder consultation is provided in Chapter 2 of this EIAR.

17.3 Receiving Environment

The Proposed Development is a pedestrian and cycle route approximately 8.1km in length. It will be constructed along and adjacent to the Royal Canal, extending eastwards from the Kildare County Boundary to the Old Navan Road, near the 12th Lock, where it will connect with the previously constructed Ashtown Greenway. The Royal Canal Urban Greenway (RCUG) forms part of the strategic Dublin to Galway greenway corridor and supports the objectives of national, regional and local cycling and greenway policy, including the National Cycle Network, the Greater Dublin Area Cycle Network Plan and Fingal County Council's greenway and active travel strategies. A study area of 500m either side of the Proposed Development has been used to support the identification of effects and assessment of impacts, where relevant.

A description of the receiving environment for the Proposed Development is set out on a section-by-section basis below with a high-level overview of key characteristics and existing land use in the area.

In summary, the western portion of the study area is characterised by predominantly rural and open space land uses, while the eastern portion is increasingly urban in character and comprises residential, community, commercial and associated land uses. Figure 17.1 provides an overview of the permissible land uses for all sections of the proposed greenway, as per the relevant land use zoning designated within the Fingal County Development Plan 2023-2029. Almost all of the application area for the Proposed Development falls directly within the OS-Open Space with the objective to “Preserve and provide for open space and recreational amenities”. Some very small portions of the route intersect with the Greenbelt (GB), Residential (RA) and Residential Area (RS) zones, as set out later in Table 17.2.

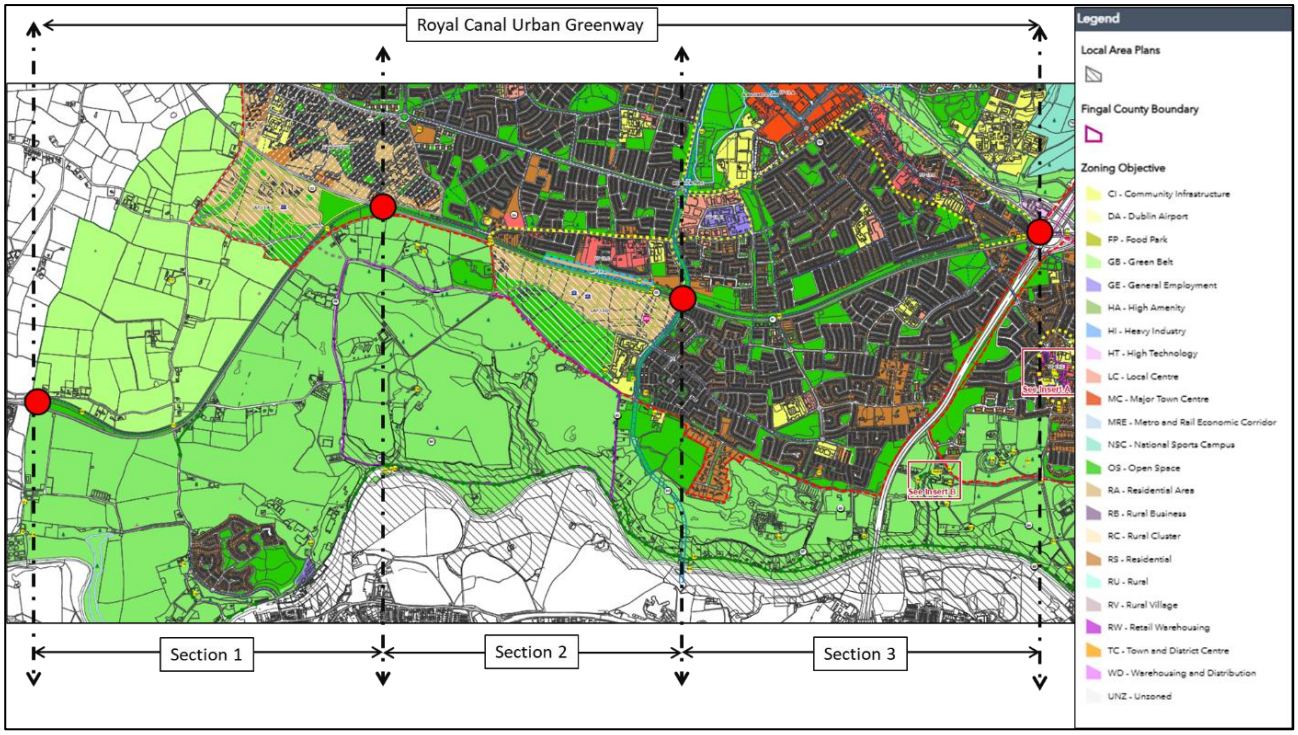


Figure 17-1 Zoning Map as per Fingal County Development Plan 2023-2029 (Section 1 to Section 3)

An overview of land use zones within the study area is provided in Figure 17.2 (please refer to Appendix 3.1 for larger version), with details for each section of the greenway provided in Figures 17.3 through 17.5. Section 1 represents the westernmost segment of the proposed greenway, extending eastward into Section 2 and terminating at Section 3.

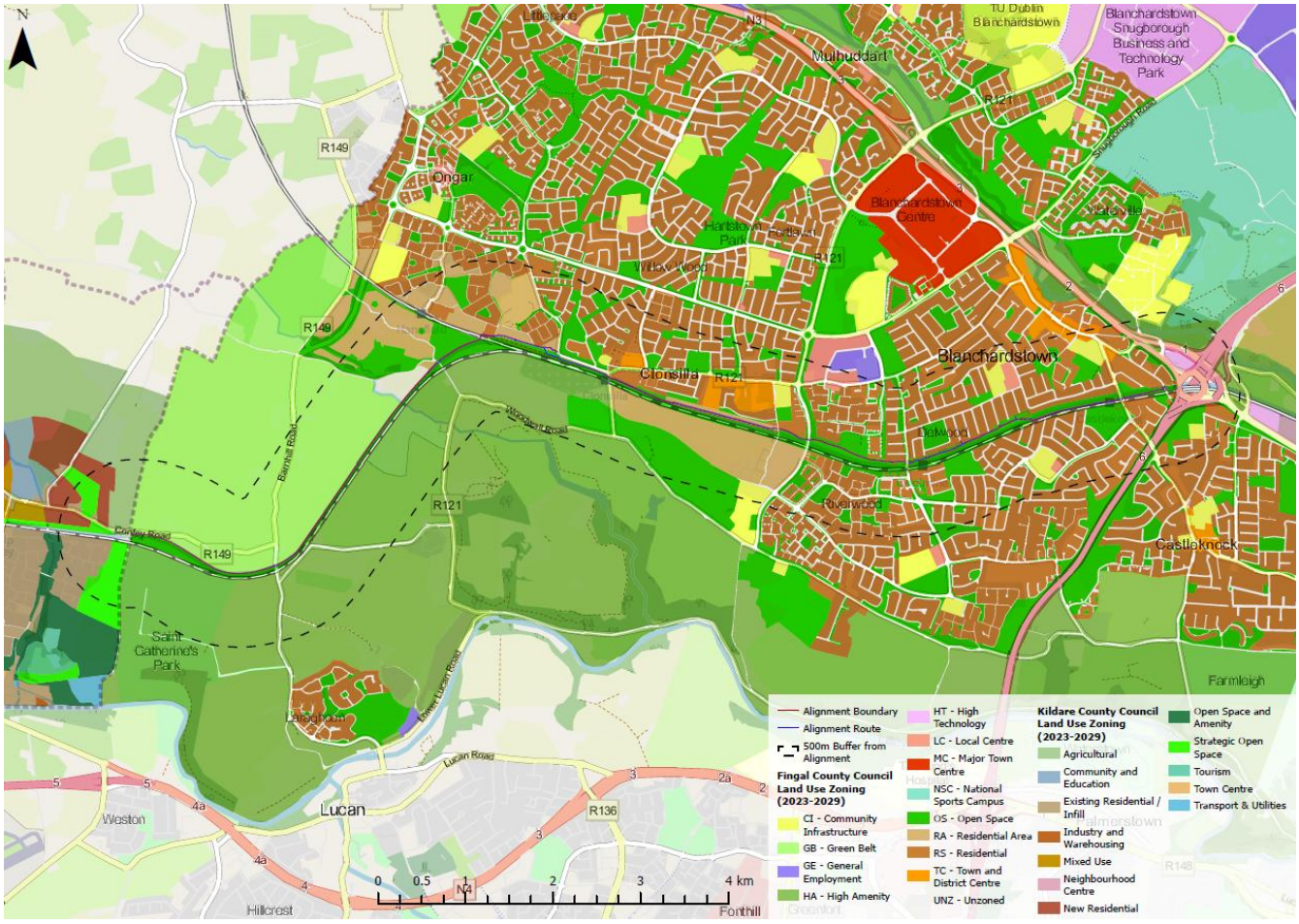


Figure 17-2 Land use zoning types for land within a 500m buffer of the RCUG alignment. Source: Fingal County Development Plan 2023 – 2029

Section 1 - *Kildare County Border to Hansfield Railway Bridge*

Section 1 extends from the Kildare County boundary eastwards to Hansfield Railway Bridge. The receiving environment is characterised by a predominantly rural and peri-urban landscape. The Royal Canal forms the defining landscape feature and traverses a largely open countryside comprising agricultural lands, hedgerows, scattered farmland and pockets of woodland vegetation. The canal corridor is designated as a proposed Natural Heritage Area (pNHA), an important ecological and recreational corridor within the wider landscape. An existing towpath is present in Section 1 and alongside much of the Royal Canal corridor and is currently used for walking and access to the canal bank. However, the existing route varies in quality and accessibility along the study area, with some sections unsuitable for all users.

Agriculture remains the dominant land use on both sides of the canal throughout much of this section, although the area is experiencing increasing development pressure associated with the continuing expansion of the Dublin 15 and Hansfield growth areas. Existing development adjacent to the corridor include Westmanstown Golf Club, Westmanstown Sports Centre, local equestrian and agricultural holdings, and a limited number of one-off rural dwellings. The Dublin–Maynooth railway line runs broadly parallel to the canal.

The landscape is generally flat and open, allowing extensive views across the surrounding agricultural lands. Vegetation along the canal comprises mature trees, scrub, grassland and hedgerows which contribute to the visual amenity and biodiversity value of the corridor.

The canal itself forms part of a significant cultural heritage landscape dating from the late eighteenth and early nineteenth centuries. Overall, Section 1 retains a distinctly rural character despite its proximity to the expanding suburban edge of Dublin, with recreation, agriculture and transport infrastructure representing the principal existing land uses.

In terms of land use zoning designations, the study area surrounding Section 1 of the proposed greenway is characterised by green areas zoned for *OS-Open Space*, *GB-Green Belt* and *HA-High Amenity*. As illustrated in **Figure 17.3** the lands adjoining Section 1 to the southeast are designated as High Amenity, with Green Belt lands adjoining the northern bank. This surrounding area also falls within the scope of the *Barnhill Local Area Plan 2019 (*LAP 13A) which is listed as an 'Operational LAP' in the Fingal County Development Plan 2023-2029.

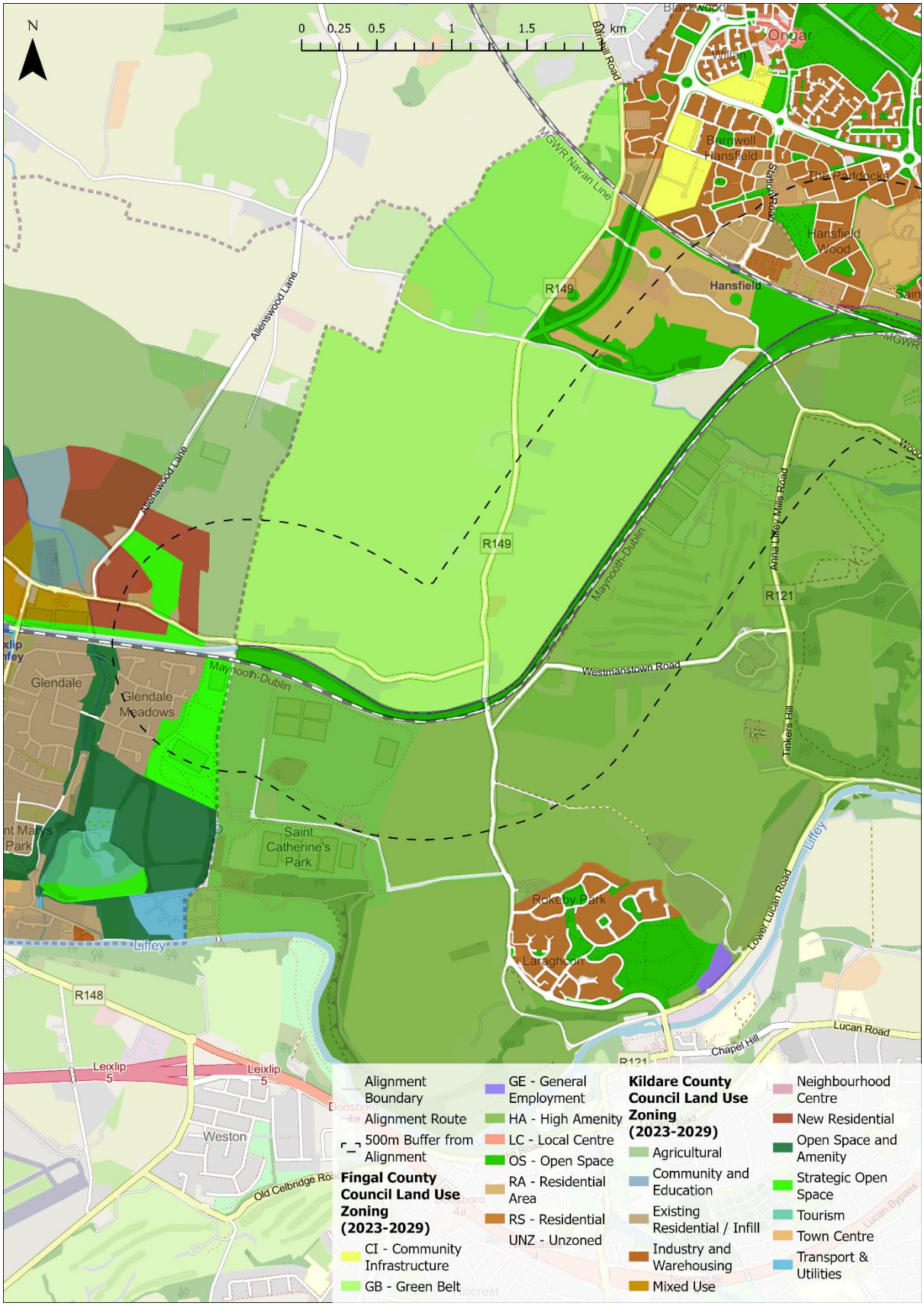


Figure 17-3 Zoning Map, RCUG - Section 1. Source: Fingal County Development Plan 2023-2029.

Section 2 - *Hansfield Railway Bridge to Kennan Bridge (Porterstown Road)*

Section 2 extends from Hansfield Railway Bridge to Kennan Bridge (Porterstown Road) and represents a transition zone between the rural landscape of west Fingal and the established suburban environments of Clonsilla and Dublin 15. The receiving environment has a mixed character with significant recent residential development coexisting alongside agricultural lands and strategic transport infrastructure.

This is an area that is undergoing substantial urban growth associated with the Hansfield Strategic Development Zone (SDZ), a principal residential growth location. Large-scale housing developments, apartment schemes, neighbourhood centres, schools and associated community infrastructure have been constructed to the north of the canal in recent years, with further phases of development continuing. By contrast, agricultural lands and open fields remain on portions of the southern side of the canal, creating a distinct contrast between the urban northern bank and the more open rural landscape to the south.

The Dublin–Maynooth railway corridor remains a dominant feature of the receiving environment and runs in close proximity to the canal for much of this section. Hansfield Railway Station and Clonsilla Railway Station serve the community in the area. Existing land uses include residential neighbourhoods, educational facilities, local parks, community facilities, railway infrastructure and agricultural lands.

This section also contains a number of protected structures and historic canal features, including Callaghan Bridge, Kennan Bridge, Porterstown School House, Clonsilla Signal Box and the former Porterstown Crossing Keeper's House. The canal also functions as an important green infrastructure corridor, providing mature tree cover, aquatic habitat and visual relief within an increasingly suburban setting.

The canal and railway occupy a narrow corridor defined by embankments and cuttings, resulting in a relatively enclosed landscape in places. While residential areas are located immediately adjacent to the route, views are often constrained by vegetation, railway embankments and changes in level.

Formal land use designations in Section 2 predominantly comprise of *OS-Open Space*, *RA-Residential Area, RS-Residential* zonings to the north, and *OS-Open Space*, *HA-High Amenity* and *RA-Residential Area* lands to the south (Fingal County Development Plan 2023-2029). As illustrated in **Figure 17.4**, the southern side of the route interacts with the *Kellystown Local Area Plan (LAP 13B)*. The northern side of Section 2 is surrounded by a number of zones including *TC-Town and District Centre, RS-Residential* and *RA-Residential Area.* This section also includes a portion of the proposed *Hansfield SDZ*.

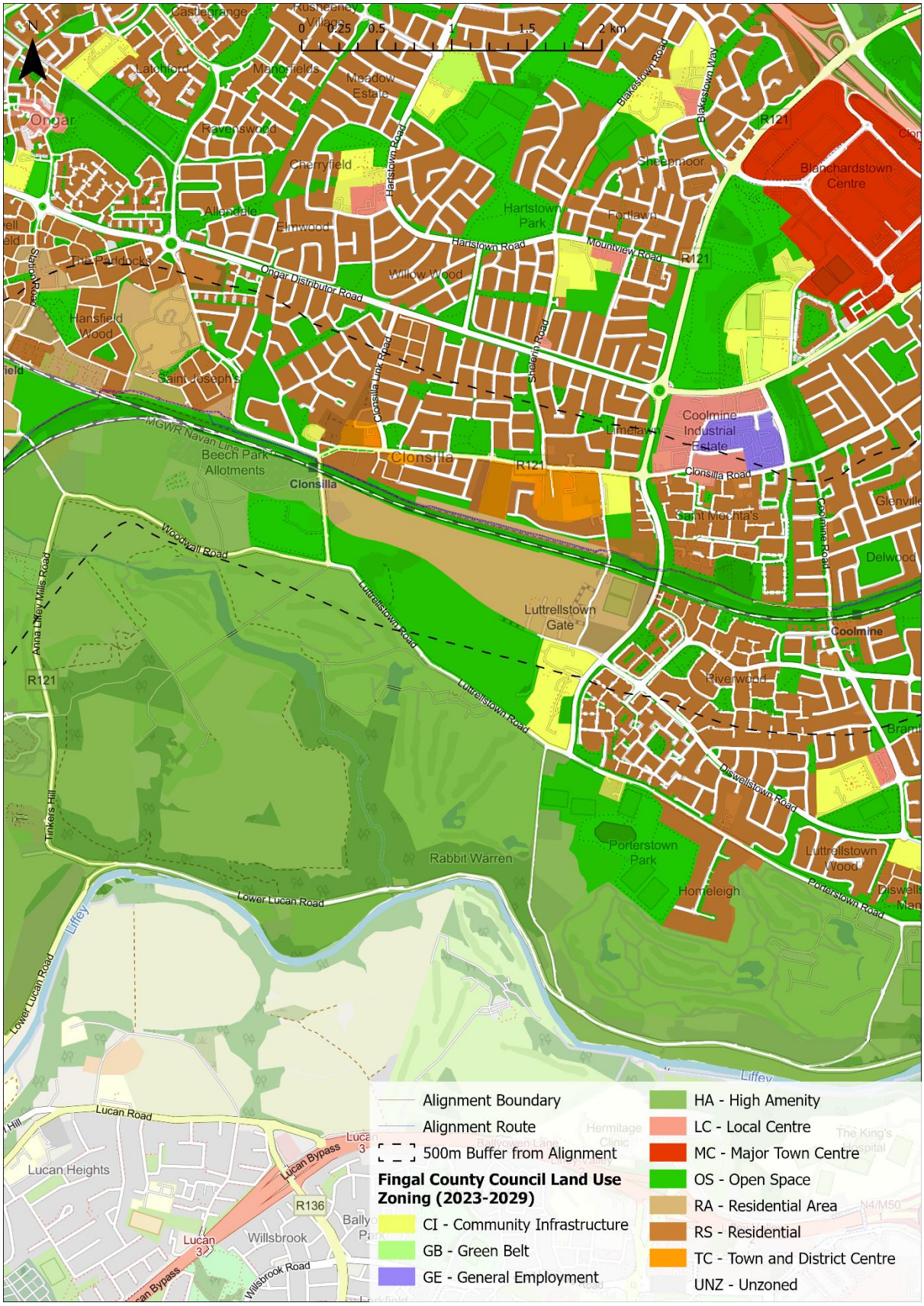


Figure 17-4: Zoning Map, RCUG - Section 2. Source: Fingal County Development Plan 2023-2029.

Section 3 Kennan Bridge (Porterstown Road) to Talbot Bridge (Old Navan Road)

Section 3 extends from Kennan Bridge to Talbot Bridge at the Old Navan Road and is characterised by a fully urban environment within the established suburbs of Clonsilla, Coolmine, Castleknock and western Dublin. The receiving environment is considerably more developed than Sections 1 and 2 and is influenced by extensive residential neighbourhoods, commercial activity, transport infrastructure and community facilities.

Recent aerial imagery (Google Maps 2026, Bing Maps 2026) confirms a dense urban pattern surrounding the canal corridor, with large residential estates located on both sides of the canal, interspersed with schools, sports facilities, local retail centres, healthcare services, employment uses and public open spaces. The canal corridor is a key green infrastructure asset in the area and an important recreational resource for surrounding communities.

The section incorporates the historic "Deep Sinking" of the Royal Canal between Clonsilla Road and Castleknock Road. This deep cutting creates a distinctive landscape character whereby the canal and towpath pass through a steep-sided excavated corridor enclosed by mature vegetation, exposed rock faces, retaining structures and railway infrastructure.

The Dublin–Maynooth railway line remains immediately adjacent to the canal throughout much of this section. Existing land uses include residential developments in Castleknock, Laurel Lodge, Coolmine and Clonsilla, educational facilities such as schools and childcare centres, local sports clubs, neighbourhood retail centres and employment-generating developments in Coolmine Business Park and the wider Blanchardstown area.

Several protected structures and historic canal features are located within this section, including Kirkpatrick Bridge, Granard Bridge and Talbot Bridge, together with the Royal Canal itself.

In terms of landscape features, mature trees lining the canal, together with areas of scrub, grassland and aquatic habitat, form an important biodiversity corridor connecting urban green spaces across western Dublin.

The study area surrounding the final Section 3 of the proposed greenway is also comprised of *OS – Open Space*, with the adjoining lands predominantly zoned for residential uses. As illustrated in **Figure 17.5**, the land use plan designates *RA- Residential Area* and *RS- Residential* to the north and south.

