

Carrigtwohill URDF Initiative

UEA Infrastructure - Part 8 Planning Application Report

Cork County Council

May 2023



Notice

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1. Introduction

1.1. Objective of Report

The objective of this report is to describe the projects which comprise the 'Carrigtwohill URDF Initiative – Urban Expansion Area (UEA) Infrastructure'. The aims of the proposed infrastructure works are as follows:

- To support regeneration, compact growth and sustainable development in Carrigtwohill;
- To support the achievement of a sustainable residential community and other development in the UEA by providing high quality, attractive and sustainable connectivity between the UEA and Carrigtwohill, public transport hubs (Carrigtwohill Train Station), educational facilities, existing development south of the railway line and employment centres.
- To provide pedestrian, cyclist and vehicular access and services to development lands in the Carrigtwohill UEA to facilitate the future development of housing while encouraging sustainable modes of transport by reducing car dominance and providing high quality, safe pedestrian and cyclist facilities;
- To provide for green open spaces within the proposals and to protect and enhance areas of local biodiversity value within the UEA to serve the needs of communities and as a key contributor to climate mitigation and climate adaptation.
- Co-ordination and integration of proposals with other proposed infrastructure projects in Carrigtwohill.

In accordance with the Planning and Development Regulations, 2001 (as amended), this report details the proposed development together with the accompanying drawings which together describe the nature and extent of the proposed development.

1.2. Proposed Development

With reference to Figure 1-1 the infrastructure which makes up the Carrigtwohill URDF Initiative UEA Infrastructure is described as follows:

- A. Western (A1) and Eastern (A2) Services Corridor Link Roads connecting Wise's Road (L3616-0) on the western side of the UEA with Carrigane Road (L3617-25) on the eastern side of the UEA. The roads will also provide connectivity to Station Road (L3603-0), Leamlara Road (L3607-37) and the Ballyadam Road (L7640-0) and includes the realignment of the Carrigane Road near Ballyadam Bridge;
- B. Northern Services Corridor Link Road connecting the Western Services Corridor Link Road with the new Northern Schools Link Road via an existing vehicular underpass below the Cork to Midleton railway line;
- C. Upgrade/ re-alignment of Wises Road (C1) from north of its crossing of the Cork to Midleton Railway Line to the L3615-0 to the north of the UEA. The upgrade will also include a pedestrian/ cycle bridge (C2) across the railway line providing connectivity to Wises Road south of the railway;
- D. Upgrade/ re-alignment of Station Road (D1) from south of its crossing of the Cork to Midleton Railway Line to the L3615-0 to the north of the UEA. The upgrade will also include a pedestrian/ cycle bridge (D2) across the railway line providing connectivity to Station Road south of the railway line;
- E. Upgrade/ re-alignment of Leamlara Road from its junction with Station Road to its new western junction with the Eastern Services Corridor Link Road and from north of the UEA to its new eastern junction with the Eastern Services Corridor Link Road;
- F. Upgrade/ re-alignment of Ballyadam Road from its new junction with the Eastern Services Corridor Link Road to the L7639-0 north of the UEA including the permanent closure of the existing Ballyadam Road between the Eastern Services Corridor Link Road and Carrigane Road to vehicular traffic including the junction of the existing Ballyadam Road and Carrigane Road;

The infrastructure will also include shared cycling/pedestrian paths connecting the new road network with the planned Carrigtwohill to Midleton Inter-urban Cycle Route, areas of green open space, underground services including surface water drainage networks including detention ponds and attenuation, foul water networks, electrical and fibre optic/ telecoms ducting and water and gas supply. Services will be connected to existing services/ infrastructure in Carrigtwohill as required.

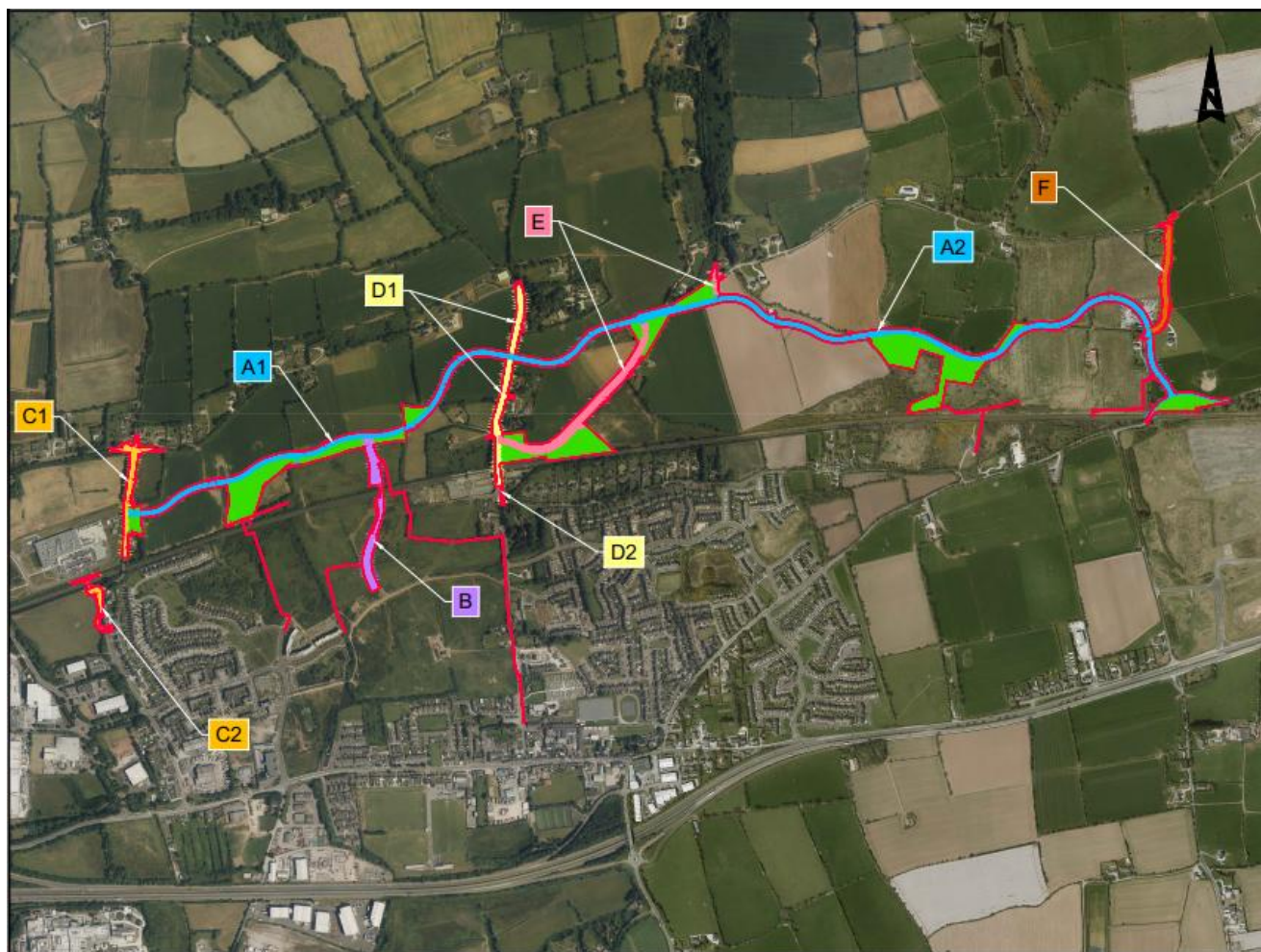


Figure 1-1 - Carrigtwohill URDF Initiative – UEA Infrastructure

1.3. Part 8 Documents

The following is a list of documents contained in the Part 8 planning application for the Carrigtwohill URDF Initiative - UEA Infrastructure:

- Part 8 Planning Application Report (this document);
- Ecological Impact Assessment;
- Flood Risk Assessment;
- Environmental Impact Assessment Screening Report;
- Environmental Impact Assessment Screening Report Determination;
- Report on Screening for Appropriate Assessment;
- Appropriate Assessment Report on Screening Determination;
- Archaeological, Architectural and Built Heritage Impact Assessment;
- Part 8 Drawings.

1.4. Inspection of Plans and Particulars

Plans and particulars of the proposed development are available for inspection, or to purchase for a fee of €15 per set, as per the dates on the site notice at the following venues:

- Cork County Council's website at:
<https://www.corkcoco.ie/en/resident/planning-and-development/public-consultations>
- Planning Counter, Ground Floor, County Hall, Cork between the hours of 09:00 and 16:00 on each working day, subject to COVID-19 restrictions.

- Cork County Council Area Engineer's Office at Ballinglanna, Glanmire and Cobh Municipal District Office, Carrig House, Cobh, Co. Cork between the hours of 09:00 and 17:00 on each working day during which the said offices are opened for the transaction of business, subject to COVID-19 restrictions.

Please note that the above offices are open subject to COVID-19 restrictions.

1.5. Submissions and Observations

Submissions and observations with respect to the proposed development may be made within the timelines noted on the site notice as follows:

- Online submission form on Cork County Council's website at <https://www.yourcouncil.ie> or
- In writing clearly marked: *'Part 8 – Carrigtwohill URDF Initiative – Public Realm Infrastructure Bundle'*, Senior Executive Engineer, Housing Infrastructure Implementation Team, Cork County Council, Floor 3, County Hall, Carrigrohane Road, Cork, T12 R2NC

2. Project and Policy Background

2.1. Carrigtwohill

Carrigtwohill is a Metropolitan Town within the County Metropolitan Strategic Planning Area. It is located in East Cork approximately 12 kilometres east of Cork City and approximately 5 kilometres west of Midleton. It is located to the north of the N25 national road which connects Cork City to Rosslare Europort. The Cork to Midleton railway line, which was re-opened in 2009, runs through the north of Carrigtwohill and Carrigtwohill Train Station is located to the north of the town.

Carrigtwohill historically functioned as a small rural village with limited residential and retail functions. Since the latter decades of the 20th century Carrigtwohill has been an important economic location and was designated as a Strategic Employment Area in the 2014 Cork County Development Plan. With reference to the 2017 Cobh Municipal District Local Area Plan (MDLAP) the re-opening of the railway line has resulted in significant population and employment growth in the town since 2002 and Carrigtwohill has experienced the most growth in percentage terms of any towns in Co. Cork.

Carrigtwohill is well placed to facilitate rapid but sustainable growth and development as noted in the Cork County Development Plan 2022. This is due to the ability of the town to provide a strong supply of housing and business land, the availability of a commuter rail service and the availability of water and wastewater infrastructure in the town. Carrigtwohill's target population for 2028 is 9,749 which is an increase of 4,669 people over the 2016 population. The most significant area to cater for this population growth in Carrigtwohill is to be in the form of a new residential neighbourhood located to the north of the rail line in an area known as the Carrigtwohill Urban Expansion Area.

2.1.1. Carrigtwohill Urban Expansion Area (UEA)

The Carrigtwohill Urban Expansion Area (UEA also known as Carrigtwohill North) is located to the north of Carrigtwohill as shown in Figure 2-1. It covers an area of approximately 100 hectares of zoned lands which are mainly just north of the Cork to Midleton railway line. It is bounded by Wises Road to the west and Ballyadam Road to the east.

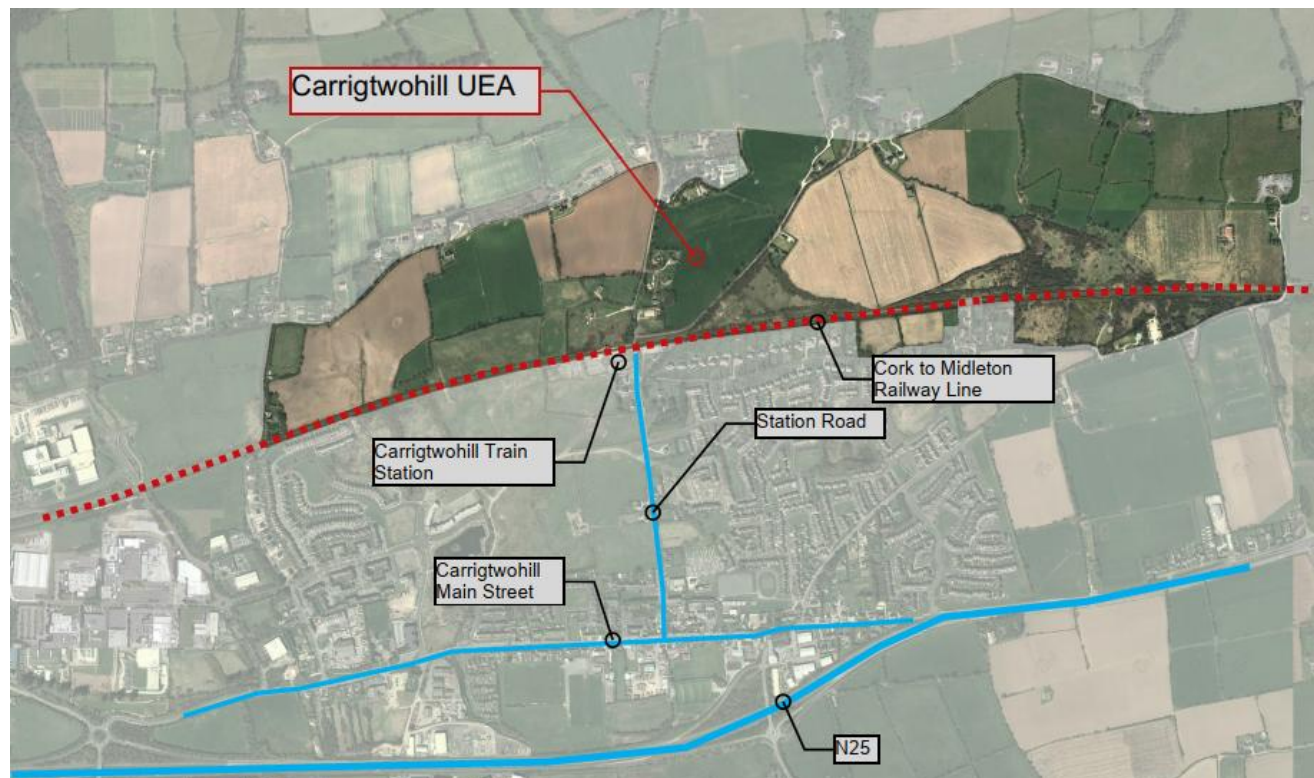


Figure 2-1 - Carrigtwohill UEA

This area was first identified in the Cork County Council's 2005 Special Local Area Plan for Carrigtwohill and again in the 2011 Midleton Electoral Area Local Area Plan as an area capable of delivering significant

residential development in tandem with the reopening of the suburban railway line. The Carrigtwohill North Framework Master Plan study was completed in 2015 and comprises a set of land use proposals for the development of the UEA. This approach was reflected in the 2017 Cobh Municipal District Local Area Plan (MDLAP) and is continued in the Cork County Development Plan 2022.

