Chapter 05 Construction



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5 CONSTRUCTION

5.1 Introduction

This Chapter of the Environmental Impact Assessment Report (EIAR) describes the construction activities associated with the BusConnects Galway: Dublin Road scheme (hereafter referred to as the Proposed Development).

The design of the Proposed Development has been developed to a stage where potential environmental impacts can be identified, and a fully informed environmental impact assessment can be carried out.

Galway City Council (GCC) (the Employer for the construction works) shall set out the Employer's Requirements in the Construction Contract including all applicable mitigation measures identified in this EIAR, as well as additional measures required pursuant to conditions attached to any decision to grant approval. Procurement of the contractor will involve the determination that the appointed contractor is competent to carry out the works, including the effective implementation of the mitigation measures. The appointed contractor will be required to plan and construct the Proposed Development construction works in accordance with the Employer's Requirements, and GCC will employ an Employer's Representative team with appropriate competence to administer and monitor the construction contract for compliance with the Employer's Requirements.

To allow an assessment of the construction stage impacts associated with the Proposed Development, this chapter describes the construction phasing and programme as well as the construction activities necessary to undertake the works, including information on the construction compounds, construction plant and equipment. This chapter includes the following information:

- An overview of the Proposed Development is presented in Section 5.2;
- A programme for the Proposed Development is presented in Section 5.3;
- A general overview description of the construction methodology (i.e., how the Proposed Development will be built) is presented in Section 5.4;
- Construction methodology is presented in Section 5.5; and
- Details on construction environmental management aspects are presented in Section 5.6.

Details of mitigation measures proposed to address potential impacts arising from construction activities are described in Chapter 6 (Traffic & Transport) to Chapter 20 (Cumulative Impact & Environmental Interactions) as appropriate and are summarised in Chapter 21 (Summary of Mitigation & Monitoring Measures) of this EIAR.

A Construction Environmental Management Plan (CEMP) has also been prepared and is included as Appendix A5.1 in Volume 4 of this EIAR. The CEMP will be updated by GCC prior to the commencement of the Construction Phase, to include any additional measures required pursuant to conditions attached to any decision to grant approval. The CEMP has regard to the guidance contained in the National Roads Authority (NRA) (now Transport Infrastructure Ireland (TII)) Guidelines for the Creation, Implementation and Maintenance of an Environmental Operating Plan, and the handbook published by Construction Industry Research and Information Association (CIRIA) in the UK, Environmental Good Practice on Site Guide, 4th Edition (CIRIA 2015). All of the measures set out in the CEMP will be implemented in full.

5.2 Construction Phasing

For the construction phasing the Proposed Development has been split into three construction sections as detailed below and shown in Figure 5-1. The construction activities to be carried out in each section are described in Section 5.3.





- Section 1: East of Moneenageisha Junction to Skerritt Junction;
- Skerritt Junction; and
- Section 2: Skerritt Junction to Doughiska Road Junction.



Figure 5-1 Construction Phasing

5.3 Construction Programme

It is expected that construction will commence in 2026, subject to funding and approval. The construction works are anticipated to take approximately 24 months. The construction duration could potentially be reduced with additional resources.

In order to achieve the overall programme duration, it will, for the most part, be necessary to work on more than one section/sub-section at any one time. The programme has been prepared with a view to providing as much separation as practicable between sections under construction at any given time. This has been done in order to minimise traffic disruption and facilitate the ease of movement of sustainable modes, bus services and goods along the Proposed Development.

An indicative programme for the Proposed Development is provided in Table 5-1. It is envisaged that Skerritt Junction will be constructed during summer months insofar as possible in order to minimise traffic disruption.

Section	Duration												Mo	nth											
Reference	(Months)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Section 1	13																								
Skerritt Junction	6	_																							
Section 2	11																								

 Table 5-1 Proposed Development Construction Programme

5.4 Overview of Construction Works

An overview of the likely Proposed Development construction phasing and the necessary construction works associated with each section is outlined in the following sections below. This Section should be read in conjunction with the drawings listed in Table 5-2. These drawings are contained in Volume 3 of this EIAR.

For the majority of the works associated with the Proposed Development, it is envisaged that normal working hours will be followed. In specific circumstances, such as road crossings or road resurfacing, the works will be carried out at night.

The works on the proposed road development comprise of the installation of inbound and outbound bus lanes, reconfiguration of traffic movements to facilitate improved pedestrian, cyclist and bus accessibility and movement, and infrastructural works at certain roads and junctions as well as resurfacing of the roads for the length of the Proposed Development. This is to be achieved via a combination of carriageway



widening, repurposing of existing traffic lanes, and setting back the existing footpath. Additional land will be required throughout the Proposed Development to facilitate the widened cross section.

For the length of the Proposed Development, 2m wide footpaths, 2m wide cycle tracks and 3m wide bus lanes will be provided at both sides of the road. The construction and installation of the new footpaths (including reinstatement of existing footpaths) will comprise of a mix of in-situ concrete, concrete paving, concrete setts, and natural stone setts. Footpath widening works will require the existing footpaths to be broken out, and the bituminous layers of the road carriageway where widening is proposed to be removed, and the new widened footpath installed. This will require excavations of approximately 300mm of the existing road and footpaths. Carriageway widening works will require a full road buildup to be constructed and jointed to the existing adjacent carriageway.

Throughout the Proposed Development and where possible existing signage will be retained or relocated. Additional new signage will also be required at locations throughout the Proposed Development. Typical excavation depths for installation of new signage will be approximately 1.0m. New road markings will be applied throughout the Proposed Development following resurfacing works.

Drainage gullies will be relocated to the new kerb edge and will connect back to existing drainage or a new drainage network. Combined kerb and drainage systems will also be constructed for the collection of surface water. New petrol interceptors will be provided at the existing Lough Atalia outfall pipe, at the outfall pipe to Muton Island WWTP, at the connection to the existing network at Ballyloughane Road. An online attenuation tank system with flow controls shall provide attenuation, where a stormwater rising main pump, and proposed 225mm carrier drain shall convey network flows to an existing 1500mm Φ surface water main connection.

Works will involve the diversion of utilities where present. These will be either retained, protected, or diverted as required. All existing utilities that will be left in place will be protected during the construction works. The landscape works will involve the removal of existing trees and planting of new trees. Ducting for the proposed signalised pedestrian crossings will be trenched across the road.