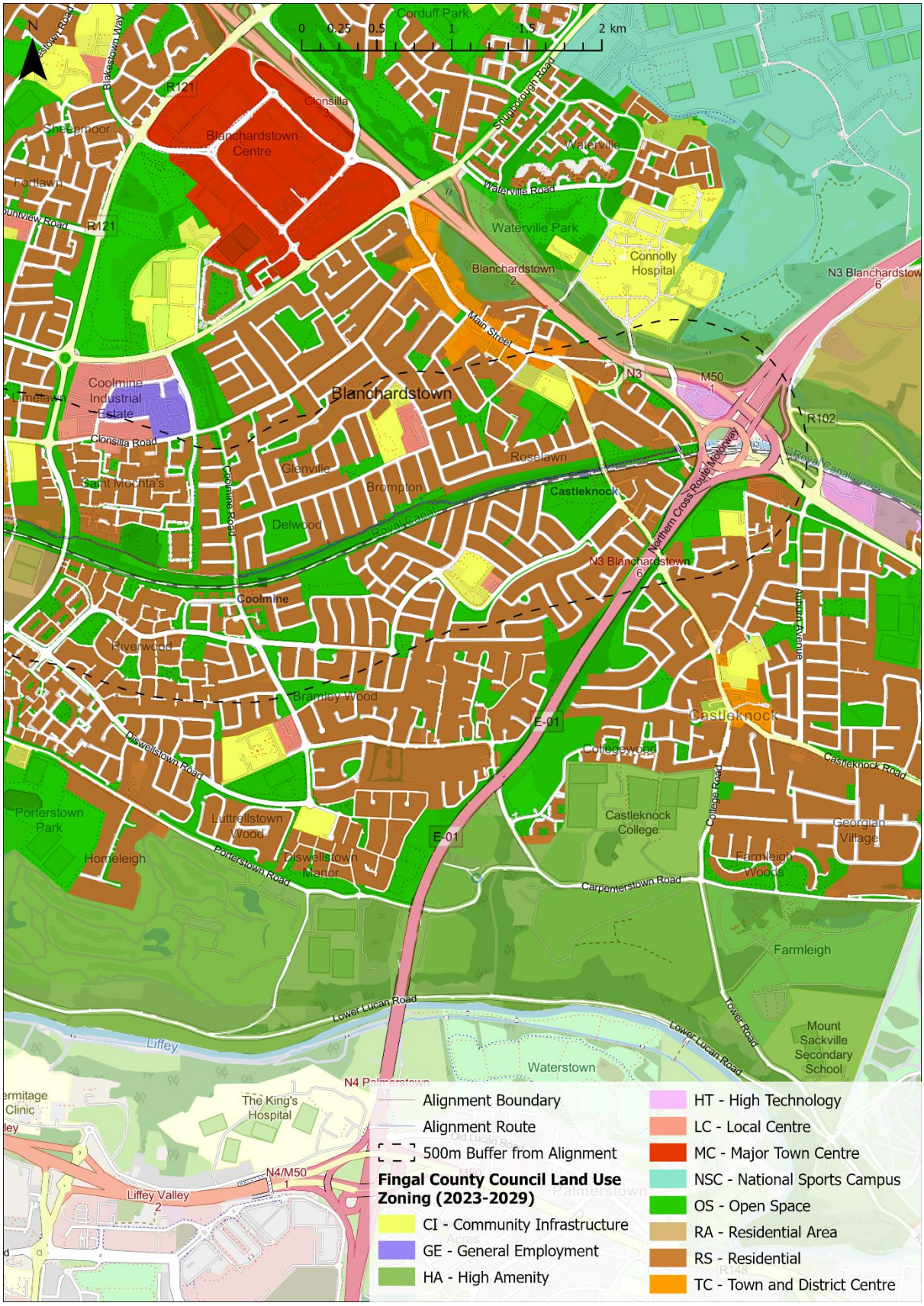


Figure 17-5 Zoning Map, RCUG - Section 3. Source: Fingal County Development Plan 2023-2029.

17.4 Potential Impacts

The direct and indirect impacts of the Proposed Development are assessed in relation to land use and property, during the construction and operational phases of the proposed project, including potential changes in land use function and the requirement for temporary and permanent land acquisition, including by Compulsory Purchase Order (CPO). The assessment then considers potential effects on the character, use, and function of the receiving environment, duration of potential effects, land use compatibility, future development potential and relevant zoning objectives. A 'do nothing scenario' is first set out.

17.4.1 'Do Nothing' Scenario

In the absence of the Proposed Development, the existing pattern of land use and property ownership along the Royal Canal corridor would continue to evolve in accordance with the applicable statutory planning framework and permitted development. Ongoing residential and mixed-use development associated with the Hansfield SDZ, Barnhill LAP, Kellystown LAP and other planned growth areas within Dublin 15 would continue, together with the delivery of other permitted and planned transport and infrastructure projects within the wider study area. Existing and planned land uses, including residential, recreational, educational, agricultural and open space uses, would therefore continue to develop and intensify in accordance with relevant planning policy and development plan objectives.

In the absence of the Proposed Development, no additional land acquisition, temporary land take or changes to property interests associated with the Greenway would occur. However, existing and new residential, employment and social infrastructure centres in the area would not benefit from the proposed improvements to walking and cycling infrastructure, recreational facilities, accessibility and connectivity between existing and planned communities. A number of national, regional and local policy objectives relating to active travel infrastructure, greenways, sustainable transport and recreational amenity provision, as described in Chapter 3 of this EIAR, would therefore not be advanced through implementation of the Proposed Development.

Overall, the receiving environment would continue to evolve in response to ongoing development pressure, population growth and implementation of the statutory planning framework, but without the specific land use, accessibility and active travel improvements associated with the Proposed Development.

17.4.2 Impact on Land Use and Property

The assessment set out below first considers the overall effects of the Proposed Development on land use and property, including temporary and permanent changes to land use function, access arrangements, land take and property interests. A detailed assessment of the specific land parcels required for acquisition, including those subject to Compulsory Purchase Orders (CPOs) is then set out. This is followed by an assessment of impacts on land use objectives.

Construction Phase

The principal construction phase effects on land use and property will arise from the temporary occupation of lands required for construction activities, temporary changes in land use function within working areas, and temporary disruption to existing access arrangements.

As much of the Proposed Development is located on lands currently zoned and functioning as open space, including existing canal towpaths, pedestrian and cycle routes, or adjoining amenity areas, the majority of construction phase effects are expected to be localised, temporary and reversible following completion of the works. Accordingly, impacts on land use associated with the temporary use of these lands for construction purposes are generally assessed as **Negative, Slight and Temporary.**

Construction activities will also require temporary working areas, vegetation clearance, earthworks, site compounds, material storage areas and site access arrangements in certain locations outside the

existing corridor, as detailed in Chapter 14 Material Assets: Traffic and Transport. This will result in localised disturbance to undeveloped lands, open space, agricultural lands and landscape features adjoining the route. In particular, the removal or severance of trees, hedgerows, scrub and other vegetation required to facilitate construction activities will result in temporary changes to the character and function of lands. At locations where vegetation loss or tree and hedgerow severance occurs, the resulting alteration to the character and function of the receiving environment is assessed, from a land use perspective, as **Negative, Moderate and Temporary**.

Temporary impacts will also arise from restrictions to existing access and movement patterns along the canal corridor and surrounding lands during construction. Construction of the Proposed Development will require the phased and incremental closures of sections of the existing towpath and canal side routes, particularly where works are undertaken directly adjacent to, or on, the existing towpath. This includes sections between the Kildare County boundary and Hansfield, and between Hansfield Road and Kennan Bridge, where construction of the cantilevered boardwalk, upgraded towpath and associated greenway infrastructure will necessitate temporary restrictions on public access. Temporary diversions and alternative routes for pedestrians and cyclists will be required in certain locations during these works and during bridge installation activities.

Temporary disruption to accessibility may also occur at road crossings, bridge locations and areas where construction traffic enters or exits the site. The Construction Methodology identifies the potential for temporary lane restrictions, shuttle traffic management arrangements, local traffic diversions and, where necessary, temporary road closures. In particular, construction of the proposed underpass at Granard Bridge may require temporary traffic diversions via Kirkpatrick Bridge during certain stages of the works.

The use of temporary construction compounds at Hansfield, Sheepmoor Lane and Castleknock/Laurel Lodge Park, together with associated haul routes, storage areas and temporary working areas, may temporarily affect access to adjoining lands, public open spaces and local amenities. Temporary disruption may also arise for recreational users of the Royal Canal corridor, including walkers, cyclists, anglers and other amenity users, as well as for nearby residents, schools and businesses. Measures such as phased construction, temporary traffic management, advance notification, diversion routes and maintenance of canal operational access will minimise these effects where practicable.

Taking account of the temporary nature of the works, the phased construction approach, the maintenance of access where practicable, and the implementation of temporary traffic management and diversion measures, impacts on land and property access during the construction phase are assessed as **Negative, Slight to Moderate and Temporary**.

Operational Phase

The Proposed Development will enhance the existing land use function along much of the route through the provision of strategic walking, cycling, recreation and amenity infrastructure. In some locations, lands currently comprising undeveloped, agricultural, canal bank, open space or ancillary lands will be permanently incorporated into the Greenway corridor and associated infrastructure. The principle of this land use change is supported by the Fingal Development Plan 2023–2029 and the wider policy framework set out in Chapter 3 of this EIAR.

The principal operational effects on land use and property arise from permanent land acquisition, land take, demolition requirements and the implementation of Compulsory Purchase Orders (CPOs). These works will result in a reduction in the area of undeveloped lands, agricultural lands, canal banks and open spaces in certain locations. Portions of existing pedestrian and cycle routes, residential streets, vacant lands and undeveloped lands will be acquired. While these acquisitions represent a permanent change in land ownership and land use, they are generally localised in extent and are necessary to

facilitate the delivery of the Greenway and its associated public benefits. The locations of land take by CPO and the impact of this are set out in detail below

Permanent land acquisition may affect the future development potential of certain lands and their relationship with adjoining infrastructure and development proposals. These interactions are considered in the cumulative effects assessment in Section 17.8. Additionally, the impacts of the Proposed Developments in terms of land use, property and land acquisition on relevant local plans are described in Section 17.8.

Notably, the Proposed Development will require the removal of two Fingal County Council-owned houses and associated ancillary structures in the vicinity of Hansfield Road to facilitate the preferred route alignment and the delivery of the associated greenway and pocket park infrastructure. These dwellings are within the ownership of Fingal County Council and are not subject to compulsory acquisition. The need for their removal arises from the requirement to provide a continuous, safe and accessible active travel corridor and to connect the route with the existing pedestrian and cycle infrastructure within the Hansfield area. Alternative route options and design solutions were considered as part of the route selection process; however, these performed less favourably having regard to environmental, engineering, accessibility and land use considerations. The demolition of the dwellings and associated structures represents a permanent loss of existing built assets and is therefore assessed as a **Negative, Moderate and Permanent** effect.

In addition, there will be general demolition of low boundary walls and street furniture along the route, as detailed further in the Preliminary Design Report by DBFL Consulting Engineers.

Once operational, the Proposed Development is not expected to result in significant effects on agricultural lands. While the Greenway corridor passes through areas adjoining agricultural lands in certain locations, the Proposed Development does not materially alter the overall agricultural function of these areas. Any effects are limited to localised changes in land use adjacent to the Greenway corridor and are therefore assessed as **Negative, Slight and Permanent**.

Notwithstanding the above effects, the completed Greenway will significantly enhance the recreational, amenity and active travel function of the corridor and will support improved accessibility, permeability and connectivity between established and planned communities. The Proposed Development will provide a continuous strategic walking and cycling route along the Royal Canal corridor, improve connections to residential communities including Hansfield, Clonsilla, Porterstown, Brompton, Roselawn and Castleknock, improve access to existing public transport facilities and recreational amenities, and remove existing barriers to movement through the provision of new structures including the Landmark Bridge and the proposed underpass at Granard Bridge. The Proposed Development will also support the active travel and green infrastructure objectives for the area, as referred to in Chapter 3 of this EIAR, will be supported. These benefits are assessed as **Positive, Significant and Permanent**.

Overall, the Proposed Development will result in a range of both beneficial and adverse effects on land use and property. Adverse effects arise primarily from permanent land take, the demolition of two properties within the ownership of FCC, changes to some existing land uses, and the acquisition of land and property interests required to facilitate the Proposed Development. Beneficial effects arise from the enhanced connectivity, permeability, accessibility, recreation and amenity value, together with improved active travel infrastructure and strengthened links between existing and planned communities. These effects are reported separately within this chapter. The balancing of beneficial and adverse effects is a matter for the competent authority.

Land Take by CPO

As noted above, delivery of the Proposed Development requires the acquisition of several land parcels or plots to facilitate both construction and operational phases. In total, there are 15 no. plots identified which are acquired or otherwise made available through the CPO process on a permanent or temporary basis. These are listed in Table 17.2 and described in detail in the series of tables below. Plots located close to one another are grouped for description purposes. **Please refer to the 'Compulsory Purchase Order – CPO Drawing Pack' submitted with this application for full context on permanent and temporary CPO areas via the CPO maps and drawings.**

The CPO identifies permanent and temporary land interests required to facilitate the Proposed Development. Permanently acquired lands will be incorporated into the Proposed Development, while temporary land interests will be required during construction and the affected lands will subsequently be reinstated, subject to the terms of the CPO. Extensive consultation involving numerous public meetings have taken place with the relevant landowners and interested parties to inform them of the scheme including the planning and CPO process.

Table 17-2 Lands to be Acquired via Compulsory Purchase Order

land interests / plots	Type	Plot Number	Area (Ha)	Folio Number	Chainage
Plot 1	Permanent	1.1a	0.0031	DN184078F	3218-3318
		1.1b	0.0737	DN184078F	3215-3218
		Total	**0.0768**		
Plot 2	Permanent	2.1	0.0012	DN232321F	3280-3288
		Total	**0.0012**		
Plot 3	Permanent	3.1a	0.2026	Unregistered	3320-3770
		3.1b	0.2052	Unregistered	3320-3770
		Total	**0.4078**		
	Temporary	3.2	0.0835	Unregistered	3320-3770
		Total	0.0835		
Plot 4	Permanent	4.1	0.0011	DN78331F / 2 / 1B	3780-3782
		Total	**0.0011**		
	Temporary	4.2	0.00007	DN78331F / 2 / 1B	3780-3782
		Total	**0.00007**		
Plot 5	Permanent	5.1	0.027241	DN5119F / 1 / 21F	3780-3815
		Total	**0.027241**		
Plot 6	Permanent	6.1	0.3465	Unregistered	4625-5364
		Total	**0.3465**		
	Temporary	6.2	0.0744	Unregistered	4625-5364
		Total	**0.0744**		
Plot 7	Permanent	7.1	0.0356	Unregistered	5365-5456
		Total	**0.0356**		
Plot 8	Permanent	8.1	0.0345	Unregistered	5535-5616
		Total	**0.0345**		
	Temporary	8.2a	0.0086	Unregistered	5535-5616
		8.2b	0.0075	Unregistered	5535-5604
		Total	**0.0161**		
Plot 9	Permanent	9.1	0.0037	Unregistered	6670-6675
		Total	**0.0037**		
	Temporary	9.2a	0.0012	Unregistered	6670-6675
		9.2b	0.0002	Unregistered	6670-6675
		Total	**0.0014**		
	Permanent	10.1	0.000500	DN191751F	6670-6675

Plot 10		**Total**	0.000500		
	Temporary	10.2a	0.000200		
		10.2b	0.000200		
		Total	0.000400		
Plot 11	Permanent	11.1	0.0007	DN15935N / 1 / 16	6670-6675
		Total	**0.0007**		
	Temporary	11.2	0.0011	DN15935N / 1 / 16	6670-6675
		Total	**0.0011**		
Plot 12	Permanent	12.1	0.000900	DN215198F	6670-6675
		Total	**0.000900**		
	Temporary	12.2a	0.000300	DN215198F	6670-6675
		12.2b	0.000300	DN215198F	6670-6675
		Total	**0.000600**		
Plot 13	Permanent	13.1a	0.0017	DN31229L / 1 / 364_2	6855-6873
		13.1b	0.0653	DN31229L / 1 / 364_2	6950-7060
		Total	**0.0670**		
	Temporary	13.2a	0.0134	DN31229L / 1 / 364_2	6950-7060
		13.2b	0.0078	DN31229L / 1 / 364_2	6980-7060
		13.2c	0.0006	DN31229L / 1 / 364_2	6970-6975
		13.2d	0.0020	DN31229L / 1 / 364_2	6855-6873
		Total	**0.0238**		
Plot 14	Permanent	14.1	0.0335	DN14718L / 1 / 267	7060-7108
		Total	**0.0335**		
	Temporary	14.2a	0.0089	DN14718L / 1 / 267	7060-7108
		14.2b	0.0024	DN14718L / 1 / 267	7060-7098
		Total	**0.0113**		
Plot 15	Permanent	15.1a	0.0022	DN232539F / 1 / DP6C3	8048-8092
		15.1b	0.0003	DN232539F / 1 / DP6C3	8018-8028
		15.1c	0.0005	DN232539F / 1 / DP6C3	7995-8003
		Total	**0.003**		

Overall, the lands subject to CPO comprise a combination of existing pedestrian and cycle routes, open space lands, canal-side lands, undeveloped lands and local access areas required to facilitate the RCUG. The impact of the CPO on each individual plot is described in the series of Plot tables below – for full context on the locations of each CPO plot please refer to 'Compulsory Purchase Order – CPO Drawing Pack' submitted with this application. A summary overview is first provided:

During the **construction phase**, impacts associated with the CPO lands will primarily relate to temporary land occupation, vegetation clearance, construction working areas, temporary access restrictions and localised disruption to existing land uses. Temporary construction compounds are proposed within the Hansfield, Sheepmoor Lane and Laurel Lodge Park (Castleknock) areas (refer to Figure 14.14 of Chapter 14), in proximity to Plots 3, 4, 5, 1 and 2; Plots 6, 8 and 7; and Plots 13, 14 and 15 respectively. These compounds, together with the temporary and permanent land requirements necessary to facilitate construction, will contribute to temporary land use disruption and access restrictions. The resulting impacts are generally assessed as **Negative, Slight and Temporary**. In more sensitive locations, particularly those adjacent to residential properties or requiring vegetation clearance within wooded areas, impacts are assessed as **Negative, Moderate and Temporary**.

During the **operational phase**, the majority of acquired lands comprise existing route corridors, open space or underutilised lands that will be incorporated into the Greenway. The Proposed Development

will improve accessibility, permeability, connectivity, recreation and amenity provision along the Royal Canal corridor. Benefits will arise for surrounding residential communities, including Pipers Court, St. Joseph's, Windmill Court, Brompton Green and the wider Hansfield area, where existing pedestrian and cycle connections will be upgraded and enhanced. The Greenway will utilise and improve existing active travel routes through the St. Joseph's and Pipers Court developments, provide a new pocket park within the Hansfield lands, improve connectivity through the Old Schoolhouse Masterplan area, and deliver enhanced active travel infrastructure in the Sheepmoor Lane, Windmill Court and Brompton areas. These measures will improve access to recreational amenities, support active travel and strengthen connections between existing and planned communities. Accordingly, operational effects are generally assessed as **Positive, Slight to Significant and Permanent**, depending on the scale of improvement provided at each location, while lands subject only to temporary acquisition will be reinstated and will not give rise to operational effects.

Impact assessments for each plot are set out below. Plots located close to one another are grouped for description purposes.

Plot 1, Plot 2, Plot 3, Plot 4 and Plot 5

These plots comprise lands associated with the existing pedestrian and cycle route through the St. Joseph's residential scheme. The Proposed Development will utilise and upgrade this existing route as part of the wider greenway corridor. As shown in Figure 17.6, the land requirements comprise a combination of permanent land acquisition and temporary land occupation required to facilitate construction activities. The permanent acquisition of these plots is necessary to accommodate the operational greenway infrastructure, while the temporary land requirements will facilitate construction access and working areas and will be reinstated following completion of the works. The likely effects associated with each land interest are assessed separately below.

Plot 1

Plot 1 is located in the Hansfield Strategic Development Zone adjacent to the west of Plot 3. The Plot contains two sub-plots (1.1a and 1.1b) under folio Ref. DN184078F. These plots will be acquired permanently, with a gross area of 768 sq.m. The plots currently accommodate an existing pedestrian/cycle route that runs alongside the Pipers Court development and onto the St. Joseph's estate area, as described in Plot 3.

Construction Phase:
Plot 1.1a (ch. 3218-3318) comprises 31 sq.m. The impact of the construction phase on land use and land ownership will be Negative, Slight and Temporary.
Plot 1.1b (ch. 3215-3218) comprises 737 sq.m. The impact of the construction phase on land use and land ownership will be Negative, Slight and Temporary.

Operational Phase:
Plot 1.1a – the Proposed Development will enhance the existing pedestrian/cycle route in compatibility with the current use, resulting in a direct Positive, Slight and Permanent impact.
Plot 1.1b - the Proposed Development will enhance the existing pedestrian/cycle route in compatibility with the current use, resulting in a direct Positive, Slight and Permanent impact.

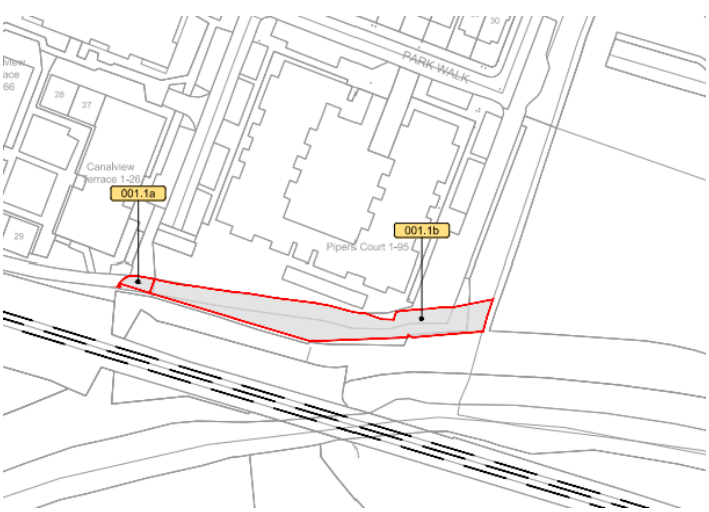




Figure 17-6 Location of Plot 1

Plot 2

Plot 2 (ch. 3280-3288) is also located alongside Plot 1. The Plot contains a single plot 2.1, under folio Ref. DN232321F. This plot will be acquired permanently, with a gross area of 12 sq.m. The site also forms part of the Pipers Court existing pedestrian/cycle route.

Construction Phase:
The impact of the construction phase on land use and land take will be Negative, Slight and Temporary.

Operational Phase:
The Proposed Development will enhance the existing pedestrian/cycle route resulting in a direct Positive, Slight and Permanent impact.



Figure 17-7 Location of Plot 2

Plot 3

Plot 3 (Figure 17.8) is located close to St. Joseph's Avenue. It currently comprises an existing pedestrian /cycle route through St. Joseph's residential estate. A grass verge to the south also forms part of the plot to be acquired. The Plot comprises three sub-plots, two of which will form part of the operational Proposed Development. The total gross area for permanent acquisition is 4078 sq.m. The total gross area for the temporary acquisition 835 sq.m

Construction Phase:
Plot 3.1a and 3.1b at chainage (ch- 3320-3770) will be acquired permanently. The impact of the construction phase on land use and land take will be Negative, Slight and Temporary.

Plot 3.2 will be acquired on a temporary basis to facilitate the construction phase of the development – the Hansfield Construction Compound is situated in this general area. The impact on land use and land take in this area is Negative, Slight and Temporary.

Operational Phase:
Plot 3.1a comprises 0.2026 ha and Plot 3.1b comprises comprises 0.2052 ha of land in use as the existing pedestrian/cycle route through St. Joseph's residential scheme. The Proposed Development represents a significant upgrade to the existing pedestrian/cycle route in this area. The lands mark the entry point onto the proposed pocket park which will provide an important new amenity for local residents and visitors. The impact is therefore assessed as Positive, Slight and Permanent.

Plot 3.2 will be reinstated once construction is completed. No operational related impacts.



Figure 17-8: Location of Plot 3

Plot 4

Plot 4 is a small parcel of land located to the north of the existing towpath and directly south of Hansfield Road. The Plot contains two plots (4.1 and 4.2) which are under folio Ref. DN78313F / 2 / 1B at ch 3780-3782.

Construction Phase:
Plot 4.1 will be acquired permanently, with a gross area of 11 sq.m.The impact of the construction phase on land use and land take will be Negative, Slight and Temporary.

Plot 4.2 has a gross area of 0.7 sq m. and is to be acquired on a temporary basis only to facilitate construction works. The impact on land use and land take in this area is Negative, Slight and Temporary.

Operational Phase:
Plot 4.1 is presently covered by shrubbery and trees. The Proposed Development will bring this underutilised and vacant plot into a functional, high amenity value use on a permanent basis. The impact on land use and land take is therefore assessed as Positive, Slight and Permanent.

Plot 4.2 will be reinstated once construction is completed. No operational related impacts.