As per the CDP 2022 the ‘*vision for the Carrigtwohill North UEA when fully developed is the delivery of 2747 homes, 3 schools, a mixed use station quarter, a small park to the west and a large linear park to the east linked with a segregated inter-urban greenway and biodiverse green network, all integrated with the Main Town of Carrigtwohill via high quality sustainable transport linkages.*’ Development in this area is hoped to facilitate a significant modal shift to more sustainable transport modes due to the proximity of the railway line and existing/planned cycling and walking infrastructure.

The CDP 2022 identifies significant onsite and offsite infrastructure that is required to facilitate the delivery of housing in the UEA. Much of that infrastructure is included in the Carrigtwohill URDF Initiative – UEA Infrastructure which is described in this report.

2.2. National Planning and Transport Policy

The following national policy is relevant to the proposed Carrigtwohill UEA Infrastructure and has been considered as part of this project, with the relevant policy documents summarised below.

2.2.1. National Planning Framework

The National Planning Framework (NPF) is a planning framework to guide development in the coming years. It is a vision and a development strategy to shape Ireland’s national, regional and local social development in economic, environmental and social terms to 2040.

By 2040 it is anticipated that there will be roughly an extra one million people living in Ireland. It is imperative that the NPF is able to manage such growth to ensure that the population increase enhances the entire country. The NPF has been developed to guide public and private investment, to create and promote opportunities for people across the country, and to protect and enhance the environment - from villages to cities.

As the NPF states, it is important that communities are designed to encourage active travel which supports improved public health, creating a variety of economic and social benefits.

“Communities that are designed in a way that supports physical activity, e.g. generously sized footpaths, safe cycle lanes, safe attractive stairways and accessible recreation areas, all encourage residents to make healthy choices and live healthier lives.

Countries with extensive cycle infrastructure report higher levels of cycling and lower rates of obesity. Healthy places in turn create economic value by appealing to a skilled workforce and attracting innovative companies.”

The NPF has a variety of national objectives presented below which have been considered during the design of the Carrigtwohill URDF Initiative – UEA Infrastructure.

- National Policy Objective 4 - Ensure the creation of attractive, liveable, well designed, high quality urban places that are home to diverse and integrated communities that enjoy a high quality of life and well-being.
- National Policy Objective 5 – Develop cities and towns of sufficient scale and quality to compete internationally and to be drivers of national and regional growth, investment and prosperity.
- National Policy Objective 7 – Apply a tailored approach to urban development that will be linked to the Rural and Urban Regeneration and Development Fund, with a particular focus on items including:-
 - Encouraging population growth in strong employment and service centres of all sizes, supported by employment growth;
 - Addressing the legacy of unplanned growth, by facilitating amenities and services catch-up, jobs and/ or improved sustainable transport links to the cities, together with a slower rate of population growth in recently expanded commuter settlements of all sizes.
- National Policy Objective 27 - Ensure the integration of safe and convenient alternatives to the car into the design of our communities, by prioritising walking and cycling accessibility to both existing and proposed developments and integrating physical activity facilities for all ages.
- National Policy Objective 29 - Plan for a more diverse and socially inclusive society that targets equality of opportunity and a better quality of life for all citizens, through improved integration and greater accessibility in the delivery of sustainable communities and the provision of associated services.
- National Policy Objective 33 - Prioritise the provision of new homes at locations that can support sustainable development and at an appropriate scale of provision relative to location.

2.2.2. National Development Plan

The National Development Plan (NDP) sets out the investment priorities that will underpin the successful implementation of the NPF. The NDP will steer planning policy as well as guide investment decisions at a national, regional and local level. The NDP details the main investment projects, programmes and priorities envisaged over the next decade in order to drive implementation of the NPF.

The NDP and the NPF outline the importance of compact growth, where more compact urban and rural settlements are supported by jobs, houses, services and amenities. It states that a transport-led housing development approach will allow for the emergence of sustainable and well-connected communities where active travel is feasible and attractive for many localised journeys and good quality public transport is available to facilitate longer journeys into the major urban centres.

The €2 billion Urban Regeneration and Development Fund (URDF) aims to achieve sustainable growth in Ireland's five cities and other large urban centres to transform cities and towns.

As stated in the NDP, the Irish economy's ability to realise its full growth potential in a sustainable way is inextricably linked and critically dependent on the quality of spatial planning. A key aspect of spatial planning is sustainable mobility. Providing sustainable transport options will enable growth by facilitating the increasing demand on the transport network, allowing for further development.

Active travel also contributes to Ireland's low-carbon economy aspirations. The NDP states the importance of cycle and walking infrastructure and the opportunity to align to public transport:

“provision of safe alternative active travel options such as segregated cycling and walking facilities can also help alleviate congestion and meet climate action objectives by providing viable alternatives and connectivity with existing public transport infrastructure”.

2.2.3. Get Ireland Active

Healthy Ireland, A Framework for Improved Health and Wellbeing 2013-2051 is the national framework for seeking to improve the health and wellbeing of people living in Ireland. The Framework identifies a number of broad inter-sectoral actions, one of which commits to the development of a plan to promote increased physical activity levels.

Get Ireland Active's aim is to increase physical activity levels across the entire population, thereby helping to improve health and wellbeing. Get Ireland Active has developed a plan which will seek to ensure that no group is disadvantaged and recognises that targeted interventions are required to address and overcome barriers to participation which are experienced by some people.

Get Ireland Active acknowledges the role that cycling and walking can play in achieving physical activity targets. The plan highlights the importance of good planning to promote the use of cycling and walking, stating that the layout of the environment has a significant impact on the levels of physical activity undertaken across age groups.

“The built environment is an important determinant of physical activity behaviour. The way the built environment is designed, planned and built can also act as a barrier to being active and can reinforce sedentary behaviour and car dependence.

Walking or cycling for transport or leisure is a form of physical activity that can easily be incorporated into the daily activities for many people. Supportive environments for walking, cycling and recreational and outdoor physical activity have many benefits beyond the immediate physical activity gains.”

The Carrigtwohill URDF Initiative – UEA Infrastructure has the potential to be a positive example of how the built environment can be developed to promote physical activity, improving the health and wellbeing of those that choose to travel by bike or on foot. The Carrigtwohill URDF Initiative – UEA Infrastructure will provide high quality pedestrian and cyclist facilities with connectivity to key destinations in Carrigtwohill and will be used for a variety of journey purposes including travelling to work (directly or via the train), travelling to school, travelling to Carrigtwohill Town Centre etc. Making these journeys on foot or bike is an ideal opportunity to increase physical activity through everyday journeys.

2.3. Regional and Local Policy and Background Documents

The following regional and local policy and background documents have been considered as part of this project, with the relevant sections summarised below.

2.3.1. Cork County Development Plan

2.3.1.1. Main Policy Material

The Cork County Development Plan 2022 is a six year plan that sets out the policy objectives and the overall strategy for the proper planning and sustainable development of the County over the plan period from 2022 to 2028. The Plan sets out an approach centred on the core principle of sustainability with a focus on creating vibrant, liveable, climate resilient communities. This Plan is consistent with the ‘National Planning Framework’ (2018). The Cork County Development Plan sets out detailed objectives under a number of headings including the following which are applicable to the Carrigwohill URDF Initiative - UEA Infrastructure:

Ref.	Objective
PL 3-3	<p>Delivering Quality and Inclusive Places</p> <p>In assessing future development proposals the Plan will implement and promote a series of aims outlined in the Guidelines on Sustainable Residential Development in Urban Areas and accompanying Urban Design Manual and the Design Standards for New Apartments, which seek to create high quality inclusive places including:</p> <ul style="list-style-type: none"> • To achieve/ reinforce a better sense of place and distinctiveness therefore, strengthening local character; • Prioritise walking, cycling and public transport, and minimise the need to use cars; • Deliver a quality of life which residents and visitors are entitled to expect, in terms of amenity, safety and convenience; • Provide a good range of community and support facilities, where and when they are needed; • Promote the efficient use of land and energy and minimise greenhouse gas emissions; • Enhance and protect the built and natural heritage.
SC 6-1	<p>Social and Community Infrastructure Provision</p> <ul style="list-style-type: none"> • Support the provision of social and community facilities which meet the current and future needs of the entire population and which should grow in tandem with development in communities. • Secure lands for social and community facilities in appropriate locations and encourage the provision of facilities suitable for intergenerational activities, which are accessible to all members of the community, through initiatives in partnership with community groups and sporting organisations. Encourage the provision of community facilities, in accordance with the liveable town concept, in order to enhance ease of access to social and community facilities and services to all members within the community.
EC 8-5	<p>Connectivity</p> <p>Prioritise infrastructure delivery across the County to enhance connectivity (multi-modal transport and digital) with the wider southern region as supported in Chapter 12 Transport and Mobility and Chapter 13 Energy and Telecommunications.</p>
WM 11-2	<p>Surface Water Protection</p> <ul style="list-style-type: none"> • Protect and improve the status and quality of all surface waters throughout the County, including transitional and coastal waters. • At least secondary treatment should be provided to all wastewater discharges from any new development, to surface waters.
WM 11-7	<p>Climate Change</p> <ul style="list-style-type: none"> • The design and planning of water services infrastructure will fully consider the potential impacts of climate change and the need for measures to increase the resilience of this infrastructure to any such impacts. • Encourage the implementation of rainwater harvesting and water recycling, both in new development or retrospectively, so as to minimise the need for use of drinking standard water for those activities for which it is not required.

Ref.	Objective
WM 11-10	<p>Surface Water, SuDS and Water Sensitive Urban Design</p> <ul style="list-style-type: none"> Require that all new developments incorporate sustainable drainage systems (SuDS). Efforts should be taken to limit the extent of hard surfacing and impermeable paving. Encourage the application of a Water Sensitive Urban Design approach in the design of new development or other urban interventions. Opportunities to contribute to, protect or re-enforce existing green infrastructure corridors or assets should be maximised. Optimise and maximise the application of Sustainable Urban Drainage Systems (SuDS) to mitigate flood risk, enhance biodiversity, protect and enhance visual and recreational amenity; all in the most innovative and creative manner appropriate and in accordance with best practices. Proposals should demonstrate that due consideration has been given to nature based solutions in the first instance in arriving at the preferred SuDS solution for any development. Provide adequate storm water infrastructure in order to accommodate the planned levels of growth expected for the County. Where surface water from a development is discharging to a waterbody, appropriate pollution control measures (e.g., hydrocarbon interceptors, silt traps) should be implemented. The capacity and efficiency of the national road network drainage regimes will be safeguarded for national road drainage purposes.
WM 11-12	<p>Surface Water Management</p> <p>Manage surface water catchments and the use and development of lands adjoining streams, watercourses and rivers in such a way as to minimise damage to property by instances of flooding and with regard to any conservation objectives of European sites within the relevant catchments and floodplains.</p>
TM 12-1	<p>Integration of Land Use and Transport</p> <p>Support and facilitate the integration of land use with transportation infrastructure, through the development of diverse, sustainable, compact settlements, to achieve sustainable transport outcomes, with the pattern, location and design of new development in the County to support existing and planned well-functioning, integrated public transport, walking and cycling transport modes.</p> <ul style="list-style-type: none"> Residential development will, where possible, be carried out sequentially, whereby lands which are within or contiguous with the existing urban areas, and which are, or will be, most accessible by walking cycling or public transport - including infill and brownfield sites – are prioritised. Future developments will be planned and designed to maximise their accessibility by public transport, walking and cycling and in particular, larger scale, trip intensive developments, such as offices and retail, will generally be focused into central locations highly accessible by sustainable transport modes; New employment and residential development will be consolidated and intensified in a manner which renders it serviceable by public transport and ensures that it is highly accessible, by walking, cycling and public transport. Within Metropolitan Cork, trip intensive developments or significant levels of development will occur in locations which are well served by existing or proposed high capacity public transport; Higher residential development densities will be promoted in settlement centres benefiting from high quality provision of public transport services. The design of all roads and streets within the urban areas, including suburbs, towns and villages within the 60 kph zone shall be as per the Design Manual for Urban Roads and Streets, being the designated appropriate road design standards for such locations. DMURS will be implemented in the preparation of all statutory and non-statutory plans and through the development management process.
TM12-2-1	<p>Active Travel</p> <p>Deliver a high level of priority and permeability for walking and cycling to promote accessible, attractive, liveable, vibrant and safe settlements to work, live, shop and engage in community life, within a ten minute walk of one’s home. Prioritise development in our settlements that is</p>