Temporary traffic management will be required to accommodate these works, including temporary road closures, traffic diversions and narrowing the road to a one-way shuttle system to facilitate road crossing trenches, works through narrow pinch points at certain times and for the surfacing of the road.

Drawing Series Number	Description
BCGDR-BTL-SPW_ZZ-XX-DR-CR-00001-00003	Site Location Map and Site Location Plan
BCGDR-BTL-GEO_GA-XX-DR-CR-00000_00013	General Arrangement
BCGDR-BTL-GEO_HV-XX-DR-CR-00000-00011	Mainline Plan and Profile
BCGDR-BTL-GEO_CS-XX-DR-CR-00000_00006	Typical Cross Sections
BCGDR-BTL-ENV_LA-XX-DR-CE-00000_00011	Landscaping General Arrangement
BCGDR-BTL-SPW_BW-XX-DR-CR-00000-00011	Fencing and Boundary Treatment
BCGDR-BTL-TSM_KP-XX-DR-CR-00000-00011	Traffic Signs and Road Markings
BCGDR-BTL-DNG_RD-XX-DR-CD-00000_00011	Surface Water Drainage
BCGDR-BTL- XX_No_XX-DR-CD-06047-06050	Catchment Areas
BCGDR-BTL-DNG_RD-XX-DR-SE-00110	Attenuation Tank 1 General Arrangement
BCGDR-BTL-DNG_RD-XX-DR-SE-00111	Pump Station 1 Plan & Section
BCGDR-BTL-DNG_RD-XX-DR-SE-00120	Attenuation Tank 2 General Arrangement
BCGDR-BTL-DNG_RD-XX-DR-SE-00121	Pump Station 2 Plan & Section

Table 5-2 List of Relevant Drawings





Drawing Series Number	Description
BCGDR-BTL-UTL_UC-ZZ-DR-CU-00000-00011	Combined Existing Utilities Records
BCGDR-BTL-UTL_UW-ZZ-DR-CU-00000-00011	UE Water Asset Alterations
BCGDR-BTL-UTL_UE-ZZ-DR-CU-00000-00011	ESB Asset Alterations
BCGDR-BTL-UTL_UG-ZZ-DR-CU-00000-00011	GNI Asset Alterations
BCGDR-BTL-UTL_UL-ZZ-DR-CU-00020-00031	Telecommunications Asset Alterations
BCGDR-BTL-SPW_BW-XX-DR-SE-00101	Retaining Wall
BCGDR-BTL-LHT_RL-XX-DR-EO-00000_00011	Street Lighting

Further details on the design specifications, with regards to matters such as signalised junctions, priority junctions, bus stops, accessibility, traffic signals, lighting, utilities, drainage, pavement, and landscape design, can be found in Chapter 4 (Proposed Development Description) of this EIAR.

5.4.1 Section 1 - East of Moneenageisha Junction to Skerritt Junction

Section 1 encompasses a length of approximately 1500m along Dublin Road, between just East of Sáilín Road and Skerritt Junction. The construction activities at Section 1 will comprise pavement reconstruction and resurfacing of the roads, footpaths, and cycle tracks, and new kerbs. Construction activities will also consist of relocation and reconstruction of boundary walls and boundary fences, additional signage, new road markings, new and amended traffic signal infrastructure, new street furniture (rubbish bins, seats, lighting, benches, planters, bollards, bus stop (including shelters and information displays etc.) and landscaping works. Drainage gullies will be relocated to the new kerb edge and will connect back to existing drainage or a new drainage network. A heritage monument will be restored at the front of the Brothers of Charity site. Various utility diversions and/or protections will be required; including electricity overhead lines and underground cables, water distribution, gas mains and telecommunications infrastructure.

Additional lands for the proposed cross-section widening and construction of new footpaths and cycleways will be required. The following locations will be impacted by the additional land take for the Proposed Development:

- Greenspace and paved area outside of Brothers of Charity Services Galway;
- Greenspace by Wellpark Grove;
- Greenspace in The Connacht Hotel Car Park;
- Garden and driveway of 18 Dublin Road;
- Parking spaces outside of Duggan's Spar;
- Greenspace at Glenina Heights;
- Greenspace by Galwegians Rugby Football Club;
- Greenspace and a parking space in Flannery's Hotel Car Park;
- Industrial area to the west of Ballyloughane Road;
- Greenspace in Belmont; and
- Greenspace on both sides of Dublin Road at ATU Galway Campus.

Where greenspace land is needed for construction of footways and cycleways, the topsoil and subsoil will be removed and replaced with a layer of granular sub-base and surfacing.

The works in the Brothers of Charity will include demolition of two single-story buildings located just inside the existing boundary wall. The wall will also be demolished either side of the main entrance and will be rebuilt at the new boundary location reusing the stone from the existing wall. The existing boundary wall outside the Connacht Hotel will also be demolished and the stone reused in the new boundary treatment.

Raised tables will be provided to both entrances to the Brothers of Charity, to the Kia Car Dealership, the Londis, to Bathroom World, to the junction at Renmore Park Road, to the entrance to the Connacht Hotel,





to both entrances at the Glenina Heights estate, and to Flannery's Hotel. For the provision of entry treatments and the raised tables, the works will involve the milling of the top layer of surface course, application of bond coat and the construction of the entry treatment/raised table utilising bituminous materials.

The access to Belmont estate is proposed to be realigned to tie in with the Ballyloughane Road junction with a new signalised junction provided. The works for this realignment will include removal of topsoil and subsoil in the existing grassed area to allow for the new road construction. The redundant section of the former access will be broken up and areas restored as green space.

Additional bus stops will be provided outside ATU Galway Campus to provide for regional and intercity bus services.

Where boundary walls are impacted throughout Section 1, they will be rebuilt to match existing at the new boundary location.

5.4.2 Skerritt Junction

Skerritt Junction is proposed to be replaced with the construction of a new "cyclops" (Cycle Optimised Protected Signals) junction. The new junction is designed to separate pedestrians and cyclists from traffic, reducing the possibility of collisions or conflict. The works at Skerritt Junction will involve breaking up the existing roundabout and providing full depth construction for the new junction arrangement.

Construction activities will also consist of additional signage, new road markings, new and amended traffic signal infrastructure, drainage works, utility diversions and/or protections and landscaping works.