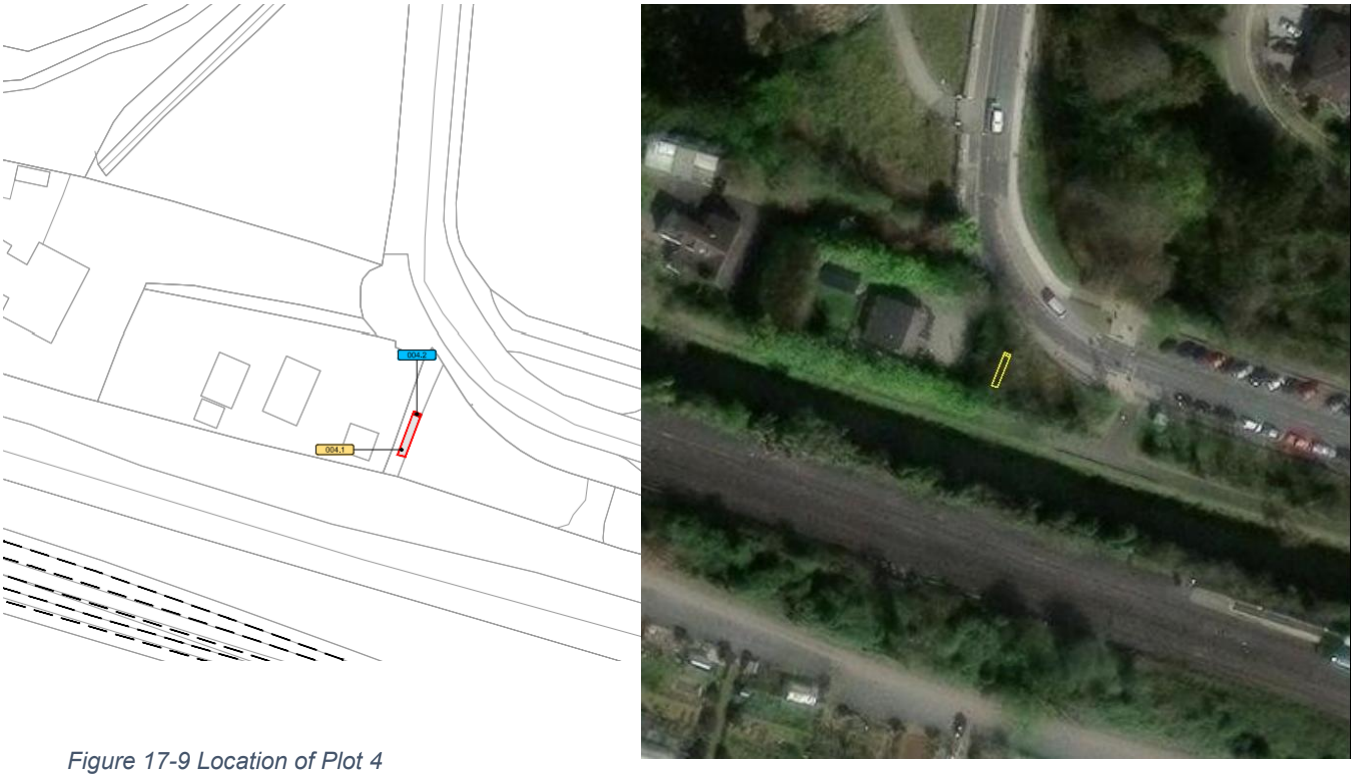


Figure 17-9 Location of Plot 4

Plot 5

Plot 5 is located adjacent to Plot 4 at ch. 3780-3815 on the Hansfield Road service access to the greenway. The Plot contains a single folio Ref. DN5119F / 1 / 21F.

Construction Phase:
Plot 5.1 will be acquired permanently, with a gross area of 272.41 sq.m. The impact of the construction phase on land use and land take will be Negative, Slight and Temporary.

Operational Phase:
Plot 5.1 is presently partially used as existing pedestrian and cycle way. The Proposed Development will enhance the land use function in this area with the impact identified as Positive, Slight and Permanent.

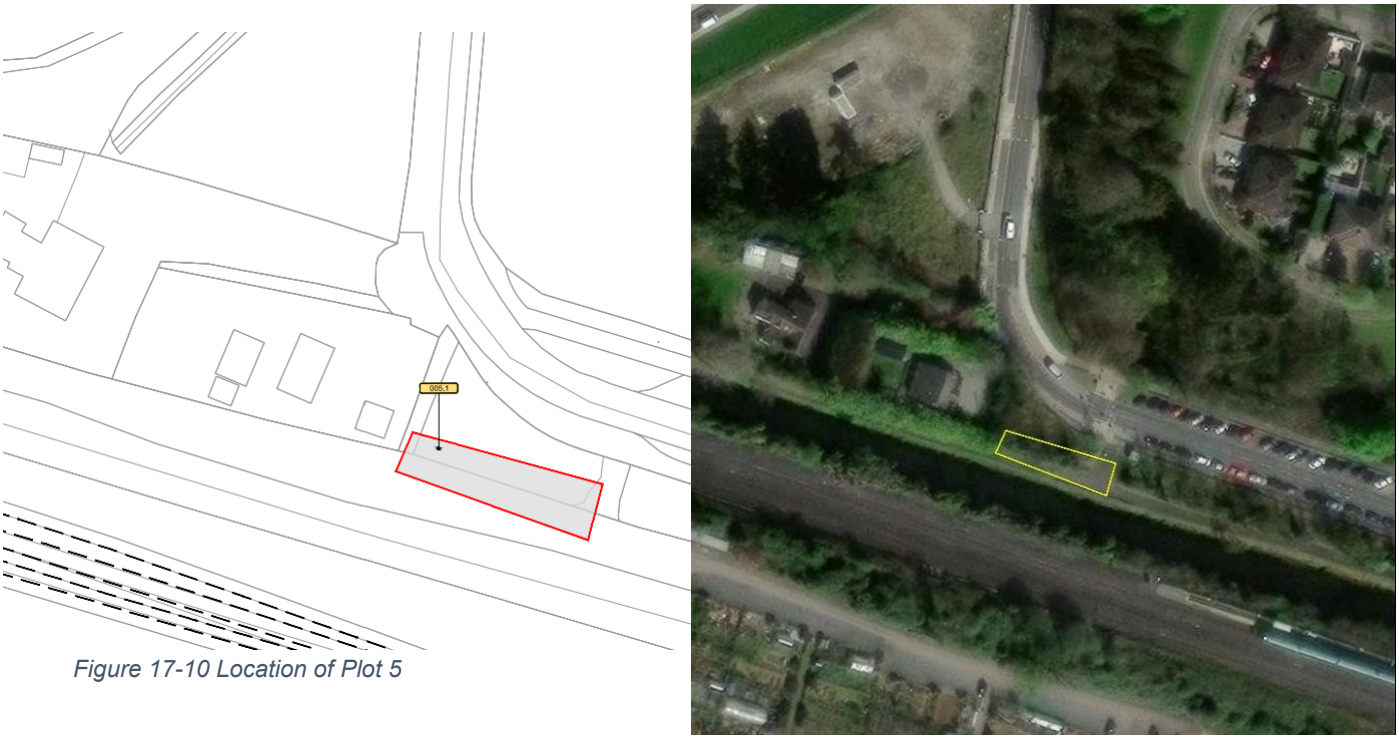


Figure 17-10 Location of Plot 5

Plot 6, Plot 7 and Plot 8

Plot 6, Plot 7, and Plot 8 are situated on the southern portion of the landbank which forms part of the Old Schoolhouse Masterplan area (Old School Housing Masterplan, Fingal County Council) through to the lands below the Dr. Troy Bridge. The delivery of the Royal Canal Urban Greenway is a central element of the Masterplan and is part of the overall vision for the Masterplan area having regard to its unique local setting.

The plots currently comprise undeveloped land with trees and vegetation. The acquisition of these lands will be permanent (as indicated in yellow in Figure 17.11) and limited / temporary in some areas (as indicated in blue in Figure 17.11 below) in nature. Given that the proposed route will run through this area, the compulsory purchase of this plot is fundamental to the development of this scheme.



Figure 17-11 Location of Plot 6, Plot 7 and Plot 8

Plot 6

Plot 6 is also located on the Old Schoolhouse Masterplan lands. The Plot contains two plots (6.1 and 6.2).

Construction Phase
Plot 6.1 (ch.4625-5364) is 3465sq.m and will be subject to permanent acquisition. The plot comprises a sloping, vegetated area extending down to the existing towpath and is characterised by trees and hedgerows. While the land take is permanent, the resulting effect on land use and property during the construction phase is assessed as Negative, Slight and Temporary due to the limited influence on the existing land use function of the plot.

Plot 6.2 (ch. 4625-5364) is 744 sq.m to be acquired on a temporary basis. This site directly south of the Village residential development comprises a grass strip along the existing towpath. The impact of the land take in this area is Negative, Slight and Temporary.

Operational Phase
Plot 6.1 – the impact of the land take in this area will not result in a significant change to the existing land use. The impact is assessed as Positive, Slight and Permanent impact.
Plot 6.2 – no operational impacts as the land take is temporary and for the construction phase only.

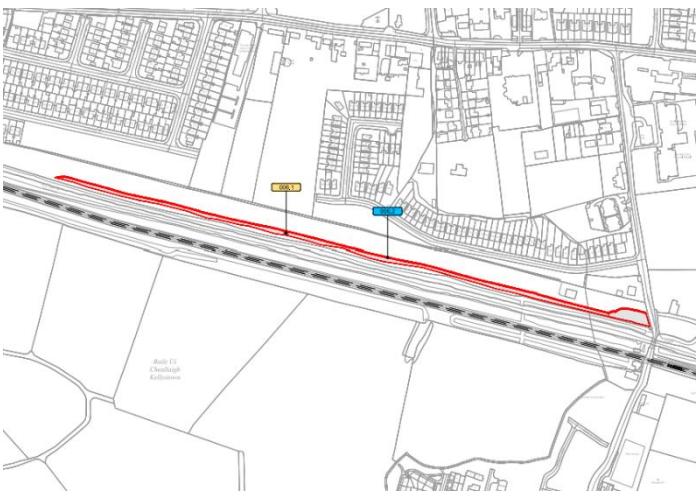




Figure 17-12 Location of Plot 6

Plot 7

Plot 7 comprises a single plot (7.1) which is part of the existing access road from Porterstown Road to 2 no. existing residential properties. There is also live residential planning case (Ref. FW25A/0416E) directly adjacent to the northern side of Plot 7.

Construction Phase

Plot 7.1 (ch. 5365-5456) will be acquired permanently (unregistered folio). The gross area for the permanent acquisition is 356 sq.m. Vehicular access to the two houses will be maintained and managed throughout the construction phase with no diversions required. The impact of construction phase is assessed therefore as Negative, Slight and Temporary.

Operational Phase

Vehicular access to the existing dwellings will be maintained following implementation of the Proposed Development. Accordingly, no material adverse effect on access to these properties is anticipated and the effect is assessed as Neutral, Imperceptible and Permanent. The Proposed Development will also provide improved active travel connectivity and accessibility for future residents of the adjoining residential lands to the north, together with enhanced access to the Royal Canal corridor and associated amenities. The resulting effect for these future residents is assessed as Positive, Moderate and Permanent.

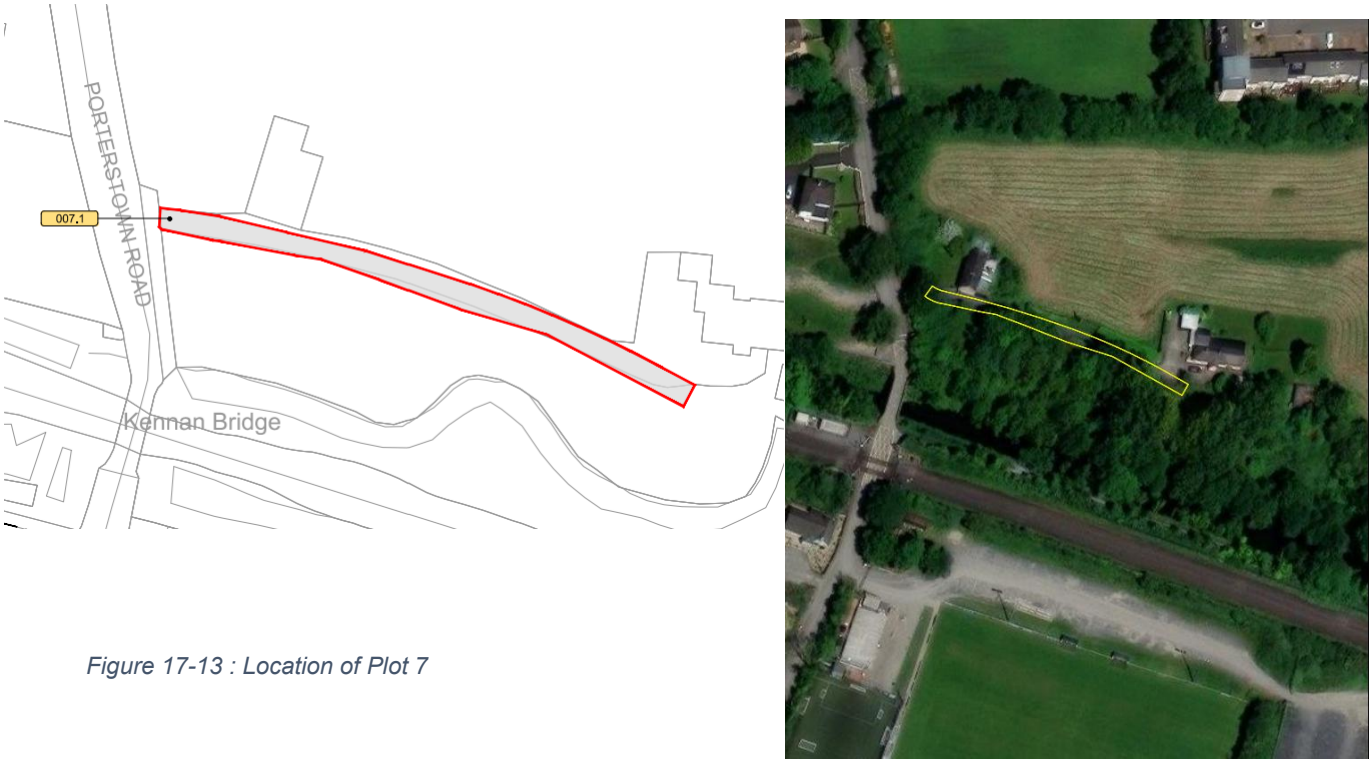


Figure 17-13 : Location of Plot 7

Plot 8

Plot 8 is located below the Dr. Troy Bridge in a densely wooded area. The Plot contains three plots (8.1, 8.2a and 8.2b).

Construction Phase

- Plot 8.1 (ch. 5535-5616) which will be acquired permanently (there is no registered folio number). The gross area for the permanent acquisition is 345 sq.m. With some tree and vegetation clearance required in this area to facilitate the works, the impact of the land take in this area during the construction is assessed as Negative, Moderate and Temporary.
  Plot 8.2a (ch. 5535-5616) is 86sq.m and 8.2b (5535-5604) is 75sq.m which are to be acquired on a temporary basis (there is no registered folio number). The gross area for the temporary acquisition is 161 sq.m. With some tree and vegetation clearance required in this area to facilitate the works, the impact of the land take in this area during the construction is assessed as Negative, Moderate and Temporary.

Operational Phase

- The impact of the land take on Plot 8.1 is assessed as a Positive, Slight and Permanent at operational stage.
- As Plot 8.2a and 8.2b will be acquired on a temporary basis and will be reinstated following the construction phase, there is no operational impact.

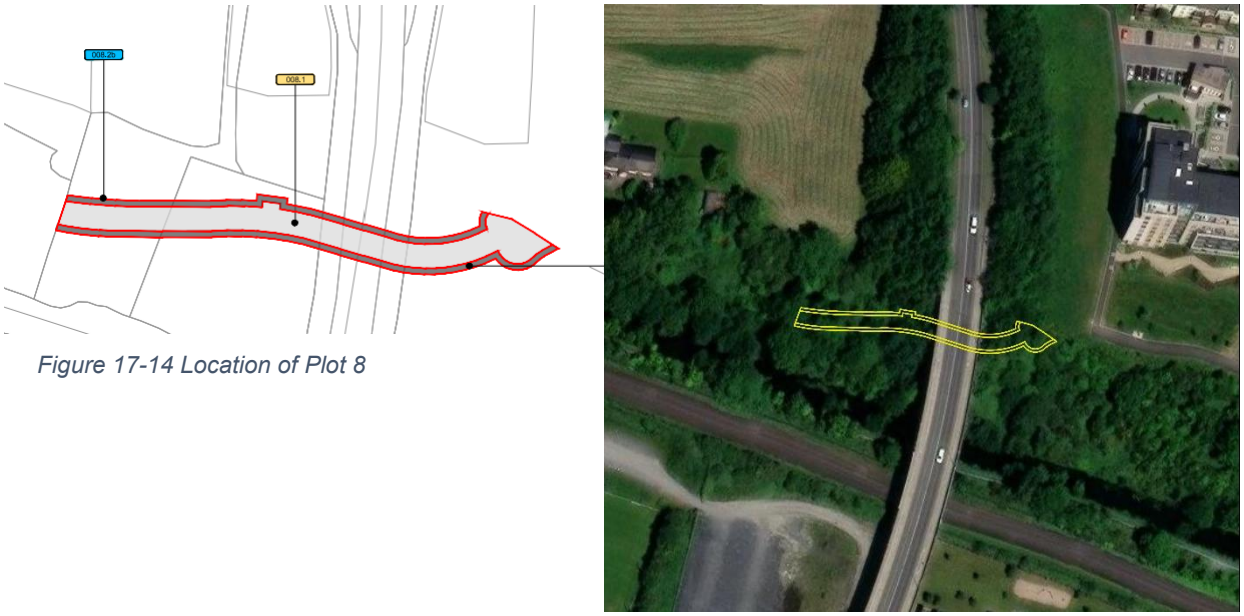


Figure 17-14 Location of Plot 8

Plot 9, Plot 10, Plot 11 and Plot 12

Plot 9, Plot 10, Plot 11 and Plot 12 are all located on the northern bank of the Royal Canal at Delwood Close. The surrounding land uses are residential to the north and open space / undeveloped lands to the south of the canal. These plots comprise part of the existing cul-de-sac at Delwood Close. The Delwood Close access point forms part of the preferred route option developed through the route selection and design process. The access utilises an existing public cul-de-sac to provide a direct connection between the surrounding residential area and the proposed greenway, supporting permeability and accessibility to the route while limiting the extent of additional access infrastructure required.

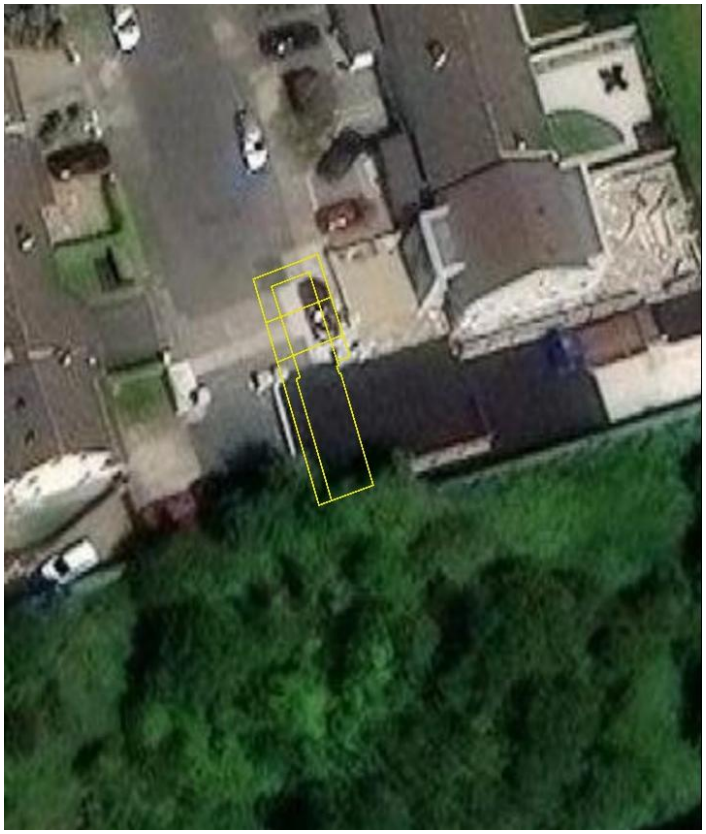


Figure 17-15 Location of Plot 9, 10, 11, and 12

Plot 9

Plot 9 comprises three sub-plots (9.1, 9.2a and 9.2b).

Construction Phase
Plot 9.1 (ch. 6670-6675) is an unregistered folio measuring 37sq.m and is to be acquired on a permanent basis.
Given the proximity to dwellings, this is a sensitive location. The impact of the construction phase on land use and land take in this area is assessed as Negative, Moderate and Temporary.

Plot 9.2a (ch. 6670-6675) is an unregistered folio measuring 12 sq.m and is to be acquired on a temporary basis. Plot 9.2b (ch. 6670-6675) is an unregistered folio measuring 2 sq.m and is to be acquired on a temporary basis. The impact on land use and land take of the construction phase at these plots, located side by side, is assessed as Negative, Moderate and Temporary.

Operational Phase
The permanent land take of Plot 9.1 will provide access to the greenway from existing and planned residential communities in the area (including at Delwood Close and Brompton Green). The access will be designed in accordance with the Design Manual for Urban Roads & Streets (DMURS) and the NTA Permeability Best Practice Guide. This will create a safer, more accessible access to the new Greenway and the canal, resulting in greater passive surveillance and security for greenway users. This access will also be used by emergency services, allowing more efficient access in case of an emergency. The impact on land use and land take at operational stage is assessed as Positive, Moderate and Permanent.

Plot 9.2a will be acquired on a temporary basis and will be reinstated following the construction phase, there is no operational impact.
Plot 9.2b will be acquired on a temporary basis and will be reinstated following the construction phase, there is no operational impact.

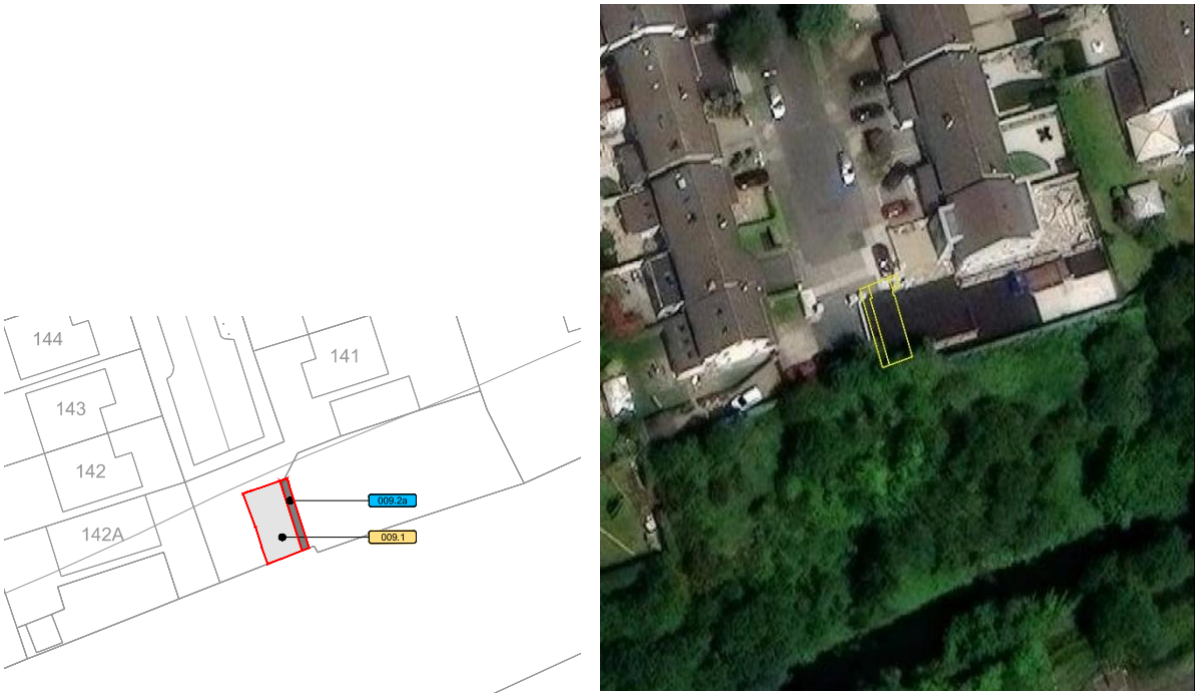


Figure 17-16 Location of Plot 9

Plot 10

Plot 10 comprises three sub-plots under folio DN191751F (ch. 6670-6675).