Ref.	Objective
	<p>well located and designed to facilitate walking, cycling and public transport trips. Promote equal access for all through the adherence to universal design in the external built environment to facilitate greater use of public transport, walking and cycling.</p> <ul style="list-style-type: none"> • New development areas will be permeable for walking and cycling, via safe, convenient and enjoyable routes, and the retrospective implementation of walking and cycling facilities shall be undertaken where practicable in existing neighbourhoods, to give competitive advantage to these modes. See DMURS (2020 or later revision) and National Cycle Manual and Permeability Best Practice Guide (NTA) for guidance. • All new developments are to be designed to latest DMURS standards, unless precluded by space or other constraints, to be accessible and permeable for pedestrians, cyclists and those of reduced mobility. • Walkability and accessibility by walking mode will be a central objective in the planning and design of all new transport infrastructure and public transport services.
TM 12-2-2	<p>Active Travel</p> <p>Promote and facilitate an active travel culture in the County where active travel is a viable choice.</p>
TM 12-2-5	<p>Active Travel</p> <p>New paths and cycleways/ greenways and upgrades to existing paths and cycleways/greenways will be sensitively designed having regard to environmental, nature conservation, landscape and other heritage considerations, and committing, in particular to providing appropriate set-backs from water courses where new paths and cycleways/greenways are proposed along rivers, streams, lakes or other sensitive areas.</p>
GI 14-1	<p>Countywide Green and Blue Infrastructure Objectives</p> <ul style="list-style-type: none"> • Create an integrated and coherent green infrastructure for the County by encouraging the retention and strengthening of substantial networks of green space in urban, urban fringe and the wider countryside to serve the needs of communities now and in the future and as a key contributor to climate mitigation and climate adaptation. • Develop the green infrastructure network (including green corridors) to ensure the conservation and enhancement of biodiversity, including the protection of Natura 2000 European Sites, the provision of accessible parks, open spaces and recreational facilities (particularly within settlements), the sustainable management of water, the maintenance of landscape character and the protection and enhancement of architectural and archaeological heritage. • Capitalise on and highlight the multifunctional benefits/opportunities (ecosystem services) that green and blue infrastructure can present. Seek to advance the use of nature based solutions as an alternative to traditional infrastructure. Seek to advance an ecosystem services approach and ecosystem services valuation as a decision-making tool in plans and projects. • Recognise rivers and streams (and their wider riparian corridors) as one of the natural foundations for multi-functional green and blue infrastructure corridors. Seek to strengthen ecological linkages which watercourses have with other water dependent habitats as well as with hedges/treelines, woodland and scrub in the wider landscape. • Ensure that all settlements have an adequate level of quality green and recreational infrastructure (active and passive) taking into account existing deficits, planned population growth as well as the need to serve their surrounding hinterlands. • Achieve a net gain in green infrastructure through the protection and enhancement of existing assets and through the provision of new green infrastructure as an integral part of the planning process. Encourage the provision of different green infrastructure elements, such as trees in urban areas and green roofs in town centres, so that a net gain in green infrastructure is achieved over the lifetime of this Development Plan. • Integrate the provision of green infrastructure with infrastructure provision and replacement, including walking and cycling routes, as appropriate, while protecting biodiversity and other landscape resources.

Ref.	Objective
GI 14-4	<p>Recreation and Amenity</p> <ul style="list-style-type: none"> Support the provision of recreation and amenity facilities in new developments and ensure that the widest range of facilities is provided at locations which can serve the wider community and intergenerational activities, which are accessible to members of the community of all ages and abilities, through initiatives in partnership with community groups and sporting organisations.) Ensure the protection, and seek the enhancement and wise management of existing recreational facilities and public open space, and ensure that all new developments make adequate provision for recreational and amenity facilities in accordance with the requirements of the Council’s Recreation and Amenity Policy (Interim) and any successor policy and having regard to the Council’s policy regarding the management of Green Infrastructure assets.
BE 15-2	<p>Protect sites, habitats and species</p> <ul style="list-style-type: none"> Protect all natural heritage sites which are designated or proposed for designation under European legislation, National legislation and International Agreements. Maintain and where possible enhance appropriate ecological linkages between these. This includes Special Areas of Conservation, Special Protection Areas, Marine Protected Areas, Natural Heritage Areas, proposed Natural Heritage Areas, Statutory Nature Reserves, Refuges for Fauna and Ramsar Sites. These sites are listed in Volume 2 of the Plan. Provide protection to species listed in the Flora Protection Order 2015, to Annexes of the Habitats and Birds Directives, and to animal species protected under the Wildlife Acts in accordance with relevant legal requirements. These species are listed in Volume 2 of the Plan. Protect and where possible enhance areas of local biodiversity value, ecological corridors and habitats that are features of the County’s ecological network. This includes rivers, lakes, streams and ponds, peatland and other wetland habitats, woodlands, hedgerows, tree lines, veteran trees, natural and semi-natural grasslands as well as coastal and marine habitats. It particularly includes habitats of special conservation significance in Cork as listed in Volume 2 of the Plan. Recognise the value of protecting geological heritage sites of local and national interest, as they become notified to the local authority, and protect them from inappropriate development Encourage, pursuant to Article 10 of the Habitats Directive, the protection and enhancement of features of the landscape, such as traditional field boundaries, important for the ecological coherence of the Natura 2000 network and essential for the migration, dispersal and genetic exchange of wild species
BE 15-4	<p>Local Authority development and projects</p> <ul style="list-style-type: none"> Ensure that biodiversity protection is considered at design stage for works and development planned and progressed by Cork County Council and that all such projects comply with nature conservation legislation and policy as required; Fulfil Appropriate Assessment and Environmental Impact Assessment requirements and carry out Ecological Impact Assessment in relation to Local Authority plans and projects as appropriate.
BE 15-6	<p>Biodiversity and New Development</p> <p>Provide for the protection and enhancement of biodiversity in the development management process and when licensing or permitting other activities by:</p> <ul style="list-style-type: none"> Encouraging the retention and integration of existing trees, hedgerows and other features of high natural value within new developments; Requiring the incorporation of primarily native tree and other plant species, particularly pollinator friendly species in the landscaping of new developments; Fulfilling Appropriate Assessment and Environmental Impact Assessment obligations and carrying out Ecological Impact Assessment in relation to development and activities, as appropriate; Ensuring that the implementation of appropriate mitigation (including habitat enhancement, new planting or other habitat creation initiatives) is incorporated into new

Ref.	Objective
	development, where the implementation of such development would result in unavoidable impacts on biodiversity - supporting the principle of biodiversity net gain.
CA 17-2	<p>Climate Action</p> <p>In order to achieve a reduction in greenhouse gas emissions, an increase in renewable energy production, an increase in energy efficiency and enhanced biodiversity, support the transition to a low carbon, competitive, climate resilient and environmentally sustainable economy by 2050 through implementation of the polices of this plan that seek to deliver the following:</p> <ul style="list-style-type: none"> • Compact growth, • Integrated land use and transport, • Sustainable transport choices, • Liveable settlements, • Enhanced ecological biodiversity • Climate adaptation measures such as through flood risk management, sustainable urban drainage systems and high quality placemaking and design.

2.3.1.2. Carrigtwohill

The CDP 2022 outlines a number of general objectives which apply to all development proposals in Carrigtwohill which are applicable to the Carrigtwohill URDF Initiative - UEA Infrastructure:

- CT-GO-03: The green infrastructure, biodiversity and landscape assets of Carrigtwohill include its hedgerows, mature trees, woodlands, wetlands (adjoining Cork Harbour Special Protection Area and Great Island Chanel Special Area of Conservation), and other habitats. New development should be sensitively designed and planned to provide for the protection of these features and will only be permitted where it is shown that it is compatible with the requirements of nature conservation directives and with environmental, biodiversity and landscape protection policies
- CT-GO-05: Support the implementation of the Carrigtwohill North Urban Expansion Area.
- CT-GO-09: Ensure that provision is made in proposals for new development, particularly for housing, employment, retail, and educational uses to provide safe, convenient and pleasant routes for walkers and cyclists linking the development to the railway station, town centre and the other principal areas of the town for walkers and cyclists. Any such provision must have regard to the existing deficiencies in infrastructure and the requirement to ensure the delivery of adequate infrastructure ahead of or in tandem with the new development. In achieving this objective, special attention will be paid to the layout of the development, to latest DMURS standards, to ensure that appropriate measures are taken to establish a walking and cycling friendly environment.
- CT-GO-12: Provide direct high quality segregated links for pedestrians and cyclists from Inter-Urban Cycle route / Greenway IU-1 (see CMATS) to Carrigtwohill Town centre, the IDA Business and Technology Park, the permitted Carrigtwohill Schools' Campus, and existing and future residential areas.
- CT-GO-16: All new development will need to make provision for Sustainable Urban Drainage Systems (SuDS) and provide adequate storm water infrastructure. Surface water management and disposal should be planned in an integrated way in consideration with land use, water quality, amenity and habitat enhancements as appropriate.

2.3.1.3. Carrigtwohill UEA

The Carrigtwohill UEA lands are made up of multiple land ownerships and the assembly of the entire site into a single ownership would be a difficult challenge for any housing developer. Also, this pattern of land ownership adds to the complexity of funding and delivering the roads, water services and other infrastructure necessary at the outset of development. Because of this, the CDP 2022 notes that Cork County Council proposes to deliver the key strategic infrastructure to facilitate housing development within the UEA on a phased basis.

Two bundles of core, on site infrastructure, including access roads, water services, and particular areas of open space, are proposed within the UEA that will enable individual parcels of zoned land to be developed independently of each other but in accordance with the LAP. The CDP 2022 states that it is intended for Bundle A infrastructure to be delivered first followed by Bundle B.

Bundle A infrastructure, which is included in the Carrigtwohill URDF Initiative – UEA Infrastructure is as per Table 1.

Table 1 – Carrigtwohill UEA Bundle A Infrastructure (CDP 2022)

Zoning Ref (see Figure 2-2)	Infrastructure	Comments
CT-U-02	Western Spine Link Road (Wises Road to Leamlara Road) to access development lands in the UEA	Proposed initial infrastructure bundle. Delivery of Bundle 'A' will facilitate development on the following zones:
CT-U-12	Completion of the Northern Spine Link Road linking the Western Spine Link Road via the underpass to lands south of the railway	<ul style="list-style-type: none"> • CT-R-02 • CT-R-03 • CT-R-04
CT-U-15	Upgrade of Station Road North (within UEA)	<ul style="list-style-type: none"> • CT-RFAP-05
CT-U-05	Upgrade Leamlara Road to accommodate Pedestrian and Cycling facilities.	<ul style="list-style-type: none"> • CT-R-06 • CT-R-07
-	Delivery of phase 1 of surface water management system	<ul style="list-style-type: none"> • CT-RFAP-08 • CT-C-03 • CT-B-06

Bundle B infrastructure, which is included in the Carrigtwohill URDF Initiative – UEA Infrastructure is as per Table 2.

Table 2 – Carrigtwohill UEA Bundle B Infrastructure (CDP 2022)

Zoning Ref (see Figure 2-2)	Infrastructure	Comments
CT-U-02	Eastern Spine Link Road B (Leamlara Road to Ballyadam Road) to access development lands in the UEA	Delivery of this infrastructure bundle is not proposed to commence until after the delivery of Bundle 'A'.
-	Delivery of phase 2 of surface water management system.	Delivery of Bundle 'B' will facilitate development on the following zones: <ul style="list-style-type: none"> • CT-RFAP-09 • CT-RFAP-10 • CT-RFAP-13 • CT-RFAP-16 • CT-RFAP-17 • CT-C-04 • CT-RFAP-19

Off-site infrastructure works which are necessary for the development of the UEA are also identified in the CDP - 2022. Again, these works are intended to be delivered on a phased basis. Off-site infrastructure which is included in the Carrigtwohill URDF Initiative – UEA Infrastructure is as follows:

- Installation of segregated Pedestrian/ Cycling crossing at Wise's Bridge (CT-U-06)

This infrastructure is linked to Phase 2 of the UEA development. Other works including junction upgrades, traffic management measures and the walking/ cycling network are being addressed as part of the Carrigtwohill URDF Initiative – Public Realm Infrastructure Bundle and the Carrigtwohill to Midleton Inter-urban Cycle Route both of which are adjacent but separate projects already approved under Part 8 of the Planning and Development Regulations, 2001 (as amended).