5.4.3 Section 2 - Skerritt Junction to Doughiska Road Junction

Section 2 extends approximately 2360m from the Skerritt Junction to west of the Martin junction at the eastern end the Proposed Development. Similar to Section 1, the construction activities will comprise pavement reconstruction and resurfacing of the roads, footpaths, and cycle tracks, new kerbs, the relocation and reconstruction of boundary walls and boundary fences, additional signage, new road markings, new and amended traffic signal infrastructure, new street furniture, landscaping works and utility diversions. Drainage gullies will be relocated to the new kerb edge and will connect back to existing drainage or a new drainage network.

Additional required land is primarily to the north of the existing R338. The land take impacts include:

- The southern boundary of the former Corrib Great Southern Hotel site (now derelict);
- Greenspace outside the Woodhaven Estate;
- HSE lands at Merlin Park Hospital;
- Agricultural land located adjacent to the Dublin Road to the east of Merlin Park; and
- Greenspace outside the Lios an Uisce Estate.

A retaining wall will be constructed along part of the boundary with the former Corrib Great Southern Hotel site to reduce impact on the site. Raised tables will be provided to the access at Woodhaven estate and the access to the Merlin Gate estate.

The junction of Dublin Road with Rosshill Road will be signalised. At the junction of Coast Road and Dublin Road, a new cycle link will be provided along the old Dublin Road alignment. Between the Coast Road junction and Doughiska Road junction a segregated two-way cycle lane will be provided on the northern side of Dublin Road.

The drainage works for Section 2 includes construction of trenches for short sections of attenuation pipes , two storm water holding tanks/pumping stations and surface water chambers. Combined kerbs and drainage systems will also be constructed at discrete locations.



5.5 Construction Methodology

This section provides an outline of how each element of the Proposed Development infrastructure will be constructed. It should be read in conjunction with the phasing set out in Section 5.2 and Section 5.3, and also with the traffic management stages set out in Section 5.7

5.5.1 Pre-Construction

GCC will prepare the Construction Contract documents, which will include all applicable mitigation measures identified in this EIAR, as well as any additional measures required in any conditions attached to An Bord Pleanála's decision, should they grant approval.

The preparations will also include the need for additional investigative survey works (such as ground investigation and slit trenching to confirm the location of existing utilities) to supplement the information in the Construction Contract documents. Any such additional investigative survey works that could be deemed to be construction activities will follow the requirements of the CEMP, where necessary.

GCC will also serve notices on impacted landowners in accordance with the requirements of the Compulsory Purchase Order (CPO) process to ensure necessary lands are available for the construction works.

5.5.2 Preparatory and Site Clearance Works

Additional preparations will be required prior to commencing the road upgrade works, to confirm the construction methodology, such as additional investigative survey works (such as confirmatory invasive species surveys, ground investigation and slit trenching to confirm the location of existing utilities).

There will be elements of preparatory works, including establishing the Construction Compound, demolition of buildings at the Brothers of Charity, other demolition works (e.g., such as boundary walls), installation of fencing and signage, vegetation clearance and treatment of non-native invasive species, etc. required in preparation for the main construction activities.

5.5.2.1 Land Acquisition and Boundary Treatment

Condition surveys of properties adjacent to the Proposed Development that the works have the potential to affect will be undertaken prior to works commencing. Liaison with impacted landowners will be carried out in advance of commencement of boundary works to properties.

Boundary works will be commenced where both permanent and temporary land acquisition is required to ensure that sufficient space is available to construct the Proposed Development. This will be a mixture of boundary walls / fencing along industrial / commercial land, railings along parks and temporary boundaries, as required. Any land temporarily acquired from a landowner will only be utilised for the purposes of undertaking boundary works or accommodation works related to the land in question.

Any lands acquired temporarily to facilitate construction work will be returned to landowners on completion of the works. Existing boundary walls or fencing being relocated will be constructed to match the existing conditions, unless otherwise agreed. The removal of trees, vegetation, lawns, paving etc will be minimised in so far as practicable.

5.5.2.2 Construction Traffic Management Measures and Signage

Prior to commencing the construction works temporary traffic management measures will be installed. The temporary traffic management measures, including measures for pedestrians, cyclists, public transport users, general traffic, proposed lane closures, road closures and diversions are discussed in detail in the Construction Traffic Management Plan (CTMP) in Appendix 5.1 CEMP in Volume 4 of this EIAR. Temporary traffic management signage will be put in place in accordance with the requirements of the Department of Transport's Traffic Signs Manual, Chapter 8, Temporary Traffic Measures and Signs for Roadworks (DTTS 2019), hereafter referred to as the Traffic Signs Manual.





5.5.2.3 Tree Protection

Trees to be retained within and adjoining the works areas will be suitably protected as necessary as per 'British Standard (BS) 5837:2012 Trees in Relation to Design, Demolition, and Construction' (British Standards Institution (BSI) 2012). Trees identified for removal will be removed in accordance with 'BS 3998:2010 Tree Work. Recommendations' (BSI 2010). The location of trees to be retained, and trees to be removed is shown on the Landscaping General Arrangement Drawings (BCGDR-BTL-ENV_LA-XX-DR-CE-00000 to 00011).

A suitably qualified arborist will be appointed by the contractor to monitor tree protection, and tree removal related activities. The design has been developed to ensure removal of trees has been minimised in so far as practicable. Where necessary, protective fencing will be erected, and mitigation measures will be put in place, prior to construction works commencing in the immediate vicinity.

Works required within the root protection areas of trees to be retained will follow the arboricultural methodology included in Appendix A16.1 Arboricultural Impact Assessment Report contained in Volume 4 of this EIAR. Further information on mitigation measures with regards to the removal, and protection of trees is provided in Chapter 12 (Biodiversity) and further information on the assessment of tree removal with regards to landscape and visual impact is provided in Chapter 16 (Landscape & Visual) of this EIAR.

5.5.2.4 Vegetation Clearance and Treatment of Non-Native Invasive Species

Vegetation (e.g. hedgerows, scrub, grassland) clearance and treatment of non-native invasive species (e.g. Japanese knotweed, Himalayan balsam, Giant hogweed) will be undertaken within the Proposed Development boundary, where necessary.