Construction Phase
Plot 10.1 measures 5 sq.m and is subject to a permanent CPO. Given the proximity to sensitive receptors (local homes), the impact of the construction phase on land use and land take in this area is assessed as Negative, Moderate and Temporary.

Plot 10.2a and 10.2b both measure 2sq.m each and are to be acquired on a temporary basis for the construction phase. The impact is assessed as Negative, Moderate and Temporary.

Operational Phase
Plot 10.1 will provide a permanent access point to the Proposed Development greenway from existing and planned residential areas, improving accessibility, passive surveillance, user safety and emergency service access. The operational land use impact is assessed as Positive, Moderate and Permanent.

Plot 10.2a and 10.2b will be acquired temporarily for construction and reinstated on completion, resulting in no operational impact.

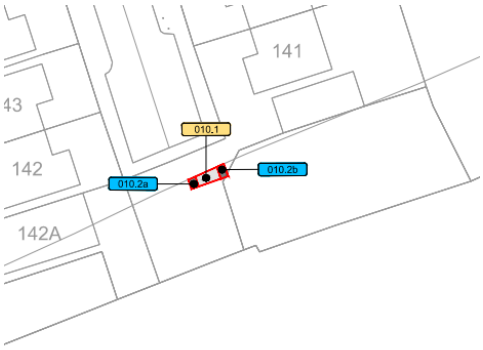




Figure 17-17 Location of Plot 10

Plot 11

Plot 11 comprises two sub-plots under folio DN15935N / 1 / 16 (ch. 6670-6675).

Construction Phase
Plot 11.1 measures 7sq.m and is subject to a permanent CPO. Given the proximity to sensitive receptors (local homes), the impact of the construction phase on land use and land take in this area is assessed as Negative, Moderate and Temporary.

Plot 11.2 measures 11sq.m and is to be acquired on a temporary basis for the construction phase. The impact is assessed as Negative, Moderate and Temporary.

Operational Phase
Plot 11.1 will provide a permanent access point to the Proposed Development greenway from existing and planned residential areas, improving accessibility, passive surveillance, user safety and emergency service access. The operational land use impact is assessed as Positive, Moderate and Permanent.

Plot 11.2 will be acquired temporarily for construction and reinstated on completion, resulting in no operational impact.



Figure 17-18 Location of Plot 11

Plot 12

Plot 12.1 comprises two sub-plots under DN215198F (ch. 6670-6675)

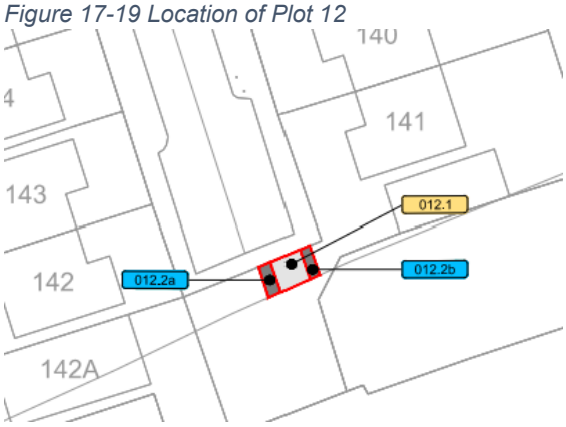
Construction Phase
Plot 12.1 measures 9 sq.m and will be permanently required. Given the proximity to dwellings, the impact of the construction phase on land use and land take in this area is assessed as Negative, Moderate and Temporary.

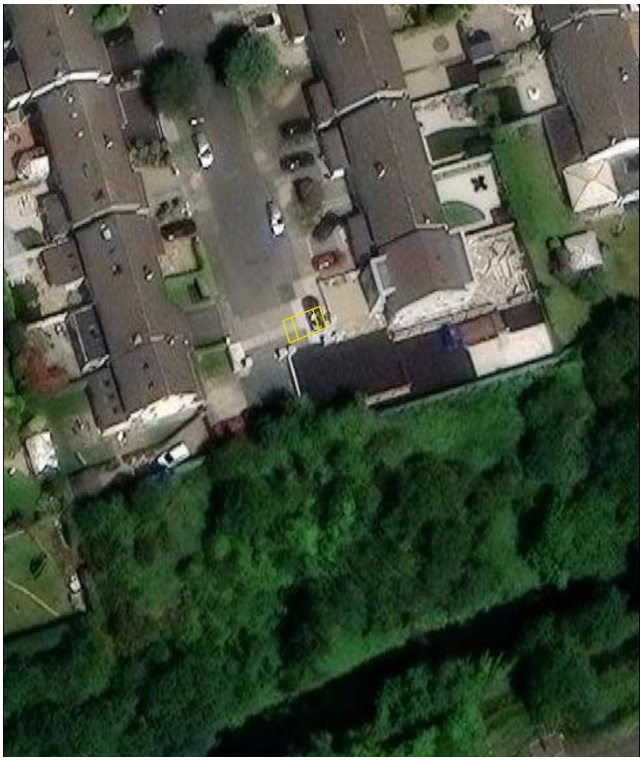
Plot 12.2a and Plot 12.2b measures 3 sq.m each and are to be acquired on a temporary basis for the construction phase. The impact is assessed as Negative, Moderate and Temporary.

Operational Phase
The permanent land take of Plot 12.1 will provide access to the greenway from existing and planned residential communities in the area (including Delwood Close and Brompton Green). As with the permanently required Plots 9, 10 and 11, safer, more accessible access to the new Greenway and the canal will be created, supporting passive surveillance and security for residents and other greenway users. The impact on land use and land take at operational stage is assessed as Positive, Moderate and Permanent.

Plot 12.2a and 12.2b will be acquired on a temporary basis and will be reinstated following the construction phase, there is no operational impact.

Figure 17-19 Location of Plot 12





Plot 13 and Plot 14

Plot 13 and Plot 14 are located on the northern bank of the Royal Canal, located at the south end of Brompton Court, Brompton Grove, Brompton Lawn and Brompton Green. The plots are part of a green, open space area at the edge of a wooded area north of the canal.



Figure 17-20 Location of Plot 13 and Plot 14

Plot 13

Plot 13 comprises six sub-plots within a single folio (DN31229L / 1 / 364_2) which are required on a permanent basis with four temporary sub-plots.

Construction Phase
Plot 13.1a (ch. 6855-6873) measures 17sq.m and Plot 13.1b (ch. 6950-7060) is 653 sq.m. Both are permanently required lands to deliver the Proposed Development. During the construction phase, the function of the existing land use of these plots will be temporarily unavailable resulting in a minor inconvenience to users of the open space. The impact is assessed as Negative, Slight and Temporary.

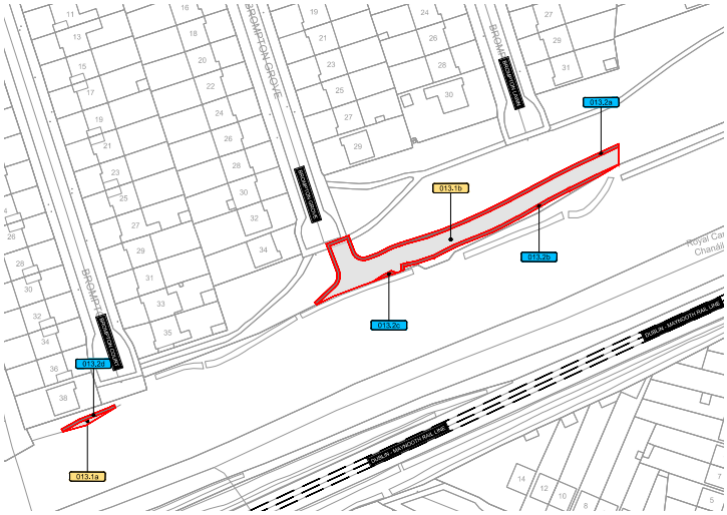
Plot 13.2 is further divided into sub-plots as follows:
13.2a (ch. 6950-7060) comprising 134 sq.m
13.2b (ch. 6950-7060) comprising 78 sq.m
13.2c (ch. 6970-6975) comprising 6 sq.m
13.2d (ch. 6855-6873) comprising 20 sq.m

The sub-plots are required on a temporary basis to support the construction phase. With the land temporarily unavailable a minor inconvenience to users of the space will arise resulting in Negative, Slight and Temporary impact.

Operational Phase
In the case of permanently acquired plots 13.1a and 13.b, the Proposed Development will enhance the existing land use and function through the provision of a high-quality pedestrian and cycle way which will be accessible to residents of neighbouring Brompton Court, Brompton Grove, Brompton Lawn and Brompton Green. The impact is Positive, Moderate and Permanent.

No impact at operational stage for Plot 13.2 as the land will be reinstated and back to its existing use.

Figure 17-21 Location of Plot 13





Plot 14

Plot 14 comprises two plots within the same folio DN14718L / 1 / 267.

Construction Phase
Plot 14.1 (ch. 7060-7108) is 335sq.m of permanently required lands. During the construction phase, the function of the existing land use of these plots will be temporarily unavailable resulting in inconvenience to users of the open space/ green area. The impact is assessed as Negative, Moderate and Temporary.

Plot 14.2 comprises two sub-plots. 14.2a (ch. 7060-7108) is 89 sq.m and 142.b (ch. 7060-7098) is 24 sq.m both of which are required on a temporary basis only to support the construction phase. This land will be temporarily unavailable resulting in inconvenience to users of the open space/ green area. The impact is assessed as Negative, Moderate and Temporary.

Operational Phase
In the case of permanently acquired plot 14.1, the Proposed Development will enhance the existing function of the space and will strengthen accessibility to the Greenway from neighbouring homes. The impact is Positive, Moderate and Permanent.

No impact at operational stage for Plot 14.2a and b as the land will be reinstated back to its existing use.

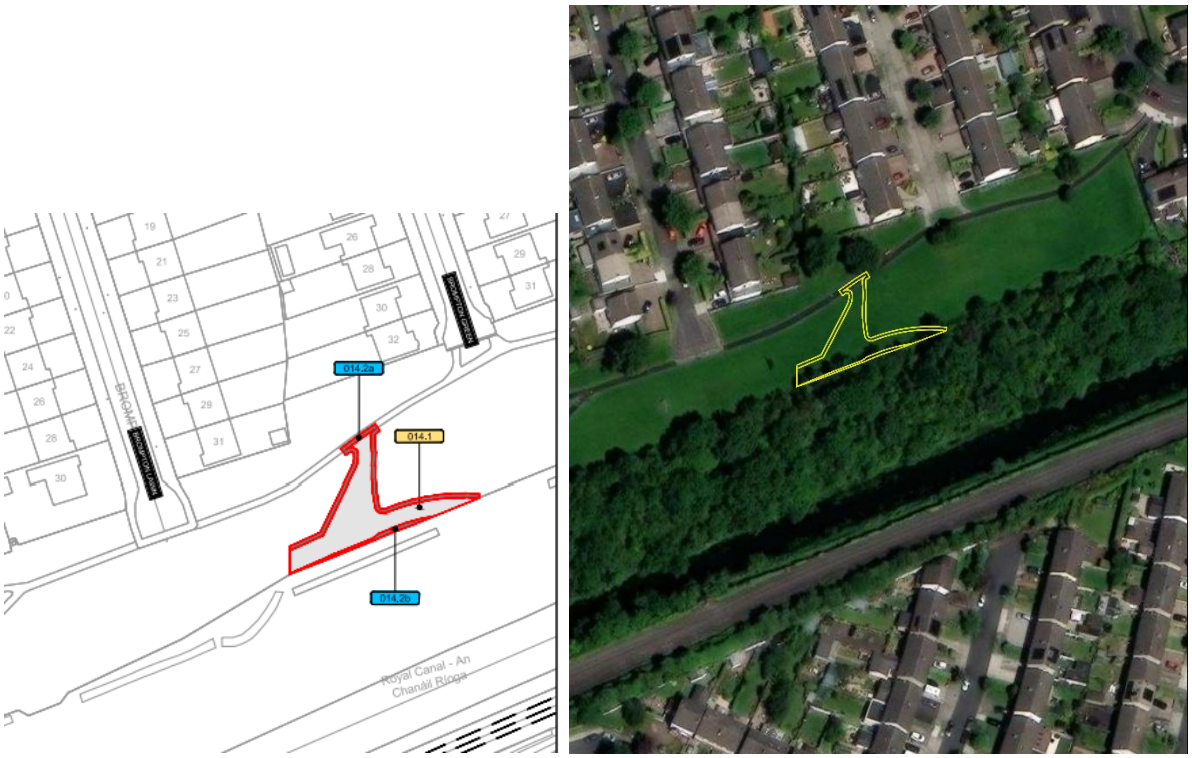


Figure 17-22: Location of Plot 14

Plot 15

Plot 15 is located on the northern bank of the Royal Canal and on the southern side of the Canal, located directly east of Granard Bridge and on the verge of the 12th lock. The land adjoins the 12th Lock Pub and car park. The combined area of this Plot is 30 sq.m, which is marked for permanent acquisition and currently comprises grass verge, undeveloped land.

Plot 15
Plot 15 comprises three plots within folio DN232539F / 1 / DP6C3 all of which are to be permanently acquired. **Construction Phase** Plot 15.1a is 22sq.m (ch. 8048-8092) Plot 15.1b is 3sq.m (ch. 8018-8028) Plot 15.1c is 5sq.m (ch. 7995-8003) During the construction phase, the function of the existing land use of these plots will be temporarily unavailable resulting in a minor inconvenience to users of the open space. The impact is assessed as Negative, Slight and Temporary. **Operational Phase** The Proposed Development will enhance the existing land use and function through the provision of a high-quality pedestrian and cycle way which will have a Positive, Moderate and Permanent impact.

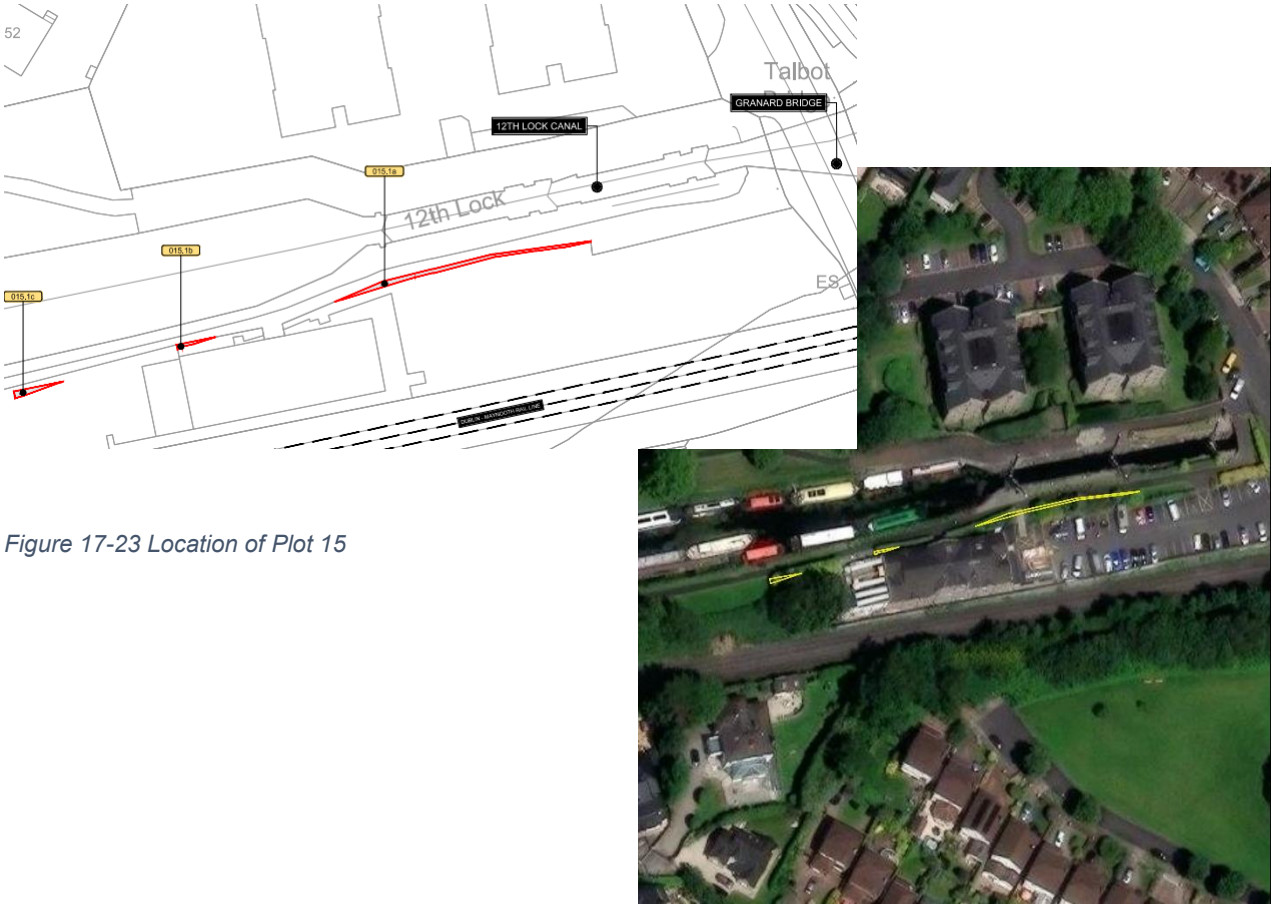


Figure 17-23 Location of Plot 15

Impact on Land Use Objectives and Local Plans

Construction Phase

During the construction phase, lands acquired on a temporary basis will be restored to their original condition in accordance with the Outline Construction Environmental Management Plan (OCEMP) submitted with this application. The construction of the Proposed Development is not likely to result in any material effects on the existing land use function or land use zoning objectives applicable to the affected lands, as described in the Receiving Environment section of this chapter earlier, and will not prejudice the long-term use or development potential of adjoining lands. The impact is overall assessed as Imperceptible and Temporary for the construction phase of the Proposed Development.

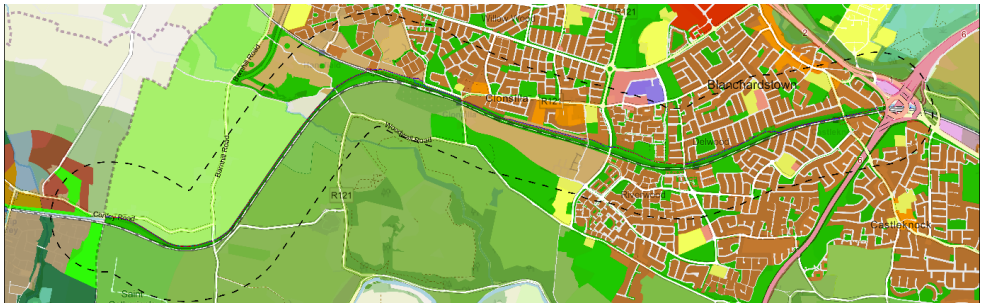
Operational Phase

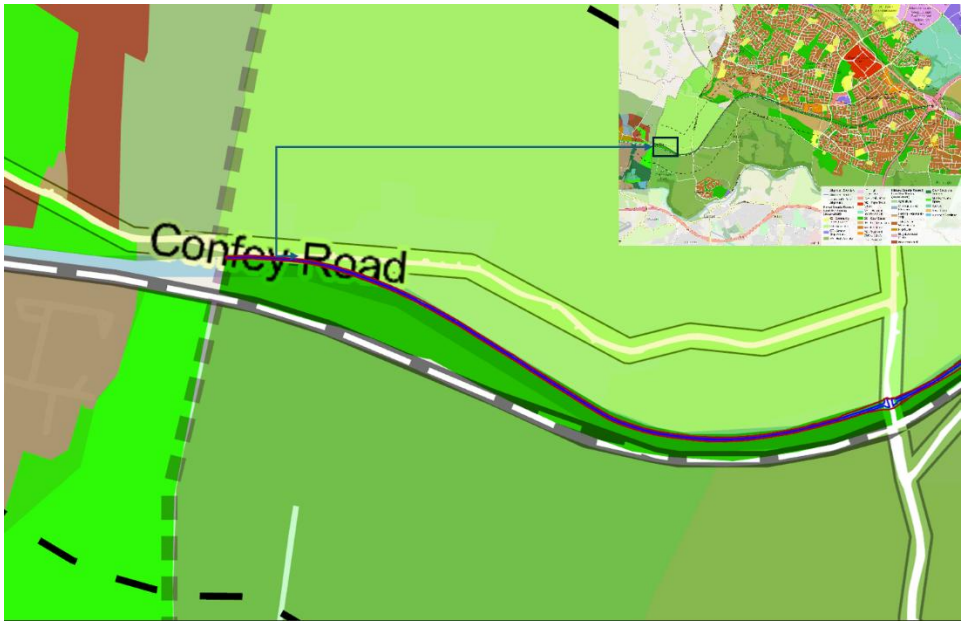
The character and use of lands adjoining the Royal Canal have evolved significantly since the canal ceased to function as a primary transport corridor, with the surrounding area now comprising a mix of residential, agricultural, open space and other urban land uses. The Proposed Development is compatible with and complementary to the established and emerging land use pattern of the area and with the zoning objectives applicable to the lands through which it passes.

The Proposed Development greenway will reinforce the role of the canal corridor as a strategic recreational and active travel route, while supporting connectivity between existing communities and planned growth areas. The Proposed Development will not constrain the future development potential of adjoining lands and is expected to complement and support the delivery of planned residential, community and transport infrastructure envisaged under the relevant statutory planning framework – please refer to Section 17.8 for more information.

An overview of the impact of the Proposed Development on Land Use Zoning Objectives of the Fingal County Development Plan 2023-2029 is provided in Table 17-3.

Table 17-3 Land Use Zoning of the Subject Site and Surrounding Area

Land Use Zoning for the subject site under the *Fingal County Development Plan 2023 - 2029*			
Zoning Objective	**Permitted Uses**	**Relevant Section of Proposed Development - RCUG**	**Proposed Development – Operational Stage**
OS - Open Space Preserve and provide for open space and recreational amenities	Community Facility, Golf Course, Open Space, Recreational/Sports Facility	The vast majority of the Proposed Development is located within the Open Space zoning. 	The provision of open space is strategically concentrated along the Royal Canal corridor, serving as a key component of the recreational infrastructure network. In alignment with the objectives outlined in the development plan, this area has been pre-designated for integration into the proposed greenway, reinforcing its role as a multi-functional public amenity and sustainable mobility route. The open spaces are also distributed in and around the existing residential areas and along with royal canal. **Impact is Positive, Significant and Permanent.**
GB – Green Belt	Agricultural Buildings, Agri-	A small section at the start of Section 1 close to the boundary with Kildare County Council is located directly adjacent to and alongside the southern boundary of the Greenbelt zone, located near Allenswood.	The Proposed Development is fully

Protect and provide for a Green Belt.	Tourism Bed and Breakfast, Boarding Kennels, Burial Grounds, Childcare Facilities, Community Facility, Farm Shop, Golf Course, Guest House, Health Practitioner, Holiday Home/Apartments, Office Ancillary to Permitted Use, Open Space, Recreational/Sports Facility, Research and Development, Residential, Restaurant/Café, Veterinary Clinic, Campsite		compatible with the existing green belt zone and will form a natural boundary between the green belt and high amenity zone uses alongside the canal and existing railway tracks. **Impact is Positive, Slight and Permanent.**
HA - High Amenity Protect and enhance high amenity areas.	Agri-Tourism, Bed and Breakfast, Boarding Kennels, Burial Grounds, Campsite, Childcare Facilities, Farm Shop, Guest House, Health Practitioner, Holiday Home/Apartments, Office Ancillary to Permitted Use, Open Space,	Predominantly centered on the south-east region surrounding RCUG Section 1 – the route does not pass directly through the HA zone.	The Proposed Development is separated from the high amenity land by the existing canal and railway. The high amenity region currently comprises local facilities such as golf clubs, gardens, eco-farms and active agricultural land. The Proposed Development adjoins local amenities such as

	Residential, Restaurant/Café		Westmanstown Golf Club and Westmanstown Sports Centre. **Impact is Positive, Slight and Permanent.**
RA - Residential Area Provide for new residential communities subject to the provision of the necessary social and physical infrastructure.	Bed and Breakfast, Childcare Facilities, Community Facility, Education, Funeral Home/Mortuary, Guest House, Health Centre, Health Practitioner, Hospital, Office Ancillary to Permitted Use, Office ≤ 100 sqm, Office > 100 sqm and < 1,000 sqm, Open Space, Place of Worship, Public House, Public Transport Station, Recreational/Sports Facility, Residential, Residential Care	A small portion of the RCUG route in Section 1 passes through the RA zone, located near Hansfield Wood.  In addition, a small portion of the RCUG route in Section 2 passes through this zone, located near the Village Road, Porterstown.	The Proposed Development will support existing and future residential developments by providing physical and social infrastructure improvements, in the form of a pedestrian and cycling-friendly greenway as well as accessible open/recreational space. The Proposed Development will further contribute to the proposed objectives of the Hansfield SDZ, Barnhill LAP and Kellystown LAP.