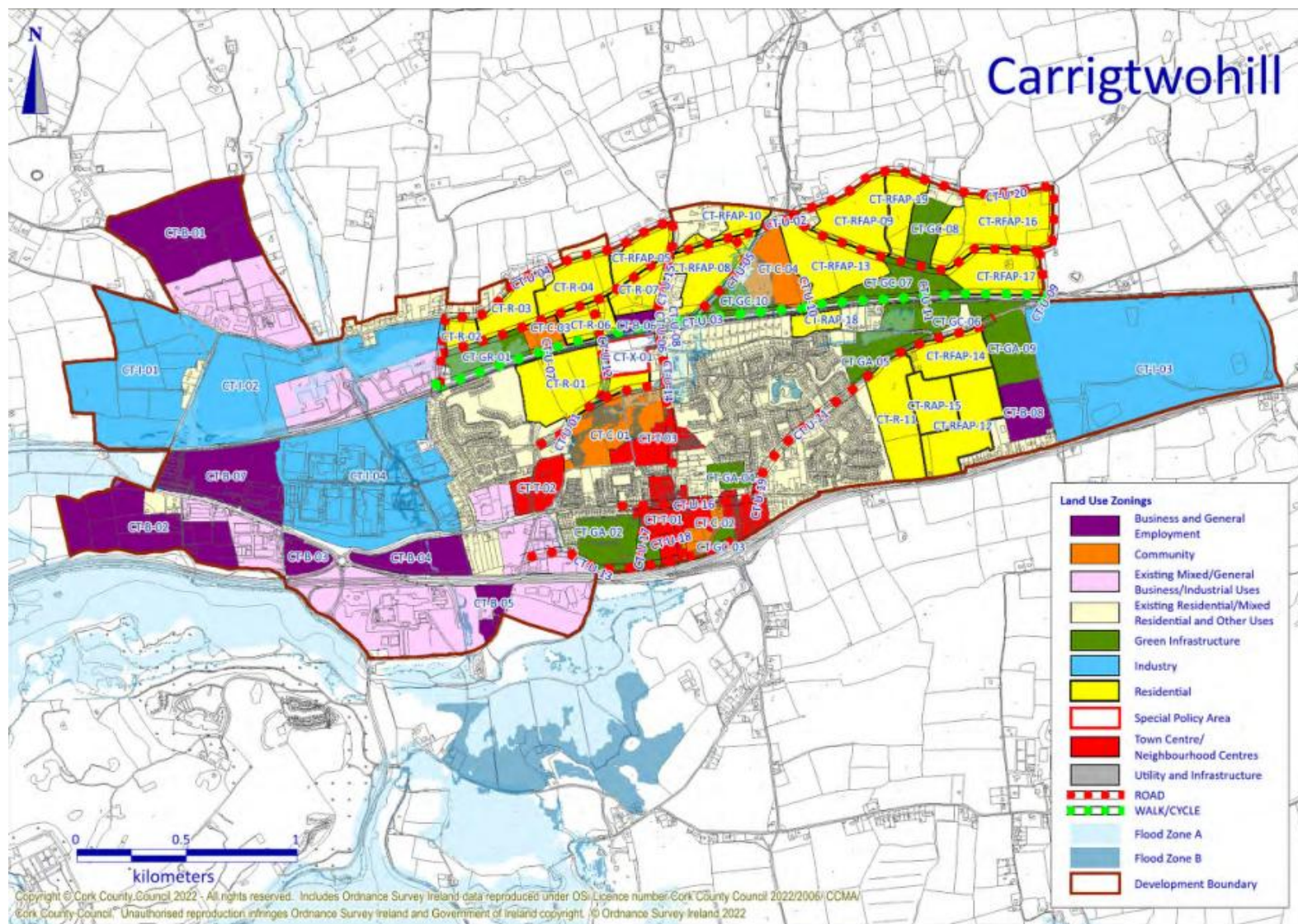


Figure 2-2 - Carrigtwohill Land Zoning Map - CDP 2022

2.4. Other Key Projects in Carrigwohill

A number of key infrastructure projects are currently being progressed in Carrigwohill as follows:

2.4.1. Carrigwohill URDF Initiative – Public Realm Infrastructure Bundle (Adjacent but separate project already approved under Part 8)

Cork County Council approved Part 8 planning for the Carrigwohill URDF Initiative – Public Realm Infrastructure Bundle on 27th June 2022. That project included:

- Carrigwohill Main Street and Station Road public realm works enhancement (Figure 2-3) including new link roads, road junction upgrades, footpath widening, provision of off-road cycling facilities, road re-alignment, resurfacing, signalisation, traffic calming measures, street lighting, demolition of buildings at the junction of Main Street and Station Road along with other small-scale demolition works and provision of new public spaces;
- Upgrade of junctions on Wises Road;
- Additional interim capacity upgrade measures at N25 Junction 3 (Cobh Cross) including widening and realignment of approach roads to the roundabout.

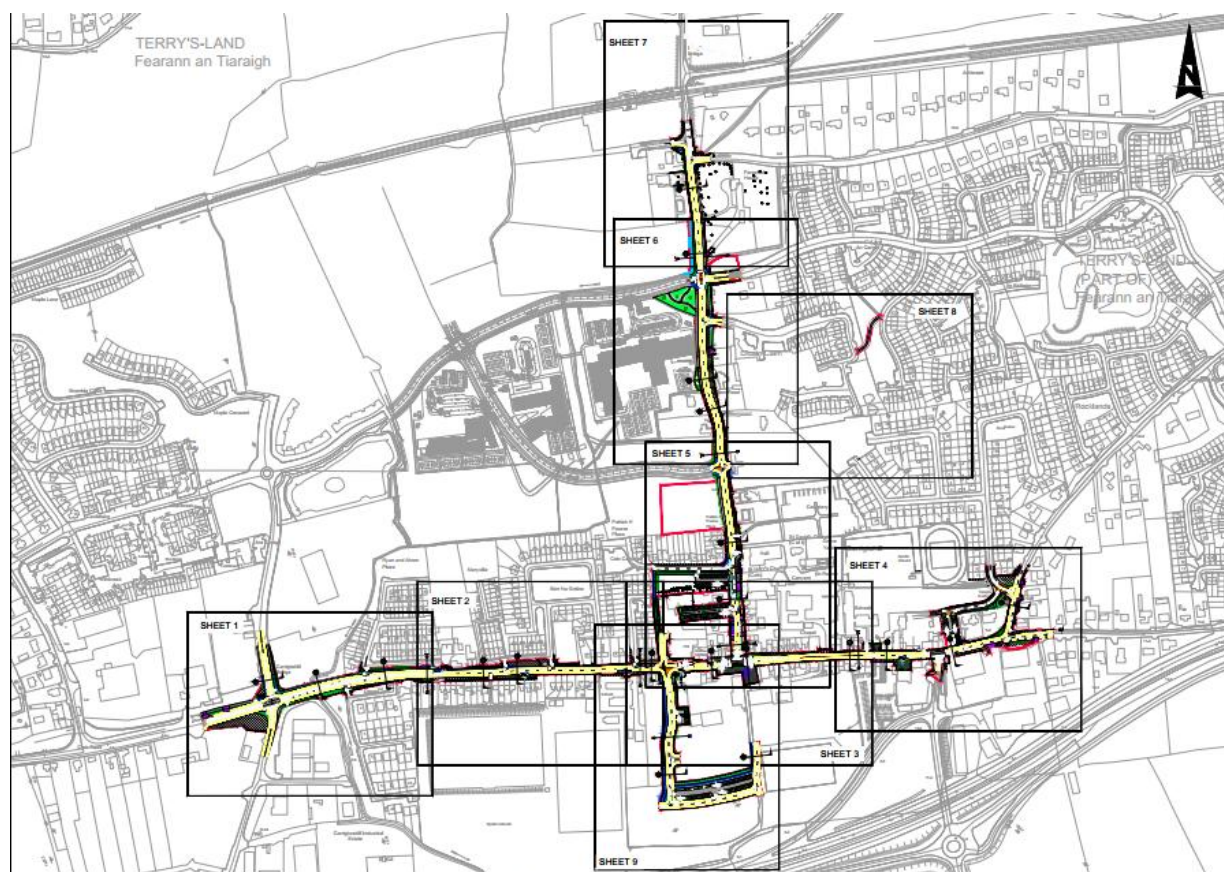


Figure 2-3 – Main Street and Station Road Public Realm Works

The proposed Carrigwohill UEA Infrastructure is compatible with that of the public realm infrastructure bundle. Together both projects will:

- Support regeneration, compact growth, and sustainable development in Carrigwohill and its urban expansion area;;
- Provide better quality streetscapes and public spaces to unlock the potential of Carrigwohill;
- Improve connectivity between Carrigwohill Town Centre and residential developments (existing and future), employment centres, Carrigwohill train station, schools, business parks, commercial premises etc.
- Encourage sustainable modes of transport by reducing car dominance and providing safe pedestrian and cyclist facilities;

2.4.2. Station Road Schools Campus (Adjacent but separate project)

Cork County Council granted planning permission to the Department of Education (Planning reference: 19/5707) for a new school's campus on Station Road. This campus includes two new link roads connecting Station Road and Castlelake which have been completed, and comprises two primary schools and one post-primary school which are currently under construction. An extract of the site layout plan from the planning application is shown in Figure 2-4 below.



Figure 2-4 - Proposed Schools Campus Layout Plan (Planning Reference: 19/5707)

2.4.3. Midleton to Dunkettle Inter-urban Cycle Route (Adjacent but separate project)

The Midleton to Dunkettle Inter-urban Cycle Route (IU-1) is proposed in the Cork Metropolitan Area Transport Strategy 2040. This cycle route will connect major employment centres such as Little Island (10,000+ employees) and Carrigtwohill IDA Business Park (3,800 employees) with existing and proposed residential areas including in Carrigtwohill, Midleton, Glanmire and Glounthaune. The Midleton to Dunkettle route will form part of the Cork to Waterford Inter-urban Demonstrator which is included in the Department of Transport Pathfinder Programme.

Sections of this route which are adjacent to the Carrigtwohill UEA Infrastructure project are described below.

2.4.3.1. Bury's Bridge Cycleway

Cork County Council granted Part 8 planning permission for a strategic cycleway scheme connecting Bury's Bridge at Dunkettle outside Cork City with Carrigtwohill. This scheme, part of which has now been constructed, provides approximately 7.7 kilometres of pedestrian and cycle path segregated from vehicular traffic. The indicative route of the cycleway, as extracted from the Preliminary Design Report included with the planning submission, is shown in Figure 2-5 below. The cycleway enters the east side of Carrigtwohill to the north of Cobh Cross (N25 Junction 3). It runs parallel to Carrigtwohill Main Street before turning north and running along the Castlelake Access Road. It then joins the link roads associated with the new schools' campus as described above.



Figure 2-5 - Bury's Bridge Cycleway (Extract from Preliminary Design Report by Aecom 2020)

2.4.3.2. Carrigtwohill to Midleton Inter-urban Cycle Route Phase 1

Phase 1 of the Carrigtwohill to Midleton Inter-urban Cycle Route received Part 8 Planning Approval from Cork County Council in 2022. This section of the route (Figure 2-6) runs west to east to the north of Carrigtwohill, primarily through the Carrigtwohill UEA, connecting the IDA Business Park in the west with lands zoned for Industry to the south of Carrigane Road in the east. It will provide a sustainable transport link between Carrigtwohill UEA lands and existing and future employment centres, Carrigtwohill Train Station, the new school's campus on Station Road and all existing and planned residential developments south of the railway line.

Note that whilst this section of this route has been shown on the Part 8 layout plans for the Carrigtwohill UEA Infrastructure to assist with the overall understanding, it already has Part 8 planning approval.

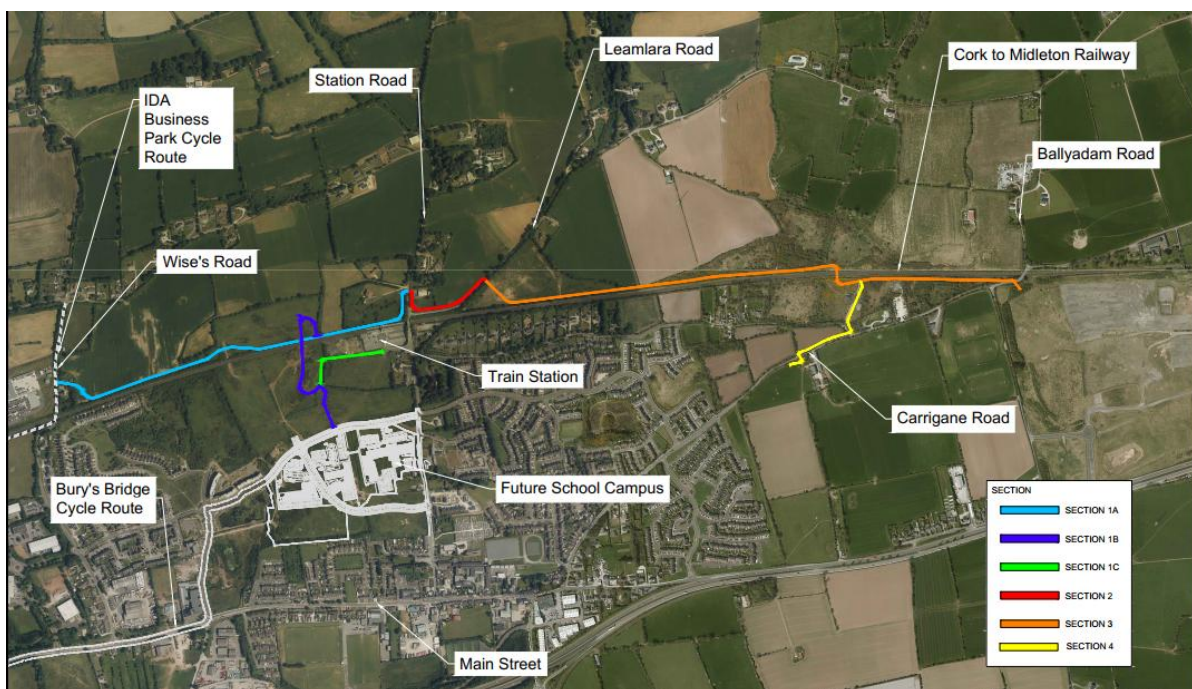


Figure 2-6 – Carrigtwohill to Midleton Inter-urban Cycle Route Phase 1

2.5. Design Guidance and Standards

The proposed works are designed in accordance with the following guidance and standards:

- Design Manual for Urban Roads and Streets (Department of Transport, Tourism and Sport, 2013);
- National Cycle Manual (National Transport Authority (NTA), 2011);
- The SuDS Manual (CIRIA C753) (CIRIA, 2015);
- The Greater Dublin Strategic Design Strategy;
- TII Design Standards.