A suitably qualified specialist will be appointed by the contractor to monitor vegetation clearance, and treatment of non-native invasive species. Prior to construction, confirmatory invasive species surveys will be undertaken by the specialist to re-confirm the presence and/or extent of species within the footprint of the Proposed Development. Further information with regards to pre-construction ecological surveys and restrictions are provided in Chapter 12 (Biodiversity) of this EIAR. Vegetation identified for removal will be removed in accordance with BS 3998:2010 Tree Work. Recommendations (BSI 2010) and best arboricultural practices as detailed and monitored by the specialist. The Invasive Species Management Plan (ISMP) for the control of invasive plant species on the Proposed Development is included in Appendix A5.1 CEMP in Volume 4 of this EIAR.

5.5.2.5 Archaeological Investigations

GCC will procure the services of a suitably qualified archaeologist as part of its Employer's Representative team administering and monitoring the works. In addition, a suitably qualified archaeologist will be appointed by the contractor to monitor archaeological and cultural heritage matters during construction; to acquire any licenses / consents required to conduct the work, and to supervise and direct the archaeological measures associated with the Proposed Development in accordance with the Employer's Requirements.

In the event of archaeological features or material being uncovered during the Construction Phase, all machine work will cease in the immediate area to allow the archaeologist time to inspect and record any such material. Further information on archaeological management is included in Section 15.6 in Chapter 15 (Archaeological Cultural Heritage and Architectural Heritage) of this EIAR.

5.5.2.6 Ground Investigations

Prior to construction, localised confirmatory ground investigation will be undertaken where necessary by the appointed contractor. Information on the specific ground investigations conducted along the Proposed Development have been outlined in Chapter 14 (Land, Soils, Geology & Hydrogeology) of this EIAR.





5.5.2.7 Construction Compounds

As part of preparatory works, a Construction Compound will be set up which will include installation of the necessary facilities including the site office, welfare facilities, etc. Controlled access to the Construction Compound will be implemented, fencing will be erected, and lighting will be installed. The Construction Compound will be secured with Closed-Circuit Television (CCTV), where necessary, to ensure safe storage of all material, plant, and equipment. Further information on the Construction Compound is contained in Section 5.6.

5.5.2.8 Lighting

The majority of the Proposed Development is already artificially lit, however temporary lighting will be required at times along the Proposed Development at certain locations during the Construction Phase. Where it is necessary to disconnect public lighting during the construction works or to undertake works outside of daylight hours where the existing lighting is low, appropriate temporary lighting will be provided. Temporary lighting will also be installed at the Construction Compound for the duration of the Construction Phase.

The standard of temporary lighting installed during the Construction Phase will meet the standard of the existing carriageway and will be appropriate to the speed and volume of traffic during construction. Temporary construction lighting will generally be provided by tower mounted floodlights, which will be cowled and angled downwards to minimise spillage of light from the site.

New permanent lighting is proposed as part of the Proposed Development's lighting strategy, the details of which are addressed in Section 4.6 (Key Infrastructure Elements) in Chapter 4 (Proposed Development Description) of this EIAR.

5.5.2.9 Demolition

In some locations along the Proposed Development, items, such walls, gates, fencing, lighting poles, bus stops, etc., will need to be removed or demolished. The following structures will be demolished as part of the Proposed Development works:

Two single storey buildings at Brothers of Charity

Demolition will be carried out in a controlled manner, and under supervision. Demolition works areas will be appropriately hoarded and signposted. Appropriate mitigation measures will be used to minimise the generation of dust and noise from the demolitions – refer to Chapter 7 (Air Quality) and Chapter 9 (Noise & Vibration) of this EIAR.

The demolition works will also involve the removal of sections of existing stone boundary walls. All cut and dressed stone will be recorded (written, drawn, photographic) prior to and after removal. The salvaged stone will be catalogued, labelled, and stored at site temporary compound area and will be used to re-build the wall along the new site boundary on an as like basis.

The impacts of materials arising from the Proposed Development demolitions are assessed in Chapter 17 (Waste & Resources) of this EIAR. Measures for managing demolition materials are included in the Construction Demolition Resource Waste Management Plan (CDRWMP) in Appendix A5.1 CEMP in Volume 4 of this EIAR.

5.5.3 Road Works and Street Upgrades

5.5.3.1 General

The Proposed Development will be constructed in a manner which will minimise, as much as practicable, any disturbance to residents, businesses and road users. Road and street upgrade works will be completed in a staged manner, as described in Section 5.8.3, whereby traffic of all modes will be managed to ensure





construction can continue while ensuring the safety of all road users, and personnel, and maintaining flow of all modes of traffic wherever practicable.

5.5.3.2 Parking and Access

When roads and streets are being upgraded, there will be some temporary disruption / alterations to onstreet and off-street parking provision, and access to premises in certain locations along the Proposed Development. Local arrangements will be made on a case-by-case basis to maintain continued access to homes and businesses affected by the works, at all times, where practicable. Details regarding temporary access provisions will be discussed with homes and businesses prior to construction starting in the area. The duration of the works will vary from property to property, but access and egress will be maintained at all times, except for short durations to facilitate tie ins of services and road alignments. The location of temporary land acquisition, proposed accesses, and the relocation of existing accesses are shown in the Fencing and Boundary Treatment Drawings (BCGDR-BTL-SPW_BW-XX-DR-CR-00000-00011) in Volume 3 of this EIAR.

Access will be maintained for emergency vehicles along the Proposed Development, throughout the Construction Phase.

5.5.3.3 Earthworks

Topsoil and subsoil will be excavated as part of the Proposed Development; for foundations, bus stop shelters, signs, public lights, traffic signal poles, tree pits etc. This topsoil and subsoil may be temporarily stored at the Construction Compound for reuse where practicable, in line with the principles of circular economy.

The Proposed Development will aim to minimise the amount of materials brought onto the Proposed Development in so far as practicable. The acceptability of earthworks material for reuse will be determined, by testing and analysis, to determine if materials meet the specific engineering standards for their proposed end-use.

All earthworks will be managed having regard to the Transport Infrastructure Ireland (TII) Guidelines for the Management of Waste from National Road Construction Projects (TII 2017), and the Waste Management Act, 1996, as amended. The management of materials is discussed in Chapter 17 (Waste & Resources) of this EIAR. The overall estimated quantities of demolition, excavation, imported and recycled fill are outlined respectively in Table 17.7, Table 17.8, Table 17.9, Table 17.12 in Chapter 17 (Waste & Resources) of this EIAR.