	Home/Retirement Home, Restaurant/Café, Retail - Local < 150 sqm, Retail - Convenience ≤ 500 sqm, Retail - Comparison ≤ 500 sqm, Retail - Supermarket ≤ 2,500 sqm, Retirement Village, Sheltered Accommodation, Sustainable Energy Installation, Taxi Office, Traveller Community Accommodation, Utility Installations, Veterinary Clinic	 The north-west and south-east region surrounding the RCUG in Section 2 is zoned RA.	**Impact is Positive, Slight and Permanent.**
RS - Residential Provide for residential development and protect and improve residential amenity.	Bed and Breakfast, Childcare Facilities, Community Facility, Education, Guest House, Office Ancillary to Permitted Use, Open Space, Residential, Residential Care Home/Retirement Home, Retirement Village, Sheltered Accommodation, Traveler	A small portion of the route near St Joseph's Cl in Section 1 passed within the RS zone.	The proposed development will enhance residential amenities along the greenway and cater to existing developments. The residential population will be served by a fully functioning pedestrian and cycle greenway which will provide extended connectivity between Dublin and Galway, with access to

	Community Accommodation, Utility Installations.	 This zone surrounds most of RCUG Section 3. 	a variety of amenities available along the greenway. **Impact is Positive, Slight and Permanent.**

Local Plans

There are several local plans which are focused on landbanks within close proximity to the Proposed Development, as set out below:

- **Barnhill LAP (LAP 13A):** The western section of the Proposed Development passes through the Barnhill LAP area. While some permanent land take is required, the Greenway supports the LAP's objectives for active travel, recreation and green infrastructure.
- **Kellystown LAP (LAP 13B):** The Greenway directly interfaces with the Kellystown growth area and supports planned residential development through the provision of strategic walking and cycling infrastructure.
- **Clonsilla Framework Plan (LAP 13.C):** The Greenway is identified as a key active travel and placemaking asset, with land use changes generally enhancing the existing canal corridor.
- **Hansfield SDZ:** Sections of the route adjoin the Hansfield SDZ, where the Greenway will improve connectivity and support the delivery of sustainable transport objectives.

Construction Phase

Implementation of the Barnhill LAP, Kellystown LAP, Clonsilla Framework Plan and Hansfield SDZ will facilitate significant residential, community and infrastructure development within lands adjoining and surrounding the Proposed Development corridor. During the construction phase, temporary land occupation, construction compounds, working areas and localised access restrictions may result in short-term disruption to existing and planned land uses within these plan areas.

However, the majority of the temporary land requirements associated with the Proposed Development are limited in extent and duration and do not prevent or materially constrain the implementation of the objectives of the Barnhill LAP, Kellystown LAP, Clonsilla Framework Plan or Hansfield SDZ. Any temporary effects on planned land uses, access arrangements or development lands are therefore assessed as **Negative, Slight and Temporary**.

Operational Phase

During the operational phase, the Proposed Development will support the implementation of the Barnhill LAP, Kellystown LAP, Clonsilla Framework Plan and Hansfield SDZ through the provision of strategic walking and cycling infrastructure, enhanced recreational opportunities, improved permeability and strengthened connections between existing and planned communities.

While some permanent land acquisition and changes in land use are required to facilitate the Greenway, these changes are generally consistent with the land use, active travel, green infrastructure and placemaking objectives of the relevant plans. The Proposed Development does not materially constrain the future development potential of lands identified for growth and development within the Barnhill, Kellystown or Hansfield areas. Rather, it will improve accessibility to existing and future residential communities and enhance connectivity along the Royal Canal corridor. Accordingly, the interaction between the Proposed Development and the Barnhill LAP, Kellystown LAP, Clonsilla Framework Plan and Hansfield SDZ is assessed as **Positive, Significant and Permanent**.

17.5 Mitigation

The design of the Proposed Development has evolved through an iterative design process, informed by environmental constraints, engineering requirements and ongoing engagement with affected landowners and stakeholders. Throughout the design process, particular consideration was given to minimising permanent and temporary land take, reducing impacts on existing land uses and property interests, maintaining access arrangements and avoiding unnecessary severance of landholdings where practicable.

An Outline Construction Environmental Management Plan (OCEMP) has been prepared as part of the planning application and will be further developed by the appointed contractor prior to the

commencement of construction. The OCEMP will include measures to minimise temporary impacts on adjacent properties, landholdings and existing land uses during the construction phase of the Proposed Development. The following measures will be implemented to avoid, reduce or mitigate potential impacts on land use and property during construction:

- Temporary and permanent land acquisition requirements have been minimised as far as practicable through the design development process.
- A dedicated point of contact will be established to facilitate ongoing communication and liaison with affected landowners and occupiers throughout the construction phase.
- Existing access arrangements to residential, commercial and agricultural lands will be maintained, where practicable, throughout the construction period. Where temporary restrictions are required, advance notice and alternative access arrangements will be provided where feasible.
- Temporary fencing, hoarding and site security measures will be provided to protect adjacent lands and property interests during construction.
- Accommodation works will be implemented where necessary to maintain the viability and functionality of affected landholdings. Such measures may include stockproof boundary fencing, replacement gates, maintenance of existing drainage infrastructure, provision of alternative service connections and measures to maintain access to severed lands.
- Construction compounds, material storage areas and temporary working areas will be restricted to designated locations and will occupy the minimum area necessary for construction activities, as outlined in the Outline Construction Traffic Management Plan (OCTMP) prepared by DBFL and accompanying this application.
- Any lands temporarily occupied during construction will be reinstated, as appropriate, following completion of the works.
- Compensation associated with land acquisition and disturbance will be provided in accordance with the relevant statutory provisions governing compulsory acquisition in the CPO process.

The principal mitigation measure incorporated into the Proposed Development is the selection of a route alignment and design that minimises permanent land take and avoids unnecessary impacts on existing properties and land uses while facilitating delivery of the proposed greenway infrastructure. Details of design selection and alternatives are assessed in Chapter 4 of this EIAR.

As the Proposed Development will provide a permanent recreational and active travel corridor in accordance with the strategic objectives of the Fingal County Development Plan, and as residual impacts on land use and property are not considered significant following implementation of the mitigation measures described above (as referred to below), additional operational mitigation measures are not considered necessary.

17.6 Residual Impacts

Following implementation of the proposed mitigation measures, residual construction-phase effects associated with temporary land occupation, working areas, vegetation clearance, access restrictions and disruption to existing land uses will generally be **Negative, Slight and Temporary**. At more sensitive locations, including areas adjacent to residential properties and areas requiring vegetation clearance, the residual effects will be **Negative, Moderate and Temporary**.

The demolition effect identified in Section 17.4.2 cannot be fully mitigated and will remain as a **Negative, Moderate and Permanent** residual effect.

During the operational phase, residual effects associated with permanent land acquisition and changes in land use will remain. The effects identified for the individual plots range from **Positive, Slight and**

Permanent to **Positive, Significant and Permanent**, reflecting the nature and scale of the accessibility, connectivity, recreational and amenity improvements provided at each location.

At Plot 7, the residual effect on access to the existing dwellings will be **Neutral, Imperceptible and Permanent**, while the effect for future residents of the adjoining residential lands will be **Positive, Moderate and Permanent**. Lands acquired temporarily will be reinstated following construction and will not give rise to residual operational effects.

17.7 Interactions

Potential effects on land use and property interact with a number of other environmental factors assessed within this EIAR, as detailed below.

Noise and Vibration

Construction plant, traffic and works areas may result in temporary noise and vibration effects on adjoining properties and sensitive land uses, with associated effects on amenity and use. These effects and the relevant mitigation measures are assessed in Chapter 7 Noise and Vibration. No material operational interaction with land use and property is identified.

Landscape and Visual

During the construction phase, temporary working areas, construction compounds, earthworks, material storage and vegetation clearance may alter the character and appearance of affected lands. Land use effects arising from vegetation loss or severance are assessed in this chapter as Negative, Moderate and Temporary, while the associated landscape and visual effects are assessed in Chapter 10 Landscape and Visual. At operational stage, the incorporation of lands into the Greenway corridor will permanently alter their use while enhancing the recreational and amenity function of the Royal Canal corridor. The land use implications are assessed in this chapter and the associated landscape and visual effects in Chapter 10.

Land, Soils and Geology

Temporary and permanent land occupation will involve earthworks and disturbance within working areas, compounds and access routes at construction stage. No material operational interaction with land use and property is identified.

Population and Human Health

Temporary land occupation, access restrictions, diversions and disturbance to open space and recreational areas may affect accessibility, movement, recreation and amenity during construction. The land use and property effects are assessed in this chapter, while the associated population and human health effects are assessed in Chapter 13 Population and Human Health. Once operational, the enhanced use of the Royal Canal corridor will improve accessibility, permeability, recreation and active travel connectivity between communities, public transport and local amenities.

Traffic and Transport

Construction traffic, temporary traffic management, closures and diversions may temporarily affect access to adjoining properties, landholdings, amenities and the Royal Canal corridor. The Proposed Development, once operational, will improve walking and cycling connectivity, accessibility and permeability, including through the Landmark Bridge and the proposed underpass at Granard Bridge.

Material Assets: Utilities

During construction, utility diversions will be coordinated with the temporary and permanent land requirements and access arrangements. Utility accommodation measures are not expected to materially affect land use patterns or property interests once the Proposed Development is operational.

17.8 Cumulative Effects

For the purposes of this assessment, cumulative effects have been considered in respect of existing, commenced, permitted and reasonably foreseeable developments located within the wider study area identified in Chapter 1. This includes major residential, transport, community and commercial developments located within approximately 500m of the Proposed Development corridor, together with strategic infrastructure projects extending beyond this area where relevant. The assessment considers cumulative effects during both the construction and operational phases and assumes a worst-case scenario whereby construction of the Proposed Development could overlap with the construction of other permitted or approved developments.

Local Projects

Construction Phase

The cumulative assessment has considered the Proposed Development in combination with existing, commenced, permitted and reasonably foreseeable developments identified in Chapter 1, including major residential developments within the Hansfield SDZ, Clonsilla, Porterstown, Kellystown and Barnhill areas, together with strategic transport projects such as DART+ West and the BusConnects Blanchardstown to City Centre Core Bus Corridor Scheme.

Should the construction phase of the Proposed Development overlap with the construction of other permitted but unimplemented developments within the study area, there is potential for temporary cumulative effects to arise in relation to land use and property. This assessment assumes a worst-case scenario whereby the Proposed Development is constructed concurrently with major residential developments in the surrounding area, including FW23A/0013 (419 residential units), FW22A/0147 (174 residential units), LRD0021/S3E (170 residential units), LRD0052/S3E (302 residential units) and ACP-320560 (1,243 residential units), together with strategic transport infrastructure projects.

Potential cumulative effects could include temporary restrictions on access to lands and properties, disruption to existing land uses during construction, increased construction activity within the wider corridor and the concurrent occupation of land for construction purposes. However, these effects would be localised and temporary in nature and would not result in any additional permanent land take beyond that assessed for the Proposed Development. Furthermore, the majority of the aforementioned developments are located on separate development sites and do not require the same land parcels as the Proposed Development.

Given the limited extent of permanent land acquisition required, the linear nature of the scheme and the absence of overlapping land requirements, significant adverse cumulative effects on land use, property, land ownership or land take are not anticipated during the construction phase. Overall, effects are expected to be Negative, Slight and Temporary.

Operational Phase

During the operational phase, cumulative effects have been considered in combination with other existing, commenced, permitted and reasonably foreseeable developments within the study area, including major residential developments within the Hansfield SDZ, Porterstown, Kellystown and Barnhill areas, together with the DART+ West Railway Order and the BusConnects Blanchardstown to City Centre Core Bus Corridor Scheme.

Potential cumulative effects could arise where multiple developments require permanent land acquisition, alter existing land uses, influence access arrangements, or affect the future development potential of adjoining lands. However, the permanent land take associated with the Proposed Development is limited in extent and primarily facilitates a change in land use to green infrastructure, public open space and active travel infrastructure. The Proposed Development is not considered to give

rise to significant constraints on surrounding land ownership, existing land uses or planned development objectives.

Particular consideration has been given to the proposed residential development at Porterstown Road (FW25A/0416E), which is located adjacent to Plot 7. While both developments will contribute to changes in land use patterns within this locality, the Proposed Development will maintain access arrangements and provide enhanced active travel connectivity and access to the Royal Canal corridor for future residents. Accordingly, no significant adverse cumulative effect on land use, property or development potential is identified in this location.

In combination with other transport, residential and community developments in the area, including DART+ West, BusConnects and the permitted residential developments identified above, the Proposed Development will contribute to the coordinated use of the corridor for sustainable transport, recreation and public amenity purposes. While some cumulative land take and land use change will occur across the wider area as a result of the Proposed Development and these other consented or reasonably foreseeable projects, such changes are not considered significant in the context of the receiving environment and do not materially affect the use or development potential of surrounding lands.

Accordingly, no significant adverse cumulative effects on land use, property or land take are anticipated during the operational phase of the Proposed Development. The Proposed Development is considered complementary to the planned pattern of development in the area and will support improved accessibility, connectivity and integration of existing and planned communities. The overall cumulative effect at operational stage is considered Positive, Moderate and Permanent.

17.9 Monitoring

The implementation of mitigation measures relating to land use, property and land take will be monitored throughout the construction phase by FCC and the appointed Contractor. Monitoring will focus on compliance with approved land acquisition requirements, the maintenance of access arrangements to retained lands and properties, the implementation of agreed accommodation works, and ongoing liaison with affected landowners and occupiers.

In particular, monitoring will focus on locations where Negative, Moderate and Temporary construction effects have been identified, including areas where temporary access restrictions, land take, vegetation clearance or disruption to existing land uses may occur.

Compliance with mitigation and reinstatement commitments relating to access, boundary treatments, drainage, fencing and other landholding matters will be managed through the Construction Environmental Management Plan (CEMP), the Construction Liaison Programme and the project's stakeholder engagement procedures. Any issues identified during construction will be addressed through the Contractor's construction management procedures in consultation with affected parties, as appropriate.

The chapter identifies a Negative, Moderate and Permanent effect associated with the demolition of two Fingal County Council-owned houses required to facilitate the Proposed Development. As this effect arises from a permanent and approved land use change which cannot be mitigated through post-construction monitoring, no specific operational monitoring is proposed in this regard.

No additional land use or property monitoring is considered necessary during the operational phase. The remaining operational effects relate either to permanent land acquisition and land use changes that form part of the approved development or to beneficial effects associated with improved accessibility, connectivity and amenity provision. Accordingly, operational monitoring would not provide additional mitigation or influence the significance of the residual effects identified.

17.10 References

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18 Interactions

18.1 Introduction

The potential for interaction of environmental effects has been assessed throughout this EIAR, as part of the impact assessment process of the individual environmental factors in Chapters 5 – 17. These previous chapters have identified, described and assessed the relevant interactions arising between one or more of the individual environmental factors. This chapter of the EIAR brings together the interactions identified and described in each chapter. Close coordination and discussion between the wider EIA team has informed the assessment of interactions and the preparation of this chapter to ensure that interactions identified have been adequately assessed and, where necessary, mitigation proposed.

This chapter has been prepared by Maria Rochford BSc (Hons), MRUP MIPI, Associate Director at KPMG Planning. Maria has 15 years of professional experience as a Town Planner. Maria has coordinated multiple EIAs for development projects and has authored introductory chapters, cumulative impact assessments, Population and Human Health assessments, Land Use and Property and Interactions assessments for inclusion in EIARs.

18.2 Definitions

The consideration of interactions derives from the provisions of the EIA Directive 2011/92/EU as amended by Directive 2014/52/EU ('the EIA Directive'). Article 3(1)(e) of the EIA Directive requires, inter alia, that the EIAR shall identify, describe and assess in an appropriate manner, in the light of each individual case, the direct and indirect significant effects of a project on the following factors:
a) population and human health;

b) biodiversity, with particular attention to species and habitats protected under Directive 92/43/EEC and Directive 2009/147/EC;

c) land, soil, water, air and climate;

d) material assets, cultural heritage and the landscape;

e) the interaction between the factors referred to in points (a) to (d).

Interaction effects occur where changes to one environmental factor have the potential to influence another environmental factor, resulting in linked or interrelated environmental effects. The assessment of interactions was undertaken through a review of the findings of Chapters 5 to 17 of this EIAR. The competent experts responsible for each environmental topic identified potential interaction pathways between environmental factors. These interactions were then collated and reviewed to identify any potential for significant interaction effects arising during the construction and operational phases of the Proposed Development.

18.3 Interactions of Effects

This section collates, in summary form, the more detailed list of interactions set out within each of the chapters 5-17 above. The potential impact interactions between the environmental factors/topic areas are identified in Table 18.1. This effects matrix identifies the factors in the left-hand column, which have the potential to impact on other factors listed in the top row of the matrix. Where a tick '✓' is present, this indicates that the Proposed Development has the potential to result in an interaction between the two environmental factors. Where no potential for an interaction between factors has been identified by the competent expert for that environmental factor, this is indicated by 'x' in the matrix. 'C' denotes the construction phase, and 'O' denotes the operational phase of the Proposed Scheme. The purpose of

the matrix is to identify the likely interactive effects of significance. A description of the interactive effect for each environmental factor/topic then follows, as also detailed in the relevant chapter of this EIAR.

Table 18-1 Matrix table showing interactions between key factors assessed

Some interaction ✔ No interaction x	Air Quality		Climate		Noise & Vibration		Biodiversity		Archaeology & Cultural Heritage		Landscape & Visual		Land, Soils, Geology		Water		Population & Human Health		Traffic & Transport		Waste Mngt		Utilities		Land Use & Property	
	C	O	C	O	C	O	C	O	C	O	C	O	C	O	C	O	C	O	C	O	C	O	C	O	C	O
Air Quality			✔	✔	x	x	✔	x	x	x	x	x	✔	x	x	x	✔	x	✔	x	x	x	x	x	x	x
Climate	✔	✔			x	x	x	x	x	x	x	x	✔	✔	x	x	x	x	✔	✔	✔	x	x	x	x	x
Noise & Vibration	x	x	x	x			✔	x	x	x	x	x	x	x	x	x	✔	✔	✔	✔	x	x	x	x	x	x
Biodiversity	✔	✔	✔	✔	✔	✔			✔	✔	✔	✔	✔	✔	✔	✔	x	x	✔	✔	✔	✔	✔	✔	x	x
Archaeology & Cultural Heritage	x	x	x	x	✔	x	x	x			x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Landscape & Visual	x	x	x	x	x	x	✔	✔	✔	✔			x	x	x	x	✔	✔	x	x	x	x	x	x	x	x
Land, Soils & Geology	✔	x	x	x	✔	x	✔	x	x	x	x	x			✔	✔	x	x	✔	x	✔	x	✔	x	x	x
Water	✔	x	✔	✔	✔	x	✔	✔	✔	x	✔	✔	✔	✔			✔	✔	✔	✔	✔	x	✔	✔	✔	✔
Population & Human Health	✔	✔	✔	✔	✔	x	x	x	x	x	✔	✔	✔	x	✔	✔			✔	✔	✔	x	x	x	✔	✔
Traffic & Transport	✔	✔	✔	✔	✔	✔	✔	✔	x	x	x	x	✔	x	✔	x	✔	✔			✔	x	x	x	✔	✔
Waste Management	✔	x	✔	x	✔	x	✔	✔	✔	x	✔	x	✔	x	✔	x	✔	✔	✔	x			x	x	✔	x
Utilities	✔	x	✔	✔	✔	x	✔	x	✔	x	✔	✔	✔	x	✔	x	✔	x	✔	✔	✔	x			✔	x
Land Use & Property	x	x	x	x	✔	x	x	x	x	x	✔	✔	✔	x	x	x	✔	✔	✔	✔	x	x	✔	x		

18.3.1 Air Quality

Air Quality and Population & Human Health

An adverse air quality impact during the construction phase can cause health and dust nuisance issues. There is a low risk of dust-related human health impacts during the construction phase of the Proposed Development. Best practice mitigation measures will be implemented during the construction phase to ensure that the impact of the Proposed Development complies with all ambient air quality legislative limits. Therefore, the predicted air quality effect is direct, short-term, negative, localised and not significant with respect to Population and Human Health during the construction phase.

Air Quality and Climate

Air Quality and Climate have interactions as the emissions from the burning of fossil fuels during the construction and operational phases generate both air quality and climate impacts. There is no impact on climate due to air quality. However, the sources of impacts on air quality and climate are strongly linked.

Air Quality and Land & Soils

Construction phase activities such as land clearing, excavations, stockpiling of materials etc. have the potential for interactions between Air Quality and Land & Soils in the form of dust emissions. With the appropriate mitigation measures to prevent fugitive dust emissions, it is predicted that there will be no significant interactions between air quality and land and soils during the construction phase.

Air Quality and Biodiversity

Dust generation can occur during extended dry weather periods due to construction traffic along haul routes and construction activities such as excavations and infilling works. Dust emissions can coat vegetation leading to a reduction in the photosynthesising ability as well as other effects. The Royal Canal pNHA is within 250 m of the Proposed Development site area. Significant dust impacts are not predicted beyond this distance. A medium risk of dust impacts are predicted in the absence of mitigation. However, dust mitigation measures will be implemented on site as set out in Section **Error! Reference source not found.** of Chapter 5. With the implementation of these mitigation measures dust emissions will be minimised and the air quality effect will be direct, short-term, negative, localised and not significant with respect to biodiversity.

Air Quality and Material Assets – Traffic & Transport

Interactions between Air Quality and Traffic can be significant. With increased traffic movements and reduced engine efficiency, i.e. due to congestion, the emissions of vehicles increase. The impacts of the Proposed Development on air quality are assessed by reviewing the change in annual average daily traffic on roads close to the site. In this assessment, the impact of the interactions between Traffic and Air Quality are linked but there is no potential for significant impacts from traffic on air quality. The air quality effect are considered to be direct, short-term, neutral, localised and not significant during the construction phase.

18.3.2 Climate

Land, Soils, Geology and Hydrology

The impact of flood risk has been assessed, and the surface water drainage network will be designed to cater for increased rainfall in future years as a result of climate change. No significant interactions between climate and land, soils, geology are predicted.

Air Quality

Air quality and climate have interactions due to the emissions from the burning of fossil fuels during the construction and operational phases generating both air quality and climate impacts. Air quality modelling outputs are utilised within the Climate Chapter. There is no impact on climate due to air quality. However, the sources of impacts on air quality and climate are strongly linked.

Traffic and Transportation

During the construction and operational phase, there is the potential for interactions between climate and traffic. Vehicles accessing the site will result in emissions of CO_2, a greenhouse gas. The effects of the Proposed Development on climate are assessed by quantifying the traffic-related GHG emissions from the construction phase. In this assessment, no significant interactions between climate and traffic and transportation are predicted.

Waste

Waste management measures will be put in place to minimise the amount of waste entering landfill, which has higher associated embodied carbon emissions than other waste management such as recycling. The effect of the interactions between waste and climate are considered not significant.

18.3.3 Noise and Vibration

Human Health

The potential effects on human health in relation to the generation of noise and vibration during the construction phase are discussed in Chapter 13 - Population and Human Health.

The potential impacts on human beings in relation to the generation of noise and vibration during the construction phases are limited to the possibility that high levels of noise and vibration could cause nuisance to people in nearby sensitive locations. Implementation of the mitigation measures set out and adherence to good practice noise reducing measures will ensure that the residual impact on human health will be lessened and impacts will be short-term, slight to significant and negative in nature.