3. Design Approach and Objectives

3.1. Objectives of Proposed Development

The objectives of the proposed works, which are outlined in Section 1.1 of this report, are outlined in more detail in the following sections.

3.1.1. To support regeneration, compact growth and sustainable development in Carrigtwohill;

Given its location along the Cork to Midleton railway line, its designation as a Strategic Employment Area in the 2014 County Development Plan and the ability of the town to provide a strong supply of housing and business land, Carrigtwohill is well placed to facilitate rapid yet sustainable growth and development.

The proposed infrastructure will facilitate the commencement of development of housing, schools and commercial areas within the Carrigtwohill UEA as per the Cork County Development Plan 2022 zoning and densities. The proposed infrastructure will provide high quality transport corridors connecting the UEA and the existing Carrigtwohill settlement. Together with other projects planned for Carrigtwohill e.g. Carrigtwohill URDF Initiative Public Realm Infrastructure Bundle, this infrastructure will meet the needs of the existing population and facilitate growth. It will attract investment to the area and send a positive signal to potential investors about the importance of Carrigtwohill as a key growth centre.

The projects proposed as part of this scheme will provide attractive streets, pedestrian and cycling routes and green spaces as envisaged by the Cork County Development Plan 2022 which will help to support regeneration, compact growth and sustainable development in Carrigtwohill.

3.1.2. To support the achievement of a sustainable residential community and other development in the UEA by providing high quality, attractive and sustainable connectivity between the UEA and Carrigtwohill, public transport hubs (Carrigtwohill Train Station), educational facilities, existing development south of the railway line and employment centres.

The proposed infrastructure aims will provide high quality, attractive and sustainable connectivity between the UEA and key locations within the existing Carrigtwohill settlement by addressing deficits in existing cycling and walking infrastructure at key locations as follows:

- A pedestrian/ cyclist bridge will be provided across the railway line to the east of the existing Station Road bridge. There are no dedicated pedestrian/ cyclist facilities on the existing bridge. The new bridge will provide sustainable transport connectivity between the centre of UEA and key destinations south of the railway line such as the train station and the new school's campus on Station Road.
- A pedestrian/ cyclist bridge will be provided across the railway line to the west of the existing Wisers Road bridge. There are no dedicated pedestrian/ cyclist facilities on the existing bridge. The new bridge will provide sustainable transport connectivity between the western UEA and a key employment centre i.e. IDA lands to the west of the UEA and to other areas south of the railway line.
- Shared pedestrian and cycling paths will also be provided that will connect the proposed footpaths/ cycle tracks in the UEA with the Carrigtwohill to the Midleton to Dunkettle Inter-urban Cycle Route (IU-1. This will connect the UEA with major employment centres such as Little Island (10,000+ employees) and Cork City.

3.1.3. To provide pedestrian, cyclist and vehicular access and services to development lands in the Carrigtwohill UEA to facilitate the future development of housing while encouraging sustainable modes of transport by reducing car dominance and providing high quality, safe pedestrian and cyclist facilities.

High quality footpaths and cycle tracks will be provided on both sides of all new and upgraded roads as part of the infrastructure. This will provide easy access to the footpaths and cyclists from future residential developments on both sides of the roads without the need for excessive crossing of the road. Cyclist and pedestrian crossing facilities will be provided at signalised junctions and vulnerable road users will have priority

over traffic at minor junctions. Traffic calming measures are included in the road design i.e. bends and raised tables to reduce traffic speeds and to help further encourage the use of sustainable transport modes. These measures, along with the connectivity to key destinations described above, will encourage sustainable modes of transport from an early stage in the development of the UEA.

3.1.4. To provide for green open spaces within the proposals and to protect and enhance areas of local biodiversity value within the UEA to serve the needs of communities and as a key contributor to climate mitigation and climate adaptation.

Ecological considerations have been key factors in the route selection and design of the UEA Infrastructure. The routes of new roads are such that areas which were identified as being of 'Higher Species Richness' in the western and eastern UEA were avoided. Where possible the routes of new roads were chosen to run parallel and offset from existing hedgerows and treelines so that they can be preserved. New roads will only require existing hedgerows to be removed at field boundary crossings. Existing road upgrades have generally been limited to widening on one side only so that treelines/ hedgerow removal is limited to one side of the road upgrade only. In total, it will be necessary to remove approximately 1,960m of hedgerows/ treelines to construct the infrastructure. This will be mitigated by the replacement of this with a minimum of 1,960m of new hedgerows/ treelines aligned to the new infrastructure as well as new areas of planting at various locations of 'passive green space' throughout the UEA.

There is a total of approximately 5.5 hectares of passive green space, located in different areas of the UEA, included in the proposals. This space has been designated as passive to enhance local biodiversity value as appropriate for each area. This will be done through the retention and integration of existing trees and hedgerows, landscaping through the planting of native trees and other suitable plant species and the planting of pollinator friendly species. Planting in each area will be specified by a Landscape Architect under the advice of a suitably qualified and experienced ecologist so that it is most appropriate for the characteristics of that area and to retain connectivity to the wider green infrastructure network.

Surface water detention ponds, stream overflow channels and low lying areas will encourage biodiversity through the creation of new aquatic and wetland habitats. These areas will also have amenity value and provide surface water pollution prevention measures which will also be located in these areas. Planting in these areas will also be specified by a Landscape Architect under the advice of a suitably qualified and experienced ecologist. These areas will also have amenity value and provide surface water pollution prevention measures which will also be located in these areas.

No works are proposed to the south of the existing Leamlara Road boundary i.e. the Woodstock Stream side of the road. No works on the south side of this road will extend into the roadside verge, treeline or hedgerow and the existing buffer between the road and the stream will be maintained. Natural buffer areas on existing watercourses outside of the infrastructure area will be maintained and protected during the construction of the proposed infrastructure. An exclusion zone around these buffers will be formed using protection fencing to ensure that construction does not encroach on these areas. Where proposed drains cross below watercourses/ ditches the methods used to install them will allow for maintaining existing buffer areas i.e. trenchless methods. An ecological buffer area between the Eastern Services Corridor Link Road and the Poulinska Stream has been maintained in the design where the road runs parallel to the stream.

Any development on adjacent lands in the future will need to recognise the importance of green infrastructure and particularly the ecological corridor along the road and connectivity to the wider green infrastructure network. Through the planning process and development management adjacent developments will be required by the Local Authority to contribute to this on their lands to be permitted to develop and connect to the road.

3.1.5. Co-ordination and integration of proposals with other proposed infrastructure projects in Carrigtwohill

As noted in Section 2 a number of key projects have recently received planning permission and/ or are under construction in Carrigtwohill including the proposed Carrigtwohill School's Campus on Station Road, the Carrigtwohill URDF Public Realm Infrastructure Bundle and the Dunkettle to Middleton Cycle Route.

These proposals have been developed in conjunction with the designs of those projects (as well as other development proposals in Carrigtwohill) to ensure a coordinated and integrated overall design approach.

4. Description of Proposed Project

4.1. Drawings

The Carrigtwohill URDF Initiative – UEA Infrastructure is shown on the following planning drawings:

- 5194601-HTR-UEA-DR-0010 to 0036
- 5194601-HTR-UEA-DR-0040 to 0042

4.2. Eastern and Western Services Corridor Link Roads

4.2.1. Overview

The proposed Western and Eastern Services Corridor Link Roads will connect the existing Wisnes Road (L3161-0) on the western side of Carrigtwohill UEA to the existing Carrigane Road (L3617-25) on the eastern side of the UEA. These roads will also have connectivity to Station Road (L3603-0) and Leamlara Road (L3607-37) within the UEA. The aim of these roads is to provide pedestrian, cyclist and vehicular access to development lands in the Carrigtwohill UEA to facilitate the commencement of development within the UEA. The roads will include all ducts and services to facilitate the future development of housing and associated public infrastructure in the UEA. Water supply and wastewater pipework will also be included within the roads. A segregated cycle track and footpath and bus stops will be provided along both sides of the road. Provision has also been made along the services corridor link roads for from the adjacent lands in the UEA.

4.2.2. Description

4.2.2.1. Cross-Section

The proposed cross-section of the Services Corridor Link Roads is described in Table 3 and a typical section is shown in Figure 4-1.

Table 3 – Proposed Eastern and Western Services Corridor Link Road cross-section parameters

Element	Width	Description
Carriageway	6.5m	This is based on a preferred lane width of 3.25 metres as per DMURS guidance.
Verge	2 x 2m	A verge is to be provided on both sides of the carriageway to act as a buffer between vehicular traffic and pedestrians/ cyclists. Trees/ planting and underground services/ public lighting will be located in the verges.
Cycle Track	2 x 2.0m	Off-road cycle tracks are proposed on both sides of the road behind the verges. This will provide easy access to the cycle track from future residential developments on both sides of the Western / Eastern Link Road without excessive crossing of the road for cyclists.
Footpaths	2 x 2m	Footpaths are proposed outside each of the cycle tracks on both sides of the road. A 1 m wide verge is proposed outside each footpath and stock proof boundary fencing or other required boundary treatment.
Services	-	Below ground services are proposed outside of the carriageway, where possible, for health and safety and ease of maintenance reasons. Any future maintenance should not require lane closures or restrictions due to excavation of the carriageway. Maintenance workers will be able to undertake works on the services away from traffic.

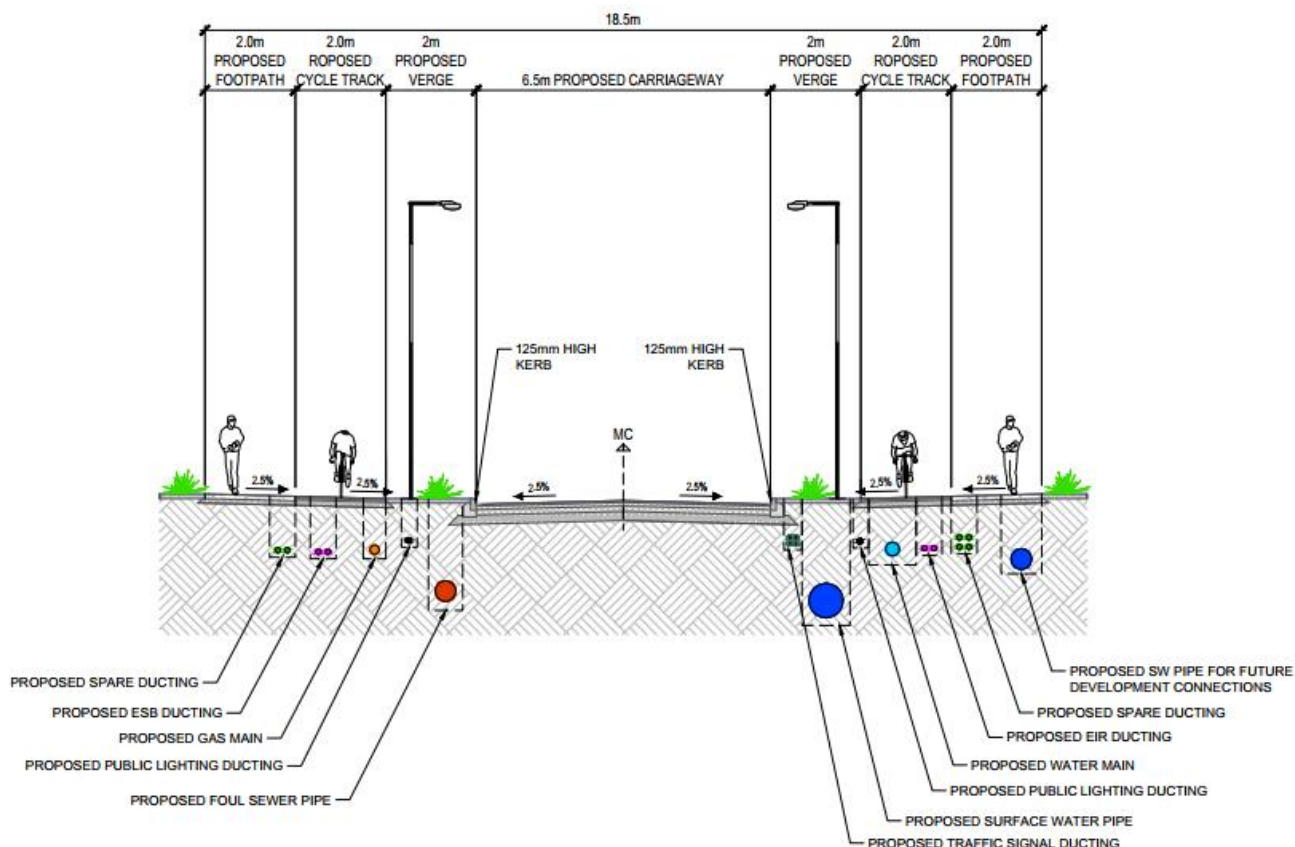


Figure 4-1 - Typical Cross-Section of Eastern and Western Services Corridor Link Roads

4.2.2.2. Junctions

New main road junctions are proposed along the Western and Eastern Services Corridor Link Road. These are at the roads' junctions with Wises Road, the Northern Services Corridor Link Road, Station Road, Leamlara Road (upgraded and existing) and Carrigane Road. These junctions are proposed to be raised tables with traffic signals including crossing facilities for pedestrians and cyclists to prioritise safe pedestrian and cyclist movements over vehicular traffic.