5.5.3.4 Drainage

Adjustment or upgrade works will be required to service chambers and manholes, gullies, etc. Access manholes located in the footways will be lowered or raised to match the proposed carriageway levels, where the carriageway will be widened into the existing footways.

Specific controls and mitigation measures will be put in place to manage runoff and minimise pollution to receiving waterbodies during the Construction Phase of the Proposed Development. Further information with regards to drainage, and drainage design is included in Chapter 4 (Proposed Development Description), Chapter 13 (Water), Chapter 18 (Material Assets) and the Surface Water Management Plan (SWMP) in Appendix A5.1 CEMP in Volume 4 of this EIAR.

5.5.3.5 Utility Works

Realignment, upgrade or replacement of utilities and services will be required in conjunction with, or to accommodate the Proposed Development. Any such works to utilities and services will be along or immediately adjacent to the Proposed Development. A list of utility and service works along the Proposed Development is provided in Chapter 18 (Material Assets) of this EIAR. Utilities and services, including overhead and underground, comprise amongst others:





- Water mains;
- Storm water and foul sewers;
- Electricity ducts and cabling;
- Gas mains;
- Telecommunications and TV ducting and cabling; and
- Traffic signalling ducting and cabling.

Proposed utility works are based on available records and from a Ground Penetrating Radar (GPR) survey carried out in December 2022. Prior to excavation works being commenced, localised confirmatory surveys will be undertaken to verify the results of the preconstruction assessments undertaken and reported in this EIAR.

Areas to be excavated for utility trenches will first be traced for live services using established scanning techniques. Where necessary, trenches excavated for utility diversions will be supported to ensure that the sides of the excavation are secure. Each of the different utilities will be re-laid at a location, depth and spacing in accordance with the appropriate standards and the trench then backfilled.

5.5.3.6 Pavement and Carriageway Works

This section describes the pavement and carriageway works to be completed along the Proposed Development, including construction, or alterations to the carriageway, kerbs, parking and loading bays, footpaths, cycle tracks (cycle paths, cycle tracks, cycle lanes), bus stops (island, shared landing area, inline, layby), etc. The following options outline the pavement construction/reconstruction scenarios required along the Proposed Development:

- Where the existing road surfacing is showing signs of deterioration, the existing pavement will be replaced (i.e. road pavement and surfacing will be removed and replaced to similar levels as existing);
- Where the quality of the existing road pavement is poor or where the existing road will be widened, full depth road foundation and pavement reconstruction will be carried out; and
- In some instances, road overlay (i.e. the addition of new pavement/road surfacing material), with no
 excavation, will be provided.

Existing asphalt / bituminous layers will be removed using road planers, with plannings being recycled where practicable, as is common practice. Following this, existing lower courses of road make-up or ground will be excavated in layers using mechanical excavators in order to segregate materials for reuse, recycling, or disposal as appropriate, with materials being transported using lorries. The new or rehabilitated pavement will then be constructed from formation level, in coordination with the installation of street furniture assets. Plant used in construction of the new road make-up will be excavators, rollers, dumpers, and lorries, as detailed in Section 5.5.5. Specialist road paving machines will be used to lay bituminous layers. Road markings and reflective road studs will also be installed.

The choice of materials will include unbound or hydraulically bound granular materials for the foundation, hydraulically bound materials, hot or cold bituminous mixtures for base and binder layers and natural stone or concrete paving units, bituminous mixtures, or concrete materials for the surface. Specialist products such as high friction surfacing treatments will also be applied to the surface of the pavement where appropriate.

5.5.3.7 Traffic Signal Junctions

During the works, the existing traffic signals will remain in operation, supplemented as necessary by temporary traffic signals, until such time as the new signals become operational.

The existing signalised junctions along the Proposed Development will be upgraded to provide bus priority, enhanced pedestrian crossings, and segregated cycling facilities. In general, traffic signals will be replaced, and additional dedicated signals will be provided for buses, cyclists, and pedestrians. Underground works will be required to provide additional ducts for traffic signal electrical and telecommunication cables with





associated chambers and control boxes above ground. Additional traffic monitoring equipment will be provided, including closed circuit television (CCTV) cameras and other detectors.

5.5.3.8 Ancillary Road Furnishings

The appointed contractor will install street furniture such as rubbish bins, signage, seats, lighting, benches, planters, bollards, cycle racks and bus stops (including shelters and information displays etc.).

5.5.3.9 Landscaping

Where vegetation, grassed areas and hedgerows are disturbed during the works, these will be reinstated, and replaced, where practicable. New trees will be planted, in suitable tree pits, where necessary, at various locations as shown in the Landscaping General Arrangement Drawings (BCGDR-BTL-ENV_LA-XX-DR-CE-00000 00011) in Volume 3 of this EIAR.

5.5.3.10 Structural Work

The principal structural works which form part of the Proposed Development are summarised in Table 5-3. Further information on the structures along the Proposed Development is provided in the Retaining Structure drawing and Drainage drawing in Volume 3 of this EIAR.

Retaining walls with a retained height greater than 1.5m are classed as principal structures. There is one retaining wall to be constructed along the proposed route. Two number storm water holding tanks/pumping stations are proposed at low points in Section 2.

Table 5-3 Principal Structures

Structure Reference	Structure Name
BCGDR-BTL-SPW_BW-XX-DR-SE- 00101	Corrib Great Southern Site Retaining Wall
BCGDR-BTL-DNG_RD-XX-DR-SE- 00111	Pump Station Holding Tank No. 1
BCGDR-BTL-DNG_RD-XX-DR-SE- 00121	Pump Station Holding Tank No. 2

The retaining wall at the site of the former Corrib Great Southern Hotel is located along the northern boundary of the Dublin Road. A proposed new retaining wall (which retains a maximum level difference of approximately 2.0m) will be constructed along the proposed new boundary.

The existing ground will be stripped to formation level. Existing services will be diverted as required to enable wall construction. A side slope will be battered back to enable construction. Binding will be installed at formation level. Formwork and reinforcing steel for the wall will be fixed in place. Then concrete will be poured in sections and formwork removed after initial curing of concrete. After a sufficient curing period the area behind the wall will be backfilled.

This wall will have an exposed face of approximately 2.4m on the Dublin Road side.