Noise sources during the operational phase are expected to generate low levels of noise and therefore the predicted noise and vibration impact is expected to be negative, imperceptible to not significant, and temporary to long-term.

Biodiversity

The potential effects on local wildlife in relation to the generation of noise and vibration during the construction phase are discussed in Chapter 8 -Biodiversity.

Traffic and Transport

The noise impact assessment has been prepared in consultation with the design team and traffic consultant, referring to vehicle movements and projections set out in Chapter 17 - Traffic and Transportation.

The expected residual impact in relation to traffic noise will be negative to positive, imperceptible and long-term.

18.3.4 Biodiversity

Interactions among Biodiversity; Water; Land, Soils and Geology; Climate (Climate Change); and Material Assets (Waste)

Construction Stage

There are potential interactions between waste management and water environment which can have a potential impact on key ecological receptors during construction, as outlined in Chapter **Error! Reference source not found. Error! Reference source not found.**. This includes the removal of invasive species during the construction stage, which involves collected waste biomass (pulled stems/roots and bagged flower heads). If this biomass is not disposed of appropriately at a facility authorized to accept such waste, it has the potential to enter adjacent habitats and the Royal Canal and be spread further downstream. Such spreading events can have adverse impacts on high value habitats, displacing native species. These potential interactions also include the removal of topsoil during the construction phase, which if not removed/stored effectively, has the potential to enter the Royal Canal, increasing water turbidity which can hinder light penetration and negatively affect macrophytes.

Operational Stage

The operational stage interactions are due to the potential for surface water run-off due to the introduction of additional artificial surfaces along the canal. The use of filer drains will help manage run-off, although overtime these drains will likely become partially clogged by debris, such as silt, meaning run-off from the long-term run-off rates will be higher during the operational phase. Climate change is projected to lead to an increase in extreme precipitation events, which will further increase long-term surface water run-off rates during the project's operation.

Interactions among Biodiversity; Air (Noise and Vibration); and Material Assets (Transport)

Construction Stage

During the construction stage, the biodiversity assessment has examined how key ecological receptors, such as species and habitats, interact with various environmental factors. Specifically, there is an interaction between traffic and transport and mortality risk for species. Airborne noise from construction activities, including vehicles, can interact with biodiversity as any increase in noise levels has the potential to impact on sensitive ecological receptors. An example of this interaction is the direct and indirect impacts likely to occur on the foraging and commuting activities of local mammals (Badger, Otter, Hedgehog), bats and birds located within the locality of the Royal Canal, resulting from the temporary noise and vibration pollution during this stage. Further, noise generated by the construction works has the potential to effect breeding bird species egg production, incubation, brooding, predators, brood parasites, and abandonment, as well as the ability to find or attract a mate and the ability of parents to hear and respond to begging calls of their offspring.

Operational Stage

Operational interaction impacts among Biodiversity, Noise and Vibration, and Traffic and Trasport are likely to occur given the increase usage of the canal by pedestrians and vehicles (bikes, e-scooters, TII maintenance vehicles). All faunal species will be subjected to increase noise levels (disturbance), as well as ground-dwelling fauna, and some less agile and/or reactionary bird species also seeing their risk of collision injuries and fatalities increase as a result of the Greenways operation and the anticipated increase in vehicles locally (bikes, e-scooters, TII maintenance vehicles).

Interactions among Biodiversity; Water; Air (Sunlight & Daylight); Climate (Air Quality); and Landscape and Visual

Construction Stage

There is an interaction between water, air quality and biodiversity, as any reduction in the quality of surface water or in air quality can contribute to habitat degradation. Air (emissions and dust) pollution generated during the construction stage has the potential to adversely impact watercourses (airborne emissions), photosynthesis and the biological functions (dusts) of valued flora. Additionally, air (sunlight & daylight) interacts with biodiversity during the construction stage as a result of changes to landscape (trees removal, creation of earth mounds etc.) will ultimately change the (sun) lighting regime for flora within the retained habitats on-site. This will have a slight impact on a subset of the more light/shading sensitive flora.

Operational Stage

During the Operational Phase, there will be an interaction between landscape and biodiversity. As outlined in Chapter 10 (Landscape & Visual), the proposed project will include replanting with native species, where possible. Air (sunlight & daylight) will interact with biodiversity during the operational stage as a result of changes to landscape (removal of scrub and trees, along with the planting of new trees and shrub, and the installation of raised sections of the Greenway) will change the (sun) lighting regime for flora within the habitats adjacent to the Proposed Development. This will have a slight impact on a small proportion of the more light/shading sensitive flora. Development pl

Interactions between Biodiversity, Land, Soils and Geology, and Material Assets (Utilities)

Construction Stage

The impact of earth works, land take (habitat loss) and tree removal for the Proposed Development on the local biodiversity along the Royal Canal will be the most notable impact on biodiversity as a result of the proposed development. Loss of soil value from construction activities and use of unsuitable soil material may affect biodiversity. There is an interaction between soils and geology and biodiversity, as non-native invasive plant species can be spread through soils and can also contribute to habitat degradation. There will be an interaction between utilities and biodiversity, with the provision of construction-based lighting impacting on light-sensitive fauna. Temporary connections with the local surface and foul water drainage networks for construction compounds and the connection of operational lighting fixtures to the electricity network will require excavations, which can spread non-native invasive plant species, contributing to habitat degradation.

Operational Stage

Given the long-term nature of the land take (habitat loss) this negative impact / interaction is carried forward to the operational stage of the Greenway. There will also be a long-term negative impact / interaction between biodiversity and utilities, with the provision of operational lighting along the Greenway adversely impacting local light-sensitive fauna.

Interactions between Biodiversity and Cultural Heritage (Archaeological & Architectural)

Construction Stage

The impact of interactions between Biodiversity and Cultural Heritage (Archaeological & Architectural) will be imperceptible during the construction stage of the Greenway, unless archaeological remains are identified during the stripping of topsoil along the Proposed Development or within proposed compound areas that have not been formerly developed. If this scenario arises, the significance of effect on biodiversity would be determined by the nature and extent of works required.

Operational Stage

In the event that the discovery of archaeological remains results in further investigation into habitats that are set to be retained, this will lead to additional ecological lag, limiting ecological functionality within the sites, as a result of the required reinstatement of habitats following archaeological investigations.

18.3.5 Architectural and Cultural Heritage

One discipline has been identified during the compilation of the EIAR chapter where there is a potential interaction between architectural heritage and vibration effects (Chapter 7). This relates to the potential for indirect negative impacts on historic structures resulting from vibration associated with the construction of the scheme. A full review of Chapter 7 has revealed that no vibration impacts are predicted upon sensitive historic structures during construction.

18.3.6 Landscape and Visual

This chapter on Landscape and Visual Impact Assessment of the proposed development, has the potential to interact with Chapter 8: Biodiversity, Chapter 9: Archaeology and Cultural Heritage and Chapter 17: Material Assets: Land Use and Property.

Biodiversity

Habitats of note have been recorded along the entirety of the project route which is a pNHA with protected species. The retention of the majority of trees and hedgerows within the site is part of the overall green infrastructure strategy of the overall landscape plan and is essential for the retention of the high sensitivity and high landscape value of the landscape associated with the Royal Canal and the aspirations of the proposed development, providing instant visual and landscape amenity value. The proposed landscape and green infrastructure strategies that are proposed for the site along with designed in mitigation measures for the flora and fauna. Landscape and Visual and Biodiversity have the potential to have an interaction that can be described as a significant positive effect in the long term.

Archaeology and Cultural Heritage

The cultural heritage of the site as a whole, with a substantial number of protected structures along the route, as well as the Royal Canal as an entity, has been considered and reviewed as part of this assessment. The potential effects of the interaction between the archaeological cultural heritage of the Royal Canal site and the landscape and visual effects of the proposed development are considered to be imperceptible and neutral. It is likely that there will be no significant adverse effects on interactions in this instance.

18.3.7 Land, Soil and Geology

Air Quality & Climate

During the construction phase, construction dust emissions have the potential to impact air quality. Dust emissions will primarily occur as a result of site preparation works, earthworks and the movement of trucks on site and exiting the site. There is also the potential for engine emissions from site vehicles and machinery to impact air quality. Further details including any potential issues and mitigation measures are outlined in Chapter 5 (Air Quality).

Noise and Vibration

Development of the site will result in a level of noise and vibration related effects on the surrounding environment during the construction phase. An OCEMP has been developed. The mitigations proposed in the OCEMP will be developed further prior to construction in order to minimise the disturbance caused by construction activities and associated traffic. Further details including any potential issues and mitigation measures are outlined in Chapter 7 (Noise and Vibration).

Biodiversity

The removal of the existing topsoil layer will be required across the site as well as removal of some trees, vegetation, and hedgerows. Further details including any potential issues and mitigation measures are outlined in Chapter 8 (Biodiversity).

Water and Hydrology

Stripping of topsoil will result in exposure of the underlying subsoil layers to the effects of weather and construction traffic and may result in subsoil erosion and generation of sediment laden surface water runoff. During the construction phase a site-specific CEMP will manage site water and will mitigate the risk of surface contaminants infiltrating into the underlying geology and hydrogeology. Works are to be carefully coordinated with FCC and IFI to minimise disruption to the existing canal. Further details including any potential issues and mitigation measures are outlined in Chapter 12 (Water).

Traffic and Transport

Delivery of materials to site (e.g. aggregates for road construction, concrete for foundations, delivery of construction plant to site) and removal of excavated topsoil / subsoil will lead to potential impact on the surrounding road network. Further details including any potential issues and mitigation measures are outlined in Chapter 14 (Material Assets – Traffic and Transportation).

Waste Management

Oil, fuel etc. storage areas are to be decommissioned on completion of the construction phase. Any remaining liquids are to be removed from site and disposed of at an appropriate licensed facility.

Topsoil not being reused on site and excavated subsoil materials may be reused on another site as by-product (and not as a waste), this will be done in accordance with Regulation 27 of the EC (Waste Directive) Regulations (2011). Should reuse opportunities be unavailable such material will be removed from site to a licenced waste receiving facility (subject to the approval of the facility operator in accordance with their facility permit or licence).

Utilities

Trench excavations to facilitate site service installation will result in exposure of subsoils to potential erosion.

18.3.8 Water

Air Quality

Interactions between Water and Air Quality arise during the Construction Phase through the management of exposed soils, excavations and stockpiles. Measures used to control dust emissions, including damping down of exposed surfaces and earthworks areas, may generate surface water runoff if not appropriately managed. Conversely, water quality protection measures implemented to manage runoff and sediment transport may also contribute to dust suppression. Accordingly, there is an interaction between the control of airborne dust emissions and the management of surface water runoff during construction. Further details are provided in Chapter 5: Air Quality.

Climate

Interactions between Water and Climate arise through both climate adaptation and climate resilience. Future increases in rainfall intensity associated with climate change have been considered within the drainage design and flood risk assessment for the Proposed Development. In addition, the adoption of infiltration drainage, filter drains and over-the-edge drainage seeks to replicate existing hydrological processes and maintain groundwater recharge where practicable. Potential climate-related effects on

surface water runoff, flood risk and drainage capacity are considered in both Chapter 12 Water and Chapter 6: Climatic Factors.

Noise and Vibration

Interactions between Water and Noise and Vibration arise during the Construction Phase where works within the Royal Canal corridor, adjacent drainage features and watercourse crossing locations generate construction-related noise and vibration. Construction activities that have the potential to affect water quality, including excavation, earthworks and drainage installation, are also the principal sources of construction noise and vibration. These effects have been assessed in Chapter 7: Noise and Vibration.

Biodiversity

The strongest interaction identified is between Water and Biodiversity. Water quality, hydrology and aquatic habitat conditions within the Royal Canal directly influence aquatic and riparian ecological receptors, including protected and notable species identified within Chapter 8: Biodiversity. Impacts relating to sediment release, accidental pollution, changes to flow regimes and physical disturbance of the canal corridor have the potential to affect ecological receptors. Chapter 8: Biodiversity and Appropriate Assessment Report assess the ecological consequences of these water-related effects.

Archaeology & Cultural Heritage

Interactions between Water and Archaeology & Cultural Heritage arise where excavation works are undertaken within areas of archaeological potential and where historic water-related features are present. Water management measures, dewatering activities and drainage works may influence archaeological investigations, while archaeological constraints may influence the design and construction of drainage and water infrastructure. Further details are provided in Chapter 9: Archaeological, Architectural & Cultural Heritage.

Landscape and Visual

Interactions between Water and Landscape & Visual arise through the incorporation of drainage features, swales, filter drains, over-the-edge drainage and other SuDS elements within the Proposed Development. Water management infrastructure forms part of the overall landscape character of the scheme and contributes to its visual appearance. These interactions are considered within Chapter 10: Landscape, Townscape & Visual.

Land, Soils and Geology

Interactions between Water and Land, Soils & Geology are significant. Construction activities have the potential to alter soil stability, generate sediment-laden runoff and affect infiltration characteristics. Geological and hydrogeological conditions influence groundwater flow, groundwater vulnerability and the effectiveness of infiltration-based drainage measures. Effects associated with erosion, sediment release, infiltration and groundwater recharge are therefore closely linked to the assessments presented in both Chapter 12 Water and Chapter 11: Land, Soils, and Geology.

Population and Human Health

Interactions between Water and Population & Human Health arise through the protection of water quality, flood risk management and the maintenance of a healthy aquatic environment. Construction-phase pollution events, sediment release or flooding could affect users of the canal corridor and surrounding communities. Conversely, improved drainage arrangements and appropriate water management contribute positively to public amenity, recreation and overall environmental quality. Further details are provided in Chapter 13: Population & Human Health.

Material Assets – Traffic and Transport

Interactions between Water and Traffic & Transport arise through the design of surface water drainage infrastructure associated with the transport network. The effective management of runoff from cycleways, roads, crossings and hardstanding areas is required to avoid flooding, maintain safe operation of the transport network and protect receiving waterbodies. These interactions have been considered as part of both the drainage design and the assessment contained in Chapter 14: Traffic & Transport.

Material Assets – Waste Management

Interactions between Water and Waste Management arise during the Construction Phase through the excavation, handling, storage and disposal of soil, subsoil and construction materials. Inappropriate storage or management of waste materials could result in sediment release or contamination of surface water and groundwater receptors. The implementation of waste management and pollution prevention measures contributes to the protection of the water environment. Further details are provided in Chapter 15: Material Assets – Waste Management.

Material Assets – Utilities

Interactions between Water and Utilities arise where existing drainage networks, water supply infrastructure, wastewater infrastructure and utility crossings interface with the Proposed Development. Damage to existing utility infrastructure or drainage systems has the potential to affect surface water management and water quality. Conversely, groundwater conditions and drainage requirements may influence utility construction methodologies and protection measures. Further details are contained within Chapter 16: Material Assets - Utilities.

Material Assets: Land Use and Property

The implementation of the proposed water quality protection, pollution prevention and drainage management measures will contribute to the protection of adjoining lands, property, community infrastructure and existing land uses by minimising the risk of flooding, erosion and contamination during construction. Accordingly, there is an interaction between the Water Environment assessment and the Land Use and Property chapter.

18.3.9 Population and Human Health

Air Quality and Climate

Interactions occur with Chapter 5 Air Quality and Chapter 6 Climate. During construction, temporary air quality effects may arise through dust emissions, construction traffic and plant operation. These effects have the potential to influence environmental quality, residential amenity and wellbeing. During operation, the Proposed Development has the potential to contribute positively to health determinants through increased active travel and reduced reliance on private car travel. The findings of Chapters 5 and 6 have informed the assessment of environmental and public health effects presented in this chapter.

Noise and Vibration

Interactions occur with Chapter 7 Noise and Vibration. During construction, noise and vibration associated with earthworks, traffic management measures, construction plant, bridge works and boardwalk installation have the potential to influence residential amenity, wellbeing and the use of outdoor spaces and recreational amenities. These pathways have been considered as part of the assessment of environmental and public health effects.

Water

During construction, potential effects on the water environment may arise through sediment release, runoff from disturbed ground, accidental spillages and works adjacent to watercourses. Such effects have the potential to indirectly influence population and human health through changes in environmental quality and amenity. The Royal Canal also represents an important recreational, environmental and amenity asset which contributes to health and wellbeing within the Study Area. The findings of Chapter 12 have therefore informed the assessment of environmental and public health determinants.

Landscape and Visual

During construction, temporary visual disturbance may influence amenity and recreation. During operation, enhancements to the public realm, visual amenity, landscape character and access to green infrastructure have the potential to contribute positively to wellbeing, recreation and quality of life. These pathways have been considered in the assessment of social infrastructure, recreation and overall wellbeing.

Land and Soils

Interactions occur with Chapter 11 Land and Soils through construction activities involving excavation, earthworks and temporary disturbance of ground conditions. The findings of Chapter 11 have been reviewed in identifying any potential pathways through which effects on population and human health could arise. No significant population and human health effects are anticipated through this pathway.

Traffic and Transportation

Traffic and Transportation represents one of the principal interaction pathways for population and human health. During construction, interactions may arise through temporary traffic disruption, changes to accessibility and connectivity, temporary diversions and access restrictions. These factors have the potential to influence health determinants such as accessibility, mobility, environmental quality, amenity and wellbeing. During operation, the Proposed Development is expected to interact positively with Chapter 14 through improvements in active travel infrastructure, accessibility, permeability, connectivity and access to community facilities, public transport services and recreational destinations. The findings of Chapter 14 have informed the assessment of population, equality and inclusion, social infrastructure and health and wellbeing effects.

Material Assets: Land Use and Property

Interactions occur with Chapter 17 Land Use and Property through changes in accessibility, connectivity, recreation opportunities, open space provision and relationships between existing and planned communities. As identified in Chapter 17, the Proposed Development will enhance the recreational and active travel function of the Royal Canal corridor and strengthen connections between existing and future communities. These outcomes have informed the assessment of accessibility, social infrastructure, social engagement and overall wellbeing.

18.3.10 Material Assets – Traffic and Transportation

Noise and Vibration

During construction, traffic and transport interactions with noise and vibration may arise from construction vehicle movements, temporary traffic management, plant movements and works at road crossings. During operation, any changes in vehicle movements associated with access to the greenway are expected to be limited and dispersed. The assessment of noise and vibration effects is provided in Chapter 7, Noise and Vibration.

Air Quality and Climate

During construction, traffic and transport interactions with air quality and climate may arise from construction traffic, plant movements, material deliveries and worker travel. During operation, the Proposed Development may support a shift towards walking, cycling and public transport. The air quality and climate assessments, including the treatment of construction traffic and operational traffic emissions, are provided in Chapter 5, Air Quality, and Chapter 6, Climate.

Biodiversity

Traffic and transport interactions with biodiversity may arise during construction through temporary access arrangements, construction compounds, traffic management, lighting, vegetation clearance and works close to the Royal Canal corridor. During operation, interactions may arise from the use of the greenway by pedestrians and cyclists, lighting and maintenance access. The assessment of biodiversity effects and mitigation is provided in Chapter 8, Biodiversity.

Land, Soil and Geology

Traffic and transport interactions with land, soils and geology are limited to construction phase activities associated with the movement of excavated material, imported construction materials and construction vehicle access. The physical effects on land, soils and geology are assessed separately in Chapter 11. No separate traffic and transport assessment of land, soils and geology effects is required in this chapter.

Water

Traffic and transport interactions with water are limited to construction phase activities such as plant movements, construction access, haulage and potential sediment or contaminant mobilisation at works areas near the Royal Canal and drainage features. The assessment of water effects, including construction drainage and pollution prevention measures, is provided in Chapter 12, Water.

Waste Management

Traffic and transport interactions with resource and waste management arise during construction through the movement of imported materials, excavated material and waste requiring recovery, recycling or disposal. The traffic effect of construction vehicle movements is assessed in this chapter, while the resource and waste management assessment is provided in Chapter 15.

Population and Human Health

Traffic and transport interactions with population and human health arise through temporary construction disruption, changes to access and movement, pedestrian and cyclist diversion arrangements, and the long-term provision of improved active travel infrastructure. The population and human health assessment, including effects on amenity, accessibility, recreation and health, is provided in Chapter 13.

Material Assets: Land Use and Property

Traffic and transport interactions with land use and property may arise during construction through construction access, haul routes, temporary traffic management, construction compounds and temporary restrictions affecting access to adjoining properties and landholdings. During operation, interactions may arise from permanent access arrangements and improved walking and cycling connectivity and permeability. Land acquisition, property interests and land use effects are assessed in Chapter 17, Material Assets: Land Use and Property, while the associated traffic and access effects are assessed in this chapter.

18.3.11 Material Assets – Waste Management

Air Quality

There is an interaction between Chapter 15 Material Assets: Waste Management and Chapter 5 Air Quality arising from excavation, stockpiling, material handling, waste management activities and construction traffic associated with the import of materials and removal of surplus waste. Measures implemented through the OCEMP and RWMP to manage material storage, waste handling, dust generation and vehicle movements will contribute to the management of potential air quality effects.

Climate

There is a direct interaction between Chapter 15 Material Assets: Waste Management and Chapter 6 Climatic Factors. Resource consumption, material imports, waste generation and waste transportation contribute to embodied and transport-related greenhouse gas emissions associated with the Proposed Development. The material quantities and waste arisings assessed in this chapter are consistent with those used in the carbon assessment presented in Chapter 6.

The application of the waste hierarchy and implementation of the RWMP will minimise the consumption of virgin materials and maximise opportunities for reuse, recycling and recovery. In particular, the beneficial reuse of suitable excavated materials within the Proposed Development reduces the requirement for imported materials and limits the quantity of material requiring off-site transport, recovery or disposal. These measures contribute to reducing embodied carbon and transport-related greenhouse gas emissions associated with the Proposed Development.

Noise and Vibration

There is an interaction between Chapter 15 Material Assets: Waste Management and Chapter 7 Noise and Vibration arising from demolition, excavation, waste and material handling activities and HGV movements associated with the import of materials and export of waste. Construction traffic associated with waste management and material deliveries forms part of the overall assessment of construction-related noise and vibration.

Biodiversity

There is an interaction between Chapter 15 Material Assets: Waste Management and Chapter 8 Biodiversity where vegetation clearance, topsoil stripping, excavation, material storage, waste handling, invasive species management and the management of contaminated materials have the potential to influence ecological receptors within and adjacent to the Proposed Development, including the Royal Canal corridor.

During operation, interactions arise through the management of litter, maintenance waste and invasive species, where present. Waste management measures and biodiversity protection measures are therefore closely linked.

Archaeology & Cultural Heritage

There is an interaction between Chapter 15 Material Assets: Waste Management and Chapter 9 Archaeological, Architectural and Cultural Heritage through excavation works and other ground disturbances. Any archaeological mitigation measures may influence excavation methodologies, material handling and management of excavated materials.

Landscape and Visual

There is an interaction between Chapter 15 Material Assets: Waste Management and Chapter 10 Landscape, Townscape and Visual as landscape design, earthworks, route levels, retaining structures and planting proposals influence excavation volumes, imported material requirements and opportunities for reuse of site-won material.

Land, Soils and Geology

There is a strong interaction between Chapter 15 Material Assets: Waste Management and Chapter 11 Land, Soils and Geology. Soil and geological conditions influence the quantity, classification and management of excavated materials, including opportunities for reuse, recovery and disposal. Ground investigation findings have informed the assessment of excavated material management presented in this chapter.

Water

There is an interaction between Chapter 15 Material Assets: Waste Management and Chapter 12 Water arising from excavation, dewatering, runoff management, waste storage and the handling of contaminated or potentially contaminated materials. The management of excavated materials, hazardous wastes and contaminated soils has the potential to influence water quality protection measures implemented during construction.

Population & Human Health

There is an interaction between Chapter 15 Material Assets: Waste Management and Chapter 13 Population and Human Health through construction traffic, waste handling, litter management, site housekeeping and the management of hazardous or contaminated materials. During operation, interactions arise through maintenance waste management and the potential for user-generated litter.

Material Assets – Traffic and Transport

There is an interaction between Chapter 15 Material Assets: Waste Management and Chapter 14 Material Assets: Traffic and Transportation arising from the import of construction materials, the export of surplus excavated material and waste, and movements associated with waste contractors. The quantities of materials and wastes identified in this chapter inform the assessment of construction-related HGV movements presented in Chapter 14.