It is proposed that the junctions of minor roads with the Services Corridor Link Road will be priority junctions. Traffic travelling east to west along the Services Corridor Link Road will have priority. Raised table crossing facilities for pedestrians and cyclists will be provided at all minor junctions.

The locations of signalised and priority junctions are shown in drawings 5194601-HTR-UEA-DR-0010 to 0038.

4.2.2.3. Pavement

The pavement will be designed in compliance with TII standards. The process will start with a ground investigation and a consideration of the cumulative traffic loading which the pavement is required to carry followed by the design of the road foundations and the base and surface layers. A change of surface will be provided at raised tables.

4.2.2.4. Drainage and Services

Refer to Section 4.6 of this report.

4.2.2.5. Public Lighting

New public lighting will be provided along the extents of the Services Corridor Link Road. The road lighting will be designed to the correct lux levels for the road carriageway, cycle lanes, footpaths and public spaces. The lighting shall be designed in accordance with Cork County Council's Public Lighting Manual and Product Specification 2020 and BS 5489:2013.

4.2.2.6. Signage and Road Markings

Traffic signs and road markings will be provided in accordance with the Department of Transport Traffic Signs Manual.

4.3. Northern Services Corridor Link Road

4.3.1. Overview

The Northern Services Corridor Link Road is a proposed road connecting the connecting the Western Services Corridor Link Road with the new Northern Schools Link Road via an existing vehicular underpass below the Cork to Midleton railway line.

The aim of the road is to provide pedestrian, cyclist and vehicular access to development lands in the Carrigtwohill UEA to facilitate the commencement of development within the UEA. The road will include ducts, services pipework and the provision of surface water drainage, drinking water pipework and wastewater services pipework.

A segregated pedestrian/cycle track will be provided at the existing underpass. Generally segregated footpaths and cycle tracks will be provided along both sides of the road. . At the underpass the footpath and cycle track will join the route of the planned Carrigtwohill to Midleton Inter-urban Cycle Route which is being developed as part of a separate project.

4.3.2. Description

4.3.2.1. Cross-Section

The proposed cross-section of the Northern Services Corridor Link Road is described in Table 4 and a typical section is shown in Figure 4-2.

Table 4 – Proposed Northern Services Corridor Link Road cross-section parameters

Element	Width	Description
Carriageway	6.5m generally except at the existing underpass where road width reduces to 5m	This is based on a preferred lane width of 3.25 metres as per DMURS guidance. The road cross-section will reduce to 5 metres at the existing underpass to allow the road to pass through the 6 metre wide clearance of the existing underpass structure.
Verge	2 x 2m minimum	A verge is to be provided on both sides of the carriageway to act as a buffer between vehicular traffic and pedestrians/ cyclists. Trees/ planting and underground services/ public lighting will be located in the verges.
Cycle Track	2 x 2.0m generally except at the underpass	Off-road cycle tracks are proposed on both sides of the road behind the verges generally except where the road crosses below the railway line.
Footpaths	2 x 2.0m generally except at the underpass	Footpaths are proposed on both sides of the road behind the verges generally except where the road crosses below the railway line. A 1 m wide verge is proposed outside each footpath and stock proof boundary fencing or other required boundary treatment.
Services	-	Below ground services are proposed outside of the carriageway, where possible, for health and safety and ease of maintenance reasons. Any future maintenance should not require lane closures or restrictions due to excavation of the carriageway. Maintenance workers will be able to undertake works on the services away from traffic.

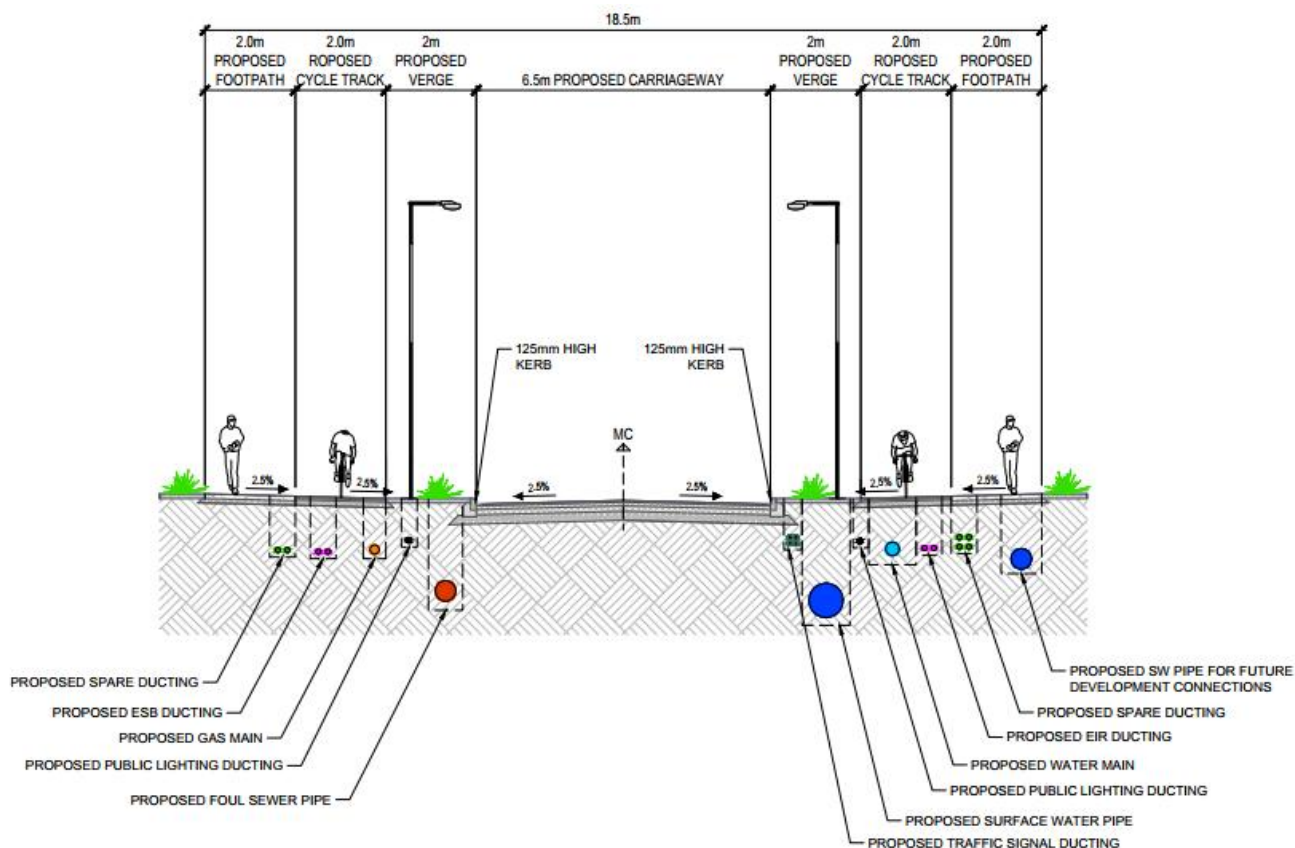


Figure 4-2 - Typical Cross-Section of Northern Services Corridor Link Road

4.3.2.2. Junctions

Two major junctions along the Northern Services Corridor Link Road junctions are proposed. These are at the roads' northern junction with the Western Services Corridor Link Road and at its southern junction with the new Northern Schools Link Road. The northern junction is proposed to be a raised tables with traffic signals including crossing facilities for pedestrians and cyclists. The southern junction will tie into the existing signalled T-junction which also includes crossing facilities for pedestrians and cyclists.

4.3.2.3. Pavement

The pavement will be designed in compliance with TII standards. The process will start with a ground investigation and a consideration of the cumulative traffic loading which the pavement is required to carry followed by the design of the road foundations and the base and surface layers. A change of surface will be provided at raised tables.

4.3.2.4. Drainage and Services

Refer to Section 4.6 of this report.

4.3.2.5. Public Lighting

New public lighting will be provided along the extents of the proposed upgrade of Main Street and Station Road. The road lighting will be designed to the correct lux levels for the road carriageway, cycle lanes, footpaths and public spaces. The lighting shall be designed in accordance with Cork County Council's Public Lighting Manual and Product Specification 2020 and BS 5489:2013.

4.3.2.6. Signage and Road Markings

Traffic signs and road markings will be provided in accordance with the Department of Transport Traffic Signs Manual.

4.4. Upgrade/ Re-alignment of Wises Road, Station Road, Leamlara Road and Ballyadam Road

4.4.1. Overview

The upgrade of the above roads is proposed as follows:

- Wises Road from north of its crossing of the Cork to Midleton Railway Line to the L3615-0 to the north of the UEA. The upgrade will also include a pedestrian/ cycle bridge across the railway line providing connectivity to Wises Road south of the railway line;
- Station Road from south of its crossing of the Cork to Midleton Railway Line to the L3615-0 to the north of the UEA. The upgrade will also include a pedestrian/ cycle bridge across the railway line providing connectivity to Station Road south of the railway line;
- Leamlara Road from from its junction with Station Road to its new western junction with the Eastern Services Corridor Link Road and from north of the UEA to its new eastern junction with the Eastern Services Corridor Link Road. It is noted that no works are proposed to the south of the existing Leamlara Road boundary i.e. the Woodstock Stream side of the road. No works on the south side of this road will extend into the roadside verge, treeline or hedgerow and the existing buffer between the road and the stream will be maintained.
- Ballyadam Road from its new junction with the Eastern Services Corridor Link Road to the L7639-0 north of the UEA including the permanent closure of the existing Ballyadam Road between the Eastern Services Corridor Link Road and Carrigane Road to vehicular traffic including the junction of the existing Ballyadam Road and Carrigane Road;

4.4.2. Description

4.4.2.1. Cross-Section

The proposed cross-sections for the road upgrades Wises Road, Station Road, Leamlara Road and Ballyadam Road are described in Table 5 and a typical section along Wises Road is shown in Figure 4-3.

Table 5 - Proposed Services Corridor Link Road cross-section parameters

Element	Width	Description
Carriageway	6m	A 6-metre carriageway is proposed generally. This is within the range noted in DMURS for 'Arterial and Link streets' with low to moderate design speeds.
Verge and Planting	2 x 1m minimum except at pinch points	A verge is generally to be provided on both sides of the carriageway to act as a buffer between vehicular traffic and pedestrians/ cyclists. Trees/ planting and underground services/ public lighting will be located in the verges.
Cycle Track	2 x 2m generally except for Wises Road	Segregated off-road cycle tracks will be provided on both sides of the upgraded roads generally. On Wises Road there is an existing 3 metre wide shared cycle/ pedestrian path on the western side of the road. This will be retained as part of the proposals with a 2m wide segregated cycle track to be provided on the eastern side of the road from its junction with the Inter-urban cycle route northwards.
Footpath	2 x 2m minimum	Footpaths will be provided on both sides of the upgraded roads generally. As above on Wises Road the 3 metre wide shared cycle/ pedestrian path on the western side of the road will retained as part of the proposals with a 2m wide footpath be provided on the eastern side of the road from its junction with the Inter-urban cycle route northwards. A 0.5m to 1 m wide verge is proposed outside footpaths and stock proof boundary fencing or other required boundary treatment.

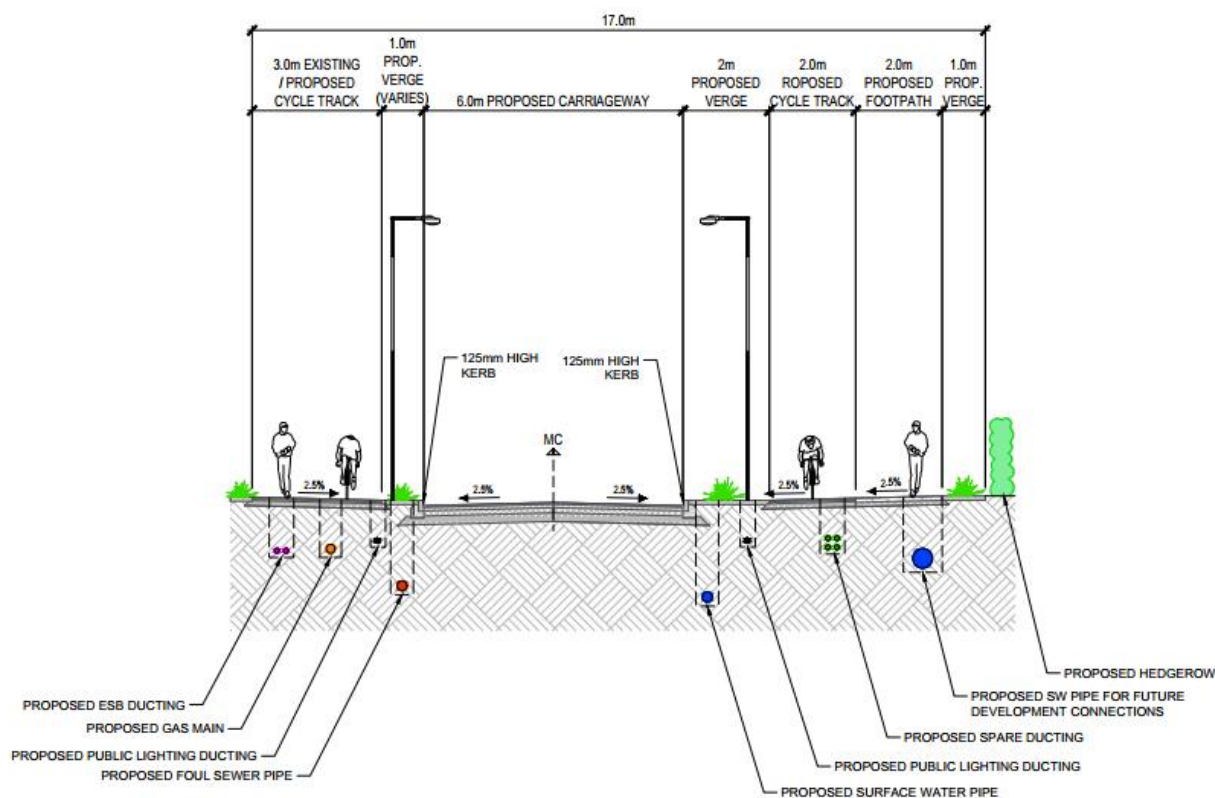


Figure 4-3 - Typical Cross-Section of Wisnes Road upgrade

4.4.2.2. Junctions

The following junction are proposed to be signalled junctions with raised tables and crossing facilities for pedestrians and cyclists:

- Wisnes Road/ L3615-0
- Wisnes Road/ Western Services Corridor Link Road
- Station Road/ Western Services Corridor Link Road
- Station Road/ Leamlara Road
- Leamlara Road/ Western Services Corridor Link Road
- Leamlara Road/ Eastern Services Corridor Link Road
- Ballyadam Road/ Carrigane Road

It is proposed that the junctions of the above roads with minor roads will be priority junctions with traffic on the minor roads giving way. Raised table crossing facilities for pedestrians and cyclists shall be provided at all minor junctions.