5.5.4 Construction Site Decommissioning

On completion of construction, all construction facilities and equipment such as plant, materials, temporary signage, laydown areas, and the Construction Compound, etc. will be removed. The area which was occupied by the Construction Compound will be reinstated.





5.5.5 Construction Plant and Equipment

In order to assess a reasonable worst-case Construction Phase impact scenario, with regards to air quality, noise, and vibration, an estimate of construction plant and equipment that will be necessary to construct the Proposed Development has been prepared. The estimated peak daily numbers of principal items of plant and equipment working within a section is indicated in Table 5-4. It should be noted that these are peak daily numbers.

The appointed contractor will select and utilise plant and equipment in a manner that ensures Construction Noise Thresholds, as defined in Chapter 9 (Noise & Vibration) of this EIAR, are not exceeded. Refer to Chapter 7 (Air Quality) and Chapter 9 (Noise & Vibration) of this EIAR for the Construction Phase air quality and noise and vibration assessments, and associated mitigation measures.

Plant/Equipment	Section 1	Skerritt Junction	Section 2
Lorry	6	3	6
Backhoe Mounted Hydraulic Breaker	2	1	2
8t Excavator	2	1	2
13t (Rubber Wheeled) Excavator	1	1	1
16t (Rubber Wheeled) Excavator	2	1	2
6t Dumper	2	2	2
Road Planer	1	1	1
Road Sweeper	1	1	1
Asphalt Paver	1	1	1
Asphalt Roller	1	1	1
3t Roller	1	1	1
Mini Digger	2	1	2
Vibratory Roller	1	1	1

Table 5-4 Estimated Peak Daily Plant and Equipment Numbers

5.6 Construction Compounds

In order to construct the Proposed Development, the appointed contractor will require a Construction Compound from which they can manage the delivery of the Proposed Development.

The Construction Compound location has been selected due to the amount of available space and its locations relative to the Proposed Development major works and the access to the Regional and Local Road network.

It is anticipated that one construction compound will be utilised during the construction of the Proposed Development, the compound will be located on Dublin Road (adjacent to The Connacht Hotel) and is shown in Figure 5-2 below.





Figure 5-2 Location of Proposed Construction Compound

The Construction Compound is approximately 12,000m² in area and will contain site offices, and welfare facilities for GCC and contractor personnel. The location of the Construction Compound in relation to the Proposed Development is shown in Figure 5.1 in Volume 3 of this EIAR. Limited car parking will be allowed at this Construction Compound, in line with the principles of the Construction Stage Mobility Management Plan (CSMMP). The Construction Compound will be used to store materials for reuse such as topsoil, subsoil, concrete, rock etc., together with materials delivered to site for use in the construction of the Proposed Development, e.g. pipes and ducting. Items of plant and equipment will also be stored within this Construction Compound.

The Construction Compound will be engineered with appropriate services. Water, wastewater, power, and communications connections will be organised by the appointed contractor. At work areas along the Proposed Development, where permanent provisions (for the duration of the construction programme) are not practicable, appropriate temporary provisions will be made, including the use of generators if required. Temporary welfare facilities will need to be used, for example, portable toilets in the vicinity of works. Wastewater from temporary welfare facilities will be collected and disposed of to a suitably licenced facility.

All necessary authorisations, under the Waste Management Act 1996, as amended, will be obtained prior to undertaking temporary storage. Certain materials will be reused where practicable, primarily excavated material. Further information on the reuse of material within the Proposed Development is included in Chapter 17 (Waste & Resources) of this EIAR.

Appropriate environmental management measures will be implemented at the Construction Compound for example, to minimise the risk of fuel spillage, and to ensure that the Construction Compound and the approaches to them are appropriately maintained. Further information on the air quality, noise, vibration, and water related mitigation measures that will be implemented is included in Chapter 7 (Air Quality), Chapter 9 (Noise & Vibration) and Chapter 13 (Water) of this EIAR.





In addition, there are a number of mature sycamore and beech trees along the boundary of the proposed construction compound. These trees and their root zones will be properly protected and no entry by individuals or machinery into the root protection zone will be permitted while the site is in use. The root protection zone will not be used for storage of any kind and the tree protection fencing must be in place prior to commencement.

Regular inspection (of the tree protection fencing and root zones) will be undertaken by a qualified arborist and reports be submitted to GCC Parks Department, one prior to commencement of use and the remainder at regular interval during operational phase of the compound. The number of inspections and the report submission dates will be agreed with GCC.

Following completion of the construction works, the main Construction Compound areas will be cleared and reinstated to match pre-existing conditions.

The appointed contractor's Construction Traffic Management Plan (CTMP) shall include measures for managing traffic accessing and egressing the Construction Compounds.

5.7 Construction Traffic Management

The Construction Traffic Management Plan (CTMP) has been prepared to facilitate the assessment of the potential impacts on traffic and transport along the Proposed Development. The CTMP includes details of the temporary traffic management measures that will be implemented during the construction of the Proposed Development.

The staging of construction and associated temporary traffic management measures has considered the receiving environment when developing the schedule of works.

The CTMP has given due consideration to facilitate the maximum practicable movement of people during the Construction Phase through implementing the following hierarchy of transport mode users:

- Pedestrians;
- Cyclists;
- Public Transport; and
- General Traffic.

Access will be maintained for emergency vehicles along the Proposed Development, throughout the Construction Phase.

The construction traffic management measures have been developed in accordance with Chapter 8 of the Traffic Signs Manual (Department of Transport, Tourism and Sport 2019, as updated). Construction traffic management measures are summarised in Section 5.7.1 to Section 5.7.3, with further details (such as routing of construction vehicles, timings of material deliveries, etc.) included in the CTMP in Appendix A5.1 CEMP in Volume 4 of this EIAR.

5.7.1 Pedestrian and Cyclist Provisions

The measures set out in Section 8.2.8 of the Traffic Signs Manual (Department of Transport, Tourism and Sport 2019, as updated) will be implemented, wherever practicable, to ensure the safety of all road users, in particular pedestrians (including able-bodied pedestrians, wheel-chair users, mobility impaired pedestrians, pushchair users) and cyclists. Therefore, where footpaths or cycle facilities are affected by construction, a safe route will be provided past the works area, and where practicable, provisions for matching existing facilities for pedestrians and cyclists will be made. Where this is not practicable, pedestrians will be directed to use the footpath the opposite side of the road, crossing at controlled crossing points.