Material Assets – Utilities

There is an interaction between Chapter 15 Material Assets: Waste Management and Chapter 16 Material Assets: Utilities through utility diversions, utility protection works and the installation of new utility infrastructure associated with the Proposed Development. Such works may generate excavated material, surplus construction materials and waste requiring management in accordance with the RWMP. Conversely, utility requirements may influence construction methodologies, material requirements and excavation quantities assessed within this chapter.

Material Assets: Land Use and Property

The implementation of the Resource and Waste Management Plan, material storage controls, waste segregation procedures and authorised waste management arrangements will contribute to the protection of adjoining lands and property by minimising nuisance effects, preventing pollution incidents and reducing the potential for waste-related impacts during construction. Accordingly, there is an interaction between the Resource and Waste Management assessment and the Land Use and Property chapter.

18.3.12 Material Assets – Utilities

Air Quality

Interactions with Air Quality arise during the Construction Phase when excavations are undertaken on site. An Outline Construction Environmental Management Plan (OCEMP) [170239-DBFL-XX-XX-RP-C-0003] has been developed to minimise disturbance caused by excavations required for the

installation or diversion of utilities. Dust control measures identified in the OCEMP and Chapter 5 (Air Quality) will be implemented during construction to minimise dust emissions arising from excavation and utility work.

Climate

Interactions with Climate arise through operational electricity demand associated with public lighting and traffic signals and through the design of drainage infrastructure having regard to projected climate change rainfall allowances. These impacts are anticipated to be adverse, imperceptible and long-term.

Noise and Vibration

Development of the Proposed Development will result in construction noise and vibration effects associated with excavation and utility works. Construction-related utility excavation works form part of the construction activities assessed in Chapter 7 (Noise and Vibration). Potential effects and associated mitigation measures are detailed therein. Noise and vibration control measures identified in the OCEMP implemented during construction in order to minimise disturbance caused by construction activities.

Biodiversity.

Interactions with Biodiversity may arise during the Construction Phase where vegetation clearance, groundworks or utility works occur near habitats or watercourses. Further details, including potential effects and mitigation measures, are outlined in Chapter 8 Biodiversity.

Archaeology & Cultural Heritage

Interactions with Archaeology and Cultural Heritage arise during the Construction Phase where groundworks are undertaken. Archaeological monitoring of relevant groundworks will be implemented by an appointed archaeologist, as set out in Chapter 9.

Landscape and Visual

Interactions with the landscape and visuals are related to the above ground infrastructure installed for public lighting and traffic signals. These will be considered as part of the visual impact study conducted for this EIAR, with appropriate mitigations as detailed in Chapter 10.

Land, Soils and Geology

Interactions with Land, Soils and Geology arise during the construction phase in that excavations are required for the installation of utility infrastructure. Potential effects associated with excavation, stockpiling, re-use and disposal of excavated materials are assessed in Chapter 11 (Land, Soils and Geology).

Water

Interactions with Water and Hydrology arise during the Construction Phase when excavations are undertaken and where groundwater or surface water pathways may be encountered. Protection measures contained within the OCEMP and Chapter 12 (Water and Hydrology), including pollution prevention, sediment control and surface water management measures, will be implemented during construction to minimise disturbance caused by excavations on site.

Population & Human Health

Interactions with Population and Human Health arise during the Construction Phase where excavation or utility diversion works could cause temporary disturbance or short-duration service interruptions. The mitigation measures set out in the OCEMP will be implemented to minimise disturbance caused by excavations required for the installation or diversion of utilities.

Material Assets – Traffic and Transport

Interactions with Traffic and Transport arise during the Construction Phase where utility works require temporary traffic management, and during the Operational Phase where electricity and telecommunications connections are required for traffic signalling. These interactions are addressed in Chapter 14 (Material Assets: Traffic and Transport.

Material Assets – Waste Management

Interactions with Waste Management arise during the Construction Phase where soil, subsoil or redundant utility materials are generated from excavation works. The management, recovery and disposal of excavated material and redundant utility infrastructure is assessed in Chapter 15 (Material Assets - Waste Management).

Material Assets: Land Use and Property

The implementation of the proposed utility protection measures, utility diversion procedures and service continuity arrangements will assist in avoiding disruption to residential, commercial, community and agricultural land uses during construction. Accordingly, there is a direct interaction between the Material Assets (Utilities) assessment and the Land Use and Property chapter.

18.3.13 Material Assets: Land Use & Property

Noise and Vibration

Construction plant, traffic and works areas may result in temporary noise and vibration effects on adjoining properties and sensitive land uses, with associated effects on amenity and use. These effects and the relevant mitigation measures are assessed in Chapter 7 Noise and Vibration. No material operational interaction with land use and property is identified.

Landscape and Visual

During the construction phase, temporary working areas, construction compounds, earthworks, material storage and vegetation clearance may alter the character and appearance of affected lands. Land use effects arising from vegetation loss or severance are assessed in this chapter as Negative, Moderate and Temporary, while the associated landscape and visual effects are assessed in Chapter 10 Landscape and Visual. At operational stage, the incorporation of lands into the Greenway corridor will permanently alter their use while enhancing the recreational and amenity function of the Royal Canal corridor. The land use implications are assessed in this chapter and the associated landscape and visual effects in Chapter 10.

Land, Soils and Geology

Temporary and permanent land occupation will involve earthworks and disturbance within working areas, compounds and access routes at construction stage. No material operational interaction with land use and property is identified.

Population and Human Health

Temporary land occupation, access restrictions, diversions and disturbance to open space and recreational areas may affect accessibility, movement, recreation and amenity during construction. The land use and property effects are assessed in this chapter, while the associated population and human health effects are assessed in Chapter 13 Population and Human Health. Once operational, the enhanced use of the Royal Canal corridor will improve accessibility, permeability, recreation and active travel connectivity between communities, public transport and local amenities.

Traffic and Transport

Construction traffic, temporary traffic management, closures and diversions may temporarily affect access to adjoining properties, landholdings, amenities and the Royal Canal corridor. The Proposed Development, once operational, will improve walking and cycling connectivity, accessibility and permeability, including through the Landmark Bridge and the proposed underpass at Granard Bridge.

Material Assets: Utilities

During construction, utility diversions will be coordinated with the temporary and permanent land requirements and access arrangements. Utility accommodation measures are not expected to materially affect land use patterns or property interests once the Proposed Development is operational.

18.4 Conclusion

The assessment of interactions has considered the potential for effects arising from the interrelationship between the environmental factors assessed within Chapters 5 to 17 of this EIAR. The assessment identified a range of interaction pathways during both the construction and operational phases of the Proposed Development, reflecting the interconnected nature of the receiving environment and the multidisciplinary assessment process. These interactions relate principally to biodiversity, water, land and soils, air quality, noise and vibration, traffic and transport, landscape and visual amenity, population and human health, and material assets.

The most notable interactions identified during the construction phase relate to earthworks, construction traffic, noise, vibration, dust generation, drainage works, vegetation clearance and temporary disturbance within the Royal Canal corridor. During operation, the principal interactions arise between the Greenway, active travel infrastructure, landscape and visual amenity, biodiversity, recreation, accessibility and population and human health outcomes.

The interaction assessment confirms that the potential effects arising from these interrelationships have been identified, considered and assessed within the relevant topic chapters of the EIAR. Appropriate mitigation measures have been incorporated into the design of the Proposed Development and will be implemented during construction and operation, where required. Following implementation of these measures, no additional likely significant adverse effects are predicted to arise as a consequence of interactions between environmental factors beyond those identified and assessed within the individual environmental assessments.

Overall, the interaction assessment demonstrates that the Proposed Development can be constructed and operated without giving rise to significant adverse interaction effects and that many of the identified operational interactions contribute positively to the overall objectives of the Proposed Development, including enhanced active travel connectivity, recreation, accessibility, public amenity and environmental quality.

19 Summary of Mitigation Measures and Monitoring

19.1 Introduction

This chapter provides a complete summary of Mitigation and Monitoring measures for Chapters 5-16 of this EIAR for the proposed project, use at, and adjacent to, this section of the Royal Canal running west to east from the Kildare County Boundary to Old Navan Road (near the 12th Lock). The appointed contractor is required to adhere to the mitigation measures and the residual impacts provided here to avoid or reduce significant effects and ensure sustainable development.

The purpose of this Chapter is to collate the mitigation and monitoring measures identified in the Environmental Impact Assessment Report (EIAR) that are considered necessary to protect the environment, prior to the commencement of, and throughout the duration of the Construction and / or Operational Phases of the Royal Canal Urban Greenway (the Proposed Development).

A Construction Environmental Management Plan (CEMP) has been prepared as part of the EIAR including all the mitigation and monitoring measures to be implemented during the Construction Phase. The design of the Proposed Development has evolved through comprehensive design iteration, with particular emphasis on minimising the potential for environmental impacts, where practicable

Annex IV of the EIA Directive states that the description of the project must include:

> *'A description of the measures envisaged to avoid, prevent, reduce, or if possible, offset any identified significant adverse effects on the environment and, where appropriate, of any proposed monitoring arrangements (for example the preparing of a post-project analysis). That description should explain the extent, to which significant adverse effects on the environment are avoided, prevented, reduced or offset, and should cover both the construction and operational phases.'*

As described throughout this EIAR, the design of the Proposed Development has been progressed taking account of environmental constraints and considerations that have been identified in assessments. This has enabled the avoidance of potential environmental impacts, wherever possible.

Mitigation and monitoring measures have been identified as environmental commitments and overarching requirements which shall avoid, reduce or offset potential impacts. Such measures have been proposed for all impacts that were determined to result in a moderate significance or above. Routine mitigation measures were also applied for some impacts considered to be of lower significance (for example, management of construction related impacts), or in circumstances where the mitigation measures are considered a material benefit to the receptor.

Residual impacts are the final or intended impacts which occur after the proposed mitigation measures have been implemented. They refer to the degree of change that will occur after the proposed mitigation measures have taken effect. This chapter does not summarise the potential significant residual impacts which may result from the Construction and Operational Phases of the Proposed Development. Please refer to Chapters 5 – 17 of this EIAR for the full impact assessments.

The following tables (Table 19-1 through Table 19-14) summarise the Construction and Operational Phase mitigation measures outlined in the relevant EIAR technical assessments but should be read in conjunction with the mitigation outlined in the specific chapter and also with the Construction Environmental Management Plan (CEMP). The Contractor will be responsible for ensuring the proper implementation of all mitigation measures and commitments detailed in the CEMP throughout the Construction Phase.

19.2 Mitigation Measures

For ease of reference and clarity, all mitigation measures contained in this EIAR are summarised below. Please refer to the individual chapters for the full scope of mitigation measures. All measures included below form part of the proposed development and will be implemented in full.

Table 19.1 Air Quality

Character of Potential Impact	Mitigation Measure
Construction Phase	
Communications	Implement a stakeholder communications plan, including community engagement prior to construction, and provide clearly displayed contact details for personnel responsible for dust and air quality management and complaint handling.
Site Management	Maintain a dust and air quality complaints register, investigate complaints and incidents promptly, implement corrective actions where necessary, and retain records for review by the relevant authority.
Preparing and Maintaining the Site	Minimise dust generation through careful site layout, screening and enclosure of dusty activities, stockpile management, prevention of mud and water runoff, and regular site housekeeping using wet cleaning methods.
Operating vehicle/machinery and sustainable travel	Minimise vehicle and plant emissions through idling restrictions, speed controls, use of lower-emission equipment where practicable, and implementation of a Construction Travel Plan promoting sustainable transport modes.
Operations	Apply dust suppression measures during construction activities, including water sprays, local extraction systems, enclosed chutes and conveyors, controlled material handling, and prompt clean-up of spillages.
Waste Management	Prohibit the burning of waste materials on site and manage waste in accordance with relevant environmental and air quality protection requirements.
Measures Specific to Demolition	Minimise dust emissions during demolition through soft stripping techniques, water suppression systems, avoidance of explosive blasting, and appropriate handling and removal of demolition materials and debris.
Measures Specific to Earthworks	Stabilise exposed soils and stockpiles as soon as practicable through re-vegetation, covering, mulching or other surface protection measures to prevent wind-blown dust.
Measures Specific to Construction	Control dust emissions from construction materials and activities through appropriate storage, handling and suppression measures, including management of aggregates and concrete-related works.
Measures Specific to Trackout	Prevent the transfer of dust and mud onto the public road network through wheel washing facilities, road sweeping, covered vehicle loads and regular inspection of haul routes and site accesses.
Operational Phase	
There is no mitigation required for the operational phase of the development as no significant impacts to air quality are predicted.	

Table 19.2 Climatic Factors

Character of Potential Impact	Mitigation Measure
Construction Phase	

Greenhouse gas emissions and embodied carbon associated with construction activities and materials.	A whole-life Carbon Management Plan aligned with PAS 2080 will be implemented to minimise embodied carbon and greenhouse gas emissions through material selection, design optimisation and carbon-conscious construction practices.
Consumption of natural resources and generation of construction waste.	Site-won and excavated materials will be reused where practicable, with reuse, recycling and resource recovery prioritised in accordance with circular economy principles, waste audits and sustainable procurement requirements.
Greenhouse gas emissions associated with plant, vehicles, transport and material supply.	Vehicle idling will be prohibited, plant and machinery will be maintained efficiently, locally sourced materials will be prioritised where practicable, and lower-carbon material alternatives, including reduced-clinker concrete, will be utilised where feasible.
Operational Phase	
Maintenance Materials	Lower carbon maintenance materials will be the preferred choice throughout the lifetime of the development. Routine monitoring of all infrastructure will be undertaken in line with best practice to ensure timely repairs and effective maintenance, thereby maximizing the full lifecycle value of all assets.
Climate Change Vulnerability and Risk	The Proposed Development will incorporate permeable surfaces which will help slow runoff rates. For fluvial and pluvial flood risk, the greenway will be constructed using flood-resilient design standards.
Landscaping and Design	Bridge structures will be engineered to meet standards for high wind speeds, and landscaping will feature deep-rooted native plants to enhance stability and resilience.

Table 19.3 Noise and Vibration

Character of Potential Impact	Mitigation Measure
Construction Phase	
Construction Noise	Construction noise and vibration will be managed with best practice measures implemented to minimise impacts at nearby noise-sensitive receptors.
Selection of Quiet Plant	The quietest practicable plant and equipment will be selected, with generators, compressors and other static plant fitted with acoustic enclosures where appropriate.
Noise Control at Source	Noise generation will be minimised at source through the use of acoustic treatments, plant maintenance, operational controls, avoidance of unnecessary idling, and restriction of noisy activities to appropriate working hours.
Screening	Temporary hoarding, acoustic barriers and mobile screens will be used where required to reduce construction noise levels at nearby sensitive receptors.
Public Liaison	A designated Environmental Liaison Officer will manage communications with the public, respond to complaints, and provide advance notification of particularly noisy works.
Project Programme	Construction activities will be programmed and phased to minimise noise and vibration disturbance, particularly during sensitive periods and where multiple high-noise activities may occur concurrently.
Operational Phase	

Operational noise sources associated with routine maintenance are expected to be below or on par with existing ambient noise levels within the various prevailing noise environments along the proposed route, and therefore no mitigation is required.

Table 19.4 Biodiveristy

Character of Potential Impact	Mitigation Measure
Construction Phase	
Habitat loss, habitat fragmentation and degradation of the Royal Canal ecological corridor.	The Proposed Development has been designed to minimise habitat loss through route optimisation, reduced Greenway widths in sensitive areas, retention of riparian buffers, minimisation of tree loss, protection of sensitive grassland habitats and use of boardwalk structures where appropriate.
Pollution of aquatic habitats, groundwater and sensitive aquatic species.	Construction works will be undertaken in accordance with the CEMP, OCEMP and industry best-practice guidance, incorporating pollution prevention measures, controlled dewatering, treatment of construction wastewater, sediment controls, bunded storage areas, spill response procedures, water quality protection measures and strict controls on discharges to the Royal Canal and associated watercourses.
Impacts on water quality associated with Landmark Bridge construction and flood events.	Additional mitigation measures, including geotextile barriers, silt fencing, sheet piling, controlled dewatering, sediment filtration systems, dry-cell construction methods, flood response procedures and enhanced ecological supervision, will be implemented during bridge construction and works in flood-sensitive locations.
Groundwater contamination, soil degradation and deterioration of habitat quality.	Topsoil stripping, excavations, stockpile management and earthworks will be carefully managed to minimise erosion, sedimentation, contamination and adverse effects on groundwater, soils and habitats.
Dust deposition, airborne pollution and climate impacts affecting habitats and species.	Dust suppression measures, wheel washing, stockpile management, road sweeping, emissions controls, vehicle management and construction hoarding will be implemented to minimise impacts on ecological receptors.
Damage to retained vegetation, woodland, grassland and riparian habitats.	Vegetation clearance will be minimised through ecological exclusion zones, tree protection fencing, root protection measures, habitat fencing, retention of sensitive habitats and ecological supervision of all vegetation removal works.
Impacts on woodland, scrub and grassland habitats.	Ecologically important woodland and grassland habitats will be protected through exclusion fencing, habitat management measures, native planting, woodland restoration and restrictions on machinery access. Woodland clearance will be undertaken using a phased and ecologist-led approach.
Disturbance, mortality and displacement of protected fauna.	Species-specific mitigation measures will be implemented for Badger, Otter, bats, breeding birds, Glutinous Snail and other ecological receptors, including pre-construction surveys, exclusion measures, setback distances, timing restrictions, habitat connectivity measures, ecological supervision and derogation licensing where required.
Disturbance caused by noise, vibration, lighting and construction activities.	Low-noise construction methods, acoustic screening, restricted working hours, minimisation of lighting, maintenance of dark corridors, controlled construction lighting and habitat connectivity measures will be implemented throughout the construction phase.

Impacts on Badger populations and setts.	Badger-specific mitigation will include pre-construction surveys, camera monitoring, ecological exclusion procedures, protection of active setts, temporary mammal access routes, habitat connectivity measures and consultation with NPWS where required.
Impacts on Otter populations and holts.	Otter-specific mitigation will include pre-construction surveys, derogation licensing where required, protection of active holts, screening measures, exclusion procedures where necessary and restrictions on works within designated buffer distances.
Impacts on bats, roost features and commuting routes.	Pre-construction bat surveys will be undertaken, dark commuting corridors maintained, construction lighting strictly controlled and derogation licensing implemented where roosts are identified. Potential roost features will be inspected before removal.
Impacts on breeding birds.	Vegetation clearance will be undertaken outside the breeding bird season where practicable. Nest surveys will be undertaken where required, and active nests protected until fledging has occurred.
Impacts on aquatic species, including Glutinous Snail, fish and macroinvertebrates.	Aquatic habitats within the Royal Canal will be retained and protected through water quality controls, pollution prevention measures, bridge design measures and avoidance of in-channel works.
Spread of invasive non-native species (INNS).	An Invasive Species Management Plan (ISMP) will be implemented incorporating updated surveys, exclusion zones, specialist supervision, biosecurity measures, containment procedures, treatment programmes, licensed excavation, transport and disposal procedures, staff training and habitat restoration measures.
Spread of invasive species through contaminated soils, plant, machinery or materials.	Biosecurity protocols will include fencing and signage, decontamination procedures, restricted access, contaminated soil controls, wheel and footwear cleaning, machinery inspections and restrictions on movement and storage of invasive species material.
Impacts associated with invasive species treatment and removal.	Invasive species management will be undertaken by suitably qualified specialists using approved treatment methods and herbicides where required, with all works carried out in accordance with legislative requirements, licensing requirements and best-practice guidance.
Failure to implement ecological mitigation measures.	A project-specific CEMP will be implemented throughout construction and overseen by the appointed ECoWs and EnvCoW, incorporating biodiversity mitigation measures, monitoring requirements, ecological management plans, emergency response procedures, auditing requirements and environmental training commitments.
Operational Phase	
Hydrological changes and increased surface water runoff affecting aquatic habitats and species.	Surface water will be managed through a SuDS-based drainage network incorporating filter drains, over-the-edge drainage and groundwater recharge measures, designed in accordance with the GDSDS to maintain water quality and hydrological conditions within the Royal Canal corridor.
Habitat fragmentation and reduced connectivity for mammals, including Badger and Otter.	Habitat connectivity will be maintained through the provision of five Badger underpasses, mammal access points, elevated boardwalk sections and associated native hedgerow planting to facilitate continued movement between foraging and breeding areas along the Royal Canal corridor.
Loss of foraging habitat and disturbance to terrestrial mammals.	Native hedgerows, species-rich grassland habitats and planted earthen berms will be established and managed to provide screening, shelter and

	enhanced foraging habitat for Badger, Otter and other fauna. Herbicide use will be avoided where practicable.
Impacts on Glutinous Snail, aquatic invertebrates and fish habitats.	Existing aquatic habitats and shading conditions along the Royal Canal will be retained. Artificial refugia and targeted macrophyte management will be implemented to enhance habitat quality and support the long-term conservation of the internationally important Glutinous Snail population.
Loss of woodland, scrub and meadow habitats.	A comprehensive native planting programme including approximately 190 trees, 2,456m² of woodland creation, 6,841m² of meadow and shrub planting, and an additional 7,000m² of compensatory woodland adjacent to St. Catherine's Park will be undertaken to offset habitat losses and strengthen ecological connectivity.
Impacts on pollinators and biodiversity value of habitats.	Habitat management will follow the All-Ireland Pollinator Plan guidance, including pollinator-friendly planting, reduced mowing regimes, protection of habitat features, native hedgerow management and minimisation of pesticide use.
Degradation of grassland habitats.	Species-rich calcareous and neutral grasslands will be managed through seasonal cutting, removal of cuttings, scrub control and avoidance of fertilisers and pesticides to maintain and enhance ecological value.
Woodland habitat degradation and spread of invasive species.	Woodland habitats will be managed to minimise disturbance, monitor ecological condition, control invasive species and protect sensitive fauna, while maintaining understory vegetation important for species such as Badger and Otter.
Loss of bat roosting and commuting habitat.	Twelve bat boxes will be installed within suitable locations along the Royal Canal corridor to compensate for the loss of potential roosting habitat and provide roosting opportunities during woodland establishment.
Disturbance to bats from artificial lighting.	A biodiversity-sensitive lighting scheme will be implemented comprising 2700K LED luminaires, louvres, 0% upward light spill, motion-activated controls and lighting-free sections where appropriate, in accordance with Bat Conservation Trust guidance.

Table 19.5 Archaeological, Architectural and Cultural Heritage

Character of Potential Impact	Mitigation Measure
Construction Phase	
Impacts on archaeological heritage during ground disturbance.	All topsoil stripping, enabling works and construction excavations will be archaeologically monitored under licence, with any archaeological discoveries subject to further investigation and mitigation in consultation with the National Monuments Service.
Impacts on architectural heritage features and historic canal infrastructure.	A pre-construction photographic survey of the Royal Canal, associated heritage features and the Landmark Bridge location will be undertaken to create a baseline record of existing conditions.
Impacts on protected structures during construction works.	Construction methodologies, including the Old Navan Road underpass works, will be implemented under engineering supervision and monitoring to avoid damage to adjacent heritage structures and infrastructure.
Temporary impacts on cultural heritage routes and features.	Pedestrian access along the National Famine Way and Royal Canal Way will be maintained where practicable, with temporary diversions, signage and protection measures implemented where necessary. Bronze shoe sculptures and other cultural heritage features will be protected and recorded prior to nearby construction works.

Operational Phase
No specific operational mitigation measures are required. The Proposed Development is not predicted to give rise to adverse operational effects on heritage resources and is expected to result in positive effects through improved access to and appreciation of the Royal Canal heritage corridor.