4.4.2.3. Pavement

The pavement will be designed in compliance with TII standards. The process will start with a ground investigation and a consideration of the cumulative traffic loading which the pavement is required to carry followed by the design of the road foundations and the base and surface layers. A change of surface will be provided at raised tables.

4.4.2.4. Drainage

Refer to Section 4.6 of this report.

4.4.2.5. Public Lighting

New public lighting will be provided along the extents of the proposed upgrade of Main Street and Station Road. The road lighting will be designed to the correct lux levels for the road carriageway, cycle lanes, footpaths and public spaces. The lighting shall be designed in accordance with Cork County Council's Public Lighting Manual and Product Specification 2020 and BS 5489:2013.

4.4.2.6. Signage and Road Markings

Traffic signs and road markings will be provided in accordance with the Department of Transport Traffic Signs Manual.

4.4.2.7. Wises Road Pedestrian/ Cycle Bridge

The proposed additional pedestrian/cycle bridge immediately west of Wises Road Bridge over the railway line will facilitate the connection of the UEA, Wises Road and the existing shared cycle/ pedestrian path in IDA lands across the railway line with the existing pedestrian/ cycling facilities on Wises Road south of the railway line.

The bridge will provide a vertical clearance of 5.3 metres to the existing track. The maximum horizontal span of the bridge will be 28 metres. The bridge will be a reinforced concrete structure built on concrete columns. The bridge will be 4 metres in width between bridge parapets and will run on the western side of the existing bridge. The bridge abutments will be outside the Irish Rail corridor including lands required for proposed dual tracking of the railway line. The bridge parapets will match the parapets of the existing bridge in terms of height.

4.4.2.8. Station Road Pedestrian/ Cycle Bridge

The proposed additional pedestrian/cycle bridge immediately east of Barry's Bridge will facilitate the connection of the junction of Station Road/ Leamlara Road (north of the railway line) across the railway with Station Road (south of the railway line). This will provide pedestrian/ cycling connectivity along Station Road between the UEA and the existing settlement located to the south of the railway line.

The bridge will provide a vertical clearance of 5.3 metres to the existing track. The maximum horizontal span of the bridge will be 25 metres. The bridge will be a reinforced concrete structure built on concrete columns. The bridge will be 4 metres in width between bridge parapets and will run on the eastern side of the existing Barry's Bridge. The bridge abutments will be outside the Irish Rail corridor including lands required for proposed dual tracking of the railway line. The bridge parapets will match the parapets of the existing bridge in terms of height and materials.

4.5. UEA Community and Open Space Development and Green Infrastructure

Community and Open Space will be provided in different areas of the UEA comprising of shared cycling/pedestrian paths connecting the new roads, footpaths and cycle tracks with the planned Inter-urban Cycle Route. The Community and Open Space will largely be Passive Open Space.

There is a total of approximately 5.5 hectares of passive open space, included in the proposals. This space has been designated as passive to enhance local biodiversity value as appropriate for each area. This will be done through the retention and integration of existing trees and hedgerows, landscaping through the planting of native trees and other suitable plant species and the planting of pollinator friendly species. Planting in each area will be specified by a Landscape Architect under the advice of a suitably qualified and experienced ecologist so that it is most appropriate for the characteristics of that area and to retain connectivity to the wider green infrastructure network.

Surface water detention ponds, stream overflow channels and low lying areas will encourage biodiversity through the creation of new aquatic and wetland habitats. These areas will also have amenity value and provide surface water pollution prevention measures which will also be located in these areas. Planting in these areas will also be specified by a Landscape Architect under the advice of a suitably qualified and experienced ecologist. These areas will also have amenity value and provide surface water pollution prevention measures which will also be located in these areas.

Any development on adjacent lands in the future will need to recognise the importance of green infrastructure and particularly the ecological corridor along the road and connectivity to the wider green infrastructure network. Through the planning process and development management adjacent developments will be required by the Local Authority to contribute to this on their lands to be permitted to develop and connect to the road.

4.6. Drainage and Services

4.6.1. Surface Water Drainage

A surface water drainage system is proposed to accommodate surface water run-off from the Services Corridor Link Roads and the proposed road upgrades. The proposed system is also designed to accommodate attenuated surface water design flows that would be generated by future UEA development.

The UEA is located within a “Karst” area and the proposed system has been designed to manage the associated risk but also having regard to the potential for nature-based solutions and the objectives within the County Development Plan 2022. While systems of gullies/pipes are proposed in the road pavement for the management of the “Karst” risk, road verges will be used for retention/treatment of surface water run-off upstream and the attenuation/treatment of the flows downstream is being proposed and managed in open ponds/basins situated within open space area/network.

The overall flow attenuation design approach is based on limiting surface water discharge to greenfield run-off rates, based on QBAR (or mean annual peak flow) from existing permeable areas where this does not require significant diversion of watercourses/ removal of hedgerows. The current run-off rates from existing impermeable road areas will also be reduced post-construction. This will result in a reduction in the total discharge rates, and associated impacts, following the construction of the proposed infrastructure to the Woodstock and Poulinska Streams respectively.

There will be several surface water networks serving infrastructure in the western and eastern UEA as summarised below.

1. In the western UEA the main surface water network will comprise of road gullies, pipes and manholes within the road corridors of Wisers Road, the western Services Corridor Link Road and the most northern part of Station Road. The run-off will pass through the network into a silt trap and on to a large detention pond which will remove pollutants and which will provide attenuation. Attenuated flows from the pond will discharge to the existing drainage ditch running along the northern boundary of the Cork to Midleton railway line.. The drainage ditch connects to the Woodstock Stream at a location south of the railway line.
2. A drainage network is required for the northern part of the Northern Services Corridor Link Road north of it's crossing of the railway line. This will consist of gullies, pipes and manholes. The surface water will pass through a silt trap, a by-pass separator and on to an attenuation tank. It will discharge to a new piped crossing of the railway line before discharging to a 600mm diameter sewer which will be extended from an existing 1050mm surface water sewer at the southern end of Station Road to the railway crossing. Discharge will again be limited to greenfield run-off rates (QBAR).
3. A drainage network is required for the lowest part of the Northern Services Corridor Link Road including the northern approach to the underpass below the Cork to Midleton railway line. This will consist of pipes, gullies, channel drains and manholes. The drainage route will run below the route of the Inter-urban Cycle Route as it passes below the Cork to Midleton railway line and below the Northern Services Corridor Link Road south of the railway line. It will then connect to an existing surface water drainage network in Castl lake via a silt trap and a by-pass separator.
4. A separate drainage network will be provided for the southern part of Station Road, Leamlara Road and the Western Services Corridor Link Road between Station Road and Leamlara Road. This will consist of gullies, pipes and manholes. The run-off will pass through the network into a silt trap and on to a detention pond south of Leamlara Road which will remove pollutants and which will provide attenuation. Discharge from the attenuation/ treatment pond will be to Woodstock Stream north of the Cork to Midleton railway line.
5. In the eastern UEA the main surface water network will comprise of road gullies, pipes and manholes within the corridors of Leamlara Road and the eastern Services Corridor Link Road. The run-off will pass through surface water networks into silt traps and on to detention/ treatment ponds which will remove pollutants and which will provide attenuation. Discharge from the ponds will be to the Poulinska Stream north of the railway line.
6. A separate drainage network will be provided in the eastern UEA for the upgrade of the Ballyadam Road and the Ballyadam Road/ Carrigane Road junction. This network will comprise of road gullies, pipes and manholes within the road corridors. This network will discharge to an attenuation tank via a silt trap and a by-pass separator which will be used to remove hydrocarbons. Discharge from the tank will be to an existing drainage ditch to the west of Ballyadam Road. This drainage ditch discharges to the Poulinska Stream north of the railway line.

Nature based drainage solutions as per ‘Nature-based solutions to the Management of Rainwater and Surface Water Runoff – Water Sensitive Urban Design – Best Practice Interim Guidance Document’ will be implemented upstream of the main drainage network during the detailed design. There are generous verges proposed along the new roads as well as pockets of green open space. They will be used where possible for

the planting of trees and low growing planted area which will retain and treat surface water run-off from adjacent hard standing areas before discharge to the downstream drainage network.

4.6.2. Foul Drainage

Two separate foul gravity sewer pipe networks are proposed to facilitate future development in the Carrigtwohill UEA. It is noted that no wastewater flows will be generated as part of the infrastructure development described in this document.

In the western part of the UEA a foul sewer pipeline, comprising of manholes and pipes, will be laid within the upgraded Wisers Road and the Western Services Corridor Link Road. The sewer pipeline will connect to an existing sewer pipe crossing of the railway line in the western part of the UEA which was laid during the reconstruction of the Midleton to Glounthaune railway line (in 2009) to allow for wastewater connectivity from the UEA to the existing sewer network south of the railway line. South of the railway line crossing the sewer will connect to the existing Irish Water foul sewer. A response to a pre-connection enquiry to Irish Water states that this connection is feasible subject to identified upgrades being implemented.

In the eastern part of the UEA a foul sewer pipeline will be laid within the Eastern Services Corridor Link Road. The sewer pipeline will connect to an existing sewer pipe crossing of the railway line which was laid to allow for wastewater connectivity from the UEA to the existing Irish Water wastewater pumping station (which is located south of the railway line). A response to a pre-connection enquiry to Irish Water states that this connection is feasible subject to identified upgrades being implemented.

Stub pipework will be provided from the proposed foul sewer network along the Services Corridor Link Road and Wisers Road to allow for future connections to accommodate development in the UEA. While sufficient flow capacity will be provided in the pipework, any connections will be subject to Irish Water approval.

4.6.3. Other Services

All new roads and road upgrades will also include ducting and services that would be normally required for the commencement of development within the Urban Expansion Area. This will include but not be limited to ESB ducting, Eir ducting, gas mains, water mains, public lighting ducting and Cork County Council spare ducting. All services and ducts will be provided within the new/ upgraded road corridors.

4.7. Project Delivery

4.7.1. Project Phasing

The Cork County Development Plan (2022) notes that infrastructure, necessary for housing development to commence within the UEA, will be delivered in two phased bundles namely 'Bundle A' and 'Bundle B' (subject to funding).

Bundle A, construction of which would be estimated to take 18 months, includes:

- Western Services Corridor Link Road (from Wisers Road to Leamlara Road)
- Northern Services Corridor Link Road
- Upgrade of Station Road
- Upgrade of Leamlara Road
- Small Park in western UEA (Community and Open Space development)
- Surface water management and other services e.g. water supply, wastewater etc. for western UEA

The County Development Plan also notes that the early phases of development are also likely to require the modification of Barry's Bridge (Station Road) to provide for cyclists and pedestrians.

The upgrade of Wisers Road is included in special development objective CT-U-04 and linked to development in western UEA. The provision of segregated pedestrian/cycle link across the railway at Wisers Road is included in Phase 2 of the "Core Off-Site Infrastructure".

Bundle B infrastructure, construction of which is likely to take 12 months, includes:

- Eastern Services Corridor Link Road
- Small Park in eastern UEA (Community and Open Space development)
- Surface water management and other services e.g. water supply, wastewater etc. for eastern UEA

The upgrade of Ballyadam Road is included in special development objective CT-U-20 and is linked to development in the eastern UEA.

The County Development plan proposes to deliver Bundle A first. It also however notes that the phasing arrangements are flexible and in the event that it proves possible to commence development on the eastern part of the UEA, then Infrastructure Bundle 'B' (together with the measures proposed for Station Road Bridge and Leamlara Road Upgrade) will be required at the outset.