5.7.2 Public Transport Provisions

Existing public transport routes will be maintained throughout the duration of the Construction Phase of the Proposed Development (notwithstanding potential for occasional road closures/diversions as discussed in Section 5.7.3). Wherever practicable, bus services will be prioritised over general traffic. However, the temporary closure of sections of existing dedicated bus lanes will be required to facilitate the construction of new bus priority infrastructure that is being developed as part of the Proposed Development. Some existing bus stop locations will need to be temporarily relocated to accommodate the works. This will be done in discussion with the NTA, and service providers. In such cases, temporary bus stops will be safely accessible to all users and all temporary impacts on bus services will be determined in consultation with the NTA and the service providers.

5.7.3 General Traffic Provisions

The roads and streets along the Proposed Development, will remain open to general traffic wherever practicable during the Construction Phase; however, lane closures, road closures and diversions will be necessary to facilitate construction of the works.

These measures will be minimised wherever possible, they are likely to be short lived and only required for limited activities. Where necessary, road closures and diversions will take into consideration the impact on road users, residents, businesses, etc. Road closures and diversions will be carried out with regard to the Traffic Signs Manual. All road closures and diversions will be determined by the GCC, in consultation with An Garda Síochána, as necessary. Access will be maintained for emergency vehicles along the Proposed Development, throughout the Construction Phase.

The anticipated lane closures, road closures, and diversions that may be required during the Construction Phase of the Proposed Development, include those identified in Table 5-5.

Section Ref.	Estimated Construction Duration	Traffic Management Provision
Section 1	13	 One lane of traffic in each direction will be maintained along the Dublin Road Phased lane closures as required (i.e. lane narrowing or realignment of lanes) to facilitate the works.
Skerritt Junction	6	- Phased lane closures as required, such as lane narrowing or single lane closure, to facilitate the works (i.e. demolition of central island of roundabout and traffic islands, utilities / cable duct laying works, installation of kerb / tracks, etc.).
Section 2	11	 One lane of traffic in each direction will be maintained along the Dublin Road Phased lane closures as required (i.e. lane narrowing or realignment of lanes) to facilitate the works.

Table 5-5 Road Closures, Lane Closures and Diversions

Two-way traffic will generally be maintained along the Proposed Development, however in circumstances where there is not sufficient road width to allow two-way traffic (e.g. reduced lane width), single lane traffic controlled by a stop / go system of temporary traffic lights will be implemented with priority provided to traffic travelling towards the City Centre during the morning and reversed during the afternoon where appropriate. Lane closures and route diversions will supplement this system if traffic volumes are heavy. Delays may occur outside of the AM and PM peaks, for example as a result of vehicles accessing the works.

For most of the Proposed Development the existing carriageway width is sufficient to maintain full width twoway traffic throughout the works. However, where the carriageway width is restricted, at various sections throughout the Proposed Development the construction works will be split into traffic management stages as described below.





The existing carriageway layout will be maintained along the Proposed Development to facilitate existing traffic flows, where practicable, however at active construction works areas, the carriageway layout will be modified to provide sufficient space for construction works to be undertaken. The active construction works areas will be dictated by the construction programme. The traffic will be split into three traffic management stages (Stage A to Stage C) to facilitate the works as described in Section 5.7.3.1 to Section 5.7.3.3.

Stage A – Construction works on the northern side, traffic reduced to a single lane in each direction, and realigned to the south, as shown in Figure 5-3;

Stage B – Construction works on the southern side, traffic reduced to a single lane in each direction, and realigned to the north, as shown in Figure 5-4; and

Stage C – Finishing works undertaken out-of-hours, traffic reduced to a single lane shuttle working.

5.7.3.1 Stage A

To carry out Stage A works safely, traffic management will be implemented as shown in Figure 5-3, by means of narrowing the existing lanes carrying public transport and general traffic to 3.0m. A lateral safety zone will be implemented between the carriageway and the works area, with an appropriate safe distance as per Table 8.2.2.2 of the Traffic Signs Manual.



Figure 5-3 Work Area - Stage A

5.7.3.2 Stage B

Stage B commences following the completion of Stage A. Public transport, general traffic, pedestrians, and cyclists will be transferred to the opposite side of the carriageway to facilitate Stage B works. This stage will include the same methodology as outlined in Stage A, however carried out on the opposite side of the carriageway, as shown in Figure 5-4.







Figure 5-4 Work Area - Stage B

5.7.3.3 Stage C

Once Stage B is complete, Stage C will entail completion of the proposed final road surfacing. To maintain traffic movement at this stage, lane closures, road closures, or diversions will be implemented, as appropriate.

5.7.4 Interface with Other Projects

The likely timelines of the Proposed Development construction works have considered the potential for simultaneous construction of, and cumulative impacts with other infrastructure projects and developments which are proposed along, or in the vicinity of, the Proposed Development. The likely significant cumulative impacts caused by the Proposed Development in combination with other existing or planned projects were identified and assessed in Chapter 20 (Cumulative Impacts & Environmental Interactions) of this EIAR.

Interface liaison will take place on a case-by-case basis through GCC, as will be set out in the Construction Contract, to ensure that there is coordination between projects, that construction access locations remain unobstructed by the Proposed Development works and that any additional construction traffic mitigation measures required to deal with cumulative impacts are managed appropriately.

5.8 Construction Environmental Management

5.8.1 Construction Environmental Management Plan

As stated in Section 5.1, a Construction Environmental Management Plan (CEMP) has been prepared for the Proposed Development and is included as Appendix A5.1 in Volume 4 of this EIAR. The CEMP will be updated by GCC prior to finalising the Construction Contract documents for tender, so as to include any additional measures required pursuant to conditions attached to An Bord Pleanála's decision. It will be a condition of the Employer's Requirements that the successful contractor, immediately following appointment, must detail in the CEMP the manner in which it is intended to effectively implement all the applicable mitigation measures identified in this EIAR. The CEMP has regard to the guidance contained in the Guidelines for the Creation, Implementation and Maintenance of an Environmental Operating Plan (NRA 2007), and the handbook published by Construction Industry Research and Information Association (CIRIA) in the UK, Environmental Good Practice on Site Guide, 5th Edition (CIRIA 2023).