Table 19.6 Landscape and Visual

Character of Potential Impact	Mitigation Measure
Construction Phase	
Construction activities, compounds, stockpiles and vegetation removal.	Construction works will be managed in accordance with the OCEMP and CEMP, with compounds confined to designated locations and all temporary works areas reinstated following completion of construction.
Visual intrusion associated with construction activities.	Site hoarding, screening and good site management practices will be implemented, including minimising dust, maintaining site tidiness and restricting stockpile heights where practicable.
Impacts on retained trees and landscape features.	Protective fencing will be installed around retained trees and Root Protection Areas (RPAs), with arboricultural protection measures maintained throughout construction.
Temporary disturbance of landscape and visual receptors.	Construction plant, materials and site activities will be confined to designated work and compound areas to minimise impacts on adjacent residential, recreational and amenity receptors.
Temporary loss of landscape quality within construction compounds and work areas.	All temporary compound areas, access routes and disturbed lands will be reinstated, reseeded, replanted and restored in accordance with the approved landscape proposals following completion of construction works.
Operational Phase	
Long-term integration of the Greenway within the receiving landscape.	Landscape mitigation has been incorporated into the design through route alignment, sensitive siting of infrastructure, retention of key landscape features and integration with the Royal Canal corridor.
Loss of vegetation and landscape structure.	Existing trees and hedgerows will be retained where feasible and supplemented with native tree, shrub and hedgerow planting to strengthen landscape character, biodiversity and green infrastructure connectivity.
Visual impacts on adjacent receptors and public amenity areas.	High-quality landscaping, public realm enhancements, open space provision and sensitive design measures have been incorporated throughout the scheme to improve visual amenity and recreational value.
Long-term landscape establishment and amenity value.	Existing and proposed planting, hedgerows and landscape areas will be subject to ongoing maintenance and management to ensure successful establishment and long-term landscape integration.

Table 19.7 Land, Soils and Geology

Character of Potential Impact	Mitigation Measure
Construction Phase	
Chemical pollution of soils, geology and groundwater receptors.	Construction activities will be managed in accordance with the OCEMP and CEMP, incorporating pollution prevention measures, controlled fuel and chemical storage, designated refuelling areas, spill response procedures and environmental monitoring.

Loss of soil quality and degradation of soil resources.	Topsoil and subsoil will be stripped, stored, protected and reinstated in a controlled manner, with soil reuse prioritised and exposed soils stabilised as soon as practicable to minimise erosion and degradation.
Erosion, sediment generation and instability of exposed soils and excavations.	Earthworks and material stockpiles will be managed to minimise exposed ground and sediment runoff, with erosion control, stockpile protection and surface water management measures implemented throughout construction.
Impacts associated with imported fill and construction materials.	Excavated materials will be segregated, tested and reused on site where practicable, while imported materials will be sourced, stored and managed in accordance with best practice and environmental requirements.
Impacts arising from construction traffic and plant movements.	Construction traffic will be confined to designated haul routes and work areas, with wheel washing, road sweeping and dust suppression measures implemented as required.
Risks to human health and safety during earthworks and excavation activities.	Safe systems of work, utility verification procedures, construction traffic management measures, staff training and appropriate PPE will be implemented throughout construction.
Material generation and consumption of natural resources.	Excavated materials will be reused on site where practicable, material reuse and recovery will be maximised, and all waste and surplus materials managed in accordance with applicable legislation and best practice guidance.
Operational Phase	
Disturbance of soils and geology during maintenance activities.	Maintenance works will be confined to established access routes and hardstanding areas, with excavated materials, stockpiles and construction arisings managed to prevent erosion, contamination and unnecessary soil disturbance.
Soil contamination associated with maintenance activities.	Fuels, oils and chemicals used during maintenance will be stored and handled within controlled and bunded areas, with appropriate spill prevention and response measures in place.
Generation of maintenance-related waste and surplus materials	Excavated materials, drainage arisings and removed pavement materials will be segregated, reused or disposed of appropriately, with imported materials sourced from approved suppliers.
Temporary construction areas and material storage locations.	All temporary compounds, site entrances, fuel storage areas and construction materials will be removed on completion of construction, with disturbed areas reinstated in accordance with the approved landscape and engineering design.

Table 19.8 Water

Character of Potential Impact	**Mitigation Measure**
Construction Phase	
Risk of pollution to surface water and groundwater receptors	Construction works will be undertaken in accordance with the OCEMP and CEMP, incorporating pollution prevention measures including controlled refuelling, bunded storage of fuels and chemicals, spill response procedures, plant maintenance, wastewater management and protection of surface water and groundwater receptors.
Sediment release and deterioration of water quality	Earthworks and construction activities will be phased to minimise exposed ground, with sediment and erosion control measures, temporary drainage infrastructure and appropriate treatment of pumped water implemented to protect water quality.

Disturbance to the Royal Canal, watercourses and drainage infrastructure	Construction activities within and adjacent to the Royal Canal corridor will be minimised and managed to protect canal banks, maintain hydraulic connectivity and ensure the continued operation of existing drainage infrastructure.
Changes to surface water runoff and drainage patterns	Temporary drainage and runoff management measures will be implemented to maintain existing drainage patterns, provide treatment and attenuation of runoff and prevent adverse effects on the receiving water environment.
Water quality arising from construction activities	Water quality protection measures, monitoring requirements and corrective actions will be implemented throughout construction in accordance with the CEMP and recognised industry best practice guidance.
Operational Phase	
Impacts on water quality, drainage and flood risk	The Proposed Development has been designed to minimise impacts on the water environment through the use of clear-span bridge crossings, avoidance of flood-risk areas where practicable, source-control drainage measures, groundwater recharge and compliance with applicable drainage design standards.
Impacts on surface water, groundwater and drainage infrastructure	Routine inspection and maintenance of drainage, water and wastewater infrastructure will be undertaken in accordance with statutory requirements and best practice to protect water quality and maintain drainage performance throughout the operational life of the development.

Table 19.9 Population and Human Health

Character of Potential Impact	Mitigation Measure
Construction Phase	
Mitigation measures proposed throughout the various chapters of this EIAR are designed to avoid significant adverse impacts. These measures contribute to the protection of population and human health by minimising temporary construction effects and maximising the accessibility, connectivity, safety and recreational benefits of the completed greenway.	
Operational Phase	
Having regard to the embedded mitigation measures and the design of the Proposed Development, no additional population and human health mitigation measures are considered necessary.	

Table 19.10 Material Assets: Traffic and Transportation

Character of Potential Impact	Mitigation Measure
Construction Phase	
Traffic Plans	Construction activities will be managed in accordance with the Outline Construction Environmental Management Plan (OCEMP), including the implementation of a construction-stage CEMP and Construction Stage Traffic and Transportation Management Plan (CSTTMP) prior to commencement of works.
Construction Traffic	Construction traffic impacts will be minimised through managed construction worker travel arrangements, provision of dedicated compound parking, controlled delivery scheduling, designated haul routes, wheel washing facilities and restrictions on HGV movements during peak traffic periods where practicable.
Traffic Management	Temporary traffic management measures, including traffic marshals, diversion routes, pedestrian and cyclist management measures, advance warning signage and stakeholder notification, will be implemented as

	required to minimise disruption to the local road network and surrounding communities.
Compounds and Storage	Construction compounds and material storage areas will be managed to prevent impacts on the surrounding environment, including provision of recycling facilities, appropriate site signage, secure hoarding and reinstatement of all temporary construction areas following completion of works.
Operational Phase	
As the Proposed Development is expected to result in positive effects for both walking and cycling, no further mitigation measures are considered necessary beyond those already incorporated into the Proposed Development.	

Table 19.11 Material Assets: Waste Management

Character of Potential Impact	Mitigation Measure
Construction Phase	
Generation of construction, demolition and excavation waste.	A Resource and Waste Management Plan (RWMP) will be implemented in accordance with the waste hierarchy, prioritising waste prevention, reuse, recycling and recovery over disposal.
Consumption of natural resources and generation of surplus materials.	Excavated materials, topsoil and construction materials will be reused within the Proposed Development where practicable, with recycled and reclaimed materials utilised where suitable.
Management of excavation waste, contaminated materials and hazardous waste.	Waste materials will be segregated, classified and managed in accordance with applicable legislation, with hazardous materials removed by authorised contractors to appropriately authorised facilities.
Impacts associated with waste storage, handling and transport.	Waste and material storage areas will be located away from sensitive receptors, with source segregation, appropriate containment measures and use of authorised waste contractors and facilities.
Spread of invasive non-native species through construction activities.	Invasive plant material and associated soils will be managed in accordance with the Invasive Species Management Plan, with contaminated materials segregated and disposed of appropriately.
Operational Phase	
No specific operational mitigation measures are proposed.	

Table 19.12 Material Assets: Waste Management

Character of Potential Impact	Mitigation Measure
Construction Phase	
Generation of construction, demolition and excavation waste.	A Resource and Waste Management Plan (RWMP) will be implemented in accordance with the waste hierarchy, prioritising waste prevention, reuse, recycling and recovery over disposal.
Consumption of natural resources and generation of surplus materials.	Excavated materials, topsoil and construction materials will be reused within the Proposed Development where practicable, with recycled and reclaimed materials utilised where suitable.
Management of excavation waste, contaminated materials and hazardous waste.	Waste materials will be segregated, classified and managed in accordance with applicable legislation, with hazardous materials removed by authorised contractors to appropriately authorised facilities.

Impacts associated with waste storage, handling and transport.	Waste and material storage areas will be located away from sensitive receptors, with source segregation, appropriate containment measures and use of authorised waste contractors and facilities.
Spread of invasive non-native species through construction activities.	Invasive plant material and associated soils will be managed in accordance with the Invasive Species Management Plan, with contaminated materials segregated and disposed of appropriately.
Operational Phase	
Generation of maintenance waste and incidental litter.	Operational waste arisings will be minimised and managed in accordance with the waste hierarchy, with maintenance responsibilities agreed between Fingal County Council and Waterways Ireland.
Management of operational waste streams.	Maintenance waste will be segregated where practicable, appropriately stored and transferred by authorised waste collectors to authorised facilities for reuse, recycling, recovery or disposal.
Litter accumulation along the Greenway.	The Greenway will operate on a 'Leave No Trace' basis, with incidental litter managed through routine operational maintenance and cleansing arrangements.

Table 19.13 Material Assets: Utilities

Character of Potential Impact	Mitigation Measure
Construction Phase	
Damage to existing utility infrastructure and disruption to utility services.	Construction works will be undertaken in accordance with the OCEMP and CEMP, with utility records verified prior to construction and utility locations confirmed through survey and investigation where required.
Interruption to existing utility services during construction.	Existing utility services will be maintained throughout construction where practicable, with any diversions, protection measures or service interruptions undertaken in consultation with utility providers and in accordance with approved methodologies.
Accidental damage to buried services, including strategic telecommunications infrastructure.	Works in the vicinity of utility infrastructure will be undertaken under controlled conditions, including utility detection, verification surveys, supervised excavation and implementation of utility protection measures.
Utility impacts associated with construction compounds and temporary site facilities.	New utility connections required for construction activities will be installed subject to the necessary approvals and in accordance with utility provider requirements.
Operational Phase	
Impacts on utility infrastructure and service provision.	The Proposed Development has been designed to avoid utility conflicts where practicable and to incorporate appropriate utility protection, diversion and drainage measures.
Operational performance of diverted or upgraded utility infrastructure.	Any utility infrastructure diverted or upgraded as part of the Proposed Development will be designed and constructed in accordance with utility owner requirements and integrated into established operation and maintenance programmes.
Residual impacts	No additional operational mitigation measures are required, as no significant residual effects on utility infrastructure are predicted.

Table 19.14 Material Assets: Land Use and Property

Character of Potential Impact	Mitigation Measure
Construction Phase	

Outline Construction Environmental Management Plan	An Outline Construction Environmental Management Plan (OCEMP) has been prepared as part of the planning application and will be further developed by the appointed contractor prior to the commencement of construction. The OCEMP will include measures to minimise temporary impacts on adjacent properties, landholdings and existing land uses during the construction phase of the Proposed Development.
Temporary Land Take and Disruption to existing land uses.	Land take and temporary working areas will be minimised through detailed design and construction planning.
Impacts on Property Owners, Occupiers and Landholdings.	Ongoing stakeholder liaison, accommodation works and maintenance of access arrangements will be implemented throughout construction.
Construction Compounds and Working Areas.	Construction areas will be restricted to designated locations and all temporarily affected lands will be reinstated following completion of the works.
Operational Phase	
No additional operational mitigations are required, as the Proposed Development is consistent with the strategic objectives of the Fingal County Development Plan and residual land use and property effects are not significant following implementation of the proposed mitigation measures.	

19.3 Monitoring

The following table summarises the Construction and Operational Phase monitoring measures outlined in the relevant EIAR technical assessments but should be read in conjunction with the monitoring measures outlined in the specific chapter. Please refer to the individual chapters for the full description of the proposed monitoring measures.

Table 19.15 Summary of Proposed Monitoring by Chapter

Chapter 5 – Air Quality
Construction Phase
• Undertake daily on-site and off-site inspection, where receptors (including roads) are nearby, to monitor dust, record inspection results, and make the log available to the local authority when asked. This will include regular dust soiling checks of surfaces such as street furniture, cars and windowsills within 100 m of site boundary, with cleaning to be provided if necessary. • Carry out regular site inspections to monitor compliance with the Dust Management Plan, record inspection results, and make an inspection log available to the local authority when asked. • Increase the frequency of site inspections by the person accountable for air quality and dust issues on site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions.
Operational Phase
There is no monitoring recommended for the operational phase of the Proposed Development as impacts to air quality are predicted to be not significant.
Chapter 6 – Climactic Factors
Construction Phase
• Embodied carbon, greenhouse gas emissions, energy use, fuel consumption, water use and waste generation (including reuse and recycling rates) will be monitored and reported throughout the construction phase to assess compliance with climate action objectives and project sustainability targets.

• Construction phase climate performance will be reviewed through the CEMP and contractual environmental requirements, with additional mitigation measures implemented where monitoring identifies underperformance against established targets. • Potential impacts associated with extreme weather events, including flooding, will be monitored throughout construction, with appropriate risk management and response measures implemented through the Contractor's Environmental Management System (EMS).	
Operational Phase	
Ongoing monitoring and reporting of embodied carbon of maintenance materials throughout the operational lifetime of the Proposed Development will be undertaken.	
Chapter 7– Noise and Vibration	
Construction Phase	
Where required, construction noise monitoring will be undertaken at periodic sample periods at the nearest NSLs to the Proposed Development to check compliance with the construction noise criterion. Monitoring locations will include those representative of the closest dwellings to work areas or those located in proximity to areas where works are forecast for an extended period of time.	
Operational Phase	
There is no monitoring recommended for the operational phase of the Proposed Development.	
Chapter 8 – Biodiversity	
Construction Phase	
Implementation of biodiversity mitigation measures and environmental controls.	Two Ecological Clerks of Works (ECoWs) and one Environmental Clerk of Works (EnvCoW) will oversee implementation of the CEMP, ecological mitigation measures, habitat protection measures, pollution prevention controls and surface water monitoring for the duration of the construction phase.
Surface water quality and aquatic habitats.	A Surface Water Monitoring Plan will be implemented prior to, during and following construction. Monitoring will include baseline surveys, continuous monitoring at high-risk locations, monthly laboratory sampling, event-triggered monitoring, and compliance assessment against agreed trigger levels and environmental quality standards.
Pollution incidents and deterioration in water quality.	Monitoring will include parameters such as pH, dissolved oxygen, temperature, conductivity, turbidity, suspended solids, nutrients, hydrocarbons and other contaminants, with defined alert thresholds, corrective actions and stop-work procedures where necessary.
Visual indicators of water pollution.	Regular visual inspections of the Royal Canal and associated drainage features will be undertaken by the ECoWs throughout construction and following significant rainfall events to identify discolouration, sedimentation, hydrocarbon sheens, foams, litter or other evidence of pollution.
Implementation of water quality protection measures.	Silt fencing, swales, geotextile barriers, stockpile controls, dewatering systems, drainage infrastructure, discharge locations and construction compounds will be regularly inspected by the ECoWs and EnvCoW to ensure compliance with mitigation requirements.
Landmark Bridge construction works.	Enhanced monitoring of sediment controls, sheet piling, geotextile barriers, dewatering activities, discharge points and other water protection measures will be undertaken throughout the construction of Landmark Bridge.
Former Annex I grassland habitats, species-rich grasslands and protected flora.	Annual monitoring of identified grassland plots will be undertaken throughout construction to assess habitat condition, species composition and the presence of rare, protected or notable flora, with mitigation measures updated where required.

Retained woodland habitats and woodland clearance works.	Annual monitoring of retained woodland habitats will assess habitat condition, effectiveness of habitat protection measures, invasive species management and the occurrence of sensitive flora and fauna.
Badger populations and sett protection measures.	Badger surveys and monitoring, including camera trapping where required, will be carried out throughout construction to assess sett activity, habitat use, effectiveness of mitigation measures and any requirement for additional protection measures.
Otter populations and holt protection measures.	Otter surveys will be undertaken annually throughout construction to monitor holt activity, habitat use, effectiveness of mitigation measures and compliance with derogation licence requirements where applicable.
Bat activity, commuting routes and construction lighting.	Annual bat monitoring will assess commuting routes, habitat use, light spill, effectiveness of dark corridor protection measures and potential displacement effects associated with construction activity.
Breeding birds and nesting activity.	Annual breeding bird monitoring will be undertaken during the nesting season, including checks for active nests within vegetation, trees, bridge structures and other affected habitats.
Glutinous Snail populations and associated aquatic habitats.	Quarterly monitoring of Glutinous Snail populations and associated habitats will be undertaken throughout construction to assess population trends, habitat condition and the effectiveness of water quality protection measures.
Invasive Non-Native Species (INNS).	Updated invasive species surveys and ongoing monitoring of treatment areas will be undertaken throughout construction to assess treatment effectiveness, identify new infestations and prevent the spread of invasive species within the Royal Canal corridor.
Construction compounds, habitat protection measures and ecological exclusion zones.	Regular ecological inspections of site compounds, stockpiles, fuel storage areas, exclusion zones, habitat fencing, tree protection fencing and biosecurity measures will be undertaken throughout the construction phase.
Effectiveness of ecological mitigation measures.	Monitoring results will be reviewed by the ECoWs, EnvCoW, FCC, Waterways Ireland, NPWS and the Fingal Biodiversity Officer, with mitigation measures amended where necessary to address observed impacts or changing site conditions.
Operational Phase	
Effectiveness of biodiversity mitigation and habitat management measures.	Long-term ecological monitoring will be undertaken by suitably qualified ecologists in consultation with FCC, Waterways Ireland, NPWS and the Fingal Biodiversity Officer, with mitigation measures reviewed and adapted where required.
Condition of species-rich grasslands and ecological enhancement areas.	Dry grassland and calcareous grassland habitats will be monitored annually for five years following construction to assess habitat condition, species composition and progression towards Annex I habitat criteria.
Condition of retained and compensatory woodland habitats.	Woodland habitats will be monitored annually for five years to assess habitat condition, invasive species establishment and use by protected species.
Badger and Otter populations and habitat connectivity.	Badger populations, underpass usage and habitat connectivity will be monitored annually for five years. Otter surveys will be undertaken annually for two years following completion of construction.
Bat activity, lighting impacts and bat box utilisation.	Bat activity, commuting routes, bat box occupancy and lighting impacts will be monitored annually over five consecutive summer seasons following completion of construction.

Glutinous Snail populations and habitat enhancement measures.	Glutinous Snail populations, habitat condition, artificial refugia performance and aquatic vegetation management areas will be monitored annually for five years.
Invasive Non-Native Species (INNS).	Invasive species monitoring and management will continue throughout the operational life of the Greenway, with particular focus on Third Schedule species and woodland planting areas.
Chapter 9 – Archaeological, Architectural and Cultural Heritage	
Construction Phase	
Archaeological remains uncovered during construction.	Archaeological monitoring will be undertaken during all topsoil stripping and ground disturbance works, with additional archaeological investigation undertaken where required.
Architectural heritage features and structures.	Pre-construction photographic surveys will provide a baseline record of heritage assets and landscape context, while engineering supervision will monitor works adjacent to historic structures.
Protected cultural heritage features and public heritage routes.	The condition of cultural heritage features, including the National Famine Way markers and bronze shoe sculptures, will be recorded prior to construction and monitored during nearby works to ensure protection measures remain effective.
Operational Phase	
No specific operational monitoring measures are required. The Proposed Development is not predicted to give rise to adverse operational effects on heritage resources and is expected to result in positive effects through improved access to and appreciation of the Royal Canal heritage corridor.	
Chapter 10 – Landscape and Visual	
Construction Phase	
A suitably qualified arboricultural consultant / Arboricultural Clerk of Works (ACoW) will be employed prior to commencement of demolition and constructions works to monitor and supervise any tree removal and ensure tree protection measures are in place and maintained. Archaeological monitoring will be undertaken during the construction stage of the project. A suitably qualified Ecological Clerk of Works (ECoW) will be employed prior to commencement of demolition and construction works to provide ecological consultancy to the construction team. Both the ACow and ECow will liaise with each other as there will be interactions between both professions.	
Operational Phase	
No specific monitoring measures are required following completion of the construction phase.	
Chapter 11 – Land, Soils and Geology	
Construction Phase	
• Compliance with the CEMP, Construction Methodology Report and associated mitigation measures will be monitored through regular site inspections and environmental audits, with corrective actions implemented where required. • Excavations, earthworks, stockpiles and ground stability will be regularly inspected to identify erosion, instability, contamination risks or other adverse ground conditions, with corrective measures implemented as necessary. • Fuel and oil storage areas, dust suppression measures, wheel wash facilities and the cleanliness of the local road network will be monitored to minimise risks to soils, geology and the surrounding environment.	
Operational Phase	
No ongoing monitoring is proposed on completion of the construction phase.	
Chapter 12 – Water	
Construction Phase	
• Water quality monitoring, including visual inspections, turbidity monitoring (where required), and inspection of sediment controls, drainage infrastructure and pollution prevention measures, will be undertaken adjacent to active works and other locations identified in the CEMP.	

• Any exceedances, pollution incidents or failures of control measures identified during monitoring will be investigated, corrective actions implemented, and monitoring repeated prior to recommencement of affected works. • Monitoring records will be maintained throughout construction, with water quality protection measures implemented in accordance with the CEMP, OCEMP and industry best practice pollution prevention guidance.	
Operational Phase	
No operational water quality monitoring is proposed, as the operational drainage and water management measures incorporated into the design are not expected to result in significant adverse effects on surface water quality.	
Chapter 13 – Population and Human Health	
In relation to the impact of the development on population and human health, it is considered that the monitoring measures outlined in the chapters of this EIAR sufficiently address monitoring requirements. These measures will assist in ensuring that any effects on key health determinants, including socio-economic conditions, environmental quality, accessibility and connectivity, recreation and amenity, social engagement, equality and inclusion, and overall health and wellbeing, are appropriately monitored and managed throughout the construction and operational phases of the Proposed Development. No additional monitoring measures specific to population and human health are considered necessary.	
Chapter 14 – Material Assets: Traffic and Transport	
As the Proposed Development is expected to result in positive effects for both walking and cycling, no further monitoring measures are considered necessary beyond those already incorporated into the Proposed Development.	
Chapter 15 – Material Assets: Waste Management	
Construction Phase	
Implementation of waste management measures.	A Resource Manager will oversee implementation of the RWMP and undertake periodic reviews of waste management performance throughout construction.
Waste generation, reuse, recovery and disposal.	Records of waste generation, reuse, recycling, recovery and disposal will be maintained throughout construction and reviewed against project waste management objectives.
Waste tracking and regulatory compliance.	Waste movements, contractors, receiving facilities, waste classifications and quantities will be recorded and audited to ensure compliance with waste legislation and project requirements.
Overall waste management performance.	Waste audits and reporting will be undertaken during construction, with corrective actions implemented where required and a final waste management report prepared at project completion.
Operational Phase	
Management of operational waste.	Records of waste arising from maintenance activities will be retained where required and reviewed as part of routine operational management activities.
Effectiveness of waste management measures.	Operational waste management practices and litter management arrangements will be monitored through ongoing maintenance inspections and management procedures.
Chapter 16 – Material Assets: Utilities	
No specific construction or operational monitoring measures are considered necessary in respect of material assets and utilities.	
Chapter 17 – Material Assets – Land Use and Property	
Construction Phase	
• Compliance with land acquisition requirements, access arrangements, accommodation works, and stakeholder commitments will be monitored throughout the construction phase.	

• Areas subject to temporary land take, access restrictions, vegetation clearance, or disruption to existing land uses will be monitored to ensure implementation of mitigation and reinstatement measures. • Compliance with commitments relating to access, drainage, fencing, boundary treatments and landowner liaison will be monitored through the CEMP, Construction Liaison Programme and stakeholder engagement procedures.
Operational Phase
No operational monitoring is proposed, as the identified operational effects relate to approved permanent land use changes or beneficial effects that cannot be influenced through post-construction monitoring.