4.7.2. Works Methods

For each phase of infrastructure development, the works will commence with site clearance/ accommodation works. Temporary traffic management including measures for pedestrians and cyclists will be put in place. Pre-construction demolition surveys of buildings/ boundary walls necessary for the construction of the works will be undertaken followed by the demolition of these structures. Trees/ vegetation to be retained will be marked/ protected. Natural buffer areas on existing watercourses outside of the infrastructure area will be maintained and protected during the construction of the proposed infrastructure. The site will be cleared of redundant fencing and road signage, street lighting to be replaced and existing vegetation to be removed. Vegetation clearance will be done in the appropriate season, i.e. outside the bird nesting season (March 1st – August 31st inclusive).

Underground utilities which conflict with the main works will be uncovered using mechanical excavators and hand digging. A utility survey, including slit trenches for verification, will be carried out during the detailed design stage to determine the location of services to the most accurate extent possible. Any service diversions or protection works that are required will be commenced at this stage. This will include the diversion of all overhead lines to underground ducts and chambers on Wises Road, Station Road, Leamlara Road and Ballyadam Road as necessary for that phase of development.

The routes of new roads to be constructed (Western/ Eastern and Northern Services Corridor Link Roads) and roads to be upgraded (Wises Road, Station Road, Leamlara Road, Ballyadam Road) will be excavated to formation/ sub-formation level. It is anticipated that generally the maximum excavation depth for the road build up will be 1 metre. Excavations will be undertaken by mechanical means with any spoil arisings to be removed off site or reused locally where testing confirms its suitability. The new roads, cycle tracks and footpaths will then be constructed.

Generally, the roads will have asphalt surfacing with road widths varying by location as outlined earlier in this report. Sub-base and base layers will be compacted stone materials and asphalt layers respectively. Footpaths will be a mixture of concrete and natural stone finishes. The roads and cycle tracks will have asphalt surfacing.

Drainage works will run in tandem with earthworks and road construction. There is a north to south fall across the site and interceptor filter drains will be installed on the northside of the road prior to the earthworks commencing to prevent overland flows from impacting upon the earthworks. These drains will drain to ground directly or to existing drainage ditches/ streams via the detention ponds which are to be excavated as part of the surface water drainage network. Gullies will be connected to a new surface water drainage sewer, consisting of pipes and manholes, to be installed below the new alignment. The maximum anticipated trench excavation depths for the surface water network is 4 metres. The detention ponds will be an anticipated maximum depth of 2 metres.

The foul drainage, consisting of a network of manholes and pipes, will be installed at the same time as the surface water drainage network. The drainage will connect to existing foul sewers south of the railway line. Maximum trench excavation depths for the foul water network will be 4 metres. Other services i.e. gas mains, ESB ducting, Eir ducting etc. will also be installed at the same time.

Road crossings of existing field drains and streams will also run in tandem with earthworks. Smaller culverts of field drains will be pipe culverts up to a diameter of 900mm. Culverts of field drains larger than this will be box culverts with the maximum width to be 1500mm. Crossings of the Woodstock Stream will be small bridge crossings with abutments constructed outside of the stream embankments. All culverts, headwalls and bridge beams/ decks will be pre-cast concrete. The bed level of the culverts will meet the requirements of 'Guidelines for the Crossing of Watercourses During the Construction of National Road Schemes'. Where proposed drains cross below watercourses/ ditches the methods used to install them will allow for maintaining existing buffer areas where possible. New road signs, road markings, public lighting columns, traffic signals and bollards will be installed and commissioned where required. Areas of soft landscaping (verges, open space areas) will be top-soiled, seeded and planted following specification by a Landscape Architect working with a suitably qualified and experienced ecologist. Permanent accommodation works will be completed, including the erection of permanent fencing and boundary walls and other required boundary treatments. Temporary traffic management measures will be removed when appropriate.

The new cycle/ pedestrian bridges at the existing Barry's and Wise's Bridges will be constructed on piled foundations and will span across the railway. Necessary clearances, protection and monitoring measures, as required by Irish Rail, will be put in place for the construction of the bridges.

5. Environmental Summary

5.1. Flood Risk Assessment

A flood risk assessment (FRA) for the Carrigtwohill URDF Initiative – UEA Infrastructure has been undertaken in accordance with under the Planning System and Flood Risk Management Guidelines for Planning Authorities (Department of Environment, Heritage and Local Government & Office of Public Works, 2009). The FRA was completed to inform the proposed development as it relates to flood risk and is included as part of the Part 8 planning application. The objectives of the FRA were to:

- Identify potential sources of flood risk;
- Confirm the level of flood risk at and adjacent to the proposed development and identify key hydraulic features;
- Assess the impact the proposed development has on flood risk;
- Develop appropriate flood risk mitigation and management measures which will reduce the flood risk and allow for safe and sustainable development of the proposed infrastructure.

A hydraulic model was developed to assess the fluvial flood risk to the proposed development, The model results showed overland flows during the 1% and 0.1% AEP events along the Woodstock Stream, which pass through the UEA lands. Mitigation measures, including a proposed open channel, culverts, and a flow storage, have been incorporated into the model and subsequently the proposals to address these risks as well as risk from pluvial flooding. The flood risk assessment shows that the proposed development, along with the mitigation measures, will not result in increased flood extents or flood levels.

The Flood Risk Assessment concludes that the development is in agreement with the core principles contained within the Planning System and Flood Risk Management Guidelines.

5.2. Appropriate Assessment Screening

An Appropriate Assessment (AA) Screening Report has been prepared to assist the competent authority, in this case Cork County Council, to carry out a Screening for Appropriate Assessment for the Carrigtwohill URDF Initiative – UEA Infrastructure.

The report has examined the details of the proposed Carrigtwohill URDF UEA Infrastructure Project and the Natura 2000 sites in their Zone of Influence. It has analysed the potential impacts of the proposed development on the receiving natural environment and evaluated their effects, both individually and in combination with other plans and projects, in view of the conservation objectives of the relevant Natura 2000 sites. This report has been prepared in line with the Habitats Directive, as transposed into Irish law by the Habitats Regulations, relevant case law and guidance from the European Commission, the Department of the Environment, Heritage and Local Government and the Office of the Planning Regulator, on the basis of objective information and adhering to the precautionary principle.

Following the assessment detailed in the report, the AA Screening Report concludes that the proposed development will not, either individually or in combination with other plans or projects, give rise to impacts which would constitute significant effects on the Great Island Channel SAC or Cork Harbour SPA, in view of its/their conservation objectives. Therefore, it is the recommendation of the authors of that report that Cork County Council, as the competent authority, may determine that Appropriate Assessment is not required in respect of the proposed Carrigtwohill URDF Infrastructure Project. Should any aspect of the design or construction methodology for the proposed development be materially changed, a new AA Screening Report would be required.

5.3. Environmental Impact Assessment Screening

An Environmental Impact Assessment (EIA) screening report has been carried out in accordance with the Planning and Development Regulations as amended 2001- 2023 (which give effect to the provisions of EU Directive 2014/52/EU), and the Roads Acts 1993-2022. The report assessed the impact of the Carrigtwohill URDF Initiative UEA Infrastructure project in conjunction with committed developments in the surrounding area.

Based on all available information, and taking account of the scale, nature and location of the proposed project it is concluded by the authors of the report that the preparation of an EIAR is not a mandatory requirement. The proposed project is deemed a sub-threshold development. The potential for significant environmental effects arising as a result of the proposed project has been evaluated, in accordance with the requirements of Schedule 7A and Schedule 7 of the Planning and Development Acts 2001-2023. It is considered by the authors of the

report that no significant adverse impacts to the receiving environment will arise as a result of the proposed development. Therefore, the report concludes that the preparation of an EIAR is not required.

5.4. Archaeological and Built Heritage Assessment

An Archaeological and Built Heritage Assessment of Carrigtwohill URDF Initiative - UEA Infrastructure has been undertaken by John Cronin and Associates. The report concludes that the proposed infrastructure will not directly impact any designated or protected archaeological or built heritage sites or structures. Four fields, in which the proposed infrastructure is located, have the potential to contain previously unrecorded subsurface sites and features of archaeological significance and are considered to be of high archaeological potential. The proposed development will not directly impact any structures identified by the National Inventory of Archaeological Heritage (NIAH) or that are included in the Record of Protected Structures (RPS). There will be a slight negative indirect impact from the proposed pedestrian/ cycle bridge adjacent to Barry's Bridge on the former railway station and former station master's house. A former forge building in Terry's-land is of local heritage significance and, the scheme has been designed to allow its preservation. Demolition of the associated dwelling (which is of less significance) is unavoidable.

A programme of pre-construction archaeological geophysical survey and licensed archaeological survey of the accessible areas of the four number fields which are considered to be of high archaeological potential is recommended. A programme of pre-development archaeological testing on any geophysical anomalies identified would be required to establish the nature and extent of these anomalies. A programme of pre-development archaeological testing will be required in areas where geophysical survey is not feasible.

A programme of licenced archaeological monitoring will be required in areas where predevelopment archaeological testing is not feasible. This construction-phase of monitoring will focus on topsoil stripping for minor linear works for underground services including surface and foul water networks, electrical and fibre optic/ telecoms ducting and water and gas supply.

In the event that any previously unrecorded archaeological remains are identified during these archaeological investigations, they will be recorded in situ and the Planning Authority and the National Monuments Service will be consulted in relation to any required further mitigation, i.e., preservation in situ (avoidance) or preservation by record (archaeological excavation).

Finally it is recommended that a detailed Heritage Building Survey of the dwelling associated with the former forge building should be undertaken in order to compile a full record of the extant structure(s) in written, drawn and photographic formats. This will be prepared for review and approval by Cork County Council's Executive Archaeologist. It is recommended that the sections of boundaries to be removed be documented and described prior to their removal.

5.5. Ecological Impact Assessment

An Ecological Impact Assessment (EclA) report has been prepared for the Carrigtwohill URDF Initiative – UEA Infrastructure. The EclA has examined the biodiversity and baseline ecological conditions of the receiving environment within the site of the proposed development and its Zone of Influence, assessed the likely effects of the proposed development, individually and in combination with other plans and projects, on the sites, habitats, species and other ecological features of Local Importance (Higher Value) or above which were identified within the footprint of the proposed development and its Zone of Influence. The report has also proposed suitable measures to avoid or reduce the likely effects on those features and evaluated any residual effects. These measures, as well as further ecological enhancements of the proposed development, were developed in line with Cork County Council's policy in relation to Biodiversity Net Gain.

On the basis of that assessment, it is concluded that the Carrigtwohill URDF Infrastructure Project, provided that it is implemented in accordance with the measures proposed in the EclA, will not give rise to any significant negative effects on the biodiversity or ecology of the receiving environment and will be aligned with the principle of Biodiversity Net Gain.

5.6. Transport Assessment

Cork County Council has commissioned a Strategic Traffic and Transport Assessment (STTA) to assess the impact of development within Carrigtwohill UEA (also at Midleton and Cobh along the N25 corridor) on the existing road network and also in combination with new infrastructure as part of the Carrigtwohill URDF Initiative brief. The STTA will provide an assessment of the impacts of development on the existing road network and provide requirements and timing for upgrading elements of the existing road infrastructure in conjunction with the UEA and other development.

The STTA involved the development of two traffic models as follows:

1. A strategic level Local Area Model (LAM) developed in SATURN (Simulation Assignment of Traffic to Urban Road Networks), which is used to assess the transport impacts of the development of the study area on the road network in Midleton and Carrigtwohill and the N25 Cork to Rosslare Road between Midleton and Carrigtwohill;
2. A micro-simulation model developed in VISSIM (Verkehr In Städten –SIMulationsmodell), which is used for a more detailed assessment of the impacts of the development on existing junctions close to the Carrigtwohill UEA and proposed junctions within the UEA.

The SATURN and VISSIM traffic modelling have been completed. The traffic modelling has identified a number of interventions which are required within the Carrigtwohill road network to allow for development within the UEA and elsewhere in Carrigtwohill. For the development of Phase 1 of the UEA (1020 houses plus development elsewhere in Carrigtwohill) an upgrade of N25 Junction 3 as well as upgrades along Main Street and Station Road in Carrigtwohill are required. These upgrades were included in the Carrigtwohill URDF Initiative - Public Realm Infrastructure Bundle which has Part 8 planning approval. The Western and Northern Services Corridor Link Roads, as proposed in the UEA Infrastructure, are also required.

For this level of development a significant modal shift from car journeys to public transport, cycling and walking is also required, in particular for local journeys. Interventions which are required to support the modal shift to public transport include the dual tracking of the Cork to Midleton railway, an increased frequency of trains on the Cork to Midleton railway line and a train station at Carrigtwohill West (all of which are included in the Cork Metropolitan Area Transport Strategy (CMATS – 2040). Dual tracking of the railway line is being progressed by Iarród Éireann.

Interventions which are required to support the modal shift to walking and cycling for local journeys, include the cycling and walking infrastructure included in the Carrigtwohill URDF Initiative – UEA Infrastructure as well as the Carrigtwohill URDF Initiative – Public Realm Infrastructure Bundle which has Part 8 planning approval. This cycling and walking infrastructure will result in a local network providing high quality cycling and walking connectivity to key destinations in Carrigtwohill including the train station, existing and future residential development, employment centres and educational facilities. This network will have connectivity to the Midleton to Dunkettle Inter-urban Cycle Route (IU-1) which will enable provide connectivity to employment areas such as Little Island (10,000+ employees) as well as Cork City.

If the above interventions are implemented as planned and result in a significant modal shift development beyond 1020 houses included in Phase 1 of the UEA will be feasible.

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