Details of mitigation measures proposed to address potential impacts arising from construction activities are described in Chapter 6 (Traffic & Transport) to Chapter 20 (Cumulative Impacts & Environmental Interactions) as appropriate and are summarised in Chapter 21 (Summary of Mitigation & Monitoring Measures) of this EIAR.





A number of sub-plans have also been prepared as part of the CEMP and these are summarised in the following sections. For the avoidance of doubt, all of the measures set out in the CEMP and the sub-plans appended to this EIAR will be implemented in full by the appointed contractor to the satisfaction of GCC.

5.8.1.1 Construction Traffic Management Plan

The CTMP has been prepared to demonstrate the manner in which the interface between the public and construction-related traffic will be managed and how vehicular movement will be controlled. It will be a condition of the Employer's Requirements that the successful appointed contractor, immediately following appointment, must detail in the CTMP the manner in which it is intended to effectively implement all the applicable mitigation measures identified in this EIAR and any additional measures required pursuant to conditions imposed by An Bord Pleanála, should they grant approval. Further details on the assessment of construction traffic, and traffic related mitigation measures are provided in Chapter 6 (Traffic & Transport) of this EIAR.

5.8.1.2 Invasive Species Management Plan

The Invasive Species Management Plan (ISMP) has been prepared which provides the strategy to be adopted in order to manage and prevent the spread of the non-native invasive plant species. Non-native invasive plant species were identified in close proximity to the Proposed Development during ecological surveys. It will be a condition of the Employer's Requirements that the successful appointed contractor, immediately following appointment, must detail in the ISMP how it is intended to complete the works in accordance with the Employer's Requirements, and will be subject to the GCC's approval. Further details on the assessment of non-native invasive species, and associated mitigation measures are provided in Chapter 12 (Biodiversity) of this EIAR.

5.8.1.3 Surface Water Management Plan

The SWMP has been prepared which details control and management measures for avoiding, preventing, or reducing any significant adverse impacts on the surface water environment during the Construction Phase of the Proposed Development. It will be a condition of the Employer's Requirements that the successful appointed contractor, immediately following appointment, must detail in the SWMP how it is intended to effectively implement all the applicable measures identified in this EIAR and any additional measures required pursuant to conditions imposed by An Bord Pleanála to any grant of approval.

5.8.1.4 Construction and Demolition Resource and Waste Management Plan

The Construction and Demolition Resource and Waste Management Plan (CDRWMP) has been prepared which provides the strategy that will be adopted in order to ensure that optimum levels of reduction, re-use and recycling are achieved. It will be a condition of the Employer's Requirements that the successful contractor, immediately following appointment, must detail in the CDRWMP the manner in which it is intended to effectively implement all the applicable mitigation measures identified in this EIAR and any additional measures required pursuant to conditions imposed by An Bord Pleanála to any grant of approval. Further details on waste management are provided in Chapter 17 (Waste & Resources) of this EIAR.

5.8.1.5 Environmental Incident Response Plan

The Environmental Incident Response Plan (EIRP) has been prepared to ensure that in the unlikely event of an incident (environmental, or non-environmental), response efforts are prompt, efficient, and suitable for the particular circumstances. The EIRP details the procedures to be undertaken in the event of a significant release of sediment into a watercourse, or a significant spillage of chemical, fuel or other hazardous substances (e.g. concrete), non-compliance incident with any permit or licence, or other such risks that could lead to a pollution incident, including flood risks. It will be a condition of the Employer's Requirements that the successful appointed contractor, immediately following appointment must detail in the EIRP, the manner in which it is intended to effectively implement all the applicable mitigation measures identified in this EIAR and any additional measures required pursuant to conditions imposed by An Bord Pleanála to any grant of approval.





5.8.2 Mitigation Measures

Mitigation and monitoring measures have been identified as environmental commitments and overarching requirements which shall avoid, reduce, or offset potential impacts which could arise throughout the Construction Phase of the Proposed Development. These mitigation and monitoring measures which are relevant to the Construction Phase of the Proposed Development are detailed in Chapter 6 to Chapter 20 and are summarised in Chapter 21 (Summary of Mitigation & Monitoring Measures) of this EIAR.

5.8.3 Working Hours

The construction working hours will be time restricted in accordance with the Construction Contract. Normal construction working hours will be restricted to between 07:00 and 19:00 on weekdays and between 08:00 and 14:00 on Saturdays.

Night-time and Sunday working will be required during certain periods to minimise the impact on road traffic movements during the daytime, for example at busy road junctions and in commercial areas, and for such works as pavement / road surfacing. The planning of such works will take consideration of sensitive receptors, in particular any nearby residential areas.

5.8.4 Personnel Numbers

Throughout the Construction Phase there will be some variation in the numbers of personnel working on site. It is anticipated there will be approximately 50 personnel directly employed across the Proposed Development, rising to 70 personnel at peak construction.

5.8.5 Construction Health and Safety

The requirements of the Safety, Health and Welfare at Work Act 2005 as amended, the Safety, Health, and Welfare at Work (Construction) Regulations, 2013 as amended and other relevant Irish and EU safety legislation will be complied with at all times. As required by the Regulations, a Health and Safety Plan will be formulated which will address health and safety issues from the design stages through to the completion of the Construction Phase. This plan will be reviewed as the Proposed Development progresses. The contents of the Health and Safety Plan will follow the requirements of the Regulations. In accordance with the Regulations, a "Project Supervisor Design Process" has been appointed and "Project Supervisor Construction Stage" will be appointed as appropriate.





5.9 References

British Standards Institution (2010). British Standard 3998:2010 Tree Work. Recommendations.

British Standards Institution (2012). British Standard 5837:2012 Trees in Relation to Design, Demolition, and Construction. Recommendations.

Construction Industry Research and Information Association (CIRA) (2023). Environmental Good Practice on Site Guide, 5th Edition.

Department of Transport, Tourism and Sport (2019). Chapter 8, Temporary Traffic Measures and Signs for Roadworks, Traffic Signs Manual.

Transport Infrastructure Ireland (2007). Guidelines for the Creation, Implementation and Maintenance of an Environmental Operating Plan.

Transport Infrastructure Ireland (2017). The Management of Waste from National Road Construction Projects.

Directives and Legislation

Safety, Health, and Welfare at Work (Construction) Regulations 2013, as amended.

Safety, Health, and Welfare at Work Act 2005, as amended.

Waste Management Act 1996, as amended.

